# UNMANAGED FORAGE FISH INITIATIVE

In April 2013, the Council adopted a Pacific Coast Fishery Ecosystem Plan (FEP) for the U.S. Portion of the California Current Large Marine Ecosystem as a vehicle for bringing ecosystem-based principles into the Council decision-making process under its existing Fishery Management Plans (FMPs). At the same time, the Council adopted an Ecosystem Initiatives Appendix, which provides examples of how the Council could address issues that affect two or more Council FMPs or coordinate major Council policies across the FMPs to fulfill identified FEP needs.

Initiative 1 is intended to recognize the importance of forage fish to the marine ecosystem off of the U.S. West Coast, and to provide adequate protection for forage fish. The Council is not pursuing a permanent moratorium on fishing for forage fish. Instead, the Council's objective is to prohibit the development of new directed fisheries on forage species that are not currently managed by the Council, or the States, until the Council has had an adequate opportunity to assess the science relating to any proposed fishery and any potential impacts to existing fisheries and communities.

At its April 2014 meeting, the Council chose a preliminary preferred alternative, Alternative 2, which would result in all four of the Council's FMPs being amended to bring unfished and unmanaged forage fish species into the FMPs as ecosystem component species. This multi- FMP amendment will be known as Comprehensive Ecosystem-Based Amendment 1 (CEBA 1) and will include these FMP amendments: Amendment 15 to the Coastal Pelagic Species FMP, Amendment 25 to the Pacific Coast Groundfish FMP, Amendment 3 to the Highly Migratory Species FMP, and Amendment 19 to the Pacific Coast Salmon FMP.

In response to Council guidance in April, the *ad hoc* Ecosystem Workgroup (EWG) has prepared a summary report (Agenda Item H.1.a, EWG Summary Report) and a draft Environmental Assessment for CEBA-1 (Agenda Item H.1.a, Attachment 1) that updates the list of forage fish species, revises the alternatives to address incidental take, provides draft FMP amendment language for each of the four FMPs, and proposes a new Council Operating Procedure regarding exempted fishing permits for forage fish species. At this meeting, the Council is scheduled to affirm a preliminary preferred alternative, adopt public review draft amendment language, and consider a new Council Operating Procedure. The Council is scheduled to take final action and adopt a final preferred alternative for this initiative at its March 2015 meeting in Vancouver, WA.

**Council Action:**

1. **Adopt a Preliminary Preferred Alternative.**
2. **Adopt public review draft FMP amendment language.**

Reference Materials:

1. Agenda Item H.1.a, Attachment 1; Comprehensive Ecosystem-Based Amendment 1: Protecting Unfished and Unmanaged Forage Fish Species.
2. Agenda Item H.1.b, Ecosystem Workgroup Report; Ecosystem Workgroup Summary Report on the Unmanaged Forage Fish Protection Initiative.
3. Agenda Item H.1.b, Supplemental Ecosystem Advisory Subpanel Report.
4. Agenda Item H.1.c, Public Comment.

Agenda Order:

a. Agenda Item Overview — Mike Burner
b. Reports and Comments of Advisory Bodies and Management Entities
c. Public Comment
d. **Council Action:** Adopt Preliminary Preferred Alternative and Public Review Draft Amendment Language for Incorporating Protection to Unmanaged Forage Fish in Council Fishery Management Plans

PFMC
8/21/14

# COMPREHENSIVE ECOSYSTEM-BASED AMENDMENT 1: PROTECTING UNFISHED AND UNMANAGED FORAGE FISH SPECIES

## OF THE U.S. PORTION OF THE CALIFORNIA CURRENT ECOSYSTEM

**DRAFT ENVIRONMENTAL ASSESSMENT FOR**

**AMENDMENT 15 TO THE COASTAL PELAGIC SPECIES FISHERY MANAGEMENT PLAN**
**AMENDMENT 25 TO THE PACIFIC COAST GROUNDFISH FISHERY MANAGEMENT PLAN**
**AMENDMENT 3 TO THE HIGHLY MIGRATORY SPECIES FISHERY MANAGEMENT PLAN**
**AND AMENDMENT 19 TO THE PACIFIC COAST SALMON FISHERY MANAGEMENT PLAN**

**PACIFIC FISHERY MANAGEMENT COUNCIL**
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**AUGUST 2014**

## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| CalCOFI | California Cooperative Oceanic Fisheries Investigations |
| CCE | California Current Ecosystem, or California Current Large Marine Ecosystem |
| CDFG | California Department of Fish and Game (documents prior to January 1, 2013) |
| CDFW | California Department of Fish and Wildlife (present agency name) |
| CEQ | Council on Environmental Quality (of the White House) |
| CFR | Code of Federal Regulations |
| COP | Council Operating Procedure |
| Council | Pacific Fishery Management Council |
| CPS | Coastal Pelagic Species |
| EC | Ecosystem component (species) |
| EEZ | Exclusive Economic Zone |
| EFH | Essential Fish Habitat |
| EFP | Experimental Fishing Permit |
| ESA | Endangered Species Act |
| FEP | Fishery Ecosystem Plan |
| FMP | Fishery Management Plan |
| FMU | Fishery management unit |
| FONSI | Finding of No Significant Impact |
| HMS | Highly Migratory Species |
| MSA | Magnuson-Stevens Fishery Conservation and Management Act |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| ODFW | Oregon Department of Fish and Wildlife |
| OY | Optimum yield |
| RIR | Regulatory Impact Review |
| SAFE Report | Stock Assessment and Fishery Evaluation Report |
| U.S. | United States of America |
| WDFW | Washington Department of Fish and Wildlife |

Document cover image – Blue Marble: Next Generation, Reto Stöckli, NASA Earth Observatory

# Contents

# 1.0 Introduction

The Pacific Fishery Management Council (Council) adopted a Fishery Ecosystem Plan (FEP) and FEP appendix in April 2013 (PFMC 2013). From its *Purpose and Need Statement*, the FEP is intended in part to provide "management policies that coordinate Council management across its Fishery Management Plans (FMPs) and the California Current Ecosystem (CCE)." For FMP policies, the FEP is needed to "identify and prioritize research needs and provide recommendations to address gaps in ecosystem knowledge and FMP policies, particularly with respect to the cumulative effects of fisheries management on marine ecosystems and fishing communities." The FEP's appendix provides a series of example ecosystem-based fishery management initiatives exploring how the Council could address issues that affect two or more Council FMPs or coordinate major Council policies across the FMPs to fulfill identified FEP needs. Concurrent with the adoption of its FEP, the Council also began planning this Ecosystem Initiative 1, which is intended to implement the Council's policy on protection for forage fish species that are unfished and unmanaged in Federal waters off the U.S. West Coast.

At its April 2014 meeting, the Council chose a preliminary preferred alternative for this action, Alternative 2, which would result in all four of the Council's FMPs being amended to bring unfished and unmanaged forage fish species into the FMPs as ecosystem component (EC) species. This multi-FMP amendment will be known as Comprehensive Ecosystem-Based Amendment 1 (CEBA 1) and will include these FMP amendments: Amendment 15 to the Coastal Pelagic Species (CPS) FMP, Amendment 25 to the Pacific Coast Groundfish FMP, Amendment 3 to the Highly Migratory Species (HMS) FMP, and Amendment 19 to the Pacific Coast Salmon FMP.

The following species and species groups are under Council consideration to become EC species shared between all four of the Council's FMPs:

- Round herring (*Etrumeus teres*) and thread herring (*Opisthonema libertate* and *O. medirastre*)
- Mesopelagic fishes of the families *Myctophidae, Bathylagidae, Paralepididae,* and *Gonostomatidae*
- Pacific sand lance (*Ammodytes hexapterus*)
- Pacific saury (*Cololabis saira*)
- Silversides (family *Atherinopsidae*)
- Smelts of the family *Osmeridae*
- Pelagic squids (families: *Cranchiidae, Gonatidae, Histioteuthidae, Octopoteuthidae, Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*), *Onychoteuthidae, and Thysanoteuthidae*)

Throughout this document, this group of species is collectively referred to as the "Shared EC Species."

## 1.1 How this document is organized

This document includes required elements of a National Environmental Policy Act (NEPA) analysis and responses to the Council's April 2013, September 2013, and April 2014 directions on the action. This document will evolve along with Council direction on the action, meaning that sections may be added, removed, or amended over time. Chapter 1 of this document describes the document's organization, provides the Purpose and Need, and outlines a schedule and process for action. Chapter 2 discusses the no action alternative, the action alternatives and the alternatives eliminated from further consideration. Chapter 3 describes the current physical, biological, and socio-economic environments relevant to the action. Chapter 4 discusses the potential effects of the alternatives. Chapter 5 addresses the action's consistency with FMPs and applicable laws. Chapter 6 addresses the action's consistency with NEPA.

Chapter 7 provides draft FMP amendatory language and a draft Council Operating Procedure (COP) for review and consideration by the Council, its advisory bodies, and the public. Sources cited throughout the document are listed in Chapter 8. The appendix provides the Council's policy on the development of new fisheries for unfished species from Section A.1.1 of the FEP Appendix.

## 1.2 Purpose and Need

At its April 2014 meeting, the Council adopted the following Statement of Purpose and Need for this action:

> *The purpose of this action is to prohibit new directed commercial fishing in Federal waters on unmanaged, unfished forage fish species until the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. This action is needed to proactively protect unmanaged, unfished forage fish of the U.S. West Coast Exclusive Economic Zone (EEZ) in recognition of the importance of these forage fish to the species managed under the Council's FMPs and to the larger CCE. This action is not intended to supersede tribal or state fishery management for these species, and coordination would still occur through the existing Council process.*

## 1.3 Schedule and Process for Developing CEBA 1

CEBA 1 will bring new species into the Council's four FMPs, requiring FMP amendments for each of the FMPs. Each of the Council's FMPs requires that the Council follow public notice and comment processes to develop and consider amendments to the FMPs. The Council has adopted a process for CEBA 1 intended to meet all four of the FMPs' requirements for Council processes to develop, consider, and adopt FMP amendments.

*1st Council meeting (September 2013)*: review a draft process and schedule for FMP amendment(s) to add new species to applicable FMP(s) and provide guidance to the Ecosystem Workgroup on future reports to the Council.

*2nd Council meeting (April 2014)*: review list of potential species to be added to FMP(s), review ecological, biological, economic and other data on the role of species as forage and potential for the development of fisheries on those species in the CCE, adopt preliminary preferred and other alternatives for review and comment, adopt process and schedule for potential draft FMP amendment(s).

*3rd Council meeting (September 2014)*: review CEBA 1 analysis document and recommend any changes or additional analysis; review draft FMP amendatory language, revise as needed, and, after the meeting, send analysis document and FMP amendatory language out for public review.

*4th Council meeting (March 2015, tentative)*: Review and either adopt final FMP amendatory language, or revise and send language out for an additional round of review and comment by advisory bodies and the public. If an additional round of review and comment is needed, a 5th Council meeting will be needed to finalize Council recommendations to the National Marine Fisheries Service (NMFS).

*1st **Federal Register** Notice*: NMFS publishes a Notice of Availability for an FMP amendment for the appropriate FMP(s).

*2nd **Federal Register** Notice*: NMFS publishes Council recommendations as proposed rule.

*3rd **Federal Register** Notice*: NMFS publishes a final rule if it partially or fully approves the Council's recommendations to amend the FMPs and Federal regulations.

As stated in Section 1.0, CEBA 1 includes the following FMP amendments: Amendment 15 to the CPS FMP, Amendment 25 to the Groundfish FMP, Amendment 3 to the HMS FMP, and Amendment 19 to the Salmon FMP. CEBA 1 would amend the Council's FMPs as follows, and as detailed in Chapter 7, *Draft FMP Amendatory Language*:

***CPS FMP***

Amendment 15 to the CPS FMP, detailed in Section 7.1 of this document, would amend these sections of the FMP:

- 1.1 *History of the Fishery Management Plan* updated to briefly describe Amendment 15
- 1.2 *Stocks in the Fishery Management Plan* amended to add Shared EC Species
- 1.4 *Ecosystem Component Species* amended to add prohibition language for Shared EC Species
- 2.2.8 *Exempted Fishing* updated to reference potential exempted fishing permits (EFPs) for Shared EC Species
- 5.1.7 *Incidental Catch Allowance for Shared EC Species*, new section to describe potential incidental allowances for Shared EC Species

***Groundfish FMP***

Amendment 25 to the Groundfish FMP, detailed in Section 7.2 of this document, would amend these sections of the FMP:

- Section 1.1 *History of the FMP* updated to briefly describe Amendment 25
- Section 1.2 *How This Document is Organized* amended at the description of Chapter 3 of the FMP to add mention of EC species, in addition to the fishery management unit (FMU) species already mentioned
- Section 2.2 *Operational Definition of Terms* amended to revise the definition of "Ecosystem Component Species" to include EC species that are shared between to all four FMPs
- Section 3.1 *Species Managed by this Fishery Management Plan* amended to include Shared EC Species
- Section 4.4.4 *Ecosystem Component Stocks Without OFL Values* amended to add a paragraph on Shared EC Species
- Section 6.5.2.1 *Endangered Species Act Species* amended to add a sentence on eulachon
- Chapter 8 *Experimental Fisheries* amended to reference potential EFPs for Shared EC Species

***Highly Migratory Species (HMS) FMP:***

Amendment 3 to the HMS FMP, detailed in Section 7.3 of this document, would amend these sections of the FMP:

- Section 1.1 *Purpose of This Document* updated to briefly describe Amendment 3
- Section 3.3 *Species Included in the FMP as Ecosystem Component Species* amended to include Shared EC Species

- Section 6.1.11 *Exempted Fishing Permits* amended to reference potential EFPs for Shared EC Species

***Salmon FMP***

Amendment 19 to the Salmon FMP, detailed in Section 7.4 of this document, would amend these sections of the FMP:

- *Introduction, Table 1, and Section 1* updated to briefly describe Amendment 19
- 1.1 *Stock Classification and Table 1-4* amended to include Shared EC Species in the FMP
- 1.4 *Ecosystem Component Species* amended to add prohibition language for Shared EC Species
- 6.6.6 *Experimental Fishing* updated to reference potential EFPs for Shared EC Species

# 2.0 Description of Alternatives

Between April 2013 and April 2014, the Council considered a variety of processes and options for action alternatives that would meet its Statement of Purpose and Need (Section 1.2). At the April 2014 meeting, the Council adopted a range of alternatives for analysis, rejected some previously considered alternatives from further consideration (Section 2.2), and adopted a preliminary preferred alternative, Alternative 2. At that meeting, the Council also asked the Ecosystem Workgroup to report back in September 2014 with options for defining minimal catch levels for the group of lower trophic level species subject to this action (referred to herein as "Shared EC Species") and for providing for incidental catch levels of these species. To explore different approaches to retaining or discarding incidentally-caught Shared EC Species and to solicit public comment and guidance from the Council and its advisory bodies, the Ecosystem Workgroup recommends adding Alternative 3 to this analysis – see Section 2.1.3.

## 2.1 Alternatives

In developing these alternatives, the Council reviewed, among other items: Amendment 12 to the CPS FMP to prohibit the harvest of krill within the U.S. West Coast EEZ; the South Atlantic Fishery Management Council's Comprehensive Ecosystem-Based Amendment analysis and regulatory processes; and the North Pacific Fishery Management Council's regulation of forage fish species in its Arctic FMP and in its Groundfish FMPs for the Bering Sea and Aleutian Islands and for the Gulf of Alaska. Alternative 1 is the No Action alternative, which is to protect Shared EC Species through the Council's September 2013 recommendations to narrow the range of gear types and fisheries allowed for use within the U.S. West Coast EEZ without prior Council consultation. Alternative 2 (Preferred) is to use a comprehensive FMP amendment process to bring certain forage fish into the FMPs as EC species to prohibit new directed commercial fishing in Federal waters on unmanaged, unfished forage fish species until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.

At its April 2014 meeting, the Council asked the Ecosystem Workgroup to explore opportunities for allowing existing fisheries to continue to retain the historically small amounts of Shared EC Species that have been taken from the EEZ, while restricting the future development of large-scale fisheries to target these species. To meet that direction and to ensure that this EA would adequately explore the potential effects of allowing or not allowing fisheries retention of Shared EC Species at historical levels, the Ecosystem Workgroup developed an additional action alternative for analysis. Like Alternative 2, Alternative 3 would also use a comprehensive FMP amendment process to bring the same forage fish species into the FMPs as Shared EC Species to prohibit new directed commercial fishing on those species in Federal waters. However, under Alternative 3, fisheries participants would be prohibited from retaining or landing these species when they are taken in the EEZ.

Under Alternative 2 or 3, the species listed in Section 1.0 and described in Section 3.2.1 would be added to all of the FMPs as Shared EC Species. Federal regulations at 50 CFR 600.310(d)(5) provide details on classifying species as EC species, saying that those species should:

> (A) Be a non-target species or non-target stock;
> (B) Not be determined to be subject to overfishing, approaching overfished, or overfished;
> (C) Not likely to become subject to overfishing or overfished, according to the best available information, in the absence of conservation and management measures; and
> (D) Not generally be retained for sale or personal use.

Shared EC Species meet these qualifications for all fisheries in Federal waters. Some Shared EC Species, particularly the osmerid smelts, are subject to artisanal commercial and small recreational fisheries within state waters, primarily within the surf zone. One of the Shared EC Species, eulachon, is an osmerid smelt listed as threatened under the Endangered Species Act (ESA). Under any of the alternatives, a directed fishery for eulachon could not develop without advance NMFS assessment for compliance with the eulachon recovery plan (NMFS 2013a) and other ESA requirements.

### 2.1.1 Alternative 1 (No Action Alternative) – Federal List of Authorized Fisheries and Gear

Under the No Action alternative, Alternative 1, fishing within the EEZ for species that are not managed under a Council FMP or a state management program is governed by the Federal list of authorized fisheries and gear at 50 CFR 600.725(v). The list of authorized fisheries and gear specifies those fisheries and gears that are authorized to operate within an EEZ, but does not prohibit new fisheries from emerging. Rather, it requires that persons wanting to develop new fisheries notify the Council, so that the Council has an opportunity to comment on, develop a regulatory plan for, or recommend that NMFS prohibit the proposed fishery as it deems appropriate.

A person wanting to begin a new fishery that is not listed in 50 CFR 600.725 must first notify the relevant fishery management council or its Director. If the council or its Director receives a complete notification, then "a signed return receipt for the notice serves as adequate evidence of the date that the notification was received by the appropriate Council and establishes the beginning of the 90-day notification period, unless required information in the notification is incomplete" (50 CFR 600.747(c)(2)(i)). More information on what constitutes a complete notification under Federal regulations is available at 50 CFR 600.747(c)(2).

At its September 2013 meeting, the Council finalized its recommendations to update the portion of that list that applies to the EEZ off the U.S. West Coast. These recommendations would explicitly remove Pacific saury, a Shared EC Species, from the list of species that could be fished without prior notification to the Council. The Council's recommendations would also explicitly remove all commercial net gear from those gears that are generally available for use in new fisheries that could develop within the U.S. West Coast EEZ without prior notification of the Council. Its rationale for requiring advance Council consultation on new uses of net gear (e.g. trawl, seine, gillnet, trammel net) was that those are the gear types that are used to fish for the Shared EC Species and their analogs in other parts of the world. NMFS published a proposed rule to implement the Council's recommendations on August 7, 2014 (79 FR 46214).

Under Alternative 1, anyone wanting to begin a new fishery for one of the Shared EC Species could follow the process described in Federal regulations at 50 CFR §§ 600.725 and 600.747 to initiate that fishery. In other words, the no action alternative would give new fisheries the opportunity to begin after the passage of the 90-day notification period. The Council could recommend new regulations, including complete prohibition, for the new fishery at any time during or after the 90-day notification period.

### 2.1.2 Alternative 2 (Preferred) – Bring Species into FMPs and Prevent Future Fisheries from Developing Without Scientific Information on Harvest Sustainability and Potential Ecological Effects, *Incidental Retention Allowed*

Under this alternative, the Council will use a comprehensive FMP amendment process to bring Shared EC Species into the FMPs as EC species and to prohibit new directed commercial fishing in Federal waters on them until the Council has had adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the

greater marine ecosystem. No new directed fishing could begin for these species without a Council process to develop an EFP. As allowed for krill, Shared EC Species could continue to be taken incidentally and landed or discarded without violating Federal regulations, unless regulated or restricted for other purposes, such as with bycatch minimization regulations for eulachon recovery. No long-term directed EEZ fisheries would be possible for these species without some future FMP amendment to specify the targeted species as an FMU species and to meet MSA requirements for FMU species, which include: developing harvest specifications, identifying EFH for the species, and providing gear specifications for the fishery.

Under Alternative 2, all of the Shared EC Species would be identified in all four FMPs as EC species, to recognize that, as a group, these species serve as prey for many CCE predators, including FMP species. Shared EC Species would be identified in the FMPs as EC species under 50 CFR 600.310(d)(5)(iii) to address "other ecosystem issues," because these species are the broadly used prey of marine mammal, seabird, and fish species in the U.S. West Coast EEZ. Shared EC Species are among the known prey of FMU species of all four of the Council's FMPs; therefore, Shared EC Species support predator species' growth and development and may also be identified as EC species under 50 CFR 600.310(d)(5)(iii) "for ecosystem considerations related to specification of optimum yield for the associated fishery."

### 2.1.3 Alternative 3 – Bring Species into FMPs and Prevent Future Fisheries from Developing Without Scientific Information on Harvest Sustainability and Potential Ecological Effects, *Incidental Retention Prohibited*

Under this alternative, the Council would also use a comprehensive FMP amendment process to bring Shared EC Species into the FMPs as EC species and prohibit new directed commercial fishing in Federal waters on these species until the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. No new directed fishing could begin for these species without a Council process to develop an EFP. Shared EC Species could continue to be taken incidentally **but must be discarded at sea**, unless regulated or restricted for other purposes, such as with bycatch minimization regulations for eulachon recovery. No long-term directed EEZ fisheries would be possible for these species without some future FMP amendment to: specify the targeted species as an FMU species, develop harvest specifications and identify EFH for that species, and provide gear specifications for the species.

Under Alternative 3, all of the Shared EC Species would be identified in all four FMPs as EC species, to recognize that, as a group, these species serve as prey for many CCE predators, including FMP species. Shared EC Species will be identified in the FMPs as EC species under 50 CFR 600.310(d)(5)(iii) to address "other ecosystem issues," because these species are the broadly used prey of marine mammal, seabird, and fish species in the U.S. West Coast EEZ. Shared EC Species are among the known prey of FMU species of all four of the Council's FMPs; therefore, Shared EC Species support predator species' growth and development and may also be identified as EC species under 50 CFR 600.310(d)(5)(iii) "for ecosystem considerations related to specification of optimum yield for the associated fishery."

## 2.2 Alternatives Considered But Rejected from Further Analysis

At its September 2013 meeting, the Council established the list of species it wanted to consider under this action. The Council explicitly decided to not include American shad (*Alosa sapidissima*) in this action, despite its role as forage within the CCE. American shad is an introduced species, and the Council determined that it did not need to extend protections to non-native forage species. The Council also considered, but rejected, the possibility of including Pacific tomcod (*Microgadus proximus*) and small croakers (*Sciaenidae*) in this action. Both tomcod and croakers are native to the CCE; however, they are

also both predominantly or exclusively nearshore species that are not thought to range into the EEZ, which is the Council's geographic area of authority.

At its April 2014 meeting, the Council confirmed the range of alternatives for this action and rejected the alternatives in this section from further consideration. At that meeting, the Council considered three different pathways for developing Alternative 2, above, each of which would have brought different species into the FMPs using different criteria. The Council rejected a pathway that would have brought particular species into the FMPs where FMP fisheries might take those species incidentally, or where those species could be taken by fishing gear similar to gear authorized for use under the FMPs. Not all of the Shared EC Species are taken as bycatch in FMP fisheries; therefore, the Council determined that the connections between Shared EC Species and FMP gear and fisheries were not strong enough to support that pathway. The Council also rejected a pathway that would have brought particular species only into the FMPs that managed predator species that prey upon those species. Each of the Shared EC Species or species groups are preyed upon by predator species harvested in Council-managed fisheries, and most Shared EC Species are prey for predators managed under more than one FMP. The Council determined that bringing all of the Shared EC Species into all of the FMPs to acknowledge their broad trophic role as the prey of Council-managed fish species and other predators (Alternatives 2 and 3) would have the benefit of explicitly acknowledging connections between FMP species and Shared EC Species, while also accounting for other predators within the CCE ecosystem. The Council did not choose to develop either of the rejected pathways as a stand-alone alternatives because all three of the pathways, including the adopted pathway for Alternatives 2 and 3, would have had the same effects on the environment and thus did not differ from each other in any measurable way.

### 2.2.1 Bring All Shared EC Species into the CPS FMP as FMU species

Krill is an FMU species in the CPS FMP. In Council discussions prior to the development of the FEP, the Council had considered bringing other forage species into the CPS FMP as FMU species, but rejected this alternative because not all of the Shared EC Species could be connected to the CPS FMP as either prey of FMP species or as bycatch taken in FMP fisheries. The lack of connection between some Shared EC Species and the CPS FMP also caused the Council to reject the idea of including all of the Shared EC Species as EC species only within the CPS FMP. In other words, the Shared EC Species are not all components of the CPS fishery; therefore, they cannot be EC species of just that FMP. By including all of the Shared EC Species in all of the FMPs, the FMPs collectively acknowledge the connections among Shared EC Species, FMP species, and the larger ecosystem.

### 2.2.2 Convert the FEP to an EFMP

One alternative for accomplishing the Council's Purpose of and Need for Action would be to convert the FEP to an Ecosystem FMP, and to amend the CPS FMP to move krill from that FMP into the Ecosystem FMP. In an Ecosystem FMP, krill could serve as the sole FMU species, and the species subject to this action could be EC species. Similar to the North Pacific Fishery Management Council's Arctic FMP, the Ecosystem FMP would prohibit all commercial harvest of these species until and unless sufficient information is available to manage sustainable harvest for those species. The Shared EC Species would be identified as EC under 50 CFR 600.310(d)(5)(iii) to address "other ecosystem issues," because these species are broadly used prey of marine mammal, seabird, and fish species of the U.S. West Coast EEZ. For any fishery to develop on any of these species, the targeted species would need to be moved to one of the Council's species group FMPs, where that species would be identified as an FMU species, with harvest specifications, EFH, gear specifications and other management measures.

During the development of its FEP, the Council considered the possibility of creating an Ecosystem FMP with regulatory authority, but rejected that option because doing so would have added an unnecessary administrative and regulatory layer to the Council's management processes. This "considered but rejected" alternative is referenced in this document to illustrate how forage fish management measures used in another fishery management council might have been adapted for the U.S. West Coast.

# 3.0 Description of the Affected Environment

## 3.1 Physical Environment

This action addresses species and fisheries of the U.S. portion of the CCE, 3-200 nm off the coasts of Washington, Oregon, and California. The physical environment is described in the following sections of the FEP: Section 3.1.1, General Description and Oceanographic Features of the CCE; Section 3.1.2, Major Bio-Geographic Sub-Regions of the CCE; Section 3.3.1, Geological Environment; Section 3.3.2, Water Column and Chemical Regimes; Section 3.3.3, CCE Vegetation and Structure-Forming Invertebrates; Section 3.3.4, Human Effects on Council-Managed Species' Habitat; Section 4.3, Direct and Indirect Effects of Fishing on Biophysical Habitat, and; Section 4.5, Aspects of Climate Change Expected to Affect Living Marine Resources within the CCE (PFMC 2013).

## 3.2 Biological Environment

The larger biological environment of the CCE, including the roles and major species groups of lower trophic level CCE species, is described within the FEP in the following sections: Section 3.2, Biological Components and Relationships of the CCE; Section 3.3.3, CCE Vegetation and Structure-Forming Invertebrates; Section 4.1, Changes in Fish Abundance within the Ecosystem; Section 4.2, Changes in the Abundance of NonFish Organisms within the Ecosystem, and; Section 4.3, Direct and Indirect Effects of Fishing on Biophysical Habitat (PFMC 2013).

This section addresses Shared EC Species (3.2.1), Council-managed species that prey upon Shared EC Species (3.2.2), and species managed under the ESA, Marine Mammal Protection Act (MMPA) and Migratory Bird Treaty Act (MBTA) that prey upon Shared EC Species (3.2.3). In Section 3.2.1, this EA discusses what is known of the life history of Shared EC Species and their roles as prey in the CCE. Sections 3.2.2 and 3.2.3 describe what is known of the predator-prey relationships between Shared EC Species and many of the higher-order predators of the CCE.

### 3.2.1 Shared EC Species

The FEP categorizes CCE species by broad trophic level. Shared EC Species are generally categorized within the FEP's "low trophic level" category, discussed in section 3.2.1.3 of the FEP. This section of the EA provides some life history characteristics of the species the Council has identified as the subjects of this action:

- Round herring (*Etrumeus teres*) and thread herring (*Opisthonema libertate* and *O. medirastre*)
- Mesopelagic fishes of the families *Myctophidae, Bathylagidae, Paralepididae,* and *Gonostomatidae*
- Pacific sand lance (*Ammodytes hexapterus*)
- Pacific saury (*Cololabis saira*)
- Silversides (family *Atherinopsidae*)
- Smelts of the family *Osmeridae*
- Pelagic squids (families: *Cranchiidae, Gonatidae, Histioteuthidae, Octopoteuthidae, Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*), *Onychoteuthidae, and Thysanoteuthidae*)

#### *3.2.1.1 Round (Etrumeus teres) and Thread Herrings (Opisthonema spp.)*

Round and thread herrings are members of the widely distributed and often abundant group of fishes in the suborder *Clupeoidei*. This taxonomic group includes herrings, sardines, anchovies, sprats, shads and others. Clupeoid fishes are targets of commercial and subsistence fisheries worldwide and catches are substantial. Half of the worldwide catch of fishes comes from just sixty species of various groups, half of which are clupeoids (Whitehead 1985).

Round herring (*Etrumeus teres*) is a circumglobal, marine, pelagic species. In the Eastern Pacific Ocean, they are found from Southern California, throughout the Gulf of California, to Peru and in the Galapagos and Hawaiian islands (STRI 2013, Whitehead 1985). Within the U.S. EEZ, round herring have been taken off the U.S. West Coast from approximately Monterey Bay to the southern boundary with Mexico.

Round herring is a pelagic, schooling fish found mostly in nearshore waters. They range to depths as great as 200 meters, but are found mostly from about 12 meters depth to the surf zone. Round herring fall into the general category of lower trophic level fishes. The adults are planktivores, feeding on euphausiids and copepods and they, in turn, are fed upon by birds and higher tropic level fishes (e.g. see Abitía-Cárdenas et al. 1997, Wilson 1985, Shimose et al. 2013). Round herring are summer-to-fall spawners and their eggs and larvae are a common part of ichthyoplankton communities off southern California in summer and fall (Green-Ruiz and Acal-Sánchez 1987, Oozeki et al. 2007, Watson and Sandknop 1996).

Thread herrings (*Opisthonema* spp.) are schooling, pelagic fishes from tropical and subtropical coastal waters of the western Atlantic and eastern Pacific oceans. Deepbody thread herring (*O. libertate*) and middling thread herring (*O. medirastre*) are occasional visitors to southern areas of the U.S. EEZ, from approximately Port Hueneme, CA to the southern boundary (Coto et al. 2010a, b). They are opportunistic planktivores with a wide spectrum of prey ranging from diatoms to euphausiids, copepods, ostracods and polychaetes (Lopez-Martinez et al. 1999). They are preyed upon by marine mammals, birds and predatory fishes (Abitía-Cárdenas et al. 1997). Thread herring spawn in the spring-to-fall period and their eggs and larvae are part of ichthyoplankton communities (Watson and Sandknop 1996).

#### *3.2.1.2 Mesopelagic Fishes of the families Myctophidae, Gonostomatidae Paralepididae, and Bathylagidae*

Mesopelagic fish are a very large, yet lightly exploited, marine resource with wide distribution in the world oceans. Worldwide mesopelagic fish biomass has long been estimated at one billion tons (Tsarin 1997), but recent data indicate that the true biomass may be closer to 10 billion tons (Kaartvedt et al. 2012, Irigoien 2014). For comparison, worldwide harvest of all marine capture fisheries was 82.4 million tons in 2011 (FAO 2013). Within the California Current region (770,000 km2) alone, there is an estimated mesopelagic fish biomass of 18.5 million metric tons or 24.0 g/m2. This compares to less than 2 million tons for the combined stock of sardines and anchovies, the dominant epipelagic planktivores in the region (Davidson et al. 2013). Based on the abundance of larvae sampled annually from 1955 through 1960 in the CCE (Alstrom 1969), deep-sea pelagic fishes are predominantly of three kinds, myctophids (41.1%), gonostomatids (40.6%) and bathylagids (18.3%). However, bathylagids appear to be only a small portion of samples from studies of adult mesopelagic fishes in the CCE.

Most mesopelagic fish are small, generally only growing to a few centimeters in length, and thus are considered to be part of the micronekton, which also includes larger-sized crustaceans, such as euphausiids, shrimps, mysids, and small squids, most of which dwell in the mesopelagic zone and undertake diel vertical migration. A significant portion of the fish biomass in the CCE is concentrated in micronektonic fishes, most of which are in the families *Myctophidae*, *Gonostomatidae*, *Bathylagidae*, and juvenile pelagic nekton (Suntov and Brodeur 2008).

During daylight hours, mesopelagic fish are mostly found in the mesopelagic zone (between 200 m and 1,000 m deep) along the continental slopes and further out into the deep ocean. Many mesopelagic species are diel vertical migrators. They move upward into the epipelagic zone at night to feed and migrate back to the mesopelagic zone at dawn to avoid predation. Although occurring from Arctic to Antarctic seas, they are most abundant in tropical and subtropical seas (FAO 1997). Scattered evidence suggest that some micronektonic mesopelagic fishes may undertake spawning and feeding migrations of up to 1,000 km (Brodeur and Yamamura 2005). California Cooperative Oceanic Fisheries Investigations (CalCOFI) larval surveys in the southern portion of the CCE consistently found that myctophids (lanternfish), gonostomatids (lightfishes) and bathylagids (deep-sea smelts) made up 90% of the larvae of deep-sea pelagic fishes (Ahlstrom 1969). In this southern part of the CCE, the dominant myctophid is *Triphoturus mexicanus*. CalCOFI larval fish sampling from in the transitional zone off Newport, OR and Crescent City, CA found densities (number/1000 m3) of 131.46 for *Myctophidae*, 1.58 for *Bathylagidae*, 0.07 for *Paralepididae* and 0.00 for *Gonostomatidae* (Auth 2009). In the subtropical eastern Pacific region, *Myctophidae*, *Gonostomatidae* and *Phosichthydae* comprise most of the total mesopelagic fish (Brodeur and Yamamura 2005). Mesopelagic larvae sampled off California and Baja California annually from 1955 to 1960 were 39.4% Myctophids (mainly *Triphoturus mexicanus*, *Stenobrachius leucopsarus* and *Diogenichthys laternatus*), 37.9% Gonostomatids (Vinciguerria lucetia, *Cyclothone* spp., and *Ichthyococcus* spp.), 17.6% Bathylagids (*Leuroglossus stilbius*, *Bathylagus ochotensis*, and *Bathylagus wesethi*) and 5.2% other, which included very few Paralepidids (Ahlstrom 1969). The genus Vinciguerria is now in the family Phosichthyidae.

*Myctophidae*

Myctophids are often the dominant component of micronektonic communities in the North Pacific, with very high abundances and biomass (Beamish et al. 1999, Brodeur and Yamamura 2005). Myctophids represent an important trophic link between phytophagous zooplankton such as copepods and euphausiids and higher trophic level organisms such as salmon, tuna, seabirds, and marine mammals (Brodeur and Yamamura 2005). They dominate the fish biomass in oceanic waters of the Northeast Pacific (Pearcy 1977, Gjøsaeter and Kawaguchi 1980, Beamish et al. 1999), and their transport onto continental shelves represents an important flux of energy into these systems, as represented in food web models of the CCE (Field et al. 2006, Brodeur et al. 1999).

Worldwide, myctophids comprise at least 50% of all fish larvae taken in open-water plankton tows (Moser and Ahlstrom, 1974), and as adults, they comprise some 65% of all mesopelagic fishes (Stiassny 1997). Myctophids are the key members of mesopelagic fish communities and their total resource in the world oceans is estimated at 600 million tons. While distribution is worldwide, production appears to be highest in tropical and sub-tropical areas (FAO 1997). Myctophids account for about 75% of total global catch of small mesopelagic fishes (Vipin et al. 2011). Myctophids typically have a maximum size of 7-8 cm (standard length), with individuals in this size range weighing 2-6 g. A unique characteristic of the myctophids is the presence of non-bacterial bioluminescent organs that give myctophids their common name, lanternfish. Three lanternfish species (*Tarletonbeania crenularis*, *Stenobrachius leucopsarus*, and *Diaphus theta*) form the bulk of micronekton fishes found in the northern California Current. These three species account for two thirds of all fishes collected in Isaac-Kidd midwater trawl tows in the upper 200 m off Oregon, USA (Pearcy 1977, Suntsov and Brodeur 2008.)

The great majority of myctophid species undergo extensive vertical diurnal migrations and while average peak abundance during the day ranges between 300-1200 m, nighttime peaks are more usually between 10-100 m (at or around the surface mixing zone). Migratory disposition may depend on factors such as recency of last feeding, general condition, and reproductive state. Diel vertical migration of micronekton contributes significantly to the rapid vertical transport of organic material from epipelagic to mesopelagic

zones, referred to as the biological pump. Through this biological pump, carbon fixed as living organic matter plus anthropogenic substances such as insecticides, butyltin and PCBs are transported to deep-sea ecosystems. Myctophids have been suggested as particularly good monitors of deep-sea pollution because they encounter a variety of water masses (of different origin) during their substantial diel vertical migrations (Brodeur and Yamamura 2005). In the Northeast Pacific Ocean, vertically migrating mesopelagic fish play an important role in the global carbon cycle and account for 15% to 17% of the carbon exported from the epipelagic zone down into the mesopelagic zone (Davidson et al. 2013).

Owing to their large mouths, relatively scarce and serrated gill rakers, well-developed stomach, and short intestine, myctophids consume predominantly actively moving prey (copepods, euphausiids, etc.). Among the micronekton, myctophids are believed to be the most important consumers of crustacean zooplankters, and act as competitors for prey with small pelagic fishes (such as sardine, anchovy, and saury) and the juveniles of various larger-sized oceanic fishes, such as tuna and salmon (Tyler and Pearcy 1975). Suntsov and Brodeur (2008) found that myctophids of the northern California Current primarily prey upon euphausiids, followed by hyperiid amphipods, planktonic tunicates and copepods.

In the sub-Arctic and transitional regions of the Northeast Pacific Ocean, fishes of the families *Myctophidae* and *Microstomatidae* are the most abundant by numbers and biomass, accounting for 80% to 90% of total micronektonic fish catch (Brodeur and Yamamura 2005). Off the U.S. West Coast, myctophids are known as prey for marine mammals, birds, and fish (Gjøsæter and Kawaguchi 1980, Brodeur 1990, Brodeur and Yamamura 2005). Groundfish consume mesopelagic prey, including myctophids (Pereyra et al. 1969). In the slope region of the Bering Sea, species from the families *Bathylagidae* and *Myctophidae,* along with pollock, were important forage fish for groundfish predators (Lang and Livingston 1986). In the Kamchatka and North Kuril Islands area, Pacific halibut (*Hippoglossus stenolepis),* Greenland turbot (*Reinchardtius hippoglossoides)* and Kamchatka flounder (*Atherestes evermanni)* all fed on myctophids (Orlov 1997). *S. leucopsarus* were recovered from stomachs of trawl-caught sockeye (*Oncorhynchus nerka),* pink (*O. gorbuscha)* and chum (*O. keta)* salmon and dolly varden trout (*Salvelinus malma)* in the Bering Sea (Nagasawa et al. 1997). Among marine mammal species, Dall's porpoise (*Phocoenoides dalli*) have been particularly documented to include myctophids in their diets and consume a significant portion of their biomass (Ohizumi et al. 2003).

There are few examples of commercial fisheries targeting mesopelagic fishes. A Soviet fishery for the myctophids *Diaphus coeruleus* and *Gymnoscopelus nicholski* (species considered edible) in the Southwest Indian Ocean and Southern Atlantic began in 1977, and catches by the former Soviet Union reached 51,680 t in 1992, after which the fishery ceased (Kock 2000). Despite this, the Commission for Conservation of Antarctic Marine Living Resources still permits a total allowable catch for this fishery of 200,000 t in its convention area. An industrial purse seine fishery for the myctophid *Lampanyctodes hectoris* in South African waters closed in the mid-1980s due to processing difficulties caused by the high oil content of the fish (FAO 1997). In the late 1970s and early 1980s, researchers investigated the feasibility of developing a commercial fishery for mesopelagic fishes in the northern Arabian Sea. These studies indicated that such a fishery might be commercially feasible, especially for *Benthosema pterotum* in the Gulf of Oman region (FAO 1997). After decades of studies and planning, with recommendations based on extensive research as to the best fishing seasons, areas and depths, trial catch rates were too low (<30 tons daily per boat) to support a commercially viable fishery (Valinassab et al. 2007).

*Gonostomatidae (20 genera)*

Fishes of this family have elongated bodies with adults ranging from 2 to 30 cm. They have a number of green or red light-producing photophores aligned along the underside of their head and bodies. Their common name, bristlemouths, comes from their equally sized bristle-like teeth. The genus Cyclothone, with 12 species, is thought to be the most abundant vertebrate genus in the world (Paxton and Eschmeyer

1998). Worldwide, fishes of the families *Myctophidae* and *Gonostomatidae* account for 60% to 90% of the total micronekton catch in both weight and number (Gjostaeter and Kawaguchi 1980).

Most of the gonostomatid genus *Cyclothone* and some of the *Gonostoma* genus do not make vertical migrations, remaining in deep water. Non-migrants do not form dense (easily harvested) schools and have high wax contents. Fish with high wax contents are not considered suitable for human consumption (Brodeur and Yamamura 2005). For these reasons, the *Gonostomatidae* are considered to have little commercial fishery potential (Gjostaeter and Kawaguchi 1980).

*Paralepididae (five genera)*

Paralepidids are small to medium-sized (6 to 56 cm), very elongate and slender aulopiform fishes. The body cross-section is oval or compressed. The eye is medium to large, the snout very long and pointed with terminal mouth, but lower jaw projects as a fleshy process. They have alternately fixed and depressible fang-like teeth on the lower jaw and roof of mouth. The caudal fin is deeply forked. Their appearance is similar to that of barracuda, and for this reason their common name is barracudina. Barracudinas are found from polar to tropical regions worldwide, but are most common in the tropics. They can be found from the surface to about 800 m. Some species have separate sexes; others are synchronous hermaphrodites. They feed on small fishes. No fisheries exists, however, Paralepidids exist in large quantities in the waters off Nova Scotia and have been considered as a replacement for sperm whale oil due to their high body lipid content (Ackman et al. 1972).

A 2005 diet study (Allain 2005) of four tuna species from the west and central Pacific found mesopelagic fish to be an important part of the diet of three of the species. The diet of big eye tuna was 36% mesopelagic fish of which *Paralepididae* were 22.3%. The bathypelagic Paralepidid, *Magnesudes indica* was 10% of the diet. Yellow fin tuna diet was 5% mesopelagic fish including 3% *Paralepididae*. Albacore diet was 47% mesopelagics, 25% of which were Paralepidids. Only skipjack tuna, which appears to be a diurnal, epipelagic feeder, did not have mesopelagic fish in its diet.

*Bathylagidae (two genera)*

Bathylagidae (deep-sea smelts, black smelts; subclass *Actinopterygii*, order *Salmoniformes*) is a family of small (15 cm) open-ocean fish with large eyes, a small mouth, and varying body shape, that probably undertake vertical migrations between different ocean depths. There are about 35 species (Allaby 1999).
As stated above in the section on *Gonostomatidae*, Ahlstrom (1969) found that 37.5% of the mesopelagic fish larvae in CalCOFI surveys were bathylagids. Bathylagid larvae exhibited a threefold range in relative abundance between years sampled, with greatest abundance when waters were cooler (Ahlstrom 1969).

#### *3.2.1.3 Pacific sand lance (Ammodytes hexapterus)*

Pacific sand lance are an abundant nearshore species ranging from coastal California, northward to Alaska's Beaufort Sea, and westward to the Sea of Okhotsk and the water's off Japan's Hokkaido Island (Kitaguchi 1979, Craig 1984, Hashimoto 1984, Field 1988, Robards and Piatt 1999). *Ammodytes* species worldwide, commonly known as sand lances or sand eels, are similar to each other in their life histories and trophic roles. Pacific sand lance are strongly associated with sand and gravel bottom habitat shoreward of the 50-100 m depth range (Macy et al. 1978, Field 1988, Ostrand et al. 2005). Off British Columbia, Pacific sand lance prefer shallow depth habitat (<80 m) featuring coarse sand particles of 0.25-2.0 mm diameter grains and waters with relatively higher current speeds (Robinson et al. 2013). Sand lances, *A. hexapterus* included, are known for a habit of alternating between burying themselves individually in sandy or pebbled substrate and forming pelagic swimming schools (Richards 1965, Meyer et al. 1979, Ostrand et al. 2005).

Sand lance bury themselves both on a nightly basis during their active periods in spring through fall, and for prolonged periods during winter hibernation (Robards and Piatt 1999, Robards et al. 1999a).

Sand lance recruitment success appears to be temperature-related, such that when sea surface temperatures rise or fall beyond their preferred range, recruitment declines (Bertram et al. 2001, Arnott and Ruxton, 2002, Robards et al. 2002). Off the U.S. West Coast, the southern and warmer portion of the species' range, low sand lance recruitment in El Niño years has been shown to have notable negative effects on seabird nestling survival (Bertram et al. 2001, Hedd et al. 2006). In areas where sand lance fisheries occur, sand lance recruitment success appears to be inversely related to fisheries harvest levels (Furness 2002, Frederiksen et al. 2004, Greenstreet et al. 2006). Interestingly, seabird predation has similar effects on sand lance recruitment in areas where fisheries do not occur (Bertram and Kaiser 1993, Hedd et al. 2006).

Pacific sand lance are not targeted in U.S. or Canadian Pacific coast fisheries. As a result, sand lance data are not collected with the geographic and temporal regularity needed to estimate coastwide abundance for coastal North American populations. Existing studies tend to not discuss the species as a coastwide stock, but instead focus on populations in particular bays and estuaries, such as Puget Sound (West 1997, Quinn 1999, Penttila 2007), and the bays and islands of British Columbia (Bertram et al. 1993, Hedd et al. 2006, Haynes et al. 2007) and Alaska (Robards et al. 1999b, Bertram et al. 2001, Ostrand et al. 2005). Because sand lance lack swim bladders, their populations are not good subjects for acoustical surveys, unlike several other lower trophic level species or larvae with pelagic schooling habits (Thomas et al. 2002).

Pacific sand lance prey upon plankton throughout their lives, focusing on larger-sized zooplankton, particularly copepods, as adults (Field 1988, Allen 2008, Hipfner and Galbraith 2013). *A. hexapterus* grow to greater sizes in the northern portions of their range, reaching 270 mm (10.6 in) in the Bering Sea, but about 200 mm (7.9 in) off California (Robards et al. 1999a). Reaching maturity between their first and second years of life, none of the six *Ammondytes* species worldwide are long-lived. Pacific sand lance have been aged to 7 years, although individuals over age-3 are rarely found (Field 1988, Robards and Piatt 1999).

Off the U.S. West Coast, Pacific sand lance are known prey of marine mammals, seabirds, and fish (Hobson 1986, Litzow et al. 2000, Willson et al. 1999, Daly et al. 2013). Of particular relevance to the Council, Pacific sand lance have been shown to figure strongly in the diet and survival of juvenile salmon (*Oncorhyncus* spp.) in the northern California Current (Beacham 1986, Daly et al. 2013). Among seabird species, rhinoceros auklet (*Cerorhinca monocerata*), tufted puffin (*Fratercula cirrhata*), and pigeon guillemot (*Cepphus columba)* are known for their heavy sand lance predation (Vermeer 1980, Bertram and Kaiser 1993, Davoren and Burger 1999, Bertram et al. 2001, Litzow et al. 2000).

#### *3.2.1.4 Pacific saury (Cololabis saira)*

Pacific saury are a scomberesocid fish common throughout the epipelagic waters of the northern Pacific Ocean (Hubbs and Wisner 1980). They feed primarily on zooplankton, copepods, euphausiids and other small crustaceans, and reach a length of 12-13 inches. Major predators include yellowfin, bluefin, and albacore tuna, fur seals, sei whales, birds and squid (Pinkas et al. 1971, Pearcy 1972, Kato 1992, Gould 1997b).

Pacific saury are distributed primarily between 20-25° N. lat. and the Gulf of Alaska. There are three distinct stock groups within this broad geographic area: the western Pacific (the largest), the central Pacific, and the eastern Pacific. Evidence suggests that the western and central stocks mix, while the eastern Pacific population does not (Kato 1992). Within the water column, they are found from the surface down to approximately 230 m. Saury distribution is strongly influenced by sea surface temperatures (Tseng et al. 2013), with a preference for waters between 15-18° C. As a result, Pacific saury make extensive migrations from the subtropical spawning regions to subarctic regions as temperatures change seasonally. This link

between distribution and sea surface temperatures may also make Pacific saury susceptible to interannual and interdecadal environmental change (Tseng et al. 2013). For this reason, Pacific saury may be a useful indicator of changing oceanographic conditions (Brodeur et al. 2005b).

There has been debate regarding the lifespan of Pacific saury, but more recent research suggests it is 2 years with maturity reached after 1 year (Huang et al. 2007). Pacific saury spawn throughout the year in 2-4 month intervals with defined peak spawning periods (Love 2011). Females produce 500-2000 eggs per batch depending on size (Kato 1992). Within the eastern Pacific population, peak spawning first occurs in January off southern California. Saury spawning occurs off the coast of San Francisco in the spring, and then the population migrates northward, with saury eventually spawning off the Washington coast in August through October. Recruitment success is determined by oceanographic conditions and therefore abundance and size composition exhibit large variations from year to year (Huang et al. 2007). Current population estimates for the eastern Pacific stock are unavailable, but past estimates put the entire eastern Pacific stock at 450,000 tons (Kato 1992).

The western Pacific saury stock is the largest and is fished heavily by Japan for food and fish meal. Additionally, it is a preferred baitfish in the longline fishery for tuna. The average annual catch in Japan is 258,000 mt (Huang 2007). No eastern Pacific saury fishery currently exists in U.S. waters. In the 1960s, the western Pacific saury stock reached record lows, which led to research by the Japanese into a potential U.S. waters fishery. However, with catches not considered high enough for economical fishing and the rebound of the Western Pacific population, fishing efforts off the coast of the U.S. were abandoned in the 1970s (Kato 1992).

#### *3.2.1.5 Silversides (family Atherinopsidae)*

There are three species of silversides off the U.S. West Coast: jacksmelt, topsmelt, and grunion. "Smelt" is included in the common names of two of these species; however, silversides are not true smelts of the family *Osmeridae*. Osmerid smelts are described in Section 3.2.1.6. In 2010, the Council designated jacksmelt as an ecosystem component species of the CPS FMP to ensure monitoring of their landings in the fishery. A description of jacksmelt is provided here in case the Council also wants to reconsider its placement of jacksmelt within the CPS FMP as part of this action.

*Jacksmelt, (Atherinopsis californiensis)*

Jacksmelt occur throughout the year in nearshore waters from the tip of Baja California, Mexico, to Yaquina Bay, Oregon. They are schooling fish, often found near kelp and other structures, as well as in most bays and estuaries south of Coos Bay, Oregon. Jacksmelt are rarely seen offshore and are most often found at depths ranging from 5-50 feet. They are a relatively fast growing species and can reach approximately five inches in their first year and up to eight inches in their second, with a maximum size of about 17 inches (Miller and Lea 1972, Clark, 1929). Jacksmelt are known to spawn several times during their October to April spawning season, and to lay their eggs on nearshore algae and eelgrass.

Jacksmelt is an important member of the coastal and estuarine marine community in California (Allen and DeMartini 1983), as both a consumer and as a prey species, however they are a relatively poorly studied species. Jacksmelt, like most atherinids, are omnivorous, feeding on algae, crustaceans, and detritus, with their diet varying based on their habitat (Horn 2006). In turn, they are eaten by a variety of nearshore and kelp forest piscivorous fishes such as yellowtail, kelp bass, California halibut and sharks among others. It is also eaten by some piscivorous birds such as brown pelicans, gulls, least terns and common murres and is likely eaten by other surface feeding birds as well as some marine mammals (Baxter 1960, Feder et al. 1974). Although jacksmelt are likely preyed upon by a variety of predators, little is known regarding their relative importance as a prey component of the nearshore environment.

As a commercial species along the U.S. West Coast, jacksmelt is of minor importance, showing up intermittently as incidental catch in some fisheries in California. Most commercial catch of jacksmelt over the years has been incidental to roundhaul/encircling net fisheries; however, some minor directed catch of jacksmelt, typically by gillnets in harbors and bays, has occurred historically with the fish marketed in fresh fish markets. Jacksmelt commercial landings have varied over the last 70 years with landings reaching a high in 1945 of approximately 1,000 mt (likely a result of the high sardine catches at the time). Since the mid-1990s, annual landings have varied between a high of approximately 18 metric tons to a low of less than a ton (CDFG 2001, CDFW 2013). From 2000 through 2009, average incidental catch in the coastal purse seine fisheries was 5.79 mt, with most of the catch being landed in the Los Angeles area as incidental catch to the CPS fisheries (PFMC 2010). In California, jacksmelt are also commonly caught from piers and along the shoreline (Love 1996) and make up a significant portion of recreational landings in the state.

*Topsmelt, (Atherinops affinis)*

Similar to jacksmelt, topsmelt range from the Gulf of California, Baja California, Mexico, to the southern end of Vancouver Island, British Columbia; however, it is not common north of Tillamook Bay, Oregon (Emmett 1991). They are usually found near the ocean's surface and are common inhabitants of the nearshore coastal environment, typically found around kelp beds and along sandy beaches. Topsmelt are also often the most abundant pelagic fishes in many estuaries along the Pacific coast (Horn and Allen 1985) and like jacksmelt, are uncommon offshore. Most juvenile and adult topsmelt make seasonal movements between bay and estuarine environments and coastal kelp beds, being typically found in or close to bays in the spring and summer when they move to shallow water to spawn and coastal areas in the fall and winter (Wang 1986). During their first year of growth, topsmelt grow from 2.5 to 4 inches, adding another 2 inches during their second year, at which time most are sexually mature. They are thought to live up to 8 years old, with the largest measured topsmelt reaching approximately 15 inches (Miller and Lea, 1972).

Topsmelt are omnivorous, with their prey and feeding habits varying depending on the habitat they are using. When occupying nearshore kelp and beach habitat, they typically feed on zooplankton near the surface, while primarily being herbivorous and feeding along the bottom when in shallow estuarine habitats (Horn 2006, Quast 1968). Topsmelt are known to be preyed upon by a variety of nearshore piscivorous fish, birds and marine mammals, including kelp and sand bass, California halibut, leopard sharks, cormorants, terns and sea lions (Feder et al. 1974, Kao 2000).

As it relates to fishery exploitation, topsmelt are far less common as incidental catch compared to jacksmelt in commercial fisheries, possibly due to their smaller size and lower affinity for schooling. However, like jacksmelt, topsmelt make up a significant portion of the recreational pier and shore catch throughout California (CDFG 2001, CDFW 2013).

*Grunion, (Leuresthes tenuis)*

The primary range for California grunion is from the middle of Baja California northward to Point Conception, California. They are non-migratory and are most often found in shallow water (15-40 ft) very close to shore. Very little is known about the overall population status of the species, but it is not an abundant stock and the population is likely concentrated in southern California (Fritzsche 1985).

California grunion grow rapidly in their first year of life reaching 5 inches long by age one. At this point, they are capable of spawning and typically live only two more years. The most studied and well known aspect of the life history of California grunion is their unusual and unique spawning behavior. During spawning, they strand themselves on sandy beaches. Grunion are the only California fish known to exhibit this behavior. Spawning occurs from early March through September during very specific lunar and tidal

time periods. During the 3 or 4 nights following the full moon and only in the few hours immediately after high tide, grunion use waves to swim as high up onto the beach as possible and dig themselves into the sand to spawn. After spawning, they use the next wave to return to the ocean (Martin 2011). The fertilized eggs remain in the sand and incubate until the next high tide series, when they hatch. Females can produce up to 3,000 eggs every two weeks and spawn four to eight times a year (Byrne 2009).

California grunion are infrequently caught incidentally by the CPS fishery and have historically had no commercial fisheries. However, they do support a very limited but important recreational fishery in southern California (CDFG 2001). During a limited time of the year, the fish may be taken by hand when they are on the beach. Although not an abundant prey item, a variety of nearshore fish, bird and marine mammal predators are known to feed on grunion, primarily when they aggregate before and during spawning (Martin 2011).

#### *3.2.1.6 Osmerid Smelts*

Osmerid smelts found in U.S. West Coast estuarine and marine waters include: whitebait smelt (*Allosmerus elongatus*), capelin (*Mallotus villosus*), surf smelt (*Hypomesus pretiosus*), night smelt (*Spirinchus starksi*) and eulachon (*Thaleichthys pacificus*). Eulachon is listed as threatened under the ESA and is managed under that law; however, management measures for eulachon focus on the nearshore and freshwater portions of its range. Eulachon occur within Federal waters, but are not subject to directed fisheries there. This action to prevent the future development of fisheries for eulachon and other forage fish species in Federal waters is consistent with eulachon recovery planning under the ESA (NMFS 2013a). Therefore, eulachon is retained on the list of osmerid smelts considered Shared EC Species for this action. Delta smelt (*Hypomesus transpacificus*) and longfin smelt (*S. thaleichthys*) are both osmerids, but are not eligible as Shared EC Species because they are freshwater and estuarine species not found offshore of 3 nm (USFWS 2013, CDFG 2009). Delta smelt is listed as endangered under the ESA and longfin smelt is listed as threatened in California under the California Endangered Species Act.

Although various smelt species have been part of the diets of Native Americans for centuries (see Gustafson et al. 2010 for eulachon in human cultural history) and are still taken in small nearshore fisheries coastwide, they are not subject to offshore commercial fisheries off North America. As a result, there is little information on the marine life stages of these species and data taken on smelt found in marine waters often does not distinguish between the different species of smelt. Therefore, this section discusses osmerid smelts as a species group, with some references to particular species, but will not discuss each smelt species individually.

Like salmonids, osmerid smelts of the northeastern Pacific Ocean are anadromous and smelt populations tend to be more strongly aggregated as they approach or arrive in their estuarine and freshwater ranges (Martin and Swiderski 2001, Rosenfeld and Baxter 2007, Vandeperre and Methven 2007, Arimitsu 2008, Therriault et al. 2009). Osmerid smelt species have similar life histories, varying from each other in the northern and southern extents of their ranges, and varying from each other in how far upriver they travel to spawn. Whitebait smelt, surf smelt, night smelt, longfin smelt, and eulachon are all broadly distributed along the U.S. West Coast, with surf smelt having the most southerly distribution (Hubbs 1925, Eschmeyer et al. 1983, Ilves and Taylor 2008, Gustafson et al. 2010, Love 2011). Capelin is a circumpolar species, with the southern end of its distribution occurring off northern Washington and in the Strait of Juan de Fuca (Brown 2002, Rose 2005, Dodson et al. 2007).

Osmerid smelts are short-lived, several with 2-3 year lifespans, and most living no longer than 8-9 years. Like other anadromous species, some smelt species, such as eulachon, breed once before dying (Macy et al. 1978, Christiansen et al. 2008, Gustafson et al. 2010). Most Pacific *Osmeridae* with marine life stages, as opposed to those that are almost exclusively freshwater species, spawn in estuarine waters and

immediately seaward of the tideline. Of the *Osmeridae* of the northeast Pacific, eulachon travels the farthest upstream to spawn (Mecklenburg et al. 2002). Smelt eggs adhere to sand particle and both smelt eggs and the spawning adults are heavily preyed upon during the spawning through egg maturation periods.

Osmerid smelts are planktivorous and several studies have shown that adult-stage smelts rely heavily upon crustacean zooplankton like krill (Miller and Brodeur 2007, Wilson 2009, Miller et al. 2010, Love 2011). Off the U.S. West Coast, osmerid smelts are known prey of marine mammals, seabirds, and fish (Antonelis and Perez 1984, Hunt et al. 1999, London et al. 2002, Roby et al. 2003, Roth et al. 2008, Lance and Jeffries 2009, Strong 2010, Emmett and Krutzikowsky 2008). Of particular relevance to the Council, osmerid smelts are parts of the diets of Chinook salmon (Hunt et al. 1999), Pacific whiting, rockfish, and jack mackerel (Emmett and Krutzikowsky 2008). Smelts are taken as bycatch in the pink shrimp fishery (Hannah and Jones 2007) and in the groundfish fisheries (Al-Humaidhi et al. 2012).

#### *3.2.1.7 Pelagic Squids other than Humboldt Squid*

Pelagic squid in the Shared EC Species category include all species from the families: *Cranchiidae, Gonatidae, Histioteuthidae, Octopoteuthidae, Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*), *Onychoteuthidae, and Thysanoteuthidae*.

*Cranchiid squids*

Cranchiid squids are known as "glass squids" for their transparent or translucent mantles. Cranchiid squids are broadly distributed throughout the world ocean, except for within the Arctic Ocean (FAO 2010). A common life history characteristic of cranchiids is that many species tend to occupy sunlit pelagic waters as juveniles, but descend to greater ocean depths as they grow larger and older (Voss 1980). This cranchiid habit of descending to great depths with age has confused squid taxonomists in their attempts to distinguish different cranchiid species and habitats (Voss 1980). There are no directed fisheries for cranchiid squids, possibly because their ammonia-filled, gelantinous mantles make them unappealing for human consumption (FAO 2010). Their North Pacific predators include groundfish consuming them at their demersal adult life stages, and sharks, tunas, and a wide variety of marine mammals and seabirds (Antonelis et al. 1987, Hills and Fiscus 1988, Gould et al. 1997a, Tsuchiya et al. 1998, Buckley et al. 1999, Drazen et al. 2001, Walker et al. 2002, Ohizumi et al. 2003, Pitman et al. 2004, Kubodera et al., 2007). Clarke (1996) considers *Cranchiidae*, along with *Ommastrephidae*, and *Histioteuthidae* (described below) to be the most important cephalopod families in the diets of whales.

*Gonatid squids*

Many high seas squid species are distinguishable from each other only by subtle differences in the shapes of their mantles or configurations of their tentacles, some of which are only visible under magnification. Gonatid squids are known as "armhook squids" for having small hooks, rather than suckers, on some parts of some of their tentacles (FAO 2010). Gonatid squid are temperate and polar species that inhabit near-surface waters as juveniles, but descend to mesopelagic depths as they grow to adulthood. Of the squid families of the northeast Pacific Ocean, *Gonatidae* are the most abundant (Nesis 1997). Although *Gonatidae* are often found as prey within the stomachs of higher order predators, the delicacy of the bodies of most gonatid species makes collecting organisms difficult, complicating potential ecology and life history studies for these species (Jorgensen 2007). Except for one of the more dermersal of the *Gonatidae, Berryteuthis magister,* gonatid squids are not the subject of target fisheries, but they can be taken incidentally in temporal and near-polar fisheries (Jorgensen 2007). *Berryteuthis magister* has been directly targeted in commercial fisheries off Russia and Japan since the 1960s, but is primarily taken as bycatch in demersal fisheries off northern North America (Nesis 1997). Although life history information for *Gonatidae* is minimal, they are thought to live for approximately 2 years, and to spawn throughout the year,

with some periods of concentrated spawning (FAO 2010). Gonatid squid prey heavily upon euphausiids and other crustacean zooplankton as juveniles, then descend in the water column as adults, where they feed broadly on other squids, fishes, and crustaceans. Their North Pacific predators include groundfish, Chinook salmon, sharks, albacore, and a wide variety of marine mammals and seabirds (Antonelis et al. 1987, Hills and Fiscus 1988, Pearcy et al. 1988, Nesis 1997, Buckley et al. 1999, Drazen et al. 2001, Walker et al. 2002, Pitman et al. 2004, Watanabe et al. 2004b, Kubodera et al., 2007).

*Histioteuthid squids*

Histioteuthid squids have several distinct physical characteristics that make them relatively easy to distinguish from squids of other families. One of their common names, "cock-eyed squids" refers to the size differences between their two eyes, with the left eyes of histioteuthids being noticeably larger than their right eyes. Their more complimentary common name, "jewel squids" references the photophores, light-emitting spots that cover their mantles and arms (FAO 2010). In addition to these distinctive characteristics, histioteuthid squids have webbed connective tissue between their arms, giving them a moderate umbrella look. Histioteuthid squid are deep water species (Watanabe et al. 2006), making them less appealing as fisheries targets. There are no large-scale commercial fisheries for histioteuthids, although the United Nations' Food and Agriculture Organization (FAO) considers future bycatch of these species a possibility, should deep-water trawling (greater than 1500 m) become more commonplace (FAO 2010). Marine waters off the U.S. West Coast are closed to trawling offshore of the 700 fathom (1280 m) depth contour (50 CFR 660.76), making future histioteuthid bycatch unlikely in West Coast fisheries. Histioteuthids prey upon fish and crustaceans (Voss et al. 1998) and are preyed upon by groundfish, sharks, tunas, and a wide variety of marine mammals and seabirds (Antonelis et al. 1987, Hills and Fiscus 1988, Clarke 1996, Gould et al. 1997a, Tsuchiya et al. 1998, Voss et al. 1998, Drazen et al. 2001, Walker et al. 2002, Ohizumi et al. 2003, Pitman et al. 2004, Kubodera et al., 2007).

*Octopoteuthid squids*

Octopoteuthid squids, known as "octopus squids" for their eight arms, inhabit mesopelagic and deeper waters of the world's tropical oceans. Their preference for deeper waters makes them challenging research subjects and infrequently encountered in fisheries; their gelatinous bodies also make them unappealing for human consumption (FAO 2010). Several octopoteuthid species are thought to have wide-ranging habitats throughout the world ocean, although there is an octopoteuthid species with a range thought to be limited to the deep waters of the CCE, *Octopoteuthis deletron* (FAO 2010). Like other deep ocean, high seas squids, octopoteuthids are a frequent prey of toothed whales (Clarke 1996), and *Octopoteuthis deletron* serves that role within the CCE (Fiscus et al. 1989), as well as being preyed upon by northern elephant seals and other pinnipeds (Condit and LeBoeuf 1984). Little is known about the life history and reproductive behavior of octopoteuthids, although their complex bioluminescing habits have been recently studied by researchers collecting data via remotely-operated underwater vehicles, or ROVs (Bush et al. 2009, Hoving et al. 2012, Zylinski and Johnsen 2014). Their known Pacific predators include groundfish, sharks, tunas, and a wide variety of marine mammals and seabirds (Condit and LeBoeuf 1984, Hills and Fiscus 1988, Fiscus et al. 1989, Clarke 1996, Gould et al. 1997a, Tsuchiya et al. 1998, Drazen et al. 2001, Walker et al. 2002, Ohizumi et al. 2003, Pitman et al. 2004, Kubodera et al., 2007).

*Ommastrephid squids*

Ommastrephids are known as "flying squids" for their habit of escaping predators by hurling themselves above the ocean's surface and skimming over the water for several meters at a time. According to the FAO, ommastrephids are "the most abundant, widely distributed and ecologically active family of cephalopods" (FAO 2010 at p. 269). The muscularity required for their flying habits make many ommastrephid species appealing for human consumption and they are important commercial fishery targets throughout the world

(FAO 2010). As elsewhere in the world, ommastrephids are broadly distributed throughout the North Pacific Ocean. Like all squid species, ommastrephid species are short-lived, usually only living for one year. Humboldt squid (*Dosidicus gigas*) and neon flying squid (*Ommastrephes bartramii*) dominate commercial catches of North Pacific ommastrephids (FAO 2010). Neon flying squid were the subject of large high seas driftnet fisheries in the 1970s and 1980s, and has been studied by various scientists of North Pacific nations (Yatsu 1997, Bower and Ichii 2005, FAO 2010). Ommastrephids, particularly the larger-bodied species like neon flying squid and Humboldt squid, must be voracious predators in order mature quickly and to attain their large sizes. Their high growth rates mean that their survival, abundance and distribution are all strongly dependent upon prey availability (FAO 2010). Bower and Ichii (2005) demonstrated that neon flying squid abundance is also strongly linked to water temperature and salinity, which may themselves be indicators of prey availability. Due to their rapidly changing body size, the prey favored by the larger-bodied ommastrephids varies considerably throughout their brief lives, ranging from the zooplankton and myctophids they favor as juveniles to larger fish they consume as adults (Yatsu 1997, Walker et al. 2002, Chen and Chiu 2003, Watanabe et al. 2004a, Bower and Ichii 2005, Xinjun et al. 2008, FAO 2010). Similarly, ommastrephids are prey for many different species of fish, mammals, and birds

*Onychoteuthid squids*

Like gonatids, the common name for squids of the family *Onychoteuthidae*, "clubhook" refers to apparatuses at the ends of their tentacles, which include suckers, hooks, and club-shaped tentacle ends. Onychoteuthids tend to inhabit open ocean areas of the temperate and tropical oceans, eschewing northern and southern polar waters. The two clubhook squid species that appear in the U.S. West Coast EEZ as both prey and predators, *Onykia robusta*, and *Onychoteuthis borealijaponicus*, have the one-year life spans of many squid species. Like neon flying squid and Humboldt squid, these Onychoteuthid squids are voracious, rapidly-growing predators that die after spawning. As juveniles, they are prey to a wide range species and adults, they prey on some of those same species (FAO 2010). Onychoteuthids are considered muscular and fast-swimming, as opposed to some of the more gelatinous squid families like Octopoteuthids. Although experimental fisheries have been tried for *Onykia robusta*, the robust clubhook squid, its flesh is too ammonia-filled to be made palatable for human consumption (FAO 2010). Boreal clubhook squid, *Onychoteuthis borealijaponicus*, is caught in small numbers off the northern U.S. West Coast, and in larger numbers around northern Japan. The boreal clubhook squid appears to be less abundant in the northeastern Pacific than in the northwestern Pacific (Orlov 2007), making it less likely to support U.S. or Canadian fisheries. Scientific data and analyses for these species is somewhat slim; while their ranges within the North Pacific are generally known, clarity on their taxonomic classification is relatively new (Tsuchiya and Okutani 1991) and limited individual samples of these species makes describing their life histories challenging (Orlov 2007).

*Thysanoteuthid squids*

There is only one living Thysanoteuthid squid species, *Thysanoteuthis rhombus*, commonly known as "Diamond" or "rhomboid" squid for its broad diamond-shaped mantles. Diamond squid is widely distributed in a large belt of temperate and tropical waters throughout the world ocean. This species exclusively uses tropical waters for spawning and is one of the few squid species with egg masses known to float at the ocean's surface (Nigmatullin et al. 1995). Off the U.S. West Coast, diamond squid is not common in the cooler waters off Oregon and Washington. Although capable of migrations to 650-800 meters in depth, diamond squid often drift fairly passively in upper ocean layers. Like other squid species, they feed on myctophids, small fishes and small squids (Bower and Miyahara 2005). Their varied vertical distribution makes them prey for a range of predators, from highly migratory tunas feeding near the surface, to sperm whales feeding at lower depths (FAO 2010). Like the other squid discussed in this section, diamond squid are highly fecund and have a one-year life cycle. Diamond squid tend not to aggregate in large numbers in much of their world habitat, making them more difficult to target in commercial fisheries.

However, they do aggregate somewhat within the coastal waters of Japan, and are caught in relatively large numbers there (Miyahara et al. 2005, FAO 2010).

### 3.2.2 Council-Managed (FMP) Predators of Shared EC Species

As stated in Section 1.2, *Purpose and Need*, "The purpose of this action is to prohibit new directed commercial fishing in Federal waters on unmanaged, unfished forage fish species . . ." This action focuses on the role of Shared EC Species as forage, or prey, for other species within the U.S. portion of the CCE. Therefore, the affected biological environment includes predators of Shared EC Species. While there are a variety of species interactions other than the predator/prey relationship (e.g. competition, parasitism, etc.), this section 3.2.2 focuses on the predator/prey relationships, if known, between FMP species and Shared EC Species. This section is not a complete discussion of all the predator/prey interactions for all the FMP species; it is simply a targeted look at connections between FMP species and Shared EC Species. All FMP species prey upon wide ranges of prey species, often including other FMP species and sometimes including at least some Shared EC Species. This section also does not provide detailed life history information on Council-managed species. We may have little or no diet data for many CCE species, which limits our understanding of the full web of predatory-prey relationships between species. Each FMP contains information on its managed species, as do the stock assessments and many NEPA analyses completed for actions taken under the authority of the FMPs.

#### *3.2.2.1 CPS FMP species*

The CPS FMP includes five species and one species group within its FMU: Pacific sardine (*Sardinops sagax*), Pacific or "chub" mackerel (*Scomber japonicas*), northern anchovy (*Engraulis mordax*), market squid (*Loligo opalescens*), jack mackerel (*Trachurus symmetricus*), and krill or euphausiids. General descriptions of the life histories of CPS FMP species may be found in Appendix A of Amendment 8 to the CPS FMP (PFMC 1998). Most CPS FMP species fit within the low trophic level group described in Section 3.2.1.3 of the FEP (PFMC 2013).

*Shared EC Species that are prey of at least one CPS FMP species:*

- *Mesopelagic fishes*
- *Pacific sand lance*
- *Pacific saury*
- *Osmerid smelts*
- *Pelagic squids*

Most of the CPS FMP finfish species are similarly sized to Shared EC finfish species, have the same prey as Shared EC Species, and are consumed by the same predators as Shared EC Species. Adult Pacific mackerel are known to prey upon copepods and other crustacean zooplankton, and on unspecified fish (Collette and Nauen 1983). Jack mackerel, however, is a voracious mid-trophic predator that preys upon several Shared EC Species. While euphausiids are jack mackerel's dominant prey, Brodeur et al. (1987) found fishes (including northern anchovy) in several jack mackerel stomachs. Grinols and Gill (1968) found Pacific saury and myctophids in jack mackerel diets of fish sampled off Oregon. Emmett and Krutzikowsky (2008) analyzed the stomach contents of night-feeding jack mackerel collected over a seven year period and found their prey to include a wide variety of crustaceans, molluscs, and fishes, including osmerids, myctophids, and sand lance. Therefore, the CPS FMP species jack mackerel may be considered a predator of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, Pacific saury, osmerid smelts, and, possibly, pelagic squids.

#### *3.2.2.2 Groundfish FMP species*

*Shared EC Species that are prey of at least one Groundfish FMP species:*

- *Mesopelagic fishes*
- *Pacific sand lance*
- *Pacific saury*
- *Silversides*
- *Osmerid smelts*
- *Pelagic squids*

There are over 90 species in the Groundfish FMP's FMU, including: 60+ rockfish species, 12 flatfish species, 6 roundfish species, 6 sharks and rays, plus ratfish, finescale codling, and Pacific grenadier. General descriptions of the life histories of Groundfish FMP species may be found in Appendix B, Part 2, to the Groundfish FMP (PFMC 2005). Many groundfish species occupy the mid-trophic levels that may prey upon Shared EC Species and, as a group, are described with other mid to high trophic level fishes and invertebrates in Section 3.2.1.3 of the FEP (PFMC 2013). Species of the Groundfish FMP tend to occupy those parts of the water column close to or at the ocean floor; therefore, their prey from the Shared EC Species group tend to be those species that are also found at or near the ocean floor. Groundfish FMP species diet data varies widely from species to species, with some species being particularly well-studied and others not studied at all. This Section 3.2.2.2 separates Groundfish FMP species roughly by type, addressing whether Shared EC Species are eaten by some members of the groups: roundfish, rockfish, flatfish, and minor Groundfish FMP species (sharks, skates, ratfish, morids, and grenadiers). More detailed diet descriptions for some groundfish species are available in Chapter 6 of Groundfish Essential Fish Habitat Synthesis: A Report to the Pacific Fishery Management Council (NMFS 2013b, and Appendix at NMFS 2013c). Groundfish species for which we could not find diet analyses are not discussed herein.

*Roundfish*

Laidig et al. (1997) examined the contents of 1,868 sablefish (*Anoplopoma fimbria*) stomachs, found sablefish to be strongly piscivorous, and found their prey to include Shared EC Species from the mesopelagic fish and pelagic squid groups. Buckley et al. (1999) analyzed the diets of Pacific whiting (*Merluccius productus*, 1,334 stomachs) and sablefish (731 stomachs), among other groundfish species. Both species eat a wide variety of prey, and their prey includes the Shared EC Species myctophids, gonostomatids, Pacific saury, osmerid smelts, and gonatid squids (Buckley et al. 1999). Brodeur et al. (1987) also included sablefish and Pacific whiting in a larger study of the diets of finfish species and found sablefish and whiting stomach contents to include the Shared EC Species or species groups of myctophids, Pacific sand lance, Pacific saury, and osmerid smelts. Emmett and Krutzikowsky (2008) examined Pacific whiting stomach contents from samples taken off Oregon, and found whiting diet to include osmerid smelt and Pacific sand lance. Tinus (2012) found a wide variety of fishes, including Pacific sand lance, and invertebrates in the stomachs of lingcod taken off Oregon. Beaudreau and Essington (2009) also found sand lance in the stomachs of lingcod taken off the San Juan Islands of Washington State, as well as other Shared EC Species groups, mesopelagic fishes and osmerids. Therefore, Groundfish FMP roundfish species may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, Pacific saury, osmerid smelts, and pelagic squids.

*Rockfish*

Brodeur and Pearcy (1984) examined the contents of 480 stomachs of a mix of five shelf rockfish species: yellowtail rockfish (*Sebastes flavidus*), canary rockfish (*S. pinniger*), Pacific ocean perch (*S. alutus*), splitnose rockfish *S. diploproa*), and darkblotched rockfish (*S. crameri*). This study found that these shelf rockfish, taken off the coast of Oregon, fed predominantly on euphausiids, but also that their prey included myctophids, osmerid smelts, Pacific sand lance, and gonatid squids (Brodeur and Pearcy 1984). Brodeur et al. (1987) examined over 1,600 stomach of 20 finfish species taken off Oregon, including black rockfish (*S. melanops*) and yellowtail rockfish (*S. flavidus*). Both black and yellowtail rockfish diets in the Brodeur et al. (1987) study had eaten a wide variety of smaller-sized crustaceans, but also included Pacific sand

lance and osmerid smelts. Adams (1987) examined the contents of 381 widow rockfish stomachs and found that, although widow rockfish feed heavily on salps (*Thaliacea* spp.), their Shared EC Species prey include myctophids. Buckley et al. (1999) collected stomach samples from commercially important groundfish species taken off the U.S. West Coast, including shortspine and longspine thornyhead, and found the two thornyhead species diets to include bathylagids, myctophids, Pacific saury, and gonatid squid. Therefore, Groundfish FMP rockfish species may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, Pacific saury, osmerid smelts, and pelagic squids.

*Flatfish*

Dover sole (*Microstomus pacificus*), one of the most common West Coast flatfish species, predominantly preys upon benthic worms and smaller benthic crustaceans (Pearcy and Hancock 1978, Gabriel and Pearcy 1981, Buckley et al. 1999), rather than on the finfish and squid of the Shared EC Species groups. Pearcy and Hancock (1978) confirmed this trend for other, smaller flatfish species, finding that rex sole (*Glyptocephalus zachirus*) has a diet similar to Dover sole, feeding on polychaetes and amphipods, while Pacific sanddab (*Citharichthys sordidus*) and slender sole (*Lyopsetta exilis*, not an FMP species) tend to prey on pelagic crustaceans. Ketchen and Forrester (1966) found that petrale sole preyed upon Pacific sand lance in addition to its primary prey of euphausiids and Pacific herring (*Clupea pallasii*). Buckley et al. (1999) also looked at the stomach contents of arrowtooth flounder (*Atheresthes stomias*), a larger-bodied flatfish, and found that arrowtooth prey largely upon a wide variety of crustaceans and other invertebrates, but that their vertebrate prey includes osmerid smelts and mesopelagic fishes. Yang and Nelson (2000) studied the diets of a variety of groundfish taken off Alaska, and found that arrowtooth flounder taken off Alaska also prey primarily upon crustaceans, with some osmerids, Pacific sand lance, and myctophids in their diets. Therefore, Groundfish FMP flatfish species may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, and osmerid smelts.

*Minor Groundfish FMP species (sharks, skates, ratfish, finescale codling, and Pacific grenadier)*

Jones and Geen (1977) studied the stomach contents of spiny dogfish (*Squalus acanthias*) taken off British Columbia and found both eulachon and Pacific sand lance in dogfish stomachs. While Brodeur et al. (1987) did not identify Shared EC Species in spiny dogfish stomachs, they did find gonatid squid beaks in the stomachs of soupfin sharks (*Galeorhinus zyopterus*). Grinols and Gill (1968) observed blue sharks (*Prionace glauca*, an HMS FMP species), and soupfin sharks feeding on Pacific saury and myctophids off the coast of Oregon. Robinson et al. (2007) collected longnose skates (*Raja rhina*) off the coast of California and identified gonatid squids, histioteuthid squids, and myctophids within the wide variety of prey species in their stomachs. Leopard sharks (*Triakis semifasciata*) sampled from California's Elkhorn Slough had eaten a variety of invertebrates as well as several fish species, including Pacific topsmelt (Kao 2000). Diets for big skate (*R. binoculata*) taken off the U.S. West Coast have not been identified to the species or family level; however, Ebert et al. (2008) found Pacific sand lance within the varied diet of big skates sampled from the Gulf of Alaska. There are few food habits studies on ratfish (*Hydrolagus colliei*), although those studies that do address ratfish diet characterize ratfish as preying primarily upon smaller invertebrates like shrimp, molluscs, and echinoderms (Johnson and Horton 1972, Quinn et al. 1980), and thus are less likely to prey upon Shared EC Species. There is little available information on the diets of CCE finescale codling (*Antimora microlepis*). Like its Atlantic analog, blue antimora (*Antimora rostrata*), finescale codling occupies bathypelagic waters and tends to regurgitate upon being raised to the surface, making stomach content sampling difficult (Sedberry and Musick 1978); therefore, finescale codling diets were not considered in this EA. A Drazen et al. (2001) study on the diets of Pacific grenadier (*Coryphaenoides acrolepis*) and giant grenadier (*Albatrossia pectoralis*, not an FMP species) identified Shared EC pelagic squids (cranchiidae, gonatidae, histioteuthidae, octopoteuthidae) among the Pacific grenadier stomach contents. Buckley et al. (1999)

also identified gonatid and cranchiid squid as Pacific grenadier prey, as well as myctophids. Therefore, minor Groundfish FMP species (sharks, skates, ratfish, finescale codling, and Pacific grenadier) may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, Pacific saury, silversides, osmerid smelts, and pelagic squid.

#### *3.2.2.3 HMS FMP species*

The FMU for the HMS FMP includes: North Pacific albacore (*Thunnus alalunga*), yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*), skipjack tuna (*Katsuwonus pelamis*), northern bluefin tuna (*Thunnus orientalis*), common thresher shark (*Alopias vulpinus*), shortfin mako or bonito shark (*Isurus oxyrinchus*), blue shark (*Prionace glauca*), striped marlin (*Tetrapturus audax*), swordfish (*Xiphias gladius*), and dorado or dolphinfish (*Coryphaena hippurus*). General descriptions of the life histories of HMS FMP species may be found in Appendix F to the HMS FMP (PFMC 2003). HMS FMP species are among the highest order cold-blooded predators of the CCE and, as a group, are described with other mid to high trophic level fishes and invertebrates in Section 3.2.1.3 of the FEP (PFMC 2013). Species of the HMS FMP tend to occupy waters farther offshore than many other FMP species; therefore, their prey from the Shared EC Species group tend to be those species that are also found farther offshore.

