



Native Fish Society
221 Molalla Ave., Suite 100
Oregon City, OR 97045
503-496-0807
bmbakke@gmail.com

Conserving biological diversity of native fish and protecting wild populations

Pacific Fishery Management Council
Dan Wolford, Chairman
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

RE: Proposed quota expansion on forage fish fisheries

Dear Mr. Wolford:

The Native Fish Society is a regional conservation organization concerned about the health, abundance and biological diversity of native fish ecosystems. Forage fish are native wild populations of animals that require thoughtful management based on scientific information, monitoring and evaluation. The expansion of fishery quotas for so-called forage fish has an impact upon the entire ocean ecosystem and can impact freshwater aquatic and terrestrial environments affecting mammals, birds and other species of fish that rely upon those fish for food, growth, reproductive success and survival