*Shared EC Species that are prey of at least one HMS FMP species:*

- *Round and thread herring*
- *Mesopelagic fishes*
- *Pacific saury*
- *Silversides*
- *Pelagic squids*

As their name implies, the HMS FMP species that spend some part of their life cycle within the U.S. West Coast EEZ also migrate to and throughout the larger Pacific Ocean. Diet studies for the HMS FMP species that migrate between the U.S. EEZ, the EEZs of other nations, and the high seas are developed by scientists from the member nations of the multi-national HMS management entities of the Pacific Ocean, described in the FEP at Section 3.5.4.4 (PFMC 2013). While the HMS FMP species' diet studies discussion below includes studies from individual fish taken in waters off Washington, Oregon, and California, it also includes scientific work on fish taken from the high seas, or from waters off other northern and eastern Pacific nations. This Section 3.2.2.3 separates HMS FMP species roughly by type, addressing whether Shared EC Species are eaten by tuna species (albacore, yellowfin, bigeye, skipjack, and bluefin), shark species (common thresher, shortfin mako, and blue) or by billfish species (striped marlin and swordfish), or dorado.

*Albacore, Yellowfin tuna, Bigeye tuna, Skipjack tuna, and Bluefin tuna*

As discussed above in Section 3.2.1.2, yellowfin tuna, bigeye tuna, and albacore are all predators of mesopelagic fishes (Tyler and Pearcy 1975, Moteki et al. 2001, Allain 2005, Brodeur and Yamamura 2005). Pacific saury has also been documented as the prey of albacore, yellowfin, and bluefin tuna (Pinkas et al. 1971, Pearcy 1972, Kato 1992). Glaser (2009) found albacore prey to include myctophids, Pacific saury, and gonatid, octopoteuthid, and onychoteuthid squids. Pinkas et al. (1971) found a wide array of prey species in the diets of albacore, bluefin tuna, and bonito, including jacksmelt in the diet of bluefin tuna, and onychoteuthid squid in the diet of albacore. Tsuchiya et al. (1998) found a variety of pelagic squid species in the stomachs of albacore, bigeye tuna, and swordfish taken in the tropical East Pacific. Shimose et al. (2013) found round herring in the stomachs of bluefin tuna. Therefore, HMS FMP tuna species may be considered predators of the following Shared EC Species or species groups: round and thread herring, mesopelagic fishes, Pacific saury, silversides, and pelagic squids.

*Common thresher shark, shortfin mako shark, blue shark*

Preti et al. (2012) compared the CCE diets of the three FMP shark species and found that mako sharks feed heavily on jumbo squid and Pacific saury, the most important prey for blue sharks are jumbo and gonatid squids, and thresher sharks prey heavily on CPS FMP species like anchovy and sardine. This same study found that the diets of these three shark species included the following Shared EC Species or species groups: paralepipdidae, Pacific saury, topsmelt, and gonatid, histioteuthid, octopoteuthid, and onychoteuthid squids (Preti et al. 2012). In a 2001 common thresher shark diet study, Preti et al. found a variety of FMP-managed species (e.g. anchovy, Pacific whiting, Pacific mackerel, and sardine) in thresher shark stomachs, as well as California grunion and gonatid squids (Preti et al. 2001). Kubodera et al. (2007) examined stomachs of blue and salmon sharks, and found that blue shark (an FMP species) preyed upon a wide variety of cephalopods, including cranchiid, gonatid, histioteuthid, octopoteuthid, and onychoteuthid squids, as well as several different myctophid species. Markaida and Sosa-Nishizaki (2010) reviewed both blue shark diet literature and the stomach contents of almost 900 blue sharks taken in Pacific waters off Mexico, and found the following Shared EC Species or species groups in those blue shark stomachs: cranchiid, gonatid, histioteuthid, octopoteuthid, ommastrephid, and onychoteuthid squids, and Pacific saury. Therefore, HMS FMP shark species may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific saury, silversides, and pelagic squids.

*Striped marlin, swordfish, dorado*

Abitía-Cárdenas et al. (1997) studied the stomach contents of striped marlin and, among other prey species, found ommastrephid squids, round herring, and thread herring. In a follow-up 2002 study, Abitía-Cárdenas et al. evaluated more recently collected striped marlin stomach contents and again found ommastrephid squid and round herring within a broad suite of marlin prey species (Abitía-Cárdenas et al. 2002). Moteki et al. (2001) found mesopelagic fishes from the families gonostomatidae, paralepididae, and myctophidae in the stomachs of swordfish taken in the eastern tropical Pacific Ocean. Markaida and Hochberg (2005) examined swordfish stomach contents from fish taken in Pacific waters off Baja California, attempting to identify the squid prey of swordfish at the species level. That study found that swordfish prey heavily on cephalopods, including gonatid, histioteuthid, octopoteuthid, ommastrephid, onychoteuthid, and thysanoteuthid squids (Markaida and Hochberg 2005). Similarly, Watanabe et al. (2009) found swordfish of the western North Pacific to have a strongly squid-dominant diet, also identifying members from all of the Shared EC pelagic squid families among swordfish stomach contents. Olson and Galván-Magaña (2002) evaluated the stomach contents of 545 dorado (a.k.a. “dolphinfish”) and found that dorado prey heavily on both flying fish and on the Shared EC pelagic squid species, and to a lesser degree, prey upon myctophids. Moteki et al. (2001) had similar findings for dorado stomach contents, although derived from a much smaller sample size. Therefore, HMS species striped marlin, swordfish, and dorado may be considered predators of the following Shared EC Species or species groups: round and thread herring, mesopelagic fishes and pelagic squids.

#### *3.2.2.4 Salmon FMP species*

*Shared EC Species that are prey of at least one Salmon FMP species:*

- *Mesopelagic fishes*
- *Pacific sand lance*
- *Pacific saury*
- *Silversides*
- *Osmerid smelts*
- *Pelagic squids*

Salmon are anadromous fish native to the rivers and oceans of the northern hemisphere. Seven salmon species are native to the Pacific Ocean and five of those species spawn in the rivers of the western U.S.: Chinook (*Oncorhynchus tshawytscha*), chum (*O. keta*), coho (*O. kistuch*) pink (*O. gorbuscha*), and sockeye (*O. nerka*). Steelhead, an anadromous form of rainbow trout (*O. mykiss*), occupies similar habitats and a similar ecological niche to the Pacific salmon species.

The Salmon FMP manages U.S. West Coast fisheries for Chinook, coho, and pink salmon. This Section 3.2.2.4 discusses salmon species broadly and looks at whether Shared EC Species are eaten by Chinook, coho, and pink salmon. Section 3.2.3.1, *ESA-listed species other than mammals and birds*, additionally addresses whether Shared EC Species are eaten by sockeye salmon, chum salmon, or steelhead. While some U.S. West Coast populations of Chinook and coho salmon are listed under the ESA, there is insufficient information about the marine diets of particular salmon stocks to warrant discussing those stocks separately from this section's larger discussion of known diets of FMP-managed salmon species. This EA focuses on the marine (not freshwater) diets of predator species because the geographic scope of the action is the U.S. West Coast EEZ, which does not include the freshwater habitat of salmon and other predators. General descriptions of the life histories of Chinook, coho, and pink salmon may be found in Appendix A of Amendment 14 to the Salmon FMP (PFMC 2000). Salmon occupy mid- and higher trophic levels that may prey upon Shared EC Species and, as a group are described with other mid to high trophic level fishes and invertebrates in Section 3.2.1.3 of the FEP (PFMC 2013).

*Chinook salmon*

Groot et al. (1995) reviewed Chinook stomach contents and identified Chinook salmon marine prey as including fish (particularly Pacific herring and sand lance), euphausiids and other crustacean zooplankton, squid, and amphipods. Dufault et al. (2009) identified Chinook diet within the CCE as including: megazoobenthos (crabs), cephalopods, viperfish (*Chauliodus macouni*), small deepwater rockfish, small planktivores (anchovy, sardine, Pacific herring), and large zooplankton (euphausiids, chaetognaths, pelagic shrimps, pelagic polychaetes, pasiphaeids). Osmerid smelts, which also include anadromous species, have been found in Chinook stomachs (Hunt et al. 1999), as have myctophids (Brodeur et al. 1987), and gonatid squids (Pearcy et al. 1998). Hunt et al. (1999) found, among other prey, sand lance, Pacific saury, and jacksmelt within stomachs of Chinook salmon. Therefore, Chinook salmon may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, Pacific saury, silversides, osmerid smelts, and pelagic squids.

*Coho salmon*

Coho salmon are nearly as piscivorous as Chinook salmon and have some diet similarities to Chinook. Groot et al. (1995) reviewed coho stomach contents and found the following marine prey: amphipods, euphausiids, and fish (including, among others, osmerids and Pacific sand lance). While crustacean zooplankton dominate coho stomach content in several studies, coho diets also include osmerids, myctophids, paralepidids, cephalopods (particularly gonatid squid) and sand lance (Pearcy et al. 1988, Schabetsberger et al. 2003, Aydin et al. 2005, Pool et al. 2008, Daly et al. 2009). Therefore, coho salmon may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, osmerid smelts, and pelagic squids.

*Pink salmon*

The U.S. West Coast EEZ is at the southern end of the range of pink salmon within the eastern North Pacific, so there tends to be less diet data available for West Coast pink salmon than for other salmon species. Pink salmon are more planktivorous and less piscivorous than Chinook and coho. According to Groot et al. (1995), pink salmon diets are dominated by hyperiid amphipods, although the Shared EC Species they consume include myctophids and squids. North Pacific studies confirm the presence of gonatid squid in the diets of pink salmon (Kaeriyama et al. 2004, Aydin et al. 2005). There is some evidence that adult pink salmon of the western North Pacific also prey upon sand lance and capelin (Brodeur 1990). Therefore, pink salmon may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, osmerid smelts, and pelagic squids.

### 3.2.3 Protected Species Predators of Shared EC Species

As discussed in Section 3.2.1, a wide variety of predators prey upon Shared EC Species, including many species protected and managed under the ESA, MMPA, and MBTA. The FEP's Table 3.5.5 details the species of the U.S. portion of the CCE that are listed as threatened or endangered under the ESA. All marine mammals of the CCE are protected under the MMPA and listed in the FEP at Table 3.5.6. A wide variety of bird species are protected under the MBTA, including the seabirds of the CCE. Similar to Section 3.2.2, this section focuses on the predator/prey relationships, if known, between protected species and Shared EC Species. This section is not a complete discussion of all of the predator/prey interactions of all of protected species; it is simply a targeted look at connections between the protected species of the U.S. West Coast EEZ and Shared EC Species. All protected species prey upon wide ranges of prey species, often including at least some Shared EC Species, as noted in this section. We may have little or no diet data for many CCE species, which limits our understanding of the full web of predatory-prey relationships between species. In this section, protected species are divided into three groups: ESA-listed species other than marine mammals and birds, marine mammals protected under the ESA and MMPA, and birds protected under the ESA and MBTA.

#### *3.2.3.1 ESA-listed species other than mammals and birds*

The ESA-listed species that occur within the U.S. West Coast EEZ include marine mammals, seabirds, sea turtles, two species of abalone, green sturgeon, Pacific eulachon, and several populations of wild salmonids. ESA-listed mammals that may prey upon Shared EC Species are discussed in Section 3.2.3.2. ESA-listed seabirds that may prey upon Shared EC Species are discussed in Section 3.2.3.3. The Puget Sound populations of three species of rockfish (bocaccio, canary, and yelloweye) are listed and protected under the ESA, but Puget Sound is not within the geographic area for this action, the U.S. West Coast EEZ. Similarly, black abalone (*Haliotis sorenseni*) and white abalone (*Haliotis crachereodii*) are large nearshore sea snails and are not found within the EEZ.

*Shared EC Species that are prey of ESA-listed salmon and steelhead, including species also managed under MSA:*

- *Mesopelagic fishes*
- *Pacific sand lance*
- *Pacific saury*
- *Silversides*
- *Osmerid smelts*
- *Pelagic squids*

The following ESA-listed sea turtle species may occur in the U.S. West Coast EEZ: leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), olive ridley (*Lepidochelys olvivacea*), and green (*Chelonia mydas*). Sea turtles are either herbivores or, like leatherbacks, forage primarily on jellyfish (*Scyphozoa* spp., Benson et al. 2011). ESA-listed sea turtle species will not be further discussed in this EA because there is not sufficient information to link them to Shared EC Species.

The ESA-listed finfish populations that may occur within the U.S. West Coast EEZ include: green sturgeon (*Acipenser medirostris*) originating from the Sacramento River basin and from coastal rivers south of the Eel River; Pacific eulachon (*Thaleichthys pacificus*) originating from the British Columbia's Skeena River, southward to and including the Mad River in northern California; and various ESUs of Chinook salmon, chum salmon, coho salmon, sockeye salmon, and steelhead trout. Pacific eulachon is a Shared EC Species within the osmerid smelt group (see Section 3.2.1.6) and will not be discussed further in this predator-focused section. Green sturgeon is a benthic anadromous fish that primarily eats benthic invertebrates (Dumbauld et al. 2008, Huff et al. 2011), which are not subject to this action. Therefore, salmonids are the only ESA-listed predators, other than marine mammals and birds, within the affected environment for this action.

Each species of salmon has multiple genetically-distinct populations, usually identified by the population's river basin of origin and time of year the population enters fresh water to begin its spawning migration. Salmon populations listed as threatened or endangered under the ESA are often delineated by their evolutionarily significant unit (ESU), meaning a population that is substantially reproductively isolated from other conspecific populations and that represents an important component of the evolutionary legacy of the species (Waples 1991). For example, one of the threatened populations of Chinook salmon listed under the ESA is the Sacramento River winter run, meaning that population of Chinook salmon that spawns in the Sacramento River basin during the winter months. West Coast salmon and steelhead ESUs listed as threatened or endangered under the ESA are shown in Table 3.2.1.

**Table 3.2.1: ESA-listed salmonids that may occur in U.S. West Coast EEZ**

| **Species** | | **Status** |
|---|---|---|
| Chinook salmon (*Oncorhynchus tshawytscha*) | Sacramento River winter ESU | Endangered |
| | Central Valley Spring ESU | Threatened |
| | California Coastal ESU | Threatened |
| | Snake River Fall ESU | Threatened |
| | Snake River Spring/Summer ESU | Threatened |
| | Lower Columbia River ESU | Threatened |
| | Upper Willamette River ESU | Threatened |
| | Upper Columbia River Spring ESU | Endangered |
| | Puget Sound ESU | Threatened |
| Chum salmon (*Oncorhynchus keta*) | Hood Canal Summer Run ESU | Threatened |
| | Columbia River ESU | Threatened |
| Coho salmon (*Oncorhynchus kistuch*) | Central California Coastal ESU | Endangered |
| | S. Oregon/N. CA Coastal ESU | Threatened |
| | Oregon Coast ESU | Threatened |
| | Lower Columbia River ESU | Threatened |
| Sockeye salmon (*Oncorhynchus nerka*) | Snake River ESU | Endangered |
| | Ozette Lake ESU | Threatened |
| Steelhead (*Oncorhynchus mykiss*) | Southern California DPS | Endangered |
| | South-Central California DPS | Threatened |
| | Central California Coast DPS | Threatened |
| | California Central Valley DPS | Threatened |
| | Northern California DPS | Threatened |
| | Upper Columbia River DPS | Threatened |
| | Snake River Basin DPS | Threatened |
| | Lower Columbia River DPS | Threatened |
| | Upper Willamette River DPS | Threatened |
| | Middle Columbia River DPS | Threatened |
| | Puget Sound | Threatened |

This section 3.2.3.1 focuses on predator prey interactions between Shared EC Species and ESA-listed predators. NMFS includes detailed life history information on ESA-listed salmon and steelhead in ESA status review documents that are updated at least once every five years. The 2011 status reviews of ESA-listed salmon and steelhead provide life history information on each of the ESUs listed in Table 3.2.1. Five-year status reports on ESA-listed salmon and steelhead, except for Oregon Coast coho, and the supporting documents for those reports are available on the NMFS West Coast Region website: http://www.westcoast.fisheries.noaa.gov/publications/status_reviews/salmon_steelhead/2011_status_reviews_of_listed_salmon_steelhead.html. Life history and ESA status review information for Oregon Coast coho is available on a separate NMFS West Coast Region website: http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/coho/oregon_coast_coho.html..

Chinook, coho, and pink salmon are FMP species and the roles of Shared EC Species in their diets are discussed in Section 3.2.2.4. U.S. West Coast ESA-listed salmonid populations include some runs of Chinook and coho salmon, but no runs of pink salmon. As discussed above, there is not sufficient diet information on the particular ESA-listed ESUs of these species to warrant an additional discussion of these species in this section. This section additionally discusses chum and sockeye salmon and steelhead as predators and whether they are known to prey upon Shared EC Species.

*Chum salmon*

Washington State and the Columbia River are part of the southern end of the range of chum salmon within the eastern North Pacific, so there tends to be less diet data available on West Coast chum salmon than on other salmon species. Chum salmon diets are so similar to those of pink salmon that the aggressive foraging behavior of pink salmon may allow them to outcompete chum salmon for more calorie-rich prey during years when pink salmon are relatively more abundant (Ruggerone and Nielsen 2004). Like pink salmon, chum salmon are considered primarily planktivores. Chum salmon are known for consuming gelatinous zooplankton in greater quantities than other salmon species (Kaeriyama et al. 2004). Groot et al. (1995) found the marine diet of chum salmon included euphausiids, amphipods, pteropods, calanoids, and fish (unspecified). Brodeur (1990) found some evidence of myctophids, sand lance, and squid in chum salmon diets and Davis et al. (2000) confirmed the presence of squids in chum stomachs. While few finfish species or species groups have been positively identified among chum salmon stomach contents, Nagasawa et al. (1997) confirmed the presence of myctophids in chum diets. Therefore, chum salmon may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance and pelagic squids.

*Sockeye salmon*

Sockeye are known as generalist feeders, less piscivorous than Chinook or coho, yet not as planktivorous as pink and chum salmon. Groot et al. (1995) found that euphausiids play a strong role in sockeye diets, as do other crustacean zooplankton like amphipods, while the Shared EC Species in their diets include myctophids and pelagic squids. Several studies have confirmed the presence of squids in sockeye stomach contents (Pearcy et al. 1988, Davis et al. 2000, Kaeriyama et al. 2004, Kitagawa et al. 2005), and Nagasawa et al. (1997) identified myctophids among sockeye finfish prey. Brodeur (1990) additionally found evidence of sand lance in some sockeye diets. Therefore, sockeye salmon may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance and pelagic squids.

*Steelhead*

Steelhead feed at higher trophic levels than several other salmonids, with many fish, squid, and amphipods in their diets (LeBrasseur 1966, Brodeur 1990). Light (1985) conducted an extensive review of North Pacific steelhead stomach contents, finding steelhead diet to strongly feature fish, squid, polychaetes, and crustaceans, and miscellaneous zooplankton. While Atka mackerel (*Pleurogrammus monoperygius*) was the most important fish species Light (1985) found in steelhead stomachs, myctophids were also among the fish in steelhead diets, as were gonatid squids. Therefore, steelhead may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes and pelagic squids.

Taking into account the feeding habits of Chinook and coho salmon discussed in Section 3.2.2.4 and the feeding habits of chum and sockeye salmon and steelhead discussed in this section, ESA-listed salmonids of the U.S. West Coast may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, Pacific saury, silversides, osmerid smelts, and pelagic squids.

### *3.2.3.2 Marine mammals, including species listed under the ESA*

*Shared EC Species that are prey of at least one CCE marine mammal species:*

- *Mesopelagic fishes*
- *Pacific sand lance*
- *Pacific saury*
- *Silversides*
- *Osmerid smelts*
- *Pelagic squids*

The MMPA protects all marine mammals within U.S. waters, regardless of whether a species or population is listed as threatened or endangered under the ESA. MMPA conservation measures focus primarily on preventing or prohibiting the directed take of marine mammals and minimizing incidental take of marine mammals. Under the MMPA, "take" means to "harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal" (16 U.S.C. §1362). This action does not address the take of marine mammals in fisheries or elsewhere; however, many Shared EC Species are prey of CCE marine mammals. This section examines the predator-prey interactions, if known, between Shared EC Species and marine mammals. Marine mammals occupy higher trophic levels that may prey upon Shared EC Species and, as a group, are described with other high trophic level non-fish species in Section 3.2.1.1 of the FEP (PFMC 2013).

The U.S. West Coast EEZ supports a large and diverse marine mammal community that plays an important role in the ecosystem as top-level predators. Because most marine mammals make annual migrations between feeding and breeding sites, the specific species and the number of marine mammals found in the U.S. West Coast EEZ will vary both seasonally and inter-annually. However, some models estimate that cetaceans may consume around 2 million tons of prey (primarily krill, but also small fishes and squids and other prey) annually in the in U.S. West Coast EEZ (Barlow et al. 2008). Although some marine mammals prefer specific types of prey, most are opportunistic feeders. As discussed in section 3.2.1 and in this section, most of the Shared EC Species are preyed upon to some degree by at least one species of marine mammal.

Table 3.2.2 lists the marine mammal species that may occur within the U.S. West Coast EEZ and indicates whether any populations of these species are listed as threatened or endangered under the ESA. In addition to the marine mammals listed in Table 3.2.2, southern sea otters (*Enhydra lutris nereis*) occur within state waters off California. The southern sea otter population off the U.S. West Coast is listed as threatened under the ESA. Sea otters will not be considered further in this document because their West Coast population does not tend to use EEZ waters, and because they primarily prey upon benthic invertebrates like urchins (USFWS 2014). Except for some of the deeper offshore squid species included in the "pelagic squid" Shared EC category, benthic invertebrates are not addressed by this action.

NMFS is responsible for administering the MMPA for cetaceans, seals, and sea lions, while the USFWS administers the MMPA for polar bears, walruses, manatees, and sea otters [16 U.S.C. §1362]. Similar to ESA-listed finfish species, NMFS maintains marine mammal life history information on regularly-updated webpages. Detailed life history information for cetaceans (odontocetes and mysticetes) may be found on NMFS's Protected Resources Cetacean page: http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/. Detailed life history information for seals and sea lions may be found on NMFS's Protected Resources Pinnipeds page: http://www.nmfs.noaa.gov/pr/species/mammals/pinnipeds/. Carretta et al. (2013) provides U.S. Pacific marine mammal stock assessment summaries in a NOAA Technical Memorandum.

**Table 3.2.2: Marine mammal species that may occur in U.S. West Coast EEZ**

| Species | Stocks | ESA-listed? |
|---|---|---|
| **Odontocetes** | | |
| Harbor porpoise (*Phocoena phocoena*) | Various | |
| Dall's porpoise (*Phocoenoides dalli*) | CA/OR/WA stock | |
| Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) | North Pacific stock; CA/OR/WA stock | |
| Risso's dolphin (*Grampus griseus*) | CA/OR/WA stock | |
| Bottlenose dolphin (*Tursiops truncatus*) | California coastal stock | |
| Bottlenose dolphin (*Tursiops truncatus*) | CA/OR/WA offshore stock | |
| Short-beaked common dolphin (*Delphinus delphis)* | CA/OR/WA stock | |
| Long-beaked common dolphin (*Delphinus capensis)* | California stock | |
| Northern right whale dolphin (*Lissodelphis borealis*) | CA/OR/WA stock | |
| Striped dolphin (*Stenella coeruleoalba*) | CA/OR/WA stock | |
| Short-finned pilot whale (*Globicephala macrorhynchus*) | CA/OR/WA stock | |
| Sperm whale (*Physeter macrocephalus*) | CA/OR/WA stock | Endangered |
| Dwarf sperm whale (*Kogia sima*) | CA/OR/WA stock | |
| Pygmy sperm whale (*Kogia breviceps*) | CA/OR/WA stock | |
| Killer whale (*Orcinus orca*) | Eastern North Pacific southern resident stock | Endangered |
| Killer whale (*Orcinus orca*) | Eastern North Pacific offshore stock | |
| Killer whale (*Orcinus orca*) | west coast transient stock | |
| Mesoplodont beaked whales (*Mesoplodon* spp.) - (Hubbs' beaked whales, Gingko -toothed whale, Stejneger's beaked whale, Blainville's beaked whale, Pygmy beaked whale or Lesser beaked whale, Perrin's beaked whale) | CA/OR/WA stocks | |
| Cuvier's beaked whale (*Ziphius cavirostris*) | CA/OR/WA stock | |
| Baird's beaked whale (*Berardius bairdii*) | CA/OR/WA stock | |
| **Mysticetes** | | |
| Blue whale (*Balaenoptera musculus)* | Eastern North Pacific stock | Endangered |
| Fin whale (*Balaenoptera physalus)* | CA/OR/WA stock | Endangered |
| Humpback whale (*Megaptera novaeangliae*) | CA/OR/WA stock | Endangered |
| North Pacific right whale (*Eubalaena japonica*) | Eastern North Pacific stock | Endangered |
| Sei whale (*Balaenoptera borealis)* | Eastern North Pacific stock | Endangered |
| Minke whale (*Balaenoptera acutorostrata*) | CA/OR/WA stock | |
| Gray whale (*Eschrichtius robustus*) | Eastern North Pacific stock | |

| Table 3.2.2: Marine mammal species that may occur in U.S. West Coast EEZ | | |
|---|---|---|
| **Species** | **Stocks** | **ESA-listed?** |
| **Pinnipeds** | | |
| California sea lion (*Zalophus californianus californianus*) | U.S. stock | |
| Harbor seal (*Phoca vitulina richardsi*) | CA stock and OR & WA coastal stock | |
| Northern elephant seal (*Mirounga angustirostris*) | CA Breeding Stock | |
| Guadalupe fur seal (*Arctocephalus townsendi*) | | Threatened |
| Northern fur seal (*Callorhinus ursinus*) | San Miguel Island stock | |
| Steller sea lion (*Eumetopias jubatus*) | eastern Pacific stock (U.S.) | |

This section separates U.S. West Coast EEZ marine mammals into three species groups to discuss whether any members of those groups are known to prey upon Shared EC Species: odontocetes (toothed cetaceans, including sperm whales, orcas, beaked whales, and dolphins); mysticetes (baleen whales); and pinnipeds (seals and sea lions).

*Odontocetes*

Odontocetes of the U.S. West Coast EEZ includea variety of dolphins, porpoises, beaked whales, sperm whales, and killer whales (see Table 3.2.2). The most important Shared EC Species to toothed whale diets are likely the pelagic squids, followed by the mesopelagic fishes. Approximately 80 percent of all odontocete species worldwide regularly consume squids, with squids being a main food item in 28 different species (Clarke 1996). U.S. West Coast EEZ odontocete predators of various species of squid include the sperm and beaked whales, as well various dolphins and porpoises (Nesis 1997, Fiscus et al. 1989, Kawakami 1980, Walker et al. 2002). Mesopelagic fishes also often appear in marine mammal diet studies and are commonly consumed by the smaller odontocetes, such as dolphins and porpoises (Fitch and Brownell 1968).

Ohizumi et al. (2003) examined the stomach contents of 386 Dall's porpoises, finding their diets to include a wide array of pelagic squid species, mesopelagic fish species, and Pacific saury. The Dall's porpoises in that study had been taken incidentally in salmon gillnet fisheries across the North Pacific Ocean and the authors estimated that Dall's porpoise are the primary myctophid consumers in the North Pacific (Ohizumi et al. 2003). Walker et al. (1998) examined the stomach contents of beached Dall's porpoises and harbor porpoises from the beaches of Washington and British Columbia, finding their diets to include eulachon, Pacific sand lance, and gonatid and onychoteuthid squids. In a study of the ecology and feeding behavior of bottlenose dolphins in the Southern California Bight, Hanson and DeFran (1993) found the diet of this highly-piscivorous species to include jacksmelt and topsmelt (atherinopsids). Fitch and Brownell (1968) found that, in addition to mesopelagic fishes and anchovies, Pacific saury were among the stomach contents of short-beaked common dolphins off Southern California. Walker et al. (1986) examined the stomach contents of Pacific white-sided dolphins that had stranded on the beaches of Southern California and the west coast of Baja California and found their diets to include, among other organisms, mesopelagic fishes and pelagic squid. Morton (2000), studying Pacific white-sided dolphins off British Columbia, observed them feeding on schools of capelin and eulachon as well as Pacific herring (not a Shared EC Species). Stroud et al. (1981) found the diets of Pacific white-sided dolphins and Dall's porpoises taken off California and Washington to include, among other organisms, Pacific saury, osmerid smelts, mesopelagic fishes, and pelagic squid. Killer whale diets vary by population type, whether "residents" of nearshore waters that largely feed on fish, or "transients" passing through nearshore waters that feed primarily on mammals and birds. For the most part, piscivorous killer whales eschew Shared EC Species for larger and higher trophic order fish species; however, beached killer whale stomach contents have been documented to include pelagic squid (Ford et al. 1998). Fiscus et al. (1989) documented a wide variety of cephalopods in the

stomachs of sperm whales, including cranchiidae, gonatidae, histioteuthidae, octopoteuthidae, ommastrephidae, and onychoteuthidae. Flinn et al. (2002) examined the preserved stomachs of sperm whales taken from commercial whaling stations of British Columbia in the 1960s, finding a strong presence of pelagic squid in sperm whale stomachs. Therefore, odontocetes may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, Pacific saury, silversides, osmerid smelts and pelagic squid.

*Mysticetes*

There are 7 species of baleen whales (Suborder Mysticeti) that can be found off of the U.S. West Coast EEZ. Mysticetes or baleen whales primarily feed on euphausiids and copepods and other zooplankton and do not notably rely on the Shared EC Species. Blue whales, for example, prey almost exclusively on euphausiids, even showing preferences for particular euphausiid species. Off the U.S. West Coast, euphausiids are sufficiently abundant that blue whales do not need to seek out other prey (Fiedler et al. 1998, Randall et al. 1998). Gray whales also tend to prey primarily on crustacean zooplankton, including mysids and crab larvae (Dunham and Duffus 2002, Newell and Cowles 2006, Moore et al. 2007). The North Pacific right whale is extremely rare, making diet studies, fecal sampling, and stomach sampling from beached whales also rare. However, based on the diets of other right whale species worldwide and on observations of North Pacific right whales during feeding, they are also thought to prey almost exclusively on euphausiids and other crustacean zooplankton (NMFS 2013d). The existing U.S. West Coast EEZ prohibition on euphausiid (krill) harvest already preserves the prey base for mysticetes, particularly those that feed more exclusively on euphausiids.

Although mysticetes strongly prefere euphausiid prey, some mysticetes will also regularly feed on small schooling fishes such as herrings and anchovies. Specifically, fin, minke, sei and humpback whales will all commonly or opportunistically feed on fishes (Gaskin 1982, Kasamatsu and Tanaka 1991, Witteveen et al. 2008). Of the Shared EC Species fishes, sei whales are known to consume saury (Kato, 1992), and humpback whales commonly feed on certain osmerid smelts, such as capelin, while feeding in waters off of Alaska (Witteveen et al. 2008). Flinn et al. (2002) examined the preserved stomachs of fin and sei whales taken from commercial whaling stations of British Columbia in the 1960s, and found that both species primarily preyed upon euphausiids and copepods, although their other prey species included Pacific saury and myctophids, (Shared EC Species), as well as rockfish and ragfish, among the otherwise unspeciated fish and squid stomach contents. Witteveen et al. (2008) tracked humpback whales on foraging dives off Alaska and found them preying upon schools of capelin, eulachon, and pollock (*Theragra chalcogramma*, not a Shared EC species). Minke whales feed primarily on euphausiids, but will feed opportunistically on schooling fish. Although we could not find minke whale diet studies for the eastern North Pacific, western North Pacific populations have been noted for preying upon Pacific herring and anchovy and, among other species, Pacific saury and sand lance (Tamura and Fujise 2002, Song and Zhang 2014). Therefore, mysticetes may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific saury, osmerid smelts, and possibly Pacific sand lance.

*Pinnipeds*

Pinniped species of the U.S. West Coast EEZ include: California sea lion, harbor seal, northern elephant seal, Guadalupe fur seal, northern fur seal, and Steller sea lion. Since seals and sea lions spend some portion of their lives on land, more detailed diet information is typically available for them through scat samples than for other marine mammals (Lowry 2011). Estimates suggest that pinnipeds in the U.S. West Coast EEZ may consume as much as a million tons of fish and squid prey (Hunt et al. 2000). California sea lions are known to prey on Shared EC Species within every group except for the herrings (Lowry 2011, Feder et al. 1974, Weise and Harvey, 2008). Harbor seals, typically feeding nearshore, are known predators of both sand lance and osmerids (London et al. 2002, Orr et al. 2004, Lance and Jefferies 2009, Brown and Mate

1983). Antonelis et al. (1987) sampled the stomach contents of 59 live elephant seals and found their diet to include a variety of squid species, including cranchiids, gonatids, histioteuthids. Guadalupe fur seals are listed as threatened under the ESA and their population is small enough that diet data collection is more difficult than for other CCE pinnipeds (Lander et al. 2000); however, Hanni et al (1997) sampled the stomach contents of stranded Guadalupe fur seals and found that their diets included pelagic squid and mesopelagic fishes. Antonelis and Perez (1984) found that northern fur seals off the U.S. West Coast consumed a wide variety of species, including many CPS and Groundfish FMP species, as well as Pacific saury, onychoteuthid squid, and osmerid smelts. Stroud et al. (1981) found the diets of northern fur seal taken off California and Washington to include, among other organisms, Pacific saury, eulachon, and gonatid and onychoteuthid squid. Zeppelin and Ream (2006) analyzed Alaskan northern fur seal diets from fecal samples and found that fur seals had consumed gonatid squid and Pacific sand lance, among other prey. Many of the available Steller sea lion diet studies focus on the Alaska stock; however, Riemer et al (2011) focused on the food habits of Steller sea lions off Oregon and northern Calfornia, finding their diet to include the Shared EC Species Pacific sand lance and osmerid smelts, as well as many other FMP and non-FMP species. Therefore, pinnipeds may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, Pacific saury, osmerid smelts and pelagic squid.

#### *3.2.3.3 Seabirds*

A variety of seabird species prey upon Shared EC Species, including the three West Coast seabirds listed under the ESA: short-tailed albatross (*Phoebastria albatrus*, USFWS 2008) and California least tern (*Sterna antillarum browni*, UWFWS 1985), endangered; and marbled murrelet (*Brachyramphus marmoratus*), threatened (USFWS 1997). In addition to the ESA, migratory seabirds are managed under the MBTA, which protects birds that migrate between the U.S. and other nations from unlicensed or unlawful directed harvest. This action does not address the take of seabirds in fisheries or elsewhere; however, many Shared EC Species are prey of CCE seabirds. This section examines the predator-prey interactions, if known, between Shared EC Species and seabirds. Seabirds occupy the higher trophic levels that may prey upon Shared EC Species and, as a group are described with other high trophic level non-fish species in Section 3.2.1.1 of the FEP (PFMC 2013). This section discusses only those seabird species or species groups that are known to spend at least some portion of their lives within the U.S. West Coast EEZ. Shorebirds that primarily prey upon intertidal invertebrates are not discussed herein.

*Shared EC Species that are prey of at least one CCE seabird species:*

- *Thread herring*
- *Mesopelagic fishes*
- *Pacific sand lance*
- *Pacific saury*
- *Silversides*
- *Osmerid smelts*
- *Pelagic squids*

The USFWS is responsible for administering the MBTA, including seabird management and colony monitoring. Recovery of seabirds listed as threatened or endangered under the ESA is also a USFWS responsibility. On November 1, 2013, the USFWS updated its *List of Migratory Birds*, which is the list of species protected under the MBTA (78 FR 65844). That list includes migratory species that range throughout the world, which means that it includes many species that are not relevant to the geographic scope of this EA, the U.S. West Coast EEZ. To focus on species within the CCE, this Section 3.2.3.3 relies on the *List of Migratory Birds* and on the USFWS Regional Seabird Conservation Plan for the Pacific Region (USFWS 2005), which includes species profiles for seabirds of the California Current System and of U.S. Pacific Islands. The USFWS and NOAA documents discussed herein provide life history descriptions for seabirds that are known to occur within the U.S. West Coast EEZ for at least some part of their lives, listed in Table 3.2.3.

The USFWS Seabird Conservation Plan provides life history descriptions for all of the species listed in Table 3.2.3, except for: the five shearwater species, northern fulmar (*Fulmaris glacialis*), Bonaparte's gull

(*Chroicocephalus Philadelphia*), glaucous gull (*Larus hyperboreus*), Heermann's gull (*Larus heermanni*), mew gull (*Larus canus*), black-legged kittiwake (*Rissa tridactyla*), and Craveri's murrelet (*Synthlibroramphus craveri*). The USFWS Alaska Office's Seabird Information Series provides life histories for many of the species in Table 3.2.3, including short-tailed (*Puffinus tenuirostris*) and sooty (*P. griseus*) shearwaters, northern fulmar, Bonaparte's gull, glaucous gull, mew gull, and blacklegged kittiwake (Denlinger 2006). NOAA's Cordell Bank, Gulf of the Farallones, and Monterey Bay National Marine Sanctuaries maintain an online Sanctuary Integarated Monitoring Network species database (http://sanctuarysimon.org/species/) that provides life history descriptions for species that occur within those sanctuaries, including profiles for Buller's (*P. bulleri*), and pink-footed (*P. creatopus*) shearwaters, and Heermann's gull. Craveri's murrelet and black-vented shearwater (*P. opisthomelas*) are not discussed in detail in either the USFWS publications or the Sanctuary database. Craveri's murrelet nests on islands within the Southern California Bight and until 2007, Craveri's and Xantus's murrelet populations of that area had not been managed or studied separately from each other because their life histories are so similar. Black-vented shearwaters are known to have similar life histories to other petrel-like species, to nest in burrows on small islands off the Pacific Coast of Baja California, primarily Natividad Island (Keitt et al. 2003), and to migrate into and feed within the U.S. EEZ off California, with documented appearances in the National Marine Sanctuaries (http://ccma.nos.noaa.gov/ecosystems/sanctuaries/california/html/data/pdfs/bird_bvsh.pdf).

The following species are on the *List of Migratory Birds* and have been known to very occasionally range into the U.S. West Coast EEZ, but occur too infrequently or in too small numbers within the U.S. West Coast EEZ to be considered within this section: shy albatross (*Thalassarche cauta*), wandering albatross (*Diomedea exulans*), flesh-footed shearwater (*P. carneipes*), Murphy's petrel (*Pterodroma ultima*), mottled petrel (*Pterodroma inexpectata*), Cook's petrel (*Pterodroma cookii*), Stejneger's petrel (*Pterodroma longirostris*), neotropic cormorant (*Phalacrocorax brasilianus*), laughing gull (*Leucophaeus atricilla*), Thayer's gull (*Larus thayeri*) and parakeet auklet (*Aethia psittacula*). White pelican (*Pelecanus erythrorhynchos*) is also on the *List of Migratory Birds*, but it prefers inland freshwater with winter migration to the brackish waters and estuaries of California and is not considered an EEZ species off the U.S. West Coast.

CCE seabirds likely to prey upon Shared EC Species may be roughly divided by taxonomic order and family. Seabird species of the order Procelliforme include albatrosses, petrels, shearwaters, and storm-petrels. Procellliforme species tend to be highly migratory and may breed outside of the U.S. West Coast EEZ, yet migrate through and feed within the EEZ. Seabird species of the order Pelecaniformes include two families of seabird species that occur off the U.S. West Coast, *Pelecanidae* (pelicans) and *Phalacrocoracidae* (cormorants). Pelecaniformes are more nearshore species than Procelliformes and those that are residents of the U.S. West Coast EEZ may spend all or most of their lives within the EEZ. Species of the order Charadriiformes include the suborder *Lari* (gulls, terns, noddies, and skimmers) and *Alcae* (murres, auklets, guillemots, and puffins). Charadriiformes are also nearshore species, often known for their large coastal colonies at breeding sites.

**Table 3.2.3: Seabird species that may occur in U.S. West Coast EEZ**

| Species | Pacific Distribution | ESA-listed? |
|---|---|---|
| **Procelliformes** | | |
| Fork-tailed storm-petrel (*Oceanodroma furcata*) | North Pacific | |
| Leach's storm-petrel (*O. leucorhoa*) | Northern Hemipshere | |
| Ashy storm-petrel (*O. homochroa*) | CCE | |
| Black storm-petrel (*O. melania*) | Channel Islands, CA, Baja California | |
| Black-footed albatross (*Phoebastria nigripes*) | Central Pacific, ranging into CCE | |
| Laysan albatross (*P. immutabilis*) | Central Pacific, ranging into CCE | |

| Table 3.2.3: Seabird species that may occur in U.S. West Coast EEZ | | |
|---|---|---|
| **Species** | **Pacific Distribution** | **ESA-listed?** |
| Short-tailed albatross (*P. albatrus*) | North Pacific | Endangered |
| Black-vented shearwater (*Puffinus opisthomelas*) | West Coast of Baja California breeder, migrates into CCE | |
| Buller's shearwater (*P. bulleri*) | Southern Pacific breeder, migrates throughout Pacific Ocean | |
| Pink-footed shearwater (*P. creatopus*) | Southeastern Pacific breeder, migrates throughout Pacific Ocean | |
| Short-tailed shearwater (*P. tenuirostris*) | Southern Pacific breeder, migrates throughout Pacific and Indian Oceans | |
| Sooty shearwater (*P. griseus*) | Southern Pacific breeder, migrates throughout Pacific Ocean | |
| Northern fulmar (*Fulmarus glacialis*) | Arctic circumpolar, south to central CA | |
| **Pelecaniformes** | | |
| Brown pelican (*Pelecanus occidentalis*) | Temperate and tropical Americas | |
| Double-crested cormorant (*Phalacrocorax auritus*) | Western subspecies (*P.a. albociliatus*), throughout CCE | |
| Brandt's cormorant (*P. penicillatus*) | West Coast of North America | |
| Pelagic cormorant (*P. pelagicus*) | North Pacific | |
| **Charadriiformes** | | |
| Ring-billed gull (*Larus delawarensis*) | Off western N. America, CCE | |
| California gull (*Larus californicus*) | Off western N. America, CCE | |
| Western gull (*L. occidentalis*), | Off western N. America, CCE | |
| Glaucous gull (*L. hyperboreus*) | Northern Alaska to OR coast | |
| Glaucous-winged gull (*L. glaucescens*) | Northern and northeastern Pacific | |
| Heerman's gull (*L. heermanni*) | CCE south to Central America | |
| Mew gull (*L. canus*) | Northwest Alaska south to Baja California | |
| Bonaparte's gull (*Chroicocephalus Philadelphia*) | Western Alaska south to CCE | |
| Black-legged kittiwake (*Rissa tridactyla*) | Northwest Alaska to southern CA | |
| Gull-billed tern (*Sterna nilotica*) | Southern CA, northern Mexico | |
| Caspian tern (*S. caspia*), | Off western N. America, CCE | |
| Royal tern (*S. maxima*), | Subspecies (*S.m. maxima*), southern CA, northern Mexico | |
| Elegant tern (*S. elegans*), | Southern CA, northern Mexico | |
| Arctic tern (*S. paradisaea*), | Arctic circumpolar, south to WA coast | |
| Forster's tern (*S. forsteri*), | Central and southern CA | |
| Least tern (*Sterna antillarum)* | Subspecies (*S.A. browni*), central CA to Baja California | Endangered |
| Black skimmer (*Rynchops niger*) | California south to southern South America | |
| Common murre (*Uria aalge*) | Arctic circumpolar, south to central CA | |
| Pigeon guillemot (*Cepphus Columba*) | North Pacific | |
| Marbled murrelet (*Brachyramphus marmoratus*) | Northeastern North Pacific | Threatened |
| Xantus's murrelet (*Synthliboramphus hypoleucus*) | Southern CA, northern Mexico | |
| Ancient murrelet (*S. antiquus)* | Northern North Pacific, south to WA coast | |
| Craveri's murrelet (*S. craveri*) | Southern CA to Baja California | |
| Cassin's auklet (*Ptychoramphus aleuticus*) | Northeastern North Pacific | |

| Table 3.2.3: Seabird species that may occur in U.S. West Coast EEZ | | |
|---|---|---|
| **Species** | **Pacific Distribution** | **ESA-listed?** |
| Rhinoceros auklet (*Cerorhinca monocerata*) | Northern North Pacific, south to southern CA | |
| Tufted puffin (*Fraterculata cirrhata*) | Northern North Pacific, south to Farallon Islands | |

This section separates U.S. West Coast EEZ seabirds into three species groups to discuss whether any members of those groups are known to prey upon Shared EC Species: Procelliformes, Pelecaniformes, and Charadriiformes. As with marine mammals and fish, there are several species in each species group for which no diet data are available. Because seabirds must hunt at or near the ocean's surface, their diets tend to include more pelagic than benthic species, except when they may be hunting in shallow and nearshore waters.

*Procelliformes*

Most of the Procelliformes species that spend some part of their lives within the CCE do not nest on or near the U.S. West Coast. Species-specific diet sampling for highly migratory bird species that spend most of their lives on the high seas is simplest at their nesting sites, where scientists can collect the excess castings from parent birds regurgitating to feed their chicks. Birds observed at sea are often observed from fishing vessels, where they are usually feeding on vessel-discarded offal; therefore, fisheries-based observations of bird diet may not accurately represent what those bird species would eat if they were foraging away from fisheries activities. For example, Gould et al. (1997b) attributed the myctophids and Pacific saury in the stomachs of northern fulmars taken incidentally in high seas driftnet fisheries to independent hunting by the fulmars, yet concluded that the squid in fulmar stomach was likely scavenged from the squid driftnet fisheries' catch. Hatch (1993a) looked at populations of northern fulmar in their North Pacific colonies and found their diets to include Pacific sand lance, capelin, myctophids, Pacific saury and unidentified squid. In a study of Laysan and black-footed albatrosses taken incidentally in high seas driftnet fisheries, Gould et al. (1997a) found the diets of those albatross species to be dominated by neon flying squid, but to also include gonostomatids, myctophids, and Pacific saury. Gould and colleagues continued their seabird diet studies for seabirds taken incidentally in high seas driftnet fisheries with a 2000 diet study on sooty and short-tailed shearwaters, finding that those shearwater species preyed upon pelagic squid, Pacific saury, and myctophids. Outside of fisheries, several studies concur that albatrosses prey heavily on pelagic squid species, both worldwide (Cherel and Klages 1997) and within the CCE (Pitman et al. 2004). Baltz and Morejohn (1977), studying the diets of seabirds found in Monterey Bay, found pelagic squids in the diets of northern fulmar, and short-tailed, sooty and pink-footed shearwaters. Therefore, Procelliformes may be considered predators of the following Shared EC Species or species groups: Pacific saury, mesopelagic fishes osmerid smelts, and pelagic squids.

*Pelecaniformes*

Several U.S. brown pelican populations, including the coastal California population, were among the many bird populations decimated by the widespread use of the pesticide DDT in the mid-20$^{th}$ century. Brown pelican populations were delisted from their ESA-protected status in 2009 (74 FR 59444, November 17, 2009). ESA-listing for these populations led to diet studies for the specis and brown pelicans of California are well known to feed almost exclusively on northern anchovy (Anderson and Gress 1983, Briggs et al. 1983, USFWS 1983), although the USFWS recovery plan for brown pelican also noted small numbers of Pacific saury and topsmelt in pelican diets (USFWS 1983).

In examining the pellets, regurgitations, and stomach samples of pelagic, Brandt's, and double-crested cormorants, Ainley et al. (1981) found that their diets included the Shared EC Species: osmerid smelts,

Pacific sand lance, silversides, thread herring and mesopelagic fishes. Sand lance has also been found in the diets of double-crested and pelagic cormorants of British Columbia (Robertson 1974) and in the diets of double-crested cormorants of the Columbia River estuary (Collis et al. 2002). Talent (1984) found Pacific saury and jacksmelt in diets of Brandt's cormorants wintering in Monterey Bay. Therefore, Pelecaniformes may be considered predators of the following Shared EC Species or species groups: thread herring, Pacific sand lance, Pacific saury, silversides, and osmerid smelts.

*Charadriiformes*

Baltz and Morejohn (1977) studied the diets of a variety of seabirds wintering on Monterey Bay, and found that California, glaucus-winged, and Western gulls all prey upon boreal clubhook squid (*Onychoteuthis borealijaponicus)*. Hunt and Hunt (1976) looked at the diets of Western gulls nesting on Santa Barbara Island and, in addition to a heavy reliance on anchovy, found Pacific saury in their diets. Collis et al. (2002) found Pacific sand lance and osmerid smelts in the diets of glaucous-winged gulls of the Columbia River estuary. Vermeer (1982) identified Pacific sand lance and Pacific saury in the diets of the glaucous-winged gulls of Vancouver Island. Hatch (1993b, 2013) examined black-legged kittiwake diets from regurgitated stomach samples and found Pacific sand lance, osmerids, myctophids, and unidentified squid.

Burkett (1995) collected food habits information for marbeled murrelet and found that, among other prey, they consumed Pacific sand lance and osmerids. Roth et al. (2005) reviewed the diet and prey abundance of Xantus's murrelet in Southern California and, although they did not speciate much of that murrelet's diet, they did find that Xantus murrelet prey upon Pacific saury, in addition to other species. Roth et al. (2008) studied the diets of common murre in colonies between Cape Blanco, OR and Point Conception, CA, finding that common murre are strongly piscivorous, preying upon species from the Groundfish and CPS FMPs as well as osmerid smelts. Ainley et al. (1996) looked at common murre diets in California waters and also found strong piscivory, with their diets including Shared EC Species from the osmerid smelt and silversides groups. Miller and Sydeman (2004) also found heavy common murre predation on juvenile rockfish and other species, including osmerid smelts. In a report on marbled murrelet populations and productivity in Oregon, Strong (2010) found Pacific sand lance and osmerids in both marbled murrelet and common murre diets. In addition to their notorious predation on juvenile salmon, Caspian terns prey upon an array of forage fish species, including Pacific sand lance and osmerid smelts (Collis et al. 2002, Thompson et al. 2002. Roby et al. 2003).

Wehle (1982) examined the stomach contents of tufted puffins taken off Alaska and found that, in addition to preying upon squid, tufted puffins eat Pacific sand lance and capelin, an osmerid smelt. Rhinoceros auklet chicks feed so heavily on Pacific sand lance that sand lance year class strength can be a limiting factor for annual rhinoceros auklet chick survival (Vermeer 1980, Bertram and Kaiser 1993, Davoren and Burger 1999). Grover and Olla (1983) posited that intense rhinoceros auklet feeding on Pacific sand lance served to reveal concentrations of sand lance to other sand lance predators, such as glaucous-winged and Heermann's gulls, pelagic cormorants, and common murres. Thayer et al. (2008) studied the diets of rhinoceros auklets in colonies around the North Pacific Rim and found that diet contents varied by location, and that rhinoceros auklets off southern California feed on Pacific saury in addition to several FMP species, such as juvenile rockfish, salmon, and sablefish. Pacific sand lance also figure heavily in the diets of nesting Cassin's auklets (Bertram et al. 2001) and pigeon guillemots (Litzow et al. 2000). Adams et al. (2004) examined the euphausiid-heavy diets of Cassin's auklet chicks off Southern California and found paralepididae (mesopelagic fish) among their prey. Davoren and Burger (1999) also sampled rhinoceros auklet diets at colony sites off British Columbia and found that, in addition to Pacific sand lance, rhinoceros auklets were feeding on surf smelt (an osmerid smelt), as well as Pacific herring and Pacific salmon species (not Shared EC Species). Therefore, Charadriiformes may be considered predators of the following Shared EC Species or species groups: mesopelagic fishes, Pacific sand lance, Pacific saury, silversides, osmerid smelts and pelagic squid.

## 3.3 Socio-Economic Environment

The larger socio-economic environment of the CCE, including the historical and current fisheries, fishing communities, and fisheries management processes, is also described within the FEP in the following sections: Section 3.1.3, Political Geographic and Large-Scale Human Demographic Features of the CCE; Section 3.4, Fisheries of the CCE; Section 3.5, Fisheries and Natural Resource Management in the CCE; Section 4.4, Changes in Fishing Community Involvement in Fisheries and Dependence Upon Fisheries Resources (PFMC 2013).

Beyond those FEP descriptions of the socio-economic environment, this chapter addresses: directed fisheries for the species subject to this action, if any (Section 3.3.1); incidental catch, where known, of the Shared EC Species (Section 3.3.2); worldwide fisheries for lower trophic level species groups similar to the Shared EC Species (Section 3.3.3); and the effects of non-fishing activities, where known, on Shared EC Species.

Although Shared EC Species are not targeted in commercial fisheries within the CCE, those same species or similar species, are taken in the fisheries of other nations (Figure 3.2). Harvests of forage species are converted into various commodities through value added production processes (Herrick et al. 2009). Based on FAO fisheries commodities, production and trade data from 1976-2009, most of the reported lower trophic level species commodities production was in the fishmeal and fish oil category. During that period, commodities in the fishmeal and fish oil category increased to well over 50% of total annual lower trophic level species commodities production. The growing importance of these minor species in global fishery landings may reflect their increasing use as ready substitutes in the production of fishmeal and fish oils.

**Figure 3.2 Global landings of select lower trophic level species, 1950-2009.**

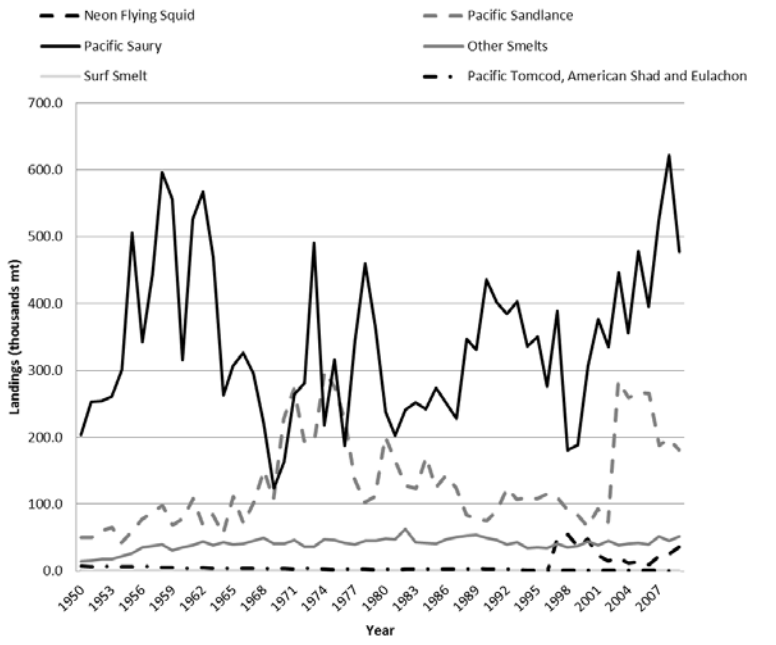
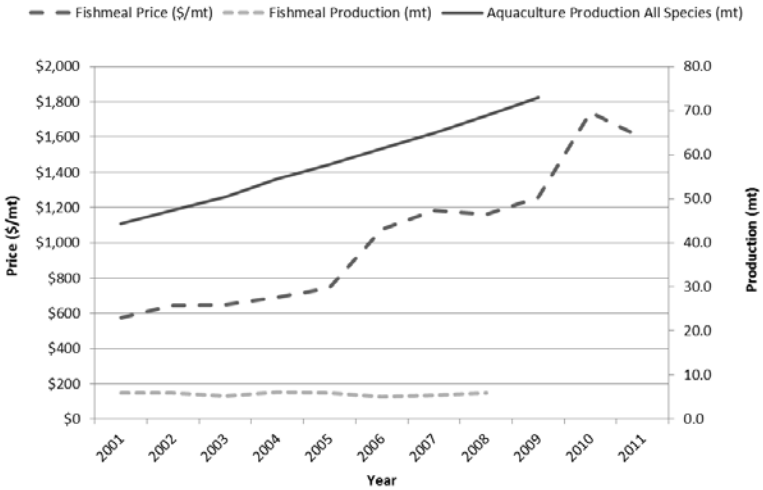



**Figure 3.3 Global aquaculture production, fishmeal production and fishmeal price, 2001-2011.**



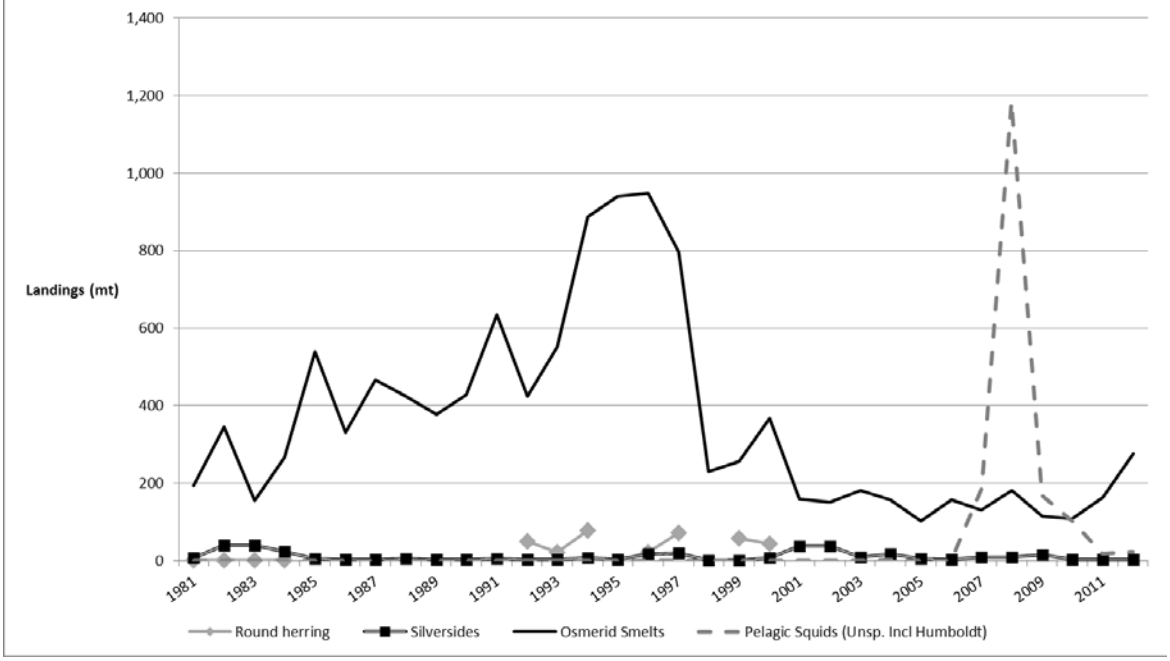
Demand for these species in the production of fishmeal has mainly been driven by the spectacular growth of global aquaculture, which is expected to continue into the foreseeable future (Tacon and Metian 2008, Shamshak and Anderson 2008, Herrick et al. 2009), see Figure 3.3. The production of many aquaculture species depends on forage species fisheries to supply the raw ingredients in today's aquafeeds. In the recent boom in capture-based aquaculture, demand has increased for whole live/fresh/frozen forage species for pen fattening aquaculture operations (Zertuche-Gonzales et al. 2008). All these feed requirements pose a potential sustainability problem for the aquaculture industry, because at present, unlike fishmeal use in livestock production, there are limited opportunities to replace lower trophic level species, either in fresh or in fishmeal form, with cost effective protein substitutes. Given limited potential for increased fishmeal production from traditional lower trophic level species prices for fishmeal and fish oil will continue to rise. This makes the prospect for fisheries developing on the minor forage species all that more attractive, since higher fishmeal prices are sure to translate into higher exvessel prices for the raw ingredients.

### 3.3.1 Directed Fisheries for Shared EC Species

The Workgroup was not able to identify any directed fisheries for Shared EC Species in Federal waters off the U.S. West Coast, 3-200 nm offshore. Sections 3.3.1.1 through 3.3.1.4, below, characterize directed state and tribal fisheries for these species, if any. When taken, most of Shared EC Species or species groups have been taken in trace amounts. With the exception of some smelts, when directed landings of these species have occurred, there were often only one or two landings per year in any one state. Therefore, some landings could not be reported without violating data confidentiality requirements. Because there are significantly fewer data for these species than for fisheries-targeted species, there may be significant and unknown problems with the accuracy and precision of any catch amounts shown in this section and in Section 3.3.2, which discusses incidental take of Shared EC Species.

With the exception of the true smelts (*Osmeridae*), coastwide landings of Shared EC Species have been relatively minimal or zero over the past 30+ years (Figure 3.1). The Shared EC Species or species groups that do not appear in Figure 3.1 were either not landed during the 1981-2013 period, or may have been landed under one of the very general Pacific Fisheries Information Network (PacFIN) "unspecified" or "other" categories. Directed fishing for osmerid smelts has largely occurred within state coastal waters,

**Figure 3.1: U.S. West Coast landings (mt) of select non-FMP forage species, 1981-2013**



where those species aggregate. Landings from the Columbia River or attributed to inland waters, areas where eulachon aggregate, were not included in Figure 3.1; therefore, no eulachon landings appear in Figure 3.1. The peak in landings of pelagic squids in the past ten years is likely attributable to Humboldt squid landings, rather than to the squid species subject to this action. However, squid are not reported by species except for market squid (*Doryteuthis (loligo) opalescens*) and Humboldt squid (California only). Confidentiality issues described above prevented displaying round herring landings in some years (refer to Section 3.3.1.3 for California landings.)

*3.3.1.1 Washington directed fisheries for Shared EC Species*

Table 3.3.1, below, summarizes known information about Washington-based commercial and recreational harvest of Shared EC Species.

**Table 3.3.1: Shared EC Species in Washington fisheries**

| | |
|---|---|
| **Round and thread herring** | |
| | Not known to occur in Washington area waters. |
| **Mesopelagic fishes** | |
| *Myctophidae*, *Bathylagidae*, *Paralepididae*, and *Gonosomatidae* | No known landings into Washington. Trace amounts observed as bycatch in the at-sea whiting fishery. |
| **Pacific sand lance** | |
| | *Commercial*: No known commercial landings. Trace amounts observed as bycatch in the at-sea whiting fishery.<br><br>*Recreational*: Limited harvest allowed under forage fish rules. Any harvest would most likely take place in state waters. |
| **Pacific saury** | |
| | No known harvest in the state. |
| **Silversides** | |
| | No known harvest in the state. |
| **Osmerid Smelts** | |
| | Washington waters are home to several members of the smelt family including surf smelt, eulachon, longfin smelt, whitebait smelt, and night smelt. There is no commercial fishing authorized for these species in ocean waters off the Washington coast. Some recreational harvest is permitted but it likely occurs primarily, if not exclusively, within state waters. Commercial and recreational harvestoccurs in Puget Sound, primarily for sand smelt. Based on PacFIN reportings for marine waters statistical areas, as much as 50% of the unidentified smelt species landed into Washington ports in any one year over 1981-1990 may have been taken from Federal waters. This figure declined to about 20% for any one year over 1991-2001, but has been at 0% for 2002 through 2012. |
| **Pelagic squids** | |
| | Commercial landings of squid are not recorded to species in Washington. Large landings in 2008 were likely Humboldt squid. Based on PacFIN reportings for marine waters statistical areas, less than 2% of the unidentified squid species landed into Washington ports in any one year over 1981-1990 may have been taken from Federal waters. This figure increased to about 7% for any one year over 1991-2000, but increased to 100% in 2001-2003, slightly decreased to about 78% in 2004-2005, and then returned to 100% in 2006 through 2012. |

*3.3.1.2 Oregon directed fisheries for Shared EC Species*

Under the general Oregon policy of marine fisheries being open unless specifically closed, commercial fishing for these species is allowed in marine waters off Oregon, with the exception of Osmerid smelts. Commercial fishing for osmerid smelts is prohibited and bycatch may not exceed 1% of the landing by weight (Oregon Administrative Rule 635-004-0545). Commercial fishing for eulachon may occur in the Columbia River if allowed under OAR 635-042-0130. For federally managed species, Oregon Department of Fish and Wildlife (ODFW) regulations for state waters automatically conform to Federal regulations (see OAR Division 004, Commercial Fisheries Other Than Salmon and Shellfish). Any Federal regulations developed to protect these forage species in the FMPs would automatically apply to state fisheries and waters.

Current commercial fisheries do not appear to target any of these species in marine waters but may land small amounts as bycatch, with no commercial value. With the exception of eulachon from the Columbia River and unspecified squid species, which are likely Humboldt squid, the annual ex-vessel revenue from Oregon landings of all these species has been zero for the past decade. During the mid-1980s, landings of unspecified smelt species peaked at 33 mt with an ex-vessel value of $21,000. Landings of unspecified smelt species declined to less than 1 mt in most years after 1989. (ODFW commercial codes identify only whitebait smelt, surf smelt and eulachon. Other smelt and unidentified smelt are coded as smelt species).

In recent years, bycatch of these species, excluding unspecified squid species and eulachon, have been taken primarily in the whiting fishery, pink shrimp fishery, and groundfish trawl fishery. For example, recent annual landings of barracudina, a mesopelagic fish, are very small (<0.1mt) and taken as bycatch in the whiting fishery. In the pink shrimp fishery, some of these forage species are commonly taken and are discarded at sea. Myctophids are a common bycatch in shrimp trawls at depths greater than about 90 fathoms; whitebait smelt are common in trawls inside of about 65 fathoms; and Pacific sand lance are rarely encountered (Bob Hannah, ODFW, personal communication). Eulachon are commonly taken in shrimp trawls and can be a large component of the bycatch that remains after biological reduction devices have excluded the majority of fishes.

For recreational fisheries, fishing for all these forage species is allowed, with the exception of eulachon. Targeting is rare, but does occasionally occur for surf smelt near or from shore. Occasionally, Pacific sand lance may be incidentally taken while fishing for herring.

Table 3.3.2, below, summarizes known information about Oregon-based commercial and recreational harvest of Shared EC Species.

**Table 3.3.2: Shared EC Species in Oregon fisheries**

| | |
|---|---|
| **Round and thread herring** | |
| | Not known to occur in Oregon area waters. |
| **Mesopelagic fishes** | |
| *Myctophidae, Bathylagidae, Paralepididae,* and *Gonosomatidae* | No landings into Oregon, except trace amounts of barracudinas taken as bycatch in the at-sea whiting fishery. Myctophids are a common bycatch in shrimp trawls at depths greater than 90 fathoms and are discarded at sea. |
| **Pacific sand lance** | |
| | *Commercial:* No known commercial landings. Trace amounts observed as bycatch in the at-sea whiting fishery. No commercial code in fish ticket system.<br><br>*Recreational:* Limited harvest allowed. No known harvest since 2000. Any harvest would most likely take place in state waters, incidental to fishing for herring. |
| **Pacific saury** | |

| | |
|---|---|
| | No known harvest in the state. (commercial: one fish landed in 2012). |
| **Silversides** | |
| | *Commercial*: No known commercial landings.<br><br>*Recreational*: No reported harvest. Harvest, if any, from ocean and estuary sampling was most likely topsmelt reported as jacksmelt. |
| **Osmerid Smelts** | |
| | Oregon waters are home to several members of the smelt family including surf smelt, eulachon, longfin smelt, whitebait smelt, and night smelt.<br><br>*Commercial:* There is no commercial fishing authorized for these species in ocean waters off the Oregon coast. Smelt landings of unspecified species during the early 1980s were taken with bait shrimp pumps and bait net gear, primarily from the southern Oregon coast. Landings ranged from 10 to 33 mt during 1984-1987 and declined rapidly to low levels until prohibited. A small amount of whitebait smelt was landed in 1989. Eulachon landings are from fisheries in the Columbia River, with the exception of a trace amount of bycatch taken in the whiting fishery in 2013.<br><br>Smelt are taken as bycatch in the pink shrimp fishery and are discarded at sea. Eulachon are very commonly encountered in Oregon shrimp trawls and can be a large component of the bycatch that remains after bycatch reduction devices have excluded the majority of fishes (in some years). Whitebait smelt are commonly encountered when shrimpers trawl inside of about 65 fathoms.<br><br>*Recreational*: Since 2000, trace amounts of unspecified smelts have been harvested in estuary waters. |
| **Pelagic squids** | |
| | Commercial landings of squid are not recorded to species in Oregon, with the exception of market squid. Commercial landings of all other squids were zero until 2007, when 103 mt were landed. Landings peaked in 2008 at 351 mt and have declined rapidly to 20 mt or less since 2010. These landings were likely Humboldt squid. |

#### *3.3.1.3 California directed fisheries for Shared EC Species*

Of the proposed list of forage species, there are only directed commercial fisheries for some of the osmerid smelts in California waters. There may be some directed landings of jacksmelt, although the landings of this species primarily occur incidental to other fisheries. Bait fisheries are allowed for the smelts, but it is not clear what portion of total landings are for bait purposes. Historically, there have been limited efforts to target Pacific saury or round herring, but reported landings of these species have been minimal or nonexistent over the past 30 or 12 years, respectively. While it is difficult to determine whether these fisheries take place in state or federal waters, it appears that for the most part, any existing directed fisheries are occurring primarily or exclusively within state waters. For federally managed fisheries for CPS, salmon and groundfish, California Department of Fish and Wildlife (CDFW) commercial regulations for state waters automatically conform to federal regulations (see Fish and Game Code Sections 159, 182 and 189, California Code of Regulations). Any federal regulations developed to protect these forage species in the CPS, salmon or Groundfish FMPs would automatically apply to California's state fisheries and waters only when they were being targeted, or part of a directed fishery, while fishing for CPS, salmon or groundfish.

Information on bycatch of the Shared EC Species in other fisheries is also limited. The West Coast Groundfish Observer Program (WCGOP) data indicate there have been some limited interactions among the proposed forage species and some California fisheries including: smelts and round herring with the California halibut trawl fishery and possibly osmerid smelts in the pink shrimp fishery (although the data

do not specify state of occurrence.) Table 3.3.3, below, summarizes known information about California-based commercial and recreational harvest of the Shared EC Species.

**Table 3.3.3: Shared EC Species in California fisheries**

| | |
|---|---|
| **Round and thread herring** | |
| Round herring | *Commercial*: Round herring landings were reported for about ten years during the 1990s, which exceeded 170,000 pounds in 1994, but no landings have been reported since 2001. Most of the reported landings were from the Los Angeles port complex using net gear incidental to CPS species (e.g., sardine, and jack and Pacific mackerel). Regulations regarding the commercial take of herring are not specific, but generally apply to Pacific herring.<br><br>*Recreational*: While the recreational take of herring is allowed, from 1980 to 2003 the estimated catch was minimal or none. Catch from 2004 on have been trace or zero. |
| Thread herring | *Commercial*: There have been no reported landings of thread herring.<br><br>*Recreational*: While both herring species may be taken in the recreational fishery, there was no estimated catch of thread herring. |
| **Mesopelagic fishes** | |
| *Myctophidae, Bathylagidae, Paralepididae,* and *Gonosomatidae* | *Commercial*: Although there are no regulations preventing or allowing the take of mesopelagics, there have been no reported landings of these groups and there is no market category for these species.<br><br>*Recreational*: There were no catch estimates of mesopelagics from 1980 to the present. It is likely they occur too deep to be taken in the recreational fishery. |
| **Pacific sand lance** | |
| | *Commercial*: There is no market category for Pacific sand lance, and there are no landings.<br><br>*Recreational*: A fishery is allowed, but they are not targeted. Occasionally they may be taken accidentally while fishing for [Pacific] herring. |
| **Pacific saury** | |
| | *Commercial*: Pacific saury may be taken commercially, but they are not targeted. Historically, there have been several attempts to initiate saury fisheries. In 1931, 1,300 pounds were delivered in Monterey; later, Hovden cannery experimented with canning them in 1947 and produced a product "…highly satisfactory…superior to sardines in taste and appearance..." (Cox, 1949). Another fishery was initiated in the 1950s following the collapse of the sardine fishery and further attempted primarily by the Japanese in the 1960s after the decline of the western Pacific stocks; the highest landing was 3,600 tons in 1970 (Kato, 1992). Since 1980, there have been trace (<100 pounds) to no reported landings. Earlier landings were likely primarily if not all from Federal waters. Anecdotal information suggests that they do not school as well as the western Pacific stock, and thus there is less incentive to initiate a fishery (pers comm, S. Moore.)<br><br>*Recreational*: A recreational fishery is allowed, but saury are not targeted; catch estimates were minimal or zero from 1980 through present. Anecdotal information suggests that they may be taken in the recreational fishery incidentally to HMS species (albacore; pers com, C. Valle, CDFW). |
| **Silversides** | |
| Topsmelt | *Commercial*: They are allowed to be taken in the commercial fishery, although there have been zero to trace landings since 1980. |

| | |
|---|---|
| | *Recreational*: Topsmelt are allowed to be taken in the recreational fishery; almost all the catch occurs in state waters.<br><br>*Marine Aquaria Trade:* They are allowed to be taken in the marine aquaria trade with the appropriate permit. |
| Grunion | *Commercial*: Grunion has a closed commercial season between April and May. There have been no or trace (≤1000 pounds) commercial landings since 1980.<br><br>*Recreational*: Grunion are targeted at night at high tides on beaches mostly in southern CA. However, due to the state's daytime and boat-based sampling priorities for its recreational fisheries, there are no reliable estimates of catch.<br><br>*Marine Aquaria*: They are allowed to be taken in the marine aquaria trade with the appropriate permit. |
| **Osmerid Smelts** | |
| | In general, there have been significant commercial landings of "smelt" from 1980 to the present ranging from almost 500,000 pounds to over 2 million pounds in the 1990s. However, landings were primarily reported as the more general "true smelt" or as "whitebait smelt" until the mid-1980s, and there was no sampling program to validate coding to various market categories. Beginning in 1990, landings of the "true smelt" category dropped to about 5,000 pounds, then to less than 2,000 pounds in more recent years. About the same time, landings of "whitebait smelt" dropped from an annual average of almost 400,000 pounds from 1978 to 1989 to 52,675 pounds in 1990, then in 1993 dropped below 10,000 pounds. The last reported landings of whitebait smelt were in 2001. While landings of "true'; and "whitebait" smelt were declining, landings of "night" and "surf" smelt began increasing; thus, declines in landings more likely represent changes in coding rather than changes in abundance. Declines observed in landings of night and surf smelt around 1999 and 2000 are likely regulatory in nature. The majority of smelt is landed from fisheries using A-frame nets from the beach (assumed because the primary gear categories included brail+other+unk). Then, trucks are used on the beach to collect and hold the smelt and transport them to markets, which means that vehicle access to beaches constrains development of fisheries. [The update of the Redwood State Park Management Plan restricts vehicle access to some "smelt beaches" at this time.] Smelts are allowed to be taken in parts of the state for live bait. [Fish and Game Code (FGC), California Code of Regulations (CCR), Sections: 8780 - 8780.1] |
| Eulachon | *Commercial*: There have been zero to trace landings since 1980.<br><br>*Recreational*: Recreational fishing is not allowed. |
| Night smelt | *Commercial*: There have been significant landings of "smelt" from 1980 to the present, and reported landings of night smelt averaged about 335,000 pounds annually from 1980 to 2012.<br><br>*Recreational*: Night smelt may be recreationally taken. However, due to the state's daytime and boat-based sampling priorities for its recreational fisheries, there are no reliable estimates of catch since the fishery primarily occurs at night. |
| Surf smelt | *Commercial*: Surf smelt reported annual landings have averaged about 200,000 pounds since 1980. Regulations and gear information for night smelt also apply to surf smelt.<br><br>*Recreational*: Recreational fishing for surf smelt is allowed. There is occasional targeting of surf smelt from or near shore; almost all catch occurs in state waters and often on the same beaches where night smelt spawn and are fished (pers com, K. Crane, CDFW). |

| | |
|---|---|
| Whitebait smelt | *Commercial*: Many early landings were attributed to "whitebait smelt" from 1980 to 1989, although there was no sampling to verify these landings. Whitebait smelt landings annually averaged 327,000 pounds until 1993, when the reported landings totaled 8,863 pounds. After 1993, landings dwindled and there have been no reported landings since 2001.<br><br>*Recreational*: Whitebait smelt may be taken in the recreational fishery. |
| **Pelagic squids** | |
| | *Commercial*: There were no landings for any species, nor are there any market codes, other than for Humboldt squid.<br><br>*Recreational*: There were no recorded landings, although the state's recreational sampling program does not routinely collect catch information on squids, other than Humboldt squid. |

*3.3.1.4 Tribal directed fisheries for Shared EC Species*

There are no directed tribal fisheries for the Shared EC Species in Federal waters. There is some limited harvest of osmerid smelts at shoreline and from estuary locations. The fisheries are limited to hand seines and dipnets used from shore. These are mostly personal-use fisheries, although some commercial sales occur in years of relatively high abundance. Availability of these fish varies considerably from year to year and annual total harvests can vary from zero to approximately 40 mt. In Puget Sound, there are directed tribal fisheries for surf and longfin smelts. Again, these are primarily personal-use fisheries but some commercial sales occur when the stocks are very abundant.

**Table 3.3.4: Shared EC Species in Treaty Tribal fisheries**

| | |
|---|---|
| **Round and thread herring** | |
| | Not known to occur in Washington, Treaty Area waters. |
| **Mesopelagic fishes** | |
| *Myctophidae, Bathylagidae, Paralepididae,* and *Gonosomatidae* | No directed fisheries. Trace amounts taken as bycatch in the at-sea whiting fishery. |
| **Pacific sand lance** | |
| | No directed fisheries. Trace amounts likely taken as bycatch in the at-sea whiting fishery. |
| **Pacific saury** | |
| | No directed fisheries. Bycatch unlikely. |
| **Silversides** | |
| | No directed fisheries. Bycatch unlikely. |
| **Osmerid Smelts** | No directed fisheries in Federal waters. Trace amounts taken as bycatch in the at-sea whiting fishery. Eulachon and Surf Smelt are targeted in small fisheries limited to beaches and estuarine shorelines. These are usually personal-use fisheries but include some commercial sales in years of relatively high abundance. |
| **Pelagic squids** | |
| | No directed fisheries. Trace amounts as bycatch in at-sea whiting fishery. |

## 3.3.2 EEZ Fisheries Taking Shared EC Species Indirectly

As stated in Section 1.2, Purpose and Need, "*The purpose of this action is to prohibit new directed commercial fishing in Federal waters on unmanaged, unfished forage fish species until the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine*

*ecosystem* . . ." During its April 2014 discussions on this action, the Council also indicated that it wanted to allow the currently low levels of incidental catch and retention of Shared EC Species to continue without disruption to existing fisheries or enforcement actions against vessels that may incidentally catch Shared EC Species while legitimately targeting other species in the EEZ. To that end, this Section 3.3.2 reviews available information on historic incidental catch of Shared EC Species that may have occurred within EEZ fisheries targeting other species. When Shared EC Species, or species similar to them, are taken in directed fisheries elsewhere in the world (see Section 3.3 introductory text), they are commonly harvested with small-mesh net gear. Therefore, this section 3.3.2 will briefly consider the Council's HMS and salmon fisheries, but will focus more on the potential for incidental catch in the groundfish and CPS fisheries.

For HMS and salmon fisheries, none of the species subject to this action are known to be taken as bycatch. Directed salmon fisheries in the EEZ use hook and line gear, which is not known to be effective at taking Shared EC Species. When considering designation of EC species for the HMS FMP in 2010, the HMSMT (Agenda Item G.2.b., HMSMT Report, April 2010) tabulated 2000-2008 commercial catches for many monitored species, specifically listed in the FMP at the time. Pacific saury was the only Shared EC Species on the monitored list and there were no reported landings during this period. Observer records for the drift gillnet fishery during this period also showed no observations of any of these forage species. Pacific saury was not designated an EC species and is no longer an HMS FMP species.

A review of incidental and bycatch data reported in the CPS SAFE (PFMC 2011 at Section 6) indicated incidental catch and bycatch of Shared EC Species in low or extremely low amounts in CPS fisheries. Information was based on a review of logbooks, landing receipts and observer or sampling records and found that there was no documented incidental catch or bycatch of Pacific saury, Pacific sand lance, whitebait smelt or myctophids based on logbooks, fish tickets or observer data. Smelts, except for jacksmelt, were infrequently observed in California's CPS fisheries (less than 1% frequency in landings from 2004-2008 based on bycatch observations and even less for California grunion). Smelts were not observed in Washington or Oregon CPS fisheries (CPS FMP Amendment 13, 2010). A review of the observed incidental landings of California's sardine and Pacific mackerel fisheries from 2006 – 2010 were similar: listed percent frequencies of California grunion, surf smelt, silversides, true smelts and top smelt did not exceed 0.7 in any year, and jacksmelt did not exceed 3.9 percent frequency (Table 6-5, 2011 CPS SAFE, Appendix A). Logbook data and observed catches from the Oregon sardine fishery from 2006 – 2010 did not include any of Shared EC Species (PFMC 2011 at Table 6-9, Appendix A.)

Some state and Federal monitoring programs are conducted to investigate the interactions of target fisheries with other species. The Workgroup looked at information from some of these programs for possible insights into the encounter rates of the Shared EC Species within FMP fisheries. To gauge current catch levels of Shared EC Species, the Workgroup used a dataset primarily used under the Council's Groundfish FMP and compiled by NMFS's WCGOP. The WCGOP dataset combines commercial landings data with available data taken by observers aboard commercial fishing vessels. The dataset focuses on the Groundfish FMP commercial sectors and other commercial sectors monitored because of their bycatch of Groundfish FMP stocks, such as the state pink shrimp trawl fisheries. While not covering all commercial fishing activities in the EEZ, these fishery sectors would be some of the most likely to have incidental catch of Shared EC Species. In addition, the Workgroup also reviewed information the CPS management team assembled for use during that FMP's Amendment 13 process, as well as information from the 2011 CPS Stock Assessment and Fishery Evaluation (SAFE, PFMC 2011) document, and HMS background documents on incorporating EC species into that FMP.

Catch estimates for the species subject to this action are shown in Table 3.3.5. The mesopelagic species group includes many taxonomic groups, so those shown in Table 3.3.5 may not include all species in the dataset. Incidental catch of Shared EC Species appears to be tens of pounds and less per year, except for

smelts and squid. Catch of American shad, which is not a species subject to this action, was highly variable over 2003-2012, but averaged 44 mt per year. The squid catch reported in Table 3.3.5 is not identified to the species level, but much of the catch weight is likely Humboldt Squid, which is not a species subject to this action.

Species level allocation of the catch is an issue for most if not all of the species considered here. There are two basic ways that fisheries catch is accounted for in commercial fisheries, through landings records and through observer data. Fish retained and brought into port are recorded on landings receipts, also known as "fish tickets." Landings are reported to differing levels of specificity for species and taxonomy, because regulations governing the reporting of fish landings do not require many species to be identified to the species, or even higher taxonomic, level. For example, Washington State's regulations would only require mesopelagics to be reported as miscellaneous marine fish together with a wide range of other species.

Onboard fishery observers will record catch amounts, but they typically focus on the fish that are discarded at sea. Species subject to this action likely have been lower priority for sampling relative to species managed under FMPs and other higher priority species like marine mammals. Sampling coverage levels were less than 100 percent in many sectors and for much of the 2003-2012 period, which meant that the Workgroup had to expand available data to produce the estimates in Table 3.3.5: therefore, the accuracy and precision of the estimates in Table 3.3.5 reflects the fishery coverage levels and estimation methodologies for unmonitored species. As the Council develops FEP Initiative 1, it may want to review the feasibility and utility of requiring further speciation of landings reports. Some Shared EC Species may be identifiable at the species level, which could improve catch or bycatch estimate accuracy for those species. However, these species may also occur so infrequently or in such trace amounts that requiring greater specificity in landings reporting may provide more questions than answers for future fishery monitors and managers.

**Table 3.3.5. Bycatch (metric tons) of the Initiative 1 species and species groups in the Groundfish FMP commercial sectors and other sectors monitored for their bycatch of Groundfish FMP stocks (source: Groundfish Mortality Multiyear Data Product, ver. 23-Dec-2013, WCGOP).**

| Species and Sectors | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round Herring** | | | | | | | | | | | |
| California Halibut | -- | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| **Thread Herring** | | | | | | | | | | | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Pacific sandlance** | | | | | | | | | | | |
| Bottom trawl | -- | -- | -- | -- | -- | -- | 0.02 | -- | -- | -- | 0.02 |
| At-sea whiting trawl | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | -- | 0.00 |
| **Pacific Saury** | | | | | | | | | | | |
| Bottom trawl | 0.01 | -- | -- | -- | 0.00 | -- | 0.02 | 0.00 | 0.00 | 0.00 | 0.04 |
| Pink Shrimp | -- | 0.00 | -- | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.01 | 0.01 |
| At-sea whiting trawl | -- | -- | -- | -- | -- | 0.00 | -- | 0.00 | 0.00 | 0.00 | 0.00 |
| Nonnearshore Fixed Gear | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 |
| **SILVERSIDES** | | | | | | | | | | | |
| **Jack Smelt** | | | | | | | | | | | |
| Nearshore Fixed Gear | -- | -- | -- | 0.00 | 0.00 | 1.26 | 0.01 | -- | -- | -- | 1.28 |
| Bottom trawl | -- | -- | 0.00 | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| California Halibut | -- | -- | -- | 0.00 | -- | -- | -- | -- | -- | -- | 0.00 |
| **Top Smelt** | | | | | | | | | | | |
| Nonnearshore Fixed Gear | -- | -- | -- | -- | -- | 0.01 | -- | -- | -- | -- | 0.01 |
| **PELAGIC SQUIDS** | | | | | | | | | | | |
| **Squid Unid. (includes Humboldt)** | | | | | | | | | | | |
| At-sea whiting trawl | 101.96 | 1,123.56 | 680.43 | 93.35 | 66.25 | 85.24 | 43.50 | 76.31 | 78.26 | 93.69 | 2,442.56 |
| Shoreside Hake | 0.16 | 0.17 | 0.06 | 0.37 | 166.19 | 880.95 | 3.09 | 98.79 | 16.26 | 22.53 | 1,188.57 |
| Bottom trawl | 52.95 | 76.97 | 46.74 | 74.25 | 53.67 | 116.69 | 113.04 | 29.22 | 6.73 | 7.80 | 578.06 |
| Tribal Shoreside | -- | -- | 0.01 | 0.16 | 5.26 | 265.76 | 100.03 | 0.00 | 0.54 | 0.25 | 372.01 |
| Pink Shrimp | 0.10 | 7.63 | 5.59 | -- | 5.47 | 5.11 | 1.21 | 14.50 | 39.44 | 79.11 | 158.15 |
| Nonnearshore Fixed Gear | 0.56 | 0.15 | 1.06 | 0.44 | 3.07 | 1.97 | 8.57 | 2.28 | 0.20 | 0.25 | 18.52 |
| Tribal At-Sea Hake | 0.04 | 0.04 | 0.05 | 0.00 | 0.01 | 0.59 | 0.76 | 0.03 | 1.16 | 0.00 | 2.69 |
| California Halibut | 0.07 | 0.25 | 0.03 | 0.02 | 0.01 | 0.02 | -- | 0.04 | 0.07 | 0.05 | 0.56 |
| Nearshore Fixed Gear | -- | -- | 0.01 | -- | -- | 0.02 | 0.08 | -- | 0.00 | 0.14 | 0.24 |
| **OSMERID SMELTS** | | | | | | | | | | | |
| **Capelin** | | | | | | | | | | | |
| Bottom trawl | -- | -- | -- | -- | -- | -- | 0.03 | -- | -- | -- | 0.03 |
| Pink Shrimp | -- | -- | -- | -- | 0.02 | -- | -- | -- | -- | -- | 0.02 |
| **Longfin Smelt** | | | | | | | | | | | |
| California Halibut | -- | -- | -- | -- | -- | -- | 0.00 | -- | 0.01 | 0.00 | 0.01 |
| **Smelt Unid.** | | | | | | | | | | | |
| Pink Shrimp | 0.00 | 68.99 | 22.87 | -- | 6.37 | 27.30 | 0.57 | 2.54 | 15.21 | 23.88 | 167.71 |
| Bottom trawl | 0.12 | 0.85 | 0.15 | 0.03 | 0.01 | 0.02 | 0.00 | 0.02 | 0.03 | 0.10 | 1.33 |
| Nearshore Fixed Gear | 0.10 | 0.11 | 0.04 | 0.03 | 0.04 | 0.01 | 0.00 | -- | 0.00 | -- | 0.34 |
| Nonnearshore Fixed Gear | 0.01 | 0.14 | 0.02 | 0.13 | -- | 0.00 | -- | 0.01 | 0.00 | 0.02 | 0.32 |
| California Halibut | -- | -- | -- | 0.00 | -- | -- | -- | -- | 0.00 | 0.00 | 0.01 |
| At-sea whiting trawl | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 | 0.00 | -- | 0.00 | 0.00 | 0.00 |
| Tribal At-Sea Hake | 0.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 |
| Shoreside Hake | -- | -- | -- | -- | -- | 0.00 | -- | -- | -- | -- | 0.00 |
| Tribal Shoreside | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 |
| **Smelt/Herring Unid.** | | | | | | | | | | | |
| At-sea whiting trawl | -- | -- | -- | -- | 0.00 | 0.04 | -- | -- | -- | -- | 0.04 |
| **Surf Smelt** | | | | | | | | | | | |
| Pink Shrimp | -- | -- | 1.91 | -- | -- | 0.20 | -- | 0.00 | 0.01 | -- | 2.11 |
| California Halibut | -- | -- | -- | -- | -- | -- | -- | 0.00 | -- | -- | 0.00 |
| Bottom trawl | -- | -- | -- | -- | -- | -- | 0.00 | -- | 0.00 | -- | 0.00 |
| **Whitebait Smelt** | | | | | | | | | | | |
| Pink Shrimp | -- | 0.21 | 1.73 | -- | 0.00 | 0.05 | 6.66 | 3.42 | 20.06 | 71.56 | 103.70 |
| Bottom trawl | -- | -- | -- | -- | -- | -- | 0.00 | -- | 0.00 | 0.00 | 0.00 |
| California Halibut | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 |

Table 3.3.5 cont'd.

| Species and Sectors | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MESOPELAGIC SPECIES** | | | | | | | | | | | |
| **Argentine Unid.** | | | | | | | | | | | |
| NonTribal At-Sea Hake | -- | -- | -- | -- | 0.00 | 0.00 | -- | 0.00 | -- | -- | 0.00 |
| **Barracudina Unid.** | | | | | | | | | | | |
| NonTribal At-Sea Hake | 0.01 | 0.09 | 0.14 | 0.02 | 0.04 | 0.04 | 0.02 | 0.05 | 0.83 | 0.01 | 1.26 |
| Bottom trawl | 0.00 | -- | 0.00 | -- | -- | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 |
| Pink Shrimp | -- | -- | -- | -- | 0.00 | -- | -- | -- | 0.00 | -- | 0.00 |
| **Blackchin Unid.** | | | | | | | | | | | |
| Bottom trawl | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | -- | 0.00 |
| **Blackdragon Unid.** | | | | | | | | | | | |
| Bottom trawl | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 |
| Nonnearshore Fixed Gear | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | -- | 0.00 |
| **Blacksmelt Unid.** | | | | | | | | | | | |
| NonTribal At-Sea Hake | -- | -- | -- | -- | -- | 0.01 | -- | -- | 0.07 | -- | 0.08 |
| **Bristlemouth Unid.** | | | | | | | | | | | |
| Nonnearshore Fixed Gear | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 | 0.01 |
| Bottom trawl | -- | -- | -- | -- | -- | -- | -- | 0 | -- | 0 | 0 |
| **Lanternfish Unid.** | | | | | | | | | | | |
| NonTribal At-Sea Hake | 0.00 | 0.01 | 0.02 | 0.08 | 0.27 | 0.37 | 0.10 | 0.08 | 0.95 | 0.16 | 2.04 |
| Tribal At-Sea Hake | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 |
| Pink Shrimp | -- | 0.06 | 0.01 | -- | 0.86 | 0.06 | 0.07 | 0.01 | 0.06 | 0.04 | 1.16 |
| Bottom trawl | 0.00 | 0.00 | 0.03 | 0.01 | 0.02 | 0.03 | 0.05 | 0.03 | 0.01 | 0.01 | 0.19 |
| Nonearshore Fixed Gear | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | -- | 0.00 |
| **Lightfish Unid.** | | | | | | | | | | | |
| Pink Shrimp | -- | 0.00 | 0.00 | -- | -- | 0.05 | -- | -- | -- | 0.00 | 0.05 |
| **Longfin Dragonfish** | | | | | | | | | | | |
| NonTribal At-Sea Hake | -- | -- | 0.00 | -- | 0.01 | 0.01 | -- | -- | 0.00 | -- | 0.03 |
| Bottom trawl | -- | -- | -- | -- | -- | 0.00 | -- | -- | 0.00 | -- | 0.00 |
| Nonearshore Fixed Gear | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | -- | 0.00 |
| **Longnose Lancetfish** | | | | | | | | | | | |
| NonTribal At-Sea Hake | 0.00 | 0.01 | 0.01 | 0.12 | 0.53 | 1.86 | 0.13 | 0.07 | 0.41 | 0.02 | 3.16 |
| Bottom trawl | -- | 0.01 | 0.03 | 0.01 | 0.02 | 0.09 | 0.08 | 0.05 | 0.01 | 0.00 | 0.30 |
| **Myctophidae** | | | | | | | | | | | |
| NonTribal At-Sea Hake | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 |
| **Pacific Argentine** | | | | | | | | | | | |
| Pink Shrimp | -- | 0.45 | -- | -- | -- | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.49 |
| Bottom trawl | 0.00 | -- | 0.01 | -- | 0.00 | -- | -- | -- | -- | 0.00 | 0.01 |
| **Pacific Viperfish** | | | | | | | | | | | |
| Bottom trawl | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | -- | 0.00 | 0.00 | 0.03 |
| Nonearshore Fixed Gear | 0.00 | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 |
| Pink Shrimp | -- | -- | -- | -- | 0.00 | -- | -- | -- | -- | -- | 0.00 |
| NonTribal At-Sea Hake | -- | -- | 0.00 | 0.00 | -- | 0.00 | -- | -- | -- | -- | 0.00 |
| **Tubeshoulder Unid.** | | | | | | | | | | | |
| NonTribal At-Sea Hake | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.06 | 0.02 | 0.02 | 0.14 | 0.04 | 0.31 |
| Bottom trawl | -- | 0.00 | 0.00 | 0.00 | 0.13 | 0.02 | 0.11 | 0.01 | 0.00 | 0.00 | 0.28 |
| Pink Shrimp | -- | -- | -- | -- | 0.00 | -- | -- | -- | -- | -- | 0.00 |
| Tribal At-Sea Hake | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | -- | 0.00 |
| **Viperfish Unid.** | | | | | | | | | | | |
| NonTribal At-Sea Hake | -- | 0.00 | 0.00 | 0.00 | 0.02 | 0.06 | 0.01 | 0.03 | 0.14 | 0.01 | 0.27 |
| Bottom trawl | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 | 0.01 | 0.01 | 0.08 |
| Pink Shrimp | -- | -- | -- | -- | 0.00 | -- | -- | -- | 0.00 | -- | 0.00 |
| Nonearshore Fixed Gear | -- | -- | 0.00 | -- | -- | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 |
| **Silvery Hatchetfish** | | | | | | | | | | | |
| NonTribal At-Sea Hake | -- | -- | -- | -- | -- | 0.00 | -- | -- | -- | -- | 0.00 |
| **White Barracudina** | | | | | | | | | | | |
| NonTribal At-Sea Hake | -- | -- | -- | -- | 0.00 | 0.01 | 0.00 | 0.00 | 0.02 | 0.01 | 0.05 |

### 3.3.3 Non-Fishing Human Activities Affecting Shared EC Species

This action will not regulate or otherwise affect non-fishing activities – see Section 4.3.3. Therefore, the effects of non-fishing human activities on Shared EC Species are only of interest to this analysis if those effects are significant when combined with the direct and indirect effects of this action. The cumulative effects of this action for Shared EC Species, when considered with past, present and reasonably foreseeable future actions, are considered in Section 4.4. This Section 3.3.3 briefly discusses those non-fishing human activities that may affect Shared EC Species.

Shared EC Species are similar to each other in their place in the food web and in having relatively brief lives and high fecundity. However, they have different habitat preferences from each other, which means that they can be affected to greater and lesser degrees by a wide variety of human activities. Nearshore and anadromous Shared EC Species include species from the osmerid smelt and silversides groups, as well as Pacific sand lance. The more pelagic Shared EC Species are round and thread herrings, mesopelagics, Pacific saury, and pelagic squids. The nearshore and anadromous Shared EC Species are more likely to be affected by non-fishing human activities, simply because they live in proximity to greater concentrations of humans. Non-fishing human activities identified under the ESA, MSA, and NEPA as having effects on species similar to Shared EC Species include:

- Climate change, ocean and freshwater effects
- Water quality, including: dredge material disposal, wastewater discharge, and discharges of oil and other hazardous substances
- Coastal development and nearshore habitat alteration, including dredging and other channel disturbances
- Dams, other water diversions, and reduced freshwater flow
- Water intake structures

Non-fishing activities that introduce chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment pose a risk to all Shared EC Species. Section 4.5 of the FEP identifies three major aspects of future climate change that will have direct effects on the CCE: ocean temperature, pH (acidity versus alkalinity) of ocean surface waters, and deep-water oxygen (or lack thereof, hypoxia). Although the effects of warming ocean temperatures have been identified as being negative for eulachon (NMFS 2013a), the likely effects of the three aspects of climate change identified by the FEP on the suite of Shared EC Species are unknown, as is whether the Shared EC Species can adapt to climate change. Pacific sand lance and atherinopsids that spawn in nearshore gravel and sand may be particularly affected by human activities that alter the quantity or quality of nearshore habitat. The negative effects of oil contamination of nearshore sand habitat on Pacific sand lance have been noted in scientific literature and were thoroughly studied in the wake of the 1989 Prince William Sound oil spill (Pinto et al. 1984, Robards et al. 2002).

The effects of shoreline modification and shoreline armoring have been particularly well-studied in Puget Sound, and documented as having negative effects on the productivity of osmerid smelts, Pacific sand lance, and other forage fish species (Rice 2006, Pentilla 2007). Dams, other water diversions, and reduced freshwater flow may impede anadromous osmerid smelt life cycles in the same way that they impede salmon life cycles. The 1996 Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes particularly identified reduced freshwater flow, water diversions, and intake structures as affecting the abundance of delta and longfin smelt, both osmerids (USFWS 1996). The 2013 Federal Recovery Outline for Pacific Eulachon also identified reduced freshwater flow, dams and water diversions, and climate impacts on ocean conditions as threats to eulachon abundance (NMFS 2013a). While stock assessments conducted for the PFMC have benefited from data collected from coastal cooling water intakes at California

electrical generating stations (e.g. Field 2013), the data are only available because power plants are entraining and impinging juvenile bocaccio and other rockfish, as well as Shared EC and other forage species (Chow et al. 1981, Grimaldo et al. 2009).

The more pelagic Shared EC Species may be primarily affected by water pollution, whether introduced by point or non-point sources from land, by ships or energy installations at sea, or by nearshore aquatic human activities like port operations and aquaculture. As of May 2014, preliminary FERC permits are pending for the following projects located in or immediately adjacent to coastal waters of the U.S. West Coast:

***California***

- San Onofre Ocean Wave Electricity Generation Electricity Farm: 2,000 megawatts (preliminary permit pending)
- Purisima Point Wave Park: 500 megawatts (preliminary permit pending)
- Morro Bay Wave Park: 100 megawatts (preliminary permit pending)
- Point Estero Wave Park: 650 megawatts (preliminary permit pending)
- Estero Bay Wave Park: 650 megawatts (preliminary permit pending)

***Oregon***

- Reedsport OPT Wave Park Project: 1.5 megawatts (license issued but project recently abandoned)
- Pacific Marine Energy Test Center South Energy Test Site Wave Test Center: 20 megawatts (pre-filing for license)

***Washington***

- Admiralty Inlet Tidal Energy Project: 1 megawatt (pilot license issued)

# 4.0 Impacts on the Affected Environment

This EA analyzes the potential impacts of the alternatives for restricting future EEZ fisheries for currently unfished forage fish using either: the Federal list of authorized fisheries and gear (Alternative 1, No Action) or by bringing the species subject to this action into the FMPs as EC species (Alternatives 2 and 3). Each of the alternatives is described more fully in Chapter 2. The only regulation the Council has recommended for these species is to implement a moratorium on future directed fishing for these species, until the Council has had an adequate opportunity to review scientific information on the potential effects of fisheries for these species on the larger suite of the Council's conservation and management measures for the living marine resources of the U.S. West Coast EEZ. The aspects of the environment that could be affected by the proposed action analyzed in this EA are described in Chapter 3. This Chapter 4 analysis focuses on the potential effects of the alternatives on: the physical environment, Shared EC Species; known predators of Shared EC Species, including any ESA listed and MMPA or MBTA protected species; and human communities, particularly state or tribal nearshore fisheries for Shared EC Species and existing Council-managed fisheries for species other than Shared EC Species.

## 4.1 Impacts of the Alternatives on the Physical Environment

For the purposes of this action, negative effects on the physical environment are those that reduce the quality or quantity of habitat used by Shared EC Species or their predators. Shared EC Species and their predators have a wide variety of relationships with habitats within the CCE, from wholly pelagic species that may associate with waters of particular temperatures or salinities, to site-loyal demersal species that may associate with particular rock formations. Negative effects to the physical environment may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of that particular habitat type. Negative effects result from actions occurring within or outside of particular habitat types and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

Under Alternative 1 (no action), new fisheries for Shared EC species could begin in Federal waters more easily than under either of the action alternatives, although no new fishery is expected at this time. Alternative 1 is expected to have either no effect on the physical environment or a minor negative effect if a fishery for a Shared EC species begins without the Council having an advance opportunity to develop regulations to restrict its effects on the physical environment.

Neither of the action alternatives (Alternative 2 or 3) proposes any new activity that would affect or alter the physical environment in any way. Both of the action alternatives are expected to have minor positive effects on the physical environment compared to the no action alternative, because they both would allow the Council greater opportunity to assess the potential effects of a new fishery on the environment than would be available under Alternative 1 (no action). If the Council considers a directed fishery for one or more of the Shared EC Species at some time in the future, the potential effects of that fishery on the physical environment would be analyzed at that time.

## 4.2 Impacts of the Alternatives on the Biological Environment

### 4.2.1 Shared EC Species

Shared EC Species are discussed in Section 3.2.1. Under Alternative 1 (no action), new fisheries for Shared EC species could begin in Federal waters more easily than under either of the action alternatives. There are no existing commercial fisheries targeting Shared EC Species in Federal waters and no new fisheries

are expected at this time. Under Alternative 1 (no action), anyone wanting to begin a fishery for a Shared EC Species would notify the Council and could begin fishing for that species 90 days after the Council has received the notification. The Council could recommend new regulations, including complete prohibition, for the new fishery at any time during or after the 90-day notification period – See Section 2.1.1. Alternative 1 does not prevent the Council from acting to bring any new fishery into compliance with MSA fishery conservation and management requirements; therefore, it is not expected to have major negative effects on Shared EC Species. Because Alternative 1 could allow a fishery for a Shared EC Species to begin without advance Council action to ensure the fishery's long-term sustainability, there is some potential for the no action alternative to have moderate negative effects on Shared EC Species.

Both of the action alternatives (Alternative 2 and Alternative 3) would have the effect of restricting the future development of new directed commercial fisheries for Shared EC Species in Federal waters until the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. To the extent that the action alternatives would protect Shared EC Species from an unmanaged target fishery that could occur between the end of the MSA-required 90-day notification period for new fisheries and the time that the Council and NMFS could implement new regulations managing such a fishery, both Alternative 2 and Alternative 3 are expected to have minor positive effects on Shared EC Species compared to the no action alternateive. As discussed in Section 3.3.2, incidental catch of Shared EC Species has been historically low; therefore, allowing incidentally-caught Shared EC Species to be retained in existing EEZ fisheries (Alternative 2) is not expected to have any measurably different effect on Shared EC Species than requiring incidentally-caught Shared EC Species to be discarded at sea (Alternative 3).

### 4.2.2 Council-Managed (FMP) Predators of Shared EC Species

Council-managed predators of Shared EC Species and their predator/prey connections to Shared EC Species, if known, are discussed in Section 3.2.2. None of the Council-managed predator species feed exclusively or predominantly on either the Shared EC Species as a group, or on any one of the Shared EC Species. All of the Council-managed predator species are opportunistic feeders, meaning that they prey upon a wide variety of lower trophic level species, including Shared EC Species.

As discussed in Section 4.2.1, Alternative 1 (no action) has some potential to allow a new fishery for Shared EC Species to begin without advance Council action to ensure the fishery's long-term sustainability. The opportunistic feeding natures of Council-managed predators makes them less susceptible to changes in availability of any one prey species than would be the case for predators with more specialized diets. Therefore, the no action alternative could have minor negative effects on Council-managed predators of Shared EC Species to the extent that it could allow a temporary reduction in the available prey base for those predators.

The potential effects of either of the action alternatives (Alternative 2 or Alternative 3) on Council-managed predators are likely to be minor and positive compared to the potential effects of the no action alternative. Both of the action alternatives (Alternative 2 and Alternative 3) would have the effect of restricting the future development of new directed commercial fisheries for Shared EC Species in Federal waters until the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. Therefore, although the action alternatives are likely to have minor effects over the long-term, those effects are likely to be positive for the Council-managed predators that prey upon Shared EC Species. As discussed in Section 3.3.2, incidental catch of Shared EC Species has been historically low; therefore, allowing incidentally-caught Shared EC Species to continue to be retained in existing EEZ fisheries (Alternative 2) is not expected to have any measurably different effect on Council-managed

predators of Shared EC Species than requiring incidentally-caught Shared EC Species to be discarded at sea (Alternative 3).

### 4.2.3 Protected Species Predators of Shared EC Species

#### *4.2.3.1 ESA-listed finfish*

ESA-listed finfish predators of Shared EC Species and their predator/prey connections to Shared EC Species, if known, are discussed in Section 3.2.3.1. None of the ESA-listed finfish predator species feed exclusively or predominantly on either the Shared EC Species as a group, or on any one of the Shared EC Species. All of the ESA-listed finfish predator species are opportunistic feeders, meaning that they prey upon a wide variety of lower trophic level species, including Shared EC Species.

As discussed in Section 4.2.1, Alternative 1 (no action) has some potential to allow a new fishery for Shared EC Species to begin without advance Council action to ensure the fishery's long-term sustainability. The opportunistic feeding natures of ESA-listed finfish predators makes them less susceptible to changes in availability of any one prey species than would be the case for predators with more specialized diets. Therefore, the no action alternative could have minor negative effects on ESA-listed finfish predators of Shared EC Species to the extent that it could allow a temporary reduction in the available prey base for those predators.

The potential effects of either of the action alternatives (Alternative 2 or Alternative 3) on ESA-listed finfish predators are likely to be minor and positive compared to the potential effects of the no action alternative. Both of the action alternatives (Alternative 2 and Alternative 3) would have the effect of restricting the future development of new directed commercial fisheries for Shared EC Species in Federal waters until the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. Therefore, although the action alternatives are likely to have minor effects over the long-term, those effects are also likely to be positive for the ESA-listed finfish predators that prey upon Shared EC Species. As discussed in Section 3.3.2, incidental catch of Shared EC Species has been historically low; therefore, allowing incidentally-caught Shared EC Species to continue to be retained in existing EEZ fisheries (Alternative 2) is not expected to have any measurably different effect on ESA-listed finfish predators of Shared EC Species than requiring incidentally-caught Shared EC Species to be discarded at sea (Alternative 3).

#### *4.2.3.2 ESA-listed and MMPA-protected marine mammal species*

Marine mammal predators of Shared EC Species and their predator/prey connections to Shared EC Species, if known, are discussed in Section 3.2.3.2. Pinnipeds and those mysticete species that prey upon fish are opportunistic feeders, meaning that they prey upon a wide variety of lower trophic level species, including Shared EC Species. Mysticete diets tend to be dominated by euphausiids, with other species (including Shared EC Species) making up small proportions of their diets. Odontocetes also have varied diets, but feed more heavily on pelagic squids and mesopelagic fishes than pinnipeds and mysticetes.

As discussed in Section 4.2.1, Alternative 1 (no action) has some potential to allow a new fishery for Shared EC Species to begin without advance Council action to ensure the fishery's long-term sustainability. The opportunistic feeding natures of pinnipeds and mysticetes, and relative unimportance of Shared EC Species in mysticete diets, makes them less susceptible to changes in availability of any one prey species than would be the case for predators with more specialized diets. Odontocetes may be more susceptible to the potential effects of Alternative 1, should it have the effect of failing to restrict the future development of large-scale and long-term fisheries for the larger-bodied pelagic squid species. Therefore, the no action alternative

could have minor negative effects on pinnipeds, minor negative or no effects on mysticetes, and moderate negative effects on odontocetes to the extent that it could allow a temporary reduction in the available prey base for those predators.

The potential effects of either of the action alternatives (Alternative 2 or Alternative 3) on marine mammal predators are likely to be minor and positive compared to the potential effects of the no action alternative. Both of the action alternatives (Alternative 2 and Alternative 3) would have the effect of restricting the future development of new directed commercial fisheries for Shared EC Species in Federal waters until the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. Therefore, although the action alternatives are likely to have minor effects over the long-term, those effects are also likely to be positive for marine mammals that prey upon Shared EC Species. The potential effects of either of the action alternatives are expected to be minor and positive for opportunistic feeding pinnipeds and for mysticetes with minimial dependence on Shared EC Species. The potential effects of either of the action alternatives could be moderate and positive for odontocetes, should they restrict the future development of large-scale and long-term fisheries for the larger-bodied pelagic squid species. As discussed in Section 3.3.2, incidental catch of Shared EC Species has been historically low; therefore, allowing incidentally-caught Shared EC Species to continue to be retained in existing EEZ fisheries (Alternative 2) is not expected to have any measurably different effect on marine mammal predators of Shared EC Species than requiring incidentally-caught Shared EC Species to be discarded at sea (Alternative 3).

#### *4.2.3.3 Seabirds*

Seabird predators of Shared EC Species and their predator/prey connections to Shared EC Species, if known, are discussed in Section 3.2.3.3. Many seabird species are opportunistic feeders, meaning that they prey upon a wide variety of lower trophic level species, including Shared EC Species, although there are some notable exceptions. Like odontocetes, the highly migratory procelliformes prey upon pelagic squid and may have few prey alternatives in their high seas habitats. Some of the pelecaniformes and charadriiformes prey heavily on one or more of the Shared EC Species, such as rhinoceros auklet's strong preference for Pacific sand lance.

As discussed in Section 4.2.1, Alternative 1 (no action) has some potential to allow a new fishery for Shared EC Species to begin without advance Council action to ensure the fishery's long-term sustainability. The opportunistic feeding natures of most seabird species makes them less susceptible to changes in availability of any one prey species than would be the case for predators with more specialized diets. Those seabird species with heavy reliance on particular Shared EC Species as prey, such as rhinoceros auklets, may be more susceptible to the potential effects of Alternative 1, should it have the effect of failing to restrict the future development of large-scale and long-term fisheries for the currently unfished prey of those species. Therefore, the no action alternative could have minor negative effects on opportunistic feeding seabirds, and moderate negative effects on seabirds with diets specializing in one or more of the Shared EC Species.

The potential effects of either of the action alternatives (Alternative 2 or Alternative 3) on seabird predators are likely to be minor and positive compared to the potential effects of the no action alternative. Both of the action alternatives (Alternative 2 and Alternative 3) would have the effect of restricting the future development of new directed commercial fisheries for Shared EC Species in Federal waters until the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. Therefore, although the action alternatives are likely to have minor effects over the long-term, those effects are also likely to be positive for seabirds that prey upon Shared EC Species. The potential effects of either of the action alternatives are expected to be minor and positive for opportunistic

feeding seabirds. The potential effects of either of the action alternatives could be moderate and positive for seabirds that specialize in preying upon Shared EC Species. As discussed in Section 3.3.2, incidental catch of Shared EC Species has been historically low; therefore, allowing incidentally-caught Shared EC Species to continue to be retained in existing EEZ fisheries (Alternative 2) is not expected to have any measurably different effect on seabird predators of Shared EC Species than requiring incidentally-caught Shared EC Species to be discarded at sea (Alternative 3).

## 4.3 Impacts of the Alternatives on the Socio-Economic Environment

### 4.3.1 Directed Fisheries for Shared EC Species

The states of Washington, Oregon, and California have long histories of working both within and outside of the PFMC process to ensure that state fisheries laws and regulations are compatible with PFMC advice for Federal fisheries regulations. Similarly, the treaty Indian tribes with fishing rights to co-manage Pacific Ocean species also work within and outside of the PFMC process to implement cooperative conservation and management goals for jointly managed species. This cooperative work among PFMC process participants reduces regulatory confusion for the public and improves the effectiveness of conservation measures for managed species.

Bringing a new suite of species into the Council's FMPs requires examining both fisheries and fishery management processes to minimize disruption to state and tribal fisheries and to best ensure compatibility between those processes and Federal implementing regulations for this action. Section 3.3.1 discusses existing state and tribal fisheries for Shared EC Species. This section 4.3.1 addresses the potential effects of the alternatives on state and tribal fisheries and fisheries management processes for Shared EC Species. During its discussions of this action, the Council has particularly requested that this analysis address state regulatory processes that ensure conformance between state and Federal regulations; those processes are discussed in this section.

As shown in Figure 3.1 of Section 3.3.1, only the following species or species groups have (>0.01 mt, or >22 lb) landings over 1981-2013 in the PacFIN database: round herring, silversides, osmerid smelts, and pelagic squids (including Humboldt squid). For most of the Shared EC Species or species groups, these landings may not be from fisheries targeting those species or from fisheries within Federal waters. Shared EC Species may be taken incidentally in fisheries targeting other West Coast species, but landed for sale rather than discarded as bycatch. Although this EA discusses directed (3.3.1 and 4.3.1) and incidental (3.3.2 and 4.3.2) fisheries for Shared EC Species as if they could be separated from each other, those distinctions do not appear as clearly in actual fisheries and landings as they do in an analysis document. In addition, coastwide landings of Shared EC species or species groups often are not readily identifiable from state reporting systems (fish tickets). Landings of some of these species may be combined with landings of other species when reported on fish tickets, and such combinations may differ among states. For some species with very minor landings of no commercial value, some states do not require landings to be reported on fish tickets, and the particular species or species groups exempted differ among states. This Section 4.3.1 discusses the effects of the alternatives on state- or tribe-managed fisheries that may target Shared EC Species, primarily fisheries for pelagic squid species other than market squid and fisheries for osmerid smelts. Because the states and tribes have varying policies for addressing forage species, this section 4.3.1 also discusses any potential interacting effects between those state or tribal policies and the CEBA 1 alternatives.

*4.3.1.1 Effects of the alternatives on Washington fisheries for Shared EC Species and on state regulatory conformance processes*

No commercial fisheries authorized by Washington state target the Shared EC Species in the Council management area. Some commercial fishing for osmerid smelts occurs in Puget Sound and may occur in state marine waters and in freshwater (e.g., eulachon). Limited recreational harvest of forage fish is allowed but any recreational fishing is almost certain to occur in state waters. To target and deliver Shared EC Species into the state in commercial quantities, a vessel would likely need an emerging commercial fishery designation from the Director of the Washington Department of Fish and Wildlife or a new commercial fisheries license type to be created by Washington State Legislature. For forage fish, the Department manages fisheries according to a policy established by the state' Fish and Wildlife Commission in 1998 (WDFW 1998). This policy requires Department to take precautionary approach take into account the ecosystem value of species and other factors and to not just consider maximum sustainable yield as the management goal. For fisheries managed by the Council's FMPs, Washington's state regulations incorporate by reference key provisions of the Federal regulations implementing those FMPs.

Washington's ability to track landings of Shared EC Species is currently limited in that landings of most would be recorded under the miscellaneous marine fish category, squid (unspecified), or some other category that would not allow for definitive identification of a Shared EC Species landing. These general categories are nonetheless recorded so that increased landings of myctophids would show as an increase in landings of miscellaneous marine fish. However, such an increase in miscellaneous marine fish might come from several other species (e.g., grenadiers, eelpouts, etc.).

*Alternative 1*

The effects of choosing the No Action alternative on Washington are uncertain and dependent on future decisions made by the Department, the Council, the treaty Indian tribes, and others with the authority to alter laws and policies affecting fisheries based in the state. As the law stands now and discussed above, the Department would need to take some action in order to authorize directed fishing on the Shared EC Species and delivery into the state whether by emerging commercial fishery permit or other method. The Department's forage fish policy requires consideration of new commercial and recreational fishing interests when requested yet also calls for a cautious approach when information on the status of a forage fish population and its role in the ecosystem is incomplete. Some quantity of the Shared EC species would continue to be caught incidentally to ongoing commercial fisheries and in some directed recreational fishing activities taking place in state waters. Some of the Shared EC Species, like the mesoplagics and the pelagic squids, are not covered by the Department's forage fish policy. All squid species may be harvested commercially with a license yet no vessels are active off Washington and landing squid into the state. The mesopelagics would be considered unclassified fish species and would need to be classified as food fish and authorized for directed commercial harvest.

*Alternative 2*

This alternative would accommodate current practices in the fisheries landing into Washington. While targeting of Shared EC Species is not authorized, incidental catches in other fisheries are not prohibited. The sardine fishery is an exception in that it only allows vessels to retain incidental catch of mackerel and jacks (*Scombridae* or *Carangidae*).

*Alternative 3*

A requirement to discard Shared EC Species might affect the state's pink shrimp fishery and perhaps vessels participating in the Council's IFQ fishery bottom trawl and whiting fisheries. These fisheries are the ones

most likely to encounter Shared EC Species incidentally. It would be logistically difficult if not completely impractical to sort and discard many of the Shared EC Species in some of the fisheries given high volume of target species and other fishery operation practices.

*4.3.1.2 Effects of the alternatives on Oregon fisheries for Shared EC Species and on state regulatory conformance processes*

Under the general Oregon policy of marine fisheries being open unless specifically closed, commercial fishing for these species is allowed in marine waters off Oregon, with the exception of osmerid smelts. Allowable commercial fishing must also conform to requirements for the Federal list of authorized fisheries and gears at 50 CFR 600.725(v). Commercial fishing for osmerid smelts is prohibited and bycatch may not exceed 1% of the landing by weight (OAR 635-004-0545). None of the Shared EC Species are the target of Oregon commercial fisheries in marine waters. (Commercial fishing for eulachon may occur in the Columbia River, which is outside the scope of the proposed action.) In general, current fisheries occasionally take small amounts of these species, which have had no commercial value when landed. In most cases this bycatch is discarded at sea, but occasionally very small amounts may be inadvertently landed. In recent years, bycatch of these species, excluding unspecified squid species and eulachon, have been taken primarily in the whiting fishery, pink shrimp fishery, and groundfish trawl fishery.

For federally managed species under the Groundfish, CPS, and HMS FMPs, ODFW rules for state marine waters automatically conform to Federal regulations, (OAR 635-004-0275, 635-004-0375, and 635-004-0555). Each of these rules specify: "Where federal regulations refer to the fishery management area, that area is extended from shore to three nautical miles from shore coterminous with the Exclusive Economic Zone." Inland waters of Oregon (i.e., bays, estuaries and rivers) are not included in this provision. Also by rule (OAR 635-004-0215), ODFW defines the species within each of these FMPs as species covered under relevant state rules, and FMP EC species are included in these state definitions. For salmon, ODFW rules adopt Federal regulations by reference but do not automatically extend Federal regulations to state waters. The Salmon FMP does not currently identify any EC species, and therefore ODFW rules do not address conformance for EC species under the Salmon FMP. If EC species are added to the Salmon FMP, it is anticipated that Oregon rules would be amended, as necessary, to automatically conform to cover these species in state marine waters. Consequently, any Federal regulations developed to protect these Shared EC Species in the FMPs would automatically apply to state fisheries in the Pacific Ocean.

Both Alternative 2 and 3 affect development of new commercial fisheries by requiring approval from the Council and NMFS before a fishery may occur in Federal waters off Oregon. Given the state's automatic conformance with Federal rules, this requirement would also apply for such fishing in state waters. At present, a fisher may fish for and land any of the Shared EC Species, other than osmerid smelts, upon meeting the notification and gear requirements of the Federal list of authorized fisheries and gears. If either Alternative 2 or 3 is adopted, an EFP would be required to fish for a Common EC species in the EEZ. For state conformance, it is anticipated that Oregon rules would be amended to require an ODFW-issued experimental gear permit to fish entirely in state waters for a Common EC species or species group, even if an otherwise legal gear were intended for use. If issued, the permit would contain similar conditions and reporting requirements that the council presumably would require in an EFP, as described in its Council Operating Procedure.

*Alternative 1*

Under Alternative 1 (no action), new Oregon fisheries for Shared EC species could begin in Federal waters if they are conformance with all current federal requirements, such as the Federal list of authorized fisheries and gear. Oregon also may adopt more conservative measures than federal regulations. No new fisheries are expected at this time and Alternative 1 is expected to have no effect on Oregon fisheries.

*Alternative 2*

Specifically for Alternative 2, the allowance for bycatch to be landed is consistent with current fishery practices for Oregon commercial fisheries. If adopted, Alternative 2 may have only a minor effect on current Oregon commercial fisheries. Additional species sorting and reporting at processing plants would be required under Alternative 2 to track landings of some Shared EC Species/species groups because they currently are not required to be reported on fish receiving tickets (OAR 635-006-0210). "Weighbacks" are fish or shellfish with no commercial value and a number of these species or species groups, usually with trace amounts of landings, are exempt from Oregon fish ticket reporting requirements. Shared EC Species or species groups that are not required to be reported on Oregon fish tickets include: barracudinas, myctophids, and squids other than market and Humboldt squid.

*Alternative 3*

For Alternative 3, bycatches of Shared EC Species must be discarded at sea. This alternative would also require more sorting at sea for most commercial fisheries, to eliminate any inadvertent landings of these species. Crew would need to be able to identify these species or species groups sufficiently well to sort and discard them. The shrimp trawl, bottom trawl, and whiting fisheries would be most affected. These fisheries frequently have large volumes of catch to sort and the added time and costs to more thoroughly sort the catch could reduce their fishing opportunity, product quality, and profits. For the whiting fishery, most vessels are allowed to discard non-IFQ or nongroundfish species at sea, but many choose not to do so in order to get whiting into the hold quickly to maintain product quality and production efficiency. Those whiting vessels that are classified as "maximized retention vessels" are allowed to discard minor operational amounts of catch at sea provided it is accounted for by an observer (75 FR 78344).

*4.3.1.3 Effects of the alternatives on California fisheries for Shared EC Species and on state regulatory conformance processes*

Commercial fishing is allowed for the Shared EC species off California, although there are regulations for the osmerid smelts and the atherinosids pertaining to specific geographic areas, seasons, and use (e.g., live bait or aquaria trade). A review of the available information provided no evidence for directed commercial fisheries for the Shared EC species in federal waters off California, and landings information indicates only the osmerid smelts have been commercially targeted in state waters in recent years. These fisheries primarily take place from shore or in very nearshore waters in the northern half of the state. With respect to interactions with federal FMP fisheries, a review of bycatch of the Shared EC species in fisheries off California indicates bycatch is restricted to incidental or trace amounts of primarily round herring or smelt in the California halibut trawl, pink shrimp and federal groundfish trawl fisheries.

Regulations in state waters for CPS, salmon and groundfish fisheries managed under federal FMPs automatically conform to federal regulations for those fisheries through state statutes (CCR, T.14, 159, 182, 189). The state's regulations apply only when engaging in fishing for these federal fisheries and to landings in those fisheries. The EC designation of these Shared EC species in the federal FMPs will have minimal impacts in the existing directed federal fisheries due to their limited interaction as bycatch. The state's target fisheries for Shared EC species in state waters should not be affected by the autoconformance statutes.

Under all of the alternatives, a request to initiate a new directed fishery in federal waters for the Shared EC species that resulted in NMFS and Council action to develop an EFP would also initiate action at the state level. If the new proposed directed fishery would only occur in federal waters, then the state's autoconformance regulations would apply. However, in order for the proposed fishery to also commence in state waters, the state's rules or policies pertaining to experimental fishery permits, emerging fisheries,

and forage fish would also apply following CDFW and California Fish and Game Commission (CFGC) consideration.

The CFGC policy on emerging fisheries specifies that the CDFW Director shall make a determination as to whether a fishery is "emerging" by considering whether there have been increases in landings, experimental fishery permit applications, an increase in the efficiency of the gear used [in an existing fishery], or if there is evidence that the existing regulations are not sufficient to insure a stable, sustainable fishery. Prior to the Director's determination of an emerging fishery, the CFGC may authorize take under a one year experimental gear permit intended to gain information on the fishery. This approach would also be consistent with the CFGC forage fish policy which would require collection of essential fishery information, prior to consideration of fishery initiation, which could be achieved via an experimental gear permit.

*Alternative 1*

Under this alternative, the initiation of a directed fishery in federal waters for one of the Shared EC Species would still proceed as described in Section 2.1.1. Action at the state level related to the proposed fishery would depend on a variety of factors (e.g., where the fishery would occur [federal only, or federal and state waters], what gear was proposed, what level of fishery was proposed.) Current levels of any incidental landings of these species already occurring would likely continue. Any existing monitoring of these species would continue under the state's commercial fishery data collection programs.

*Alternative 2*

Under Alternative 2, an incidental allowance for small amounts of Shared EC species would be consistent with current fishery practices for California's commercial CPS, salmon, HMS and groundfish fisheries. If adopted, Alternative 2 may have only a minor effect on current California commercial fisheries because of this bycatch retention allowance. California does have market codes for some of the Shared EC species, however, thread herring, mesopelagic fishes, Pacific sand lance, and pelagic squid would likely be coded to the "Unidentified Fish" category because they do not have any specific code (in the event any were retained.)

*Alternative 3*

Under this Alternative, bycatch of Shared EC species must be discarded at sea. This requirement would require additional sorting at sea for commercial fisheries under FMPs where they were taken, to eliminate any inadvertent landings of these species. The California halibut, pink shrimp trawl, and bottom trawl fisheries would be most affected based on the available bycatch information. In addition, the discarding of the incidental amounts that might have been sold would contribute to wastage, and discarding these species would eliminate the ability to collect information on their interactions with FMP fisheries.

*4.3.1.4 Effects of the alternatives on treaty tribe fisheries for Shared EC Species and on tribal fishery management processes*

There are currently no treaty tribal fisheries that target Shared EC Species in Council managed waters (see 3.3.1.4) and development of any future fisheries on those species would occur through government-to-government procedures between NOAA and the affected tribes. The Treaty Tribes have a reserved right to develop directed fisheries on any species in their respective U&A's with harvestable surplus; therefore Alternative 1 (no action) has no effect on treaty tribe tribe fisheries. Although the management alternatives considered here would likely influence harvest planning and management structures adopted by the tribes, they have no direct, constraining effect. If a treaty tribe does develop any fishery with potential effects on an EC species, the tribe would likely adopt management objectives most in line with Alternative 2 as regards

bycatch of Shared EC Species, because Alternative 3 might require too much at-sea sorting and would complicate management by requiring onerous monitoring and accounting procedures, expensive management infrastructure and could require regular estimates of total mortality of non-retained incidental catch. Therefore, Alternative 2 is expected to have no effect on tribal fisheries relative to the no action alternative, while Alternative 3 could have a minor negative effect on tribal fisheries were it adopted into tribal fisheries management programs.

### 4.3.2 EEZ Fisheries Taking Shared EC Species Indirectly

As discussed in Section 3.3.2, incidental catch of Shared EC Species in Council-managed fisheries is infrequent and small in quantity. Shared EC Species are not known to be incidentally caught in either the HMS or salmon fisheries; therefore, this section focuses on the potential effects of the alternatives on the CPS and groundfish fisheries.

Alternative 1 (no action) has some potential to allow a new fishery for Shared EC Species to begin without advance Council action to ensure the fishery's long-term sustainability. To the extent that fishing gear meeting the gear requirements of Federal groundfish or CPS regulations could directly or incidentally take Shared EC Species, the no action alternative could have minor positive effects on participants in EEZ fisheries that currently have incidental catches of Shared EC Species. Participants in those fisheries could more easily develop new fisheries for Shared EC Species under Alternative 1 (no action) than under either of the action alternatives. There have not been significant historical U.S. West Coast landings of Shared EC Species. Barring significant shifts in composition of resident and transient species in the U.S. West Coast EEZ, it is unlikely that there are potentially significant directed fishing opportunities for Shared EC Species in the EEZ. Therefore, although the effects of Alternative 1 (no action) on EEZ fisheries that have incidental catches of Shared EC Species are likely positive, those effects are minor and possibly non-existent.

Alternative 2 (preferred) would allow vessels that incidentally catch Shared EC Species to either discard that catch at sea or retain the catch for sale or other disposal on land, in keeping with the regulations for the target fishery. Alternative 2 could have neutral or no effects on fisheries participants because it will essentially allow them to continue to operate as they do now, but minor negative effects compared to the no action alternative for any fisheries participants that may be considering developing directed fisheries for Shared EC Species because it could require them to do more advance work with the Council as part of the fisheries development process.

Alternative 3 would require vessels that incidentally catch Shared EC Species to discard that catch at sea. Alternative 3 could have minor negative effects compared to both Alternative 1 (no action) and Alternative 2 for participants in EEZ fisheries that do not sort their catch at sea, such as the CPS fisheries. To the extent that Alternative 3 would require changes in existing fishing practices that would result in a slowing down of fishing operations to sort catch at sea, Alternative 3 could increase the cost of fisheries operations for fisheries participants.

### 4.3.3 Non-Fishing Human Activities Affecting Shared EC Species

As mentioned in Section 3.3.3, neither the Alternative 1 (no action) nor the action alternatives propose to regulate or otherwise affect non-fishing activities. Therefore, none of the alternatives are expected to have any effects, positive or negative, on non-fishing activities.

### 4.4 Cumulative Effects Analysis

A cumulative effects analysis is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The purpose of a cumulative effects analysis is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful. A formal cumulative impact assessment is not necessarily required as part of an EA under NEPA as long as the significance of cumulative impacts has been consid ered (U.S. EPA 1999). To be completed.

## 5.0 Consistency with FMPs and Applicable Laws

Chapter 5 considers the consistency of CEBA 1 with the FMPs and with the following applicable laws and requirements:

- Magnuson-Stevens Fishery Conservation and Management Act and FMP Objectives
- Endangered Species Act
- Marine Mammal Protection Act
- Migratory Bird Treaty Act and E.O. 13186
- Coastal Zone Management Act
- Administrative Procedure Act
- Paperwork Reduction Act
- Impacts of the action relative to federalism, E.O. 13132
- Consultation and coordination with Indian Tribal Governments, E.O. 13175
- Environmental justice, E.O. 12898
- Regulatory Flexibility Act and E.O. 12866

Consistency with NEPA requirements and a Finding of No Significant Impact (FONSI) are found in Chapter 6.

To be completed.

# 6.0 Consistency with the National Environmental Policy Act

## 6.1 National Environmental Policy Act

The CEQ has issued regulations specifying the requirements for NEPA documents (40 CFR 1500-1508), and NOAA's agency policy and procedures for NEPA can be found in NOAA Administrative Order 216-6 (NAO 216-6). The following are core elements of an EA (40 CFR §1508.9):

1. The need for the proposal,
2. Alternatives as required by NEPA §102(2)(E),
3. The environmental impacts of the proposed action and the alternatives, and
4. The agencies and persons consulted.

## 6.2 Related NEPA Documents

This action grew out of the Council's Fishery Ecosystem Plan, which is not a NEPA document, but which should be considered a resource for this action: http://www.pcouncil.org/ecosystem-based-management/fep/. The model for a comprehensive, multi-FMP amendment comes from the South Atlantic Fishery Management Council's comprehensive ecosystem-based amendment process (http://safmc.net/Library/EcosystemHome). The following NEPA documents also provide information and analyses related to the effects of this proposed action:

- Environmental Assessment for Amendment 12 to the Coastal Pelagic Species FMP, Managing Krill as an Essential Component of the California Current Ecosystem (http://www.pcouncil.org/wp-content/uploads/CPS_Am12_Krill_DraftEA.pdf)
- Draft Environmental Impact Statement for the 2015-2016 Groundfish Harvest Specifications and Management Measures and Amendment 14 to the Groundfish FMP
- Environmental Assessment for the Arctic Fishery Management Plan and Amendment 29 to the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (http://alaskafisheries.noaa.gov/analyses/arctic/earirfrfa0809final.pdf)
- Environmental Assessment for Amendment 96 to the FMP for Groundfish of the Bering Sea and Aleutian Islands Management Area and Amendment 87 to the FMP for Groundfish of the Gulf of Alaska to Comply with Annual Catch Limit Requirements.

Information may be incorporated by reference from these documents into this EA. CEQ regulations at 40 CFR 1502.21 state that "Agencies shall incorporate material into an environmental impact statement by reference with the effect will be to cut down on bulk without impeding agency and public review of the action. The incorporated material shall be cited in the statement and its content briefly described." When information from the above documents is incorporated, these procedures are followed within the body of this EA.

## 6.3 Finding of No Significant Impact (FONSI)

To be completed.

## 6.4 List of Persons and Agencies Consulted

This action is a Council-recommended action that includes all interested and potential cooperating agencies, such as the United States Fish and Wildlife Service, tribal government representatives, and state representatives from Washington, Oregon, California, and Idaho.

The main authors for this document were the members of the Council's Ad Hoc Ecosystem Workgroup:

Mike Burner (Pacific Fishery Management Council staff), Yvonne deReynier (Chair, National Marine Fisheries Service), Larry Gilbertson (Quinault Nation Division of Natural Resources), Joshua Lindsay (National Marine Fisheries Service), Corey Niles (Washington Department of Fish and Wildlife), Cyreis Schmitt (Oregon Department of Fish and Wildlife), Richard Scully (Idaho Department of Fish and Game, Retired), and Deb Wilson-Vandenberg (Vice-Chair, California Department of Fish and Wildlife).

The authors also appreciate predator diet comments received from the Farallon Institute for Advanced Ecosystem Research: Thayer, Julie A., Amber I. Szoboszlai, and Spencer A. Wood. 2014. The California Current Predator Diet Database. Pangaea Data Publisher for Earth & Environmental Science (www.pangaea.de).

The Council's suite of advisory bodies reviewed and commented on this document during its development from the September 2013 through March 2015 meetings. Additionally, the following people were also consulted on or were involved in reviewing drafts of the document:

Sarah Biegel, NMFS West Coast Region, NEPA Coordinator
Judson Feder, NOAA General Counsel, Southwest

Copies of this EA and MSA analysis and other supporting documents for this action are available from the Council website (www.pcouncil.org) and from Mike Burner, Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 101, Portland, OR 97220.

# 7.0 Draft FMP Amendatory Language and Draft Council Operating Procedure 24

CEBA 1 includes the following FMP amendments: Amendment 15 to the CPS FMP, Amendment 25 to the Groundfish FMP, Amendment 3 to the HMS FMP, and Amendment 19 to the Salmon FMP. This section provides draft amendatory language for each of the Council's four FMPs, plus draft COP 24 on EFPs for Shared EC Species. While the FMPs contain many elements in common, each is organized somewhat differently from the other FMPs, which means that different sections of the FMPs will need to be changed to implement CEBA 1 for each FMP. However, the ultimate effect of the different language changes for each FMP will be the same for all FMP species and fisheries. Draft amendment language, below, would: update each FMP's list of FMP amendments, add the Shared EC Species as EC species to each FMP, and revise any relevant FMP discussion of ecosystem component species to explain the status of Shared EC Species and the process for evaluating any future fishery for those species through an EFP.

Chapter 7 is divided into five sections: 7.1 for CPS FMP Amendment 15, 7.2 for Groundfish FMP Amendment 25, 7.3 for HMS FMP Amendment 3, 7.4 for Salmon FMP Amendment 19, and 7.5 for COP 24 – Protocol for Consideration of Exempted Fishing Permits for Shared Ecosystem Component Species. Each section excerpts those paragraphs of each FMP that would be amended by this action. Any text that is to be added to an FMP is shown underlined, <u>like this</u>. Any text that is to be removed from an FMP is shown struck out, ~~like this~~. A row of three asterisks (* * *) indicates FMP text that is not re-printed here because it will not be affected by this action. Text written in bold and small capitals, LIKE THIS, provides navigation instructions on which FMP text will be amended, but will not itself appear in the amended FMP. For example, navigation instructions might be something like "THIRD PARAGRAPH UNDER SECTION 3.3.3 WOULD BE REVISED TO READ AS FOLLOWS," with those instructions followed by the proposed revisions to FMP text.

Draft COP 24 is based on this action's Purpose and Need (Section 1.2) and on the Council's policy on the development of new fisheries for unfished species (FEP Appendix at A.1.1), and structured similarly to existing COPs associated with FMP fisheries: COP 19, *Protocol for Consideration of Exempted Fishing Permits for Groundfish Fisheries*; COP 20, *Protocol for Consideration of Exempted Fishing Permits for Highly Migratory Species Fisheries*; and COP 23, *Protocol for Consideration of Exempted Fishing Permits for Coastal Pelagic Species Fisheries*. Should a U.S. citizen want to develop targeted fisheries for Shared EC Species at some future time, COP 24 would provide the Council and the public a framework for evaluating the potential impacts of such a fishery to existing fisheries, fishing communities, and the greater marine ecosystem (See Section 1.2, Purpose and Need statement).

## 7.1 CPS FMP – Amendment 15 Revisions to the FMP

Amendment 15 to the CPS FMP would amend these sections of the FMP:

- 1.1 *History of the Fishery Management Plan* updated to briefly describe Amendment 15
- 1.2 *Stocks in the Fishery Management Plan* amended to add Shared EC Species
- 1.4 *Ecosystem Component Species* amended to add prohibition language for Shared EC Species
- 2.2.8 *Exempted Fishing* updated to reference potential exempted fishing permits (EFPs) for Shared EC Species
- 5.1.7 *Incidental Catch Allowance for Shared EC Species*, new section to describe potential incidental allowances for Shared EC Species

## Coastal Pelagic Species Fishery Management Plan

***

## 1.0 INTRODUCTION

### 1.1 History of the Fishery Management Plan

TO BE ADDED AFTER AMENDMENT 13 DESCRIPTION; AMENDMENT 14 DESCRIPTION TBD.

Amendment 15 was approved in 2015 and added a suite of lower trophic level species to the FMP's list of ecosystem component (EC) species. Consistent with the objectives of the Council's FMPs and its Fishery Ecosystem Plan, Amendment 15 restricts future development of fisheries for the suite of EC species shared between all four FMPs (Shared EC Species) until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.

### 1.2 Stocks in the Fishery Management Plan

#### *1.2.1 Fishery Management Unit*

Table 1-1. Stocks managed under this FMP ~~include~~:

| Common Name | Scientific Name |
|---|---|
| Pacific sardine | *Sardinops sagax* |
| Pacific (chub) mackerel | *Scomber japonicus* |
| Northern anchovy | *Engraulis mordax* |
| Central and northern subpopulations | |
| Market squid | *Loligo opalescens* |
| Jack mackerel | *Trachurus symmetricus* |
| Krill or euphausiids | *All Species in West Coast EEZ* |
| Including these eight dominant species. | *Euphausia pacifica* |
| First two species are common and are | *Thysanoessa spinifera* |
| most likely to be targeted by fishing | *Nyctiphanes simplex* |
| | *Nematocelis difficilis* |
| | *T. gregaria* |
| | *E. recurva* |
| | *E. gibboides* |
| | *E. eximia* |

Stocks may be added or removed from the management unit through the framework process described in Section 2.0.

### *1.2.2 Ecosystem Component Species*

Table 1-2 EC species under the CPS FMP ~~include~~:

| Common Name | Scientific Name |
|---|---|
| Pacific herring | *Clupea pallasii* |
| Jacksmelt | *Atherinopsis californiensis* |

Table 1-3 EC species shared between all four of the Council's FMPs, including the CPS FMP.

| Common Name | Scientific Name |
|---|---|
| Round herring | *Etrumeus teres* |
| Thread herring | *Opisthonema libertate, O. medirastre* |
| Mesopelagic fishes | Families: *Myctophidae, Bathylagidae, Paralepididae, and Gonostomatidae* |
| Pacific sand lance | *Ammodytes hexapterus* |
| Pacific saury | *Cololabis saira* |
| Silversides | *Atherinopsidae* |
| Smelts | *Osmeridae* |
| Pelagic squids | Families: *Cranchiidae, Gonatidae, Histioteuthidae, Octopoteuthidae, Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*), *Onychoteuthidae, and Thysanoteuthidae* |

***

## 1.4 Ecosystem Component Species

Several criteria should be met for a species to be included in the EC category (Section 660.310(d)(5)(i)). These are: 1) be a non-target stock/species; 2) not be subject to overfishing, approaching overfished, or overfished and not likely to become subject to overfishing or overfished in the absence of conservation and management measures; and, 3) not generally retained for sale or personal use, although "occasional" retention is not by itself a reason for excluding a species from the EC category. Identifying and including EC species in the an FMP is not mandatory but may be done for a variety of purposes: Data collection; For ecosystem considerations related to specification of OY for the associated fishery; As considerations in the development of conservation and management measures for the associated fishery; and/or to address other ecosystem issues.

A 2010 review of bycatch species in CPS fisheries confirmed that incidental catch and bycatch in CPS fisheries is dominated by other CPS and that bycatch/incidental catch of non-CPS is extremely low. However, jacksmelt and Pacific herring are infrequently caught with CPS gear and were therefore added to the FMP under Amendment 13 to ensure continued monitoring of incidental catch and bycatch of these species in CPS fisheries through sampling and logbook programs. This information will continue to be reported in the Stock Assessment and Fishery Evaluation (SAFE) report.

The Council intends to continue and expand its consideration of ecological factors when developing SDCs and management measures for CPS management unit species. These considerations are expected to evolve as improved information and modeling of ecological processes become available. These considerations will likely include predator- prey relationships and the overall status and role of forage species including ~~these~~ the two EC species in table 1-2.

### 1.4.1 Shared Ecosystem Component Species

No directed commercial fisheries may begin for any Shared EC Species (Table 1-3) until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.

***

**2.0 FRAMEWORK MANAGEMENT**

***

### *2.2.8 Exempted Fishing*

"Exempted fishing" is defined to be fishing practices that are new to the fishery or not allowed under the FMP. Under this FMP, the NMFS Regional Administrator may authorize the targeted or incidental harvest of CPS for experimental or exploratory fishing that would otherwise be prohibited. The NMFS Regional Administrator may restrict the number of experimental permits by total catch, time, or area. The NMFS Regional Administrator may also require any level of industry-funded observer coverage for these experimental permits. EFP proposals targeting management unit species or CPS EC species will be subject to the protocol for EFPs for CPS Fisheries (Council Operating Procedure 23). EFP proposals targeting EC species shared between all four FMPs, including the CPS FMP, will be subject to the protocol for Shared EC Species (*Proposed* Council Operating Procedure 24). Exempted fisheries for euphausiids (krill) will not be considered.

**5.0 BYCATCH, INCIDENTAL CATCH, AND ALLOCATION**

***

NEW SECTION TO BE ADDED UNDER ALTERNATIVE 2 (*INCIDENTAL RETENTION ALLOWED*).

### 5.1.7 Incidental Catch Allowance for Shared EC Species

As allowed for krill, Shared EC Species could continue to be taken incidentally without violating Federal regulations, unless regulated or restricted for other purposes, such as with bycatch minimization regulations for eulachon recovery. The target, harvest and transhipment of Shared EC is prohibited. These actions would fully achieve the objectives of the CPS SMP to the extent practicable, but would not account for environmental conditions and the responses of Shared EC Species and other resources to changes in environmental conditions. This prohibition recognizes that *de minimis* or trace amounts of Shared EC Species may be retained by fishermen while targeting other species; such inadvertent action is not intended to be the subject of this prohibition.

## 7.2 Groundfish FMP – Amendment 25 Revisions to the FMP

Amendment 25 to the Groundfish FMP would amend these sections of the FMP:

- Section 1.1 *History of the FMP* updated to briefly describe Amendment 25
- Section 1.2 *How This Document is Organized* amended at the description of Chapter 3 of the FMP to add mention of EC species, in addition to the fishery management unit (FMU) species already mentioned
- Section 2.2 *Operational Definition of Terms* amended to revise the definition of "Ecosystem Component Species" to include EC species that are shared between to all four FMPs
- Section 3.1 *Species Managed by this Fishery Management Plan* amended to include Shared EC Species
- Section 4.4.4 *Ecosystem Component Stocks Without OFL Values* amended to add a paragraph on Shared EC Species
- Section 6.5.2.1 *Endangered Species Act Species* amended to add a sentence on eulachon
- Chapter 8 *Experimental Fisheries* amended to reference potential EFPs for Shared EC Species

### Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery

* * *

**1.1 History of the FMP**

* * *

ADD A FINAL PARAGRAPH TO THIS SECTION THAT READS AS FOLLOWS:

Amendment 25 was approved in 2015 and added a suite of lower trophic level species to the FMP's list of ecosystem component (EC) species. Consistent with the objectives of the Council's FMPs and its Fishery Ecosystem Plan, Amendment 25 restricts future development of fisheries for the suite of EC species shared between all four FMPs until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.

**1.2 How This Document is Organized**

* * *

REVISE THIRD BULLET DESCRIBING CHAPTER 3 TO READ AS FOLLOWS:

Chapter 3 specifies the geographic area covered by this plan and lists the plan's Fishery Management Unit (FMU) species and Ecosystem Component (EC) species, including those EC species shared between all four of the Council's FMPs.

* * *

**2.2 Operational Definition of Terms**

REVISE DEFINITION OF "ECOSYSTEM COMPONENT SPECIES" TO READ AS FOLLOWS:

Ecosystem Component Species are FMP species that are not actively managed in the fishery (i.e., no harvest specifications are specified for these species). Ecosystem component species are not targeted, are not

generally retained for sale or personal use, are not subject to overfishing, and are not overfished or approaching an overfished condition(see section 4.4.4 for more detail). This FMP includes both EC species that are specific to the Groundfish FMP and EC species that are shared between all four of the Council's FMPs.

* * *

### 3.1 Species Managed by this Fishery Management Plan

* * *

INSERT NEW TABLE 3-3 AND EXPLANATORY TEXT TO READ AS FOLLOWS:

Table 3-3 is the listing of EC species shared between all four of the Council's FMPs, including the Groundfish FMP.

**Table 3-3. Common and scientific names of EC species shared between all four of the Council's FMPs.**

| Common Name | Scientific Name |
|---|---|
| Round herring | *Etrumeus teres* |
| Thread herring | *Opisthonema libertate, O. medirastre* |
| Mesopelagic fishes | Families: *Myctophidae, Bathylagidae, Paralepididae, and Gonostomatidae* |
| Pacific sand lance | *Ammodytes hexapterus* |
| Pacific saury | *Cololabis saira* |
| Silversides | *Atherinopsidae* |
| Smelts | *Osmeridae* |
| Pelagic squids | Families: *Cranchiidae, Gonatidae, Histioteuthidae, Octopoteuthidae, Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*), *Onychoteuthidae, and Thysanoteuthidae* |

No directed commercial fisheries may begin for any Shared EC Species until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.

* * *

### 4.4.4 Ecosystem Component Stocks Without OFL Values

* * *

INSERT A NEW FINAL PARAGRAPH IN SECTION 4.4.4. TO READ AS FOLLOWS:

EC species include both those species exclusive to this FMP (Section 3.2) and those species shared between all four of the Council's FMPs (Section 3.3). EC species common to all four FMPs may not become the subject of directed commercial fisheries until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. The Council may have additional data and analysis requirements for changing the species categorization of EC species that are shared between all four FMPs, beyond those requirements already applying to EC species specific to the Groundfish FMP.

* * *

**6.5.2.1 Endangered Species Act Species**

Marine species protected under the ESA that are not otherwise protected under either the MMPA or the MBTA (see below) include various salmon and sea turtle species, as well as eulachon. Threatened and endangered Pacific salmon runs are protected by a series of complex regulations affecting marine and terrestrial activities. In the west coast groundfish fisheries, management measures to reduce incidental salmon take have focused on the Pacific whiting fisheries, which have historically encountered more salmon than the non-whiting groundfish fisheries. Salmon bycatch reduction measures include marine protected areas (MPA) where Pacific whiting fishing is prohibited (See Section 6.8.7), and an at-sea observer program intended to track whiting and incidental species take inseason (See Section 6.4.1.1). Sea turtles are rare in areas where groundfish fisheries are prosecuted and no incidental take of sea turtles has been documented in any directed groundfish fishery. Eulachon sometimes occurs as incidental catch in the groundfish bottom trawl and at-sea hake fisheries, and mortalities result from encounters with fishing gear. However, eulachon bycatch and bycatch mortality is low (or non-existent) in most years, and is monitored through the at-sea observer program.

* * *

**Chapter 8 Experimental Fisheries**

* * *

REVISE THE 4TH INTRODUCTORY PARAGRAPH OF CHAPTER 8 TO READ AS FOLLOWS:

EFP applicants may have their proposals reviewed through the Council process in accordance with Council Operating Procedure #19, Protocol for Consideration of EFPs for Groundfish Fisheries, which applies to EFP proposals targeting management unit species (Table 3-1) or Groundfish EC species (Table 3-2). EFP proposals targeting EC species shared between all four FMPs, including the Groundfish FMP, will be subject to the protocol for Shared EC Species, Council Operating Procedure #24. ~~This~~ These protocols include~~s~~ requirements for EFP submission, proposal contents, review and approval, and progress reporting. The Council will give priority consideration to those EFP applications that: * * *

## 7.3 HMS FMP – Amendment 3 Revisions to the FMP

Amendment 3 to the HMS FMP would amend these sections of the FMP:

- Section 1.1 *Purpose of This Document* updated to briefly describe Amendment 3
- Section 3.3 *Species Included in the FMP as Ecosystem Component Species* amended to include Shared EC Species
- Section 6.1.11 *Exempted Fishing Permits* amended to reference potential EFPs for Shared EC Species

### Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species

* * *

**1.1 Purpose of This Document**

The FMP includes important species of tunas, billfish and sharks which are harvested by West Coast HMS fisheries. A complete list of species in the management unit is provided in Chapter 3. The FMP has been amended ~~once~~ three times. Amendment 1, approved in 2007, addresses overfishing of bigeye tuna, a management unit species. Amendment 1 also reorganized the FMP, which in its prior form was combined with the Final Environmental Impact Statement evaluating the effects of its implementation. The reorganized FMP is a more concise document containing those elements required by the Magnuson-Stevens Fishery Conservation and Management Act describing the management program. Amendment 2, approved in 2011, made FMP provisions (principally in Chapters 3-5) consistent with the revised National Standard 1 Guidelines (50 CFR 600.310) adopted pursuant to the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006. Amendment 3, adopted in 2015, added a suite of lower trophic level species to the FMP's list of ecosystem component (EC) species. Consistent with the objectives of the Council's FMPs and its Fishery Ecosystem Plan, Amendment 3 restricts future development of fisheries for the suite of EC species shared between all four FMPs until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.

* * *

**3.3 Species Included in the FMP as Ecosystem Component Species**

* * *

HMS FMP EC species are:

Bigeye thresher shark, *Alopias superciliosus*
Common mola, *Mola mola*
Escolar, *Lepidocybium flavobrunneum*
Lancetfishes, *Alepisauridae*
Louvar, *Luvarus imperialis*
Pelagic sting ray, *Dasyetis violacea*
Pelagic thresher shark, *Alopias pelagicus*
Wahoo, *Acathocybium solandri*

Bigeye and pelagic thresher sharks are landed by the drift gillnet fishery but in small amounts compared to common thresher and mako sharks. Originally included in the FMP as managed species, largely

because of concern that they have poor resilience to fishing, they were re-designated EC species under FMP Amendment 2, because of the low number caught in west coast commercial and recreational fisheries.

EC species shared between all four Council FMPs, including the HMS FMP are:

Round herring, *Etrumeus teres*
Thread herring, *Opisthonema libertate, O. medirastre*
Mesopelagic fishes of the families *Myctophidae*, *Bathylagidae*, *Paralepididae*, and *Gonostomatidae*
Pacific sand lance, *Ammodytes hexapterus*
Pacific saury, *Cololabis saira*
Silversides, *Atherinopsidae*
Smelts of the family *Osmeridae*
Pelagic squids (families: *Cranchiidae*, *Gonatidae*, *Histioteuthidae*, *Octopoteuthidae*, *Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*), *Onychoteuthidae*, and *Thysanoteuthidae*)

No directed commercial fisheries may begin for any Shared EC Species until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.
* * *

**6.1.11 Exempted Fishing Permits**

* * *

FIRST PARAGRAPH UNDER SUBSECTION "ADDITIONAL FMP REQUIREMENTS FOR AN EXEMPTED FISHING PERMIT" WOULD BE REVISED TO READ AS FOLLOWS:

Additional FMP Requirements for an Exempted Fishing Permit. This FMP places additional requirements for authorizing an EFP for targeting HMS species, including EC species shared between all four Council FMPs. An EFP proposal will be required to follow a specific Council protocol and be reviewed by the Council prior to application to NMFS. EFP proposals targeting management unit species or HMS EC species will be subject to the protocol for EFPs for HMS Fisheries. EFP proposals targeting EC species shared between all four FMPs, including the HMS FMP, will be subject to the protocol for Shared EC Species. The ~~intent of the protocol is~~ protocols are intended to ensure the Council has adequate information on all aspects of the proposed fishery and has adequate time to consider, review and formulate recommendations. ~~This protocol~~ These protocols will be available from the Council. ~~It~~ They will require additional detailed information and analysis beyond those specifically required for an NMFS EFP. The protocols will specify timing for submissions and timing for Council review.

* * *

## 7.5 Salmon FMP – Amendment 19 Revisions to the FMP

Amendment 19 to the Salmon FMP would amend these sections of the FMP:

- *Introduction, Table 1, and Section 1* updated to briefly describe Amendment 19
- 1.1 *Stock Classification and Table 1-4* amended to include Shared EC Species in the FMP
- 1.4 *Ecosystem Component Species* amended to add prohibition language for Shared EC Species
- 6.6.6 *Experimental Fishing* updated to reference potential EFPs for Shared EC Species

**Pacific Coast Salmon Fishery Management Plan for Commercial and Recreational Salmon Fisheries Off the Coasts of Washington, Oregon, and California**

### Introduction

*******

The primary amendment issues since 1984 have included specific spawner escapement goals for Oregon coastal natural (OCN) coho and Klamath River fall Chinook (Amendments 7, 9, 11, 13, and 15), non-Indian harvest allocation (Amendments 7, 9, 10, and 14), inseason management criteria (Amendment 7), habitat and essential fish habitat (EFH) definition (Amendments 8, 14, and 18), safety (Amendment 8), status determination criteria (SDC) (Amendments 10, 14, 16, and 17), management objectives for stocks listed under the Endangered Species Act (ESA) (Amendments 12 and 14), bycatch reporting and priorities for avoiding bycatch (Amendment 14), selective fisheries (Amendment 14 and 17), stock classification (Amendment 16 and 17), annual catch limits (ACLs) and accountability measures (AMs) (Amendment 16), de minimis fishing provisions (Amendments 15 and 16). Amendment 19 was approved in 2015 and added a suite of lower trophic level species to the FMP's list of ecosystem component (EC) species. Consistent with the objectives of the Council's FMPs and its Fishery Ecosystem Plan, Amendment 15 restricts future development of fisheries for the suite of EC species shared between all four FMPs (Shared EC Species) until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.

***

SECOND PAGE OF TABLE 1 AS FOLLOWS

| DOCUMENT | CONTENT SUMMARY |
|---|---|
| *** | |
| **Amendment 17**<br>(Effective January 1, 2013) | 1) Minor corrections from Amendment 16 and updating language to reflect current practices.<br>2) Approval of maximum fishing mortality threshold for Quillayute fall coho. |
| **Amendment 18**<br>(Effective date TBD) | Update to reflect new information on EFH, including criteria for impassable barriers; addition of HAPCs; adjustments to geographic extent of EFH; addition of non-fishing activities and conservation measures; minor typographical adjustments and clarifications. |
| **Amendment 19**<br>(Effective date TBD) | Update to add a suite of lower trophic level species to the FMP's list of ecosystem EC species and restricts future development of fisheries for the suite of EC species shared between all four FMPs (Shared EC Species) until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. |

1 What the Plan Covers

ADD A PARAGRAPH AT THE END OF THE SECTION AS FOLLOWS, LANGUAGE ON DI MINIMIS INCIDENTAL CATCH MAY NEED TO BE ADDED IN THE FUTURE DEPENDENT ON FINAL COUNCIL ACTION

The FMP also includes a suite of lower trophic level species to the FMP's list of ecosystem EC species and restricts future development of fisheries for the suite of EC species shared between all four FMPs (Shared EC Species) until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.

1.1 Stock Classification

ADD A PARAGRAPH AT THE END OF THE SECTION AS FOLLOWS

To the extent practicable, the Council has partitioned the coastwide aggregate of Chinook, coho, and pink salmon into various stock components and complexes with specific conservation objectives. A detailed listing of the individual stocks and stock complexes managed under this plan are provided in Tables 1-1, 1-2, and 1-3. Stocks designated as hatchery stocks rely on artificial production exclusively, while those designated as natural stocks have at least some component of the stock that relies on natural production, although hatchery production and naturally spawning hatchery fish may contribute to abundance and spawning escapement estimates. Table 1-4 lists the non-target Shared EC Species that are not in the fishery, for which future fishery development is restricted until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.

***

TABLE 1-4 WOULD BE ADDED TO SECTION 1 FOLLOWING TABLE 1-3

**Table 1-4. Common and scientific names of EC species shared between all four of the Council's FMPs.**

| Common Name | Scientific Name |
|---|---|
| Round herring | *Etrumeus teres* |
| Thread herring | *Opisthonema libertate, O. medirastre* |
| Mesopelagic fishes | Families: *Myctophidae, Bathylagidae, Paralepididae, and Gonostomatidae* |
| Pacific sand lance | *Ammodytes hexapterus* |
| Pacific saury | *Cololabis saira* |
| Silversides | *Atherinopsidae* |
| Smelts | *Osmeridae* |
| Pelagic squids | Families: *Cranchiidae, Gonatidae, Histioteuthidae, Octopoteuthidae, Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*), *Onychoteuthidae, and Thysanoteuthidae* |

# 6 Measures to Manage the Harvest

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### *6.6.6 Experimental Fisheries*

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SECOND PARAGRAPH IN THIS SECTION AMENDED AS FOLLOWS

The Secretary may not allow any recommended experimental fishery unless he or she determines that the purpose, design, and administration of the experimental fishery are consistent with the goals and objectives of the Council's fishery management plan, the national standards of the MSA, and other applicable law. Each vessel that participates in an approved experimental fishery will be required to carry aboard the vessel the letter of approval, with specifications and qualifications (if any), issued and signed by the Regional Administrator of NMFS. EFP proposals targeting EC species shared between all four FMPs, including the Salmon FMP, will be subject to the protocol for Shared EC Species (*Proposed* Council Operating Procedure 24).

## 7.6 Council Operating Procedure 24 – Protocol for Consideration of Exempted Fishing Permits for Shared Ecosystem Component Species

DEFINITION

An exempted fishing permit (EFP) is a one-year Federal permit, issued by the National Marine Fisheries Service (NMFS), that authorizes a party to engage in an activity that is otherwise prohibited by the Magnuson-Stevens Fishery Conservation and Management Act or other fishery regulations, for the purpose of collecting limited experimental data. The Pacific Fishery Management Council's (Council's) four fishery management plans allows for EFPs for Shared Ecosystem Component (Shared EC) species, consistent with Federal regulations at 50 CFR§600.475. EFPs can be issued to Federal or state agencies, marine fish commissions, or other entities, including individuals. An EFP applicant need not be the owner or operator of the vessel(s) for which the EFP is requested. The NMFS Regional Administrator may require any level of industry-funded observer coverage for these permits.

PURPOSE

This Council Operating Procedure (COP) provides a standard process for the Council, its advisory bodies, and the public to consider EFP proposals. The specific objectives of a proposed exempted fishing activity may vary. EFPs can be used to explore ways to develop stock surveys and assessments, explore the potential for a new fishery on Shared EC Species, or to evaluate current and proposed management measures.

PROTOCOL

A. Submission

1. The Council and its advisory bodies [Ecosystem Advisory Subpanel (EAS), Scientific and Statistical Committee (SSC), and any applicable FMP-specific advisory bodies] should review EFP proposals prior to issuance; the advisory bodies may provide comment on methodology and relevance to management data needs and make recommendations to the Council accordingly. The public may also comment on EFP proposals.
2. Completed applications for EFPs from individuals or non-government agencies for Council consideration must be received by the Council for review at least two weeks prior to the November Council meeting.
3. Applications for EFPs from Federal or state agencies must meet the briefing book deadline for the November Council meeting.

B. Proposal Contents

1. EFP proposals must contain sufficient information for the Council to determine:
    a. There is adequate justification for an exemption to the regulations;
    b. The potential impacts of the exempted activity have been adequately identified;
    c. The exempted activity would be expected to provide information useful to management and use of Shared EC Species and other Council-managed resources.
2. Applicants must submit a completed application in writing that includes, but is not limited to, the following information:
    a. Date of application;
    b. Applicant's names, mailing addresses, and telephone numbers;
    c. A statement of the purpose and goals of the experiment for which an EFP is needed, including a general description of the arrangements for the disposition of all species harvested under the EFP;

d. Valid justification explaining why issuance of an EFP is warranted;
e. A statement of whether the proposed experimental fishing has broader significance than the applicant's individual goals;
f. An expected total duration of the EFP (i.e., number of years proposed to conduct exempted fishing activities);
g. Number of vessels covered under the EFP;
h. A description of the species (target and incidental) to be harvested under the EFP and the amount(s) of such harvest necessary to conduct the experiment; this description should include harvest estimates of overfished species and protected species;
i. A description of a mechanism, such as at-sea fishery monitoring, to ensure that the harvest limits for targeted and incidental species are not exceeded and are accurately accounted for;
j. A description of the proposed data collection and analysis methodology;
k. A description of how vessels will be chosen to participate in the EFP;
l. For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place, and the type, size, and amount of gear to be used;
m. The signature of the applicant.

The Council and/or its advisory bodies may request additional information necessary for their consideration.

C. Review and Approval

1. The EAS will review EFP proposals in November and make recommendations to the Council for action; the Council will consider those proposals for preliminary action. Final action on EFPs will occur at the March Council meeting. Only those EFP applications that were considered in November may be considered in March; EFP applications received after the November Council meeting for the following calendar year will not be considered.
2. EFP proposals must contain a mechanism, such as at-sea fishery monitoring, to ensure that the harvest limits for targeted and incidental species are not exceeded and are accurately accounted for. Also, EFP proposals must include a description of the proposed data collection and analysis methodology used to measure whether the EFP objectives will be met.
3. The Council will give priority consideration to those EFP applications that:
    a. Emphasize resource conservation and management with a focus on evaluating the effects of harvesting Shared EC Species on the larger California Current Ecosystem;
    b. Can assess the potential effects of a directed fishery for one or more Shared EC Species on:
        i. Any Council-managed species;
        ii. Species that are the prey of any: Council-managed species, marine mammal species, seabird species, sea turtle species, or other ESA-listed species;
        iii. Habitat that is identified as essential fish habitat or otherwise protected within one of the Council's FMPs, critical habitat identified or protected under the Endangered Species Act, or habitat managed or protected by state or tribal fishery or habitat management programs;
        iv. Species that are subject to state or tribal management within 0-3 miles offshore of Washington, Oregon, or California;
        v. Species that migrate beyond the U.S. EEZ.
    c. Encourage full retention of fishery mortalities;
    d. Involve data collection on fisheries stocks and/or habitat;
    e. Encourage innovative gear modifications and fishing strategies to reduce bycatch;
4. The EAS review will consider the following questions:
    a. Is the application complete?

b. Is the EFP proposal consistent with the goals and objectives of the Council's Fishery Ecosystem Plan and FMPs?
c. Does the EFP account for fishery mortalities, by species?
d. Can the harvest estimates of overfished species and/or protected species be accommodated?
e. Does the EFP meet one or more of the Council's priorities listed above?
f. Is the EFP proposal compatible with the Federal observer program effort?
g. What infrastructure is in place to monitor, process data, and administer the EFP?
h. How will achievement of the EFP objectives be measured?
i. If this EFP is a re-issue of a previously issued EFP, what are the benefits to the fisheries management process to continue an EFP that began the previous year?
j. If integrating data into management is proposed, what is the appropriate process?
k. What is the funding source for at-sea monitoring?
l. Has there been coordination with appropriate state and Federal enforcement management and science staff?

5. SSC Review:
    a. All EFP applications should first be evaluated by the EAS for consistency with the goals and objectives of the Fishery Ecosystem Plan and the Council's FMPs;
    b. The SSC will evaluate the scientific merits of the application and will specifically evaluate the application's (1) problem statement; (2) data collection methodology; (3) proposed analytical and statistical treatment of the data; and (4) the generality of the inferences that could be drawn from the study.

D. Other considerations

1. EFP candidates or participants may be denied future EFP permits under the following circumstances:
    a. If the applicant/participant (fisher/processor) has violated past EFP provisions; or has been convicted of a crime related to commercial fishing regulations punishable by a maximum penalty range exceeding $1,000 within the last three years;
    b. Within the last three years assessed a civil penalty related to violations of commercial fishing regulations in an amount greater than $5,000;
    c. Has been convicted of any violation involving the falsification of fish receiving tickets including, but not limited to, mis-reporting or under-reporting of fisheries landings. Documented fish receiving tickets indicating mis-reporting or under-reporting of fisheries landings will not qualify for consideration when fish reporting documents are used as part of the qualifying criteria for EFPs.

E. Report Contents

1. The EFP applicant must present a preliminary report on the results of the EFP and the data collected (including catch data) to the EAS at the November Council meeting of the following year.
2. A final written report on the results of the EFP and the data collected must be presented to the EAS and the Council at the March Council meeting. Those EFPs containing data analysis that could benefit from a scientific review may be forwarded to the SSC for comment.
3. The final report should include:
    a. A summary of the work completed;
    b. An analysis of the data collected;
    c. Conclusions and/or recommendations;
    d. Timely presentation of results is required to determine whether future EFPs will be recommended.

## 8.0 Sources


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# Appendix

At its April 2013 meeting, the Council adopted its FEP and FEP appendix. The FEP appendix considers a series of potential cross-FMP ecosystem-based management initiatives that the Council could consider for future action. This document discusses initial alternatives and provides background information in support of FEP Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species. As discussed in Chapter 2, Alternatives, the FEP appendix provides the Council's policy on the development of new fisheries for unfished species within the U.S. West Coast EEZ. That policy is found at Section A.1.1 of the FEP Appendix and is repeated here for reference:

### *A.1.1 Council Policy on the Development of New Fisheries for Unfished Species*

*Under Title II of the MSA, there is no allowable level of foreign fishing for species currently unfished within the U.S. West Coast Exclusive Economic Zone (EEZ). Fishing vessels and fish processors of the U.S. have the capacity to harvest and process the levels of optimum yield of all species subject to Council FMPs.*

*U.S. citizens wishing to initiate new fisheries for West Coast EEZ species that are not subject to Council FMPs, nor explicitly permitted by the list of fisheries described in the Magnuson-Stevens Fishery Conservation and Management Act (MSA) at 16 U.S.C. §1855 and in federal regulations at 50 CFR 600.725(v), are urged to approach the Council with an application for an Exempted Fishing Permit (EFP,) accompanied by a science plan for that EFP fishery, describing the data to be collected by the EFP fishery and the likely analyses needed to assess the potential effects of converting the fishery to an FMP fishery over the long-term. EFP fishery data and analyses should, at a minimum, assess: the amount and type of bycatch species associated with the EFP gear, including protected species, such as marine mammals, sea turtles, sea birds, or species listed as endangered or threatened under the Endangered Species Act (ESA); how the gear will be deployed and fished, and its potential effects on EFH, including the portions of the marine environment where the gear will be deployed (surface, midwater, and bottom). The Council and its advisory bodies will review the results of the EFP to assess whether the information provided is adequate to determine the potential effects of the fishery on the Council's conservation and management measures. Depending on the quality of information received, and on the potential effects of the fishery on the Council's conservation and management measures, the Council will either reissue the EFP, or discontinue the EFP and initiate development of an FMP, FMP amendment, or regulatory amendment process to either prohibit the new fishery from the EEZ, or introduce the new fishery to the EEZ.*

*U.S. citizens wishing to bypass the EFP process to initiate new fisheries for West Coast EEZ species that are not subject to Council FMPs, nor explicitly permitted by the list of fisheries described in the MSA at 16 U.S.C. §1855 and in federal regulations at 50 CFR 600.725, may do so by following the Council notification process described at 50 CFR 600.747. However, that notification is required to be reviewed by the Council and NMFS for the potential effects of new fisheries on the Council's conservation and management measures for, at a minimum, FMP species, protected species, and for the habitat of managed and protected species. A review conducted in the absence of the scientific data that could be provided by an EFP would be necessarily precautionary.*

*Whether introduced via the EFP process, or via the notification process at 50 CFR 600.747, the Council would view new fisheries as having the potential to affect its conservation and management measures if those fisheries had an effect on:*

- *Any Council-managed species;*
- *Species that are the prey of any: Council-managed species, marine mammal species, seabird species, sea turtle species, or other ESA-listed species;*
- *Habitat that is identified as EFH or otherwise protected within one of the Council's FMPs, critical habitat identified or protected under the ESA, or habitat managed or protected by state or tribal fishery or habitat management programs;*
- *Species that are subject to state or tribal management within 0-3 miles offshore of Washington, Oregon, or California;*
- *Species that migrate beyond the U.S. EEZ.*

# ECOSYSTEM WORKGROUP SUMMARY REPORT ON THE UNMANAGED FORAGE FISH PROTECTION INITIATIVE

At its April 2014 meeting, the Pacific Fishery Management Council (Council) directed the Ecosystem Workgroup (EWG)to revise and make further progress on a draft Environmental Assessment (EA) of a Comprehensive Ecosystem-Based Amendment 1 (CEBA 1) to all four of the Council's fishery management plans (FMPs). Our main report, Agenda Item H.1.a. Attachment 1, includes the following:

Chapter 1, *Introduction*, provides the Purpose and Need statement that the Council updated in April 2014, and a schedule and process for developing CEBA 1, which would bring the following species and species groups into all four of the Council's FMPs as ecosystem component (EC) species:

- Round herring (*Etrumeus teres*) and thread herring (*Opisthonema libertate* and *O. medirastre*)
- Mesopelagic fishes of the families *Myctophidae, Bathylagidae, Paralepididae,* and *Gonostomatidae*
- Pacific sand lance (*Ammodytes hexapterus*)
- Pacific saury (*Cololabis saira*)
- Silversides (family *Atherinopsidae*)
- Smelts of the family *Osmeridae*
- Pelagic squids (families: *Cranchiidae, Gonatidae, Histioteuthidae, Octopoteuthidae, Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*), *Onychoteuthidae,* and *Thysanoteuthidae*)

The above species would be known as "Shared EC Species," meaning that they are shared between all of the FMPs. This action would include these FMP amendments: Amendment 15 to the Coastal Pelagic Species (CPS) FMP, Amendment 25 to the Groundfish FMP, Amendment 3 to the Highly Migratory Species (HMS) FMP, and Amendment 19 to the Salmon FMP.

Chapter 2, *Description of the Alternatives,* summarizes the three alternatives reviewed in the EA:

- Alternative 1 (No Action): future fishery management for unfished and unmanaged forage fish species would be governed by the Federal list of authorized fisheries and gear at 50 CFR 600.725(v).
- Alternative 2 (Preferred): bring Shared EC Species into FMPs and prevent future directed fisheries from developing in Federal waters without scientific information on harvest sustainability and potential ecological effects of the fishery, *incidental retention allowed*. In April 2014, the Council identified this alternative as its preferred alternative.
- Alternative 3: bring Shared EC Species into FMPs and prevent future directed fisheries from developing in Federal waters without appropriate scientific information on harvest sustainability and potential ecological effects of the fishery, *incidental retention prohibited*.

In April 2014, the Council had asked that future EWG documents discuss allowing small amounts of Shared EC Species to continue to be landed without triggering enforcement actions for fisheries participants targeting other species. Under Alternative 2, existing low rates of incidental catch would be allowed to continue, although the development of directed fisheries for Shared EC Species would be prohibited until the Council explicitly allows them to move forward. The EWG recommends adding

Alternative 3 so that the EA could discuss the potential effects of requiring vessels to discard at sea any Shared EC Species that may be incidentally caught during operations targeting FMP species.

Chapter 3, *Status of the Affected Environment,* provides background information on Shared EC species, and on known marine predators of Shared EC Species. Chapter 3 also discusses directed fisheries for Shared EC Species off the U.S. West Coast, if any, incidental catch of Shared EC Species, if known, and worldwide fisheries for these species. Per the Council's April 2014 direction to add new squid families to the action, Section 3.2.1.7 on pelagic squids now includes the families *Cranchiidae, Histioteuthidae,* and *Octopoteuthidae*. This chapter has also been revised since April 2014 to add Sections 3.2.2 and 3.2.3 on Council-managed and protected-species predators of Shared EC Species.

Chapter 4, *Impacts on the Affected Environment* is a new chapter and a standard requirement for National Environmental Policy Act analyses. Some sections of this chapter are still in outline format and the EWG anticipates completing these sections in support of the Council's final decision on this action.

Chapter 5, *Consistency with FMPs and Applicable Laws* is only an outline and the EWG also anticipates completing that chapter in time for the Council's final decision on this action.

Chapter 6, *Consistency with the National Environmental Policy Act* is somewhat more complete than Chapter 5, but will also require more work before the Council's final decision on this action.

Chapter 7, *Draft FMP Amendatory Language and Draft Council Operating Procedure 24* provides draft FMP amendment language for each of the FMPs as well as a draft Council Operative Procedure (COP) on a protocol for considering exempted fishing permits (EFPs) for Shared EC Species. Although each of the FMPs has its own format and structure, the draft amendment language in Chapter 7 would alter each of the FMPs in the same way. Chapter 7 draft amendment language for each of the FMPs would: update each FMP's list of FMP amendments, add the Shared EC Species as EC species to each FMP, and revise any relevant FMP discussion of EC species to explain the status of Shared EC Species and the process for evaluating any future fishery for those species through an EFP. The EWG modeled Draft COP 24 on COPs 19, 20, and 23, which are protocols for considering EFPs for the groundfish, HMS, and CPS fisheries, respectively. Draft COP 24 is based on CEBA 1's Purpose and Need for Action, and on the policy the Council adopted in its Fishery Ecosystem Plan Appendix at A.1.1 on developing new fisheries for unfished species.

Chapter 8, *Sources,* lists the references used in the document.

While the EWG welcomes comments on any part of the August 2014 draft EA, we recommend that the Council and its advisory bodies particularly review Chapter 7, FMP amendment language, before the Council's final decision on this action.

PFMC
08/21/14

# COASTAL PELAGIC SPECIES ADVISORY SUBPANEL REPORT ON UNMANAGED FORAGE FISH PROTECTION INITIATIVE

The Coastal Pelagic Species Advisory Subpanel (CPSAS), along with the Coastal Pelagic Species Management Team (CPSMT) received an overview from Mr. Mike Burner on the draft Environmental Assessment (EA) of the Comprehensive Ecosystem-Based Amendment 1 to the Council's four fishery management plans, and reviewed the draft Fishery Management Plan (FMP) language, including the newly proposed Council Operating Procedure 24.

**Preliminary Preferred Alternative**
The CPSAS recommends the Council reaffirm the preliminary preferred alternative selected during the April Council meeting, presented in the EA as Alternative 2.

As outlined in Section 1.2 of the draft EA, the purpose of this action is to prohibit **new directed** commercial fishing on these species until the Council has the opportunity to assess scientific information and potential impacts. Page 48 of the draft EA highlights discussion from the April 2014 PFMC meeting: *"the Council also indicated it wanted to allow the currently low levels of incidental catch and retention of shared Ecosystem Component (EC) species to continue without disruption to existing fisheries..."* As presently drafted, Alternative 3 would prohibit incidental retention. Additionally, incidental catch of Shared EC species is low in federally-managed CPS fisheries. Incidental amounts of catch would be virtually impossible to detect and sort at sea, making compliance with Alternative 3 unworkable in CPS fisheries.

Alternative 3 would also affect many of the other FMP fisheries. These impacts are outlined in the draft EA as well as in a joint letter submitted as public comment, from the Midwater Trawler's Cooperative, co-signed by organizations representing the majority of harvesters and processors in the CPS and groundfish fisheries on the West Coast. As described in the joint letter, prohibiting retention of Shared EC species will result in increased vessel operational costs, yet provide no direct biological benefit.

In addition, directed artisanal fisheries exist in state waters for some of the EC shared species. The CPSAS reiterates the adopted purpose and need statement, indicating that *"This action is not intended to supersede tribal or state fishery management for these species, and coordination would still occur through the existing Council process."*

The CPSAS therefore recommends the Council reiterate its support for Alternative 2 as a preliminary preferred alternative.

**Regarding Draft FMP Amendment Language:**
The CPSAS commends the Ecosystem Workgroup for the progress that has been made on the EA to date. We have no specific edits to the FMP language at this time, but support the revisions proposed by the CPSMT (Agenda Item H.1.c, Supplemental CPSMT Report). Following inclusion of the CPSMT edits, we recommended forwarding the draft EA for public review.

PFMC
09/13/14

# COASTAL PELAGIC SPECIES MANAGEMENT TEAM REPORT ON UNMANAGED FORAGE FISH PROTECTION INITIATIVE

The Coastal Pelagic Species Management Team (CPSMT) and the Coastal Pelagic Species Advisory Panel (CPSAS) jointly received a briefing by Mr. Mike Burner concerning the proposed Coastal Pelagic Species Fishery Management Plan (CPS FMP) amendment language on forage fish.

The Ecosystem Workgroup report presents three alternatives for Council consideration. The CPSMT recommends Alternative 2 (preferred) which prevents future fisheries from developing without scientific information on harvest sustainability and potential ecological effects while still allowing for limited amount of incidental take. Given the Council's intent of allowing current amounts of incidental catch to continue, the CPSMT recommends the Council not set limits on these ecosystem component (EC) species.

The CPSMT recommends the following edits to the language in section 5.1.7, Incidental Catch Allowance for Shared EC Species (page 70 of the EWG Report, Agenda Item H.1.a, Attachment 1):

> ~~As allowed for krill,~~ Shared EC Species could continue to be taken incidentally without violating Federal regulations, unless regulated or restricted for other purposes, such as with bycatch minimization regulations for eulachon recovery. The target<u>ing</u>~~, harvest and transhipment~~ of Shared EC is prohibited. ~~These actions would fully achieve the objectives of the CPS SMP to the extent practicable, but would not account for environmental conditions and the responses of Shared EC Species and other resources to changes in environmental conditions. This prohibition recognizes that de minimis or trace amounts of Shared EC Species may be retained by fishermen while targeting other species; such inadvertent action is not intended to be the subject of this prohibition.~~

PFMC
09/13/14

# ECOSYSTEM ADVISORY SUBPANEL REPORT ON THE UNAMANAGED FORAGE FISH PROTECTION INITIATIVE

The Ecosystem Advisory Subpanel (EAS) reviewed the Draft Environmental Assessment (Agenda Item H.1.a, Attachment 1) and the Ecosystem Work Group's Summary Report (Agenda Item H.1.b), together with written public comment on this action (Agenda Item H.1.c) and comments from members of the public who attended the EAS meeting on September 12, 2014. We commend the Ecosystem Work Group for supporting the Council's intentions by delivering a well-organized draft environmental assessment. The EAS remains very supportive of this initiative and encourages the Council to continue the path to full implementation.

We respectfully offer the Council the following advice with respect to advancing the Unmanaged Forage Fish Protection Initiative.

The EAS supports Alternative 2 as the preliminary preferred alternative. We support allowing incidental retention of caught ecosystem component (EC) species because it is consistent with the purpose and need statement and poses less burden on existing fisheries than the blanket prohibition on retention featured in Alternative 3.

We discussed the issues related to incidental catch of EC species at length, including discards vs. landings, whether sales should be allowed, and whether EC species catch should be capped. The EAS recommends that the Council not implement management measures to address the disposition of incidental catch at this time.

Fishery-derived data are likely to remain the best available data for assessing trends in EC species catch and relative abundance, so the EAS recommends that data from existing monitoring efforts be compiled and reported on in the annual state-of-the-ecosystem report. Further, we recommend that the data be reviewed periodically to ensure that incidental catch levels are consistent with the Council's intent for the initiative.

The EAS supports the draft Council Operating Procedure 24 for considering Exempted Fishing Permits (EFP) for Shared EC Species, and we accept the responsibility outlined for the EAS to review EFP proposals.

The EAS also supports the draft Fishery Management Plan (FMP) amendments. We note, however, that in a few cases the draft language is slightly inconsistent with the purpose and need statement. For instance, in the Coastal Pelagic Species (CPS) FMP Section 1.1 the proposed amendment reads "…Amendment 15 restricts future development of fisheries…" while the initiative purpose and need statement employs the word prohibit. We recommend using prohibits instead of restricts in the proposed FMP amendment language to be consistent with the purpose and need statement.

The EAS recommends removing the inconsistency in the designation of jacksmelt versus Silversides in the CPS FMP Table 1-2 -- EC species under the CPS FMP -- as jacksmelt fall within the taxonomic grouping of Silversides.

PFMC
09/13/14

Agenda Item H.1.b
Supplemental GAP Comment
September 2014

# GROUNDFISH ADVISORY SUBPANEL REPORT ON UNMANAGED FORAGE FISH PROTECTION INITIATIVE

The Groundfish Advisory Panel (GAP) heard a presentation from Mr. Mike Burner on the Forage Fish Initiative and reviewed the draft Environmental Assessment on this topic.

The GAP recommends the Council reaffirm its preliminary preferred alternative, Alternative 2, as the appropriate means to protect unmanaged forage fish. Further the GAP believes the Environment Assessment is ready for distribution for public review and comment. Lastly the GAP believes the proposed language for Council Operating Procedure 24 sets out an appropriate process for considering exempted fishing permits.

GAP members are committed to protecting unmanaged forage fish and we recognize that forage fish are an important ecosystem component for groundfish and other federally managed fisheries. Various groundfish fisheries have historically caught incidental amounts of these forage fish species. Table 3.3.5 from the EA enumerates these minimal catches over the last decade.

The GAP does not support Alternative 1, the no option alternative, as it does not meet the intent of the Council and stakeholders to protect unmanaged fish.

Similarly, the GAP does not support Alternative 3, which prohibits the retention of several forage fish species. Alternative 3 treats forage fish species as "in the fishery" versus "ecosystem component" species by applying specific management measures to prohibit retention. This is an inappropriate classification according to National Standard 1 guidelines. Further this alternative will negatively affect existing fisheries with no real benefit to conservation and biology. If all groundfish fisheries are required to sort at-sea and discard these species it will pose an enormous burden on the industry – particularly the whiting fleets who do not currently sort fish at-sea but rather put the fish into the hold as quickly as possible in order to immediately chill the harvest. Alternative 3 would not only be disruptive to fishing operations, in the case of whiting it would result in a degraded product that does not meet the requirements of the market.

There has been some discussion in public comment to the Council about limiting the amount of bycatch under Alternative 2. The GAP strongly opposes this approach for essentially the same reasons we oppose Alternative 3. This approach would clearly impose additional burdens and costs on the fleet without any biological benefit.

The GAP supports the Statement of Purpose and Need developed for this initiative. We believe that Alternative 2 as described in the EA is the most appropriate means of meeting the Council's goal to protect unmanaged forage fish without disrupting or hurting existing target fisheries.

PFMC
09/13/14

Agenda Item H.1.b
Supplemental GMT Report
September 2014

# GROUNDFISH MANAGEMENT TEAM REPORT ON UNMANAGED FORAGE FISH PROTECTION INITIATIVE

The Groundfish Management Team (GMT) appreciated receiving a presentation from Mr. Mike Burner on the unmanaged forage fish initiative and the analysis to date. We have heard that in addition to the existing options, there has been some discussion of additional shoreside sorting to track the landings of forage fish as ecosystem component species.

Currently, each state records landings of unsorted species differently. Additional sorting requirements would have an impact on existing requirements and priorities (e.g. sorting to better understand the potential for overfishing in stock complex component species). Some of the costs and associated process changes have been presented in state reports (Agenda Item F.8.b, ODFW Report, June 2013 and Agenda Item J.1.c, WDFW Report, September 2014). There has not been a comprehensive analysis across the states of how forage species are currently tracked on fish tickets, how additional new sampling requirements impact existing requirements and priorities, or how the coastwide sampling could be better-coordinated.

If the Council wanted to see such analyses, the Ecosystem Workgroup could be tasked with documenting how unsorted species are currently recorded on fish tickets by the various states, as well as the costs for additional sorting among states. Coordinating port sampling across the states to more efficiently address all of the competing priorities could be addressed as a new Fishery Ecosystem Plan Initiative when the Council discusses those in March 2015.

PFMC
09/13/14

# HIGHLY MIGRATORY SPECIES MANAGEMENT TEAM REPORT ON THE UNMANAGED FORAGE FISH PROTECTIVE INITIATIVE

The Highly Migratory Species Management Team (HMSMT) reviewed the proposed amendment language for the Fishery Management Plan (FMP) for West Coast Fisheries for Highly Migratory Species (HMS) found in Section 7.3 of Agenda Item H.1.a, Attachment 1. The HMSMT finds this amendment language suitable to address the purpose of this Initiative and consistent with the contents of the FMP.

The HMSMT also reviewed the proposed Council Operating Procedure (COP) 24, Protocol for Consideration of Exempted Fishing Permits (EFP) for Shared Ecosystem Component Species, found in Section 7.6 of Attachment 1. Although the title of this COP implies it would only apply to EFPs that would target forage fish Ecosystem Component (EC) species, the body of the COP text does not specify this clearly. For example, the Purpose section states "This Council Operating Procedure (COP) provides a standard process for the Council, its advisory bodies, and the public to consider EFP proposals. The specific objectives of a proposed exempted fishing activity may vary. EFPs can be used to explore ways to develop stock surveys and assessments, explore the potential for a new fishery on Shared EC Species, or to evaluate current and proposed management measures." However, this section does not make clear that the scope of the COP is limited to the Shared EC species. This ambiguity should be corrected to avoid future confusion over its applicability in relation to other COPs, such as COP 20, covering the EFP review process under the HMS FMP.

PFMC
09/12/14

# SALMON TECHNICAL TEAM REPORT ON THE UNMANAGED FORAGE FISH PROTECTION INITIATIVE

The Salmon Technical Team (STT) reviewed Agenda item H.1.a, the Ad Hoc Ecosystem Workgroup summary report on unmanaged forage fish and supports adoption of Alternative 2 (Preferred) which prevents future, directed fisheries from developing without scientific information, but allows for some incidental take. This Alternative strikes a reasonable balance in that it protects unmanaged forage fish from initiation of new fisheries in the absence of an Experimental Fishing Permit but still allows for the small level of take currently occurring in Council-area fisheries. We note that there will likely be little or no incidental take of these unmanaged forage species in west coast ocean salmon fisheries. The draft additions to the Salmon Fishery Management Plan that would implement Amendment 19 appear to be suitable to be sent out for public review, with one modification. On page 76, in the inserted text, "Amendment 15" should be changed to "Amendment 19".

PFMC
09/11/14

# PUBLIC COMMENT EMAILS AND LETTERS ON THE UNMANAGED FORAGE FISH PROTECTION INITIATIVE

From: **Kimber Nelson** <kimber_nelson@hotmail.com>
Date: Fri, Aug 1, 2014 at 9:19 PM
Subject: Forage fish management
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

From: **Carol Pattee** <tulip103@upwardaccess.com>
Date: Mon, Aug 4, 2014 at 1:19 AM
Subject: Forage Fish
To: pfmc.comments@noaa.gov

From: **Jeff and Lauretta Young** <jeffandlaurettayoung@comcast.net>
Date: Sat, Aug 2, 2014 at 11:32 PM
Subject: The importance of protecting forage fish
To: pfmc.comments@noaa.gov

From: Kirsten Miller <mille307@gmail.com>
Date: Thu, Aug 14, 2014 at 10:04 AM
Subject: Forage Fish Management Action
To: pfmc.comments@noaa.gov

From: Catha Loomis & Mary Anne Joyce <clmaj172@easystreet.net>
Date: Thu, Aug 14, 2014 at 9:09 PM
Subject: comments on unmanaged forage fish
To: pfmc.comments@noaa.gov

In preparation for your Sept 13 meeting to consider management options for forage fish species, please consider my comments.

Thank you for your attention to protecting currently unmanaged forage fish. This is a very important ecosystem, environmental and economic issue. Please move forward this issue by:
1. Incorporating unmanaged forage fish as ecosystem component species into each of your existing fishery management plans
2. Setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

Thank you

From: **Caroline Arnold** <carolineharnold@gmail.com>
Date: Fri, Aug 1, 2014 at 4:19 PM
Subject: Helping seabirds by protecting forage fish
To: pfmc.comments@noaa.gov

Dear Pacific Fisheries Management Council,

I support Portland Audubon in its recognition of the progress you have made in protectingunmanaged forage fish. Thank you!
Along with Audubon, I would encourage you to incorporate unmanaged forage fish into your fishery management plans and to set limits on the number of these fish that can be taken forgroundfish and other species.

--
Caroline Arnold
Portland, OR

From: <joanandtim89@gmail.com>
Date: Sat, Aug 2, 2014 at 12:42 PM
Subject: Protections for forage fish
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>
I am a member of Audubon Society, both the national and Portland, Oregon organizations. I strongly urge you to enact protections for forage fish for seabirds. The entire oceanic food chain is at risk and its demise would have devastating effects on the planet in time if we do not take measures now to support forage fish at different levels. Please protect oceanic fish life.

Joan Hamilton
Portland, Oregon

From: **Amy Whitworth** <plan-it-earth@comcast.net>
Date: Sat, Aug 2, 2014 at 4:34 PM
Subject: management options for forage fish species
To: pfmc.comments@noaa.gov

To Members of the Pacific Fisheries Management Council,

Thank you for your work protecting currently unmanaged forage fish.

Forage fish form the base of the ocean food web, and seabirds and other marine wildlife depend on them for food. Therefore, it is important to include and protections for these fish as components of a healthy ocean ecosystem and existing fishery management plans. Setting limits on quantities of unmanaged forage fish taken in existing fisheries is crucial in that effort, especially for groundfish and other species.

As global demand for inexpensive protein drives the opening of new fisheries, it is important to consider the needs of wildlife that depend on these same resources. By weight, forage fish now account for nearly 40 percent of all fish caught worldwide. Only ten percent of this catch is for human consumption – the other 90 percent goes to feed for livestock, pellets for farmed fish, and fertilizer.

I encourage you to move forward in your work to further protect this important resource not only for fisheries, but also for seabirds and other marine wildlife.

Sincerely,

Amy Whitworth, Earth Friendly Garden Designer & Community Educator
**Plan-it Earth Design**
503-239-0105
www.plan-it-earthdesign.com
www.abundantnaturegarden.com

From: **Jody Brass field** <jodybrass@gmail.com>
Date: Sun, Aug 3, 2014 at 9:32 PM
Subject: Please protect forage fish
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

Dear PFMC,

Thank you for your work to protect currently unmanaged forage fish. I ask that you move forward by: incorporating forage fish as ecosystem component species into each of your existing fishery management plans, and setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

Thank you,
Jody Brassfield-English

From: **Janis Clark** <JanClark@dbmorgan.com>
Date: Sun, Aug 3, 2014 at 7:43 PM
Subject: Forage Fish
To: pfmc.comments@noaa.gov

I would like to thank the Council for its work protecting the forage fish issue and please follow the “Let go Let God” mentality. Man cannot control everything, nature does a pretty good job of handling things if Man would just leave it alone.
Thank you,
Janis Clark
Redmond OR
541-316-5563

From: **tennise thornton** <tennise99@gmail.com>
Date: Mon, Aug 4, 2014 at 2:59 PM
Subject: Please protect forage fish to also protect Seabirds and, biodiversity
To: pfmc.comments@noaa.gov

Hello,
I am writing today to ask that we protect forage fish for birds...not just for fishermen.
There are so many influences affectig our dwindling bird and fish populations.
Please help protect our birds by preserving their food and most importantly maintaining Biodiversity.
Thank you for reading this message.

Tennise Thornton
10005 SW Lancaster Rd Portland OR 97219
503 246 5518

rom: **Bryan Brock** <bbriggidy@hotmail.com>
Date: Tue, Aug 5, 2014 at 10:55 PM
Subject: Help seabirds by protecting forage fish
To: pfmc.comments@noaa.gov

Thank you to the Council for working to protect currently unmanaged forage fish. I'd like to implore the council to incorporate unmanaged forage fish as ecosystem component species into each of its existing fishery management plans. Please, also institute a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.
thank you,
Bryan Brock
bbriggidy@hotmail.com

From: **Julia Harris** <jhgpdx@comcast.net>
Date: Wed, Aug 6, 2014 at 7:23 PM
Subject: Protections for 2015
To: pfmc.comments@noaa.gov

Dear Council,

Thank you for working to protect currently unmanaged forage fish. Please continue to move forward by:

- Incorportating unmanaged forage fish as a an ecosystem component species into each of the existing fishery management plans

- Setting limits on the amount of unmanaged forage fish that can be taken in existing fisheries for ground fish and other species.

The Council has a golden opportunity to set good policies before it is too late. Growing global demand for inexpensive protein drives the call to open new fisheries on forage fish, posing a threat to wildlife. By weight, forage fish now account for nearly 40% of all fish caught worldwide. Only 10% of this catch is for human consumption; the other 90% goes livestock feed, pellets for farmed fish, and fertilizer.

Regards,

Julia Harris
4045 SW Council Crest Drive
Portland, OR 97239

From: <dirios@comcast.net>
Date: Thu, Aug 7, 2014 at 2:28 PM
Subject: Forage Fish Protection
To: pfmc comments <pfmc.comments@noaa.gov>

Hello,
I am writing to urge the Pacific Fishery Management Council to continue to move forward in protecting forage fish by:
incorporating un-managed forage fish as ecosystem component species into each of the existing fishery management plans,
as well as setting a limit on the amount of un-managed forage fish that may be taken in existing fisheries for ground fish and other species.

For the forage fish (and seabirds!)
sincerely,
Diane Rios
Portland, OR

From: **LindayPeter Enticknap** <lindaypeter@gmail.com>
Date: Fri, Aug 1, 2014 at 5:11 PM
Subject: Forage Fish Protection
To: pfmc.comments@noaa.gov

TO: The Pacific Fisheries Management Council

Ladies and Gentlemen;
We respectfully request that the Council take action now to improve the management of critical forage fish in all future fishery management plans. These plans should set realistic and

sustainable limits on the quantity of forage fish that may be harvested based on sound science and conservative management prescriptions designed to ensure that forage fish remain abundant not only for fishers but for all marine life that depend on these critical species.

Please advise us of your actions to protect forage fish.

Thank you for the opportunity to comment on this important issue.

Yours,
Peter y Linda  Enticknap
2019 NW Doral St
Mcminnville, OR 97128
Mailto:lindaypeter@gmail.com

From: **Meryl Redisch** <merylaredisch@gmail.com>
Date: Sun, Aug 10, 2014 at 1:29 PM
Subject: Fwd: Forage fish management policy at Spokane , Washington meeting
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>
Dear Council Members,

I am a resident of Oregon and have been following the PMFC's work and decision making rules related to the management of forage fish for several years. I was impressed with the Council's recent approval for option 2.2.1 as the preferred alternative for protecting forage fish in federal waters and for removing Pacific Saury from the list of authorized fisheries and gear, both of which were recommended by The Audubon Society of Portland .

At the upcoming meeting in Spokane, Washington,
I am requesting that the Council take the following actions and continue to use a proactive approach for managing and protecting forage fish species;

1) include unmanaged forage fish species into all existing fisheries management plans,

2) set limits on the quantity of unmanaged forage fish that may be taken in existing fisheries for ground fish and other species,

3) advance ecosystem-based management and the precautionary principle in all council decisions, and

4) utilize the best available research and recommendations that come from the science community, including those from the Lenfest Forage Fish task force.

My interest in forage fish management is a result in my strong desire to ensure that sea and shore birds have enough food for their long term survival. A recent decade long study revealed that forage fish are the primary diet for predator species, salmon and seabirds. I strongly encourage the Council to advance a more comprehensive approach towards protecting and managing these critical fish populations which are the basis of the marine food chain. Thank you.

Sincerely,
Meryl A. Redisch
1918 sw Pendleton Street
Portland, Oregon

From: **Keith Canaday** <kcan120@hotmail.com
Date: Tue, Aug 12, 2014 at 3:16 PM
Subject: Unmanaged Forage Fish Initiative
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov
RE: Unmanaged Forage Fish Initiative

***8/11/2014***

Dear Chair Lowman and Council Members,
The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and ***AS A FISHERMAN/ANGLER***, I applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, I ask that the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species. *These fish are essential food to the species I fish for, and thus, essential to me.*

During the meeting in September, I encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.
Sincerely
Keith Canaday
***Springfield, OR***

From: <etmak6@yahoo.com
Date: Wed, Aug 13, 2014 at 5:26 AM
Subject: Unmanaged forage fish
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov
I am submitting my concern that forage fish are protected for wildlife consumption. Please limit the amount of forage fish that can be harvested for human use, so that an adequate amount remains for wildlife species.

With best regards,

Ellen Makowski

From: **Erik Schmitz** <erik.j.schmitz@gmail.com>
Date: Wed, Aug 13, 2014 at 12:25 PM
Subject: Thanks and Future Request for Management of Forage Fish Species
To: pfmc.comments@noaa.gov

To Whom It May Concern:

Thank you for your work to protect previously unmanaged fishing of forage fish.

I ask that in the future you, please, accomplish to steps. The first is to incorporate currently unmanaged forage fish as crucial component species in each of your existing fishery management plans. Furthermore, would you, please, also set a limit on the amount of unmanaged forage fish that can be taken for groundfish and other species?

Thank you for your work and for your time.

Sincerely,

Erik Schmitz
4921 SE 76th Ave
Portland, OR 97206

From: Charmaine Anderson <realartstudios@comcast.net>
Date: Wed, Aug 13, 2014 at 10:50 PM
Subject: Please help seabirds survive by protecting forage fish
To: pfmc.comments@noaa.gov

Hello,

I wish to offer my thanks for your good efforts to support and protect currently unmanaged forage fish. I support the Audubon Society and encourage you to continue progress in the effort to help seabirds survive by:

Incorporating unmanaged forage fish as an ecosystem component species into each of its existing fishery management plans and setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for ground fish and other species.

I love wildlife and believe we should continue to do our best to support lifeforms that depend upon these natural resources to survive. I applaud you in your efforts to do what is best to ensure we are good stewards of God's creation so that all species have a chance at survival.

Thank you for your kind attention.

Charmaine Anderson
Real Art Studios, LLC.
(503) 521-9004
www.realartstudios.com

From: <george7096@verizon.net>
Date: Thu, Aug 14, 2014 at 7:13 AM
Subject: Comment for Sept. 13 meeting
To: pfmc.comments@noaa.gov

Please enter this message as our comment for the September 13 meeting. I (George) am a native of Washington state and grew up in Oregon. My sister still lives in Oregon, and we visit her family often. I remember many family vacations along the coast at Smith River, Yachats, Tilllamook Bay, Nehalem, Astoria and Long Beach.

We thank the Council for the work done already toward restoration of unmanaged forage fish populations in the Pacific. These small fish serve as food for larger fish which we eat. They also support the wonderful oceanic bird population, such as murres, puffins and murrelets. They should be recognized as an essential part of the ecosystem and be placed under management to keep their population up at a sustainable level.

We would like to see this work continue with the following elements:

1. Include unmanaged forage fish as an ecosystem component species in every one of your existing fishery management plans. This will make sure they are considered when decisions are made affecting the ecosystem.

2. Set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.. Without a clear limit, industrial fishing operators might reduce the forage fish populations to an unsustainable level, placing the whole ecosystem in peril.

Thank you for considering our thoughts.
Sincerely,
George & Frances Alderson
112 Hilton Ave.
Catonsville, MD 21228
george7096@verizon.net

From: Jackson Barnes <gimmeanswers@gmail.com>
Date: Thu, Aug 14, 2014 at 10:20 AM
Subject: Forage Fish Management
To: pfmc.comments@noaa.gov

To the Pacific Fisheries Management Council,

As a resident and someone who works in the Puget Sound I would like to express my concerns about the lack of management of forage fish species. Because these species are some of the most important species in the link to higher trophic levels I would encourage you to:

1. Incorporate these species into your existing fishery management plans
2. Maintain and enhance these species' populations by setting a limit on the amount of forage fish that may be taken in existing fisheries for ground fish and other species.

Thank you for your time and efforts.

Sincerely,
Jackson Barnes

From: <harmony23fem@aol.com>
Date: Thu, Aug 14, 2014 at 12:50 PM
Subject: Managing Forage Fish_ Public Comment attached
To: pfmc.comments@noaa.gov.

Too often fisheries managers step in after fish stocks have already collapsed. This is a golden opportunity to set good policies before it is too late. Growing global demand for inexpensive protein drives the call to open new fisheries on forage fish, posing a threat to wildlife. By weight, forage fish now account for nearly 40 percent of all fish caught worldwide. Only ten percent of this catch is for human consumption – the other 90 percent goes to feed for livestock, pellets for farmed fish, and fertilizer.

Thank you for your work to protect currently unmanaged forage fish. There are no borders out in the ocean. What impacts
one area inevitably cascades into the open sea. You sit in a unique intersection in the health and future of the planet and our ability to continue to have the resources of the ocean for our work and our food. We must be wise not reckless. Prudent not greedy. Our children's future will be our legacy.

Please move forward by incorporating unmanaged forage fish as ecosystem component species into each of the existing fishery management plans. And also set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.
Mary Bradley Marinkovich
1002 D Street
Port Townsend WA 98368
360-379-3733

Wednesday, August 13th , 2014
Pacific Fishery Management Council
Dorothy Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, OR 97220

Dear Chair Lowman and Council Members,
My name is Marcus Hinz and I am an owner/operator of a tourism business which relies on the existence of abundant wildlife, natural habitat and the healthy eco-systems which support them. Our customers use our guide services to get close to wildlife such as harbor seals, the migratory Brown Pelicans, and many other sea birds which rely on healthy forage fish stocks along the entire West Coast. Therefore, it is well worth my precious time to advocate for the protection of health forage fish stocks upon which other animals depend upon for food.
I recognize that the Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and I applaud the Council's work to incorporate ecosystem principles into fishery management decisions.
Today, I ask that the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species. Please adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. I believe this action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.
I also believe this action will also fulfill the first initiative of the Council's Fishery Ecosystem Plan; a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.
As my letter demonstrates, this issue has many economic implications beyond the immediate issue of protecting ecosystems and fisheries. The tourism industry must also be protected. I very much appreciate your commitment to healthy ecosystems along the West Coast and the Pacific Ocean
Sincerely,

Marcus Hinz,
Principal Executive,
Kayak Tillamook County

From: Dena Turner <denturn0454@dsl-only.net>
Date: Thu, Aug 14, 2014 at 8:27 PM
Subject: forage fish management
To: pfmc.comments@noaa.gov

To whom it may concern:

I am a birder and a member of Portland Audubon. I want to thank you for your current work to protect forage fish, which are critical as the base of the food chain.

Please consider the following in order to protect the vital forage fish species:

1. Incorporating unmanaged forage fish as ecosystem component species into each of its existing fishery management plans.
2. Setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

Thank you for your consideration.

Dena Turner
Birder, Member of Portland Audubon Society

From: **Kevin Scribner** <scribfish@gmail.com>
Date: Fri, Aug 15, 2014 at 7:21 AM
Subject: Unmanaged Forage Fish Initiative
To: pfmc.comments@noaa.gov

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

Over the past two years, the Council has made steady progress in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and I honor the Council's work to incorporate ecosystem principles into fishery management decisions. Now, I ask that the Council continue this positive movement by incorporating forage fish into all of the existing fishery management plans as ecosystem component species.

I write you as a former commercial fisherman—1976-1996—and one who has been active in seafood marketing during the past 10 years. The seafood consumer is becoming more and more sophisticated, including awareness of sustainability, traceability, and the fishermen/processer suppliers. I see, then, the stewardship of forage fish species as a key component for both: 1) rigorous ecosystem management; and 2) authentic marketplace sustainability story.

So, during the meeting in September, I encourage the Council to formally adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. And I encourage the Council to require rigorous review and management measures to be in place before authorizing new directed fisheries, and that there be science-based limits on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.

These actions will ensure that the Council achieves its goal of establishing basic protections for forage fish and fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary

document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.

As well, as we are in the process of re-authorizing the Magnuson-Stevens Act, this action will further demonstrate the viability of the Council structure and process, and that our Council is very capable of guiding management of our Pacific Ocean waters in a balanced manner that will sustain the foundational ecosystem for generations to come.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,

Kevin Scribner
5916 N. Detroit Ave
Portland, OR 97217
509-520-8040

From: **Tim Gavin** <tim@dubelyoo.com>
Date: Fri, Aug 15, 2014 at 9:30 AM
Subject: Unmanaged Forage Fish Initiative
To: pfmc.comments@noaa.gov

Dear Chair Lowman and Council Members,
I strongly encourage you to take regulatory action to protect currently unmanaged forage fish populations in our oceans. These populations are vital to the long term survival and rehabilitation of critical food and sport fisheries as well as other marine life. Sustainable marine ecosystems can only be achieved if all of the links in the food web are addressed. Please complete the work already underway to establish meaningful, science based, management practices for forage fish populations.
Thank you,
Timothy R Gavin
Yakima Fly Fishers' Association

From: Anne Millbrooke <anne27m@yahoo.com>
Date: Fri, Aug 15, 2014 at 10:11 PM
Subject: protect seabirds!
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

Dear Pacific Fishery Management Council:

I grew up on the Long Beach Peninsula, and I loved the birds of the ocean and bay. Please continue progress toward providing stronger protections for forage fish by:
Incorporating unmanaged forage fish as ecosystem component species into each of its existing fishery management plans.

Setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.
Quality of life is reflected in diversity of species, in healthy populations of seabirds, in balancing extraction of resources with preservation of resources. Birding also provides a major economic boost to the coast via tourism.

Sincerely,
Anne Millbrooke

3410 Golden Valley Drive
Bozeman, MT 59718
anne27m@yahoo.com

**Association of Northwest Steelheaders**
6641 SE Lake Rd. • Milwaukie OR 97222
503-653-4176 • 503-653-8769 (fax)
office@anws.org • www.nwsteelheaders.org

Established 1960

August 15, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
1100 NE Ambassador Place, #101
Portland, OR 97220

**RE: Agenda Item H.1 (Unmanaged Forage Fish Initiative)**

Dear Chair Lowman and Council Members:

Thank you for the opportunity to comment on the important role of forage fish in Ecosystem Based Management of our Pacific waters.

The Association of Northwest Steelheaders, with a membership of 1,600 members in Oregon and Washington, has a long and broad history of protecting and enhancing sport fisheries since it was founded in 1960. While our members spend thousands of volunteer hours improving habitat and fishing opportunity in our inland waters, we recognize the importance of forage fish in providing good returns of healthy salmon and steelhead.

We appreciate the steady progress made by the Council toward establishing regulatory protections for currently unmanaged forage fish species and we support the Council's work to incorporate ecosystem principles into fishery management decisions. Going forward, we ask that the Council incorporate forage fish into all of the existing Fishery Management Plans as ecosystem component species, along with management measures prohibiting unregulated development of new directed fisheries.

We encourage the Council to select the option that will best designate unmanaged forage fish as an ecosystem component species, prevent new directed fisheries until after a complete assessment to determine harvest limits, and allow for a limited amount of those species to be taken in existing fisheries as by-catch. This will provide real protections for this critical link in the ocean's food chain and help ensure enough is left in place for other dependent species such as salmon, steelhead and other sport fish while avoiding negative impacts on existing fisheries.

Thank you for your exemplary work to maintain a healthy and productive Pacific Ocean.

Sincerely,

Robert Rees

Bob Rees
Executive Director
Association of Northwest Steelheaders

*Anglers dedicated to enhancing and protecting fisheries and their habitats for today and the future.*

Audubon WASHINGTON

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

August 14, 2014

RE: Agenda Item H.1. Ecosystem -- Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

Audubon Washington and Audubon chapters across Washington would like to thank you for adopting the Fishery Ecosystem Plan in 2013, and your continued efforts to see the plan implemented. We were pleased with the Council's support of the Ecosystem Trophic Pathway – Option 2.2.1 at your April 2014 meeting in Vancouver, Washington. The decision to incorporate currently unmanaged forage fish as ecosystem component species within each of the Council's existing Fishery Management Plans recognizes the clear value that forage fish hold in the marine ecosystem.

During your upcoming September meeting in Spokane, Washington, Audubon encourages the Council to continue to move your efforts to conserve these prey species **by adopting amendatory language to designate unmanaged forage fish as ecosystem component species**. Further, we respectfully request that the Council **set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species**. In combination, these actions will ensure that existing fisheries minimize impacts to unmanaged forage fish and prevent unregulated directed fisheries for these forage species from developing.

Audubon recognizes the value of forage fish to seabirds and other marine life and is concerned about the degree to which overfishing of forage fish species has contributed to the decline of seabirds around the world. Not only do seabirds require substantial quantities of prey for survival and reproduction, they are extremely sensitive to changes in prey abundance[1]. As noted in the Ecosystem Working Group's March 2014 report, "Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species," under subsections 3.2.1 through 3.2.7 of the report **each and every unmanaged forage fish group serves as prey for seabirds[2].** For example, as the report indicates at 3.2.3, some of the most recognized seabirds here in the Northwest are known to subsist substantially on sand lance, including the Rhinoceros Auklet and the Marbled Murrelet[3].

Audubon Washington is working together with our Audubon counterparts in Oregon, California and Alaska to help facilitate the protection of marine birds and their forage fish food resources at the flyway-ecosystem scale. As such, Audubon Washington supports fisheries policies and management actions that recognize the value of forage fish in the California Current Ecosystem

[1] Cury, P. M. et al. (2011). Global Seabird Response to Forage Fish Depletion – One-Third for the Birds. Science 334 : 1703-1706
[2] Available at: http://www.pcouncil.org.
[3] Gutowsky, S. et al. (2009). Concurrent declines in nestling diet quality and reproductive success of a threatened seabird over 150 years. Endangered Species Research 9: 247-254.

5902 Lake Washington Blvd S. | Seattle, WA 98118 | (206)652-2444 | wa.audubon.org

(CCE). Audubon scientists from Alaska and California collaborated with scientists and local communities to identify and designate over 200 offshore marine Important Bird Areas (IBA) along the Pacific Flyway that provide benefits for over 150 species and 33 million seabirds between Barrow, Alaska and Baja California.[4] Additionally, Audubon Washington oversees a system of 75 IBAs across Washington including 10 coastal IBAs that have been designated to protect the foraging and nesting habitats that are vital to seabirds and other marine birds in this portion of the California Current Ecosystem.

Audubon chapters in Washington have worked on a wide range of coastal stewardship issues, from oil spill prevention and preparedness to education and engagement around marine birds. In addition, many of our chapter members volunteer in citizen science efforts designed to advance our understanding of marine bird population trends and the mechanisms driving their distribution patterns.

We believe that the protection of the complex food web within the California Current Ecosystem **requires taking a precautionary approach – such as you are poised to do at your September meeting in Spokane – and that managing our forage fish as an ecosystem component (EC) species for all FMPs is the right pathway to take**. Taking these proactive steps will serve to sustain not only forage fish but the millions of birds and other fish and wildlife that rely on them further up the food chain. Thank you for your consideration.

Sincerely,

Dr. Trina Bayard, Director of Bird Conservation
Audubon Washington

Rick Jahnke, President
Admiralty Audubon Society

Sam Merrill, Conservation Chair
Black Hills Audubon Society

Tom Gauron, President
Kittitas Audubon Society

Janine Schutt, President
Kitsap Audubon Society

Mary Porter-Solberg, Conservation Chair
Olympic Peninsula Audubon Society

Ron Force, President
Palouse Audubon Society

Kathleen Snyder, President
Pilchuck Audubon Society

Susan North, Conservation Manager
Seattle Audubon Society

Gretchen Starke, Conservation Chair
Vancouver Audubon Society

Randy Smith, President
Vashon-Maury Audubon Society

[4] Nur, N. et al. (2011). Where the wild things are: predicting hotspots of seabird aggregations in the California Current System. Ecological Applications, 21: 2241-2257.

Border Grill®

Aug. 15, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

Dear Chair Lowman and Council Members,

As the owners and chefs of Border Grill restaurants and Truck, we write to thank you for the steady progress you've made to enhance protection of the forage fish that underpin a healthy and sustainable marine ecosystem on the Pacific coast. We encourage you now to take the next step forward during your meeting in September by putting forth draft language that incorporates currently unmanaged forage fish as ecosystem component species in each of the four existing fishery management plans.

Our business depends on a balanced ecosystem, including an abundance and diversity of forage species necessary to sustain bigger predatory fish such as lingcod, halibut, and tuna while leaving enough in the water to support other marine life, including seabirds, whales, seals, and dolphins.

The council was wise to make the prohibition of fishing for unmanaged forage fish the top priority of the Fishery Ecosystem Plan approved unanimously in April of last year. We urge the council to preclude new directed fishing for unmanaged forage species until having a chance to assess the effect on the rest of the food web. In so doing, the Council will fulfill the ecosystem plan's first initiative and top priority: Protecting the structure and function of the California Current as one of the most vibrant and productive marine ecosystems on earth.

Thank you for considering our comments and for working to protect a healthy ocean for generations to come.

Sincerely,
Mary Sue Milliken
Chef-Owner

**445 South Figueroa Suite B1-15, los angeles, ca 90071 213-542-1100 www.bordergrill.com**

August 12, 2014

Pacific Fisheries Management Council

Dorothy M. Lowman, Chair

7700 N.E. Ambassador Place, Suite 101

Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem – Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

As a coastal business person, I want to thank you for the steady progress you've made toward establishing protections for currently unmanaged forage fish species, which are a vital part of the food web in the entire California Current Ecosystem. These small fish are a big deal for all of us on the Oregon coast. As prey, they provide nutrition for the seabirds, whales, seals and sea lions which people come to the coast to watch -- as well as the tuna, rockfish and salmon that they come to catch. The people who visit Oregon's coast for its natural beauty and bounty are our customers, so in a very real sense we rely on forage fish for our livelihood, as well.

That is why I'm urging the Council to **continue this good work at your upcoming September meeting in Spokane by adopting amendatory language to designate unmanaged forage fish as ecosystem component species. In addition, I'd like to encourage you to set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.** Taken together, these two measures will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop.

Your continued work to protect forage fish is important to me as a business owner whose clients flock to the coast to witness the natural wonder of Oregon's marine life. In CITY, my business is DESCRIPTION. The success of my business depends on assuring that our seabird colonies, whales and other marine mammals remain healthy and well-fed. As you know, each and every one of the forage fish species being considered by the Council serves as food for seabirds and marine mammals.

In my opinion, it makes smart business sense to take precautionary steps to assure that an asset that is fundamental to the health of our coast – and to our coastal tourism sector -- is adequately protected before proposals to harvest them push us into future conflicts and force us to be reactive rather than proactive.

For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

In a similar way, I believe that in September, **the Council can provide a clear path forward for protecting unmanaged forage fish by incorporating them into each of the fishery management plans as ecosystem component species**. Doing so will recognize the important linkages they provide within an interconnected system that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for me and other coastal business owners who rely on natural-resource-based tourism, **these little fish are a big deal.** I support the Council's efforts to advance a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses that depend on a having a healthy ocean.

Thank you for your consideration.

Respectfully submitted,

Rheychol Paris,

Healthy Kitchen, Yachats, Oregon

August 12, 2014

Pacific Fisheries Management Council

Dorothy M. Lowman, Chair

7700 N.E. Ambassador Place, Suite 101

Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem – Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

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For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

In a similar way, I believe that in September, **the Council can provide a clear path forward for protecting unmanaged forage fish by incorporating them into each of the fishery management plans as ecosystem component species**. Doing so will recognize the important linkages they provide within an interconnected system that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for me and other coastal business owners who rely on natural-resource-based tourism, **these little fish are a big deal.** I support the Council's efforts to advance a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses that depend on a having a healthy ocean.

Thank you for your consideration.

Respectfully submitted,

Peter Meieirs, LPC

Construction Rehab & Counseling

August 12, 2014

Pacific Fisheries Management Council

Dorothy M. Lowman, Chair

7700 N.E. Ambassador Place, Suite 101

Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem – Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

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That is why I'm urging the Council to **continue this good work at your upcoming September meeting in Spokane by adopting amendatory language to designate unmanaged forage fish as ecosystem component species. In addition, I'd like to encourage you to set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.** Taken together, these two measures will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop.

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In my opinion, it makes smart business sense to take precautionary steps to assure that an asset that is fundamental to the health of our coast – and to our coastal tourism sector -- is adequately protected before proposals to harvest them push us into future conflicts and force us to be reactive rather than proactive.

For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

In a similar way, I believe that in September, **the Council can provide a clear path forward for protecting unmanaged forage fish by incorporating them into each of the fishery management plans as ecosystem component species**. Doing so will recognize the important linkages they provide within an interconnected system that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for me and other coastal business owners who rely on natural-resource-based tourism, **these little fish are a big deal.** I support the Council's efforts to advance a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses that depend on a having a healthy ocean.

Thank you for your consideration.

Respectfully submitted,

Julie Callow,

See Vue, LLC

August 12, 2014

Pacific Fisheries Management Council

Dorothy M. Lowman, Chair

7700 N.E. Ambassador Place, Suite 101

Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem – Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

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As a coastal business person, I want to thank you for the steady progress you've made toward establishing protections for currently unmanaged forage fish species, which are a vital part of the food web in the entire California Current Ecosystem. These small fish are a big deal for all of us on the Oregon coast. As prey, they provide nutrition for the seabirds, whales, seals and sea lions which people come to the coast to watch -- as well as the tuna, rockfish and salmon that they come to catch. The people who visit Oregon's coast for its natural beauty and bounty are our customers, so in a very real sense we rely on forage fish for our livelihood, as well.

That is why I'm urging the Council to **continue this good work at your upcoming September meeting in Spokane by adopting amendatory language to designate unmanaged forage fish as ecosystem component species. In addition, I'd like to encourage you to set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.** Taken together, these two measures will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop.

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For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

In a similar way, I believe that in September, **the Council can provide a clear path forward for protecting unmanaged forage fish by incorporating them into each of the fishery management plans as ecosystem component species**. Doing so will recognize the important linkages they provide within an interconnected system that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for me and other coastal business owners who rely on natural-resource-based tourism, **these little fish are a big deal.** I support the Council's efforts to advance a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses that depend on a having a healthy ocean.

Thank you for your consideration.

Respectfully submitted,

Christine DeMoll,

Ocean Haven, Corporation

***Submitted via email***

August 14, 2014

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

This letter is submitted on behalf of the Center for Biological Diversity. We understand the importance of and advocate for maintaining a diversity of fish and marine life in order to support a healthy ecosystem. Forage fish conservation is important because these fish provide the base of a healthy ocean food web. Without it, we will see devastating effects on our wildlife in the northeastern Pacific Ocean.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species. We applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today we urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species and limit the opening of future fisheries on these species.

The Council should prohibit new directed fisheries and set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries. This action ensures that existing fisheries are not negatively impacted while also ensuring that directed fisheries for these forage species do not develop.

During the meeting in September, we encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem and coastal economies.

Thank you for your consideration of these comments.


351 California St., Ste. 600 . San Francisco, CA 94104 tel: (415) 436.9682 fax: (415) 436.9683 www.BiologicalDiversity.org

Sincerely,

Catherine W. Kilduff, M.S., J.D.
ckilduff@biologicaldiversity.org
415-644-8580

Flying Fish Company- Portland
2310 SE Hawthorne Blvd
Portland, OR 97214
503-260-6552
oregonfreshfish@gmail.com

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and I applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, I ask that the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species.

During the meeting in September, I encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,

Lyf Gildersleeve
Owner/ Operator
Flying Fish Company

OREGON WILD
Formerly Oregon Natural Resources Council (ONRC)
PO Box 11648 | Eugene OR 97440 | 541-344-0675 | fax 541-343-0996
dh@oregonwild.org | http://www.oregonwild.org/

12 August 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384
VIA: pfmc.comments@noaa.gov

Subject: Agenda Item H.1. Ecosystem -- Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

Please accept the following comments from Oregon Wild concerning the further refinement of the Council's policy regarding unmanaged forage fish. Oregon Wild represents over 10,000 members and supporters who share our mission to protect and restore Oregon's wildlands, wildlife, and water as an enduring legacy.

Oregon Wild would like to thank you for adopting the Fishery Ecosystem Plan in Spring of 2013. We appreciate the work you and your staff have accomplished in beginning to implement the plan by focusing on protecting unmanaged forage fish as your first ecosystem-based initiative.

Oregon Wild previously sent a letter, dated March 28, 2014, prior to the Council's meeting in Vancouver, Washington in April 2014. We are pleased with the Council's support of Option 2.2.1, the Ecosystem Trophic Pathway. That option incorporates unmanaged forage fish into existing fishery management plans and allows basic conservation measures to be put into place. Forage fish have ecological and economical importance, and Option 2.2.1 manages them in a way that is sensible for their conservation. Forage fish are part of an interconnected system, and a strategy for their management should recognize their role in this system.

Please take the next step in Spokane this September. During your upcoming meeting, Oregon Wild encourages the Council to adopt mandatory language to designate unmanaged forage fish as ecosystem component species to continue forward in your efforts to conserve these prey species. Also, we respectfully request that the Council set

a limit on the amount of unmanaged forage fish species that may be taken in existing fisheries for groundfish and other species. These actions will help to ensure that unregulated directed fisheries for forage species do not develop.

It is imperative to put management measures in place for unmanaged forage fish species in place sooner rather than later. Global demand on the oceans is increasing daily and it is important to protect the ocean ecosystem from the harmful impacts of an unregulated industrial fishery. In their constant quest for cheap fish meal, the rapidly growing global aquaculture industry may expand industrial scale fishing to forage species not currently fished on the West Coast.[1]

Protections for forage fish species are important to ensure they are not exploited by fishing operations. Direct catch of forage fish makes up more than one-third of the world's marine fish catch and has contributed to the collapse of some forage fish populations. Ninety percent of forage fish catch is processed into feed for fish farms, poultry, and livestock, or as nutritional supplements for people. Forage fish species are also critical to healthy commercial fish populations such as salmon and tuna. They should be managed conservatively because forage fish populations are dynamic and have a tendency to react in unexpected ways to fishing pressures.[2]

Forage fish species have a critical role in the food webs of coastal and marine ecosystems. They form an essential link between phytoplankton, zooplankton, and top predators (large fish, marine mammals, and birds). For marine mammals and other species that rely on forage fish, lack of adequate forage can have serious consequences. Seabirds need oil-rich forage to sustain them for migrations and breeding.[3] Marbled Murrelets and Common Murres rely on forage fish species to feed chicks during the breeding season. Collectively, Common Murres devour more than 200,000 tons of forage each year.[4] As an essential component of an interconnected ecosystem, a decline in forage fish species would likely result in a decline of the multitude of species that rely on them for food.

Development of an adequate management strategy for forage fish species requires a precautionary approach that is based on science and incorporates knowledge of the critical role these species occupy within the larger ecosystem. The Council has an opportunity to take such an approach at your September meeting in Spokane. We urge you to move forward with protections for unmanaged forage fish by incorporating them into existing Fishery Management Plans as ecosystem component species. Adopting language to designate unmanaged forage fish species as ecosystem component species

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[1] http://www.oceanconservationscience.org/foragefish/press/Little%20Fish%20Big%20Impact%20Summary.pdf

[2] http://www.oceanconservationscience.org/foragefish/press/Little%20Fish%20Big%20Impact%20Summary.pdf

[3] http://www.pewtrusts.org/en/imported-old/other-resources/2012/03/26/little-fish-big-deal-see-what-we-mean-by-forage-fish

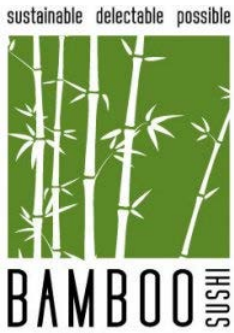
[4] http://www.pewtrusts.org/en/imported-old/other-resources/2012/03/26/little-fish-big-deal-see-what-we-mean-by-forage-fish

and allowing for a limited amount to be taken in existing fisheries would be a proactive step towards sustaining healthy populations of these species. Protections for an essential link in the ecosystem will benefit forage fish species and many others including marine mammals, seabirds, and large fish.

Thank you for your consideration.

Sincerely,

Doug Heiken




PO Box 3347, Portland OR 97208

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

Bamboo Sushi is the first certified sustainable sushi restaurant in the world. Daily, we are dedicated to bringing our customers the freshest fish, meats, and produce with the greatest consciousness to marine stewardship, sustainability, and the environment. Forage fish conservation is important to us, as many fish depend on these valuable species as their main diet, especially when spending time in the ocean before returning to their native rivers and springs.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and we applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, we urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species.

During the meeting in September, we encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,

Kristofor Lofgren
Owner
Portland, Oregon

Port Orford Ocean Resource Team
PO Box 679
444 Jackson St
Port Orford, OR97465
P: 541.332.0627
F: 541.332.1170
info@oceanresourceteam.org
oceanresourceteam.org

August 7, 2014

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

We are encouraged by Council progress over the past two years to build a program to protect forage fish species. Forage fish is a critical component of the ocean ecosystem and critical to the health of many fisheries.

We understand the importance of applying ecosystem principles to fishery management decisions and support your work.

Please continue to move forward at your September Council meeting to adopt language to protect forage fish.

Many thanks for your work on this issue.

Sincerely,

Leesa Cobb

Leesa Cobb, Executive Director


RE: Unmanaged Forage Fish Initiative

August 14, 2014

Dear Chair Lowman and Council Members,

Mother's has grown over the years from a small 90-seat restaurant to a Portland institution. Chosen Restaurant of the Year by Portland's *Willamette Week,* Best Comfort Food, Best Brunch, and Best Lunch Spot by *Citysearch* and *Portland Monthly,* and one of America's Top Restaurant Bargains by *Food and Wine Magazine*, Mother's Bistro & Bar is a destination spot for anyone who comes to downtown Portland. The menu features food with global influenced but sourced on the bounty of the northwest; fish & shellfish, small game, and produce with seasonality. We aim to be a sustainable business that is socially, ethically and environmentally responsible. In serving local, sustainable seafood, I see how much of our economies and environment depend on a strong and healthy ocean. Forage fish conservation is important to us, as our much of the local seafood we serve depend on these valuable species as their main diet.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and we applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, we urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species.

During the meeting in September, we encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem and businesses, like mine, that depend on such.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,

Lisa Schroeder
Chef/Owner
Portland, OR


August 15, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

I write to you on behalf of Hayes Street Grill, a fish restaurant in San Francisco's Civic Center district. First thing in the morning, the grill chef calls the fish man down at Monterey Fish to find out what looks good that day, and we base our daily menu on that. Above every other consideration, we want the freshness and pristine quality of the fish that we serve our customers, to speak for themselves. After 34 years in business, we understand the importance of sustainable fishing advocacy.

This September, I look forward to the Council taking positive, responsible action that gives us the security of knowing we are doing right by our beleaguered ocean. Forage fish are a crucial part of the marine food web, and we must take care to leave enough in the water for other predator species like tuna, salmon, whales, and seabirds. I encourage the Council to follow through with their goal to fulfill the first initiative of the Fishery Ecosystem Plan. Unmanaged forage fish should be incorporated into existing fishery management plans as ecosystem component species.

Thank you for the opportunity to offer my thoughts on this matter and to participate in this public decision-making process.

Respectfully submitted,

Patricia Unterman
Hayes Street Grill, Founder and Co-Owner
Ferry Plaza Farmer's Market, Founding Board Member

August 12, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem – Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

As a coastal business person, I want to thank you for the steady progress you've made toward establishing protections for currently unmanaged forage fish species, which are a vital part of the food web in the entire California Current Ecosystem. These small fish are a big deal for all of us on the Oregon coast. As prey, they provide nutrition for the seabirds, whales, seals and sea lions which people come to the coast to watch -- as well as the tuna, rockfish and salmon that they come to catch. The people who visit Oregon's coast for its natural beauty and bounty are our customers, so in a very real sense we rely on forage fish for our livelihood, as well.

That is why I'm urging the Council to **continue this good work at your upcoming September meeting in Spokane by adopting amendatory language to designate unmanaged forage fish as ecosystem component species. In addition, I'd like to encourage you to set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.** Taken together, these two measures will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop.

Your continued work to protect forage fish is important to me as a business owner whose clients flock to the coast to witness the natural wonder of Oregon's marine life. My business is based in Portland and extends to projects on the coast. ariety of shore and pelagic birds. In my eco-counseling practice I utilize the observation of the diverse marine habitat and a meditative reflection for folks to draw on the beauty of the natural world. My business depends on assuring that our seabird colonies, whales and other marine mammals remain healthy and well-fed so the tourist continue to travel here and local residents thrive. As you know, each and every one of the forage fish species being considered by the Council serves as food for seabirds and marine mammals.

In my opinion, it makes smart business sense to take precautionary steps to assure that an asset that is fundamental to the health of our coast – and to our coastal tourism sector -- is adequately protected before proposals to harvest them push us into future conflicts and force us to be reactive rather than proactive.

For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

In a similar way, I believe that in September, **the Council can provide a clear path forward for protecting unmanaged forage fish by incorporating them into each of the fishery management plans as ecosystem component species**. Doing so will recognize the important linkages they provide within an interconnected system that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for me and other coastal business owners who rely on natural-resource-based tourism, **these little fish <u>are</u> a big deal.** I support the Council's efforts to advance a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses that depend on a having a healthy ocean.

Thank you for your consideration.

Respectfully submitted,

Renee LaChance
Sustainable Adaptations

Pacific Fisheries Management Council August 15, 2014
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem -- Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

**Thank you** –

The Audubon Society of Portland and Audubon chapters across Oregon would like to thank you for adopting the Fishery Ecosystem Plan in the spring of 2013. We appreciate the deliberative work you and your staff have accomplished since that time to begin implementing the plan by focusing on protection of unmanaged forage fish as your first ecosystem-based initiative.

We were pleased with the Council's support of the Ecosystem Trophic Pathway – Option 2.2.1 – at your April 2014 meeting in Vancouver, Washington. We believe incorporating currently unmanaged forage fish as ecosystem component species within each of the Council's existing Fishery Management Plans makes good conservation sense. Doing so clearly recognizes that forage fish provide important linkages within an interconnected ecosystem that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to our Audubon members.

**Please take the next step in Spokane –**

During your upcoming September meeting in Spokane, **Audubon would encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species to continue to move your efforts to conserve these prey species. Further, we respectfully request that the Council set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species**. In combination, these actions will ensure that existing fisheries minimize impacts to unmanaged forage fish and unregulated directed fisheries for these forage species do not develop.

**About Audubon and our coastal work –**

For years Audubon has been investing in a range of efforts to improve conditions for birds and their habitats. Seabird populations, in particular, are of critical conservation concern with more than half of the world's seabird species currently in decline.[1] Audubon has been working with scientists and local communities to identify and designate over 200 offshore marine Important Bird Areas (IBA) along the Pacific Flyway that provide benefits for over 150 species and 33 million seabirds between Barrow, Alaska and Baja California.[2] Additionally, the Audubon Society of Portland oversees a system of 97 IBAs across Oregon including 36 coastal IBAs that

[1] Croxall, J. P., et al. (2012). Bird Conservation International 22: 1–34.
[2] Nur, N. et al. (2011). Where the wild things are: predicting hotspots of seabird aggregations in the California Current System. Ecological Applications, 21: 2241-2257.

have been designated to protect the foraging and nesting habitats that are vital to seabirds in this portion of the California Current Ecosystem (CCE).

Audubon chapters in Oregon have helped establish a system of marine reserves and marine protected areas along the West Coast. Coupled with our Audubon Sanctuaries – including at Ten Mile Creek near Yachats, Oregon -- we're protecting the land-sea connection that is critical for seabirds, including the imperiled Marbled Murrelet that relies on forage fish including the Pacific sand lance, squid and osmerid smelt, which are specifically under consideration here. In fact, Pacific sand lance are a key food source for Marbled Murrelets during the breeding season[3] when they're feeding hungry chicks.

Audubon recognizes the value of forage fish to seabirds and other marine life at the top of the food chain and that overfishing of forage fish species has been a major contributor to documented declines of seabirds around the world. Not only do seabirds require substantial quantities of prey for survival and reproduction, they are extremely sensitive to changes in prey abundance[4]. As noted in the Ecosystem Working Group's March 2014 report, "Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species," under subsections 3.2.1 through 3.2.7 of the report each and every unmanaged forage fish group serves as prey for seabirds. For example, as the report indicates at 3.2.3, some of the most recognized seabirds here in the Northwest are known to subsist largely on sand lance, including the Rhinoceros Auklet, Tufted Puffin and Pigeon Guillemot.

This is why we believe it is important for Audubon to engage in the fisheries management work of the Council and why **we urge you to take action in September by moving forward with protections for currently unmanaged forage fish by incorporating them into each FMP as ecosystem component species and by setting limits on the amount of unmanaged forage fish that may be taken in existing fisheries.**

Within the CCE there are complex relationships that vary from season to season and year to year, based on climate and ocean conditions. For example, the complex relationship between predator and prey and the surrounding marine environment is well documented in the long-term seabird monitoring that has occurred at Yaquina Head on the central Oregon coast.[5] This area is home to some of Oregon's largest and most visible seabird colonies, including over 60,000 Common Murres. Scientists working on this effort have found that herring, smelt and sand lance make up a significant part of the seabird's diet, but that the relative importance each fish species plays in the seabird's diet varies from year to year depending on ocean conditions and other influences.

We believe to adequately plan for the protection of the complex food web within the California Current Ecosystem (CCE) **requires taking a precautionary approach – such as you are poised to do at your September meeting in Spokane – and that managing our forage fish as an ecosystem component (EC) species for all FMPs is the right pathway to take**.

[3] Nelson, S. K. 1997. Marbled Murrelet (Brachyramphus marmoratus), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/276. doi:10.2173/bna.276

[4] Cury, P. M. et al. (2011). Global Seabird Response to Forage Fish Depletion – One-Third for the Birds. Science 334 : 1703-1706

[5] Suryan, R., et al. (2013). Yaquina Head seabird colony monitoring 2013 season summary. Unpublished Report. Oregon State University, Hatfield Marine Science Center, Newport, OR, 10pp.

**In closing –**

In summary, to Audubon, these little fish ARE a big deal **–** especially for the health of our seabird populations along the Pacific Flyway. In September, the Council has an opportunity to advance a precautionary approach to management **by adopting amendatory language to designate unmanaged forage fish as ecosystem component species and allowing for a limited amount of these species to be taken in existing fisheries**. Taking these proactive steps will serve to sustain not only forage fish but the millions of seabirds that rely on them further up the food chain. Thank you for your consideration.

Sincerely,

| | |
|---|---|
| Audubon Society of Portland | Joe Liebezeit & Paul Engelmeyer, Ocean Conservation Program |
| Audubon Society of Corvallis | Dave Mellinger & Jim Fairchild, Conservation Director & President |
| Audubon Society of Lincoln City | Jack Doyle, President |
| Cape Arago Audubon Society | Barbara Taylor, President |
| East Cascades Audubon Society | Ken Hashagen, President |
| Kalmiopsis Audubon Society | Ann Vileisis, President |
| Klamath Basin Audubon Society | Molly Russell, President |
| Lane County Audubon Society | Maeve Sowles, President |
| Salem Audubon Society | Michael Babbitt, President |
| Umpqua Valley Audubon Society | Diana Wales, President |

August 12, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem – Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

As a coastal business person, I want to thank you for the steady progress you've made toward establishing protections for currently unmanaged forage fish species, which are a vital part of the food web in the entire California Current Ecosystem. These small fish are a big deal for all of us on the Oregon coast. As prey, they provide nutrition for the seabirds, whales, seals and sea lions which people come to the coast to watch -- as well as the tuna, rockfish and salmon that they come to catch. The people who visit Oregon's coast for its natural beauty and bounty are our customers, so in a very real sense we rely on forage fish for our livelihood, as well.

That is why I'm urging the Council to **continue this good work at your upcoming September meeting in Spokane by adopting amendatory language to designate unmanaged forage fish as ecosystem component species. In addition, I'd like to encourage you to set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.** Taken together, these two measures will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop.

Your continued work to protect forage fish is important to me as a business owner whose clients flock to the coast to witness the natural wonder of Oregon's marine life. In Yachats, my business of native florist service is primarily for nature loving tourist who travel here to enjoy the natural habitats of pelagic and shore birds as well as all marine life. The success of my business depends on assuring that our seabird colonies, whales and other marine mammals remain healthy and well-fed so the tourist continue to travel here. As you know, each and every one of the forage fish species being considered by the Council serves as food for seabirds and marine mammals.

In my opinion, it makes smart business sense to take precautionary steps to assure that an asset that is fundamental to the health of our coast – and to our coastal tourism sector -- is adequately protected before proposals to harvest them push us into future conflicts and force us to be reactive rather than proactive.

For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

In a similar way, I believe that in September, **the Council can provide a clear path forward for protecting unmanaged forage fish by incorporating them into each of the fishery management plans as ecosystem component species**. Doing so will recognize the important linkages they provide within an interconnected system that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for me and other coastal business owners who rely on natural-resource-based tourism, **these little fish <u>are</u> a big deal.** I support the Council's efforts to advance a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses that depend on a having a healthy ocean.

Thank you for your consideration.

Respectfully submitted,

Catherine Lucido
Forks Farms, Yachats

August 12, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
1100 NE Ambassador Place, #101
Portland, OR 97220

**RE: Agenda Item H.1 (Unmanaged Forage Fish Initiative)**

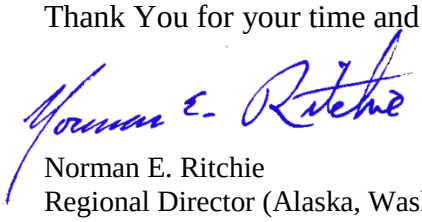
Dear Chair Lowman and Council Members:

Thank you for the opportunity to comment on the important role of forage fish in Ecosystem Based Management of our Pacific waters.

The National Wildlife Federation passed a resolution at its 2014 annual meeting in Baltimore, Maryland that was written and approved by its state affiliates, representing over two million members supporting ecosystem based management of forage fish. ( The full resolution can be seen at http://www.nwfaffiliates.org/ht/redisplay/1/printerfriendly/1 ) I originally drafted this resolution as a member of NWF's Oregon affiliate, but it was embraced and completed by other state affiliates from Hawaii to Florida.

Now as a newly elected member of the NWF board of directors, I applaud the actions taken by the Pacific Fishery Management Council up to this point toward this objective. We look forward to the Council's continued progress and voice support for prohibiting new forage fisheries until the Council can evaluate how removing prey would affect existing fisheries and fishing communities by incorporating forage fish into each of its fishery management plans as ecosystem component species with management measures that protect their critical role in the ecosystem.

Thank You for your time and consideration,



Norman E. Ritchie
Regional Director (Alaska, Washington, Oregon)
National Wildlife Federation

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August 14, 2014

Ms. Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1 –Forage Fish Protection**

Dear Chair Lowman and Council Members:

Oceana is writing in continued support of the Pacific Fishery Management Council's Ecosystem Initiative 1 to protect currently unfished and unmanaged forage fish species. We appreciate that the Council is moving forward with precautionary actions to protect forage species, building off its action in 2006 to protect krill throughout the U.S. West Coast EEZ. Precautionary actions that protect the health of the California Current food web epitomize smart, forward thinking ecosystem-based approaches to conservation and management. We look forward to the opportunity to review the draft fishery management plan amendatory language and analyses being prepared by the Ecosystem Workgroup, and we are confident that at this meeting the Council will continue to make progress toward its defined objective, and schedule final action at either the November 2014 or March 2015 meetings.

In June 2012, the Council declared that for currently unexploited forage fish, the "objective is to prohibit the development of new directed fisheries on forage species that are not currently managed by our Council, or the States, until we have an adequate opportunity to assess the science relating to the fishery and any potential impacts to our existing fisheries and communities."[1] Subsequently, in April 2013, the Council adopted its first ever Fishery Ecosystem Plan for the California Current Large Marine Ecosystem, launched "Ecosystem Initiative 1", and in September 2013 the Council adopted a specific list of unmanaged forage species being considered for protection under this action. In April 2014 the Council unanimously adopted a revised purpose and need statement as well as a Preliminary Preferred Alternative to protect forage species as part of the defined "Ecosystem Trophic Role" pathway.[2]

The Ecosystem Trophic Role pathway would place the seven currently unmanaged forage species/ groups – round and thread herring, mesopelagic fishes, Pacific sand lance, Pacific saury, Silversides, Osmerid smelts, and pelagic squids (other than Humboldt squid) – in each of the Council's four Fishery Management Plans as "ecosystem component" species. It is our expectation that the draft fishery management plan amendment language and analyses to be presented by the Ecosystem Workgroup will clearly articulate – consistent with the Council's objective, purpose and need statement, and Preliminary Preferred Alternative – that management measures associated with this ecosystem component designation will prohibit new directed fishing in federal waters on these species.

[1] PFMC. 2012. Agenda G.1.d. Supplemental REVISED Final Council Action. June 2012
[2] PFMC. 2014. April 2014 Council Meeting Decision Summary Document.

According to National Standard One guidelines, ecosystem component species can be designated for multiple purposes, including "as consideration in the development of conservation and management measures for the associated fishery; and/or to address other ecosystem issues."[3] What is more, while ecosystem component species are "not in the fishery", a Council can and should develop conservation measures "to protect their associated role in the ecosystem."[4] The Council's preliminary preferred alternative would protect these forage species with management measures, as ecosystem component species, recognizing their important role as prey for managed species and their important role as prey for other California Current Ecosystem marine life such as whales, dolphins, seals and seabirds.[5] We believe this to be the most direct and comprehensive approach.

The Council's Preliminary Preferred Alternative would allow for "*de minimis"* amounts of these species to be taken as bycatch, as allowed for with krill, and the Council requested additional guidance on defining minimal bycatch for this September meeting. As in the 2009 final rule implementing the prohibition on the directed harvest of krill, NMFS stated, it "recognizes that *de minimis* or trace amounts of krill may be retained by fishermen while targeting other species; such inadvertent action is not intended to be the subject of this prohibition."[6] Another option would be to analyze the historic levels of bycatch of these forage species groups in each of the managed directed fisheries, and implement a retention cap, or maximum retainable bycatch allowance[7] of no more than the historical average catch for each fishing trip. The intent of this, of course, is to prohibit any directed fishing for these species, prevent any unauthorized speculative fishing, or topping off on these forage species.[8] The effectiveness of any maximum bycatch allowance in preventing directed fishing on these forage species should then be reviewed over time.

Thank you for advancing the conservation of forage species and ecosystem-based fishery management.

Sincerely,

Ben Enticknap
Pacific Campaign Manager and Senior Scientist

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[3] 74 Fed. Reg. 3178, 3205 (January 16, 2009)
[4] *Id.*
[5] PFMC. Agenda Item I.1.a. April 2014. Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species of the U.S. Portion of the California Current Large Marine Ecosystem. Available at http://www.pcouncil.org/wp-content/uploads/I1a_ATT1_Eco_Initiative1_forage_APR2014BB.pdf
[6] 74 Fed Reg. 33372, 33373 (July 13, 2009).
[7] NMFS set a two percent maximum retainable bycatch allowance for forage fish in the North Pacific groundfish fisheries, meaning that vessels fishing for groundfish may retain no more than two percent of the round weight of groundfish species retained on board the vessel during a fishing trip (63 Fed Reg., 13009 (March 17, 1998).
[8] Ackley, R. Heifetz, J. 2001. Fishing practices under maximum retainable bycatch rates in Alaska's groundfish fisheries. Alaska Fishery Research Bulletin Vol 8(1). Available at: http://www.adfg.alaska.gov/static/home/library/PDFs/afrb/acklv8n1_p1.pdf


Oregon
Council

August 11, 2014

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and I applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, I ask that the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species.

During the meeting in September, I encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,

*Terry*

Terry Turner
Trout Unlimited
Oregon Council Chair

THE PEW CHARITABLE TRUSTS

111 SW Columbia St, Suite 200
Portland, OR 97201

August 15, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
1100 NE Ambassador Place, #101
Portland, OR 97220

**RE: Agenda Item H.1 (Unmanaged Forage Fish Protection Initiative PPA)**

Dear Chair Lowman and Council Members:

We write to express our support for the Pacific Fishery Management Council's (Council) ongoing efforts to protect unfished and unmanaged forage fish species through the Fishery Ecosystem Plan's (FEP) Ecosystem Initiative 1 (EI-1).[1] We appreciate the Council's proactive work on this issue over the past several years, including the considerable progress made at the April 2014 meeting.[2] We look forward to the next iteration of the EI-1 document, including the expanded analyses required under the National Environmental Policy Act (NEPA). And we are hopeful that the Council can establish regulations by early next year to prevent the development of new directed fisheries on forage fish species absent a robust science and management framework.

To that end we request the Council continue to move ahead with implementation of EI-1, and offer our specific recommendations for actions this September and beyond, summarized as follows:

- Re-affirm the Council's April 2014 Preliminary Preferred Alternative (PPA) to incorporate select forage fish species, as identified in April, into all four of the Council's existing Fishery Management Plans (FMP's) as Ecosystem Component Species (ECS), with management measures to preclude new directed fishing until scientific information has been assessed and impacts to existing fisheries, fishing communities and the ecosystem have been fully considered.
- Review and approve draft FMP amendatory language for the new management measures, to be released for a public comment period prior to final Council action.
- Identify a new PPA describing the treatment of existing *de minimis* directed, bycatch, and incidental fisheries for the subject species, with the following parameters:
    - New long-term directed fishing for these species will be prohibited absent the robust impacts analysis envisioned under this Initiative, and passage of an FMP amendment to authorize any new fishery
    - Existing artisanal fisheries, including directed, will not be negatively impacted, consistent with the Council's April 2014 directive that regulations created through EI-1 will not supersede tribal or state fishery management for these species, and coordination would still occur through the existing Council process

[1] See PFMC report entitled *Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species of the U.S. Portion of the California Current Large Marine Ecosystem*, April 2014
[2] See Pacific Fishery Management Council, Decision Summary Document for April 5-10, 2014, page 4

    - Minimal bycatch of the subject species will be permitted in Council-managed fisheries, as will minimal incidental catch (retention and landing), with incidental retention subject to an incidental retention allowance
- Develop and include a process for periodic review of the list of species classified as ECS and afforded protection under this initiative in future 5-year reviews of the Fishery Ecosystem Plan.
- Adopt a process and schedule for further development of the FMP amendments, including:
    - Utilization of an omnibus approach to the development of the action, including required National Environmental Policy Act (NEPA) documents and Federal rulemaking
    - In the event that the FMP amendatory language requires an additional Council review prior to being released for public comment, schedule EI-1 for action in November 2014 in order to stay on track for completion in March 2015
    - Schedule EI-1 for final Council action (selection of final preferred alternative and adoption of FMP amendatory language) at the March 2015 Council meeting

**Re-affirm the Council's April 2014 Preliminary Preferred Alternative (PPA)**

In April 2014, the Council made a suite of important decisions that moved EI-1 forward significantly. Specifically, the Council adopted a revised Purpose and Need statement, included three additional families of squid in the proposed action, and identified a Preliminary Preferred Alternative (PPA) that would incorporate the subject species into all four of the Council's FMP's as Ecosystem Component Species (ECS) with a prohibition on new directed fishing in the U.S. West Coast Exclusive Economic Zone (EEZ).[3] We again commend the Council for these constructive and proactive actions, which we supported, as did nearly all of the Council's Advisory Bodies and a wide array of public stakeholders.[4]

As the Council now prepares to make further progress on EI-1 at the September meeting,[5] we suggest it may be helpful to the public if the Council explicitly clarifies that any new PPA is meant to be additive to the April 2014 PPA, and not a replacement. This could be efficiently accomplished by simply re-affirming the Council's previous identification of the Ecosystem Trophic Role Pathway as a PPA, with utilization of the ECS category to incorporate the subject species into all of the FMP's for the purposes of prohibiting new directed EEZ fishing.

**Review and approve draft FMP amendatory language for the new management measures**

At the April 2014 meeting, the Council also requested that the Ecosystem Workgroup (EWG) prepare draft FMP amendatory language to incorporate the subject species into the FMP's and to describe the associated management measures. This amendatory language, once approved in draft form by the Council, will be released, along with a more detailed NEPA analysis of the

[3] See Pacific Fishery Management Council, Decision Summary Document for April 5-10, 2014, page 4
[4] See Pacific Fishery Management Council, April 2014 Briefing Book for Agenda Item I.1.
[5] See PFMC, September 2014 meeting notice and agenda, page 1

impacts of the proposed action, for public comment prior to final Council action next year.[6] The detailed FMP amendatory language is a critical part of EI-1 and warrants a close look by all the Council's Advisory Bodies and public stakeholders. The language should be carefully designed to ensure that the Council's objective is met: prohibiting new directed fisheries until adequate assessments of the science and impacts have been made, by requiring an FMP amendment and analysis for authorization of any new, long-term directed fishery.[7] At the same time, care should be given to addressing stakeholder concerns about existing catch (e.g., in state waters, traditional/artisanal directed, bycatch, incidental catch).

In April there was broad agreement in the Advisory Body reports and public comment on the importance of this action, the preferred pathway (incorporation as ECS into all of the Council's FMP's), and the basic management measures (prohibition on new directed fishing and avoiding negative impacts on existing fisheries).[8] Many Council stakeholders also expressed a desire to finish EI-1 as quickly as possible. In this context, completion of EI-1 in March 2015 as outlined under the current, proposed schedule is both possible and ideal. Therefore, if concerns arise over the amendatory language that will require additional Council review, we recommend the Council outline and request those changes for Council review at the November 2014 meeting, such that EI-1 can still be completed in March 2015.

**Identify a new PPA describing the treatment of existing *de minimis* directed, bycatch, and incidental fisheries for the subject species**

In April 2014, the Council also requested that the EWG prepare a report on ways to define and preserve existing levels of *de minimis* catch of the subject species. The Council also passed a revised Purpose and Need Statement for EI-1 designed to better address concerns over unintended negative impacts on existing state waters fisheries, including traditional directed fisheries managed by the states and treaty tribes. There are a variety of management tools that can effectively address these issues, and it is likely that the EWG will present several alternatives to the Council. We suggest that the Council identify a new or additional PPA in September outlining its preliminary preference for addressing existing catch and other issues. As previously mentioned, we also suggest that the Council clarify that any PPA identified in September is inclusive of the previous PPA from April. Specifically, the Council should reiterate its previous decisions regarding the pathway, species list, use of the ECS category, and the management measures to prohibit new directed fishing absent prior review.

We suggest that the alternatives considered in September, and the PPA selected by the Council, should be constructed to ensure the following:

[6] Ibid. Also see PFMC report entitled *Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species of the U.S. Portion of the California Current Large Marine Ecosystem*, April 2014, page 37

[7] See PFMC report entitled *Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species of the U.S. Portion of the California Current Large Marine Ecosystem*, April 2014, Section 1.2 (Purpose and Need), pages 4-5

[8] See Pacific Fishery Management Council, April 2014 Briefing Book for Agenda Item I.1.

- New long-term directed fishing for these species will be prohibited absent the robust impacts analysis envisioned under this Initiative, and passage of an FMP amendment to authorize any new fishery.

  This is the main intent of EI-1, and is thus important to keep in mind as alternatives are crafted. As the two following bulleted concerns are addressed, and existing catch is considered and protected, the Council should also take care to ensure that new directed fishing cannot develop absent the robust review envisioned under this Ecosystem Initiative. New long-term directed fishing must require passage of an FMP amendment to authorize the fishery and move the new target species from the ECS into the Fishery Management Unit (FMU). Also, a clear and precautionary process to govern the development of any new fishery, including the experimental fishing that should precede any long-term authorization, should be developed. This has been a shared priority of diverse stakeholders, including the conservation community and the fishing industry.

- Existing artisanal fisheries, including directed, will not be negatively impacted, consistent with the Council's April 2014 directive that regulations created through EI-1 will not supersede tribal or state fishery management for these species, and coordination would still occur through the existing Council process

  EI-1 is intended to prevent the development of new directed fisheries on unfished and unmanaged forage species, not close or curtail existing fisheries. Similarly, EI-1 is meant to prevent the development of new directed fisheries in the EEZ, not state waters. The revisions to the Purpose and Need Statement adopted in April 2014 were designed with this concern in mind. As such, we are supportive of identifying a PPA that clearly preserves the management authority of the Council's state and tribal partners, and any traditional fisheries that involve the subject species.

- Minimal bycatch of the subject species will be permitted in Council-managed fisheries, as will minimal incidental catch (retention and landing), with incidental retention subject to an incidental retention allowance

  We suggest that the best way to protect existing fisheries, yet prevent any unauthorized targeting of currently unfished and unmanaged forage fish species or any unauthorized evolution into a directed fishery, is through the use of limits on the amount of the subject species that may be retained. This approach will effectively address any concerns over unintentional bycatch of the subject species closing or curtailing other existing fisheries, since minimal and limited bycatch will be allowed. At the same time, this catch will be monitored to provide the Council with additional information and improve its decision-making. It will also ensure that *de minimis* catch of the subject species can occur without a requirement for laborious sorting, which a prohibition on retention might inadvertently trigger.

  This approach has been successfully used in the Alaska Groundfish fisheries by the North Pacific Fishery Management Council (NPFMC), which prohibited directed fishing on a

suite of forage species in 1998, and updated those management measures in 2010 to comply with the 2007 reauthorization of the Magnuson Stevens Act (MSA) through Amendments 96 and 87 to the Bering Sea/Aleutian Islands Groundfish FMP and the Gulf of Alaska Groundfish FMP, respectively.[9] The management measures in place for the subject forage fish species in these FMP's include placement in the ECS category, a prohibition on directed fishing, and a maximum retainable amount (MRA) of the ECS forage species set at 2 percent of the other retained species on a given trip.[10] Amendments 96 and 87 further explain that the MRA of 2 percent "was chosen to accommodate existing levels of catch that were believed to be sustainable because they were occurring at the time the category was created" and that "The category was created as a precautionary action to prevent an increase in forage fish removals, not to reduce existing levels of catch."[11] In light of these successful and sensible parameters, which are well aligned with the objectives of the Council and responsive to the concerns of all Council stakeholders, we suggest that a similar approach be used for EI-1. Specifically, an analysis of long-term, historic, existing catch of the subject species by vessels in all the existing West Coast EEZ fisheries should be conducted and an MRA set at a level consistent with historic catch, which will both accommodate future bycatch and incidental catch, and prevent directed fishing.[12]

**Develop and include a process for periodic review of the list of species**

The Council has carefully considered the question of which species to add to its FMP's under this Initiative, has responded thoughtfully to stakeholder input, and has adopted a comprehensive and complete list based on current information. Nevertheless, the state of ocean science, including food web information, is continually improving. As such, new information about important predator-prey interactions, or fishery interactions, may come to light over time. New species may respond to the effects of climate change through range shifts that bring them into the U.S. West Coast EEZ more often or for the first time, potentially altering food web structure and composition, for instance through the introduction of new forage species.[13]

The Council may wish at some point to expand the suite of forage fish subject to the protections of EI-1. Pew suggests that a process for periodic review of the forage fish in the ECS category in the Council's FMP's is warranted. We note that the Council has put in place a process for periodic review of its Fishery Ecosystem Plan every five years, with the first review scheduled for 2018.[14] Since this effort takes place under the banner of the FEP through the Ecosystem

[9] See NMFS, Final Environmental Assessment Amendment 96 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area and Amendment 87 to the Fishery Management Plan for Groundfish of the Gulf of Alaska to Comply with Annual Catch Limit Requirements, September 2010

[10] Ibid, at page 36

[11] Ibid

[12] See PFMC report entitled *Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species of the U.S. Portion of the California Current Large Marine Ecosystem*, April 2014, pages 30-33 including Table 3.3.5 with 2003-2012 bycatch in metric tons of EI-1 subject species in the groundfish fishery, which provides an example of the analyses that could be used to derive MRA levels

[13] See PFMC, Pacific Coast Fishery Ecosystem Plan, pages 165-166 and PFMC, Ecosystem Initiatives Appendix to the Pacific Coast FEP, pages A-22 to A-23

[14] See PFMC webpage titled "Ecosystem-Based Management: Fishery Ecosystem Plan Schedule"

Initiatives process, we suggest that the Council specify that a review of the forage fish species included in the ECS category be conducted as part of future FEP reviews, with consideration given to adding any new species at that time.

**Adopt a process and schedule for further development of the FMP amendments**

Under the draft schedule and process for EI-1 described in the EWG's April 2014 report, at this September meeting the Council will develop, and review and preliminarily approve for public comment, draft FMP amendatory language designed to implement EI-1.[15] Subsequently, at a later meeting the Council will again review and may adopt the amendatory language and select a Final Preferred Alternative, thus completing Council action on EI-1. Therefore we respectfully request that the Council schedule EI-1 for final Council action (selection of final preferred alternative and adoption of FMP amendatory language) at the March 2015 Council meeting. The April 2014 EWG report does contemplate the possibility that an additional Council meeting might be necessary if additional revisions and/or public review of the amendatory language is needed.[16] If this becomes necessary, we suggest that this additional review be scheduled for the November 2014 meeting, such that the Council is still able to complete EI-1 in March 2015. Finally, we note that the EWG's April 2014 report describes and recommends the utilization of an omnibus approach to the development of the action, including required National Environmental Policy Act (NEPA) documents and Federal rulemaking.[17] We are highly supportive of this approach.

In conclusion, we greatly appreciate the Council's effective and thoughtful efforts earlier this year to significantly advance this effort, as well as the Council's overall attention to this issue and to operationalizing an ecosystem-based approach to fishery management. As always, we look forward to further participation in this important initiative, including the discussions and decisions this September in Spokane.

Sincerely,

Tom Rudolph
Officer, U.S. Oceans
The Pew Charitable Trusts
trudolph@pewtrusts.org

Steve Marx
Officer, U.S. Oceans
The Pew Charitable Trusts
smarx@pewtrusts.org

[15] See PFMC report entitled *Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species of the U.S. Portion of the California Current Large Marine Ecosystem*, April 2014, page 5

[16] Ibid

[17] Ibid, at page 37 ("*NMFS would handle the amendments to multiple FMPs as a single regulatory package. The agency would plan to publish a single Notice of Availability in the Federal Register for a comprehensive amendment to multiple Pacific Council FMPs, followed by a single proposed rule and single final rule, handling all to-be-emended FMPs simultaneously")*

Kayak TILLAMOOK

**Wednesday, August 13th, 2014**

Pacific Fishery Management Council
Dorothy Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, OR 97220

Dear Chair Lowman and Council Members,

My name is Marcus Hinz and I am an owner/operator of a tourism business which relies on the existence of abundant wildlife, natural habitat and the healthy eco-systems which support them.

Our customers use our guide services to get close to wildlife such as harbor seals, the migratory Brown Pelicans, and many other sea birds which rely on healthy forage fish stocks along the entire West Coast. Therefore, it is well worth my precious time to advocate for the protection of health forage fish stocks upon which other animals depend upon for food.

I recognize that the Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and I applaud the Council's work to incorporate ecosystem principles into fishery management decisions.

Today, I ask that the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species. Please adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. I believe this action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

I also believe this action will also fulfill the first initiative of the Council's Fishery Ecosystem Plan; a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.

As my letter demonstrates, this issue has many economic implications beyond the immediate issue of protecting ecosystems and fisheries. The tourism industry must also be protected. I very much appreciate your commitment to healthy ecosystems along the West Coast and the Pacific Ocean

Sincerely,

Marcus A Hinz,
Principal Executive

**PO Box 1270 Tillamook OR 97141 | 503.866.4808 | KayakTillamook.com**

OREGON SHORES
CONSERVATION COALITION

August 15, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

**Agenda Item H.1. Ecosystem -- Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)**

Dear Chair Lowman and Council Members:

The Oregon Shores Conservation Coalition would like to thank you for the responsible steps the Council has taken toward conserving forage fish as a critical food source for marine life, including seabirds, salmon, whales and others at the top of the food web. We were particularly pleased with the Council's support of the Ecosystem Trophic Pathway – Option 2.2.1 – at your April, 2014 meeting in Vancouver, Washington. We believe incorporating currently unmanaged forage fish as ecosystem component species within each of the Council's existing Fishery Management Plans makes good conservation sense.

During your upcoming September meeting in Spokane, **Oregon Shores would encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species to continue to advance your efforts to conserve these prey species. Further, we respectfully request that the Council set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species**. In combination, these actions will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop.

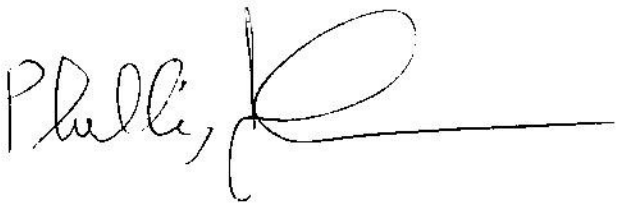
For more than four decades, Oregon Shores has worked to conserve the beauty and bounty of the Oregon coastal region, including its marine environment. We carry out our environmental stewardship efforts through education, citizen science and advocacy. For example, through our partnership with the University of Washington's Coastal Observation and Seabird Survey Team (COASST), many of our over 1,300 CoastWatchers have received training to identify and report dead seabirds that wash ashore along their adopted mile of coastline. Researchers from around

the world– including our partners at UW -- are finding that seabirds can serve as "ocean sentinels" by providing information about the health of the rest of the marine ecosystem, including the forage fish on which seabirds rely.[1]

In recent years, we've successfully advocated for a system of marine reserves to be established along Oregon's coast to serve as a "savings account" for our key marine ecosystems. We also have led the way in Oregon's efforts to plan for renewable energy siting while protecting important ecological areas within our territorial sea. These policy and planning efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal communities as well as the marine life on which they all depend.

We believe, once implemented, the Council's Fisheries Ecosystem Plan will help serve the same pro-active, precautionary purpose as Oregon's marine reserve and renewable energy efforts have. That is why we urge the Council to take the next step during its September meeting by **adopting amendatory language to designate unmanaged forage fish as ecosystem component species and setting a limit on the amount of these species that can be taken as bycatch in existing fisheries**. Doing so will take us one step closer to recognizing that forage fish provide important linkages within an interconnected ecosystem and should be managed using a precautionary approach.

Thank you for your consideration.



Phillip Johnson, Executive Director
Oregon Shores Conservation Coalition
P.O. Box 33
Seal Rock, OR 97376
(503) 754-9303
phillip@oregonshores.org

[1] Cury, P. M. et al. (2011). Global Seabird Response to Forage Fish Depletion – One-Third for the Birds. Science 334 : 1703-1706

COASTAL CONSERVATION ASSOCIATION
WASHINGTON

February 26th, 2012

Pacific Fishery Management Council
Dan Wolford, Chairman
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Chairman Wolford and Council Members,

The Coastal Conservation Association Washington (CCA Washington) is a nonprofit organization dedicated to the conservation of marine resources representing more than 6,000 Washingtonians who have a stake in protecting a well-functioning marine food web. Our members have donated thousands of hours working to restore salmon and steelhead to Northwest rivers and streams, all in the hope that we may pass along this natural heritage to our children and grandchildren. We urge the council to do its part to support a healthy ecosystem by protecting forage species in the ocean that aren't currently being managed and to analyze the effects of PFMC managed fisheries on these important prey species in relation to the impacts on salmon populations.

The history of large-scale commercial fishing reveals numerous examples of the overharvest of important targeted and non-targeted stocks, which has negative impacts throughout the marine food web. For example, commercial fisheries extracting massive numbers of forage fish directly impact the health of depleted and ESA-listed stocks dependent on such forage fish. The availability of forage fish to provide a source of food for salmon, other fish, marine birds and marine mammals should take precedence over harvest. CCA Washington supports systematic and vigilant programs of professional catch monitoring and evaluation to identify and correct problems related to bycatch and over harvest of forage fish at an early stage.

Small prey fish are an important food source for salmon and other marine life higher on the food chain. An abundance of forage fish, such as whitebait smelt, also help out-migrating juvenile salmon and steelhead by serving as alternative prey for predatory seabirds, marine mammals and larger fish in estuaries such as the mouth of the Columbia River.

We are concerned about growing worldwide demand to convert vast quantities of forage fish for secondary purposes, such as feed for poultry, livestock and farmed fish. The council noted in its own draft ecosystem plan in November that the incentive for targeting new species of lower-trophic-level fish is likely to grow more attractive due to the spectacular growth of the global aquaculture industry. CCA Washington believes that harvest management should err in favor of conservation and recovery,

which is why we urge the Council to not only hold off authorizing any new fisheries targeting forage species but to also refrain from expanding any existing forage fish fisheries such as the proposed quota increase for sardines on the west coast until the science is in place to manage both the prey fish and the predator fish that depend on them. As Washington residents, we also note that our state Fish and Wildlife Commission's Forage Fish Management Plan rightly prioritizes the role forage fish play in the ecosystem ahead of its value in the net.

Thank you,

Bryan Irwin
Executive Director
CCA Washington

Coastal Conservation Association

TEXAS • LOUISIANA • MISSISSIPPI • ALABAMA • FLORIDA • GEORGIA
SOUTH CAROLINA • NORTH CAROLINA • VIRGINIA • MARYLAND • NEW YORK
CONNECTICUT • MASSACHUSETTS • NEW HAMPSHIRE • MAINE • OREGON • WASHINGTON

May 24, 2012

Pacific Fishery Management Council
Dan Wolford, Chairman
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Chairman Wolford and Council Members,

The Washington and Oregon chapters of Coastal Conservation Association respectfully urge the Council to immediately move forward with protecting non-managed forage species as soon as possible and we are encouraged that the Council has agreed to address this issue at your June meeting. We ask that you follow through by incorporating forage species that aren't currently being targeted into a management plan.

As we have stated previously, the Council's own draft fishery ecosystem plan suggests that the market for currently unfished lower-trophic-level species is likely to grow more attractive because of the "spectacular growth" of the global aquaculture industry. It's only a matter of time before non-managed forage fish become the target of the same type high-volume, low-value fisheries that characterize the market for many coastal pelagic species (CPS) on the West Coast. [i]: "CPS finfish landed by the roundhaul fleet (fishing primarily with purse seine or lampara nets) are sold as relatively high volume/low value products (e.g., Pacific mackerel canned for pet food, Pacific sardine frozen and shipped to Australia to feed penned tuna, and northern anchovy as bait or tuna feed)," according to the Council's 2011 status assessment of Coastal Pelagic Species.

We are concerned that the decline of the West Coast sardine population, exacerbated by fishing pressure, will raise the likelihood of fisheries shifting toward non-managed forage fish. The Council has a long list of low-trophic-level species that are all vulnerable to new fisheries developing with no regulations or restrictions of any kind. If sardines continue their decline or even collapse – as suggested in the recent paper[ii] by Zwolinski and Demer – the industry will quickly shift to other forage species. That's why we believe it's urgent for the Council to act to protect non-managed forage species as soon as possible.

Many important prey species are vulnerable without the science or management in place to ensure that fishing does not harm dependent predators. As an organization representing over 10,000 Pacific Northwest residents who have a stake in protecting a well-functioning marine food web, we ask the Council to take this first tangible step toward prioritizing West Coast forage fish for their role as food for salmon, other fish, seabirds and marine mammals.

Recently, a new landmark analysis by the Lenfest Forage Fish Task Force[iii] – which includes 13 preeminent scientists from around the world -- highlighted the fact that forage fish already accounts for over one-third of the world's annual harvest of marine fish. The report noted

that pressure is rising to extract vast quantities of wild-caught forage fish from marine ecosystems, mainly for secondary uses as feed for livestock, poultry and farmed fish. The scientists concluded that forage fish are worth twice as much in the water as they are in the net solely because of the value they add to commercial fisheries like albacore tuna, salmon and cod. This is a conservative estimate, because it does not account for their value to recreational fisheries for similar species, or eco-tourism activities such as birding and whale-watching.

Notably, the Lenfest scientists recommended that no new fishery should be allowed to begin on forage species with little or no information about their population, dependency of predators, or foraging patterns. Such is the case with non-managed forage species along the West Coast. The State of Washington's forage fish management plan[iv] emphasizes caution when it comes to protecting forage species in state territorial waters. The following statement is taken directly from that management plan, "Most management plans emphasize yield (or catch) as a major goal. This plan emphasizes the role of forage fish in the ecosystem and considers catch on a secondary basis. The availability of forage fish to provide a source of food for salmon, other fish, marine birds and marine mammals will be a primary consideration. To achieve this, potential catch will be foregone if needed." The plan places the priority on the overriding ecological value of forage species to salmon and other upper-trophic animals as the primary consideration, with catch considered only on a secondary basis. It also encourages a precautionary approach when the agency is faced with a decision and a lack of information. We also believe a cautionary approach is appropriate since we know that once a new fishery emerges, and investments are made, the industry will have a built-in incentive to maximize the harvest.

Our members have dedicated countless volunteer hours to restore salmon and steelhead to West Coast rivers and streams, and the region has expended billions of dollars restoring these and other marine fish populations. We ask for the Council to act with foresight to do its part to help sustain a resilient and healthy marine ecosystem for generations to come.

Sincerely,

*Ed Wickersham*

Ed Wickersham, Chair, CCA Washington Government Relations Committee

*Bruce Polley*

Bruce Polley, Chair, CCA Oregon Government Relations Committee

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[i] Status of the Coastal Pelagic Species Fishery, Stock Assessment and Fishery Evaluation. Pacific Fishery Management Council. June 2011.
[ii] Zwolinski, J.P., and D. Demer. 2012. "A cold oceanographic regime with high exploitation rates in the Northeast Pacific forecasts a collapse of the sardine stock." Proceedings of the National Academy of Sciences.
[iii] Pikitch, E., et al., 2012. Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs. Lenfest Ocean Program. Washington, DC. 108 pp.
[iv] Forage Fish Management Plan. Adopted by the Washington Fish and Wildlife Commission on Jan. 24, 1998.

August 12, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem – Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

As a coastal business person, I want to thank you for the steady progress you've made toward establishing protections for currently unmanaged forage fish species, which are a vital part of the food web in the entire California Current Ecosystem. These small fish are a big deal for all of us on the Oregon coast. As prey, they provide nutrition for the seabirds, whales, seals and sea lions which people come to the coast to watch -- as well as the tuna, rockfish and salmon that they come to catch. The people who visit Oregon's coast for its natural beauty and bounty are our customers, so in a very real sense we rely on forage fish for our livelihood, as well.

That is why I'm urging the Council to **continue this good work at your upcoming September meeting in Spokane by adopting amendatory language to designate unmanaged forage fish as ecosystem component species. In addition, I'd like to encourage you to set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.** Taken together, these two measures will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop.

Your continued work to protect forage fish is important to me as a business owner whose clients flock to the coast to witness the natural wonder of Oregon's marine life. My business is located in Yachats and provides service to local residents and tourist who are in the area to enjoy the beauty of the natural world unique to the Oregon Coast. My clients and I support the protection of forage fish as a way to ensure the protection of the entire marine ecosystem in order to continue to draw people from all over the world to support the local economy.

In my opinion, it makes smart business sense to take precautionary steps to assure that an asset that is fundamental to the health of our coast – and to our coastal tourism sector -- is adequately protected before proposals to harvest them push us into future conflicts and force us to be reactive rather than proactive.

For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

In a similar way, I believe that in September, **the Council can provide a clear path forward for protecting unmanaged forage fish by incorporating them into each of the fishery management plans as ecosystem component species**. Doing so will recognize the important linkages they provide within an interconnected system that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for me and other coastal business owners who rely on natural-resource-based tourism, **these little fish <u>are</u> a big deal.** I support the Council's efforts to advance a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses that depend on a having a healthy ocean.

Thank you for your consideration.

Respectfully submitted,

Zeora Sage
Gentle Dragon Healing Center

South Coast Tours LLC
27436 Hunter Creek Rd.
Gold Beach, OR 97444
www.southcoasttours.net
541-373-0487

Ms. Dorothy M. Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Chair Lowman and council members:

As a coastal business owner and long time resident in Curry County, I am writing to express my concerns for the state of our forage fish and how the council plans to address fisheries on forage fish. As a kayak fishing and wildlife viewing business on the southern Oregon coast, my clients pay me to help them land fish and explore the coastline to view a variety of marine mammals, sea birds and shore birds. These animals all rely on healthy stocks of forage fish and so does my business.

While this is an extremely busy time for me I needed to voice my concerns about being conservative when addressing any forage fish fisheries. I have been saddened to see the major decline in Brown Pelican populations this year. There are way less than usual and while I understand there are natural fluctuations in population, this year is different. Scientists I have talked to about this have mentioned they may be starving due to lack of forage or the fish are simply not hear when they used to be.

I am deeply concerned for the future and hope the council will seriously and cautiously consider a full ecosystem approach when looking into existing and new forage fisheries.

Thank you for considering my comments.

Sincerely,

Dave Lacey
Owner, South Coast Tours LLC

August 12, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem – Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

As a coastal business person, I want to thank you for the steady progress you've made toward establishing protections for currently unmanaged forage fish species, which are a vital part of the food web in the entire California Current Ecosystem. These small fish are a big deal for all of us on the Oregon coast. As prey, they provide nutrition for the seabirds, whales, seals and sea lions which people come to the coast to watch -- as well as the tuna, rockfish and salmon that they come to catch. The people who visit Oregon's coast for its natural beauty and bounty are our customers, so in a very real sense we rely on forage fish for our livelihood, as well.

That is why I'm urging the Council to **continue this good work at your upcoming September meeting in Spokane by adopting amendatory language to designate unmanaged forage fish as ecosystem component species. In addition, I'd like to encourage you to set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.** Taken together, these two measures will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop.

Your continued work to protect forage fish is important to me as a business owner whose clients flock to the coast to witness the natural wonder of Oregon's marine life. My business is located in Yachats but serves the central coastal area. My clients respect the natural resources of the coastal environment and want my work to reflect the art of nature. Whereas, not a direct impact the forage fish are the basis of sustaining the ecosystem for the birds and marine life. My clients and myself support the protection of forage fish.

In my opinion, it makes smart business sense to take precautionary steps to assure that an asset that is fundamental to the health of our coast – and to our coastal tourism sector -- is adequately protected before proposals to harvest them push us into future conflicts and force us to be reactive rather than proactive.

For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

In a similar way, I believe that in September, **the Council can provide a clear path forward for protecting unmanaged forage fish by incorporating them into each of the fishery management plans as ecosystem component species**. Doing so will recognize the important linkages they provide within an interconnected system that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for me and other coastal business owners who rely on natural-resource-based tourism, **these little fish are a big deal.** I support the Council's efforts to advance a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses that depend on a having a healthy ocean.

Thank you for your consideration.

Respectfully submitted,

Jeffrey Shirley
Fine Art and Graphic Design

Cocotte
BISTRO & BAR

Katherine LeSueur
2930 NE Killingsworth St
Portland, OR 97211

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

Cocotte is my restaurant focused on European style, everyday luxury, and celebrated localism. The menu focuses on the bounty of the northwest; fish & shellfish, small game, and produce with fierce seasonality. We aim to be a sustainable business that is socially, ethically and environmentally responsible. In serving local, sustainable seafood, I see how much of our economies and environment depend on a strong and healthy ocean. Forage fish conservation is important to us, as our much of the local seafood we serve depend on these valuable species as their main diet.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and we applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, we urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species.

During the meeting in September, we encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem and businesses like mine.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,

Katherine LeSueur
Proprietor/Chef, Cocotte
Portland, OR

THE PEW CHARITABLE TRUSTS

111 SW Columbia Street, Suite 200
Portland, Oregon 97201
pewtrusts.org

Sept. 3, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 N.E. Ambassador Place, Suite 101
Portland, OR 97220-1384

**RE: Agenda Item H.1 – Unmanaged Forage Fish Initiative**

Dear Chair Lowman,

The Pew Charitable Trusts has collected 3,421 comments encouraging the Council to move forward with protections for currently unmanaged forage fish species. Please include the attached petition as an electronic submission on the web site for the supplemental briefing book.

The petition itself is included along with the names and cities of individual signers that were gathered as of Sept. 2. The Council may continue to receive additional comments in the days ahead.

Thank you,

Erik Robinson
The Pew Charitable Trusts

Dear Chair Lowman and Council Members,

The council has made steady progress over the past three years in laying the groundwork to protect forage fish species as a crucial food source for the incredible diversity of marine life along the West Coast. The Council should continue moving forward with protections for currently unmanaged forage fish by incorporating them into all appropriate existing fishery management plans as ecosystem component species.

I encourage the Council to approve draft language that would amend fishery management plans this September and release it for public comment. This language should designate unmanaged forage fish as ecosystem component species, preclude new directed fishing on these species in federally managed waters off the West Coast, and allow for a limited amount of those species to be taken in existing fisheries. Ultimately, with final approval of these provisions next year, the Council will provide meaningful protections for these important little fish. It will also help to ensure enough are left in the water for other species such salmon, tuna, whales and seabirds.

These steps will ensure that the council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously in April of 2013.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

| NAME | CITY | STATE |
|---|---|---|
| **Ivan Womboldt** | Palm Springs | CA |
| **Christine Raffetto** | Healdsburg | CA |
| **Stephen Greenberg** | Nevada City | CA |
| **Dominick Falzone** | Los Angeles | CA |
| **Darynne Jessler** | Valley Village | CA |
| **Candice Barnett** | Santa Monica | CA |
| **Jason Brock** | Los Angeles | CA |
| **Laurel Scott** | San Diego | CA |
| **Claire Jones** | Hanford | CA |
| **David Hammond** | Willits | CA |
| **Carol Tredo** | Eureka | CA |
| **Linda Jones** | Ontario | CA |
| **Kathryn Santana** | Bradbury | CA |
| **Marsha Jarvis** | Pinole | CA |
| **Joe Buhowsky** | San Ramon | CA |
| **Michael Sarabia** | Stockton | CA |
| **Bridgett Heinly** | San Diego | CA |
| **Jeremy Spencer** | Pacifica | CA |
| **Ronald Warren** | Glendale | CA |
| **Brandon Chavez** | Los Angeles | CA |
| **John Pham** | Encinitas | CA |

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| **Janice Gloe** | Oakland | CA |
| **E P** | Talmage | CA |
| **Elaine Benjamin** | Alpine | CA |
| **Mark Cappetta** | Rancho Mirage | CA |
| **Ana Herold** | Pacifica | CA |
| **Laurie Bramlage** | Sunnyvale | CA |
| **Dudley &Candace Campbell** | Valley Glen | CA |
| **Dennis B** | City | CA |
| **Gwen Romani** | Castaic | CA |
| **Heather Clough** | Ventura | CA |
| **Jon Longsworth** | Aptos | CA |
| **Dale Noonkester** | Potrero | CA |
| **Rebecca Mcdonough** | Menlo Park | CA |
| **Kira Schabram** | Valley Springs | CA |
| **Anne Tuddenham** | El Cerrito | CA |
| **Gina Gatto** | Castro Valley | CA |
| **Bob Miller** | Santa Rosa | CA |
| **Paul Vesper** | Berkeley | CA |
| **Ellen Segal** | Palm Springs | CA |
| **Rebecca Koo** | San Jose | CA |
| **Wendy Oser** | Berkeley | CA |
| **Saran Kirschbaum** | Los Angeles | CA |
| **Paula Pruner** | North Hollywood | CA |
| **Robert Parker Stellato** | Redwood City | CA |
| **J Chen** | Los Angeles | CA |
| **Michelle Wong** | South Pasadena | CA |
| **Kathleen Rogers** | Paramount, | CA |
| **Sylvia Cardella** | Hydesville | CA |
| **Sharon Lacy** | Sebastopol | CA |
| **Nancy Byers** | Berkeley | CA |
| **Denise Dardarian** | Los Angeles | CA |
| **Michael W Evans** | Los Angeles | CA |
| **Kristine Andarmani** | Saratoga | CA |
| **Roberta Lafrance** | San Leandro | CA |
| **Kristina Fukuda-Schmid** | Culver City | CA |
| **John Delaney** | Ventura | CA |
| **Karynn Merkel** | Eureka | CA |
| **Jane Merkel** | Eureka | CA |
| **Marykay Rodarte** | Phelan | CA |
| **Jan Kampa** | Soquel | CA |
| **Lanier Hines** | Redding | CA |
| **Edwin Aiken** | Sunnyvale | CA |
| **James Patton** | Los Altos | CA |
| **Alexis Miller** | Santa Monica | CA |

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| **Richard Harvey** | Paso Robles | CA |
| **Willa O'Connor** | Kensington | CA |
| **H Gray** | Hayward | CA |
| **Ann Rennacker** | Ft Bragg | CA |
| **Mercy Grieco** | Fresno | CA |
| **Judith Little** | Arcata | CA |
| **Doug Thompson** | Morongo Valley | CA |
| **Patrice Summers** | Santa Barbara | CA |
| **Gabriel Sheets** | Merced | CA |
| **Mala Wingerd** | San Diego | CA |
| **Rob Johnson** | El Cajon | CA |
| **Robert Mammon** | Richmond | CA |
| **Phyllis Hugins** | San Diego | CA |
| **Steve Robey** | Berkeley | CA |
| **Nadya Tichman** | Oakland | CA |
| **Karen Toyohara** | La Mesa | CA |
| **Sandy Stuhaan** | Ridgecrest | CA |
| **Nick Gaetano** | Laguna Beach | CA |
| **Jay Rice** | Novato | CA |
| **Richard Dimatteo** | San Diego | CA |
| **Carolyn Pettis** | Santa Clarita | CA |
| **Renee Locks** | Mill Valley | CA |
| **Dean Frick** | San Francisco | CA |
| **Lil Judd** | Sylmar | CA |
| **Laurie Mclaughlin** | San Diego | CA |
| **Mitch Dalition** | San Francisco | CA |
| **Nicole Bickel** | Antioch | CA |
| **Shirley Wallack** | Santa Rosa | CA |
| **Marguerite Shuster** | Sierra Madre | CA |
| **Dale Riehart** | San Francisco | CA |
| **Marcella Hammond** | San Diego | CA |
| **Gerald Orcholski** | Pasadena | CA |
| **Carlos Nunez** | Reseda | CA |
| **Norma Corey** | Redwood City | CA |
| **K Krupinski** | La | CA |
| **Michael Tomczyszyn** | San Francisco | CA |
| **Gloria Linda Maldonado** | Redwood City | CA |
| **Terry Badger** | Paso Robles | CA |
| **Charles Milkewicz** | Richmond | CA |
| **Robert Reed** | Lake Elsinore | CA |
| **Gary Carpenter** | Pacifica | CA |
| **Michelle Palladine** | Palm Springs | CA |
| **James Haig** | Sab Rafael | CA |
| **Marie Vogel** | Pasadena | CA |

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| **Keith Morris** | Los Angeles | CA |
| **Douglas Mccormick** | Coto De Caza | CA |
| **Colleen Lobel** | San Diego | CA |
| **Diana Kliche** | Long Beach | CA |
| **Antonia & Andrew Chianis** | Blue Jay | CA |
| **Eithne Cunningham** | Grass Valley | CA |
| **Candace Rocha** | Los Angeles | CA |
| **Alan Haggard** | San Diego | CA |
| **Steve Morris** | Los Angeles | CA |
| **Lindsay Mugglestone** | Berkeley | CA |
| **Marijeanne Sarraille** | Pittsburg | CA |
| **Frank Seewester** | Fairfield | CA |
| **Robert Bausch** | Belmont | CA |
| **Patrick Lewis** | Emeryville | CA |
| **Gustavo Sandoval** | San Mateo | CA |
| **Ruth Ungar** | Oakland | CA |
| **Ann Bein** | Los Angeles | CA |
| **Steve Purvis** | Santa Monica | CA |
| **J. Barry Gurdin** | San Francisco | CA |
| **Carol Mock** | Fremont | CA |
| **Jeffery Garcia** | Mendocino | CA |
| **Mark Schecter** | Cayucos | CA |
| **Jill Blaisdell** | La Canada | CA |
| **Natalie Alexander** | Irvine | CA |
| **William Mitchell** | Oakland | CA |
| **Frank Hill** | North Hollywood | CA |
| **Tom Gallagher** | Burlingame | CA |
| **Mary Markus** | Garden Grove | CA |
| **Michael Mitsuda** | Fremont | CA |
| **Betty Winholtz** | Morro Bay | CA |
| **Bonnie Margay Burke** | San Diego | CA |
| **Jack Milton** | Davis | CA |
| **Jan Salas** | Kentfield | CA |
| **Rob Wilkerson** | San Diego | CA |
| **Debora Michel** | Laguna Hills | CA |
| **Vic Bostock** | Altadena | CA |
| **Dave Anderson** | Berkeley | CA |
| **Frederique Joly** | Venice | CA |
| **Michele Martinez** | Hayward | CA |
| **Marisa Strange** | Long Beach | CA |
| **Joie Winnick** | Sherman Oaks | CA |
| **Evan Shamoon** | La | CA |
| **Dale Anania** | Berkeley | CA |
| **Christine Stewart** | Escondidio | CA |

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| **Kenneth Tabachnick** | West Hills | CA |
| **Lisa Krausz** | Tiburon | CA |
| **Henry Weinberg** | Santa Barbara | CA |
| **Dr. Mha Atma S Khalsa** | Los Angeles | CA |
| **Craig Cook** | Santa Rosa | CA |
| **Gilda Fusilier** | Sacramento | CA |
| **Richard Rosenthal** | Los Angeles | CA |
| **Victor Zamora** | Torrance | CA |
| **Celeste Hong** | L.A. | CA |
| **Jon Anderholm** | Cazadero | CA |
| **Kent Minault** | Sherman Oaks | CA |
| **Elaine Livesey-Fassel** | Los Angeles | CA |
| **Robert Ellis** | Oakland | CA |
| **Claire Chambers** | Murrieta | CA |
| **Suzie Stoltz** | Chula Vista | CA |
| **Charles Wolfe** | Sylmar | CA |
| **Catherine Lanzl** | Encinitas | CA |
| **Courtney Dubois** | San Francisco | CA |
| **Joe And Mary Volpe** | Ventura | CA |
| **Kim Tran** | Santa Ana | CA |
| **Donna Alleyne-Chin** | Montara | CA |
| **Sean Corrigan** | Trinity Beach | CA |
| **Gary Hennemuth** | San Francisco | CA |
| **Rex Franklyn** | Tiburon | CA |
| **Sandy Levine** | Pasadena | CA |
| **Anthony Arcure** | Fresno | CA |
| **Alison Massa** | Novato | CA |
| **Andrew Reich** | Los Angeles | CA |
| **Judy Alter** | Los Angeles | CA |
| **Jayna Williams** | Pomona | CA |
| **Susan Pelican** | Woodland | CA |
| **Sophie Miranda** | Sacramento | CA |
| **Barbara T** | Angwin | CA |
| **Kenneth Weidner** | Berkeley | CA |
| **Robert Frcek** | Los Angeles | CA |
| **Candy Bowman** | Sacramento | CA |
| **Dirk Beving** | Los Angeles | CA |
| **Jewels Stratton** | San Francisco | CA |
| **Ted Fishman** | San Jose | CA |
| **Lauren Goldman** | San Francisco | CA |
| **Nancy Freedland** | Big Bear City | CA |
| **Jeannie Pascuzzi** | Orange | CA |
| **Les Roberts** | Fresno | CA |
| **Rachel Kelley** | Santa Monica | CA |

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| **Allen Royer** | San Jose | CA |
| **Fran Watson** | Spring Valley | CA |
| **Andy Tomsky** | San Marcos | CA |
| **Christine Waddell** | Emeryville | CA |
| **Elisabeth Zenker** | Arcata | CA |
| **Misty Mcintyre** | Alameda | CA |
| **Clark Davis** | Los Osos | CA |
| **Rita Fahrner** | San Francisco | CA |
| **Charles Hochberg@Mcn.Org** | Philo | CA |
| **Dennis Young** | Shell Beach, | CA |
| **Cyril Bouteille** | Mountain View | CA |
| **Nancy Kelly** | Oakland | CA |
| **Bonnie Breckenridge** | San Diego | CA |
| **Patricia Marlatt** | Los Angeles | CA |
| **June Abner** | San Diego | CA |
| **Eric Duggan** | West Sacramento | CA |
| **Julie Smith** | Los Osos | CA |
| **Diane Marks** | Bass Lake | CA |
| **Elena Knox** | Pioneer | CA |
| **Vance Arquilla** | Los Angeles | CA |
| **Bryce Beal** | San Francisco | CA |
| **Julie Sasaoka** | Concord | CA |
| **N. B.** | Oakland | CA |
| **Natalie Kovacs** | Irvine | CA |
| **Stanley Peterson** | Los Banos | CA |
| **Hannah Freed** | Pasadena | CA |
| **Probyn Gregory** | Tujunga | CA |
| **Tim Maurer** | Anaheim | CA |
| **Regina Flores** | Lake Elsinore | CA |
| **Jess Graffell** | Yucaipa | CA |
| **Martin Marcus** | San Diego | CA |
| **Carol Majors** | Northridge | CA |
| **Amanda Withrow** | Los Angeles | CA |
| **Mark Weinberger** | San Francisco | CA |
| **Dona Longacre** | Rancho Santa Margarita | CA |
| **Sally Liu** | Foster City | CA |
| **Mark Reback** | Los Angeles | CA |
| **Bo Svensson** | Santa Rosa | CA |
| **Wandis Wilcox** | Aptos | CA |
| **Edward Sullivan** | San Francisco | CA |
| **Michael Toobert** | Grass Valley | CA |
| **James Rutford** | Anaheim | CA |
| **Carol Taggart** | Menlo Park | CA |

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| **Lacey Kammerer** | Milpitas | CA |
| **Anthony Montapert** | Ventura | CA |
| **Marjorie Streeter** | Alameda | CA |
| **Robin Fellner** | Mckinleyville | CA |
| **Mal Gaffney** | Lompoc | CA |
| **Eleanor Thomas** | Livermore | CA |
| **Gene R. Trapp** | Davis | CA |
| **Cheryl Albert** | Freedom | CA |
| **Carol Sawyers** | Santa Cruz | CA |
| **Charles Beals** | Van Nuys | CA |
| **Michael Sullivan** | San Diego | CA |
| **Scott Weldon** | Encinitas | CA |
| **Kim Chamberlain** | Fortuna | CA |
| **Suzanne A'Becket** | Cupertino | CA |
| **Long Pham** | Westminster | CA |
| **Mary Etta Moose** | San Francisco | CA |
| **George F. Klipfel Ii, Cls** | Cathedral City | CA |
| **Sandra Glover** | Malibu | CA |
| **Caryn Graves** | Berkeley | CA |
| **Karyn Gil** | Sacramento | CA |
| **Dana Wullenwaber** | Redding | CA |
| **Charles Winter** | Berkeley | CA |
| **Lynne Davies** | San Francisco | CA |
| **Victor Carmichael** | Pacifica | CA |
| **Simone Oliver** | Santa Rosa | CA |
| **Claudia Mackey** | Stockton | CA |
| **Michael Watson** | Sonoma | CA |
| **M. Canter** | Tiburon | CA |
| **Isabella La Rocca** | Berkeley | CA |
| **Christine Sepulveda** | Anaheim | CA |
| **Betty Murphy** | Long Beach | CA |
| **Jen Bradford** | Spring Valley | CA |
| **Todd Snyder** | San Francisco | CA |
| **Julie Amato** | Mountain View | CA |
| **Kenneth Lapointe** | Ottawa | CA |
| **Rhea Damon** | Calabasas | CA |
| **Linda Redman** | West Hollywood | CA |
| **Ct Bross** | Walnut Creek | CA |
| **Scott Blaze** | Atascadero | CA |
| **Cathe Dietrich** | Berkeley | CA |
| **Amber Tidwell** | Los Angeles | CA |
| **Rob Myers** | Anaheim | CA |
| **Jennifer Taylor** | Arcata | CA |
| **Jennifer Toth** | Santa Clarita | CA |

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| **Marco Aguilera** | Carlsbad | CA |
| **William Lawson** | Calimesa | CA |
| **Leigh Ann Dicarlo** | Winchester | CA |
| **Allan Chen** | Alameda | CA |
| **Kathryn Carroll** | Oakland | CA |
| **Donita Sparks** | Los Angeles | CA |
| **Cathy Holden** | Sacramento | CA |
| **Carlos Townsend** | Fountain Valley | CA |
| **Joe Harvey** | Twain Harte | CA |
| **Stacie Charlebois** | Sebastopol | CA |
| **Linda Lyerly** | Cardiff By The Sea | CA |
| **Persephone Maywald** | Orinda | CA |
| **John Nglish** | Los Angeles | CA |
| **Jorge De Cecco** | Ukiah | CA |
| **Nikki Nafziger** | Vallejo | CA |
| **Linda Riebel** | Lafayette | CA |
| **Jill B.** | San Francisco | CA |
| **Russell Weisz** | Santa Cruz | CA |
| **Terrell Rodefer** | Van Nuys | CA |
| **C S** | Sdiego | CA |
| **Yuriko Hazlett** | Oxnard | CA |
| **Ela Gotkowska** | Lodz | CA |
| **Ken Greenwald** | Santa Monica | CA |
| **Junko Card** | Exeter | CA |
| **Richard Kuntze** | Monterey | CA |
| **Chris Seaton** | Santa Barbara | CA |
| **Karl Koessel** | Blue Lake | CA |
| **Bob Rosenberg** | Kentfield | CA |
| **Frank Eichenberg** | Santa Barbara | CA |
| **Nona Weiner** | San Jose | CA |
| **Douglas Gower** | San Francisco | CA |
| **Janine Hurd-Glenn** | La Mesa | CA |
| **Rodolfo Scarpati** | Castro Valley | CA |
| **Sheila Silan** | Somerset | CA |
| **Katrina Child** | San Francisco | CA |
| **Debra Floyd** | Coronado | CA |
| **Francis Palmer** | Sacramento | CA |
| **Alicia Jackson** | Vallejo | CA |
| **Nancy Brenner** | Murrieta | CA |
| **Carolyn Frazee** | Eureka | CA |
| **Amber Coverdale Sumrall** | Soquel | CA |
| **Robert Hicks** | Long Beach | CA |
| **Anita Youabian** | Beverly Hills | CA |
| **Susanne Madden** | Playa Del Rey | CA |

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| **Rob Seltzer** | Malibu | CA |
| **Lawrence Thompson** | Livermore | CA |
| **Diane Brazil** | San Jose | CA |
| **Kamal Prasad** | Santa Rosa | CA |
| **Siavash Human** | Santa Monica | CA |
| **Mary Rojeski** | Santa Monica | CA |
| **Lauren Murdock** | Santa Barbara | CA |
| **Stephanie Linam** | Benicia | CA |
| **Kj Linarez** | Carmichael | CA |
| **Kermit Cuff** | Mountain View | CA |
| **Laila Noori** | San Jose | CA |
| **Margaret Rogers** | Redwood City | CA |
| **Gail Koza** | Half Moon Bay | CA |
| **Scott Nelson** | Betherl Island | CA |
| **Mrita Mayer** | San Anselmo | CA |
| **Maria Nowicki** | San Francisco | CA |
| **Cody Dolnick** | Joshua Tree | CA |
| **Paul Hunrichs** | Santee | CA |
| **Sandy Commons** | Sacramento | CA |
| **Karen Ratzlaff** | Santa Rosa | CA |
| **Marjorie Moss** | Del Mar | CA |
| **J. Holley Taylor** | Penn Valley | CA |
| **Clare Hooson** | Belmont | CA |
| **Babette Bruton** | Los Gatos | CA |
| **Rob Roberto** | Santee | CA |
| **Gemma Geluz** | Fairfield | CA |
| **Diane Bolman** | Novato, CA 94949 | CA |
| **Loren Madsen** | Laytonville | CA |
| **Cari Chenkin** | Citrus Heights | CA |
| **Michelle Mackenzie** | San Carlos | CA |
| **Margaret Fish** | Boonville | CA |
| **Barbara Robbin** | Studio City | CA |
| **Reuben Veek** | Mountain View | CA |
| **Jim Howard** | Sacramento | CA |
| **Dale Matlock** | Santa Cruz | CA |
| **D Schonfeld** | San Diego | CA |
| **Joseph Steinberger** | San Francisco | CA |
| **Paula Hawkins** | San Diego | CA |
| **Pec Indman** | San Jose | CA |
| **Etta Robin** | Bakersfield | CA |
| **Patricia Rogers** | Concord | CA |
| **Vera Brown** | Redwood Ciuty | CA |
| **Connie Stomper** | Santa Barbara | CA |
| **Joseph Boone** | San Luis Obispo, | CA |

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|---|---|---|
| **Martha Carrington** | Santa Cruz | CA |
| **Juliet Johns** | Grass Valley | CA |
| **Gerald Shaia** | Sun Valley | CA |
| **Susan Mcreynolds** | San Leandro | CA |
| **Gary Jones** | San Marino | CA |
| **Robin Reinhart** | San Diego | CA |
| **Rebecca Harper** | Los Angeles | CA |
| **Amy Colla** | Los Angeles | CA |
| **Kay Von Tress** | Menlo Park | CA |
| **K Perlman** | Aptos | CA |
| **Desiree Kisselburg** | Los Angeles | CA |
| **Jered Cargman** | Banning | CA |
| **Tonya Dysart** | San Diego | CA |
| **Robert Chirpin** | Northridge | CA |
| **Joan Zawaski** | Oakland | CA |
| **Susan Hathaway** | Pico Rivera | CA |
| **Celia Kutcher** | Capistrano Beach | CA |
| **Nicole Hunt** | Chula Vista | CA |
| **Gregg Sparkman** | Palo Alto | CA |
| **Alice Neuhauser** | Manhattan Beach | CA |
| **Emily Anderson** | San Jose | CA |
| **Thomas Conroy** | Manhattan Beach | CA |
| **Rebecca Shirley** | Daly City | CA |
| **Julian Siminski** | Studio City | CA |
| **Christine Gallagher** | Palm Springs | CA |
| **Vickie Chandler** | San Jose | CA |
| **Chris Johanson** | Los Angeles | CA |
| **Mr. Sidney J.P. Hollister** | San Francisco | CA |
| **Scott Rubel** | Los Angeles | CA |
| **Dan Silver** | Los Angeles | CA |
| **Josephine Coatsworth** | Berkeley | CA |
| **Christa Neuber** | W. Hollywood | CA |
| **Lindsay Merryman** | Petrolia | CA |
| **Frank Kap** | Burbank | CA |
| **Mark Mulder** | San Jose | CA |
| **Randall Potts** | Berkeley | CA |
| **Michelle Mitchell** | Claremont | CA |
| **M. Olson** | Sunnyvale | CA |
| **Arlene Wiltberger** | San Carlos | CA |
| **Chris Worcester** | Truckee | CA |
| **John Steponaitis** | San Francisco | CA |
| **Lee Smith** | California Hot Springs | CA |
| **Paul Ramos** | Solvang | CA |
| **Nancy Boyce** | San Rafael | CA |

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| **Veronica Herrera** | Culver City | CA |
| **Elizabeth Goodwin** | Hollywood | CA |
| **Tracy Ewing** | Artesia | CA |
| **Shawna Watson** | Ontario | CA |
| **Peter Corkey** | San Francisco | CA |
| **John M Keefe** | South Pasadena | CA |
| **David Scott** | Ontario | CA |
| **Pat Blackwell-Marchant** | Castro Valley | CA |
| **Charles Alexander** | Rialto | CA |
| **Deborah Filipelli, Ph.D.** | The Sea Ranch | CA |
| **Casee Maxfield** | Los Angeles | CA |
| **Sue Davies** | Philo | CA |
| **Donna Crane** | Anderson | CA |
| **Alice Polesky** | San Francisco | CA |
| **Michael Stewart** | Elk Grove | CA |
| **Annette Raible** | Petaluma | CA |
| **Dan Kuklo** | Berkeley | CA |
| **Richard Benson** | Lawndale | CA |
| **Stephen Bohac** | Twain Harte | CA |
| **Jeanne Schuster** | West Covina | CA |
| **Georgia Antonopoulos** | Pleasant Hill | CA |
| **O Medzihradsky** | La Jolla | CA |
| **Elaine Wilson** | Torrance | CA |
| **Karen Glasser** | Woodland Hills | CA |
| **Joanne Crandall-Bear** | Sacramento | CA |
| **Grace Padelford** | Los Angeles | CA |
| **Sara Mackusick** | Berkeley | CA |
| **Walker Hibben** | Newport Beach | CA |
| **Alice J. Felix** | Walnut Creek | CA |
| **Mike Kelly** | Huntington Beach | CA |
| **Janet Maker** | Los Angeles | CA |
| **Mike Rolbeck** | Placerville | CA |
| **Paula Berry** | Los Angeled | CA |
| **Carole Garrett** | Folsom | CA |
| **Felicia Chase** | Encino | CA |
| **James Provenzano** | Los Angeles | CA |
| **Stanley Edwards** | Livermore | CA |
| **Jake Schwartz** | Petaluma | CA |
| **Judith Kirk** | Redwood City | CA |
| **Erica Griffin** | San Francisco | CA |
| **James Hubbard** | Los Angeles | CA |
| **Joy Turlo** | Redondo Beach | CA |
| **Donna Flade** | Beverly Hills | CA |
| **Randy Mills** | Culver City | CA |

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| **Craig Kleber** | Los Angeles | CA |
| **Ali Van Zee** | Oakland | CA |
| **Mark Jones** | Fremont | CA |
| **Bita Edwards** | Woodacre | CA |
| **Tim Barrington** | San Jose | CA |
| **George Raymond** | Palm Springs | CA |
| **Lucy Horwitz** | L.A. | CA |
| **Lisa Hammermeister** | Granada Hills | CA |
| **Gretchen Kenney** | Redwood City | CA |
| **David Camp** | Burbank | CA |
| **Joseph Shulman** | San Diego | CA |
| **Nancy Heck** | Santa Maria | CA |
| **Henry Schlinger** | Burbank | CA |
| **Andrea Kaufman** | Guerneville | CA |
| **Andrea Bonnett** | Altadena | CA |
| **Wally Longshore** | Riversidec | CA |
| **Elizabeth Oliver** | San Diego | CA |
| **Kate Sky** | Gualala | CA |
| **Steve Eklund** | Salinas | CA |
| **Johanne Zell** | Camarillo | CA |
| **Arleen Weiss** | San Lorenzo | CA |
| **Jamie Castaneda** | Sierra Madre | CA |
| **Cathy Mcpeek** | Palm Springs | CA |
| **Tom Mccarter** | San Jose | CA |
| **Barbara Viken** | San Francisco | CA |
| **Chuck Wieland** | San Ramon | CA |
| **Marian Fricano** | San Jose | CA |
| **Pamela Osgood** | Grass Valley | CA |
| **Roberta E. Newman** | Mill Valley | CA |
| **Joseph Klein** | Benici | CA |
| **Sheilagh Creighton** | Fairfax | CA |
| **Diana Aylward** | Woodland Hills | CA |
| **Barbara Cohn** | Carlsbad | CA |
| **Joanna Katz** | Berkeley | CA |
| **Julie Heath Elliott** | Los Angeles | CA |
| **Annie Belt** | San Jose | CA |
| **Ayesha Gill** | Oakland | CA |
| **Dena Schwimmer** | Los Angeles | CA |
| **Jackie Pomies** | San Francisco | CA |
| **Sondra Boes** | Campbell | CA |
| **Willy Aenlle** | Altadena | CA |
| **Jeff Salvaryn** | Redondo Beach | CA |
| **Samuel Durkin** | Fairfield | CA |
| **Betty Buchanan** | Bakersfield | CA |

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| **Nancy Sato** | Belmont | CA |
| **Julie Kramer** | San Francisco | CA |
| **Benita Smith** | Berkeley | CA |
| **Harald Conradi** | Los Angeles | CA |
| **O Lewis** | Los Angeles | CA |
| **Nancy Peterson** | Scotts Valley | CA |
| **Jaime Mcgrath** | Aliso Viejo | CA |
| **Thomas Gillespie** | La Mirada | CA |
| **Paul Bechtel** | Redlands | CA |
| **Karen Winnick** | Beverly Hills | CA |
| **Morgan Kanae** | Hanford | CA |
| **Scott Coahran** | Los Banos | CA |
| **Joseph Hardin** | Santa Monica | CA |
| **Leslie Spoon** | Los Osos | CA |
| **Paul Norup** | Crescent City | CA |
| **Marc Silverman** | Los Angeles | CA |
| **Nancy Cohn** | Atascadero | CA |
| **Diane Rooney** | El Cerrito | CA |
| **Laurel Przybylski** | Oakland | CA |
| **Don Schwartz** | Larkspur | CA |
| **Ralph Sanchez** | Santa Cruz | CA |
| **Cathleen O'Connell** | Boulder Creek | CA |
| **Linda Judd** | Walnut Creek | CA |
| **Angie Bahris** | Santa Monica | CA |
| **Thomas Lavigne** | Fremont | CA |
| **Gayle Spencer** | Menlo Park | CA |
| **Joseph Szabo** | Los Angeles | CA |
| **Timothy Taylor** | Los Angeles | CA |
| **James Perkins** | Costa Mesa | CA |
| **Carolyn Shaw** | Los Angeles | CA |
| **Lorraine Lowry** | Sacramento | CA |
| **Valerie Romero** | Quincy, | CA |
| **Blaze Bhence** | Cypress | CA |
| **Norma Campbell** | Campbell | CA |
| **Susan Porter** | Pasadena | CA |
| **Suzy Davis Mantee** | Malibu | CA |
| **Jason Laberge** | Malibu | CA |
| **Michael Mcmahan** | Huntington Beach | CA |
| **Regina Flores** | Lake Elsinore | CA |
| **Kristen Renton** | Valencia | CA |
| **Cindy Tejeda** | Los Angeles | CA |
| **Rene Mcintyre** | San Francisco | CA |
| **Jody Weisenfeld** | Petaluma | CA |
| **Brenda Luebke** | Mountain View | CA |

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| **Christina Nillo** | W. Hollywood | CA |
| **Judith Graham** | Morro Bay | CA |
| **Leticia Cowan** | San Jose | CA |
| **Uly Silkey** | Oakland | CA |
| **Marsha Armstrong** | Los Gatos | CA |
| **Cynthia Smith** | Mission Viejo | CA |
| **Joe Cuviello** | Solana Beach | CA |
| **Relf Star** | Claremont | CA |
| **Christina Babst** | W.Hollywood | CA |
| **Joyce Banzhaf** | Grass Valley | CA |
| **John Edman** | Morgan Hill | CA |
| **David Ford** | Pasadena | CA |
| **Marjanne Vangenechten** | Stad | CA |
| **Lionel Ortiz** | Bayside | CA |
| **Randi Nielsen** | Richmond | CA |
| **Susan Chapman** | Los Angeles | CA |
| **Val Hongo-Whiting** | Laguna Niguel | CA |
| **K R** | Sf | CA |
| **Rosiris Paniagua** | Altadena | CA |
| **Subrata Sircar** | Sunnyvale | CA |
| **Kim Thatcher** | Forestville | CA |
| **Lynette Ridder** | Concord | CA |
| **Todd Fisk** | San Diego | CA |
| **Robert Gondell** | Woodacre | CA |
| **Greg Rosas** | Castro Valley | CA |
| **Joel Meza** | San Francisco | CA |
| **Mitch Cohen** | Berkeley | CA |
| **Myrna Brown** | Rosemead | CA |
| **Rick Sparks** | Toluca Lake | CA |
| **Kelly O'Donnell** | Los Angeles | CA |
| **Lauren Schiffman** | El Cerrito | CA |
| **Bianca Molgora** | San Francisco | CA |
| **Erika Vadopalas** | Moss Beach | CA |
| **Pela Tomasello** | Santa Cruz | CA |
| **Mark Beckwith** | Berkeley | CA |
| **Geraldine Card-Derr** | Exeter | CA |
| **Bret Smith** | Santa Cruz | CA |
| **Michael Darling** | Frazier Park | CA |
| **Joseph Razo** | Camarillo | CA |
| **Bert Greenbeg** | San Jose | CA |
| **Janet Vernon** | Torrance | CA |
| **Ian Edwards** | Woodacre | CA |
| **Carrie Staton** | Santa Cruz | CA |
| **Beth Shafer** | Huntington Beach | CA |

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| **Janet Kennington** | Los Angeles | CA |
| **Sheila Kothari** | Palo Alto | CA |
| **Sharon Rodrigues** | Fremont | CA |
| **Larry Keller** | Santa Cruz | CA |
| **Michael Ballot** | Stockton | CA |
| **Cierna Ritts** | Garden Grove | CA |
| **Ted Cheeseman** | Saratoga | CA |
| **Barbara Root** | Merced | CA |
| **Leonard Conly** | Berkeley | CA |
| **Kx Bx** | Lanc | CA |
| **Edmund Wright** | Trinidad | CA |
| **Gillian Schultz** | Sunnyvale | CA |
| **Mija Gentes** | Saratoga | CA |
| **John Essman** | Healdsburg | CA |
| **Barry Hottle** | Roseville | CA |
| **John Contos** | N/A | CA |
| **Char Laughon** | Montara | CA |
| **Vanessa Stine** | Los Angeles | CA |
| **Ronit Corry** | Santa Barbara | CA |
| **Hillary Melin** | Culver City | CA |
| **Philip Welanko** | Vallejo | CA |
| **Andrew Calderella** | Valencia | CA |
| **Ronald Calvisi** | Toluca Lake | CA |
| **Eileen Massey** | Oakland | CA |
| **Rohana Mclaughlin** | San Anselmo | CA |
| **Donna Ritola** | Petaluma | CA |
| **Gail Roberts** | Tecate | CA |
| **Elizabeth Cole, Md** | Burlingame | CA |
| **Ken Windrum** | Los Angeles | CA |
| **David Smith** | Irvine | CA |
| **Bruce Traficante** | San Francisco | CA |
| **Linda Straussburg** | El Segundo | CA |
| **Sharma Gaponoff** | Grass Valley | CA |
| **Steve Hanlon** | Los Angeles | CA |
| **Elizabeth Bettenhausen** | Cambria | CA |
| **Douglas Estes** | San Francisco | CA |
| **Philip Glaser** | Laguna Niguel | CA |
| **Holly Mcduffie** | Los Angeles | CA |
| **Judy Stanton** | Dana Point | CA |
| **Lynne Jeffries** | Laguna Niguel | CA |
| **Rosa Baeza** | Reseda | CA |
| **Wayne Day** | San Francisco | CA |
| **Muriel Kotin** | Malibu | CA |
| **Deanna Knickerbocker** | Cupertino | CA |

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| **Jeannette Eaton** | San Jose | CA |
| **Joyce Sortland** | Grass Valley | CA |
| **Virginia Mariposa** | Santa Barbara | CA |
| **Angelica Whitefeather** | Los Angeles | CA |
| **Lisa Gee** | La Crescenta | CA |
| **Arlene Zimmer** | Rancho Palos Verdes | CA |
| **Alicia Kern** | Palos Verdes Peninsula | CA |
| **Carol Becker** | Sherman Oaks | CA |
| **Donald Mackay** | South Pasadena | CA |
| **John Flitcraft** | Cambria | CA |
| **Molly Mendez** | Oakley | CA |
| **Robert Thornhill** | Los Angeles | CA |
| **Lily Mejia** | Ontario | CA |
| **Patrick Craig** | Guerneville | CA |
| **Mika Stonehawk** | Tustin | CA |
| **Joan Hunnicutt** | Citrus Heights | CA |
| **Maria Rausis** | Mountain View | CA |
| **Darcy Bergh** | San Diego | CA |
| **Robert Cassinelli** | Sacramento | CA |
| **Victor Afanasiev** | La Grange | CA |
| **Jessie Root** | Oceanside | CA |
| **Heather Berk** | Fountain Valley | CA |
| **Mark J. Fiore** | San Francisco | CA |
| **Nancy Gowani** | Winnetka | CA |
| **Camille Cardinale** | Los Angeles | CA |
| **Kris Head** | Garden Grove | CA |
| **Carolyn Mone** | Woodside | CA |
| **Lesley Hudak** | Orinda | CA |
| **Jason Bowman** | Placerville | CA |
| **Candy Leblanc** | Placerville | CA |
| **Mary F Platter-Rieger** | San Diego | CA |
| **Dionna Campbell** | Carmichael | CA |
| **Kathleen Jacecko** | Redondo Beach | CA |
| **Alan Gonzalez** | Long Beach | CA |
| **Gerry Collins** | Murrieta | CA |
| **Scott Clements** | Davis | CA |
| **Elizabeth Darovic** | Monterey | CA |
| **James Gonsman** | Occidental | CA |
| **Eden Kennan** | Van Nuys | CA |
| **Carolina'S Blaney** | Redlands | CA |
| **Terri Davis** | Playa Del Rey | CA |
| **Jon Siegfus** | Norwalk | CA |
| **Steven Henderson** | Palm Springs | CA |
| **Chris Yarnes** | Winters | CA |

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| **Deanna Seagraves** | Corralitos | CA |
| **Jon Steenhoven** | Santa Rosa | CA |
| **Suzanne Peã±A** | Fullerton | CA |
| **Phyllis Mottola** | Bishop | CA |
| **Michael Hoover** | Los Angeles | CA |
| **Rachel Sonnenblick** | Santa Cruz | CA |
| **Carlene Visperas** | Concord | CA |
| **Athena Clevenger** | Calabasas | CA |
| **Valerie Schadt** | Los Angeles | CA |
| **Sam Romero** | Stkn. | CA |
| **Lee Greenawalt** | Merced | CA |
| **Ayesha Vavrek** | Berkeley | CA |
| **Dennis Oliver** | Kelseyville | CA |
| **Barbara Tacker** | Camarillo | CA |
| **Michael Garden** | Sacramento | CA |
| **Kurt Cruger** | Long Beach | CA |
| **Cherie Altevers** | Lincoln | CA |
| **Susan Porter** | Pasadena | CA |
| **Carol Wiley** | Victorville | CA |
| **Tanya Baldwin** | Los Gatos | CA |
| **R L** | Rohnert Park | CA |
| **John Pasqua** | Valley Center | CA |
| **Richard Puaoi** | Novato | CA |
| **Eleanor Cohen** | Oakland | CA |
| **Barry Stelling** | Sonoma | CA |
| **Wendy Frado** | Los Angeles | CA |
| **Steven Miller** | Lakeside | CA |
| **Lori Conrad** | Davis | CA |
| **Brigette Greener** | San Jose | CA |
| **Joelle Porter** | Susanville | CA |
| **Carol Tao** | Salinas | CA |
| **Catherine Loudis** | San Anselmo | CA |
| **Behnoosh Armani** | Brea | CA |
| **Twikie Simms** | Anaheim | CA |
| **William Hewes** | Simi Valley | CA |
| **Patricia Re** | Penngrove | CA |
| **Brian Debasitis** | San Jose | CA |
| **Annalee Pineda** | San Francisco | CA |
| **Bernadette Barberini** | Alameda | CA |
| **Stan Banos** | Sf | CA |
| **Jeri Pollock** | Altadena | CA |
| **Mark Gotvald** | Pleasant Hill | CA |
| **Pat Marriott** | Los Altos | CA |
| **James Hampson** | San Francisco | CA |

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| **Beverly Poncia** | Lower Lake | CA |
| **Gabriela Sosa** | La | CA |
| **Ray Martinez** | Covina | CA |
| **Peter Mounier** | Morro Bay | CA |
| **Vincent Weis** | Sacramento | CA |
| **Victoria De Goff And Family** | Berkeley | CA |
| **Art Patey** | Vallejo | CA |
| **Margaret Demott** | Sacramento | CA |
| **Victoria Brandon** | Northridge | CA |
| **Richard Sherman And Family** | Berkeley | CA |
| **Sonia Vila** | Emeryville | CA |
| **Madeline Wright** | Loos Angeles | CA |
| **William Wallin** | Richmond | CA |
| **Steve Vicuna** | Monterey Park | CA |
| **Kevin Branstetter** | Applegate | CA |
| **Beverly Farr** | Goleta | CA |
| **Cynthia Hernandez** | Ukiah | CA |
| **Sherry Handy** | Lincoln | CA |
| **Susan Trivisonno** | San Jose | CA |
| **Ronald Bogin** | El Cerrito | CA |
| **Susan Gill** | San Anselmo | CA |
| **Abigail Bates** | Los Angeles | CA |
| **Wayne Sheridan** | San Francisco | CA |
| **Enrico Verga** | Seal Beach | CA |
| **Melva Mills** | Sacramento | CA |
| **Erika Whitton** | Irvine | CA |
| **Barri Clark** | Los Angeles | CA |
| **Scott Sinclair** | San Rafael | CA |
| **Scott Lindsay** | Fair Oaks | CA |
| **Diane Knight** | West Hills | CA |
| **George Lewis** | Los Osos | CA |
| **Lori Stayton** | Sherman Oaks | CA |
| **Dan Perdios** | Palm Springs | CA |
| **George Leddy** | Valley Glen | CA |
| **Susan Shapira** | San Rafael | CA |
| **James Kirks** | Chico | CA |
| **Elaine Bierman** | San Diego | CA |
| **Erin Lynch** | Los Ageles | CA |
| **John Harris** | Bay Point | CA |
| **Holly Bohin** | Menlo Park | CA |
| **Michelle Mehlhorn** | Richmond | CA |
| **Michael C. Ford And Richard B. Marks** | Samudra@Charter.Net | CA |
| **Roz Goldstein** | Greenbrae | CA |
| **Regina Phillips** | Winnetka | CA |

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|---|---|---|
| **Jamila G.** | Petaluma | CA |
| **Katie Zukoski** | Chico | CA |
| **Kari Dougherty** | Palo Alto | CA |
| **Namita Dalal** | La | CA |
| **Dani Palomino** | Altadena | CA |
| **Crystal Riggleman** | Rancho Cordova | CA |
| **Janice Smith** | Granada Hills | CA |
| **Ellen Shively** | San Diego | CA |
| **Kevin O'Brien** | Laguna Beach | CA |
| **Jennifer Robins** | Huntington Beach | CA |
| **Vincent Messineo** | Sacramento | CA |
| **Patricia Quinn** | Palmdale | CA |
| **Patricia Quimby** | Los Angeles | CA |
| **Barbara Taps** | Lgunaniguel | CA |
| **Linda Ullrich** | San Diego | CA |
| **Paul P. Soucek** | Sherman Oaks | CA |
| **Rachael Johnson** | Rancho Santa Fe | CA |
| **Janet Murtha** | Oxnard | CA |
| **Linda Eberle** | Venice | CA |
| **Warren Gold** | Mill Valley | CA |
| **Sherry Vatter** | Los Angeles | CA |
| **Randi Johnson** | Topanga | CA |
| **Kris Muller** | Berkeley | CA |
| **Tami Armitage** | Studio City | CA |
| **Cheryl Bivens** | Buena Park | CA |
| **Mark Galbraith** | San Jose | CA |
| **Susan Alcott Jardine** | Sherman Oaks | CA |
| **Carol Long** | Santa Cruz | CA |
| **Martha Lyons** | Monterey Park | CA |
| **Richard And Carolyn Rosenstein** | Los Angeles | CA |
| **Alexandra Campbell** | Jamul | CA |
| **Allison Jones** | San Francisco | CA |
| **Tamara Cain** | Sacramento | CA |
| **Connie George** | San Francisco | CA |
| **Maria Holguin** | Alhambra | CA |
| **Jacquie Malette** | West Covina | CA |
| **Sandra Nealon** | Laguna Beach | CA |
| **Brian Armer** | Lemoore | CA |
| **Yvonne Davis** | San Diego | CA |
| **Kathleen Kuczynski** | Lake Forest | CA |
| **Kim Forrest** | Los Banos | CA |
| **Daryl And Elizabeth Lev** | Calabasas | CA |
| **Gregg Oelker** | Altadena | CA |
| **Pamela Hamilton** | Sacramento | CA |

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|---|---|---|
| **Georgia Brewer** | Sherman Oaks | CA |
| **Lisa Lashaway`** | Montrose | CA |
| **Bruce Mcgraw** | San Diego | CA |
| **Jan Gates** | Napa | CA |
| **Susan Cadman** | Vista | CA |
| **Maryann Lanew** | San Clemente | CA |
| **Ralph Bocchetti** | Fontana | CA |
| **Nanette Cronk** | Truckee | CA |
| **Judith S Anderson** | Long Beach | CA |
| **Richard Duran** | Chino | CA |
| **Selga Sanders** | Venice | CA |
| **Ken Hedges** | Lemon Grove | CA |
| **Kortney Lillestrand** | Laguna Beach | CA |
| **Sherry Guzzi** | Tahoe City | CA |
| **Renee Crump** | Fallbrook | CA |
| **Tammy Shaver** | Los Angeles | CA |
| **Amy Veloz** | Van Nuys | CA |
| **Penelope Prochazka** | Simi Valley | CA |
| **Rosy Morales** | Rancho Palos Verdes | CA |
| **Brad Steele** | Springville | CA |
| **Sherrill Futrell** | Davis | CA |
| **Julie Ostoich** | Sacramento | CA |
| **Debi Bergsma** | Fontana | CA |
| **Pollyana Harmon** | Torrance | CA |
| **Maria Gestuvo** | San Francisco | CA |
| **Renee Hutchins** | Pittsburg | CA |
| **Jean Gladstone** | Eureka | CA |
| **Lynn Kullas** | Twentynine Palms | CA |
| **Lori Kegler** | San Pedro | CA |
| **Barbara Greenwood** | Walnut Creek | CA |
| **Lori Caudill** | Los Osos, | CA |
| **Liane Rudberg** | Burbank | CA |
| **Lance Moseley** | Marina Del Rey | CA |
| **Barbara Poland** | La Crescenta | CA |
| **Mary Pat White** | Berkeley | CA |
| **Anita Simons** | La Jolla | CA |
| **Mark Rudningen** | Citrus Heights | CA |
| **Debra Atlas** | Redding | CA |
| **Cybele Wolf** | Soquel | CA |
| **Anne Kaeser** | San Jose | CA |
| **Deisha Garcia** | San Jose | CA |
| **Deborah Taylor** | San Jose | CA |
| **Susan Lilly** | Winnetka | CA |
| **Oliver Beqaj** | Venice | CA |

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| **Jason Warshawsky** | San Jose | CA |
| **Nancy Walker** | Glendale | CA |
| **Rebecca Frey** | Ukiah | CA |
| **Ian Turner** | Sacramento | CA |
| **Jena Reid** | Temecula | CA |
| **Joann Gerfen** | Santa Maria | CA |
| **Frank Andrews** | San Rafael | CA |
| **Dee Warenycia** | Roseville | CA |
| **Colin Donohue** | Fountain Valley | CA |
| **Geneg Golden** | Rancho Santa Margarita | CA |
| **Susan Maletsky** | Sonora | CA |
| **David Scharf** | Los Angeles | CA |
| **John Sefton** | Trabuco Canyon | CA |
| **Richard Steiger** | Oakland | CA |
| **William Keenan** | Salinas | CA |
| **Amrit Khalsa** | Redondo Beach | CA |
| **Sandy Esque** | San Clemente | CA |
| **Yvette Doublet-Weislak** | Morgan Hill | CA |
| **Brian Florian** | Beverly Hills | CA |
| **Roberto Romo** | San Francisco | CA |
| **Mickey Mccarthy** | San Francisco | CA |
| **Virginia Stewart Carton** | Orinda | CA |
| **M Ross** | San Rafael | CA |
| **Mariyn Livote** | Buena Park | CA |
| **David Adams** | Penn Valley | CA |
| **Meredith Gold** | Glendale | CA |
| **Samuel Twobears** | Windsor | CA |
| **Mary Izett** | Walnut Creek | CA |
| **Kyle Petlock** | Los Angeles | CA |
| **Christina Chang** | Newport  Beach | CA |
| **Gina Crane** | Tehachapi | CA |
| **Joe Weis** | Reedley | CA |
| **Gabriela Till** | San Diego | CA |
| **Sheila Peterson** | Fallbrook | CA |
| **Miranda Todd** | Redondo Beach | CA |
| **Tj Kenny** | San Jose | CA |
| **Leslie Williams** | El Cajon | CA |
| **Stephen Rebello** | Los Angeles | CA |
| **James Bigger** | San Diego | CA |
| **Diane Stewart** | San Pablo | CA |
| **Jenny Boris** | Fremont | CA |
| **N Macaluso** | Rancho Santa Fe | CA |
| **Antonio Buensuceso** | Poway | CA |
| **Lisa Annecone** | Santa Rosa | CA |

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|---|---|---|
| **Stephen Thompson** | Ben Lomond | CA |
| **Jennifer Crum** | La Mesa | CA |
| **Rebecca Aguirre** | Los Angeles | CA |
| **James Talbot** | Granada Hills | CA |
| **Phillip Randall** | Woodland Hills | CA |
| **Vince Harper** | Orange | CA |
| **Chris Spanos** | La | CA |
| **Dr. George B. Kauffman** | Fresno | CA |
| **Angela Black** | Long Beach | CA |
| **Andree Armand** | Venice | CA |
| **Samuel Popailo** | West Hollywood | CA |
| **Barbara Frazer** | Sacramento | CA |
| **April Singh** | Fresno | CA |
| **Gilia Humrich** | Forestville | CA |
| **Francine Larstein** | Watsonville | CA |
| **Mark Feldman** | Santa Rosa | CA |
| **Michele Coakley** | Rancho Cordova | CA |
| **Alison Dayne Frankel** | Tarzana | CA |
| **David Broadwater** | Atascadero | CA |
| **Josephine Hamilton** | Windsor | CA |
| **Gina Bilwin** | Santa Barbara | CA |
| **Britt Lind** | Thousand Oaks | CA |
| **Richard Desantis** | Palm Desert | CA |
| **Malc Moore** | Portola | CA |
| **Jacki Hunter** | Hollywood | CA |
| **Tim Swanson** | Torrance | CA |
| **Nancy Goldberg** | Los Angeles | CA |
| **Edward Goral** | Montrose | CA |
| **Jed Holtzman** | San Francisco | CA |
| **Geoffrey Gallegos** | San Francisco | CA |
| **Laurie Eisler** | Cotati | CA |
| **Vanessa Hemlock** | Pacifica | CA |
| **Andrew Olsen** | Los Angeles | CA |
| **Joli Bennett** | Pacifica | CA |
| **Deb Pierce** | San Francisco | CA |
| **Lynne Weiske** | Losangeles | CA |
| **Naila Sanchez** | Sacramento | CA |
| **John Lamb** | Sierra Madre | CA |
| **Arleen Whitmore** | San Anselmo | CA |
| **Leslee Mcpherson** | San Mateo | CA |
| **Cammi Pierre** | Glendora | CA |
| **Walter Ramsey** | Oakley | CA |
| **Marietta Hayes** | Encino | CA |
| **Nancy Miller** | Santa Maria | CA |

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|---|---|---|
| **Larry Blood** | Santa Cruz | CA |
| **Charles Almack** | Calexico | CA |
| **Marcia Dale-Lewinter** | San Francisco | CA |
| **Arthur Connor** | Idyllwild | CA |
| **Chyrl A. Russell** | Lake Arrowhead | CA |
| **Marina Munoz** | Hollywood | CA |
| **Janet Williams** | Oakland | CA |
| **Jitka Valkova** | San Francisco | CA |
| **Bonnie Dombrowski** | Pasadena | CA |
| **Lynda Harrison** | Sacramento | CA |
| **Jane Drexler** | Solvang | CA |
| **Balfour Gerber** | San Francisco | CA |
| **Jessica Beaudry** | Petaluma | CA |
| **Chad Johnson** | Long Beach | CA |
| **Susan Hanger** | Topanga | CA |
| **Robert Thomas** | San Francisco | CA |
| **Vinit Allen** | Hidden Valley Lake | CA |
| **Martin Ansell** | West Hollywood | CA |
| **Sarah Murdoch** | Pac. Pal. | CA |
| **Daniel Blum** | Gilroy | CA |
| **Anne Kobayashi** | San Diego | CA |
| **Holly Hall** | Temecula | CA |
| **Brett Holland** | Los Angeles | CA |
| **Christine Walker** | Stanton | CA |
| **Tami Phelps** | Redding | CA |
| **Amber Wallace** | Costa Mesa | CA |
| **Alexander Yeung** | Clovis | CA |
| **Robert Davis** | San Diego | CA |
| **Laura Manning** | Goleta | CA |
| **Charlotte Vrooman** | Losangeles | CA |
| **John Wiesner** | Castro Valley | CA |
| **Elizabeth Taylor** | Encinitas | CA |
| **Richard Burnett** | Sunnyvale | CA |
| **Ernest Ely** | San Francisco | CA |
| **Cecilia Brown** | Oakland | CA |
| **Gail Mccredie** | Aptos | CA |
| **Sean Ray** | Los Angeles | CA |
| **Cynthia Flewelling** | Cool | CA |
| **Betty Gaines** | Antioch | CA |
| **C G** | Sd | CA |
| **James Vollaro** | Lake Elsinore | CA |
| **Benjamin Schlau** | Los Angeles | CA |
| **Denise Oliver** | Nevada City | CA |
| **Abraham H** | La Puente | CA |

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|---|---|---|
| **Nancy Dix** | La Jolla | CA |
| **Frank Ortiz** | Los Angeles | CA |
| **Sifredo Galdamez** | Oakland | CA |
| **Darren Frale** | Los Angeles | CA |
| **Mary Tullock** | Rohnert Park | CA |
| **Shoshanah Mcknight** | Santa Cruz | CA |
| **Francie Mitchell** | Alamo | CA |
| **Charles Schaffer** | Healdsburg | CA |
| **David Ruger** | Los Angeles | CA |
| **Nicole Dunlap** | Port Hueneme | CA |
| **Ernest Boyd** | Sunnyvale | CA |
| **J Angell** | Rescue | CA |
| **Chris Mills** | Needles | CA |
| **A Tung** | Newbury Park | CA |
| **Nikki Doyle** | Oakland | CA |
| **Kenneth Miller** | Topanga | CA |
| **John Sutton** | Los Angeles | CA |
| **Jeanne Ewy** | Oakland | CA |
| **A. M. Miller** | Sunnyvale | CA |
| **M Sanders** | Petaluma | CA |
| **Nancy Mead** | Santa Cruz | CA |
| **John Kohler** | Daly City | CA |
| **Kirstyn Kay** | Riverside | CA |
| **Lynne Harkins** | Cambria | CA |
| **Randy Herz** | San Jose | CA |
| **Jerry Clymo** | Union City | CA |
| **Lew Douglas** | Oakland | CA |
| **Cheryle Steele** | La Habra | CA |
| **Wendy Derbort** | Redlands | CA |
| **Ma Garcia** | Noho | CA |
| **A.L. Hern** | Los Angeles | CA |
| **Kathryn Gallagher** | San Anselmo | CA |
| **S S** | Cv | CA |
| **Francesca Bolognini** | Cambria | CA |
| **Steve Roth** | Santa Rosa | CA |
| **Katherine Wagner** | Studio City | CA |
| **Sue Knight** | Long Beach | CA |
| **Linda Knight** | Kenwood | CA |
| **Margo Krindel** | San Francisco | CA |
| **Pamala Thomas** | Santa Monica | CA |
| **Michelle Miranda** | Santa Cruz | CA |
| **Meaghan Simpson** | Fortuna | CA |
| **Denise Bowland** | Lake Elsinore | CA |
| **Terryll Rainey** | San Francisco | CA |

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| **Caitlin Strom-Martin** | Sebastopol | CA |
| **Andy Philpot** | Solvang | CA |
| **Beth Orlik** | Orange | CA |
| **Sarah Forester** | Bakersfield | CA |
| **Jody Hansell** | Emeryville | CA |
| **Debbie Sturt** | Marina | CA |
| **Julie Du Bois** | West Hills | CA |
| **Hali Rederer** | Sacramento | CA |
| **Mary Riblett** | Culver City | CA |
| **Iris Chynoweth** | Midpines | CA |
| **Catherine George** | Napa | CA |
| **Joel Despas** | Castro Valley | CA |
| **Oliver Osborn** | Corte Madera | CA |
| **Joel Masser** | San Jose | CA |
| **Michael Taaffe** | Lompoc | CA |
| **Diane Carney** | Sacramento | CA |
| **Carol Kuelper** | Oakland | CA |
| **Alan Schenck** | Sunnyvale | CA |
| **Thomas Masterson** | Chico | CA |
| **Elizabeth Shore** | San Anselmo | CA |
| **Mike Clipka** | Lathrop | CA |
| **Idajane Dalpino** | Corte Madera | CA |
| **Maureen Mannion** | Santa Rosa | CA |
| **Jennifer Fraissl** | Morgan Hill | CA |
| **Martha Muller** | Long Beach | CA |
| **Kim Peterson** | Cloverdale | CA |
| **Erin Suyehara** | Torrance | CA |
| **Debra Hunt** | Pasadena | CA |
| **Wendy Kupsaw** | Oakland | CA |
| **James Mickle** | Sacramento | CA |
| **Lisa Jensen** | Santa Cruz | CA |
| **Teresa Edmonds** | Carmel Valley | CA |
| **Glenn Embrey** | Redondo Beach | CA |
| **Maia De Raat** | San Francisco | CA |
| **Barbara Jane Harpe** | Lomita | CA |
| **Kathleen Ostridge** | West Hollywood | CA |
| **Janet Eyre** | San Francisco | CA |
| **Ron Kutch** | San Jose | CA |
| **William Crandall** | Hesperia | CA |
| **Bob Miller** | Woodland Hills | CA |
| **Carole Miller** | Los Angeles | CA |
| **Miriam Neff** | Laguna Niguel | CA |
| **Richard B Maselow, Cpa, Cgma** | Encino | CA |
| **Joan Andersson** | Topanga | CA |

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| **Jennifer Will** | Morgan Hill | CA |
| **Sharie Foster** | Tujunga | CA |
| **Carol Maehr** | Monterey | CA |
| **Steve Parmenter** | Bishop | CA |
| **Sarbi Anand** | Concord | CA |
| **Rosalind Milliken** | Indio | CA |
| **Kathleen Taugher** | Sonoma | CA |
| **Marilyn Shepherd** | Trinidad | CA |
| **Edith Ogella** | Santa Barbara | CA |
| **Bina Israni** | South San Francisco | CA |
| **Jana Perinchief** | Sacramento | CA |
| **Gretchen Vogel** | San Francisco | CA |
| **Glenn Pritchard** | Eureka | CA |
| **Hal Forsen** | San Clemente | CA |
| **George Loveday** | Grass Valley | CA |
| **Michal Lynch** | Santa Barbara | CA |
| **Vicki Kopinski** | Menifee | CA |
| **Sharon Haywood** | Laguna Beach | CA |
| **Trevolyn Haines** | Chino Hills | CA |
| **Geoffrey Collins** | Garden Grove | CA |
| **Ana Kirola** | San Francisco | CA |
| **Landry Wildwind** | El Cerrito | CA |
| **Joy Zadaca** | Long Beach | CA |
| **Luise Perenne** | Fountain Valley | CA |
| **Darlene Lovell** | Bakersfield | CA |
| **L R** | La | CA |
| **Mark Mazhnyy** | Fresno | CA |
| **Robert Teister** | Sonoma | CA |
| **Michael Tomlinson** | Sacramento | CA |
| **Brad Rae** | Lake Forest | CA |
| **Scott Douglas Laxier** | Pacific Grove | CA |
| **John Marzich** | Arroyo Grande | CA |
| **Christy Schauf** | San Francisco | CA |
| **Bradford Martin** | Redlands | CA |
| **Jeri Langham, Ph.D.** | Sacramento | CA |
| **Nancy Petersen** | Claremont | CA |
| **Denise Wright** | Los Angeles | CA |
| **John Stallone** | San Jose | CA |
| **Jo Ann Henderson** | Aptos | CA |
| **Mara Johnson** | Lafayette | CA |
| **Susan Bullen** | San Rafael | CA |
| **Erica Lann-Clark** | Soquel | CA |
| **Hugo Mira** | Los Angeles | CA |
| **Nancy Dopp** | Beaumont | CA |

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| **Kait Ferrall** | Mountain View | CA |
| **Michael Decker** | Los Angeles | CA |
| **Michael Harrington** | Granite Bay | CA |
| **Susan Mcmullen** | Lemon Grove | CA |
| **Elaine Holder** | San Luis | CA |
| **Melissa Dalzell** | Magalia | CA |
| **Diana Duncan** | Santa Monica | CA |
| **Laurie Garrett** | Fairfax | CA |
| **Kristy Asao** | Monrovia | CA |
| **Jim Miller** | Carlsbad | CA |
| **Cody Walters** | Bakersfield | CA |
| **Joan Borame** | El Cerrito | CA |
| **Dan Nickerson** | North Hollywood | CA |
| **Rhonda Lynn** | Sacramento | CA |
| **Jay Baum** | Los Angeles | CA |
| **Karen Garnett** | Sacramento | CA |
| **Barbara Crane** | Healdsburg | CA |
| **Janet Mclaughlin** | Rancho Santa Fe | CA |
| **Alan Cunningham** | Carmel Valley | CA |
| **Eric Svenson** | Watsonville | CA |
| **Alan Carlton** | Alameda | CA |
| **Howard Miller** | Ventura | CA |
| **Patrice Curedale** | Topanga | CA |
| **Georgia Carver** | Rancho Cordova | CA |
| **Stephen Bartlett-Re** | San Francisco | CA |
| **Madge Miller** | Tustin | CA |
| **Kelly Brannigan** | Fresno | CA |
| **Jorge Velez** | San Jose | CA |
| **Kenneth Martin** | Oakland | CA |
| **R Miles Mendenhall** | Sonora | CA |
| **Esther Chavez** | Northridge | CA |
| **Patricia Savage** | Mammoth Lakes | CA |
| **Earl Kuon** | Oceanside | CA |
| **Virginia Sharkey** | Santa Rosa | CA |
| **Michelle Marsico** | Torrance | CA |
| **Chris Candell** | Oakland | CA |
| **Leanna Sharp** | Los Angeles | CA |
| **Dorothy Shelley** | Napa | CA |
| **Alice Welchert** | Los Osos | CA |
| **Sherryann Pardee** | Riverside | CA |
| **Alexis Carter** | Torrance | CA |
| **Tami Mccready** | Simi Valley | CA |
| **Linda Stock** | Cypress | CA |
| **Benita Cohen** | Desert Hot Springs | CA |

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| **Nicholas Frangakis** | West Hollywood | CA |
| **Holly Photenhauer** | Los Angeles | CA |
| **Caroline Ko** | Livermore | CA |
| **Wendy Raymond** | Monrovia | CA |
| **Marty Bostic** | La | CA |
| **Nathan Myers** | Davis | CA |
| **Mary Harte** | Berkeley | CA |
| **Martha Hunkins** | Arcata | CA |
| **Anna Cottle** | Santa Claita | CA |
| **Gerald Stratman** | Glen Ellen | CA |
| **Lynn Camhi** | Petaluma | CA |
| **Malka Essig** | Oakley | CA |
| **Verna Winters** | Berkeley | CA |
| **Carol Ruth** | Stanford | CA |
| **Glenn Ross** | Eureka | CA |
| **Janet Mc Entee** | San Jose | CA |
| **Joann Fuller** | Santa Rosa | CA |
| **Connie Beck** | El Cajon | CA |
| **Jennifer Valentine** | Sherman Oaks | CA |
| **Candace Rocha** | Los Angeles | CA |
| **Christina Burton** | Apple Valley | CA |
| **Dana Monroe** | San Diego | CA |
| **Cynthia Ratliff** | Santa Cruz | CA |
| **Ian Jewett** | Freshwater | CA |
| **Richard & Amelia Hill** | Oceanside | CA |
| **Robert Hicks** | Long Beach | CA |
| **Lala Stanley** | San Francisco | CA |
| **Darcy Abrahams** | San Diego | CA |
| **Linda B.** | Pasadena | CA |
| **Katherine Rykowski** | Desert Hot Springs | CA |
| **Jill Hartman** | Simi Valley | CA |
| **Bryan Bergstrand** | Fortuna | CA |
| **Cecilia Mcghee** | Bodega Bay | CA |
| **Ben Cachola** | Union City | CA |
| **Gail Lusson** | Los Angeles | CA |
| **Josephine Polifroni** | Danville | CA |
| **Sheila Wyse** | Sherman Oaks | CA |
| **David Isaac** | Livermore | CA |
| **Steven Fitzgerald** | Oakland | CA |
| **Jane Affonso** | Redondo Beach | CA |
| **Sean O'Day** | Corte Madera | CA |
| **Carole Sipos** | Marina Delrey | CA |
| **Julia Frisk** | Plumas Lake | CA |

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| **Richard Date** | Santa Clara | CA |
| **Mark Locke** | Simi Valley | CA |
| **Maureen Burness** | Sacramento | CA |
| **Carol Mcrae** | Fairfax | CA |
| **Jessica Wodinsky** | Los Angeles | CA |
| **Phillip Cripps** | Cathedral City | CA |
| **Patricia J. Crother** | Los Angeles | CA |
| **Lena T. Hansen** | Monte Nido | CA |
| **Constance Walker** | San Francisco | CA |
| **David Pinckard** | Martinez | CA |
| **Sandra Reynolds** | Windsor | CA |
| **Rich Perez** | Torrance | CA |
| **Hector Garcia** | Los Angeles | CA |
| **Melissa Bryan** | Half Moon Bay | CA |
| **Lorna Buratto** | Carlsbad | CA |
| **Naomi Gilmore** | Sacramento | CA |
| **Nicole D. Bilotti** | San Francisco | CA |
| **Stan Watt** | San Jose | CA |
| **Claudy Assalit** | Monterey | CA |
| **Maureen Mehler** | Laguna Woods | CA |
| **Kimberly Jannarone** | San Francisco | CA |
| **Michelle Davis** | Vacaville | CA |
| **Gretchen Sauer** | San Leandro | CA |
| **Anthonyh Arn** | West Hollywood | CA |
| **Jenna Peterson** | Inverness | CA |
| **Gail Blumberg** | Santa Cruz | CA |
| **Janice Vieth** | Covina | CA |
| **Jennifer Jensen** | Canyon Country | CA |
| **Sarah Natalini** | Los Angeles | CA |
| **Deb Ebling** | Santa Rosa | CA |
| **Alison Barratt** | Monterey | CA |
| **Marian Tarbox** | La Mesa | CA |
| **Patrick Kruse** | La Mesa | CA |
| **Jake O'Rourke** | Loomis | CA |
| **Jeff Vandenburgh** | Huntington Beach | CA |
| **S. S** | Oakland | CA |
| **Josh Wolf** | Half Moon Bay | CA |
| **Cindy Koch** | Long Beach | CA |
| **Patti Shea** | Bay Point | CA |
| **Amelia Gonzalez** | Piru | CA |
| **Seana Graham** | Santa Cruz | CA |
| **Donna J Wagner** | Pacifica | CA |
| **Michael Williams** | Antioch | CA |
| **Daniel Stephenson** | Shingle Springs | CA |

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| **Patty Harrison** | Novato | CA |
| **Brent Riggs** | Inglewood | CA |
| **Lindy Tillement** | Rio Linda | CA |
| **Pavel Jedlicka** | Costa Mesa | CA |
| **Kelley Lamke** | Santa Rosa | CA |
| **Howard Leonard** | Petaluma | CA |
| **Colleen Auernig** | Folsom | CA |
| **Courtney Gartin** | San Jose | CA |
| **Raquel Sanchez** | Escondido | CA |
| **Vic And Barby Ulmer** | Saratoga | CA |
| **Carrie Ousley** | Oakland | CA |
| **Ron Price** | Ontario | CA |
| **Mike Weiss** | Benicia | CA |
| **Robert Furst** | Joshua Tree | CA |
| **Rick Burns** | Petaluma | CA |
| **Alice Labay** | Benicia | CA |
| **Richard Montgomery** | San Francisco | CA |
| **Irene Sriboonwong** | Walnut | CA |
| **Bruce Hudson** | Redondo Beach | CA |
| **Holly Evans** | Studio City | CA |
| **Freda Salatino** | Felton | CA |
| **Anne Benveniste** | Felton | CA |
| **Mark Hansen** | Oakland | CA |
| **Meta Ellis** | Morongo Valley | CA |
| **Alecia Morgan** | Felton | CA |
| **Mrs. Sonya Garbutt** | Davis | CA |
| **Maria Perales** | Alameda | CA |
| **Alex Anshus** | Escondido | CA |
| **Nadine Cano** | Van Nuys | CA |
| **Jose Arteaga** | Los Angeles | CA |
| **Alfredo Barroso Ruiz** | San Diego | CA |
| **Marcia Taylor** | Yorba Linda | CA |
| **Jim Lansing** | San Francisco | CA |
| **John Teevan** | Chula Vista | CA |
| **Bob Kurz** | Laguna Niguel | CA |
| **Sally Kurz** | Laguna Niguel | CA |
| **Janet Pielke** | Claremont | CA |
| **Richard Weiss** | Thousand Oaks | CA |
| **Diana Barbee** | Calabasas | CA |
| **Dorina Solymar** | Los Angeles | CA |
| **Helen Babcock** | Ventura | CA |
| **Linda Mitchell** | San Rafael | CA |
| **Gina Anson** | Orange | CA |

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| **Garth Murphy** | Encinitas | CA |
| **Chelsea Eng** | San Francisco | CA |
| **Tami Petty** | Lake View Terrace | CA |
| **Joelle Porter** | Susanville | CA |
| **Julie Jumonville** | San Francisco | CA |
| **Brian Von Dedenroth** | Camarillo | CA |
| **M Gosline** | Oakland | CA |
| **Suzan Newman** | Green Valley | CA |
| **Sharon Salisbury** | Mill Valley | CA |
| **Tina Overland** | Leucadia | CA |
| **Julie Fisher** | Encinitas | CA |
| **Charlotte Sonoda** | Berkeley | CA |
| **Nancy Ives** | Oceanside | CA |
| **Kate Ashley** | Redwood City | CA |
| **Yves Decargouet** | Sebastopol | CA |
| **Cristian Contreras** | Bell | CA |
| **Peggy Sharp** | Marina | CA |
| **Shayna Bailey** | Atascadero | CA |
| **Zelma Fishman** | Los Osos | CA |
| **Victoria Miller** | Encino | CA |
| **Gregg Johnson** | San Jose | CA |
| **Vincent Louie** | San Francisco | CA |
| **Koorosh Hahidzadeh** | San Jose | CA |
| **Phyllis Gifford** | Rio Linda | CA |
| **Clare Kelemen** | Carlsbad | CA |
| **Stephen Weitz** | Oakland | CA |
| **Anne Huber** | Los Gatos | CA |
| **Elaine Brandt** | Venice | CA |
| **Tom Falvey** | San Diego | CA |
| **Maxine Williams-Gboizo** | Santa Monica | CA |
| **Erin Lindquist** | Carlsbad | CA |
| **Chris Anderson** | Lafayette | CA |
| **Eva Adamyan** | Los Angeles | CA |
| **Rev Gregory Yaroslow** | Redlands | CA |
| **Lee Jenkinson** | Canyon Country | CA |
| **Shana Doverspike** | Bakersfield | CA |
| **Beatriz Pallanes** | Santa Ana | CA |
| **Jennifer Sellers** | Concord | CA |
| **Peter Gaposchkin** | Berkeley | CA |
| **James Cray** | Desert Hot Springs | CA |
| **Matthew Davila** | Modesto | CA |
| **Connie Kirkham** | Concord | CA |
| **Faith Strailey** | Quincy | CA |

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| **Anne Wayman** | National City | CA |
| **Max Kaehn** | Sunnyvale | CA |
| **Vanessa Santarsiero** | Oakland | CA |
| **Gail Alford** | Santa Rosa | CA |
| **Noah Evans** | Mill Valley | CA |
| **Danielle Richardson** | Rialto | CA |
| **Vincenza Baldino** | Vallejo | CA |
| **Allyson Frye-Henderson** | Del Mar | CA |
| **Nancy Barcellona** | Los Angeles | CA |
| **Alicia Salazar** | Los Angeles | CA |
| **Ernie Walters** | Union City | CA |
| **Anne Lyon** | Cotati | CA |
| **Kyle Ashby** | Los Angeles | CA |
| **Norm Ellis** | Laguna Hills | CA |
| **Sharon Porter** | Paradise | CA |
| **Nancy Treffry** | Aromas | CA |
| **Pat Smith** | Boulder Creek | CA |
| **Joseph Rhoades** | Vacaville | CA |
| **Clayton Berling** | Carmel | CA |
| **George Latta, M.D., Mba** | Visalia | CA |
| **David Marott** | Simi Valley | CA |
| **Laura Leifer** | Santa Ynez | CA |
| **Joanna Welch** | Eureka | CA |
| **Thomas Schweickart** | Studio City | CA |
| **Dennis Ruffer** | Santa Clara | CA |
| **Kazuko Mitose** | San Diego | CA |
| **Jose Luis** | Chula Vista | CA |
| **Justin Toledo** | San Diego | CA |
| **Gerit Perry** | Palm Desert | CA |
| **Michael Reardon** | Guerneville | CA |
| **Jay Atkinson** | El Sobrante | CA |
| **Merrilee Morgan** | Carlsbad | CA |
| **Michael Lipinski** | San Mateo | CA |
| **Jamie Green** | Ventura | CA |
| **Kat H.** | Sanger | CA |
| **Dan Miner** | Long Beach | CA |
| **Kirk Walser** | Modesto | CA |
| **Jessica C. Kroontje** | Modesto | CA |
| **Paula Thompson** | San Diego | CA |
| **Timothy Ryan** | Capistrano Beach | CA |
| **Tom Pitman** | Burbank | CA |
| **Phyllis Holliday** | San Francsco | CA |
| **Raymond Marshall** | Foresthill | CA |
| **Maria Bon** | Simi Valley | CA |

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| **Lisa Ann Kelly & Family** | Santa Barbara | CA |
| **Michelle Huang** | Monterey Park | CA |
| **Tessa Williamson** | Canyon Country | CA |
| **Carol Altavilla** | Woodland | CA |
| **Constantine Bogios** | Walnut Creek | CA |
| **L.M. Ashley** | Sacramento | CA |
| **Luis Garcia** | Garcia | CA |
| **Mark Armen** | Santa Ana | CA |
| **Barbara Britton** | Pleasant Hill | CA |
| **Russell Symonds** | Costa Mesa | CA |
| **Maris Bennett** | Antioch | CA |
| **Alexandra Karlinski** | Newport Beach | CA |
| **David P** | Culver City | CA |
| **Shari Amos** | Sacramento | CA |
| **Kate Ague** | Menlo Park | CA |
| **Debra Todd** | Citrus Heights | CA |
| **Robin Vantassell** | San Rafael | CA |
| **Walter Santucci** | Los Angeles | CA |
| **S Nicola** | Los Angeles | CA |
| **Linda Reuter** | Pasadena | CA |
| **Jane Nichol** | Encino | CA |
| **Samantha Tabak** | La | CA |
| **Bruce Keegan** | San Francisco | CA |
| **Carla Kitchen** | Posey | CA |
| **Gabriel Peralta** | El Segundo | CA |
| **Annemarie Call** | San Jose | CA |
| **Elizabeth Milliken** | St. Helena | CA |
| **Lori Haage** | Montclair | CA |
| **Dulce Twist** | San Diego | CA |
| **Kelley Akin** | San Francisco | CA |
| **Ken Hoag** | El Cerrito | CA |
| **Paul Meehan** | Ventura | CA |
| **Barbara Bersell** | Los Ã¡Ngeles | CA |
| **Roswitha Baughman** | San Clemente | CA |
| **Lehua Kane** | Fallbrook | CA |
| **Stanford Crane** | San Jose | CA |
| **James Lowman** | San Bernardino | CA |
| **Cecelia Faigin** | Granada Hills | CA |
| **Ivan Lacore** | Cayucos | CA |
| **Angie Deng** | Davis | CA |
| **Candace Wilhelm** | Redwood City | CA |
| **Thomas Pick** | L.A. | CA |
| **Rene Alvarez** | Tecate | CA |
| **Frances Luevano** | Woodland | CA |

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| **Jef Cameron-Hawkins** | San Francisco | CA |
| **Lola Lynch** | Port Hueneme | CA |
| **Michael Whicker** | Sacramento | CA |
| **Judith Richey** | Discovery Bay | CA |
| **Robert Husbands** | San Diego | CA |
| **Angelica Gomez** | Los Angeles | CA |
| **Malcolm Elgut** | Simi Valley | CA |
| **Clare Block** | San Diego | CA |
| **Belinda Smith** | Anaheim | CA |
| **Irene Brown** | Los Altos | CA |
| **Mary Johnston** | San Jose | CA |
| **Joyce Kolasa** | Springville | CA |
| **Anneliese Monnes** | Monterey | CA |
| **Robert Paskus** | Santa Monica | CA |
| **Gayle Noble** | Boulder Creek | CA |
| **Elena Ennouri** | Redwood City | CA |
| **Ron Jacob** | San Jose | CA |
| **Linda Tabb** | North Hills | CA |
| **Cheryl Chase** | Stockton | CA |
| **Simone Boudriot** | Tujunga | CA |
| **Amanda Holland** | Davis | CA |
| **Roberta Stern** | Oakland | CA |
| **Thea Doty** | Sebastopol | CA |
| **Benjamin Sawicki** | Emeryville | CA |
| **Kimberly Fowler** | San Ramon | CA |
| **Eugene Bunch** | Alameda | CA |
| **Luis Fuentes** | San Diego | CA |
| **Barbara Messer** | Ventura | CA |
| **Thomas Turney** | Mendocino | CA |
| **Joanne Hattum** | Diablo | CA |
| **Steve Crase** | Antioch | CA |
| **Cathy Castro** | Long Beach | CA |
| **Rene Pineda** | Hollywood | CA |
| **William Mittig** | Mariposa | CA |
| **Jo Kenney** | La Canada | CA |
| **Brian Flores** | San Diego | CA |
| **Sergio Quezada** | Rancho Cucamonga | CA |
| **Mike Panza** | Canoga Park | CA |
| **Moriah Woolworth** | Cupertino | CA |
| **Samara Hanson Velloo** | Petaluma | CA |
| **Margery Gray** | San Francisco | CA |
| **Nicole Orestano** | Healdsburg | CA |
| **David Barrymore** | Redwood City | CA |
| **Gina Freitas** | San Diego | CA |

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| **Brad Nelson** | Oxnard | CA |
| **Greg Goodmacher** | Carlsbad | CA |
| **Leigh Clark** | Granada Hills | CA |
| **Maureen Oshea** | San Francisco | CA |
| **Ward Mccreery** | Yucaipa | CA |
| **Susan Ryan** | Santa Rosa | CA |
| **Eric Rosenberg** | San Diego | CA |
| **Steven Wong** | Cupertino | CA |
| **Josh Carman** | Forestville | CA |
| **James Mccluskey** | Watsonville | CA |
| **Laura Jensen** | Modesto | CA |
| **Virginia Krutilek** | Alameda | CA |
| **Paul Mcneely** | Pasadena | CA |
| **Nazlee Ghannadi** | Valencia | CA |
| **Rich Waters** | Culver City | CA |
| **Neal Steiner** | Los Angeles | CA |
| **Marjorie David** | Venice | CA |
| **Karina Oleynikov** | Van Nuys | CA |
| **Ana Hall** | Stockton | CA |
| **Tiffany Cooper** | Gardena | CA |
| **Lisa Nelson Colton** | Los Angeles | CA |
| **Ani Aslanian** | Tujunga | CA |
| **Katie Levine** | San Francisco | CA |
| **Gerhard Eckardt** | Stockton | CA |
| **Leslie Andrews** | Santa Cruz | CA |
| **Emilio Verdugo** | Los Angeles | CA |
| **Ricardo Abreu** | Long Beach | CA |
| **Querido Galdo** | Oakland | CA |
| **Mary Ingraham** | Oceanside | CA |
| **Coralie Carraway** | Auburn | CA |
| **Lisa Hoivik** | Monterey | CA |
| **Gary Hileman** | Hesaperia | CA |
| **Robert Ortiz** | Novato | CA |
| **John Mora** | El Sobrante | CA |
| **Charles Skip"" Wilkins** | Pacific Grove | CA |
| **Lowell Young** | Mariposa | CA |
| **Suzanne Sutton** | Stinson Beach | CA |
| **Scott Kaminski** | San Leandro | CA |
| **Kristy Andres** | Oakland | CA |
| **Kenneth Lum** | Sacramento | CA |
| **Jeff Pantukhoff** | San Clemente | CA |
| **Eleni Psyllos** | San Diego | CA |
| **Jordan Briskin** | Palo Alto | CA |

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| **Gina Matteucci** | Sacramento | CA |
| **Adolfo Camacho Humphrey** | Santa Cruz | CA |
| **Jeff Rasmussen** | Westminster | CA |
| **Thomas Pecore** | Fallbrook | CA |
| **Susana Ramirez** | Riverside | CA |
| **Sharyn Watt** | Fairfield | CA |
| **Shaina Lerner** | Oakland | CA |
| **Sara Fogan** | Santa Clarita | CA |
| **Katharine Kehr** | Sebastopol | CA |
| **David Ruiz** | Antelope | CA |
| **George Hummel** | Rosemead | CA |
| **S. Cutuli** | Los Angeles | CA |
| **Steve Yaffee** | Long Beach | CA |
| **Jeff Johansen** | Fresno | CA |
| **Liga Worthington-May** | San Francisco | CA |
| **Matthew Trbovich** | Los Angeles | CA |
| **Terry Banister** | Westlake Village | CA |
| **C Lascala** | La Mesa | CA |
| **Thomas Marinello** | Los Angeles | CA |
| **Karl M. Levin** | Canoga Park | CA |
| **Elizabeth Jache** | Lemon Grove | CA |
| **Jim Petkiewicz** | San Jose | CA |
| **Bernice Precourt** | Riverside | CA |
| **Mark Crane** | Elk Grove | CA |
| **Ana Menjivar** | Santa Monica | CA |
| **Cynthia Mannion** | Boulder Creek | CA |
| **Cathy Cousins** | North Hollywood | CA |
| **Sam Romero** | Stkn. | CA |
| **Kasey Konkel** | Laguna Beach | CA |
| **Kathleen Ryan** | Lakewood | CA |
| **Christine Halley** | Irvine | CA |
| **Stacey Sklute** | Los Angeles | CA |
| **Robert Burton** | Fowler | CA |
| **Lynnette Barrera** | La Grange | CA |
| **Claudia Afonso** | El Macero | CA |
| **Jeff Nadler** | Oceanside | CA |
| **Karsson Bartlett** | San Rafael | CA |
| **Cassi Goldsmith** | San Luis Obispo | CA |
| **Julie Harris** | Los Angeles | CA |
| **Ellis Heyer** | San Rafael | CA |
| **Drs. Hilary & Derre;; Lorraine-Chambers** | Kensington | CA |
| **Nonie Batra** | Beverly Hills | CA |
| **Victor De Vlaming** | Sacramento | CA |

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| **Karen Erickson** | San Jose | CA |
| **Marco Pizzo** | Long Beach | CA |
| **Gilly Lloyd** | San Francisco | CA |
| **Ruth Beckner** | Los Gatos | CA |
| **Susan Ferraro** | Copperopolis, CA 95228 | CA |
| **S O'Neill** | Berkeley | CA |
| **Odelkis Barrera** | Montclair | CA |
| **James Harris** | Stanford | CA |
| **Paula Swanson** | Sebastopol | CA |
| **Barbara Greene** | Winnetka | CA |
| **Inna Habelski** | Castro Valley | CA |
| **Jessica Robie** | San Diego | CA |
| **Peter Garber** | South Lake Tahoe | CA |
| **Blaise Gauba** | Torrance | CA |
| **Bruce Hirayama** | Los Angeles | CA |
| **Mariel Morison** | Blue Lake | CA |
| **Yvetta Williams** | Rancho Palos Verdes | CA |
| **Gayle Cerri** | San Francisco | CA |
| **Margaret T.M. Petkiewicz** | San Jose | CA |
| **Steve & Benita Benitez** | Richmond | CA |
| **Zoe Huang** | Oakland | CA |
| **Isabel Charleston** | North Hollywood | CA |
| **Charlotte Martinez** | Studio City | CA |
| **Ramona Zulch** | Palo Alto | CA |
| **Sheri Rollison** | Novato | CA |
| **Nancy Riggleman** | Tollhouse | CA |
| **Saundra Holloway** | El Cajon | CA |
| **Geoffrey Cook** | Berkeley | CA |
| **R Cox** | Venicecox Entice | CA |
| **Gregg Norman** | Santa Monica | CA |
| **Frances Martin** | Carmel | CA |
| **Anika Taylor-Cohen** | Portola Valley | CA |
| **Helen Dickey** | El Cerrito | CA |
| **William De Goff, M.D. And Family** | San Francisco | CA |
| **Constantine Lackides** | Ben Lomond | CA |
| **Kit Ho** | Rodeo | CA |
| **Sophie Miranda** | Sacramento | CA |
| **Michele Wright** | Anaheim | CA |
| **Carol Lillis** | Albion | CA |
| **Trudie Leap** | Chico | CA |
| **Megan Stevenson** | Los Angeles | CA |
| **Barbara White** | Laguna Beach | CA |
| **Peter Weinberger** | Los Angeles | CA |

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|---|---|---|
| **Terri Sharpe** | Seattle | WA |
| **Trina Cooper** | Federal Way | WA |
| **Ken Woolard** | University Place | WA |
| **Eleanor Dowson** | Mill Creek | WA |
| **Ruth Darden** | Seattle | WA |
| **Nathaniel Harrison** | Seattle | WA |
| **Gary Bennett** | Bellingham | WA |
| **David Arntson** | Bothell | WA |
| **Robert Gabriel** | Olympia | WA |
| **John Eschen** | Grand Coulee | WA |
| **Margaret Hashmi** | Bellingham | WA |
| **Nick Barcott** | Lynnwood | WA |
| **Glen Zorn** | Seattle | WA |
| **Denee Scribner** | Ellensburg | WA |
| **Linda Swan** | Snohomish | WA |
| **Chad Evans** | Seattle | WA |
| **Brandie Deal** | Bothell | WA |
| **Kay Moretti** | Seattle | WA |
| **Alexander Mouton** | Seattle | WA |
| **Jack Stansfield** | Stanwood | WA |
| **Thomas Swoffer** | Ravensdale | WA |
| **Douglas Risedorf** | Concrete | WA |
| **Dan Schneider** | Seattle | WA |
| **Jeff Guay** | Chewelah | WA |
| **Tom & Patricia Moreland** | Port Townsend | WA |
| **Constance Rodman** | Seattle | WA |
| **Michelle Galo** | Tacoma | WA |
| **Gill Fahrenwald** | Olympia | WA |
| **Ai Mccarthy** | Redmond | WA |
| **Kathy Kestell** | Spokane | WA |
| **Maradel Gale** | Bainbridge Island | WA |
| **Zandra Saez** | Spokane | WA |
| **Ronlyn Schwartz** | Langley | WA |
| **Patricia Meeks** | White Salmon | WA |
| **Mr.Shelley Dahlgren, Phd** | Issaquah | WA |
| **Scott Cecile** | Everett | WA |
| **Bruce Dobson** | Langley | WA |
| **Anne Baker** | Vancouver | WA |
| **Linda Ellsworth** | Eastsound | WA |
| **Jamie Caya** | Vancouver | WA |
| **Mike Smith** | Seattle | WA |
| **Carolyn Eden** | Bainbridge Island | WA |
| **Meryle A. Korn** | Bellingham | WA |
| **Elena Rumiantseva** | Seattle | WA |

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|---|---|---|
| **Dean Windh** | Lakewood | WA |
| **Dan Stabel** | Aberdeen | WA |
| **Marie Weis** | Fox Island | WA |
| **Danny Dwinell** | Shoreline | WA |
| **Marcia Clarke** | Bothell | WA |
| **Jb Pearce Sr** | Seattle | WA |
| **Alice Tobias** | Seattle | WA |
| **Robert Hilgenberg** | Everett | WA |
| **Melissa Rees** | Spokane Valley | WA |
| **Rick Romito** | Bellingham | WA |
| **Becky Anderson** | Bellingham | WA |
| **Patricia Layden** | Seatac | WA |
| **Gene Lawson** | Lynnwood | WA |
| **Joanne Pflepsen** | Seattle | WA |
| **Marilyn Evenson** | Tacoma | WA |
| **John Bremer** | Bellingham | WA |
| **Teresa Allen** | Deming | WA |
| **Delphi Locey** | Seattle | WA |
| **Nadine Lavonne** | Seattle | WA |
| **Brookie Judge** | Seattle | WA |
| **Adina Parsley** | Stanwood | WA |
| **John Vinson** | Olympia | WA |
| **Sammy Low** | Stanwood | WA |
| **Elaine Green** | Bellingham | WA |
| **K G** | Orting | WA |
| **Tim Durnell** | Rice | WA |
| **Dennis Reid** | Shoreline | WA |
| **James Roberts** | Palouse | WA |
| **Baker Smith** | Burien | WA |
| **Hiroko Patterson** | Silverdale | WA |
| **Mark Redmond** | Seattle | WA |
| **Joyce Grajczyk** | Kent | WA |
| **Carol Stevens** | Lynnwood | WA |
| **Scott Widdas** | Silverdale | WA |
| **Lura Irish** | Lakebay | WA |
| **James Mulcare** | Clarkston | WA |
| **Jc Bower** | Sumner | WA |
| **Nancy White** | Spokane Valley | WA |
| **Kate Frangos** | Vancouver | WA |
| **Hal Glidden** | Bellingham | WA |
| **Carla Alzuro** | Seattle | WA |
| **Rena Childs** | University Place | WA |
| **Mark Kidd** | South Bend | WA |
| **Emily Willoughby** | Tukwila | WA |

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|---|---|---|
| **Madelaine Moir** | Sequim | WA |
| **Noryne Chappelle** | Vancouver | WA |
| **Bill Leyrer** | Seattle | WA |
| **Paul Talbert** | Seattle | WA |
| **Jennifer Wheeler** | Gold Bar | WA |
| **Werner Bergman** | Stanwood | WA |
| **Stephen Eichelberger** | Tacoma | WA |
| **Taen Scherer** | Seattle | WA |
| **Norman Baker** | Sequim | WA |
| **Helena Fantin** | Snohomish | WA |
| **Steve Serbousek** | Bremerton | WA |
| **Emily Happy** | Tacoma | WA |
| **Brian Baltin** | Seattle | WA |
| **Del E. Domke** | Bellevue | WA |
| **Clayton Jones** | Shoreline | WA |
| **Jan Weisel** | Woodinville | WA |
| **Michelle Hamilton** | Marysville | WA |
| **Glen Anderson** | Lacey | WA |
| **Penny Derleth** | Deer Park | WA |
| **Lisa Critchlow** | Lummi Island | WA |
| **Julie Leavenworth** | Indianola | WA |
| **Jeff Steenbergen** | Seattle | WA |
| **David Daniels-Lee** | Ocean Shores | WA |
| **Jessica Tucker** | Mill Creek | WA |
| **Nate Marino** | Bellingham | WA |
| **Robin Lindsey** | Seattle | WA |
| **Donna Hanson** | Pullman | WA |
| **Seth Snapp** | Bellingham | WA |
| **Linda Massey** | Seattle | WA |
| **Katherine Nelson** | Kent | WA |
| **Adam Blumenthal** | Seattle | WA |
| **Patrick Conn** | Kent | WA |
| **Don Dicken** | Ellensburg | WA |
| **Devon Van Alyne** | West Richland | WA |
| **Stephen Friedrick** | Steilacoom | WA |
| **Klouise Cook** | Seattle | WA |
| **Ron Quigley** | Olympia | WA |
| **Gayle Janzen** | Seattle | WA |
| **Tina Brown** | Anacortes | WA |
| **Winfield Hutton** | Shoreline | WA |
| **Joe Neumann** | Seattle | WA |
| **June Macarthur** | Port Orchard | WA |
| **Ron Macarthur** | Port Orchard | WA |
| **Elyette Weinstein** | Olympia | WA |

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|---|---|---|
| **Linda Woodall** | Kennewick | WA |
| **Robert Bamford** | Seattle | WA |
| **Sharon Fetter** | Puyallup | WA |
| **Randall Collins** | Seattle | WA |
| **Karen Wible** | Vancouver | WA |
| **Patricia Rodgers** | Kirkland | WA |
| **Dennis Tudos** | Kent | WA |
| **Steve Uyenishi** | Seattle | WA |
| **Ellen Dorfman** | Olympia | WA |
| **Patricia Ranstrom** | Vashon | WA |
| **Mary Guard** | Friday Harbor | WA |
| **Duane Niatum** | Seattle | WA |
| **Lael Bradshaw** | Camano Island | WA |
| **Howard Zimmerman** | Lacey | WA |
| **Lisa Ayala** | Tumwater | WA |
| **Pam Obst** | Seattle | WA |
| **Cami Cameron** | Vancouver | WA |
| **Darlene St. Martin** | Mount Vernon | WA |
| **Jeri Ichikawa** | Auburn | WA |
| **Tatiana Korry** | Seattle | WA |
| **Anna Blake** | Seattle | WA |
| **Suz Garcia** | Bellevue | WA |
| **Beth Dannhardt** | Zillah | WA |
| **Anthony Buch** | Seattle, | WA |
| **Lynne Treat** | Chehalis | WA |
| **Carolyn Hall** | Renton | WA |
| **Jon Noggle** | Bellingham | WA |
| **Rachael Bigham** | Seattle | WA |
| **Scott Species** | Seattle | WA |
| **Margery Barlow** | Packwood | WA |
| **Robyn Cleaves** | Tacoma | WA |
| **Eve Chen** | Seattle | WA |
| **Wesley Banks** | Vancouver | WA |
| **Jean Lnaz** | Seattle | WA |
| **Anita Gwinn** | Amboy | WA |
| **David Young** | Seattle | WA |
| **Dorothy Jordan** | Lynden | WA |
| **Ramona Menish** | Bellingham | WA |
| **Elizabeth Taylor** | Seattle | WA |
| **Leslie Smith** | Bellingham | WA |
| **G G** | Orting | WA |
| **Debbie Thorn** | Kirkland | WA |
| **Rand Guthrie** | Snohomish | WA |
| **Julie Holtzman** | Snohomish | WA |

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|---|---|---|
| **Nancy Enz Lill** | Spokane | WA |
| **Karen Rogers** | Vashon | WA |
| **Jenny Clark** | Bothell | WA |
| **Mai Hermann** | Mercer Island | WA |
| **Joe Thompson** | Kalama | WA |
| **Mike Acker** | Vancouver | WA |
| **Kathleen Mckeehen** | Indianola | WA |
| **Adam Levine** | Seattle | WA |
| **Carol Whitehurst** | Tacoma | WA |
| **Renee Milkie** | Mercer Island | WA |
| **John Gordon** | Port Townsend | WA |
| **Leslie Kentor** | Buckley | WA |
| **Debi Aldrich** | Covington | WA |
| **Julie O'Donnell** | Seattle | WA |
| **Barb Scavezze** | Olympia | WA |
| **Paula Shafransky** | Sedro Woolley | WA |
| **Marilyn Hurrell** | Kent | WA |
| **Kathleen Wolfe** | Des Moines | WA |
| **Laura Apley** | Fort Lewis | WA |
| **Barbara Rosenkotter** | Deer Harbor | WA |
| **Hugh Lentz** | Olympia | WA |
| **Raelyn Michaelson** | Seatac | WA |
| **Marilyn Watson** | Clinton | WA |
| **Deborah Efron** | Bellevue | WA |
| **Roberta Mcbride** | Edmonds | WA |
| **Bob Aegerter** | Bellingham | WA |
| **Scott Bishop** | Olympia | WA |
| **Gregry Loomis** | Seattle | WA |
| **Jackie Easley** | Auburn | WA |
| **Joann Polley** | Poulsbo | WA |
| **Ashley Sullivan** | Lacey | WA |
| **Kristin Jensen** | Seattle | WA |
| **Diann Macrae** | Bothell | WA |
| **Kathyryn Oliver** | Seattle | WA |
| **Mark Simpson** | Shelton | WA |
| **Greyling Gentry** | Redmond | WA |
| **Peg Keough** | Sammamish | WA |
| **John Sailer** | Port Townsend | WA |
| **Dr James L. Rowland, Ed.D.** | Pullman | WA |
| **Sandra Smith** | Seattle | WA |
| **Kerry Moore** | Toledo | WA |
| **Diana Covington** | Tacoma | WA |
| **Lorraine Hartmann** | Seattle | WA |
| **Robin Hirsch** | Orcas | WA |

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|---|---|---|
| **Gerry Martin** | University Place | WA |
| **William Sneiderwine** | Vancouver | WA |
| **John Ballard** | Woodinville | WA |
| **Joan Bykonen** | Lacey | WA |
| **John Seeburger** | Lakewood | WA |
| **Mary Masters** | Orcas | WA |
| **David Henry** | Bellingham | WA |
| **Lorena Havens** | Acme | WA |
| **Jack Zektzer** | Seattle | WA |
| **Michelle Carr** | Shoreline | WA |
| **David Jackson** | Mukilteo | WA |
| **Joan Peter** | Gig Harbor | WA |
| **Kathleen Malley** | Tacoma | WA |
| **Mark Wirth** | Seattle | WA |
| **Judith Cohen** | Seattle | WA |
| **Heather Davidson** | Seattle | WA |
| **Sarah Sloane** | Ocean Park | WA |
| **Karen Chestney** | Camano Island | WA |
| **K. Youmans** | Roslyn | WA |
| **Dave Werntz** | Bellingham | WA |
| **Sandra Carr** | Edmonds | WA |
| **Patrick Allen** | Poulsbo | WA |
| **Reuben Yancey** | Olympia | WA |
| **Don Thomsen** | Spokane | WA |
| **Sally Vogel** | Lacey | WA |
| **Don Johnson** | Kent | WA |
| **Kelly Ragsdale** | Longview | WA |
| **John Vinson** | Olympia | WA |
| **Lynnette Anderson** | Seattle | WA |
| **Gene Wheeler** | Darrington | WA |
| **Nancy Jacobs** | Bellevue | WA |
| **Darlene Schanfald** | Sequim | WA |
| **Gordon Wood** | Seattle | WA |
| **Fred Karlson** | Ferndale | WA |
| **Michael Boyd** | Mercer Island | WA |
| **Russell Anthes** | Malo | WA |
| **Paul Davies** | Chattaroy | WA |
| **Richard Lunt** | Seattle | WA |
| **Laura Craig** | Lakewood | WA |
| **Otto Youngers** | Tacoma | WA |
| **Thomas Libbey** | Seattle | WA |
| **Marianne Larkins-Strawn** | Vancouver | WA |
| **Susan Morse** | Vancouver | WA |
| **Martha Shade** | Seattle | WA |

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|---|---|---|
| **Shannon Fouts** | Spokane | WA |
| **Pamela Bendix** | Bainbridge Island | WA |
| **Daveu Moazed** | Leavenworth | WA |
| **Ben Rall** | Spokane | WA |
| **Don Syverson** | Seattle | WA |
| **Charles Riddle** | Mercer Island | WA |
| **Susanne Scott** | Sequim | WA |
| **Nadia Kim** | Seattle | WA |
| **Jamie Glasgow** | Olympia | WA |
| **Conor Corkrum** | Seattle | WA |
| **Julie Lawell** | Seattle | WA |
| **M Hooley** | Bell | WA |
| **Christine Klunder** | Bellingham | WA |
| **Nancy Young** | Seattle | WA |
| **Dae Kim** | Seattle | WA |
| **Janne Abullarade** | Seattle | WA |
| **Michelle Rossee** | Olympia | WA |
| **Leslie Johnson** | Vancouver | WA |
| **Ruth Martin** | Everett | WA |
| **Amber Heath** | Seattle | WA |
| **Joan Wattles** | Seattle | WA |
| **Sigrid Asmus** | Seattle | WA |
| **Shannon Gregor** | Bothell | WA |
| **Diane Anicker** | Vancouver | WA |
| **P.E. Crawford** | Stevenson | WA |
| **Luke Kelly** | Seattle | WA |
| **Marianne Hoffman** | Bremerton | WA |
| **Cheri Streimikes** | Kingston | WA |
| **Sue Jarrard** | Castle Rock | WA |
| **Houston Wong** | Kirkland | WA |
| **Julia Mclaughlin** | Rochester | WA |
| **Kathleen Francis** | Sedro Woolley | WA |
| **Michele King** | Port Orchard | WA |
| **Erik Robinson** | Vancouver | WA |
| **Robert Jensen** | Lacey | WA |
| **Margaret Remington** | Richland | WA |
| **Nicole Westre** | Bellevue | WA |
| **Sherry Rogers** | Seattle | WA |
| **Sunday Kraushaar** | 1237 NW 7th Way | WA |
| **Jean Thornsbury** | Federal Way | WA |
| **Susanna Tan** | Renton | WA |
| **Carol Affleck** | Seattle | WA |
| **Debbi Pratt** | Seattle | WA |
| **Dean Webb** | Seattle | WA |

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|---|---|---|
| **John Zinner** | Mossyrock | WA |
| **Vanessa Skantze** | Seattle | WA |
| **Brian Larson** | Seattle | WA |
| **Darlene O'Grady** | Monroe | WA |
| **Nancy Pare** | Fox Island | WA |
| **Kim Dickey** | Leavenworth | WA |
| **Paul Ames Reinhold** | Seattle | WA |
| **Tonjia Phenicie** | Seattle | WA |
| **Wendy Weger** | Centralia | WA |
| **Lisa Kelsey** | Olympia | WA |
| **Greg Zupansic** | Bellevue | WA |
| **Alfred Colter** | Yakima | WA |
| **Korrine Fraser** | Lake Forest Park | WA |
| **Merryl Woodard** | Mill Creek | WA |
| **Glenn Fain** | Seattle | WA |
| **Matthew Van Camp** | Olympia | WA |
| **Kate O'Brien** | Seattle | WA |
| **Patricia Perron** | Seattle | WA |
| **Debbie Morgenstern** | Richland | WA |
| **Chasity Hungerford** | Kirkland | WA |
| **Kimberly Crane** | Snohomish | WA |
| **Ryann Stafford** | Ellensburg | WA |
| **Eugene Thorne** | Tacoma | WA |
| **Rebecca Glass** | Shoreline | WA |
| **Sue Hogan** | Kennewick | WA |
| **Kun Kang** | University Pl | WA |
| **David Linn** | Ocean Shores | WA |
| **David Peha** | Renton | WA |
| **Barbara Bonfield** | Tacoma | WA |
| **Rob Thomson** | Redmond | WA |
| **Ruth Riordan** | Walla Walla | WA |
| **Donna Weissbeck** | Sultan | WA |
| **Colleen Johnson** | Seattle | WA |
| **Devin Smith** | Seattle | WA |
| **Julie Plumb** | Lynnwood | WA |
| **Laura Boss** | Seattle | WA |
| **Lindell Haggin** | Spokane | WA |
| **Allen Bauer** | Shoreline | WA |
| **James Reeder** | Edmonds | WA |
| **Stella Sun** | Medina | WA |
| **Luther E. Franklin** | Issaquah | WA |
| **Greg Weber** | Arlington | WA |
| **Charles Hartik** | Tonasket | WA |
| **Beverly Hawkins** | Edmonds | WA |

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|---|---|---|
| **Nancy Hines** | Seattle | WA |
| **Victoria Trimble-Lowe** | Bellevue | WA |
| **Stephanie Trasoff** | Blaine | WA |
| **Michelle Maani** | Vancouver | WA |
| **Tina Whitman** | Orcas | WA |
| **Whitney Neugebauer** | Woodinville | WA |
| **Erica Bleke** | Friday Harbor | WA |
| **Sandra Dubpernell** | Coupeville | WA |
| **Kathleen O'Hara** | Seattle | WA |
| **Peter Hamar** | Olympia | WA |
| **Barbara Rosenkotter** | Deer Harbor | WA |
| **Danny Thorn** | Kirkland | WA |
| **Randall Esperas** | Bend | OR |
| **Ian Shelley** | Portland | OR |
| **Robert And Dolores Scheelen** | Medford | OR |
| **Dave Dunkak** | Portland | OR |
| **Amy Danielson** | Portland | OR |
| **Eileen Chieco** | Ashland | OR |
| **Martha Perez** | Portland | OR |
| **Cynthia Enlow** | Albany | OR |
| **Virginia Pabst** | Sisters | OR |
| **Dan Sherwood** | Portland | OR |
| **Hector Amaro** | Salem | OR |
| **Wayne Kelly** | Ashland | OR |
| **Linda K Swift** | Keno | OR |
| **Mary Garcia** | Scotts Mills | OR |
| **Stephen Oder** | Corvallis | OR |
| **Heather Marsh** | Lake Oswego | OR |
| **Casey Schnaible** | Medford | OR |
| **Melanie Feder** | Philomath | OR |
| **Mauria Mcclay** | Portland | OR |
| **Angie Mason** | Phoenix | OR |
| **Paula Eppler** | Milwaukie | OR |
| **Cassandra Browning** | Salem | OR |
| **Nicole Staudinger** | Portland | OR |
| **Marguery Lee Zucker** | Eugene | OR |
| **Greeley Wells** | Jacksonville | OR |
| **Patrick Grady** | Grants Pass | OR |
| **Carol Ampel** | Medford | OR |
| **Jess B** | Portland | OR |
| **Monica Gilman** | Estacada | OR |
| **Jay Humphrey** | Estacada | OR |
| **Peter Sergienko** | Portland | OR |
| **Valerie Guinan** | Bend | OR |

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|---|---|---|
| **John Del Signore** | Medford | OR |
| **Darvel Lloyd** | Portland | OR |
| **Janette Wells** | Bend | OR |
| **Ms. Karen Deora** | Portland | OR |
| **Lars Jefferson** | Albany | OR |
| **Maria White** | Beaverton | OR |
| **Constance Kosuda** | Aloha | OR |
| **Philip Ratcliff** | Salem | OR |
| **Barry Oaks** | Eugene | OR |
| **Mariya Stimson** | Beaverton | OR |
| **Wade Stoddard** | Portland | OR |
| **Lauren Kelley** | Portland | OR |
| **Vita Lawson** | Medford | OR |
| **Randall Nerwick** | Milwaukie | OR |
| **Claudia Hall** | Beaverton | OR |
| **Susan Wechsler** | Corvallis | OR |
| **Brayden Criswell** | Lincoln City, Formerly Roads End | OR |
| **Audrey Shepard** | Springfield | OR |
| **Harriet Adams** | Eugene | OR |
| **Sarah Wiebenson** | Portland | OR |
| **Michael Gotmer** | Eugene | OR |
| **Mark Mullbock** | Portland | OR |
| **Mary Peterson** | Newport | OR |
| **Bob Thomas** | Myrtle Creek | OR |
| **Rick Ross** | Sweet Home | OR |
| **Steve Aydelott** | Bend | OR |
| **Joel Kay** | Milwaukie | OR |
| **Anthony Albert** | Corvallis | OR |
| **Jamie Fillmore** | Beaverton | OR |
| **Susan Rose** | Corvallis | OR |
| **Sarah Hafer** | Portland | OR |
| **Marci Taylor** | St. Helens | OR |
| **Dody H** | Jacksonville | OR |
| **Bruce Hellemn** | Portland | OR |
| **Zachary Nelms** | Portland | OR |
| **Harris Dubin** | Eugene | OR |
| **Lora Roode** | Bandon | OR |
| **David Wilson** | Myrtle Point | OR |
| **Fran Good Medicine Wolf Woman Klabunde** | Beaverton | OR |
| **Sharon Lee** | Bend | OR |
| **Ben Earle** | Portland | OR |
| **Scott Crockett** | Florence | OR |
| **Franklin Kapustka** | Aloha | OR |

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|---|---|---|
| **L. Griffiths** | Beaverton | OR |
| **Charles Looney** | Scappoose | OR |
| **Bob Hammond** | Sisters | OR |
| **Maureen O'Neal** | Portland | OR |
| **Bruce Bauer** | Medford | OR |
| **Dana Bleckinger** | Yachats | OR |
| **Patricia Carcasses** | Portlnd | OR |
| **Stuart R. Shaw** | Salem | OR |
| **Di Kekule** | Lincoln City | OR |
| **Gary Gilardi** | Hood River | OR |
| **Patty Bonney** | Portland | OR |
| **Gabriel Sheridan** | Portlando | OR |
| **Diane Luck** | Portland | OR |
| **Lori Dennis** | Eugene | OR |
| **Claire Cohen** | Lake Oswego | OR |
| **A. Todd** | Eugene | OR |
| **Basey Klopp** | Bend | OR |
| **Roger Kofler** | Portland | OR |
| **Steve Sheehy** | Klamath Falls | OR |
| **Sandra Joos** | Portland | OR |
| **William Lee Kohler** | Eugene | OR |
| **Margaret Keene** | White City | OR |
| **Cherie Reeves-Rutledge** | Central Point | OR |
| **Margaret Quentin** | Portland | OR |
| **Mark Wheeler** | Portland | OR |
| **Susanna Askins** | Portland | OR |
| **Julia Russell** | Portland | OR |
| **Irene Mills** | Portland | OR |
| **Setsuko Maruki-Fox** | Grants Pass | OR |
| **Mika Gentili-Lloyd** | Hillsboro | OR |
| **Karen Horton** | Independence | OR |
| **David Hermanns** | Portland | OR |
| **M. W.** | Brookings | OR |
| **Wendy Mcgowan** | Eugene | OR |
| **Jeffrey White** | Forest Grove | OR |
| **Evan Jackson** | Philomath | OR |
| **Susan Shampo** | Brookings | OR |
| **Christine Kleiman** | Ashland | OR |
| **Rv Branham** | Portland | OR |
| **Steven Adcock** | Portland | OR |
| **Anna Becker** | Hillsboro | OR |
| **Danny Dyche** | Hillsboro | OR |
| **Jim Geear** | Medford | OR |
| **Donald Dimock** | Monmouth | OR |

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|---|---|---|
| **Beryl Oliver** | Springfield, Or. | OR |
| **Mary Cody** | Ashland | OR |
| **Tara Brock** | Portland | OR |
| **Helen Hays** | Oregon City | OR |
| **Michelle Unger** | Hillsboro | OR |
| **Laurence Overmire** | West Lin | OR |
| **Susan Delles** | Rogue River | OR |
| **Geraldine Stewart** | Eugene | OR |
| **Joy Mamoyac** | Corvallis | OR |
| **Steve Ru** | Beaverton | OR |
| **Erica St.John** | Hillsboro | OR |
| **Randy Harrison** | Eugene | OR |
| **Yvonne Hall** | Elmira | OR |
| **Lois White** | Grants Pass | OR |
| **John Peterson** | Mcminnville | OR |
| **Tara Brock** | Portland | OR |
| **Nancy Carey** | Roseburg | OR |
| **J Estep** | Portland | OR |
| **Skylaar Amann** | Portland | OR |
| **John Rose** | West Linn | OR |
| **Joan Levine** | Portland | OR |
| **Paulette And Ron Tatum** | Aloha | OR |
| **Gary Myers** | Salem | OR |
| **R S Dorsey** | Dexter | OR |
| **Jana Maksuta Waltz** | Springfield | OR |
| **Sylvia Casillas** | Springfield | OR |
| **Jacqueline Poehner** | Lake Oswego | OR |
| **Jim Oleachea** | Portland | OR |
| **Nannette Taylor** | Damascus. | OR |
| **Stockton Garver** | Dallas | OR |
| **David Taylor** | Corvallis | OR |
| **Carol J. Loomis** | Portland | OR |
| **Charlie Graham** | Hillsboro | OR |
| **Patricia L Carlson** | Portland | OR |
| **Timothy Rinner** | Portland | OR |
| **Georgeanne Samuelson** | Oakridge | OR |
| **Gwen Jameson** | Philomath | OR |
| **Thomas Osborn** | Stanfield | OR |
| **Jada Baker** | Eagle Point | OR |
| **Carol Coons** | Redmond | OR |
| **Teresa Floyd** | Boring | OR |
| **Patricia Misner** | Cannon Beach | OR |
| **Lisa Matthews** | Medford | OR |
| **Makailelani Osborne** | Toledo | OR |

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| **Vickie Mcalister** | Eugene | OR |
| **Linda Schwartz** | Cannon Beach | OR |
| **Sara Lucas** | Corvallis | OR |
| **Madeleine Bateman** | Portland | OR |
| **Nikki Martin** | Mount Angel | OR |
| **Gilly Lyons** | Portland | OR |
| **Serena Wittkopp** | Portland | OR |
| **Joan Turner** | Portland | OR |
| **Shannon Sicocan** | Redmond | OR |
| **Dr. Steven J. Prince** | Eugene | OR |
| **Laura Hanks** | Portland | OR |
| **Mv Cassell** | Eugene | OR |
| **Kathleen Henley** | Portland | OR |
| **Robert Miller** | Portland | OR |
| **Robert Hinely** | Sheridan | OR |
| **Wendy Mckee** | Corvallis | OR |
| **Family Hood** | Roseburg | OR |
| **Emily Vigue** | Roseburg | OR |
| **Bob Mionske** | Portland | OR |
| **H Millard** | Salem | OR |
| **Dresden Skees-Gregory** | Hillsboro | OR |
| **Tasha Carpenter** | Deer Island | OR |
| **Debra Poscharscky** | Portland | OR |
| **Dave Plaehn** | Corvallis | OR |
| **Eugene Hogan** | Newport | OR |
| **Osalyn Houser** | Albany | OR |
| **Brenda Gaines** | Blachly | OR |
| **Suzanne Kindland** | Cannon Beach | OR |
| **Karen Debraal** | Springfield | OR |
| **Evelyn Pietrowski-Ciullo** | Salem | OR |
| **Chad Halsey** | Salem | OR |
| **Shawn Thompson** | Portland | OR |
| **Sally Purbrick-Illek** | Salem | OR |
| **Estelle Voeller** | Medford | OR |
| **Eben Futral** | Eugene | OR |
| **Sara W. Baker** | Portland | OR |
| **Soohyen Park** | Portland | OR |
| **Jessica Waddell** | Yachats | OR |
| **Camille Hall** | Corvallis | OR |
| **Berklee Robins** | Lake Oswego | OR |
| **Debra Slater** | Portland | OR |
| **Jackie Henry** | Portland | OR |
| **Arlene Fromer** | Portland | OR |
| **Michael Nelson** | Roseburg | OR |

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| **Polly Henjum** | Portland | OR |
| **Paul Borcherding** | La Grande | OR |
| **Will Ware** | West Linn | OR |
| **John Jordan** | Bend | OR |
| **Alan Eliason** | Eugene | OR |
| **Dianne Ensign** | Portland | OR |
| **Christopher Michaels** | Eugene | OR |
| **Lauren Magnee** | Portland | OR |
| **Diana Saxon** | Salem | OR |
| **Jeffrey Jones** | West Linn | OR |
| **M. W.** | Brookings | OR |
| **Lise Hull** | Bandon | OR |
| **Kelly Hibbert** | Roseburg | OR |
| **Jan And Larry Slobin** | Portland | OR |
| **Laura Zimmerman** | Eugene | OR |
| **Alexandra Bwye** | Eugene | OR |
| **Terry Whitlatch** | Lake Oswego | OR |
| **Kate Royston** | Tigard | OR |
| **Ken Wheeler** | Beaverton | OR |
| **Joan Hamilton** | Eugene | OR |
| **Rob Bodner** | Portland | OR |
| **Kristen Swanson** | Springfield | OR |
| **Earth Thunder** | Boise | ID |
| **Katherine Noble** | Hailey | ID |
| **Jim May** | Boise | ID |
| **Barb Crumpacker** | Coeur D Alene | ID |
| **Michael Martin** | Mountain Home | ID |
| **Stephen Hackney** | Grangeville | ID |
| **Mark Weber** | Twin Falls | ID |
| **Gloria D.** | Cataldo | ID |
| **Kenneth Fisher** | Pinehurst | ID |
| **Richard A Rusnak Jr** | Nampa | ID |
| **Cathy Hudson** | Boise | ID |
| **Heather Rodman** | Boise | ID |
| **Ronda Reynolds** | 136 Lost Trail Place | ID |
| **Bill Ventre** | Boise | ID |
| **Gustaf Sarkkinen** | Moscow | ID |
| **Dian Berger** | Boise | ID |
| **Jill Hirschi** | Pocatello | ID |
| **Peter Brockett** | Boise | ID |
| **Lorna Emdy** | Hailey | ID |
| **Kevin Harvey-Marose** | Lewiston | ID |
| **Valerie Stone** | Norfolk | ID |
| **Carmen Chacon** | Pocatello | ID |

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| **Grace Himmelberger** | Boise | ID |
| **Martha Foster** | Potlatch | ID |
| **Russ Berger** | Boise | ID |
| **Mark Berria** | Eagle | ID |
| **Susan Mann** | Boise | ID |
| **Lynne Doria** | Hayden | ID |
| **Barbara Chaffin** | Mackay | ID |
| **Bonnie Tanner** | Eagle | ID |
| **Joan Hobbs** | Mountain Home | ID |
| **Mike Mathis** | Boise | ID |
| **Lori Walker** | Coeur D Alene | ID |
| **Joy Cassidy** | Coeur D' Alene | ID |
| **Phyllis Mollen** | Ny | |
| **Lisa Daloia** | Elkton | |
| **Pam Slater-Price** | Del Mar | |
| **Kimberly Thomas** | San Diego | |
| **Susan Allen** | Ca | |
| **Laurie Fisher** | Tigard | |
| **Mary Miceli** | Chugiak | AK |
| **Margaret Bish** | Birmingham | AL |
| **Karen Spradlin** | Jacksonville | AL |
| **Alper Arslan** | Istanbul | AL |
| **Shona Howarth** | Teagardens | AL |
| **Susan Vogt** | Fairbanks | AK |
| **Leslie Slater** | Homer | AK |
| **Natalie Van Leekwijck** | Deurne | Antwerpen |
| **Silvana Zelmanovich** | Bsas | argentina |
| **Robert Racine** | Mesa | AZ |
| **Drena Lapointe** | Scottsdale | AZ |
| **Cristina Sanchez** | Glendale | AZ |
| **John Nowlin** | Scottsdale | AZ |
| **Annie Mcmahon** | Clarkdale | AZ |
| **Dennis Yee** | Scottsdale | AZ |
| **Carrie Darling** | Phoenix | AZ |
| **Annabelle Herbert** | Tucson | AZ |
| **Duncan Brown** | Tucson | AZ |
| **Ruth Bescript** | Tucson | AZ |
| **Liana Moran** | Glendale | AZ |
| **Dara Rider** | San Tan Valley | AZ |
| **Richard Arthur Iv** | Phoenix | AZ |
| **Richard Skinner** | Tucson | AZ |
| **Toni Thomas** | Tucson | AZ |
| **Mireya Landin-Erdei** | Bullhead City | AZ |
| **Denise Romesburg** | Phoenix | AZ |

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| **Ruthanne Wohl** | Scottsdale | AZ |
| **J David Gillanders** | State University | Arkansas |
| **Valerie Paterson** | Pocahontas | Arkansas |
| **Paula Xiberras** | Hobart | AUS |
| **Carl Dick** | Ballarat | AUS |
| **Catherine Money** | Ferntree Gully | AUS |
| **Jon La Forgia** | Adelaide | AUS |
| **Olivia Kemp** | Exeter | AUS |
| **Kushla Gale** | Toowoomba | AUS |
| **George Walters** | Adelaide | AUS |
| **Sonia Crozier** | Sydney | AUS |
| **Sandie Macdougall** | Geelong | AUS |
| **Monika Huber** | Vienna | Austria |
| **Ted Sebastian** | Surprise | AZ |
| **Peggy Yeargain-Williams** | Fountain Hills | AZ |
| **R-Laurraine Tutihasi** | Oracle | AZ |
| **Susan Garcia** | Phoenix | AZ |
| **Terry Tedesco-Kerrick** | Phoenix | AZ |
| **Kyle Schmierer** | Phoenix | AZ |
| **Olga Strickland** | Mesa | AZ |
| **Dale Mattes** | Bullhead City | AZ |
| **Georgia Braithwaite** | Cottonwood | AZ |
| **Tiffany Fotos** | Mesa | AZ |
| **Vickie Rudd** | Phoenix | AZ |
| **Rita Guidi** | Wickenburg | AZ |
| **Lori Grone** | Green Valley | AZ |
| **Mary Puglia** | Florence | AZ |
| **Maria Schneider** | Munich | Bavaria |
| **Chantal Buslot** | Hasselt | Belgium |
| **Stephanie J. Goldbach** | Berlin | Berlin |
| **Lynne Matcham** | Southampton | Bermuda |
| **Chereale Cormack** | Bristol | Bristol |
| **Elizabeth Abrantes** | Cambridge | canada |
| **Jonine Lichtenwld** | Port Moody | Canada |
| **Josiane Dalcourt** | Montreal | canada |
| **Erica Munn** | Halifax | Canada |
| **Doreen Forbes** | London | Canada |
| **Kanwaljeet Dewan** | Montreal | Canada |
| **Eduardo Basz** | Buenos Aires | capital federal |
| **Mauricio Carvajal** | Santiago | chile |
| **Alejandra Vega** | Buenos Aires | Ciudad de Buenos Aires |
| **Janeene Porcher** | Golden | CO |
| **Ingrid Rochester** | Elbert | CO |

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| **Sarah Manno** | Ft. Collins | co |
| **Georgia Mattingly** | Longmont | CO |
| **Bobbie Knight** | Denver | CO |
| **Shannon Milhaupt** | Denver | CO |
| **Kathryn Rose** | Denver | CO |
| **Andi Shotwell** | Wheat Ridge | Co |
| **Athena Huff-Sandstrom** | Denver | CO |
| **Eldridge Hardie** | Denver | CO |
| **Ed Larson** | Boulder | CO |
| **Robert Burnett** | Crested Butte | CO |
| **Eric Lane** | Denver | CO |
| **Martha Izzo** | Evergreen | CO |
| **Jen Wittlinger** | Steamboat | Co |
| **Margaret Lohr** | Commerce City | CO |
| **Judith Jones** | Steamboat Springs | CO |
| **Martha W D Bushnell** | Boulder | CO |
| **Jill Crouch** | Colorado Springs | CO |
| **Sharon Balzano** | Wheat Ridge | CO |
| **Richard Mckee** | Longmont | CO |
| **Patricia Mckelvie** | Aurora | CO |
| **William Barrett** | Boulder | CO |
| **Joyce Wood** | Bayfield | CO |
| **Nancy Morgan** | Fort Collins | CO |
| **Janine Kondreck** | Denver | CO |
| **Sara Avery** | Lafayette | CO |
| **Michelle Sewald** | Denver | CO |
| **Holly Kennedy** | Arvada | CO |
| **Michael Parsons** | Aguilar | CO |
| **Stuart Weiss** | Denver | CO |
| **Lanelle Lovelace** | Crestone | CO |
| **Nancy Gregory** | Littleton | CO |
| **Debbie Brush** | Castle Rock | CO |
| **Bruce Cratty** | Denver | CO |
| **Rosalyn Rohloff** | Golden | CO |
| **Amanda Mcneill** | Cortez | CO |
| **Kathy Durrum** | Aurora | CO |
| **Shirley Mccarthy** | Branford | CT |
| **Francis Mastri** | West Haven | CT |
| **Karen Baouche** | Ellington | CT |
| **Drew Cucuzza** | New Haven | CT |
| **Joann Koch** | Lebanon | CT |
| **Radha Shenoy** | Cromwell | CT |
| **Marianne Corona** | Middlefield | CT |

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| **Juan Antelo** | Newington | CT |
| **Heather Files** | Stratford | CT |
| **Beverlee Goynes** | Ridgefield | CT |
| **Jill Badyrka** | Stratford | CT |
| **Norman Hines** | Simsbury | ct |
| **Ken Martin** | Newtown | CT |
| **Tom Adamski** | Oxford | CT |
| **Sara Dodson** | Chester | CT |
| **Leona Klerer** | Stamford | CT |
| **Chris Wrinn** | Milford | CT |
| **Joan Seguin** | Old Greenwich | CT |
| **Robin Tierney** | Branford | CT |
| **Charles Dunn** | Southport | CT |
| **Lisa Hey** | Winsted | CT |
| **George Grafton** | Stratford | CT |
| **Linda Wilscam** | Rockville | CT |
| **Melene Rose** | Ridgefield | CT |
| **Brandon Fuller** | Washington | DC |
| **Aaron Ucko** | Washington | DC |
| **Mary Carrick** | Washington | DC |
| **Edrie Irvine** | Washington | DC |
| **Gail Yborra** | Wilmington | Delaware |
| **Ramsay Kieffer** | Milford | Delaware |
| **Jim Black** | Wilmington | Delaware |
| **Jared Cornelia** | Wilmington | Delaware |
| **Lisa Faller** | Wilmington | delaware |
| **Kevin Watkins** | Rehoboth Beach | Delaware |
| **Michael Jones** | Newark | Delaware |
| **Yvonne Fast** | Aalborg | Denmark |
| **Paul Emerson** | Washington, DC | DC |
| **Shel Grove** | Washington | DC |
| **Simon Cake** | Dorchester | dorset |
| **Aid Green** | Birmingham | england |
| **Maureen Burke** | Palm Beach Gardens | FL |
| **Mark Donaldson** | Melbourne | FL |
| **Vaughan Greene** | Panama City Beach | FL |
| **Elisabeth Carroll** | Indian Shores | FL |
| **Nicholas Pappas** | Delray Beach | FL |
| **Rob Nobrega** | Boca Raton | Fl |
| **Sid Jennings** | Ocala | FL |
| **James Brunton** | Tampa | FL |
| **David Knight** | Winter Haven | FL |
| **Marjorie Angelo** | Flagler Beach | FL |
| **Lisa Mazzola** | Tampa | FL |

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| **Suzy Siegmann** | Temple Terrace | FL |
| **Kris Pagenkopf** | Gainesville | FL |
| **Tricia Holliday** | Oviedo | FL |
| **Judih King** | Vero Beach | FL |
| **Benjamin Joannou Jr** | Pinecrest | Fl |
| **Jamie Harrison** | Palm Beach Gardens | FL |
| **Elizabeth Horvath** | Crawfordville | FL |
| **Dorothy Doyle** | South Pasadena | FL |
| **Sheila Lobel** | Lauderhill | FL |
| **S Lowe** | Sebastian | fl |
| **Lizbeth Simpson** | Pinellas Park | FL |
| **James Rizzolo** | Stuart | FL |
| **Christian Czingula** | Palm City | FL |
| **Gail Stewart-Iles** | Rockledge | FL |
| **Russell Riley** | Pensacola | FL |
| **Paul Kripli** | Palm Bay | FL |
| **Paul Fullerton** | Micanopy | fl |
| **Luci Fowler** | Graceville | FL |
| **Janine Cianciolo** | Saint Petersburg | FL |
| **Susan Volk** | Sebastian | FL |
| **Morgan Barrett** | St. Petersburg | FL |
| **Ron Silver** | Atlantic Beach | FL |
| **Steven Combes** | St Augustine | FL |
| **Stewart Rosenkrantz** | Pompano Beach | FL |
| **Sylvia R** | Launder Hill | FL |
| **Patricia Deluca** | Nokomis | FL |
| **Caroline Miller** | St. Petersburg, | FL |
| **D Wolf** | Naples | FL |
| **Val Marjoricastle** | Inverness | FL |
| **S Logan** | Miami | FL |
| **Diana Ward** | St. Petersburg | FL |
| **Doug Landau** | St Petersburg | FL |
| **Sandra Hazzard** | Riverview | FL |
| **Susie Tealdo** | Miami | FL |
| **Erica Coco** | Palm Bay | FL |
| **Joanna Stalker** | Margate | FL |
| **Donna Pemberton** | Cocoa | FL |
| **Shirley Blevins** | Wesley Chapel | FL |
| **Susan Stavros** | Altamonte Springs | FL |
| **Michael Deloye** | Boynton Beach | FL |
| **Scott Finamore** | Citrus Springs | FL |
| **Carolyn Kiel** | Port Orange | FL |
| **Quida Jacobs** | Miami Beach | FL |
| **John Dieffenbach** | Winter Springs | FL |

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| **Andre Yokers** | Cape Coral | FL |
| **Sheri Cutright** | St Augustine | FL |
| **Lanette Rapp** | Leesburg | FL |
| **Mark Holmgren** | St. Petersburg | FL |
| **Eric Hensgen** | Tampa | FL |
| **Tim Rose** | Lighthouse Point | FL |
| **Richad Allen** | Miami Shores | FL |
| **Susan Dorchin** | Delray Beach | FL |
| **Nina Cioffi** | Royal Palm Beach | FL |
| **Laurel Covington** | Lutz | FL |
| **Walter Graue** | Panama City | FL |
| **Jean Cameron** | Gainesville | FL |
| **Marion Lindsay** | Safety Harbor | FL |
| **Robin Peterson** | Jacksonville | FL |
| **Nancy Griffin** | Gainesville | FL |
| **Guillermo Cancio** | Miami | FL |
| **Hervã© Bã©Rard** | Orsay | France |
| **Michele Dessons** | Sagnat | France |
| **Anna-Marie Soper-O'Rourke** | Atlanta | GA |
| **Janet Leavell** | Atlanta | GA |
| **Dennis Stansell** | Suches | GA |
| **Danna Williams** | Athens | GA |
| **Dan Magee** | Watkinsville | GA |
| **Gerald Gouge** | Athens | GA |
| **Douglas Shumate** | Warner Robins | GA |
| **Gina Gilberto** | Atlanta | GA |
| **Judith Gordon** | Evans | GA |
| **Christine Schneebeli** | Geneva | Geneva |
| **Louise Blume** | Clermont, | GA |
| **Bruce Wheeler** | Savannah | GA |
| **Sonya Rice** | Lavonia | GA |
| **Aaron Stearns** | Atlanta | GA |
| **Andrew Kramer** | Athens | GA |
| **Nadejda Sitnikova** | Spassk-Dalniy | GA |
| **Susan Spencer** | Douglasville | GA |
| **C. Daniel Bailey** | Stone Mountain | GA |
| **Lydia Aletraris** | Athens | GA |
| **Dorothea Stephan** | Winzer | Germany |
| **Diana Nymand** | Bonn | Germany |
| **Walt Hesse** | Fulda | Germany |
| **Andreas Vlasiadis** | Athens | greece |
| **Sandra Arapoudis** | Rhodos | greece |
| **Elena Diamanti** | Thessaloniki | Greece |

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| **M. Dã¼Rrenberg** | Hamburg | Hamburg |
| **Michele Nihipali** | Hauula | Hawaii |
| **Alex Oshiro** | Honolulu | Hawaii |
| **K. Chung** | Honolulu | Hawaii |
| **Fred Luke** | Honolulu | Hawaii |
| **Bobbi Lempert** | Paia | Hawaii |
| **K. Francis** | Laupahoehoe | hawaii |
| **Stefan Merten** | Frankfurt A.M. | Hesse |
| **Ulli Fitz** | Offenbach Am Main | Hesse |
| **Rosy Silberfluss** | Fulda | Hesse |
| **Ruthie Bernaert** | Honokaa | HI |
| **Donna Thelander** | Kailua-Kona | HI |
| **Miklos Antal** | Pecs | Hungary |
| **Frank Belcastro** | Dubuque | IA |
| **Deborah Rossum** | Council Bluffs | IA |
| **Brandi Mccauley** | Des Moines | IA |
| **Margo Vanderhill** | Alton | IA |
| **Georgia Shankel** | Chicago | IL |
| **Hope Grable** | Bourbonnais | IL |
| **Carol Johnson** | Winfield | IL |
| **Caroline Mead** | Glenview | IL |
| **Mary Davidson Stanton** | Oak Park | IL |
| **Stephen Anderson** | Deerfield | IL |
| **Cara Ammon** | Chicago | IL |
| **Barrett Goldflies** | Chicago | IL |
| **Patricia Chelmecki** | Elburn | IL |
| **Janell Smith** | New Douglas | IL |
| **Jennifer Cunningham** | Aurora | IL |
| **M C Kubiak** | Bmi | IL |
| **Bonnie Duman** | Deerfield | IL |
| **Andrea F.** | Beach Park | il |
| **Jan Barshis** | Wilmette | IL |
| **V Evan** | Chicago | IL |
| **Debbie Neimark** | Chicago | IL |
| **Carol Jurczewski** | Riverside | IL |
| **Carey Boehmer** | Sycamore | IL |
| **Marcy Somenek** | Elk Grove | IL |
| **Matthew Alschuler** | Warren | IL |
| **Judy Dufficy** | Skokie | IL |
| **Cheryl Jennings** | Highland Park | IL |
| **Cynthia Linton** | Chicago | IL |
| **Louise Friedenson** | Des Plaines | IL |
| **Marianne Flanagan** | Des Plaines | IL |

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| **Robert Linzmeier** | Palatine | IL |
| **Carolyn Massey** | Quincy | IL |
| **Mark Brooker** | Chicago | IL |
| **Rhonda Lawford** | South Wilmington | IL |
| **Bret Sher** | Vernon Hills | IL |
| **Lenore Reeves** | Mokena | IL |
| **Olga Abella** | Robinson | IL |
| **Marcy Gustafson** | Chicago | IL |
| **Patricia Pruitt** | Oak Park | IL |
| **Sergio Rivera** | Chicago | IL |
| **J Beverly** | Urbana | IL |
| **Michael Stuart** | Wonder Lake | IL |
| **Deb Christensen** | Manteno | IL |
| **Steve Lyons** | Rockford | IL |
| **Janet Kuncl** | Collinsville | IL |
| **Peter Tijerina** | Chicago | IL |
| **Andrew Sledd** | Chicago | IL |
| **Dori Cole** | Wheaton | IL |
| **Craig Figtree** | Chicago | IL |
| **Karen O'Brien** | Westmont | IL |
| **Alicia Paravola** | Chicago | IL |
| **Margaret Waltershausen** | Urbana | IL |
| **Clarence Krygsheld** | Bolingbrook | IL |
| **Rafael Albarran** | Bridgeview | IL |
| **Candace Gabriel** | Chicago | IL |
| **Monica Randell** | Chicago | IL |
| **Kaye Aurigemma** | Westchester | IL |
| **Marilyn Nicol** | Geneva | IL |
| **Renee Caputo** | 60185 | IL |
| **Dean Peerman** | Chicago | IL |
| **Theresa Usry** | Lombard | IL |
| **Merrie Thornburg** | Chicago | IL |
| **Jessica Cresseveur** | New Albany | IN |
| **Kim English** | Logansport | IN |
| **Sandra Miller** | South Bend | IN |
| **Marcia Ouellette** | Lafayette | IN |
| **Ernest Cooper** | Indianapolis | IN |
| **Lyn Berling** | Indianapolis | IN |
| **Kathleen Shannon** | Sunman | IN |
| **Linda Brown** | Gas City | IN |
| **Dina Frigo** | Highland | IN |
| **Mark Hallett** | Bloomington | IN |
| **Maura Buckley** | Indianapolis | IN |

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| **Kathleen O'Connell** | Indianapolis, | IN |
| **Matthew Baucco** | Bloomington | IN |
| **Kevin Brown** | Clarksville | IN |
| **Dale Lacognata`** | Indianapolis | IN |
| **Jeane Harrison** | Des Moines | Iowa |
| **Dan Meier** | Cedar Falls | Iowa |
| **Deke Gliem** | Dawson | Iowa |
| **Eileen Bowerman** | Des Moines | Iowa |
| **Jack Robins** | Iowa City | Iowa |
| **Symone Ma** | Cedar Falls | Iowa |
| **Marya Zanders** | Centerville | Iowa |
| **John Tovar** | Cedar Falls | Iowa |
| **Enzo Mulas** | Florence | italy |
| **Paola Scodellari** | Roma | Italy |
| **Mario Giannone** | Florence | italy |
| **Enzo Mulas** | Florence | italy |
| **Annamaria Bini** | Varese | italy |
| **Toni Caldwell_Clark** | Kansas City | KS |
| **Kathe Garbrick** | Manhattan | KS |
| **Charles Brumleve** | Manhattan | KS |
| **Janet Carmichael** | Shawnee | KS |
| **Patricia Nazzaro** | Union | KY |
| **Jacqueline Newman** | Greenville | KY |
| **Jennifer Edelen** | Louisville | KY |
| **Mike Vanlandingham** | Shawnee | KS |
| **Michael Ribordy** | Wellington | KS |
| **Ronald Kestler** | Louisville | KY |
| **Brian K Sutton** | Louisville | KY |
| **Dan Meyer** | Louisville | KY |
| **Joseph Brown** | Hammond | LA |
| **Joseph Vincent** | Harvey | LA |
| **Tony Medlin** | Baton Rouge | LA |
| **Jacqueline Edmundson** | New Orleans | LA |
| **Lauren Stone** | Northfield | MA |
| **William Parr** | Weymouth | MA |
| **Andrew Woitkoski** | Pittsfield | MA |
| **Donald Cronin** | Somerville | MA |
| **Nina Kornstein** | Framingham | MA |
| **John Hess** | Roslindale | MA |
| **Walt Luerken** | Seekonk | MA |
| **Nilah M. Macdonald** | Scituate | MA |
| **Barry De Jasu** | Montague | MA |
| **Holly F. Malarney** | Chelsea | MA |

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| **Kathleen Medina** | Lenox | MA |
| **Susan Earle** | Cambridge | MA |
| **Maryanna Foskett** | Arlington | MA |
| **Michael Riley** | Quincy | MA |
| **Laurel Facey** | Millers Falls | MA |
| **Kate Kenner** | Jamaica Plain | MA |
| **John Schaechter** | Canton | MA |
| **Richard Warren** | Halifax | MA |
| **Joanna Cutting-Brady** | Dracut | MA |
| **Kristopher Kvenvold** | Harvard | MA |
| **Margie Hancock** | Arlington | MA |
| **Peter Gallo Jr** | Agawam | MA |
| **Lawrence Walker** | Hanover | MA |
| **Carol Walker** | Winthrop | MA |
| **Jennifer Salhus** | Norfolk | MA |
| **Claire Nivola** | Newton Highlands | MA |
| **Debbie Koundry** | Waltham | MA |
| **Linda Waine** | Taunton | MA |
| **Adam Rollins** | Cambridge | MA |
| **Russell Se** | Greenfield | MA |
| **D Muraco** | Needham | MA |
| **Ann Sweeten** | Salem | MA |
| **Francine Traniello** | Middleboro | MA |
| **Melissa Zilembo** | Merrimac | MA |
| **Deirdre Morris** | Medford | MA |
| **Alice Mcgough** | Mashpee | MA |
| **Donna Arsenault** | New Bedford | MA |
| **Oscar Revilla** | San Sebastian De Los Reyes | Madrid |
| **Doris Luther** | Hollis | Maine |
| **Lawrence Fischman** | Yarmouth | Maine |
| **Jaremy Lynch** | Harpswell | Maine |
| **Kristin Krause** | Durham | Maine |
| **Joan Yates** | Portland | Maine |
| **Michael Haskell** | Scarborough | Maine |
| **Julia Hathaway** | Veazie | Maine |
| **Anette Stauske** | Davidsonville | Maryland |
| **Dorothy Tartaglia** | Silver Spring | Maryland |
| **Leigh Sands** | Denton | Maryland |
| **Omar Siddique** | Ellicott City | Maryland |
| **Marc Santora** | Takoma Park | Maryland |
| **David Land** | Silver Spring | Maryland |
| **Brad Knopf** | Annapolis | Maryland |
| **Jodi Wick** | Silver Spring | Maryland |

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| **Joyce Robinson** | Glen Burnie | Maryland |
| **Gary Herwig** | Baltimore | Maryland |
| **Dave Bard** | Silver Spring | Maryland |
| **George And Frances Alderson** | Catonsville | Maryland |
| **Patrick Digiulian** | Rockville | Maryland |
| **Douglas Mcneill** | Greenbelt | Maryland |
| **Natalie Batovsky** | Union Bridge | Maryland |
| **Stefan Byrd-Krueger** | Baltimore | Maryland |
| **Jill Langford** | Silver Spring | Maryland |
| **Sybil Schlesinger** | Natick | Massachusetts |
| **Deborah Spencer** | Billerica | Massachusetts |
| **Carole Smudin** | Bridgewater | Massachusetts |
| **Dennis Rogers** | Hubbardston | Massachusetts |
| **Christine Roane** | Springfield | Massachusetts |
| **Julie Kennie** | West Dennis | Massachusetts |
| **Robert Foley Jr** | Attleboro | Massachusetts |
| **Vidya Sivan** | Boston | Massachusetts |
| **Laurie Conroy** | Wellesley | Massachusetts |
| **Linda Frisone Frisone** | Florence | Massachusetts |
| **David Dow** | East Falmouth | Massachusetts |
| **Felicity Botwinik** | Westwood | Massachusetts |
| **Susan Blain** | Gardner | Massachusetts |
| **Allyssa Kvenvold** | Harvard | Massachusetts |
| **Nancy Woolley** | Stoughton | Massachusetts |
| **Dorothy Anderson** | Weymouth | Massachusetts |
| **Dorothy Vollans** | Siasconset | Massachusetts |
| **Eileen Sonnenberg** | Brewster | Massachusetts |
| **William Dearstyne** | Salem | Massachusetts |
| **Valerie Clark** | Needham | Massachusetts |
| **Kelly Allison** | Berlin | MD |
| **James Snively** | Smithsburg | MD |
| **Carolyn Ricketts** | Edgewater | MD |
| **Leslie Winston** | Columbia | MD |
| **Joseph Gordon** | Silver Spring | MD |
| **Jacqueline Walsh** | Baltimore | MD |
| **Cinzia Mattiace** | Potomac | MD |
| **Patricia Snowden** | Bethesda | MD |
| **Rusty Simpson** | Baltimore | MD |
| **Mark Sweeney** | Ellicott City | MD |
| **Lyn Lowry** | Takoma Park | MD |
| **Mary Louise Wooldridge** | Annapolis | MD |
| **Ken Wenzer** | Laurel | MD |
| **Lee Bonini-Koch** | Warwick | MD |
| **Robert Hegarty** | Darlington | MD |

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| **Valerie Brown** | Crownsville | MD |
| **Dudley Lindsley** | Leonardtown | MD |
| **Karan Hughes** | Silver Spring | MD |
| **Terri Taylor** | Glen Burnie | MD |
| **Jim Long** | Accokeek | MD |
| **Bradley Oremland** | Rockville | MD |
| **Aleksandra Spekke** | Dundalk | MD |
| **Joe Brenner** | Owings Mills | MD |
| **Patrick Digiulian** | Pasadena | MD |
| **B Horne** | B | MD |
| **April Kohles** | Annapolis | MD |
| **Karen Stickney** | Lewiston | ME |
| **Tia Simon** | Gorham | ME |
| **Abigail Gindele** | South Berwick | ME |
| **Trish Stevens** | Troy | ME |
| **Yvette Pratt** | South Portland | ME |
| **Colleen Mckenna** | Brunswick | ME |
| **Art Hanson** | Lansing | MI |
| **Natalie Hanson** | Lansing | MI |
| **Greg Gumina** | Birmingham | MI |
| **John Rokas** | Eastpointe | MI |
| **M Leszczynski** | Lapeer | MI |
| **Anca Vlasopolos** | Grosse Pointe | MI |
| **T Kelly** | Novi | Mi |
| **Richard Han** | Ann Arbor | MI |
| **Joyce Coe** | Hastings | MI |
| **Gail Walter** | Kalamazoo | MI |
| **Aubrey Guilbault** | Grand Blanc | MI |
| **Lilly Mahaney** | Leland | MI |
| **Mike Raymond** | Shelby Township | MI |
| **Sue Nearing** | Vassar | MI |
| **Herb Glahn** | Harbor Springs | MI |
| **Francine Dolins** | Ann Arbor | MI |
| **Ilene Beninson** | Ann Arbor | MI |
| **Ed Abdool** | Pawpaw | MI |
| **Mary Tanoury** | Grosse Pointe Vitu | MI |
| **Mary Ann Baier** | Dearborn | MI |
| **Bobby Belknap** | Frankfort | MI |
| **Carol Sears** | Grand Rapids | MI |
| **Julie Skelton** | Belleville | MI |
| **Daniel Solano** | Detroit | MI |
| **Ilene Kazak** | Detroit | MI |
| **Theresa M. Campbell** | Madison Heights | MI |
| **Bradley Graham** | Jackson | MI |

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| **Lyda Stillwell** | Kalamazoo, | MI |
| **Gavin Bornholtz** | Grand Blanc | MI |
| **Katherine Wright** | Milford | MI |
| **Mario Maraldo** | Harrison Township | MI |
| **Lawrence Yox** | Grandville | MI |
| **Jim Head** | Oak Park | MI |
| **Holly Chisholm** | Oxford | MI |
| **Kathy Oppenhuizen** | West Olive | MI |
| **Twyla Douaire** | Livonia | MI |
| **Emily Worden** | Jeddo | MI |
| **Judi Poulson** | Fairmont | Minnesota |
| **Wanda Ballentine** | St. Paul | Minnesota |
| **Richard Fish** | Minneapolis | Minnesota |
| **Paul Moss** | White Bear Lake | Minnesota |
| **Pat Combs** | Mpls | Minnesota |
| **Juliann Rule** | Avon | Minnesota |
| **Susan Jobe** | Afton | Minnesota |
| **Harriet Mccleary** | Minneapolis | Minnesota |
| **Joseph Wenzel** | Maplewood | Minnesota |
| **Nathan Hofstad** | Mound | Minnesota |
| **Julia O'Neal** | Ocean Springs | Mississippi |
| **Tracy S Troth** | Pearl | Mississippi |
| **Jeanne Lebow** | Gautier | Mississippi |
| **Danny Grantham** | Biloxi | Mississippi |
| **T Bergeron** | Saint Louis | Missouri |
| **Billy Woods** | Chaffee | Missouri |
| **Linda Bishop** | El Dorado Springs | Missouri |
| **Bobbie Kuehl** | Kansas City | Missouri |
| **Paulette Zimmerman** | St. Louis | Missouri |
| **Cathy Lambeth** | Springfield | Missouri |
| **Crickett Miller** | St Louis | Missouri |
| **Nancy Black** | Saint Charles | Missouri |
| **Denise Thomas** | West St Paul | MN |
| **Ordell Vee** | Madelia | MN |
| **William Nusbaum** | Saint Louis Park | MN |
| **Victoria Soulia** | St Paul | Mn |
| **Duane Gustafson** | Cook | MN |
| **Kim Kokett** | Minneapolis | MN |
| **Ann Galbraith Miller** | Duluth | MN |
| **Susan Imker** | Isanti | MN |
| **Tenaya Egbert** | Minnetonka | MN |
| **Kathy Johnson** | St Paul Park | MN |
| **Allyson Harper** | Plymouth | MN |
| **Carole Feray** | St Paul | MN |

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| **Heidi Ahlstrand** | Owatonna | mn. |
| **Cathie Schneider** | Squires | MO |
| **Martha Jaegers** | St. Louis | MO |
| **Craig Asbury** | Springfield | MO |
| **Robin Rysavy** | Lake Winnebago | Mo |
| **Robin Zeplin** | Kansas City | MO |
| **Tristan Sophia** | Absarokee | Montana |
| **Clinton Sennett** | Lewistown | Montana |
| **Tammy Fredericks** | Belgrade | Montana |
| **Lilyana Srnoguy** | Bozeman | Montana |
| **Lynn Matheny** | Purvis | ms |
| **Toddy Perryman** | Corvallis | MT |
| **Cathy Ream** | Clinton | MT |
| **Jonathan Matthews** | Helena | MT |
| **Shelley Frazier** | Durham | NC |
| **Connie Raper** | Durham | NC |
| **Gladys Cattanach** | Kernersville | NC |
| **George Neste** | High Point | NC |
| **Jessica Mcgratty** | Charlotte | nc |
| **Linda Peterson** | Indian Trail | NC |
| **Heather Payne** | Chapel Hill | NC |
| **Arthur Firth** | Salisbury | NC |
| **Richard Strowd** | Chapel Hill | NC |
| **Thomas Struhsaker** | Durham | NC |
| **James Zizzo** | Wilmington | NC |
| **Della Oliver** | Charlotte | NC |
| **Debbie Kenyon** | Apex | NC |
| **Norman Sharp** | Wilmington | NC |
| **Jeanie Rodgers** | Durham | NC |
| **Mike Kenton** | Asheville | NC |
| **Mae Basye** | Fuquay Varina | NC |
| **Julia Brannon** | Reidsville | NC |
| **Lois Hoot** | Washington | NC |
| **Brandon Oakley** | Rougemont | NC |
| **Leila Jackson** | Boone | nc |
| **Lynn Elliott** | Durham | NC |
| **Pamela Kjono** | Grand Forks | ND |
| **Michelle Gorton** | Kearney | NE |
| **Mary Gittings** | Omaha | NE |
| **Sarah Bauman** | Lincoln | Nebraska |
| **Linda Gertig** | Bellevue | Nebraska |
| **Heidi Ludwick** | Papillion | Nebraska |
| **Carol Smith** | Omaha | Nebraska |
| **Marlies W** | Hr | netherlands |

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| **David Cencula** | Sparks | Nevada |
| **Gene Fox** | Reno | Nevada |
| **Jill Ransom Rn** | Reno | Nevada |
| **Fabienne Cros** | Noumã©A | New caledonia |
| **Grace Burson** | Plymouth | New Hampshire |
| **Dan Hubbard** | Rochester | New Hampshire |
| **Dara Gagne** | Nashua | New Hampshire |
| **John Richkus** | Jersey City | New Jersey |
| **Denise Lytle** | Fords | New Jersey |
| **Millicent Sims** | Montclair | New Jersey |
| **Harriet Jernquist** | Millburn | New Jersey |
| **Christi Demark** | H | New Jersey |
| **Matthew Franck** | New Brunswick | New Jersey |
| **Linda Mckillip** | Erial | New Jersey |
| **Roger Bultot** | Edgewater | New Jersey |
| **Gordon Schochet** | Edison | New Jersey |
| **Erica Johanson** | 8525 | New Jersey |
| **Judy Fairless** | Warren | New Jersey |
| **Joann Ramos** | Iselin | New Jersey |
| **Marie Curtis** | Oakhurst | New Jersey |
| **Betsy Cousins-Coleman** | Leonia | New Jersey |
| **Patricia Soteropoulos** | Chatham | New Jersey |
| **Laura Levey** | Somerset | New Jersey |
| **Lance Michel** | Jersey City | New Jersey |
| **De Ru** | Belmar | New Jersey |
| **Alan Bixler** | Sandia Park | New Mexico |
| **Doris Vician** | Albuquerque | New Mexico |
| **Jan Mccreary** | Silver City | New Mexico |
| **Reeve Love** | Albuquerque | New Mexico |
| **Lesley Jorgensen** | Santa Fe | New Mexico |
| **Lynda Goin** | Las Cruces | New Mexico |
| **Judith Smith** | Yarrawonga | New South Wales |
| **Thomas V. Connor** | Wallkill | New York |
| **Vicky Brandt** | New York | New York |
| **Louise Bikoff** | Huntington Station | New York |
| **Moraima Suarez** | Brooklyn | New York |
| **R Martire** | New York | New York |
| **Beth Darlington** | Poughkeepsie | New York |
| **Karen Walker** | Brooklyn | New York |
| **Arthur Hansen** | Kew Gardens Hills | New York |
| **Franco De Nicola** | Pittsford | New York |
| **Edgar Tobachnik** | Yonkers | New York |
| **Stanley Becker** | Long Beach | New York |
| **Steven Kostis** | New York | New York |

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| **Ken Ward** | Gloversville | New York |
| **Laura Dame** | Saranac Lake | New York |
| **Cathleen Kelly** | Calverton | New York |
| **Cristina Fiorillo** | Nyc | New York |
| **Heather Cross** | Brooklyn | New York |
| **Esther Weaver** | Highland | New York |
| **Fletcher Cossa** | New York | New York |
| **William Sharfman** | New York | New York |
| **Pam Brocious** | New York | New York |
| **Christy Carosella** | Ozone Park | New York |
| **Timothy Dunn** | Babylon | New York |
| **Carol Hinkelman** | Rochester | New York |
| **Pamylle Greinke** | Peconic | New York |
| **William Sarovec** | Lake Ronkonkoma | New York |
| **William Toner** | Mcgraw | New York |
| **Peter Keiser** | Manlius | New York |
| **Leslie Just** | West Seneca | New York |
| **Peter Sweeny** | Pleasantville | New York |
| **Melissa Bishop** | Deposit | New York |
| **Florence Morris** | Rochester | New York |
| **Kimberly Wiley** | Rochester | New York |
| **Elizabeth Guthrie** | Webster | New York |
| **Nicholas Prychodko** | Bridgehampton | New York |
| **Tyler Harrington** | Schuyler Falls | New York |
| **Joseph Quirk** | New York | New York |
| **Edward Butler** | New York | New York |
| **Elizabeth Ashby** | New York | New York |
| **Aron Shevis** | Brooklyn | New York |
| **George Picchioni** | Bronx | New York |
| **Caitlin Schneider** | Seaford | New York |
| **Galen Trembath** | Long Island City | New York |
| **Elisse Antczak** | Cheektowaga | New York |
| **Laura Raforth** | Rochester | New York |
| **Laura Klein** | New York | New York |
| **Joel Finley** | Ogdensburg | New York |
| **Andrew Harwin** | New York | New York |
| **Laura Pakaln** | Nyack | New York |
| **Annette Bailey** | Syracuse | new york |
| **Matt Stedman** | Montauk | New York |
| **Susan Krause** | Saint James | New York |
| **Keri Bennett** | Valleystream | New York |
| **Ira Ballen** | New York | New York |
| **Kate Sherwood** | Long Beach | New York |

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| **Meredith Priestley** | Bedford | New York |
| **Jacob Shirmer** | New York | New York |
| **Mari Smet** | Woodhaven | New York |
| **Jk Kibler** | Ghent | New York |
| **Lois Kral** | Yorktown Heights | New York |
| **May E. Dorn** | Clay | New York |
| **Ruth Fitzgerald** | Syracuse | New York |
| **Rebecca Barclay** | Auckland | New Zealand |
| **Wendy Walker** | Exeter | NH |
| **Deborah Munson** | Chester | NH |
| **Nathan Schaefer** | Antrim | nh |
| **Marie Talbot** | Contoocook | NH |
| **Fred Fall** | Cherry Hill | nj |
| **Mark Yushak** | Jackson | NJ |
| **Terry Vaccaro** | North Plainfield | NJ |
| **Dennis Morley** | Old Bridge | NJ |
| **Ellen Mcconnell** | Sayreville | NJ |
| **Diane Barry** | Cedar Knolls | NJ |
| **Tom Harris** | Bordentown | NJ |
| **O. Ruiz** | Clifton | NJ |
| **Sue Swiss** | Hopatcong | nj |
| **Jacob Blaustein** | Eatontown | NJ |
| **Judith Gilbert** | Hoboken | NJ |
| **Clotilda G. Devlin** | Bernardsville | NJ |
| **Steve Zimet** | Glen Ridge | nj |
| **Paul Tarlowe** | Hackettstown | NJ |
| **Elke Passarge** | Colonia | NJ |
| **Patricia Burke** | Mountainside | NJ |
| **Tom Brown** | Lakewood | NJ |
| **Cori Bishop** | Brigantine | NJ |
| **E Sto** | Passaic | nj |
| **Jessica Lederman** | Jersey City | nj |
| **Wanda Plucinski** | Cranbury | NJ |
| **James Thoubboron** | Ringwood | NJ |
| **Alla Sobel** | Hoboken | NJ |
| **Martina Clark** | Westampton | NJ |
| **S Simpson** | Hillsborough | NJ |
| **Merelyn Dolins** | Maplewood | NJ |
| **Trudy Dittmar** | Colts Neck | NJ |
| **Ann Kelly** | Mount Laurel | NJ |
| **D. Lap** | Clifton | nj |
| **William O'Hearn** | Ringwood | NJ |
| **Carolyn Enger** | Englewood | NJ |
| **George Costich** | Cape May | NJ |

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| **Susan Farro** | Lakewood | NJ |
| **Rita Gentry** | Santa Fe | NM |
| **Ernestina Ripberger** | Los Lunas | NM |
| **Edward Lewis** | Santa Fe | NM |
| **Todd Monson** | Albuquerque | NM |
| **Dottie & Stanley Butler** | Valdez | NM |
| **Jc Corcoran** | Santa Fe | NM |
| **Santi Guallar** | San Antonio | NM |
| **Elizabeth Sosa** | Las Cruces | NM |
| **V Alexander** | Albuquerque | NM |
| **Barbara Swyden** | Rio Rancho | NM |
| **Gary Cronin** | Santa Fe | NM |
| **Rebecca Kraimer** | Las Cruces | NM |
| **Klaus Steinbrecher** | Angel Fire | NM |
| **Bernadette Cuellar** | Nã©Vian | |
| **Jelica Roland** | Buzet | |
| **Josh Pellef** | Omer | |
| **Joseph Phillips** | Kernersville | NC |
| **Joe Phillips** | Colfax | NC |
| **Janice Phillips** | Kernersville | NC |
| **Gale Rullmann** | Youngsville | NC |
| **Sharon Mora** | Whittier | NC |
| **Pamela Diliberto** | Pittsboro | NC |
| **A. Gardner** | Mount Airy | NC |
| **Paul Hawkins** | Brevard | NC |
| **Carolyn Smith** | Stoneville | NC |
| **Jules Fraytet** | Charlotte | NC |
| **Shel Anderson** | Durham | NC |
| **Michael Little** | Durham | NC |
| **Barbara Kepley** | Graham | NC |
| **Sue Tuman** | North Topsail Beach | NC |
| **Jim Chaney** | Raleigh | NC |
| **Gloria Shen** | Asheville | NC |
| **Ran Zirasri** | Bismarck | North Dakota |
| **Doug Krause** | Fargo | North Dakota |
| **Eva Schmelzer** | Duesseldorf | North Rhine-Westphalia |
| **Ingrid Isaksen** | Hvalstad | Norway |
| **Margaret Runfors** | Ã–Rebro | |
| **Roland Paret** | Saint Etienne | |
| **Annie Wei** | Queensland | |
| **Barbara Silvia Calamai** | Pisa | |
| **Ludger Wilp** | Bottrop | NRW |
| **Emma Brooks** | Sydney | Nsw |
| **Mike Seyfried** | Boulder City | NV |

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|---|---|---|
| **Ken Gibb** | Zephyr Cove | NV |
| **Jeanne Stidham** | Las Vegas | NV |
| **Jennifer Sumiyoshi** | North Las Vegas | NV |
| **Rosemary French** | Reno | NV |
| **Keith Augusto** | Las Vegas | NV |
| **William Mejia** | Brooklyn | NY |
| **Maryann Burch** | Aurora | NY |
| **Wendy Fast** | Dansville | NY |
| **Marc Beschler** | New York | NY |
| **Chuck Donegan** | Yonkers | NY |
| **Devin Henry** | Nichols | NY |
| **John Catherine** | New York | NY |
| **L Glasner** | Ny | NY |
| **Paula Neville** | Rochester | NY |
| **Jonathan Nash** | New York | NY |
| **Edith Borie** | New Paltz | NY |
| **Janet Moser** | Island Park | NY |
| **Christine B.** | Brooklyn | NY |
| **Donna Lenhart** | Poughkeepsie | NY |
| **Michele Temple** | Woodside | NY |
| **Liz Piercey** | Ny | NY |
| **Barry Zuckerman** | Middletown | NY |
| **Julie Jensen** | New York | NY |
| **Tammy M** | New York | Ny |
| **August Scheer** | Ardsley | NY |
| **Michael Bilecki** | Brookhaven | NY |
| **Sandy Sobanski** | New York | NY |
| **Richard Eng** | Hancock | NY |
| **Joe Connors** | New York | NY |
| **Janet Forman** | New York | NY |
| **Donna Knipp** | New York | NY |
| **Veronica Cox** | Canastota | NY |
| **Kristin Walsh** | South Nyack | NY |
| **Robert Puca** | Brooklyn | NY |
| **Ryan Wilson** | Waterford | NY |
| **Michael Van Riper** | Putnam Valley | NY |
| **Sarah Lilley** | Brooklyn | NY |
| **Richard Gast** | Constable | NY |
| **Marianne Mukai** | Delhi | NY |
| **Tony Alberico** | Romulus | NY |
| **Anna Lukaszewicz** | Blasdell | NY |
| **Leslie Krygier** | Buffalo | NY |
| **Susan Baxter** | New York | ny |
| **Justice M** | Brooklyn | NY |

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| **Kathy Haverkamp** | Geneva | ny |
| **Karen Fabiane** | Schenectady | NY |
| **Dorniece Stephen** | South Setauket | NY |
| **Elizabeth Belasco** | Massapequa | NY |
| **Julie Takatsch** | Port Jervis | NY |
| **Peggy Klee** | Buffalo | ny |
| **John Keiser** | New York | NY |
| **Hope Carr** | Brooklyn | NY |
| **Deb Beck** | Peekskill | NY |
| **Yvonne Kravitz** | Port Jefferson | NY |
| **Tina Martin** | Rochester | NY |
| **Bonnie Conrow** | New Berlin | NY |
| **Elisabeth Guss** | Ny | ny |
| **Len Jacobs** | Locust Valley | NY |
| **Kenneth Honig** | Scarsdale | NY |
| **Nicole Gambino** | Si | NY |
| **Alisha Begell** | Savona | NY |
| **Kenneth Clark** | Rochester | ny |
| **Jg Garey** | New York | NY |
| **Marilyn H** | Rochester | NY |
| **Mary Christy** | Tonawanda | NY |
| **Isabelle Kanz** | Peconic | NY |
| **Carrie Rosenthal** | New York | NY |
| **Pat Pascual** | Patterson | NY |
| **Michael Palladino** | New York | NY |
| **Heidi Lechner** | Long Island | NY |
| **M S** | Hamburg | ny |
| **J. Kaczynski** | Northport | ny |
| **Susan Gunther** | Beacon | ny |
| **Sarah Gallagher** | New York | NY |
| **Dawn Kosec** | Austintown | OH |
| **Mark Cosgriff** | Lakewood | OH |
| **Toby Ann Reese** | Valley City | OH |
| **Valerie Hildebrand** | Parma | oh |
| **Jayleen Hatmaker** | Springboro | OH |
| **Emma Shook** | Cleveland Heights | OH |
| **Denise Mulligan** | Oak Harbor | oh |
| **Laura Sulewski** | Toledo | OH |
| **Paula Paulayurkovitch** | Pataskala | OH |
| **Marc Masto** | Boardman | Ohio |
| **R S** | N Ridgeville | Ohio |
| **Michael O'Niell** | Vienna | Ohio |
| **John Brewer** | Marietta | Ohio |
| **Stacy Grossman** | Bexley | Ohio |

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| **Michael Norden** | Defiance | Ohio |
| **Kathleen Morris** | Columbus | Ohio |
| **Gayle Richardson** | Grove City | Ohio |
| **Amy Schumacher** | Beavercreek | Ohio |
| **Earl Grove** | East Canton | Ohio |
| **Sandra Cobb** | Moreland Hills | Ohio |
| **Barbara Scholl** | Lancaster | Ohio |
| **Keary Missler** | Dublin | Ohio |
| **Daniel Kozminski** | Solon | Ohio |
| **Linda Kiernan** | Loveland | Ohio |
| **Paulette Capperis** | Euclid | Ohio |
| **Tom Bullock** | Lakewood | Ohio |
| **Valerie Sherrill** | Boardman | Ohio |
| **Max Frazier** | Columbus | Ohio |
| **Marlene Barrett** | Maumee | Ohio |
| **Doug Scott** | Findlay | Ohio |
| **Sheryl Union** | Maple Heights | Ohio |
| **Mary Price** | Cleveland | Oklahoma |
| **Lydia Garvey** | Clinton | Oklahoma |
| **J. David Scott** | London | Ontario |
| **Emily Lancaster** | Guelph | Ontario |
| **Michael Kirkby** | Toronto, ON | Ontario |
| **Kristen Lowry** | Toronto | Ontario |
| **Linda Mellen** | Newport Beach | Orange |
| **M Solomon Ii** | Harrisburg | pa |
| **V Smith** | Lansdale | Pa |
| **Craig Martin** | New Stanton | PA |
| **Helene Rosen** | Ivylanf | Pa |
| **William Anderson** | Philadelphia | PA |
| **Daniel Shively** | Greensburg | PA |
| **Donna Rose Sherman** | Butler | PA |
| **Thomas Nelson** | Lansdowne | PA |
| **George Mostoller** | Philadelphia | PA |
| **Carol Dewees** | Pottstown | pa |
| **Jennifer Zielinski** | New Providence | PA |
| **Jeanne Held-Warmkessel** | North Wales | pa |
| **Judy Buchsbaum** | Philadelphia | PA |
| **Joan Kyler** | Philadelphia | PA |
| **Connor Duffy** | Norwood | PA |
| **Al Deroy** | Pittsburgh | PA |
| **Craig Conn** | Pgh | pa |
| **Allison Alberts** | Green Lane | pa |
| **Jonathan Bruck** | Wyomissing | PA |
| **Nezka Pfeifer** | Scranton | PA |

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| **William Montgomery** | Pottstown | PA |
| **Libby J. Goldstein** | Philadelphia | PA |
| **Joe Shaw** | Quakertown | pa |
| **Benita J. Campbell** | Burgettstown | PA |
| **Rande Mandelblatt** | Philadelphia | PA |
| **Henry Berkowitz** | Sabinsville | Pa |
| **Loretta Lehman** | Duncannon | PA |
| **Beverly Williamson-Pecori** | Mckees Rocks | PA |
| **Karla Mcnamara** | Baden | PA |
| **Nancy Soister** | Orwigsburg | PA |
| **Gayle A'Harrah** | Doylestown | Pa |
| **Cailin Miller** | Harrisburg | Pa |
| **Melinda Richards** | West Chester | PA |
| **Nicholas Mosunic** | Pocono Pines | pa |
| **Michael Ashner** | Lancaster | PA |
| **Pierre Madl** | Bloomsburg | PA |
| **Robert And Donna Janusko** | Bethlehem | PA |
| **Barbara Manning** | Morgantown | PA |
| **Robert Jenks** | Landisburg | PA |
| **Richard Van Aken** | Holland | Pa. |
| **Dennis Hartenstine** | Birdsboro | Pennsylvania |
| **Evelyn Oak** | Pgh | Pennsylvania |
| **Mary Ann Smith** | Fort Washington | Pennsylvania |
| **Sidne Baglini** | Malvern | Pennsylvania |
| **Garry M. Doll** | Williamsport | Pennsylvania |
| **Michael Lawrence** | Harrison City | Pennsylvania |
| **Paul Kalka** | Conshohocken | Pennsylvania |
| **K Danowski** | Pittsburgh | Pennsylvania |
| **Michael Miller Jr** | Phila | Pennsylvania |
| **Tracey Eakin** | Mcmurray | Pennsylvania |
| **John Ferguson** | Blue Bell | Pennsylvania |
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| **Linda Myers** | Petersburg | Pennsylvania |
| **Edmund Weisberg** | Philadelphia | Pennsylvania |
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| **Diane Ciullo** | Scranton | Pennsylvania |
| **Juan Carlos Sueiro** | Lima | peru |
| **Ewa Piasecka** | Warsaw | Poland |
| **Evelio Pina** | San Juan | PR |
| **Robyn Adams** | Brisbane | Qld |
| **Maxhe Duthie** | Twin Waters | Queensland |
| **Kerrie Hall** | Cairns | Queensland |
| **Michael Langlais** | West Warwick | Rhode Island |
| **Max Salt** | Woonsocket | Rhode Island |
| **Sally Sorensen** | Westerly | Rhode Island |
| **Frances Harriman** | Cumberland | RI |
| **Zak Mettger** | Providence | RI |
| **Aurora Margareta Barabancea** | Bucharest | Romania |
| **Marco A Simioni** | Porto Alegre | rs |
| **Elena Sorokina** | Moscow | Russia |
| **Tatiana Fedotova** | Cherepovets | Russia  Vologodskayi obl |
| **Ginger Neimo** | Adelaide | SA |
| **R. David Jones** | San Francisco | San Francisco |
| **Kathy Lindler** | Chapin | SC |
| **Christy Borriello** | Charleston | SC |
| **Bert Corley** | Hanahan | SC |
| **Mike Kittrell** | Mt. Pleasant | SC |
| **Miranda Brooker** | Charleston | SC |
| **Ronald Ratner** | Sioux Falls | SD |
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| **Jaedra Luke** | Mount Pleasant | South Carolina |
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| **Martin Bernard** | Fort Worth | Texas |
| **Kimberly Locke** | Austin | Texas |
| **Jennifer Oppenheim** | Alba | Texas |
| **Sandra Woodall** | San Antonio | Texas |
| **Brant Kotch** | Houston | Texas |
| **Annette Pieniazek** | Houston | Texas |
| **Joel Perkins** | Denton | Texas |
| **James Klein** | Corpus Christi | Texas |
| **Franklin Platizky** | Denton | Texas |
| **Karen Kawszan** | Spring | Texas |
| **Bruce Ross** | Katy | Texas |
| **Av Harville** | Benbrook | texas |
| **Patrice Johnson** | Lubbock | Texas |
| **Peggy La Point** | Denton | Texas |
| **Mary Price** | Houston | Texas |
| **David Berkshire** | Houston | Texas |
| **Thomas Windberg** | Austin | Texas |
| **Kathy Newman** | San Antonio | Texas |
| **Beverly Walker** | Kingsland | texas |
| **Frank Blake** | Houston | Texas |
| **Lindsey Mcmahan** | Houston | Texas |
| **Aditi Sundarajan** | Mckinney | Texas |
| **Patricia Brooks** | Houston | Texas |
| **Penny Hammack** | North Richland Hills | Texas |
| **Marie Bernache** | Houston, Texas | Texas |
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| **Analisa Crandall** | Adkins | Texas |
| **Julie Wade** | Carrollton | Texas |
| **Kathi Kibbel** | Dallas | Texas |
| **Ryan Rodriguez** | Austin | Texas |
| **Matt Griffith** | Austin | Texas |
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| **Jose Luis Camacho** | Houston | TEXAS |
| **Richard Pate** | San Benito | Texas |

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| **Susan Averitt** | Houston | Texas |
| **P Morello** | White Pine | TN |
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| **Jeff H** | Nashville | TN |
| **Teresa Iovino** | Memphis | TN |
| **Dr. Ed Slack** | Nashville | TN |
| **S Owens** | Memphis | TN |
| **Kel Wall** | Brentwood | Tn |
| **Jim Steitz** | Gatlinburg | TN |
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| **Catherine Hill** | Nashville | TN |
| **Charles Wear** | Maryville | TN |
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| **Lorelei Stierlen** | Plano | TX |
| **Pamela Evans** | Kemp | TX |
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| **Carolyn Riddle** | Austin | TX |
| **Kevin Rolfes** | Austin | TX |
| **H. Guh** | Dallas | TX |
| **Judy Landress** | Corpus Christi | TX |
| **Kinney Evitt** | Odessa | TX |
| **Jennifer Anderson** | Austin | tx |
| **Linda Heagy** | Arlington | TX |
| **Bruce Burns** | Austin | TX |
| **Geri Cade** | Plano | TX |
| **Mary Cato** | Arlington | TX |
| **Eren Giles** | Austin | TX |
| **Mel Templet** | Pottsboro | TX |
| **Dyan Muse** | Bridge City | Tx |
| **Anita Faulkner** | Carrollton | TX |
| **Ellen Smith** | Dallas | TX |
| **Leigh Fabbri** | Plano | TX |
| **Steven Rodriguez** | Cedar Creek | TX |
| **Peggy Shaver** | Spring | TX |
| **Kara Masharani** | Stafford | TX |
| **Sharron Stewart** | Lake Jackson | Tx. |
| **Ed Bukovinsky** | Lowellville | U.S. |
| **H Kirk** | Inverness | uk |
| **Ali Haines** | Nottingham | UK |

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| **Anne-Marie Hewitt** | Bromsgrove | UK |
| **Helen Bennett** | Lancaster | UK |
| **Donna Hamilton** | Great Yarmouth | United Kingdom |
| **Tom Neo Poet And Realtor Finholt** | Wildwood | United States |
| **Matt Bango** | Palo Alto | United States |
| **Julie Stinchcomb** | Roseville | united states |
| **Bonnie Steiger** | San Francisco | United States |
| **Marie Ellis** | Watsonville | us |
| **Gary Robertson** | Clinton | usa |
| **Lisa Adams** | New Orleans | USA |
| **Scott Marckx** | Port Townsend | USA |
| **Wm Laestadius** | San Diego | usa |
| **Marla Katz** | Seattle | USA |
| **Simon Wilson** | Nyc | USA |
| **M Garrett** | South Jordan | UT |
| **Jon Hager** | Riverton | Ut |
| **Ya Hui Shih** | Draper | UT |
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| **Carla L** | Draper | Utah |
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| **Loralee Clark** | Williamsburg | VA |
| **Deborah Perrero** | Potomac Falls | VA |
| **Dick Reiss** | Lexington | VA |
| **Matea Leon** | Virginia Beach | VA |
| **Eleanor Lasky** | Roanoke | VA |
| **Emile Boyle** | Burke | VA |
| **Devon Kendall** | Virginia Beach | VA |
| **Barbara Oleksa-Reis** | Lexington | VA |
| **Dawn Franklin** | Manassas | va |
| **Danny Aiuto** | Sterling | VA |
| **Louise Perini** | Springfield | VA |
| **Lynne Salomon Miceli** | Norfolk | VA |
| **Theo Giesy** | Norfolk | VA |
| **Wendy Crannage** | Bremo Bluff | VA |
| **Cristina Mittermeier** | 432 Walker Rd | VA |

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| **Katja Kristinnsdã³Ttir** | Sandavã¡Gur | VÃ¡gar |
| **Ralph Palmer** | Brattleboro | Vermont |
| **William Anderson** | St. Thomas | VI |
| **Melissa Storey** | Riddells Creek | Victoria |
| **Richard Stafford** | The Plains | Virginia |
| **Adam D'Onofrio** | Petersburg | Virginia |
| **Sue D'Onofrio** | Keysville | Virginia |
| **John Light** | Arlington | Virginia |
| **Anka Jhangiani** | Reston | Virginia |
| **Judith Shematek** | Seaford | Virginia |
| **James Jeffrey** | Virginia Beach | Virginia |
| **Mark Alexander** | Fredericksburg | Virginia |
| **Charles Maddox** | Broadway | Virginia |
| **Christine Lofgren** | Roanoke | Virginia |
| **Ellen O'Connor** | Arlington | Virginia |
| **Kathy Day** | Richmond | Virginia |
| **Will Packard** | Arlington | Virginia |
| **Marjorie Wells** | .Midlothian | Virginia |
| **Sue And John Morris** | Marshfield | VT |
| **Alan Podber** | Brattleboro | VT |
| **Heather Kennedy** | Montpelier | VT |
| **Robin Gorges** | Montpelier | VT |
| **Larry Franks** | Issaquah | w |
| **Robert Brown** | Fircrest | W |
| **Dr. Darlene Townsend** | Spokane | w |
| **Bonnie Jean Brown** | Morgantown | West Virginia |
| **Frances Yule** | Mount Barker | Western Australia |
| **Karen Kuhl** | Noranda | Western Australia |
| **Corey E. Olsen** | Delafield | WI |
| **Laura Stewart** | Maidons | wi |
| **Randolph Schoedler** | Milwaukee | WI |
| **Carol Steinhart** | Madison | WI |
| **Rose Bertrand** | Madison | WI |
| **C K** | Lake Geneva | WI |
| **Marylee Fahlstrom** | Chippewa Falls | wi |
| **Theodore Voth Iii** | Madison | WI |
| **Richard Phillips** | Neenah | WI |
| **Rachel Scott** | Whitewater | WI |
| **Jeanne Graffin** | Madison | WI |
| **David Koeller** | Shawano | WI |
| **Julia Heiman** | Watertown | wi |
| **Dave Searles** | Brodhead | Wisconsin |
| **Roger Schmidt** | Madison | Wisconsin |
| **Nancy Moore** | Madison | Wisconsin |

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| **Donald Kosak** | Menomonee Falls | Wisconsin |
| **Jackie Tryggeseth** | Grand Marsh | Wisconsin |
| **Ruth Johnston** | Hales Corners | Wisconsin |
| **Mary Jones-Giampalo** | New Lisbon | Wisconsin |
| **Michelle Buerger** | Madison | Wisconsin |
| **Karolyn Beebe** | Madison | Wisconsin |
| **Barbara Decoursey** | Milwaukee | Wisconsin |
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| **Joe Gray** | Martinsburg | WV |
| **Sandra Materi** | Casper | WY |
| **Geoff Skews** | Yellowstone NP | Wy |
| **Elsie Pope** | Memphis | YN |

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Ocean Conservancy

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August 22, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
1100 NE Ambassador Place, #101
Portland, OR 97220

RE: Agenda Item H.1 (Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative)

Dear Chairman Wolford and Council Members:

Ocean Conservancy[1] appreciates the Pacific Fishery Management Council's ongoing work to protect unfished and unmanaged forage fish species through the Fishery Ecosystem Plan's (FEP) Ecosystem Initiative 1. We believe the Ecosystem Working Group's (EWG) April 2014 report that developed Initiative 1 for Council consideration represents significant progress in applying ecosystem-based, precautionary measures across Fishery Management Plans (FMPs) as envisioned by the FEP.[2] We look forward to the expanded analyses of the EWG requested by the Council, which will address additional policy options along with National Environmental Policy Act (NEPA) analyses and FMP amendatory language. We also look forward to final Council Action in spring of 2014 to amend the full suite of Council FMPs to protect currently unmanaged forage species and successfully complete the first FEP Ecosystem Initiative.

To this end, Ocean Conservancy urges the Council to:

1. Affirm the April 2014 preliminary preferred alternative provisions which would add Council-identified forage species to all four FMPs as Ecosystem Component (EC) species, and adopt management measures prohibiting their directed harvest prior to a specific review and approval process;

[1] Ocean Conservancy is a non-profit organization that educates and empowers citizens to take action on behalf of the ocean. From the Arctic to the Gulf of Mexico to the halls of Congress, Ocean Conservancy brings people together to find solutions for our water planet. Informed by science, our work guides policy and engages people in protecting the ocean and its wildlife for future generations.

[2] Pacific Fishery Management Council, Ecosystem Working Group, *Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species of the U.S. Portion of the California Current Large Marine Ecosystem*, Agenda Item I.1.a., Attachment 1 (April 2014).

2. Develop a standard process by which the Council will review and consider proposals for directed harvest of prohibited forage species, including review criteria and conditions for exempted fishing permits that should precede any such consideration;
3. Include, as part of the preliminary preferred alternative, a set of measures addressing the important issues of bycatch, incidental, and *de minimus* directed catch; and
4. Adopt a schedule and process for final FMP amendments in spring 2015.

These recommendations are discussed in more detail below.

1. Affirm and Expand the April 2014 preliminary preferred alternative

Based on the thorough work by the Ecosystem Work Group in developing the April 2014 EWG report, the Council has made tremendous progress on the Unmanaged Forage Initiative. The Council adopted a revised statement of purpose and need for Initiative 1, and adopted as its preliminary preferred alternative a cross-FMP, ecosystem-trophic role approach for forage protection measures which would assign an expanded list of forage species to each FMP as EC species.[3] The Council received broad support from its advisory bodies and the public for this approach. In order to preserve this support and momentum, we recommend the Council affirm these components of its April 2014 direction, and build into its preliminary preferred alternative additional information and measures expected in the next iteration of the Initiative 1 EWG report. This should include the items discussed below.

2. Develop and Adopt a Robust Process for Considering Proposed Directed Fishing on Subject Forage Species

The essence of Initiative 1 lies in preventing unmanaged directed fishing on forage species *unless and until* scientific information about the impacts of such fishing can be considered. At the April 2014 meeting, the Council adopted revised purpose and need language emphasizing the proactive intent of this scientific review:

> *"This action is needed to proactively protect unmanaged, unfished forage fish of the U.S. West Coast EEZ in recognition of the importance of these forage fish to the species managed under the Council's FMPs and to the larger CCE"*[4]

The proactive nature of this review appropriately recognizes that prospective forage fisheries should bear the burden of proof of their appropriateness given the broad impacts these species have on harvested species and the wider marine ecosystem. To ensure only sustainable and appropriate new forage fisheries are developed, we believe proposed fisheries must clearly pass a standardized and specific review process. This process should consist of criteria including

[3] See Pacific Fishery Management Council, Decision Summary Document for April 5-10, 2014, page 4.
[4] Pacific Fishery Management Council, Ecosystem Working Group, *Ecosystem Initiative 1: Protecting Unfished and Unmanaged Forage Fish Species of the U.S. Portion of the California Current Large Marine Ecosystem*, Agenda Item I.1.a., Attachment 1 (April 2014), at page 4

scientific essential fishery data on subject forage species, ecosystem information including subject species' importance for dependent predators including FMP-managed species, and data collected from experimental fishing via exempted fishing permits. We urge the Council to consider information and recommendations from the Ecosystem Work Group and other advisory bodies in developing a specific process to guide the Council in assessing the appropriateness of proposed fishing on subject forage species. Authorization of a new directed forage fishery would require a FMP amendment to convert the subject species from an EC species status to a fishery management unit. A clear procedure would aid in developing necessary FMP amendatory information. A formal, specific process would also serve a crucial purpose in defining a clear and fair procedure to guide proponents of such a fishery in their business planning. This formal process might consist of or include a Council Operating Procedure to guide Council review and the issuance of exempted fishing permits. Furthermore, some Pacific states may also wish to develop forage fish policies and protections. The states would benefit both from a set of Council review procedures as a template and from the policy consistency that would result from such a template. These measures should be released for comment by the public and Council advisory bodies.

3. Consider and Adopt Measures to Address the Important Issues of Bycatch, Incidental, and *de minimus* Directed Catch of Subject Forage Species

Ocean Conservancy recognizes the importance of ensuring protections for unmanaged forage do not substantially affect existing or traditional fishing practices or fisheries, nor alter the management authority of the Council's state and tribal partners. Rather than prohibiting the retention of forage species subject to Initiative 1 prohibitions, we encourage the establishment of maximum retention amount (MRA) on these species based on existing and historical levels of incidental catch.

This approach would be similar to the North Pacific Fishery Management Council's forage protections policies, as used in the Alaska Groundfish FMPs (the Bering Sea/Aleutian Islands Groundfish FMP and the Gulf of Alaska Groundfish FMP).[5] The management measures in place for the subject forage fish species in these FMP's include a maximum retainable amount (MRA) of the EC forage species set at 2 percent of the other retained species on a given trip, based on the goals of accommodating existing levels of catch assumed be sustainable while preventing these levels from increasing or even becoming a *de facto* fishery.[6] With respect to artisanal or *de minimus* fisheries occurring in state waters potentially impacted by this action, we are supportive of identifying a preliminary preferred alternative that clearly preserves the management authority of the Council's state and tribal partners, and any traditional fisheries that involve the subject species.

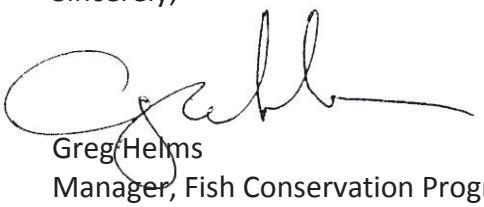
[5] *See* NMFS, Final Environmental Assessment Amendment 96 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area and Amendment 87 to the Fishery Management Plan for Groundfish of the Gulf of Alaska to Comply with Annual Catch Limit Requirements, (Sept. 2010).
[6] Id. at 36

4. Adopt a Schedule and Process for Final Adoptions of FMP Amendments in Spring 2015

We encourage the Council to affirm its support for the draft schedule for completing Initiative 1 provided in the EWG report, which consists of actions to be taken at the September 2014 and March 2015 meetings. Should the Council determine, however, that additional time is needed for review by advisory bodies or the public, we would respectfully suggest scheduling additional time at the November 2014 meeting.

Once again, we appreciate the Council's thorough and productive effort in advancing the unmanaged forage initiative and to its ongoing work to develop the FEP as a vehicle for advancing ecosystem-based fisheries management. We look forward to continued engagement in this important work in September.

Sincerely,



Greg Helms
Manager, Fish Conservation Program

Corey Ridings
Policy Analyst

Heal the Bay

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Aug. 26, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, #101
Portland, OR 97220

**RE: Agenda Item H.1.c, Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

On behalf of Heal the Bay, a non-profit environmental organization with over 15,000 members and almost 30 years dedicated to making Santa Monica Bay and Southern California coastal waters and watersheds safe, healthy, and clean, we respectfully submit our comments in support of the Council moving ahead to protect forage fish species that aren't currently managed. We appreciate the work that the Council has accomplished to date, particularly the unanimous approval of the first Fishery Ecosystem Plan for the West Coast in April of 2013. We now encourage you to move expeditiously to fulfill the ecosystem plan's first initiative to conserve forage fish that help to sustain the structure and function of a healthy marine ecosystem.

We applaud the Council for prioritizing protection of unmanaged forage fish as its first Ecosystem Initiative, which will prohibit new unmanaged forage fisheries until the Council can assess potential impacts to existing fisheries and communities. We also appreciate the fact that the Council has committed to incorporating several forage fish species into existing fishery management plans, where basic conservation measures can be put in place.

Now we encourage the Council to take the next step and release for public comment draft language amending existing fishery management plans, so that the Council is in position to take final action in the spring of 2015. We encourage the Council to select amendatory language that designates unmanaged forage fish as ecosystem component species, precludes new directed fisheries without robust prior review, and allows for a limited amount of those species to be taken in existing fisheries.

Many of these species – such as Pacific saury, sand lance, various squids, and lanternfish – are already targeted by industrial-scale fishing elsewhere around the world. With the increasing demand for protein from our world's oceans, it's only a matter of time before new fisheries begin targeting West Coast species that have been overlooked until now. The Council would be wise to make sure it has basic safeguards in place before new fisheries begin.

An abundance and diversity of forage fish species helps to ensure a healthy and resilient marine food web. Thank you for acting now to protect forage fish.

Sincerely,

Dana Roeber Murray, MESM
Marine & Coastal Scientist, Heal the Bay

Sarah Abramson Sikich, MESM
Coastal Resources Director, Heal the Bay

Wednesday, April 02, 2014

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

**Re: Support for Adoption of Alternative 2.2.1 as Preferred Option for Currently Unmanaged Forage Fish Species**

Dear Members of the Pacific Fisheries Management Council,

Mayfly Group, including its affiliate companies, has been in the fly fishing industry since 1973. We own and operate some of leading brands in the sport and have been active in protection of wildlife and fishing habits.

In this spirit, we the request that you act during your April 2014 meeting to better protect forage fish species, and the salmonids (salmon, steelhead, and sea-run trout) that depend on them during their ocean life stage.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species. Please institutionalize this progress by selecting Alternative 2.2.1 as the preliminary preferred option for protecting currently unmanaged forage fish by incorporating them into all of the Council's existing fishery management plans as ecosystem component species.

The Council's Ecosystem Working Group has delivered a new report justifying your decision to conserve these forage species, because of their importance to our salmonid populations and the sport and commercial fisheries that depend on them, their critical role in the California Current ecosystem, and because of growing worldwide demand to harvest forage fish.

The steps laid out in Alternative 2.2.1 will ensure that the Council achieves its goal of basic management protections for currently unmanaged forage fish. By protecting forage fish as a key link in the marine food web, we can sustain a healthy marine ecosystem and the fishing heritage and economies that depend on this ecosystem.

Each year Trout Unlimited spends hundreds of thousands of volunteer-hours and millions of dollars to conserve, protect and restore inland habitat for trout and salmon. Protecting their primary food source in the open ocean is a sensible, cost-effective tactic to ensure our work on land delivers its full promise: self-sustaining runs of wild salmon and steelhead in their native watersheds.

Thank you for your commitment to keeping the Pacific Ocean healthy and productive.

Sincerely,

David C Dragoo
President

Aug. 19, 2014

Ms. Dorothy M. Lowman
Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

**RE: Agenda Item H.1, Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

We at Wyland Worldwide applaud and thank the Council for the progress made over the past two years laying the groundwork for establishing regulatory protections for unmanaged forage fish species. Wyland Worldwide is founded on the love of our oceans. For the past 30 years, Wyland has been dedicated to ocean conservation. His art has provided a window into the marine ecosystem and connection to a typically unseen, vast world. This marine ecosystem is heavily dependent on forage fish to sustain the wondrous and majestic creatures in Wyland's murals worldwide. We are incredibly encouraged to see see the Council's commitment to ecosystem-based fisheries management. We ask that the Council continue its plans by protecting unmanaged forage fish.

This September we urge the Council to amend current fishery management plans to incorporate unmanaged forage fish as ecosystem component species. Also, these unmanaged forage fish species should have a limited catch limits in current fisheries. We would love to see the Council take the next step toward fulfilling its goal of prohibiting new forage fisheries until it can evaluate how removing prey would affect existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.

Sincerely,

Steve Creech
Vice President

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August 15, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

I am writing on behalf of Azul, an environmental project focused on empowering Latinos as marine and coastal stewards. In the past, I managed operations at an international aquaculture company and helped design a network of marine protected areas stretching from Santa Barbara to the Mexican border as part of California Marine Life Protection Act Initiative. My extensive involvement in the seafood industry and the preservation of our coastal waters has given me special insight into the interconnectedness of everything in the marine ecosystem.

As you look toward future regulations for unmanaged forage fish species, I ask that you follow through on the great work you have done over the past couple of years. In September, please move forward with protections for unmanaged forage fish by incorporating them into existing fishery management plans. Furthermore, the Council should set a limit on the forage fish that can be taken by existing fisheries for groundfish and other species. It is crucial that we leave enough forage fish in the water for the larger predator species that depend on them for sustenance.

I am encouraged that the Council recognizes the need to protect these ecologically and economically critical species. Thank you for considering these comments, for your leadership, and for your commitment to a sustainable marine environment.

Respectfully submitted,

Marce Gutiérrez
Executive Director
Azul

**YOSEMITE OUTFITTERS**
**FLY FISHING GUIDE SERVICE**

August 8, 2014

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

**Re: Support for Adoption of Alternative 2.2.1 as Preferred Option for Currently Unmanaged Forage Fish Species**

Dear Members of the Pacific Fisheries Management Council,

Trout Unlimited and I submit the following letter on behalf of the undersigned business owners, operators and organizations who represent fishermen who catch salmon and steelhead, processors who bring it to market, marinas and supporting businesses that sustain fishing jobs, and fishing guides and charter boat operators. We request that you act during your September 2014 meeting to better protect forage fish species, and the salmonids (salmon, steelhead, and sea-run trout) that depend on them during their ocean life stage.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species. In April 2014 the Council selected Alternative 2.2.1 as the preliminary preferred option for protecting currently unmanaged forage fish, and we commend this decision. We urge the Council to institutionalize this progress by formally selecting Alternative 2.2.1 and incorporating ecosystem component species into all of the Council's existing fishery management plans.

The steps laid out in Alternative 2.2.1 will ensure that the Council achieves its goal of basic management protections for currently unmanaged forage fish. By protecting forage fish as a key link in the marine food web, we can sustain a healthy marine ecosystem and the fishing heritage and economies that depend on this ecosystem.

Our businesses have suffered from inadequate fisheries management practices, and each year hundreds of thousands of volunteer-hours and millions of dollars are spent to conserve, protect and restore habitat for salmon and steelhead. From 2008-2009, California's salmon fishery was completely closed for the first time in our great state's history, with devastating impacts to thousands of men and women whose livelihood depends on the salmon fishery. Similarly, tourism is California's biggest industry and it is hampered when our oceans and rivers have too few fish. We hope the Council will help restore the long-lost balance in ocean ecosystems by protecting forage fish, thus also protecting the salmonids that depend on them.

Thank you for your commitment to keeping the Pacific Ocean healthy and productive.

Sincerely,

Rick Mazaira
Yosemite Outfitters
North Fork, CA. 93643

LOGO

7 Devils Brewing Co.
Carmen Matthews
247 S 2nd St
Coos Bay, OR 97420

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

7 Devils Brewing company is a local brewery in Coos Bay with local ingredients. We aim to be a sustainable business that is socially, ethically and environmentally responsible. Being part of the Oregon coastal community, we see how much of our economies and environment depend on a strong and healthy ocean. Forage fish conservation is important to us, as our much of the local seafood we serve depend on these valuable species as their main diet.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and we applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, we urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species.

During the meeting in September, we encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem and coastal economies for businesses like ours.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,

Carmen Matthews
Co-owner, 7 Devils Brewing
Coos Bay, OR


RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

National Wildlife Federation is a voice for wildlife, dedicated to protecting wildlife and habitat and inspiring the future generation of conservationists. We understand the importance of marine health to many ecosystems. Forage fish conservation is important because these fish are the basis for a healthy ocean food web, and without it, we will see devastating effects on our wildlife in the Pacific Northwest .

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and we applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, we urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species and evaluate controlling the opening of future fisheries on these species because of their critical role in the ecosystem.

Further, the Council should prohibit new directed fisheries absent rigorous review and management measures being in place beforehand, and set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species. This action ensures that existing fisheries are not negatively impacted while also ensuring that unregulated directed fisheries for these forage species do not develop.

During the meeting in September, we encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem and our coastal economies.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,

Nic Callero
Regional Outreach Coordinator
National Wildlife Federation
Portland, OR


13210 E INDIANA AVE
SPOKANE VALLEY, WA 99216

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

Silverbow Flyfishing is a flyfishing shop, educator, and guide service. Opening its doors in the late 80's, we have been talking fly fishing, selling gear, and **Making Fish Nervous** longer than anyone in town. Our goal since day one has been simple... to help anglers fish better and to share our knowledge. Forage fish conservation is important to us, as our sportfish depend on these valuable species as their main diet, especially when spending time in the ocean before returning to their native rivers and springs.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and we applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, we urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species.

During the meeting in September, we encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, trout, and tuna, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine and river ecosystems, including the valuable sustainable fisheries we rely upon.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,
Sean Visintainer
Owner/Guide
Spokane Valley, WA

Pacific Fishery Management Council
Dan Wolford, Chairman
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

September 2, 2014

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

As a marine biologist and concerned citizen living in coastal Oregon, I understand the importance of maintaining productive oceans. My own research focuses on the population dynamics of whales and dolphins but, living in Newport, I am also aware of the importance of well-managed commercial fisheries for a healthy economy. Forage fish serve an important role as essential diet for many of the marine animals I study and for many of the high-value species of fish taken in commercial and sport fisheries along the Pacific Coast.

I realize that the Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and I applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, I urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species and to evaluate controlling the opening of future fisheries on these species because of their critical role in the ecosystem.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem and coastal economies.

Sincerely,

Professor C. Scott Baker
P.O. Box 677
South Beach, Or 97366

west marin environmental action committee

Ms. Dorothy M. Lowman
Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

**RE: Agenda Item H.1, Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

The Environmental Action Committee of West Marin (EAC) would like to thank the Pacific Fishery Management Council for making strides since the unanimous adoption of your Fishery Ecosystem Plan. EAC is excited to hear that ecosystem-based management is being made a priority, especially since we tenaciously advocate for the appreciation and protection of the wildlife, wilderness, wild lands, watersheds, and rural characters of West Marin. For 40 years it has been our mission to protect and enhance the natural environment of West Marin. Our beloved West Marin would not be the wonderful place it is without a healthy, productive Pacific Ocean. Our oceans require forage fish to bridge the gap between plankton and important species such as tuna, sharks, salmon, whales, and many others.

Due to the immensely important role that forage fish play in our marine ecosystem, we encourage you to move forward with protections for currently unmanaged forage fish. By doing so, the Council acknowledges the crucial role of these species in the marine food web and ensures that role is maintained should a fishery for them be considered.

EAC strongly urges the Council to incorporate unmanaged forage fish as ecosystem component species into each of its existing fishery management plans. Additionally, the Council should limit unmanaged forage fish catch limits in existing fisheries.

We remain hopeful the Council will press forward to conserve forage fish as a vital food source in our marine ecosystem. Fulfilling the first initiative the Fishery Ecosystem Plan will protect forage fish and recognize them as a key link in the marine food web.

Thank you for continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely yours,

Amy Trainer, JD
Executive Director

ENDANGERED HABITATS LEAGUE
DEDICATED TO ECOSYSTEM PROTECTION AND SUSTAINABLE LAND USE

August 20, 2014

*VIA ELECTRONIC MAIL*

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chairperson Lowman and Council Members:

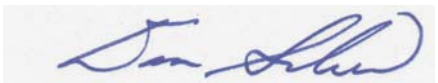
The Endangered Habitats League (EHL) applauds the Council for its work to protect currently unmanaged forage fish and to further advance an ecosystem-based management approach which acknowledges their critical role in the ecosystem. For your reference, EHL is Southern California's only regional conservation group and has helped lead the way toward an unprecedented, interconnected, and science-based system of nature reserves in our region.

This September, we ask the Council to incorporate unmanaged forage fish as ecosystem component species into each of its existing fishery management plans. A limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species must be set. This will ensure that fisheries are not negatively impacted while also ensuring that unregulated fisheries for these forage species do not develop in the future.

We ask the Council to continue the steady progress made over the past two years in laying the groundwork for establishing regulatory protections for forage species. It is vital that the Council take the next step toward fulfilling its goal of prohibiting new forage fisheries until it can evaluate how removing prey would affect existing fisheries and fishing communities.

Thank you for your time and attention to this matter. We appreciate your stewardship of our marine resources and the work you do to maintain sustainable fisheries.

Yours truly,



Dan Silver, MD
Executive Director

8424 SANTA MONICA BLVD SUITE A 592 LOS ANGELES CA 90069-4267 ♦ WWW.EHLEAGUE.ORG ♦ PHONE 213.804.2750

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Sacramento, CA 95814
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(916) 448-4560 (fx)

REGIONAL OFFICE
483 9th St., Ste. 100
Oakland, CA 94607
(415) 622-0039 (ph)
(415) 622-0016 (fx)

September 3, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

Thank you for the work that you have done over the past two years to move toward meaningful protections for unmanaged forage fish. Environment California is a statewide, citizen-based environmental advocacy organization. We believe our magnificent Pacific coastline and vast ocean are worth protecting and preserving for future generations.

Forage fish are a vital part of the marine ecosystem, serving as a critical food source for seabirds, whales, and larger fish like salmon and tuna. We ask that the Council adopt language to designate unmanaged forage fish as ecosystem component species and allow for a limited number of those species to be taken in existing fisheries. It is important to ensure that there are enough of these important little fish left in the water for other species, to avoid negatively impacting existing fisheries.

We are confident that the Council will move continue to move forward with its goal to establish basic protections for currently unmanaged forage fish. These actions will go a long way towards maintaining a vibrant marine ecosystem.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Respectfully submitted,

Nathan Weaver
Oceans & Preservation Advocate
Environment California

printed on recycled paper

**Ram Papish**
**750 Meadow Hill Dr.**
**Toledo, OR 97391**

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September 2, 2014

Dear Chairman Lowman and Council Members,

I am writing to support the Pacific Fisheries Management Council's efforts to encourage further research, monitoring and progress toward conserving forage fish. The council is to be commended for acknowledging this issue and praised for its efforts thus far. I am writing to encourage you to continue with your efforts at your meeting in Spokane. Please move forward in limiting the amount of unmanaged forage fish that can be taken by existing fisheries.

As a longtime coastal resident, the health of our marine ecosystem is very important to me. As a wildlife photographer and birdwatcher I enjoy the annual spectacle of seabirds nesting at Yaquina Head, Haystack Rock and other colonies along the coast. It's important to me that the prey species these seabirds depend on be protected in the future.

Just as forage fish are essential to the health of the ecosystem, a healthy ecosystem is essential to our local economy. High quality fisheries including salmon and are part of the lifeblood of our economy. As you know these species too depend on abundant and healthy populations of forage fish.

I have worked as a research assistant on several seabird studies in Alaska. As I am sure you are aware, many studies, including those I have been part of, have repeatedly demonstrated the lipid or fat content of high quality forage fish including smelt, sand lance and squid lead to greater reproductive success for seabirds over lower quality food sources. To ensure the future of our seabird populations, we must protect these high-quality forage fish.

With so many uncertainties affecting the marine environment in the future including climate change, increasing human populations and greater demands for fish meal, it is important to implement sound management and protection policies now.

Thank you for taking this matter seriously and addressing the issue while forage fish stocks are still healthy enough to recover and be managed appropriately for us and for our future generations of fishermen and women, nature enthusiasts, and wildlife populations.

Ram Papish

PACIFIC ■ ENVIRONMENT

*Protecting the living environment of the Pacific Rim*

September 3, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

RE: Agenda Item H.1 Unmanaged Forage Fish Protection Initiative

Dear Chair Lowman & Council Members,

We at Pacific Environment are proud to do all we can to protect the living environment of the Pacific Rim. We partner with local and indigenous communities all over the world to achieve our goals. The health and productivity of the Pacific Ocean is paramount for the success of our work. That is why we are so grateful for the progress the PFMC has made to conserve forage fish, the cornerstone of our marine ecosystem.

In Spokane, we implore you to continue your progress to protect unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species. Furthermore, I encourage the Council to limit the amount of these species to be incidentally caught. These steps will provide needed protections on these important bait fish, and ensure that this base level of the food chain remains plentiful. Seabirds, bears, and many other animals we work so hard to protect depend on these fish.

These actions will acknowledge the importance of these forage fish and mark a large step toward fulfilling the Council's Fishery Ecosystem Plan. The document's unanimous approval shows how important maintaining a healthy marine ecosystem is to the Council.

Thank you for your commitment and dedication to a healthy and productive Pacific Ocean.

Sincerely,
Domenique Zuber, Development Manager
Pacific Environment

369 Pine Street, Suite 518 ▪ San Francisco, CA 94104
Ph: 415.399.8850 ▪ Fax: 415.399.8860 ▪ www.pacificenvironment.org

GALVAN FLY REELS.

21103 Longeway Rd., Sonora CA, 95370

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Date: April, 2 2014

**Re: Support for Adoption of Alternative 2.2.1 as Preferred Option for Currently Unmanaged Forage Fish Species**

Dear Members of the Pacific Fisheries Management Council,
We, Galvan Fly Reels, request that you act during your April 2014 meeting to better protect forage fish species, and the salmonids (salmon, steelhead, and sea-run trout) that depend on them during their ocean life stage.
The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species. Please institutionalize this progress by selecting Alternative 2.2.1 as the preliminary preferred option for protecting currently unmanaged forage fish by incorporating them into all of the Council's existing fishery management plans as ecosystem component species.
The Council's Ecosystem Working Group has delivered a new report justifying your decision to conserve these forage species, because of their importance
to our salmonid populations and the sport and commercial fisheries that depend on them, their critical role in the California Current ecosystem, and because of growing worldwide demand to harvest forage fish.
The steps laid out in Alternative 2.2.1 will ensure that the Council achieves its goal of basic management protections for currently unmanaged forage fish. By protecting forage fish as a key link in the marine food web, we can sustain a healthy marine ecosystem and the fishing heritageand economies that depend on this ecosystem.
Each year Trout Unlimited spends hundreds of thousands of volunteer-hours and millions of dollars to conserve, protect and restore inland habitat for trout and salmon. Protecting their primary food source in the open ocean is a sensible, cost-effective tactic to ensure our work on land delivers its full promise: self-sustaining runs of wild salmon and steelhead in their native watersheds.
Thank you for your commitment to keeping the Pacific Ocean healthy and productive.

Sincerely,

Bonifacio Galvan, Carmen Galvan, Veronica Anderson, Lou Galvan, Marcos Galvan and Rachelle Galvan

GoldenGate Salmon Association

"The New Voice of Salmon"

September 3, 2014

Ms. Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, #101
Portland, OR 97220

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Ms. Lowman and Council Members,

We write to you in support of the Pacific Fishery Management Council's efforts to maintain a healthy marine ecosystem by protecting forage fish. Specifically, we support your plan to evaluate how removing prey would affect existing fisheries and fishing communities before allowing new forage fisheries.

The Golden Gate Salmon Association is a coalition of commercial and recreational salmon fishermen, businesses, restaurants, an Indian tribe, environmentalists, elected officials, families and communities that rely on salmon. GGSA's mission is to protect and restore California's largest salmon producing habitat; a habitat comprised of the Central Valley Rivers that feed the Bay-Delta ecosystem and the communities that rely on salmon as a long-term, sustainable, commercial, recreational and cultural resource.

Currently, California's salmon industry is valued at $1.4 billion in economic activity annually and about half that much in economic activity and jobs again in Oregon. The industry employs tens of thousands of people from Santa Barbara to northern Oregon, including in the California's Central Valley. This is a huge common market made up of commercial fishermen, recreational fishermen, fish processors, marinas, coastal communities, equipment manufacturers, the hotel and food industry, tribes, and the salmon fishing industry at large.

For those of us who earn a living related to salmon, having plenty of "bait fish" in the water is essential. We know that forage fish are critically important as a major source of food for salmon and many other fish, birds and marine mammals. We support Council efforts to establish basic protections for unmanaged forage fish and incorporate them into all existing fishery management plans as ecosystem component species.

Fishermen face plenty of challenges already, from irrigators tapping salmon streams in the Central Valley to a market influx of cheap farmed fish, mainly from overseas. Our members continue to work hard to improve inland freshwater salmon habitat. Now, we support council efforts to ensure a healthy marine environment by adequately conserving forage fish.

Thank you for your time and commitment to maintaining healthy oceans and sustainable fisheries.

Sincerely,

John McManus

John McManus, Executive Director
Golden Gate Salmon Association

August 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

I write to you as the owner of La Posta Restaurant and Soif Wine Bar & Merchants. Although my restaurants differ in cuisine, they share the intent to support the continuing rise of the Santa Cruz area as a center of sustainable, organic, small production food. At both restaurants, the chefs deliver a fresh, market-driven menu inspired by the local community of farmers, foragers and fishermen, who provide an abundance of riches to our kitchen.

It has recently come to my attention that the Council has been working for the past couple of years to establish basic protections for unmanaged forage fish. I applaud your efforts and urge you to continue this work by fulfilling the first initiative of the Fishery Ecosystem Plan. Forage fish serve as a critical food source for many of the fish that I serve to my diners, like tuna. It is important that we leave enough forage fish in the water to maintain a balance in the ocean food web and avoid negatively impacting existing fisheries. Please move forward with designating unmanaged forage fish as ecosystem component species and incorporating them into existing fishery management plans.

Thank you for allowing me the opportunity to weigh in on this important issue.

Respectfully submitted,

Patrice Boyle, Owner
La Posta Italian Cuisine
Soif Restaurant Wine Bar & Merchants

Confederated Tribes of Siletz Indians
201 SE Swan Ave
P.O. Box 549
Siletz, OR 97380

August 14, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem -- Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

As the biologist for the Confederated Tribes of Siletz Indians (CTSI) I would like to thank you for your efforts in working toward improving management of forage fish these past few years and for adopting the Fishery Ecosystem Plan in the spring of 2013. We at the Tribe appreciate the deliberative work you and your staff have accomplished since that time to begin implementing the plan by focusing on protection of unmanaged forage fish as your first ecosystem-based initiative. In addition, we were pleased with the Council's support of the Ecosystem Trophic Pathway – Option 2.2.1 – at your April 2014 meeting in Vancouver, Washington. We believe incorporating currently unmanaged forage fish as ecosystem component species within each of the Council's existing Fishery Management Plans makes good conservation sense.

I am writing you today to ask you to take the next step forward and designate *unmanaged forage fish* as ecosystem component species to allow for conservation of these key prey species. Further we request Council set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

The Tribe was fortunate enough to become the owner of the Siletz and Alsea Basin Marbled Murrelet mitigation lands acquired through the New Carissa mitigation process. The Tribe manages approximately 4,000 acres for the Murrelet. Not only are these forage fish key components of the food chain that determine the Tribe's ability to continue the existence its cultural practices (e.g. such as salmon harvest) but they are key to our ability to succeed with our mitigation lands.

Sincerely,

Stan van de Wetering
Aquatic Programs Leader

**Agenda Item H.1**
**Unmanaged Forage Fish Protection Initiative**
**Pacific Fishery Management Council**
**30 August 2014**

Dear Chair Lowman and Council Members:

I thank and applaud the Council for its important progress toward ecosystem-based approaches in fisheries management in recent years. I am a college textbook author in environmental science, secretary of the Audubon Society of Portland, and a naturalist with a keen interest in seabirds and other coastal marine life, and I have been encouraged by your actions at recent meetings. A vital component of continued progress would be to extend protections to currently unmanaged forage fish, those species low on the food chain that are so vital to supporting populations of larger fish and maintaining healthy marine communities.

At your September meeting, I would like to encourage you to pursue language to incorporate unmanaged forage fish as ecosystem component species into the management plans for groundfish and other existing fisheries. I would also urge that limits be set on the amount of forage fish that can be taken in existing fisheries. Finally, I would request that new directed fisheries not be allowed without rigorous review and prior management plans.

These steps will help fulfill Initiative #1 in the Council's Fishery Ecosystem Plan, and will be crucial in restoring and maintaining the health of the marine and coastal fisheries and ecosystems on which larger fish, seabirds, marine mammals, and our coastal economies all depend.

Thank you very much for your ongoing efforts to sustain healthy fisheries and marine ecosystems.

Jay Withgott
Textbook author in environmental science
Portland, Oregon
withgott@comcast.net

# NATIVE FISH SOCIETY

*Advancing the Recovery of Native, Wild Fish in Their Homewaters*

August 29, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem -- Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

Thank you for the constructive work you and your staff have undertaken to begin implementing the Fishery Ecosystem Plan by focusing on protection of unmanaged forage fish as you first initiative. I especially appreciate the Council's support of the Ecosystem Trophic Pathway – Option 2.2.1 – at your April 2014 meeting in Vancouver, Washington because incorporating currently unmanaged forage fish as ecosystem component species within each of the Council's existing Fishery Management Plans makes good conservation sense for upper trophic level species of seabirds, whales and other marine life.

I'm encouraged to hear that you plan to take the next step at your upcoming September meeting in Spokane. I respectfully request that the Council **adopt amendatory language to designate unmanaged forage fish as ecosystem component species to continue to move your efforts to conserve these prey species. Further, I would urge the Council to set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species**. In combination, these actions will ensure that unregulated directed fisheries for these forage species do not develop while providing some assurance that existing fisheries are not negatively impacted.

Your continued work to protect forage fish is important to me as an Oregonian who cares about the sustainability of our native fish and the habitat upon which they depend. Efforts to secure the future of our wild salmon means taking action on many fronts – from hatchery and harvest reforms to protection of spawning grounds – and improving conservation of forage fish is a vital step for tending to the full circle of life of these anadromous fish.

Forage fish are important for wild salmon. For one thing, forage fish serve as **alternative prey**. Schooling marine fish such as sardines, anchovies, herring and smelt provide cover against a gauntlet of predatory seabirds, harbor seals and larger fish that might otherwise devour out-

221 Molalla Ave., Suite 100, Oregon City, Oregon 97045, 503-496-0807
nativefishsociety.org, admin@nativefishsociety.org

migrating salmon and steelhead smolts. This one point is crucial in determining the proportion of smolts that will return as spawning adult salmon.

Secondly, once in the ocean, **as salmon mature, forage fish become a key food source**. For example, forage fish account for nearly half the diet composition of Chinook salmon. The extra calories provided by oil-rich forage fish enable salmon to grow larger, produce stronger eggs and improve reproductive success once they return to their natal waters.

I have been involved in wild salmonid conservation for over 40 years in Oregon and recognize the value of effective regulation of fisheries in conservation and recovery of salmonids including their food base. Salmonids and their prey in the ocean are important as a food source for other species of wildlife and the integrity, productivity, and abundance of this ecosystem to Oregon jobs and our sense of wellbeing that these fish provide.

In my opinion, it makes good conservation sense to take proactive steps to assure that the vital forage fish link in our fragile and complex ocean food web is protected and recognized for its ecosystem value before proposals to harvest them push us into future conflicts and force us to be reactive rather than proactive.

In September, the Council has an opportunity to advance a precautionary approach to management **by adopting amendatory language to designate unmanaged forage fish as ecosystem component species and allowing for a limited amount of these species to be taken in existing fisheries**. Taking these steps will serve to sustain not only forage fish but the millions of salmon and other wild marine life that rely on them further up the food chain. Thank you for your consideration.

Sincerely,

Bill M. Bakke,
Conservation and Science Director
Native Fish Society

# WILDLIFE CENTER
## of the NORTH COAST

P.O. Box 1232 ◆ Astoria, Oregon 97103 ◆ (503) 338-0331
◆ director@coastwildlife.org ◆ www.coastwildlife.org ◆

*"Promoting compassion, empathy and respect for all life through wildlife rehabilitation, ecological teachings and non-lethal / non-invasive conservation monitoring of wildlife and environmental health"*

September 2, 2014

Subject: Fisheries Ecosystem Plan
Protecting Unfished and Unmanaged Forage Fish Species

Submitted via e-mail: pfmc.comments@noaa.gov

Pacific Fisheries Management Council
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Ladies and Gentlemen:

Please accept this correspondence as a public comment on the Fisheries Ecosystem Plan to protect unfished and unmanaged forage fish species.

Wildlife Center of the North Coast (WCNC) is a private non-profit 501(c)(3) Oregon corporation located in Astoria, OR. Over the past 18 years, WCNC has assisted distressed wildlife throughout the north and central Oregon coast and southwest Washington. Due to the coastal location of WCNC, the majority of our wildlife patients consist of pelagic avian species. Many of those seabirds are admitted in a state of extreme emaciation. Although there are many factors that can lead to starvation, a lack of available forage fish is among the top causes. If that prey deficiency is human caused, it can be among the most difficult ecosystem disrupters to reverse.

WCNC would like to take this opportunity to thank the Pacific Fishery Management Council for its proactive efforts in adopting the Fisheries Ecosystem Plan (FEP). Initiative 1 of that plan extends additional protection to currently unmanaged and unfished forage species that represent an integral part of the marine food web. Of particular note is protection of Pacific saury, a key prey species for seabirds including avian species that are facing large declines.

WCNC also supports Option 2.2.1, the Ecosystem Trophic Role Pathway as a preliminary preferred alternative base on which to build conservation measures for the Council's oversight of forage fish harvest.

One important indicator species of healthy forage fish populations is the highly visible Brown Pelican. The Brown Pelican was removed from listing under the Endangered Species Act in 2009. In the years since delisting, the Brown Pelican has experienced unprecedented breeding failures as well as unusual mortality events, both likely associated with inadequate supplies of forage fish near breeding islands and in wintering areas of the California Current Ecosystem.

At the U.S. Channel Islands, the most northern and important U.S. breeding colonies for this subspecies, biologists have noted a general decline in reproductive success since 2010 with near total nesting failure in 2012 and marginal breeding success in 2013. These failures have been attributed to a lack of prey availability during the breeding season. *(Harvey, L. 2013. California Institute of Environmental Studies. California Brown Pelican reproductive decline on the Channel Islands colonies. Unpublished data.)*

Unusual adult Brown Pelican mortality events during the non-breeding season on the California and Oregon coasts in 2008-2009 and 2009-2010 were attributed primarily to starvation. *(Nevins, H. et al. 2011. Summary of unusual stranding events affecting Brown Pelican along the US Pacific Coast during two winters, 2008-2009 and 2009-2010, California Department of Fish and Wildlife.)*

Although the FEP pertains to the U.S. portion of the California Current Large Marine Ecosystem, we wish to highlight the importance of a strong by-catch clause within the plan language based on events occurring in Mexico. For instance, by-catch mortality of Brown Pelicans in the sardine and anchovy fishery in the Gulf of Mexico appear to be increasing, yet there are no fisheries observers and no reporting of by-catch information. *(Velarde, E. Personal Communication, September 2013.)*

Thank you for considering our comments and for noting our support of science-based ecosystem management, transparent decision making and public comment involvement.

Sharnelle A. Fee, Director

By-catch of Brown Pelicans in Mexico

By-catch of Brown Pelicans in Mexico

By-catch and death of Brown Pelicans in Mexico

http://sancarlos.tv/guaymas-commercial-sardine-fishery-preliminary-report/

Pacific Fisheries Management Council August 19, 2014
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Subj: Unmanaged Forage Fish Protection Initiative – Preliminary Preferred Alternative

Dear Chair Lowman and Council Members,

My name is Jeff Dose, I am a retired Fisheries Biologist with over 35 years of experience in the field, primarily in Pacific salmon restoration activities in the Rogue and Umpqua River basins. Additionally, I authored a chapter in the 2006 American Fisheries Society publication ***"Salmon 2100: The Future of Wild Pacific Salmon"***. First, I'd like to thank you for the opportunity to comment on this topic and for your previous support for important marine conservation actions, particularly your adoption of the Fishery Ecosystem Plan and support for Ecosystem Trophic Pathway – Option 2.2.1.

I strongly support incorporating unmanaged forage fish as an ecosystem component in your existing Fishery Management Plans (FMP's) because of their importance as a link within the interconnected ecosystem that salmon and many other upper trophic species are dependent. To this end, I encourage you to adopt language at your September meeting in Spokane that would designate unmanaged forage fish as an ecosystem component species and as a result, that you also establish harvest limits for these fish where they are taken incidentally in other fisheries or if targeted fisheries develop in the future.

In closing, I again thank you for all the conservation and management activities the Council has undertaken to date. As detailed in the Ecosystem Working Group March, 2014 report, as a group, these fish are an important ecosystem component and are deserving of prudent management. It would seem that an effective method of achieving this goal would be to specifically identify unmanaged forage fish as ecosystem component species and incorporate their management as a component of every FMP where they occur.

Sincerely,

Jeffrey J. Dose
1306 Fisher Road
Roseburg, Oregon 97471

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N. E. Ambassador Place, Suite 101
Portland, Oregon, 97220-1384

Agenda Item H.1 Ecosystem: Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members"

Thank you for the work of you and your staff in the implementation of the Fishery Ecosystem Plan which is a very important step in helping the conservation of upper trophic level species. We are also excited to learn that you plan to take the next step at the upcoming September meeting by adopting amendatory language to designate unmanaged forage fish as ecosystem component species to continue to move your efforts to conserve these prey species. I would especially encourage the Council to set a limit on the number of unmanaged forage fish that may be taken in existing fisheries for ground fish and other species.

The consideration of the setting of take limits is especially important. We live in Charleston, Oregon and have frequent contact with the fleet and processors. We know how demand for a species can occur seemingly overnight and the how slow the lack of regulation takes to catch up to the present. I realize that Hagfish is not a forage species but it provides a good example of how take limits could limit any adverse consequences. The Hagfish are popular in Korea where they were overfished. They were also overfished on the eastern U.S. coast. In 2001 there was no Hagfish unloaded in Charleston. In 2002/2003 just one Charleston boat was involved in the harvest. In recent years, the vessel numbers have been as high as ten or twelve. There are currently no limits or permits and I believe little knowledge about the tonnage that would constitute overfishing. This same scenario could just as easily occur with a currently unmanaged forage fish species and the consequences could prove to be calamitous.

In September, the Council has an opportunity to advance a precautionary approach by adopting the language that designates unmanaged forage fish as an ecosystem component species and allowing for a limited amount of these species to be taken in existing fisheries. We urge the Council to take this important step.

Sincerely,

Steve and Linda Anderson
P. O. Box 5480
Charleston, OR 97420

# International Game Fish Association
## Fishing Hall of Fame & Museum

300 Gulf Stream Way, Dania Beach, Florida, 33004 U.S.A.
Phone: (954) 927-2628 • Fax: (954) 924-4299 • Museum Fax (954) 924-4220




Pacific Fishery Management Council
Dorothy Lowman, Chair
7700 N.E. Ambassador Place, Suite 101

Portland, Oregon 97220-1384

Dear Chair Lowman and Council Members,

The International Game Fish Association is a non-profit organization representing 12,000 members in 135 countries around the world. I write today to thank the Council for the steps taken so far to conserve a productive marine food web along the U.S. West Coast, and to encourage you to take the next step in September toward fulfilling the first priority of the Council's fishery ecosystem plan: Protecting forage fish species that are not currently managed.

These species, including round and thread herrings, lanternfish, sand lance, saury, silversides, smelts and pelagic squids, help to ensure an abundance and diversity of forage fish species that form one of the most vibrant marine ecosystems on the planet. I ask that the Council continue to move forward by incorporating them into existing fishery management plans as ecosystem component species with management measure that prohibit the unregulated development of new directed fishing.

The Council would be wise to act as soon as possible, before new fisheries begin. Our members on the West Coast have seen the negative repercussions in the ecosystem when forage fish become scarce, as is the case with sardines and anchovies in recent months. Seabirds, marine mammals, and larger game fish all suffer the effects. At the same time, global demand continues to be strong to use forage fish for high-volume products such as animal feed and commercial bait. Indeed, the Council's ecosystem plan development team cited the "spectacular growth" of the global aquaculture industry as raising the likelihood for industrial-scale fishing to expand to forage species that aren't yet being fished on the West Coast.

The Lenfest Forage Fish Task Force in 2012 calculated that forage fish worldwide are worth $11.3 billion left in the water to sustain commercially valuable wild fish like salmon, tuna, and cod. That's roughly twice the ex-vessel value to fishermen catching forage fish directly, and it does not even account for their economic contribution to recreational fishing or ecotourism pursuits like birding and whale-watching.

Thank you for your diligent attention to this issue and for your commitment to a healthy and productive Pacific marine ecosystem.

Jason Schratwieser
IGFA Conservation Director

7/13/2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem – Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

We at Sea Lion Caves, want to thank you for the steady progress you've made toward establishing protections for currently unmanaged forage fish species, which are a vital part of the food web in the entire California Current Ecosystem. These small fish are a big deal for all of us along the Oregon coast. As prey, they provide nutrition for the seabirds, whales, seals, and our Steller sea lions which people come to the coast to view and enjoy from all over the world -- as well as the tuna, rockfish and salmon that they come to catch. The people who visit Oregon's coast for its natural beauty and bounty are our customers, so in a very real sense Sea Lion Caves relies on forage fish for our livelihood, as well.

That is why we are urging the Council to **continue this good work at your upcoming September meeting in Spokane by adopting amendatory language to designate unmanaged forage fish as ecosystem component species. In addition, we'd like to encourage you to set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.** Taken together, these two measures will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop.

Your continued work to protect forage fish is very important to Sea Lion Caves and all coastal businesses whose clients flock to the coast to witness the natural wonder of Oregon's marine life. In Florence, my business is a unique coastal attraction. We are America's largest sea cave and the year-round home of the Steller sea lion. The success of our business depends on assuring that our seabird colonies, whales, Steller sea lion population and other marine mammals remain healthy and well-fed. As you know, each and every one of the forage fish species being considered by the Council serves as food for seabirds and marine mammals.

In our opinion, it makes smart business sense to take precautionary steps to assure that an asset that is fundamental to the health of our coast – and to our coastal tourism sector -- is adequately protected before proposals to harvest them push us into future conflicts and force us to be reactive rather than proactive.

For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know

that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

In a similar way, we believe that in September, **the Council can provide a clear path forward for protecting unmanaged forage fish by incorporating them into each of the fishery management plans as ecosystem component species**. Doing so will recognize the important linkages they provide within an interconnected system that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for Sea Lion Caves and all other coastal business owners who rely on natural-resource-based tourism, **these little fish <u>are</u> a big deal.** We support the Council's efforts to advance a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses that depend on a having a healthy ocean.

Thank you for your consideration.

Sincerely,

Gerald Duane "Boomer " Wright
General Manager Sea Lion Caves
91560 Hwy 101
Florence, OR. 97431
541-547-3111

**Robert R. Kurz**
**23256 Arelo Court**
**Laguna Niguel, CA 92677**
**(949) 495-7272**
**FAX (949) 495-7676**
**E-mail rkurz@hotmail.com**

August 30, 2014

Pacific Fishery Management Council
Dorothy Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

I am writing today to thank the Council for the great work they've done and to encourage forward momentum towards a productive, healthy Pacific Ocean.

As past-president of the Balboa Angling Club and Laguna Niguel Billfish Club, and current Southern California Representative for the International Game Fish Association, I have spent the past several decades fishing in the Pacific and around the globe. I am deeply invested in the marine ecosystem and all of the important links in it. That is why I am writing you, to protect a very crucial link in our ecosystem – forage fish.

The progress the Council has made since unanimously adopting the Fishery Ecosystem Plan has been reassuring. I urge you to continue this progress by protecting unmanaged forage fish species. Protect them by incorporating these species as ecosystem component species into each of its existing management plans. In addition to this, the Council should prohibit new directed fisheries without proper management measures being in place beforehand. Unmanaged forage fish species should also have catch limits set in existing fisheries.

A multitude of species, including billfish, salmon, tuna, whales, seabirds, and other game fish rely on these forage fish to sustain them. If the Council takes these actions and fulfills the first initiative of the Fishery Ecosystem Plan, it will ensure that these fish have basic protections and retain the abundance necessary for all the species that rely on them.

Thank you for your diligent attention to this issue and for your commitment to a healthy and productive Pacific marine ecosystem.

Sincerely,

Robert R. Kurz
IGFA Representative – Southern California

**Tillamook Estuaries Partnership**
*A National Estuary Project*

*613 Commercial Street, PO Box 493, Garibaldi, OR 97118* *Phone (503) 322-2222 Fax (503) 322-2261*

August 29, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item H.1. Ecosystem -- Unmanaged Forage Fish Protection Initiative PPA

Dear Chair Lowman and Council Members:

The Tillamook Estuaries Partnership (TEP) is writing to respond to the above referenced agenda item. The Tillamook Estuaries Partnership is part of the National Estuary Program, created through Section 320 of the Clean Water Act and overseen by the EPA. In adopting the Tillamook Bay Comprehensive Conservation and Management Plan, our guiding document, the community identified four key areas that we focus on: 1) key habitat loss, 2) water quality, 3) minimizing flood impacts, and 4) citizen involvement. Understanding our ecosystem and the many complex interactions between habitat, fish and wildlife, and water quality are critical to our planning efforts.

Thank you for the constructive work you and your staff have undertaken to begin implementing the Fishery Ecosystem Plan by focusing on protection of unmanaged forage fish as your first initiative. I especially appreciate the Council's support of the Ecosystem Trophic Pathway – Option 2.2.1 – at your April 2014 meeting in Vancouver, Washington because incorporating currently unmanaged forage fish as ecosystem component species within each of the Council's existing Fishery Management Plans makes good conservation sense for the seabirds, marine mammals, fisheries and other marine life that depend upon them.

I'm encouraged to hear that you plan to take the next step at your upcoming September meeting in Spokane. I respectfully ask that Council consider including language to designate unmanaged forage fish as ecosystem component species to continue to move your efforts to conserve these prey species. The Council may also find that additional actions will be necessary to protect both the forage species as well as provide some assurances impacts to existing fisheries are minimized.

Forage fish are a building block in the marine ecosystem with many fish and wildlife species dependent upon healthy forage fish populations. As an entity focused on the restoration and conservation of the estuaries and watersheds in Tillamook County, we know the role that forage fish play in the health of our estuarine ecosystems. It makes sense to take proactive steps to assure that the vital forage fish link in our fragile and complex ocean food web is recognized for its ecosystem value.

Please feel free to contact me at either 503-322-2222 or lphipps@tbnep.org

Sincerely,

Lisa M. Phipps, Executive Director

**Salmon Drift Creek Watershed Council**

*Protecting and Restoring Local Watersheds*

**P.O. Box 112**
**Neotsu, OR 97364**
**541.996.3161 – office**
**541.994.4739 – fax**
**www.salmondrift.org**

August 31, 2014

To: **pfmc.comments@noaa.gov**.

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

**RE: Agenda Item I.1. Unmanaged Forage Fish Initiative**

Dear Chair Lowman and Council Members:

I had the pleasure of attending and providing comment at your last meeting in Vancouver, Washington. I was very impressed with your commendable efforts toward establishing protections for currently unmanaged forage fish species, which are a vital part of the food web in the entire California Current Ecosystem. These small fish are a big deal for all of us on the Oregon Coast, in that they provide nutrition for a multitude of species from seabirds and rockfish to whales and sea lions.

I urge the Council to continue this good work, and at its upcoming September meeting in Spokane, by adopt amendatory language to **designate unmanaged forage fish as ecosystem component species.** In addition, I encourage the Council to **set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries for groundfish and other species.** Taken together, these two measures will ensure that existing fisheries are not negatively impacted and unregulated directed fisheries for these forage species do not develop. These actions will provide a clear path forward for protecting forage fish by recognizing they provide important linkages within an interconnected ecosystem that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the Coast.

Thank you for your continued consideration.

Sincerely,

*Catherine Pruett*

Catherine Pruett, JD, MPA
Executive Director
Salmon Drift Creek Watershed Council

September 3, 2014

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

**Re: Support for Adoption of Alternative 2.2.1 as Preferred Option for Currently Unmanaged Forage Fish Species**

Dear Members of the Pacific Fisheries Management Council,

Trout Unlimited submits the following letter on behalf of the undersigned business owners, operators and organizations who represent fishermen who catch salmon and steelhead, processors who bring it to market, marinas and supporting businesses that sustain fishing jobs, and fishing guides and charter boat operators. We request that you act during your September 2014 meeting to better protect forage fish species, and the salmonids (salmon, steelhead, and sea-run trout) that depend on them during their ocean life stage.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species. In April 2014 the Council selected Alternative 2.2.1 as the preliminary preferred option for protecting currently unmanaged forage fish, and we commend this decision. We urge the Council to institutionalize this progress by formally selecting Alternative 2.2.1 and incorporating ecosystem component species into all of the Council's existing fishery management plans.

The steps laid out in Alternative 2.2.1 will ensure that the Council achieves its goal of basic management protections for currently unmanaged forage fish. By protecting forage fish as a key link in the marine food web, we can sustain a healthy marine ecosystem and the fishing heritage and economies that depend on this ecosystem.

Our businesses have suffered from inadequate fisheries management practices, and each year hundreds of thousands of volunteer-hours and millions of dollars are spent to conserve, protect and restore habitat for salmon and steelhead. From 2008-2009, California's salmon fishery was completely closed for the first time in our great state's history, with devastating impacts to thousands of men and women whose livelihood depends on the salmon fishery. Similarly, tourism is California's biggest industry and it is hampered when our oceans and rivers have too few fish. We hope the Council will help restore the long-lost balance in ocean ecosystems by protecting forage fish, thus also protecting the salmonids that depend on them.

Thank you for your commitment to keeping the Pacific Ocean healthy and productive.

Sincerely,

Kyle Smith
President
Blueback Trout Unlimited Chapter
Corvallis, OR

Chris Daughters
Owner
The Caddis Fly Shop
Eugene, OR

Ethan Barrow
Adventures Across Oregon
Banks, OR

Joel La Follette
Owner
Royal Treatment Fly Fishing
West Linn, OR

Clay Holloway
Licensed Fishing Guide
Eugene, OR

Austin Tomlinson
Owner
Northwest Regolith
Seaside, OR

Travis “TJ” Dawson
Owner
Opportunity Fly Fishing
Manzanita, OR

Jack Hagan
Owner
Northwest Fly Fishing Outfitters
Portland, OR

Don Nelson
Owner
River City Fly Shop
Beaverton, OR

James Brown
Owner
Home Waters Fly Shop
Eugene, OR

Dean Finnerty
Licensed Fishing Guide
Cottage Grover, OR

Terry Turner
Owner
Terry’s Custom Rods
Gladstone, OR

Tye Krueger
Owner
Confluence Fly Shop
Bend, OR

Bend Casting Club
President
Gabe Parr
Bend, OR

Brian O’Keefe
Catch Magazine
Powell Butte, OR

Kate Taylor and Justin Crump
Owners
Frigate Travel
Rockaway, OR

Wild North Coast Chapter
Trout Unlimited
Seaside, OR

Erle Norman
Tualatin Valley Chapter
Lake Oswego, WA

Gabe Parr
President
Bend Casting Club
Bend, OR

Mike Tripp
President
Deschutes Chapter of Trout Unlimited
Bend, OR

Leonard A. Volland
President
Steamboaters
Roseburg, OR

Rosendo Guererro
President
Washington Council of Trout Unlimited
Tacoma, WA

John Sikora
CA Council Chair
Trout Unlimited
Placerville, CA

Bernard Bahro
President
El Dorado Chapter TU
Placerville, CA

Jim Brock
President
North Bay Chapter TU
San Rafael, CA

Richard Jorgensen
President
Redwoods Empire Chapter TU
Santa Rosa, CA

Dan Brosier, President
Sac-Sierra Chapter TU
Sacramento, CA

John Jewett
President
Truckee River Chapter TU
Truckee, CA

Bill and Sharon Reynolds
Owners
Ebbett's Pass Sporting Goods
Arnold, CA

Josh Brockett
Owner
Fish On Fly Gear
Sonora, CA

Melanie and Dan Lewis
Owners
Glory Hole Sports
Angels Camp, CA

Jim Allday
President
Calaveras Fly Fishers
Arnold, CA

Cary Westbrook
President
Motherlode Fly Fishers
Sonora, CA

Kevin Bell
Manager
Bob Marriott's Flyfishing Store
Fullerton, CA

Alan Grosdidier
President
Downey Fly Fishers
Downey, CA

Ken Lindsay and Steve Ellis
Owners
Fisherman's Spot
Van Nuys, CA

Gary Bulla
Owner
Gary Bulla Fly Fishing Adventures
Ojai, CA

Lew Riffle
President
Santa Barbara Fly Fishers
Santa Barbara, CA

Dick Harris
President
Santa Clarita Casting Club
Santa Clarita, CA

Lew Leicher
President
Santa Lucia Fly Fishers
San Luis Obispo, CA

Paul Wilson
President
Sespe Fly Fishers
Ventura, CA

Michael Centofanti
President
South Bay Fly Fishers
Redondo Beach, CA

Amy Kileen
President
Kern River Fly Fishers
Bakersfield, CA

Jimmie Morales
Owner
Sierra Fly Fisher Tours
Oakhurst, CA

Jerry Neuburger
Licensed Guide
Deltastrippers.com
Lodi, CA

TROUT UNLIMITED



July 25, 2014

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

**Re: Support for Adoption of Alternative 2.2.1 as Preferred Option for Currently Unmanaged Forage Fish Species**

Dear Members of the Pacific Fisheries Management Council,

Trout Unlimited submits the following letter on behalf of the undersigned business owners, operators and organizations who represent fishermen who catch salmon and steelhead, processors who bring it to market, marinas and supporting businesses that sustain fishing jobs, and fishing guides and charter boat operators. We request that you act during your September 2014 meeting to better protect forage fish species, and the salmonids (salmon, steelhead, and sea-run trout) that depend on them during their ocean life stage.

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species. In April 2014 the Council selected Alternative 2.2.1 as the preliminary preferred option for protecting currently unmanaged forage fish, and we commend this decision. We urge the Council to institutionalize this progress by formally selecting Alternative 2.2.1 and incorporating ecosystem component species into all of the Council's existing fishery management plans.

The steps laid out in Alternative 2.2.1 will ensure that the Council achieves its goal of basic management protections for currently unmanaged forage fish. By protecting forage fish as a key link in the marine food web, we can sustain a healthy marine ecosystem and the fishing heritage and economies that depend on this ecosystem.

Our businesses have suffered from inadequate fisheries management practices, and each year hundreds of thousands of volunteer-hours and millions of dollars are spent to conserve, protect and restore habitat for salmon and steelhead. From 2008-2009, California's salmon fishery was completely closed for the first time in our great state's history, with devastating impacts to thousands of men and women whose livelihood depends on the salmon fishery. Similarly, tourism is California's biggest industry and it is hampered when our oceans and rivers have too few fish. We hope the Council will help restore the long-lost balance in ocean ecosystems by protecting forage fish, thus also protecting the salmonids that depend on them.

Thank you for your commitment to keeping the Pacific Ocean healthy and productive.

Sincerely,

Scott West, President
Fresno Fly Fisher's for Conservation
Fresno, Calif.

PFMC Comments - NOAA Service Account <pfmc.comments@noaa.gov>

# Agenda Item H.1 - Unmanaged Forage Fish Protection Initiative

1 message

**Richard Kelllogg** <dkellogg36@gmail.com> Fri, Aug 22, 2014 at 2:10 PM
To: pfmc.comments@noaa.gov

I'd like to thank you for your previous support for important marine conservation actions, particularly your adoption of the Fishery Ecosystem Plan and support for Ecosystem Trophic Pathway – Option 2.2.1.

I strongly support incorporating unmanaged forage fish as ecosystem component species in your existing Fishery Management Plans (FMP's) .

I also urge you to establish limits on the amount of these species that may be incidentally taken in other existing fisheries.

In closing, I again thank you for all the conservation and management activities the Council has undertaken to date.

Best wild fish,
Dick Kellogg

Sincerely,
Richard Kelllogg
Camp Sherman, OR
97730

**As of the Supplemental public comment deadline, the Council office received over 145 of the above emails regarding the unmanaged forage fish protection initiative.**

August 13, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Subject: Agenda Item H.1 -Unmanaged Forage Fish Protection Initiative

Dear Chair Lowman and Council Members:

This letter is a follow-up to my previous comments supporting your efforts to take steps to include currently unmanaged forage fish into existing fishery management plans. I appreciate the work you and your staff have accomplished toward implementing protection of forage fish as your first ecosystem-based initiative. These are critical species in our ocean food web. It makes good business sense to take a precautionary approach to their management.

At your upcoming meeting in Spokane I urge you to adopt amendatory language to designate unmanaged forage fish as an ecosystem component species. In addition, I feel it is important for you to set a limit on the amount of unmanaged forage fish that may be taken as bycatch in existing fisheries. These two measures will ensure that current fisheries are not negatively impacted and unregulated fisheries directed at forage species do not develop.

My wife and I have lived in Florence, Oregon for 10 years, after I retired from a career with the USDA Natural Resources Conservation Service in Oregon. During our time here on the coast, I was involved for several years with the community team process for establishing Marine Reserves, focusing on the Cape Perpetua site. Most participants; fishermen, conservationists, business interests, and local community leaders, felt that protection for forage fish in Marine Reserves and Marine Protected Areas was essential. I am pleased that forage fish are now protected in all components of the newly established Cape Perpetua Marine Reserve/Protected Areas complex.

It is now time to extend management of these critical resources to all of our state and federal waters.

Sincerely,

Mark Tilton
Florence, Oregon


August 27, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
1100 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1 (Unmanaged Forage Fish Protection Initiative PPA)**

Dear Chair Lowman and Council Members:

The Wetlands Conservancy, an Oregon land trust that works in the Yaquina, Beaver Creek and Alsea estuaries on Oregon's Central Coast, thanks you for your past work laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species, including the considerable progress made at the Pacific Fishery Management Council's April 2014 meeting. The role that forage fish play in the web of healthy estuarine and marine ecosystems has become focus, as we update our own preserve management and conservation plans.

Today, I am writing to encourage the Council to move forward with efforts to protect currently unmanaged forage fish by selecting amendatory language that incorporates them as ecosystem component species into all of the Council's existing fishery management plans. I also ask that the Council move to prohibit new directed fisheries without rigorous review and management measures being in place beforehand, and to set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species. These actions will ensure that existing fisheries are not negatively impacted while also ensuring that ample numbers of forage fish remain in the water to support other crucial species such as salmon, whales, and seabirds.

These steps are very much in keeping with the Council's Ecosystem Working Group's recent report which describes the importance of conserving forage species because of their role in the California Current Ecosystem and the growing worldwide demand to catch them. Such actions

4640 sw Macadam, #50 Portland, Oregon 97239 t503 227 0778 f971 229 1968 www.wetlandsconservancy.org

will also help the Council fulfill the first initiative of its Fishery Ecosystem Plan, a visionary document that the Council approved unanimously.

By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.

Thank you for your continued commitment to maintaining a healthy and productive Pacific Ocean.

Sincerely,

Esther Lev

Executive Director

4640 sw Macadam, #50 Portland, Oregon 97239 t503 227 0778 f971 229 1968 www.wetlandsconservancy.org


September 2, 2014

Ms. Dorothy Lowman, Chair
Pacific Fishery Management Council
70 NE Ambassador Place, Suite 101
Portland, OR 97220

***Re: Agenda Item H.1 – Unmanaged Forage Fish Initiative***

Dear Chair Lowman and Council Members:

Wild Oceans, founded by fishermen in 1973, is dedicated to keeping the oceans wild to preserve fishing opportunities for the future. We promote a broad, ecosystems approach to fisheries management that reflects our expanding circle of concern for all marine life and the future of fishing. Our programs emphasize conserving the ocean's top predators – the big billfish, swordfish, tunas and sharks – while preserving healthy ocean food webs and critical habitats essential to the survival of all fish, marine mammals and seabirds.

We strongly support the Pacific Fishery Management Council's work to protect unfished and unmanaged forage fish under Ecosystem Initiative 1. For the September meeting, the Council is tasked with adopting a preliminary preferred alternative for Comprehensive Ecosystem-Based Amendment 1 (CEBA 1), which will incorporate protection of unmanaged forage fish into Council Fishery Management Plans. **We recommend that the Council choose Alternative 2.1.2 to bring the listed unmanaged forage fish into all four of the Council's Fishery Management Plans as Ecosystem Component Species, to prevent new fisheries from developing without scientific information on harvest sustainability and potential ecological effects, while allowing the continuation of incidental retention in existing fisheries.**

As you well know, the forage base of the California Current is essential to the health and productivity of the ecosystem overall as well as to important

**P.O. Box 258 • WATERFORD, VA 20197 • (703)777-0037**
**WWW.WILDOCEANS.ORG**

commercial and recreational fisheries that target the many fish (tuna and salmon among them) that feed on lower trophic level species. But, pressures on limited ocean resources are increasing. Unexploited species will be sought and targeted to meet growing aquaculture demands, competing directly with the needs of wild predators and associated fisheries, making this action timely and important. The benefits of protecting forage fish are even greater when taking into account their enormous value to non-consumptive (*e.g.*, bird - watching, whale watching) and non-use benefits (*e.g.*, protecting the health of marine ecosystems).

The council is well on its way toward preventing new fisheries for unfished and unmanaged forage species until they can be managed in a manner consistent with the council's ecosystem goals and policies as established in its new Fishery Ecosystem Plan. CEBA 1 Alternative 2.1.2 accomplishes this in three important ways:

### 1. Bringing the listed unmanaged forage fish into all four of the Council's Fishery Management Plans as Ecosystem Component Species.

CEBA 1 identifies the following species and species groups as candidates for inclusion as ecosystem component (EC) species: Round herring (*Etrumeus teres*) and thread herring (*Opisthonema libertate* and *O. medirastre*); Mesopelagic fishes of the families *Myctophidae, Bathylagidae, Paralepididae,* and *Gonostomatidae;* Pacific sand lance (*Ammodytes hexapterus*); Pacific saury (*Cololabis saira*); Silversides (family *Atherinopsidae*); Smelts of the family *Osmeridae; and* Pelagic squids (families: *Cranchiidae, Gonatidae, Histioteuthidae, Octopoteuthidae, Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*), *Onychoteuthidae, and Thysanoteuthidae*).

The designation of these unfished and unmanaged forage as EC species recognizes the vital ecological roles that the proposed species serve within the ecosystem and acknowledges the connections between managed and unmanaged species across FMPs.

We agree with an omnibus approach to the development of this action. This approach allows the Council to provide management protection for unmanaged forage fish while minimizing the staff burden associated with annual catch limit (ACL) requirements for these species.

### 2. Preventing future fishing from developing without scientific information on harvest sustainability and potential ecological effects.

This precautionary approach is a hallmark of ecosystem-based fishery management. The NMFS Ecosystem Principles Advisory Panel advised that Fishery Ecosystem Plans should consider "management actions with respect to

all living marine resources, managed or not."[1] The Panel called for shifting the burden of proof to prohibit the development of new fisheries for so-called "under-utilized species" when the effects on associated species or the ecosystem are poorly known.

That is why we have long advocated for the development of a forage status indicator as a companion to Initiative 1 and a necessary component of the Fishery Ecosystem Plan. As participants at the 4th National SSC Workshop agreed, it is equally or more important to identify an overall forage base cutoff or biomass threshold to augment species-specific goals.[2] Ecological conditions that result in poor survival across species can have broader and greater impacts on the system than fluctuations in a single species' population level, and this aggregated treatment of forage could better mitigate such fluctuations.

*As the council develops a process for gathering and evaluating scientific information on harvest sustainability and potential ecological effects, it makes sense to develop a forage base status indicator to help us better assess the impact of a forage fishery on the health of the overall forage base and on the ecosystem.*

### 3. Allowing incidental retention.

The purpose of Initiative 1 is clear: to prevent the development of new directed fisheries on unfished and unmanaged forage species unless and until we can assess the impact on the ecosystem. It is not meant to close existing fisheries or supersede tribal or state fishery management for these species.

———

**Finally, we urge the council to adjust the schedule as needed to take final action on CEBA1 by March 2015**. Once the council reviews draft FMP language and comments from the advisory bodies and the public at the September 2014 meeting, it can either release the document for public comment, or if needed, schedule additional revisions of public review of amendatory language for the November 2015 meeting. Either way, the council can and should take final action in March 2015.

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[1] Ecosystem-Based Fishery Management. 1999. A Report to Congress by the Ecosystem Principles Advisory Panel. National Marine Fisheries Service/NOAA. p. 27.

[2] Seagraves, R. and K. Collins (editors). 2012. Fourth National Meeting of the Regional Fishery Management Council's Scientific and Statistical Committees. Report of a National SSC Workshop on Scientific Advice on Ecosystem and Social Science Considerations in U.S. Federal Fishery Management. Mid-Atlantic Fishery Management Council, Williamsburg, VA. p. 80.

This timeline, aimed at completion by March 2015, has two advantages: 1) it builds a buffer into the Council's schedule, should it need to revise and send amendatory language out for an additional round of review and comment by advisory bodies and the public; and, 2) ensures that action on Initiative 1 will not be delayed further into 2015, thereby delaying decisions on additional Ecosystem Initiatives important to the progress of the Fishery Ecosystem Plan, including development of a forage status indicator.

We look forward to working with you throughout the fall and winter as we transform Initiative 1 from paper into real protection for the unfished and unmanaged forage fish of the California Current Ecosystem.

Sincerely,

Theresa Labriola
West Coast Fisheries Project Director

From: David Smith <david@theotherfirm.com>
Date: Sat, Aug 16, 2014 at 11:14 AM
Subject: Please continue progress toward stronger protections for forage fish!
To: pfmc.comments@noaa.gov

Dear Pacific Fishery Management Council,

Thank you for your on-going work to establish regulatory protections for currently unmanaged forage fish species. It is so important to incorporate unmanaged forage fish as ecosystem component species into each of the existing fishery management plans. It's critical that these species aren't overfished since these forage fish form the base of the ocean food web and cannot be overlooked as a key component to any species-specific, as well as, ecosystem-based plan management plans.

Demand for cheap fish meal from the rapidly growing global aquaculture industry will increase the likelihood that industrial-scale fishing will expand to forage species that aren't currently fished on the West Coast. Getting management measures in place sooner rather than later makes sense, especially as worldwide demand on our oceans grows more intense. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon.

Thank you for your continued commitment to maintaining a healthy and productive Pacific Ocean.

Sincerely,

David Smith
3410 NE Multnomah
Portland, OR 97232

From: Susan <s.nolte@frontier.com>
Date: Thu, Aug 21, 2014 at 9:25 AM
Subject: Forage fish conservation
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

I am writing to address the issue of regulation on the harvesting of forage fish which I understand are fish species important in the food chain for shore birds, coastal birds and marine life that are used only in part for human consumption. It is my understanding that this protein source is used for animal feed, fertilizer, and farmed fish. As a consumer directly and indirectly of these products I understand that there are economic trade-offs to restricting this catch that will impact farmers and consumers alike. However it is not just a feel good need to avoid over harvesting this portion of the food chain. Setting limits is a wise thing to do before a crisis develops as often it is not sound science that drives the demand. For example in the pet food industry, "grain free diets" that are fish based have become popular. The science behind this trend is faulty and misunderstood by the average pet owner.  Grain sources of protein are

excellent as part of a balanced ration. So restricting this demand does not place an undo burden on the market. I would hope that requests to increase catch levels of these forage fish would be examined very carefully with the soundest science and that experts in widely related fields are consulted. The economic effects should be broadly considered with global health at the forefront and eco tourism considered as well.

Sincerely,
Susan Nolte

From: Steve Holmer <sholmer@abcbirds.org>
Date: Wed, Aug 27, 2014 at 12:55 PM
Subject: Comment in Support of Forage Fish Conservation
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

August 27, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Chair Lowman and Council Members:

American Bird Conservancy thanks the Council for its selection of a Preliminary Preferred Alternative in April that incorporates forage fish as ecosystem component species into each of the Council's existing Fisheries Management Plans. Forage fish are a critical food source for marine life, including seabirds.

We ask the Council to move forward at its September meeting by selecting, and releasing for public review, draft amendatory language that would designate unmanaged forage fish as ecosystem component species into each fishery management plan.

We also urge the Council to preclude new directed fisheries absent robust prior review, and allow for a limited amount of those species to be taken in existing fisheries. This action ensures that existing fisheries are not negatively impacted while also ensuring that unregulated directed fisheries for these forage species do no develop.

Thanks for your continued commitment to a healthy marine environment and sustainable fisheries.

Sincerely,

Steve Holmer
Senior Policy Advisor
American Bird Conservancy

From: Sarah Clark <blueredwhitebird@gmail.com>
Date: Tue, Aug 26, 2014 at 9:16 PM
Subject: protect forage fish
To: pfmc.comments@noaa.gov

I'm writing to ask you to please protect forage fish, an important food source for sea birds like the tufted puffin.
Thank you,
Sarah Clark

From: Vicki Bucklin <vickibucklin@pugetisland.com>
Date: Fri, Aug 29, 2014 at 4:31 PM
Subject: Protecting Unmanaged Forage Fish
To: pfmc.comments@noaa.gov

Thank you for your work to increase recognition of the role forage fish play in the Pacific Northwest ecosystem.

My husband and I are residents in the Lower Columbia River, and we are in favor of continued steps toward stronger protections for forage fish.
Active protection is necessary to cultivate a sustainable ecosystem.

We would like to see forage fish classified as an ecosystem component species that is monitored with limits set on their take to prevent depletion. These fish are critical to the health of a wide variety of sea life. Their protection should become an integral part of existing fisheries management.

Regards,
Vicki and Jim Bucklin
Cathlamet, WA
360-200-2042

From: Andrea Scharf <dreams@peak.org>
Date: Fri, Aug 29, 2014 at 4:33 PM
Subject: forage fish
To: pfmc.comments@noaa.gov

To: Pacific Fishery Management Council
Re: Forage fish catch
Date: August 28, 2014

Thank you for moving forward with your work of protecting currently unmanaged forage fish. As you consider management options for these fish species, I hope you will set policies which insure that these species are not overfished. Clearly, these species are a critical part of the marine ecosystem. Overfishing affects not only the fish themselves but all of the other species which depend on them for food. We finally understand that everything is connected to everything else.

Even if these fish are not specifically “harvested” for human food, they are important to so many other species in the complicated food web that exists in the ocean.

As you develop your fishery management plans, please make a commitment to limiting the amount of unmanaged forage fish that may be taken in existing groundfish and other fisheries.

Thank you for your attention.

Sincerely,
Andrea Scharf
9777 Yachats River Road
Yachats OR 97498

From: vrhoden <vrhoden@comcast.net>
Date: Sat, Aug 30, 2014 at 10:50 AM
Subject: Expanding fish management
To: pfmc.comments@noaa.gov

I encourage you to expand the management of unmanaged forage fish as supported by the Audubon Society. Let’s protect the entire ecosystem. It will surely pay off in the future.
Thanks,

From: Kit Kirkpatrick <kitkirkpatrick@gmail.com>
Date: Sun, Aug 31, 2014 at 10:11 PM
Subject: Forage fish
To: pfmc.comments@noaa.gov

The ocean is in trouble. Humans are over harvesting the creatures that depend on it. We need to protect all the creatures out there - large and small. Forage fish feed the animals higher on the food chain and keep our oceans vital. I believe that we need to create more ocean sanctuaries where all the life forms can thrive and reproduce without interference by human beings. I believe that limits should be set on the number of creatures that are harvested from the ocean in order to maintain an in-tact food chain.

Thank you, Kit Kirkpatrick

From: Maria Ruth <mariaruthbooks@comcast.net>
Date: Tue, Sep 2, 2014 at 2:49 PM
Subject: Agenda Item H.1. Ecosystem -- Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101

Portland, Oregon 97220-1384

Dear Chair Lowman and Council Members:

Thank you all for focusing on protection of unmanaged forage fish and respectfully urge you to adopt amendatory language to designate unmanaged forage fish as ecosystem-component species. Please set limits on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

While many species of seabirds and other marine life will benefit from such measures, I am partial to the marbled murrelet, a forest-nesting seabird dependent on many species of forage fish (including juvenal rockfish, herring, salmon, capelin, sandlance, anchovy).

This federally threatened seabird faces in the marine environment, but the depletion of forage fish populations as one of the greatest newly documented threats to its survival. Without adequate fatty protein in the form of forage fish, marbled murrelets may not initiate nests during the breeding season, or, if they do, they may not have adequate supplies of forage fish to bring inland to their chick on the nest. Murrelet chicks require 1-8 fish a day during the 28 days they spend on the nest. A recent study in California reported marbled murrelets feeding on krill where forage fish was inadequate.

On behalf of the marbled murrelets and other imperiled seabird species, please limit the take of unmanaged forage fish to help ensure the survival of the marbled murrelets and the sustainability of our commercial fisheries.

Thank you.

Maria Mudd Ruth, Author
Rare Bird: Pursuing the Mystery of the Marbled Murrelet

From: David Mandell <davidmandell@earthlink.net>
Date: Sat, Aug 30, 2014 at 12:37 PM
Subject: Unmanaged Forage Fish Initiative
To: pfmc.comments@noaa.gov

Dear Chair Lowman and Council Members,

I want to thank the Council for the progress it has made in the last few years in establishing regulatory protections for previously unmanaged forage fish species and urge the Council to move forward in incorporating these protections into all of the existing fishing management plans as ecosystem component species.

For well over decade, I have been guiding pelagic birding trips off of the Oregon coast. Each year we have clients from all of the country who have come to Oregon to witness the abundant numbers and rich variety of seabirds that spend time in Oregon's waters. Oregon's waters are a truly global feeding ground for the earth's pelagic species. From Black-footed Albatross who fly all the way out from Hawaii to find food their young, to the hordes of Sooty Shearwaters who

have wandered up from Chile, to the Common Murres, Rhinoceros Auklets and Tufted Puffins who make Pacific Northwest their year round home, none of this would be possible without the essential role of forage fish in the ecosystem.

During the meeting in September, I encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections that will ensure enough forage fish are left in the water for other species such as salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem, including the valuable sustainable fisheries we rely upon. I look forward to continuing to be able to share with others the magnificent beauty of Oregon's seabirds. I want to thank you for taking the right steps that will make that possible.

Sincerely,

David Mandell

President, Audubon Society of Portland
Trip Leader, The Birdguide

From: Mac Leibert <mac@pier23cafe.com>
Date: Fri, Aug 29, 2014 at 5:30 PM
Subject: Agenda Item H.1: Unmanaged Forage Fish Protection Initiative
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

August 29, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative

Dear Chair Lowman and Council Members,

I write to you on behalf of Pier 23 Café, a time honored San Francisco establishment located right on SF Bay. As a restaurant known for its fresh seafood, Pier 23 Café is a proud member of the Monterey Bay Aquarium Seafood Watch Restaurant Program. Here at Pier 23, we are committed to actively advocating for sustainably caught seafood, and were participants of last year's America's Cup Healthy Ocean Project awareness campaign to promote ocean-friendly seafood among Bay Area diners.

We are aware that forage fish are an important part of the food web and serve as sustenance for larger species, like many of the fish we serve in our restaurant. We appreciate and applaud the work the Council has done over the past two years to lay the groundwork for establishing regulatory protections for unmanaged forage fish. It is our hope that the Council continues this work and incorporates unmanaged forage fish into existing fishery management plans. If we are to maintain a healthy and productive marine environment for future generations, we must take care to sustain a balanced ecosystem where we leave enough forage fish in the water for other species such as tuna, salmon, seabirds, and whales. We encourage the Council to fulfill the first initiative of the Fishery Ecosystem Plan by establishing basic protections for unmanaged forage fish, and avoid negatively impacting existing fisheries.

Thank you for the opportunity to submit our opinion and for your continued stewardship of our ocean.

Sincerely,
McGurrin Leibert
Pier 23 Cafe
San Francisco, Ca. 94111
415.362.5125

From: Lance Morgan <Lance.Morgan@marine-conservation.org>
Date: Tue, Sep 2, 2014 at 4:03 PM
Subject: Agenda Item H.1: Unmanaged Forage Fish Protection Initiative
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

Pacific Fishery Management Council
Dorothy Lowman, Chair
7700 NE Ambassador Place, #101
Portland, OR 97220

Dear Chair Lowman and Council Members,

On behalf of Marine Conservation Institute, I write to thank you for your efforts to move ahead with the first initiative of your Fishery Ecosystem Plan: Putting basic conservation measures in place for West Coast forage fish that aren't yet managed. I encourage you to keep the process moving so that you can take final action by the spring of 2015.

I ask that the Council incorporate currently unmanaged forage species into each of the four existing fishery management plans as ecosystem component species, preclude new directed fishing on those species absent robust scientific review, and allow for a limited amount of those species to be taken as incidental catch in existing fisheries.

The Council would be wise to act sooner rather than later. The Council's own ecosystem plan development team noted that the "spectacular growth" of the global aquaculture industry will raise the likelihood for fisheries to develop on West Coast forage species that aren't currently fished. Many of these species are already fished industrial levels elsewhere across the world.

The Council has made great strides over the past two years in laying the groundwork to fulfill your commitment to prohibit new directed fishing on forage species at least until assessing the impact on other fisheries and coastal communities. By protecting forage fish as a key link in the marine food web, the Council can help to maintain the structure and function of a healthy and productive marine environment for generations to come.

Sincerely,

Lance Morgan, Ph.D.
President
Marine Conservation Institute

From: Abigail DeYoung <abigaildeyoung2011@gmail.com>
Date: Tue, Sep 2, 2014 at 8:48 PM
Subject: Agenda Item H.1 - Unmanaged Forage Fish Protection Initiative
To: pfmc.comments@noaa.gov

First off, I would like to thank you for your previous support for important marine conservation actions, particularly your adoption of the Fishery Ecosystem Plan and support for Ecosystem Trophic Pathway – Option 2.2.1.

I would really appreciate the Council incorporating unmanaged forage fish as ecosystem component species in your existing Fishery Management Plans (FMP's) because of their importance as a link within the interconnected ecosystem that salmon, steelhead and many other upper trophic species. I encourage you to adopt language at your September meeting in Spokane that would designate unmanaged forage fish as ecosystem component species and prohibit new directed fisheries without rigorous review and management measures being in place beforehand. I also think establishing limits on the amount of these species that may be incidentally taken in other existing fisheries would be wise.

I would like to also add, as a biologist and a small business owner of Northwest Ecotours, I had record marbled murrelet detections while surveying up on Euchre Mountain this season. This corresponds with amazingly high numbers of bait fish seen in the ocean and the bay due to the rare La Nina weather pattern this year. Protection of these species will help ensure that the high numbers don't disappear with changing weather patterns.

In closing, I again thank you for all the conservation and management activities the Council has undertaken to date. As detailed in the Ecosystem Working Group March 2014 report, as a group, these fish are an important ecosystem component and deserve prudent management. It would seem that an effective method of achieving this goal would be to specifically identify unmanaged forage fish as ecosystem component species within each of the Council's FMP's and incorporate management measures that protect their critical role in the ecosystem.

Sincerely,
Abigail DeYoung

Newport, OREGON
97365

From: Tim Shelmerdine <tshelmerdine@yahoo.com>
Date: Tue, Sep 2, 2014 at 10:10 PM
Subject: Unmanaged forage fish
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

Dear Members of the Pacific Fisheries Management Council,

I have been a sport fisherman for many years, have worked as a deckhand on a sportfishing boat, and have been guiding ocean trips geared for people wanting to observe birds and marine mammals for nearly twenty years. Next year, I will move to managing my own ocean guiding business, taking over from the man who began our ecotours. Oregon boasts a rich collection of marine and avian life, and our tours have become highly regarded. Our pelagic trips have put Oregon on the map for many birdwatchers. Birders come from all over the United States to join our tours, and we occasionally will book passengers from other countries, including Canada, France, England, Germany, and Chile, just to name a few. Some of our passengers plan their trip to Oregon around our ocean trips. Many of our passengers stay at least one night in Newport (or Charleston), and spend money in restaurants, stores, gas stations, etc. In addition to the personal enjoyment I receive from spending days on the ocean, I am very proud of the contribution our tours make to the science of ornithology, as well as to the state and local economies. What our participants contribute to Newport's motel industry alone must be in the tens of thousands of dollars annually. I strongly urge protection of all components of our marine ecosystem, including the forage fish on which birds, mammals, and fish depend.

Small businesses such as ours depend on a healthy marine ecosystem. I encourage the Council to adopt language that will enhance protection for forage fish as part of its management plan.

Sincerely,

Tim Shelmerdine
Oregon Registered Agent and Head Guide for The Bird Guide, Inc.
Former President, Oregon Birding Association

From: Chris Lish <lishchris@yahoo.com>
Date: Wed, Sep 3, 2014 at 10:23 AM
Subject: Protect the Food Web by Conserving Little Fish
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

Wednesday, September 3, 2014

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Subject: Protect the Food Web by Conserving Little Fish

Dear Chair Lowman and Council Members,

The Pacific Fishery Management Council (Council) has made steady progress over the past three years in laying the groundwork to protect forage fish species as a crucial food source for the incredible diversity of marine life along the West Coast. The Council should continue moving forward with protections for currently unmanaged forage fish by incorporating them into all appropriate existing fishery management plans as ecosystem component species.

“Our duty to the whole, including to the unborn generations, bids us to restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wildlife and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose and method.”
-- Theodore Roosevelt

I encourage the Council to approve draft language that would amend fishery management plans this September and release it for public comment. This language should designate unmanaged forage fish as ecosystem component species, preclude new directed fishing on these species in federally managed waters off the West Coast, and allow for a limited amount of those species to be taken in existing fisheries. Ultimately, with final approval of these provisions next year, the Council will provide meaningful protections for these important little fish. It will also help to ensure enough are left in the water for other species such salmon, tuna, whales and seabirds.

“As we peer into society’s future, we—you and I, and our government—must avoid the impulse to live only for today, plundering for our own ease and convenience the precious resources of tomorrow. We cannot mortgage the material assets of our grandchildren without risking the loss also of their political and spiritual heritage. We want democracy to survive for all generations to come, not to become the insolvent phantom of tomorrow.”
-- Dwight D. Eisenhower

These steps will ensure that the council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the council will fulfill the first initiative of the Council’s Fishery Ecosystem Plan, a visionary document that the Council approved unanimously in April of 2013.

“A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.”
-- Aldo Leopold

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean, and for your consideration of my comments. Please do NOT add my name to your mailing list. I will learn about future developments on this issue from other sources.

Sincerely,

Christopher Lish
Olema, CA

From: Erich Hoyt <erich.hoyt@mac.com>
Subject: Comment letter re Forage Fish to PFMC 8.14.2014 Erich Hoyt
Date: 15 August 2014 10:41:50 BST
To: pfmc.comments@noaa.gov

August 14, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

Dear Chair Lowman and Council Members,

My name is Erich Hoyt and I am an author of more than 20 books on whales and sea life; Research Fellow with Whale and Dolphin Conservation (WDC, US and UK); and member of several IUCN commissions and co-chair of the IUCN Marine Mammal Protected Areas Task Force (MMPATF). I am a US citizen, currently living in the UK, but I have done various research projects in the NW, and my main research focus continues to be in the North Pacific, also on the BC and Russian Kamchatka coasts. Also, in May 2014, I undertook a 9 city tour of the west coast including northern and central California, Oregon and Washington State in support of The Whale Trail (thewhaletrail.org) a conservation group that promotes the viewing, education, research and conservation of cetaceans along the Pacific coast. All of my work, activities and long-time goals depend on the maintenance of healthy ecosystems which support whales and other marine life.

As part of my work, I often advocate for the consumption of sustainably caught seafood, and of course forage fish conservation is essential to making that available. Forage fish also serve an important role as essential diet for many of the marine animals I study. I applaud the Council for the strong efforts over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and in the context of the Council's work to incorporate ecosystem principles into fishery management decisions. With this letter, I would like to urge the Council to continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species such that they would be fully considered before future fisheries on these species open up.

These steps will help ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's unanimously approved Fishery Ecosystem Plan. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem and coastal economies.

Thank you very much for your attention.

Best regards,

Erich Hoyt
Senior Research Fellow, Whale and Dolphin Conservation (WDC, US and UK)
Head, WDC Global Critical Habitat / Marine Protected Areas Program
Invited Member, IUCN Cetacean Specialist Group and World Commission on Protected Areas
Co-chair, IUCN SSC-WCPA Marine Mammal Protected Areas Task Force

From: <mcwc@midcoastwatershedscouncil.org>
Date: Wed, Sep 3, 2014 at 4:08 PM
Subject: Comments on forage fish management.
To: pfmc.comments@noaa.gov

To Whom it may Concern:

I am writing on behalf of the MidCoast Watersheds Council (MCWC) to express our support for a protective conservation strategy for "forage" fish. The MCWC works to understand and improve watershed health on the west slope of the Oregon Coast Range from Cascade Head to Heceta Head, including the watersheds of the Salmon River, Siletz River, Yaquina River, Alsea River Yachats River and over 20 smaller ocean tributaries. We focus particularly on salmon habitat, healthy stream function and complexity, clen water, estuarine function, and the nearshore marine environment. We do so in the context of healthy coastal communities and sustainable resource-based economies.

We recognize the roles "forage" fish play in marine and estuarine systems as food for economically important fishes. We also recognize their role as the primary food of our seabird communities, and their important contribution to other ecosystem components.

We favor science-based protective management for the following reasons:

1) Overfishing of forage fishes will harm higher-value fisheries such as salmon, albacore, rockfish, and flatfish.

2) Overfishing of forage fishes could complicate recovery of Marbled Murrelet populations, leading to further complications for forest management.

3) Overfishing of forage fishes could slow the recovery of currently depleted fish stocks, including several rockfish species.

4) Ecosystem-based management needs to be adopted before larger-scale harvest of forage fish are instituted. Currently, economics do not support reduction (fish-meal) fisheries in our area, but those economics could change. The harvest of schooling forage fish to feed offshore net-pen aquaculture operations might be more feasible off our coast, and these fish need protective management before investments are made in such operations.

Thank you for this opportunity to comment.

Sincerely,

Wayne Hoffman, Coordinator
MidCoast Watersheds Council

From: Michelle Monk <michelle.monk123@gmail.com>
Date: Sat, Aug 16, 2014 at 7:33 AM
Subject: thanks
To: pfmc.comments@noaa.gov

thanking the Council for its work to protect currently unmanaged forage fish and asking it to move forward by:
-Incorporating unmanaged forage fish as ecosystem component species into each of its existing fishery management plans.
-Setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.
Thanks and keep up good work!

From: H. Tom Davis <tomlin2@bendcable.com>
Date: Wed, Aug 20, 2014 at 2:59 PM
Subject: unmanaged forage fish
To: pfmc.comments@noaa.gov

Thanks for working to protect currently unmanaged forage fish. Please::
Incorporate unmanaged forage fish as ecosystem component species into each fishery management plan.
Set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

Tom Davis, PE

Hydrologist and Water Resources Engineer
69217 Tapidero, Sisters, OR 97759
541 549 1222
http://tomswildlandphotography.com/

From: **Maxine Centala** <mcentala@peak.org>
Date: Wed, Aug 27, 2014 at 5:17 PM
Subject: Forage fish comments
To: pfmc.comments@noaa.gov

Thank you for accepting comments on this issue. I support

(1) Incorporating unmanaged forage fish as an ecosystem component species into each of its existing fishery management plans; and

(2) Setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

Maxine Centala
PO Box 375
Seal Rock, OR 97376

From: Diana Lynn Kekule <luvsea33@gmail.com>
Date: Wed, Aug 27, 2014 at 4:46 PM
Subject: THANK YOU
To: pfmc.comments@noaa.gov

The Pacific Fishery Management Council, which sets catch levels on the West Coast, will be meeting Sept. 13 in Spokane, Wash. to consider management options for forage fish species. It's critical that these species aren't overfished: Forage fish form the base of the ocean food web, and seabirds like this Rhinoceros Auklet fledgling depend on them for food.

Over the past two years, the Council has made continued progress toward providing stronger protections for forage fish. Now that we're in the home stretch – the Council will hopefully finalize these protections in spring 2015.
We want to thank the Council for its work to protect currently unmanaged forage fish and asking it to move forward by:
Incorporating unmanaged forage fish as ecosystem component species into each of its existing fishery management plans.
Setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

THANK YOU FOR HELPING TO RAISE THE CONSCIOUSNESS OF HUMANITY
Kekule Bastron Family and Friends

From: Vickie <ptakkrolowa@yahoo.com>
Date: Wed, Aug 27, 2014 at 11:26 AM
Subject: Forage Fish
To: pfmc.comments@noaa.gov

To whom it may concern:

I thank you for your work to protect currently un-managed forage fish and ask you to move forward by:

Incorporating un-managed forage fish as ecosystem component species into all existing fishery management plans.
Setting a limit on the amount of forage fish species, that may be taken in existing fisheries, for groundfish and other species.
Too often fisheries managers step in after fish stocks have already collapsed. This is a golden opportunity to set good policies before it is too late. Growing global demand for inexpensive protein drives the call to open new fisheries on forage fish, posing a threat to wildlife. By weight, forage fish now account for nearly 40 percent of all fish caught worldwide. Only ten percent of this catch is for human consumption – the other 90 percent goes to feed for livestock, pellets for farmed fish, and fertilizer.
I value the wildlife that depend on this food source, and have been made aware that nearly half of all seabird species are known or suspected to be experiencing population declines.
I join the Audubon Society of Portland, in requesting that you consider the health and well-being of the pelagic avian species that live and feed in these habitats.
Sincerely,

Victoria Gantz
Portland, Oregon

From: Patricia Armstrong <patriciajane@gmail.com>
Date: Mon, Aug 25, 2014 at 5:20 PM
Subject:
To: pfmc.comments@noaa.gov

Dear Pacific Fishery Management Council members,

Thank you for the work you are doing to protect currently unmanaged forage fish. Living in Yachats next to a marine reserve I get to see on a near daily basis foraging wildlife. I urge you to incorporate unmanaged forage fish as ecosystem component species in your management plans. I urge you to set a limit on the amount of unmanaged forage fish that may be taken by existing fisheries. I fear that if these fish aren't recognized for the sustaining role that they serve, and limits aren't set on the numbers that can be harvested, there will be little or no fish for the survival of all the other species that rely on them.

Sincerely,

Patricia Armstrong

From: Meg Ruby <megruby@gmail.com>
Date: Tue, Sep 2, 2014 at 7:28 PM
Subject: Forage Fish Protection - PFMC September 2014
To: PFMC Comments - NOAA Service Account <pfmc.comments@noaa.gov>

Dear Chair Lowman and Council Members,

Thank you for your leadership and good work in establishing the Fisheries Ecosystem Plan (FEP) in order to protect currently unmanaged forage fish. Forage fish are extremely valuable to the wellbeing of the entire California Current Ecosystem for the critical role they play in the ocean's food web.

The Sooty Shearwater is Oregon's most numerous bird species. Sooties and other seabirds and marine species (e.g., bigger fish and marine mammals) flat out depend upon forage fish. Like many, we travel to the coast to fish and boat in nearshore waters. We watch the birds and other wildlife that feed on forage fish. We are part of the coastal economy that depends on forage fish. We are members of the Audubon Society of Portland.

We write to ask the Council to manage conservatively, basing your decisions upon the precautionary principle and best available science (i.e., Lenfest Forage Fish taskforce) in order to sustain these critical species and their ecosystem roles.

Specifically, we ask you to take the following actions:
1) Please incorporate unmanaged forage fish as ecosystem component species into each existing fishery management plan.

2) Please set a limit of the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

Please update us on you actions to protect forage fish.

Thank you for the opportunity to comment on this important issue.

Sincerely,

Meg Ruby, M.S. and Jonathan Lindgren, M.D.
3218 SE Tibbetts St.
Portland, OR 97213

From: <eandersea@aol.com>
Date: Tue, Sep 2, 2014 at 7:52 PM
Subject: Comment on Fisheries Ecosystem Plan - catch levels on the West Coast for forage fish
To: pfmc.comments@noaa.gov

Subject: Fisheries Ecosystem Plan
Protecting Unfished and Unmanaged Forage Fish Species

Submitted via e-mail: pfmc.comments@noaa.gov

To : Pacific Fisheries Management Council
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

From Ellen Anderson,
Individual wildlife lover and rehabber
29001 H Street
Ocean Park, Washington

First, I want to thank you for your work to protect currently unmanaged forage fish. As a wildlife lover and rehabber I know it is critical that these species aren't overfished since forage fish form the base of the ocean food web. You only have to handle so many starving juvenile AND adult sea birds to realize how critical this food base is to the world's wildlife. Yet growing global demand for inexpensive protein drives the
call to open new fisheries on forage fish, posing a threat to wildlife that have no other food source choices. While forage fish by weight now account for nearly 40% of all fish caught worldwide, only 10% goes to human consumption. Someone, somewhere has to manage these critical fish species in a balanced manner so that the critical dietary needs of wildlife plays an equal role to man's unsatiable needs.
I am asking you to consider:
1) Incorporating unmanaged forage fish as ecosystem component species into each of its existing fishery management plans.

2) Setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

Thank you for involving the public and considering my comments.

Ellen Miller Anderson

From: <powolfe@earthlink.net>
Date: Wed, Sep 3, 2014 at 10:51 AM
Subject: Save Foraging Fish
To: PFMC Comments - NOAA Service Account <pfmc.comments@noaa.gov>

As a member of Portland Audubon and a frequent traveler and consumer of services on our Oregon Coast in order to study and view sea birds, I am requesting that the members of the Pacific Fisheries Management Council please vote to protect forage fish so we can maintain sufficient food for our population of seabirds. These birds are a vital part of our habitat, which must be healthy in order to maintain our beautiful coast. This can be accomplished if you will incorporate the forage fish which are currently not managed as an ecosystem component species into each of the existing fishery management plans. Also, please set limits on the amount of currently not managed forage fish which may be taken in existing fisheries for ground fish.

Thank you for protecting both the economic and environmental aspects of our precious coast by protecting both the sea birds and their food supply.

Sincerely, Phyllis Wolfe 4329 SE Steele St., Portland, Oregon

From: Rhett Lawrence <rhettlawrence@yahoo.com>
Date: Wed, Sep 3, 2014 at 11:18 AM
Subject: Forage fish management
To: "pfmc.comments@noaa.gov" <pfmc.comments@noaa.gov>

Hello,

I am a resident of Oregon with a great fondness for our oceans and their inhabitants. I am writing to urge you at the Pacific Fishery Management Council to continue to move forward in protecting forage fish by incorporating unmanaged forage fish as ecosystem component species into each of the existing fishery management plans. I also urge you to set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for ground fish and other species.

Thanks very much for considering my comments and I look forward to hearing how you proceed.

Rhett Lawrence
Portland OR

From: Bruce Hoeft <brucehoeft3@gmail.com>

Date: Wed, Sep 3, 2014 at 5:53 PM
Subject: forage fish management
To: pfmc.comments@noaa.gov

To the Pacific Fishery Management Council:

Thank you for your efforts to include consideration of forage fish in fishery management plans.

We, of course, focus our concerns on commercial resources, those that directly benefit our jobs and economies. But it takes a level of maturity often missing in public discourse to recognize what nature has taught us in the past half century: that the biological resources we favor must live in an ecosystem. And as the ecosystem is degraded, so are the prospects for survival of the species we harvest commercially.

Please include the health of forage fish populations in your management plans. They are critical members of the ecosystem that other fish depend on, and management decisions must protect their survival to ensure that fish further up the food chain remain healthy.

This is particularly true of harvest practices that target groundfish, and bottom-dwelling species in general. Many of those practices dramatically degrade benthic ecosystems, and are extremely short-sighted. Limits should be established for forage fish taken, as well as other bi-catch species.

thank you, Bruce Hoeft
508 N 11th St.

Incorporating unmanaged forage fish as ecosystem component species into each of its existing fishery management plans.
Setting a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species.

MISO HARNEY SUSHI

3964 Harney St. San Diego, Ca 92110 619.295.3272 Fax 619.295.0727
301 Mission Ave. Oceanside, Ca 92054 760.967.1820
www.HarneySushi.com

August 2014

Ms. Dorothy Lowman
Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

I am writing to you today as the master sushi chef at Harney Sushi, which has recreated the sushi industry experience over the course of the last 10 years. I am committed to providing my customers with sustainable fish, never compromising taste or quality. My commitment however does not stop with the fish I serve; my team and I have fostered relationships to ensure that we are educating our diners and developing a local economy and culture of sustainable seafood.

I am thankful for the work the Council does to ensure that our treasured ocean remains healthy and sustainable for future generations to enjoy. I have followed the Council's work on unmanaged forage fish since last June, and am pleased with the progress that has been made. It is my hope that in light of the groundwork that has been laid, the Council will move forward with the first initiative of the Fishery Ecosystem Plan. At September's meeting, basic protections for unmanaged forage fish should be established. It's time to acknowledge the vital role that forage fish play in the marine food web and incorporate them into existing fishery management plans as ecosystem component species.

Thank you for your continued commitment to our ocean. I appreciate the opportunity to weigh in on this important issue.

Respectfully yours,

Dustin Summerville, President & Founder
Harney Sushi Restaurants


August 21, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

I want to applaud the Council for the progress it has made over the last couple of years, in regards to unmanaged forage fish. I am writing as the President of the Ocean Conservation Society, a California nonprofit organization organized to conduct marine mammal research to promote the conservation and protection of ocean ecosystems. Since our inception in 1998, we have sought to form collaborative relationships with other researchers and organizations, to obtain a more comprehensive and multi-disciplinary picture of the marine environment. Forage fish are a major part of this picture, serving as a critical food source for marine life, including marine mammals, seabirds, and bigger fish like tuna and salmon.

That is why, at next month's meeting in Spokane, I encourage the Council to move forward with the first initiative of the Fishery Ecosystem Plan. It is vital that forage fish are incorporated into existing fishery management plans. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species, and avoid negatively impacting existing fisheries. If we seek to ensure the sustainability of our marine ecosystem, maintaining a balance is key.

Thank you for your continued commitment to maintaining a healthy and productive Pacific Ocean. I appreciate the opportunity to submit my opinion on this important matter.

Sincerely,

Maddalena Bearzi Saylan

Maddalena Bearzi, Ph.D.
Ocean Conservation Society, President
P.O. Box 12860
Marina del Rey, CA 90295
310-822-5205
mbearzi@earthlink.net
www.oceanconservation.org

ALCHEMY
CULTURAL FARE & COCKTAILS

August 21, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

I am writing as the executive chef and partner of Alchemy Cultural Fare & Cocktails, a southern California restaurant based out of San Diego. As a chef, I strive to be conscious of the effects a productive marine environment has on the food that I serve to my diners, and vice versa.

As you look toward your upcoming meeting in Spokane, I urge you to continue with the great work you have been doing to protect unmanaged forage fish for the last two years. Please move forward with your goal to establish basic protections for unmanaged forage fish by incorporating them into existing fishery management plans as ecosystem component species. I have followed and weighed in on the Council's work this past year, and hope to see the first initiative of the Fishery Ecosystem Plan fulfilled.

Forage fish are a vital component of the marine ecosystem. They serve as the food source to many species, including fish that I serve to my customers. We need to make sure that we are leaving enough forage fish in the water to maintain a healthy balance.

Thank you for your consideration of my comments and your continued stewardship of our marine resources.

Respectfully yours,

Ricardo Heredia
Executive Chef & Partner
Alchemy Cultural Fare & Cocktails

# Living Sea Images

190 Orchard Road · Felton, CA 95018 · 831-335-4849 · books@LivingSeaimages.com

August 15, 2014

Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

**RE: Agenda Item H.1. Unmanaged Forage Fish Protection Initiative**

Dear Chair Lowman and Council Members,

I write to you on behalf of Living Sea Images, a multimedia company which publishes all three volumes of my *Wonders of the Sea* series of coffee-table books and manages the sales of my stock photography and fine art prints. My relationship with our beautiful ocean spans over 35 years; it began the moment I first learned to dive in 1978, which led to my passion for marine life photography years later, and continued in my work with the Marine Life Protection Act, until present day. I quickly learned that my photography was not only the best way to share my passion with others, but also a way I could help life in the ocean communicate to humanity. It is my hope that my photographs will communicate some of the fragility and indescribable beauty I experience in our living ocean, and motivate people who might otherwise never know about it to preserve it.

I have been following the Council's work on the unmanaged forage fish initiative for some time now, and have submitted several letters in the past. It is encouraging to see the great strides the Council has made over the last two years to further protections for unmanaged forage fish species. It is my hope that in September, the Council will continue the work towards fulfilling the first initiative of the Fishery Ecosystem Plan, which was approved unanimously. Basic protections for these species must be established in order to avoid negatively impacting entire ecosystems, which enable the existing fisheries that so heavily rely on forage fish.

As a concerned citizen and a lover of the ocean, I thank you for the continued opportunity to offer my thoughts on this matter and to participate in the public decision making process. I appreciate all that you do to maintain healthy oceans and sustainable fisheries.

Respectfully submitted,

Marc Shargel
Living Sea Images

Author of ***Wonders of the Sea: North Central California's Living Marine Riches***
and ***Wonders of the Sea Volume Two: Marine Jewels of Southern California's Coast and Islands***
and ***Wonders of the Sea Volume Three: Hidden Treasures of California's Far North Coast***
and ***Yesterday's Ocean: A History of Marine Life on California's Central Coast***

Supplemental Public Comment #4

September 7, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

RE: Agenda Item H.1. Ecosystem -- Unmanaged Forage Fish Protection Initiative Preliminary Preferred Alternative (PPA)

Dear Chair Lowman and Council Members:

As a coastal citizen, business consultant, and science writer, I've followed for decades the economics of fisheries and the interconnection between a steady supply of commercial fish and the environment that sustains that supply.

Your efforts to conserve forage fish preserves an important part of the marine food web. As you consider elaborating on your efforts at the upcoming September meeting in Spokane, I hope that you will recognize the complex nature of the food web and the place of forage fish in that web, and that you will strengthen efforts to maintain the necessary populations of these fish for both the natural system and the fishing economy so important to our region.

To this end I hope the Council will consider a range of methods for preventing forage species from being overfished. In the range of possible methods I encourage you to look at the work of people like Dr. Daniel Botkin and at ways to use economic incentives as well as regulations. On the matter of incentives interesting work and proposals have been made by PERC. It seems clear to me from my knowledge of environmental history that incentives are as important, or more important, then regulations, and I hope you will think creatively and arrive at a proper mix. Incentives of course, give fishermen a personal stake in sustainable fisheries.

The basis for your decisions, quite clearly, should be both the very best scientific information on the dynamics of the food web, and on the behavioral and economic impacts of both regulations and incentives. If questions arise about the proper population levels, I urge you to act conservatively in to give high priority to answering scientific and economic questions.

Among the actions that seem almost obvious for the September meeting is to recognize in amendment language the role of forage fish in the ecosystem that sustains commercial fishing of species higher in the food chain and of more economic value.

Thank you for your continuing attention to these issues,

Sincerely,

Wallace Kaufman
PO Box 756
Newport, OR 97365
541 995 4785

CALIFORNIA WETFISH PRODUCERS ASSOCIATION
PO Box 1951 • Buellton, CA 93427 • Office: (805) 693-5430 • Mobile: (805) 350-3231 • Fax: (805) 686-9312 • www.californiawetfish.org

September 10, 2014

Ms. Dorothy Lowman, Chair
And Members of the Pacific Fishery Management Council
7700 NE Ambassador Place #200
Portland OR 97220-1384

RE: Agenda Item H.1.c. Unmanaged Forage Fish Initiative

Dear Ms. Lowman and Council members,

As Executive Director of the California Wetfish Producers Association (CWPA), representing the majority of coastal pelagic species 'wetfish' fishermen and processors in California, I appreciate your consideration of the following points in the continuing discussion regarding protecting largely unfished, unmanaged forage species.

We commend the Ecosystem Work Group for compiling a very thoughtful and thorough document: Comprehensive Ecosystem-Based Amendment (CEBA) 1: *Protecting Unfished and Unmanaged Forage Fish Species.*

We note the finding that the fish species identified in this document are largely UNFISHED in the California Current, yet represent a vast forage pool available for marine life:
[page 11] "Within the California Current region alone, there is an estimated mesopelagic fish biomass of 18.5 million metric tons. This compares to less than 2 million tons for the combined stock of sardines and anchovies, the dominant epipelagic planktivores in the region (Davidson et al, 2013)."

We acknowledge the Council's interest in protecting this untapped resource on the west coast as a safeguard against potential future exploitation, although we again point out that the industry has voiced no interest in developing fisheries for this biomass, and I further note that at least in California there exists virtually no infrastructure to prosecute a large reduction fishery, which would entail an investment of multi-millions of dollars with no assurance of product to fuel production. Reduction limitations also exist in OR and WA.

Of the options identified in the document, we recommend that the Council support Alternative 2 as its Final Preferred Alternative. We further agree with the Work Group's approach in amending the CPS FMP, retaining jacksmelt as a listed Ecosystem Component (EC) species, and simply adding the boilerplate for Shared EC Species, as written.
Jacksmelt really is the only species in the group that is found in small amounts in CPS fisheries.

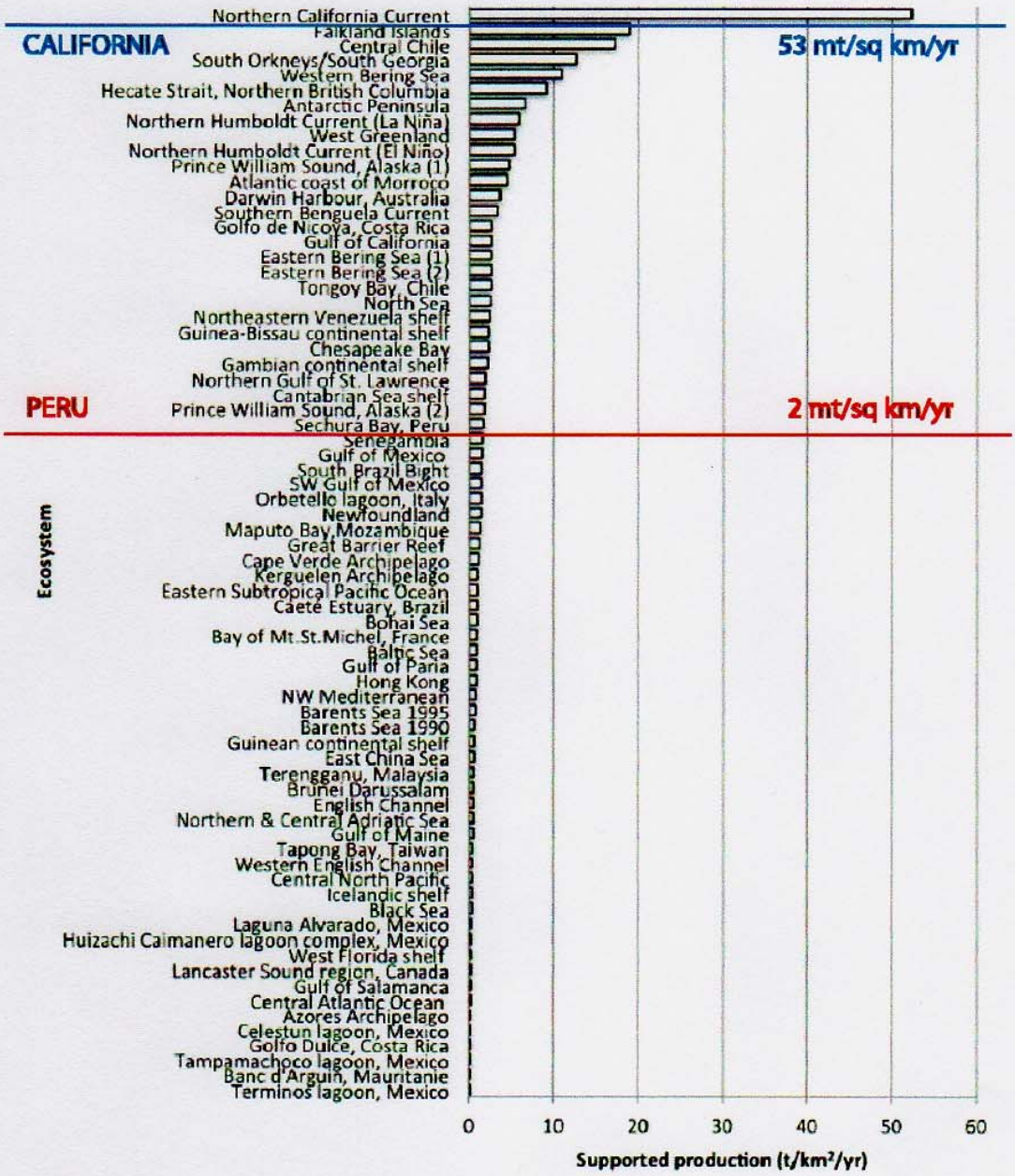
As the Council deliberates on this forage fish initiative, we believe it is important to consider this in context of the existing highly precautionary management framework for our existing CPS fisheries. The prohibition on new directed fisheries should not be considered as precedent for future efforts to ratchet back or curtail existing fisheries for CPS. We mention this now as we have heard that future action is part of a long-term strategy to further reduce, if not curtail, fishing on our historic CPS fisheries, including sardine and anchovy. In fact, the forage coalition letter submitted to the Council, calling for further protection for anchovy, notwithstanding our current precautionary harvest control rule, is case in point.

– more –

We reiterate our earlier comments noting the small harvest limits of CPS now allowed in CPS harvest control rules. We also call Council attention, again, to graphs that appeared in the Appendices of the Lenfest "Little Fish, Big Impact" paper, which illustrate the volume of forage available in the California Current Ecosystem, and the tiny amount harvested in CPS fisheries:

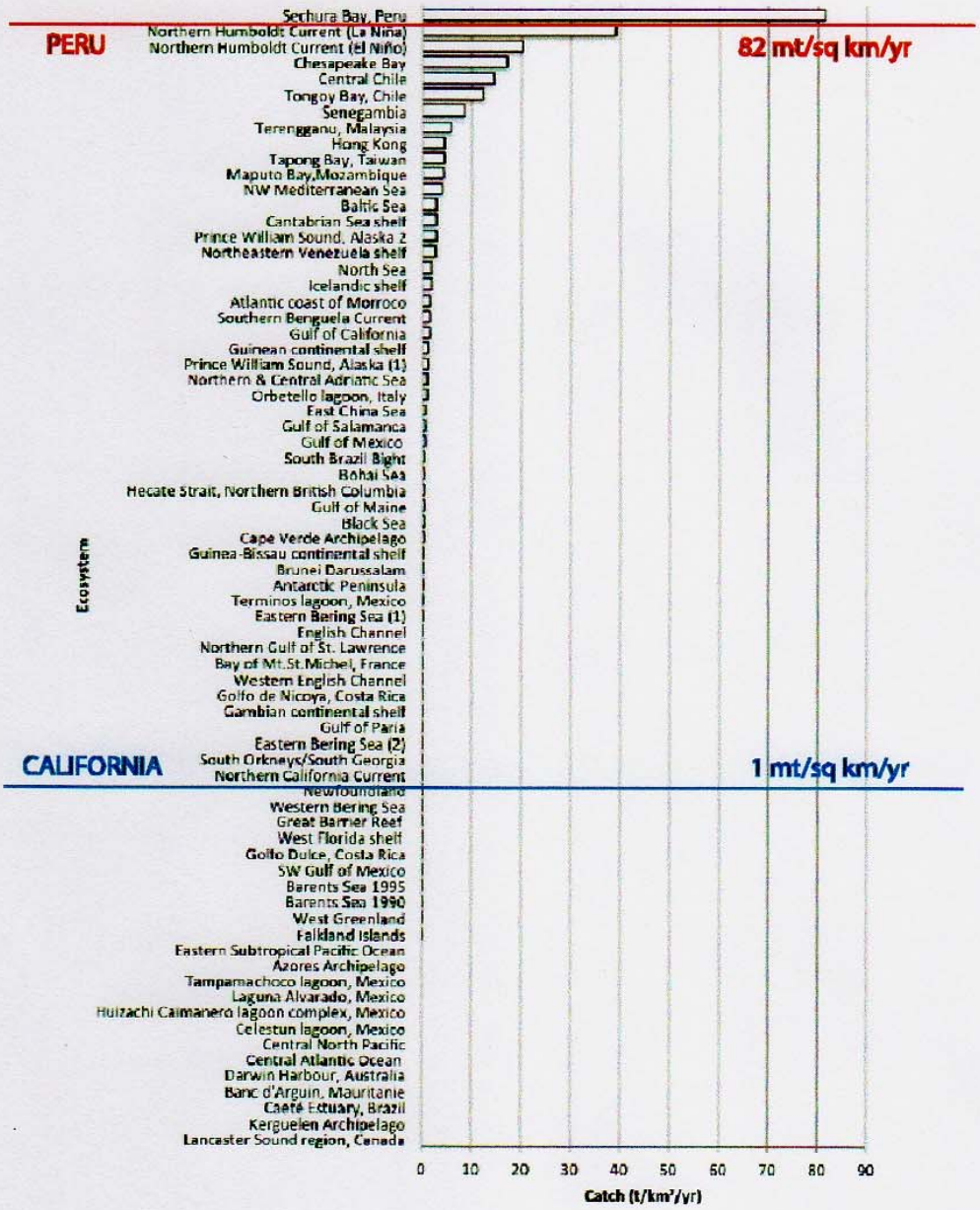
Predators in the California Current consume 53 mt of forage fishes per sq km per year.
Predators in Sechura Bay, Peru consume 2 mt of forage fishes per sq km per year.

Figure E5.5
Supportive Contribution of Forage Fish to Ecosystem Predator Production Across all Ecopath Models.



The Secura Bay, Peru fishery harvests 82 mt of forage fishes per sq. km per year
The California Current fishery harvests 1 mt of forage fishes per sq km per year

Figure E5.1
Forage Fish Catch Across all Ecopath Models by Volume.



Thank you for your consideration of these comments.

Best regards,

Diane Pleschner-Steele
Executive Director


Northern California River Watch PO Box 817 Sebastopol CA 95472 www.ncriverwatch.org

RE: Unmanaged Forage Fish Initiative

August 14, 2014

Dear Chair Lowman and Council Members,

California River Watch's mission is to strengthen the ability of citizens to protect water quality in rivers, tributary watersheds, oceans, bays, wetlands, surface and groundwater in California. We understand the importance of marine health to many ecosystems. Forage fish conservation is important because these fish are the basis for a healthy ocean food web, and without it, we will see devastating effects on our wildlife in the Pacific Northwest .

The Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and we applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, we urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species and evaluate controlling the opening of future fisheries on these species because of their critical role in the ecosystem.

Further, the Council should prohibit new directed fisheries absent rigorous review and management measures being in place beforehand, and set a limit on the amount of unmanaged forage fish that may be taken in existing fisheries for groundfish and other species. This action ensures that existing fisheries are not negatively impacted while also ensuring that unregulated directed fisheries for these forage species do not develop.

During the meeting in September, we encourage the Council to adopt amendatory language to designate unmanaged forage fish as ecosystem component species and allow for a limited amount of those species to be taken in existing fisheries. This action will provide meaningful protections for these important little fish, help ensure enough are left in the water for other species such salmon, tuna, whales and seabirds, and avoid negatively impacting existing fisheries.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem and coastal economies.

Thank you for your continued commitment to maintain a healthy and productive Pacific Ocean.

Sincerely,

Larry Hanson, Manager
California River Watch

Pacific Fishery Management Council
Dan Wolford, Chairman
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

September 2, 2014

RE: Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members,

As a marine biologist and concerned citizen living in coastal Oregon, I understand the importance of maintaining productive oceans. My own research focuses on the population dynamics of whales and dolphins but, living in Newport, I am also aware of the importance of well-managed commercial fisheries for a healthy economy. Forage fish serve an important role as essential diet for many of the marine animals I study and for many of the high-value species of fish taken in commercial and sport fisheries along the Pacific Coast.

I realize that the Council has made steady progress over the past two years in laying the groundwork for establishing regulatory protections for currently unmanaged forage fish species and I applaud the Council's work to incorporate ecosystem principles into fishery management decisions. Today, I urge the Council continue to move forward with protections for currently unmanaged forage fish by incorporating them into all of the existing fishery management plans as ecosystem component species and to evaluate controlling the opening of future fisheries on these species because of their critical role in the ecosystem.

These steps will ensure that the Council achieves its goal of establishing basic protections for unmanaged forage fish. In so doing, the Council will fulfill the first initiative of the Council's Fishery Ecosystem Plan, a visionary document that the Council approved unanimously. By protecting forage fish as a key link in the marine food web, we can maintain a healthy marine ecosystem and coastal economies.

Sincerely,

Professor C. Scott Baker
P.O. Box 677
South Beach, Or 97366


**Oregon Chapter**

RE: Agenda Item G.3 – Highly Migratory Species New or Routine Management Measures Range of Alternatives

September 2, 2014

Dear Chair Lowman and Council Members,

The American Cetacean Society was the world's first cetacean protection organization. ACS' mission is to protect whales, dolphins, porpoises, and their habitats through public education, research grants, and conservation actions. In encouraging others to learn about and watch cetaceans, we are very concerned with the risks to cetaceans and other marine animals the current drift gillnet fishery presents.

We applaud the Council's stated intent in June to require strict management measures on the drift gillnet fishery. However, given the indiscriminate nature of drift gillnet gear, we urge the Council to begin the process of transitioning the drift gillnet fishery to alternative gear types that are more selective and actively fished.

In the interim, and for as long as the drift gillnet fishery exists, we support the implementation of bycatch reduction measures including hard caps on protected species such as sperm whales and leatherback turtles and overall bycatch targets on sharks, cetaceans, and other finfish. When establishing take caps for protected species, we ask that you set limits at conservative levels and shut down the fishery should any of those limits be reached. It is tragic to see how these endangered animals suffer and die when caught in these nets and then their populations decrease. These animals are not only important to the ecosystem and us, but also are the basis of ecotourism along the west coast.

In order to properly account for the incidental catch of non-target species and to ensure take caps are enforced, we ask the Council to increase observer coverage above 2013 levels and continue to increase coverage until 100% accountability is achieved, either through onboard observers or electronic monitoring.The Magnuson-Stevens Fishery Conservation and Management Act requires fishery managers to minimize bycatch as a primary conservation goal in managing fisheries. We are encouraged by the direction the Council took in June and we urge the Council to continue to hold the drift gillnet fleet accountable until a plan is developed for transitioning the drift gillnet fishery to other gear types.

Species caught as bycatch in the drift gillnet fishery are an important part of the ocean ecosystem and are essential to maintain an ecological balance. Marine animals are of great national significance providing aesthetic and recreational value as well as economic value to coastal communities and the tourism industry through whale watching tours, dive trips, and other activities. The Council should protect these species by ensuring fishing practices are conducted in the least harmful way.

Thank you for your work to reduce bycatch in the fisheries you manage. We look forward to engaging throughout the process to transition the drift gillnet fishery to alternative gears.

Sincerely,
Joy Primrose
ACS Oregon Chapter President
marine_lover4ever@yahoo.com (541) 517-8754

August 14th, 2014

Pacific Fisheries Management Council
Dorothy M. Lowman, Chair
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda Item J.1. Unmanaged Forage Fish Initiative

Dear Chair Lowman and Council Members:

As a coastal business person involved in the fisheries business, I want to thank you for the steady progress you've made over the past year toward establishing protections for currently unmanaged forage fish species, which are a vital part of the food web in the entire California Current Ecosystem. These small fish are very important to all of us doing business on the Oregon coast. As prey, they provide nutrition for the seabirds, whales, seals and sea lions which people come to the coast to watch -- as well as the tuna, rockfish and salmon that our company depends on. In that regard, we rely on forage fish for our bread and butter, too. (www.fishpeopleseafood.com)

That is why I'm urging the Council to **approve and release for public comment a range of alternatives to protect currently unmanaged forage fish and to select option 2.2.1, the Ecosystem Trophic Role Pathway, as the preliminary preferred alternative.**

Your continued work to protect forage fish is important to me as a business owner whose clients flock to the coast to witness the natural wonder of Oregon's marine life. In Otis and Newport our business is creating value added seafood entrees and soups for the grocery trade and we create long term jobs in our facilities while maintaining the value of our seafood in the community. As indicated in Chapter 3 of the Workgroup's report, each and every one of the forage fish being considered by the Council serve as food for seabirds, marine mammals and the seafood species that is the life blood of our business. .

I believe these small fish are at risk without being protected as ecosystem component species in each of the fisheries management plans. In my opinion, it makes smart business sense to take precautionary steps to assure that an asset that is fundamental to the health of our coast – and to our coastal tourism sector -- is adequately protected before proposals to harvest them push us into future conflicts and force us to be reactive rather than proactive.

For the past decade, coastal citizens in Oregon have participated in planning for our ocean's future through establishing marine reserves and marine protected areas, as well as planning for renewable energy siting within our territorial sea. These efforts have not been easy, but we know that having these protections and plans in place will help sustain our coastal business communities as well as the marine life on which they all depend.

I believe the Fisheries Ecosystem Plan will help serve the same purpose and appreciate the Council's vision and commitment to advancing it through implementation of Initiative 1. **That's why I urge the Council to take the next step by adopting alternative 2.2.1 as the preliminary preferred alternative and moving the package forward for review and ultimately adoption**. This option incorporates currently unmanaged forage fish as ecosystem component (EC) species within each of the Council's existing Fishery Management Plans (FMP) where basic conservation measures can be put in place to prevent the development of new directed commercial fisheries absent a strong science and management framework.

I believe using Alternative 2.2.1 as a framework for the Council's oversight of forage fish makes the most sense of the three pathways outlined under Chapter 2 of the report because it provides clear recognition that forage fish provide important linkages within an interconnected ecosystem that includes upper trophic level species of seabirds, whales and other marine mammals that are of great interest and concern to those of us who make our living on the coast.

In closing, for me and other coastal business owners who rely on this natural-resource-base, **these little fish are critically important to our business.** By advancing a range of alternatives for public comment and settling on alternative 2.2.1 as the preliminary preferred alternative, the Council will be advancing a proactive and precautionary approach to management that will serve to sustain not only forage fish but coastal businesses like our own that depend on a having a healthy ocean.

Thank you for your consideration.

Sincerely,

Duncan Berry
CEO
Fishpeople Seafood
1940 Three Rocks Road, Otis, OR. 97368

817 N Madrona Ave, Portland, OR. 97211

www.fishpeopleseafood.com

Agenda Item H.1c
Supplemental Public Comment 6
September 2014

9/13/14

35417 N. Dalton Road
Deer Park, WA 99006
September 13, 2014

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Re: September 13, 2014, PFMC Agenda Item H.1 Unmanaged Forage Fish Protection Initiative

Ladies and Gentlemen:

Please include this public comment under Agenda Item H.1. I represent Spokane Audubon Society, its officers, directors and approximately 150 members. We are dedicated to protecting birds and their habitats and are associated with 24 other active Audubon chapters within Washington State--a network representing nearly 22,000 concerned citizens.

The regulatory issues before the Council offer an opportunity to incorporate previously unmanaged forage fish--the little fish that are a big deal in the web of life for marine mammals, sea birds, sharks, tuna, and other larger and anadromous predator fish like salmon and steelhead that populate our inland waters as well as the ocean where they grow to maturity. Accordingly we urge your approval of Final Management Option 2.2.1 to incorporate all forage fish on an ecosystem scale for each existing fishery management plan under your jurisdiction.

These forage fish apparently constitute 37 per cent of commercial catch world wide; and 90 per cent of that catch is utilized for other than human consumption. It follows, then, that the Council will set reasonable limits on forage fishing and focus on conservation, sustainability and non-commercial species--all for the health of forage fish stocks themselves as well as for continued species diversity and ecosystem function in the California Current.

Also, please note: this week's published projections indicate that half of the birds living on this continent will lose significant parts of their habitats by 2050 from climate change and associated environmental threats unless action is taken. Further, starvation and extinction for sea birds, larger predator fish and marine mammals are also likely without sustainable forage fish.

Please help avert this crisis: adopt Option 2.2.1. Your service with extremely complex matters and for the sometimes thankless work you assume are appreciated. We look forward to progress details.

Very truly yours,

SPOKANE AUDUBON SOCIETY

By Mary Jokela

Agenda Item H.1.c.
Public Comment
September, 2014

Ms. Dorothy Lowman, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

September 9, 2014

Dear Chair Lowman & Council Members,

Please accept these comments regarding ecosystem-based management and the protection of forage fish on behalf of the following organizations:

Midwater Trawlers Cooperative
United Catcher Boats
Oregon Trawl Commission
Fishermen's Marketing Association
Pacific Whiting Conservation Cooperative
West Coast Seafood Processors Association
Coos Bay Trawlers Association
California Wetfish Producers Association
Fishing Vessel Owners Association
Point Conception Groundfish Fishermen's Association
Ocean Gold Seafoods
Ilwaco Fish Company
Del Mar Seafoods
Argos, Inc

Our organizations represent the majority of trawlers and shore-based and at-sea processors that participate in the west coast groundfish fishery. In addition, several of the organizations also represent a major portion of the participants in the coastal pelagic species fisheries. **We are unified in our recommendation that the Council adopt Alternative 2 as written in the Environmental Assessment as its Final Preferred Alternative (FPA) for the Unmanaged Forage Fish Protection Initiative under agenda item H.1.**

Rationale
Our groups have all demonstrated a commitment to sound fisheries management through a variety of actions over the years. This includes reasonable protections for forage fish, which fulfill an important role in a healthy ecosystem. To that end we support the Council's Statement of Purpose and Need for this action:

*The purpose of this action is to prohibit new directed commercial fishing in Federal waters on unmanaged, unfished forage fish species until the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. This action is needed to proactively protect unmanaged, unfished forage fish of the U.S. West Coast Exclusive Economic Zone (EEZ) in recognition of the importance of these forage fish to the species managed under the Council's FMPs and to the larger California Current Ecosystem.*

Further, we believe that of the three alternatives analyzed, the Council's Preliminary Preferred Alternative (PPA), Alternative 2 selected in April 2014, best meets this Purpose and Need Statement. Alternative 2 brings specific forage fish species into four fishery management plans and prevents future targeted fisheries from developing on these species unless a scientific assessment of harvest sustainability is conducted. At the same time, Alternative 2 allows for the minor incidental take of these species, which currently takes place and has historically occurred. Alternative 2 requires that the species harvest be monitored so there will continue to be information available as to what levels of harvest of these species is occurring. The Council's mandate for biological protection is met without instituting potentially complex and possibly punitive regulations, which could have unnecessary negative economic consequences on existing fisheries.

Policy Guidance

The use of an ecosystem approach to management is strongly recommended by NMFS, which is why the comprehensive forage fish amendment is so important. The approach being considered by the Council of including particular forage fish species in the four Council fishery management plans as "ecosystem component" stocks is clearly contemplated under National Standard (NS) 1 Guidelines. Ecosystem component stocks are those which are not targeted and for which overfishing or overfished status is not a concern and that are generally not retained or sold. The species being considered under this action are clearly ecosystem component stocks. They have not now nor have they ever been targets for our fisheries. They are not now nor have they ever been deemed overfished. Any contact with these species is purely incidental in the pursuit of the target species and the small amounts that have been harvested historically reflect this reality.

Other Alternatives in Relation to Purpose and Need Statement

Alternative 1, the No Action alternative, is simply not appropriate given the Pacific Council's commitment to protecting forage fish species.

Alternative 3, which places prohibitions on retention of incidental catch, is also not appropriate given the direct consequences this requirement will have on existing fisheries. Additional species identification, sorting and discarding at-sea of these ecosystem component species will take additional time and effort and increase costs to existing fisheries with no direct biological benefit. The current and historic incidental take levels of these species are very minor and there is no indication that this trend will change in the future. Further, Alternative 3 essentially imposes management measures that are appropriate for "in the fishery" stocks, not "ecosystem components" as defined by NS 1.

There has been some additional discussion of adopting Alternative 2 with an added restriction on the amount of ecosystem species that could be taken incidentally defined as either a bycatch allowance or cap. It has been suggested that this would somehow be a compromise between Alternatives 2 and 3. We do not support this approach and any additional restrictions for the same reasons we do not support Alternative 3. Imposing additional management implications and associated costs that do not result in direct conservation benefits is unnecessary and unwarranted, particularly when there is no threat of target fishing for these species. This hybrid alternative also incorporates management measures that NS 1 guidelines define as "in the fishery" stocks, of which these are not. Based on everything we currently know, a target bycatch fishery on any of these species is not only unlikely, it borders on the realm of not possible.

Conclusion

In summary, our organizations represent the majority of the industry that will be affected by this action. We are responsible stewards of the ocean and we are committed to the protections of important forage fish. To that end, we support Alternative 2 as the best approach with regards to the National Standard guidelines and to meet the Council's mandate and Statement of Purpose and Need without adding additional expense and burden to existing fisheries. The analysis in the draft Environmental Assessment more than adequately supports our position. Alternative 2 protects unmanaged forage fish and we strongly recommend the Council support its Preliminary Preferred Alternative as the Final Preferred Alternative.

Thank you for your consideration.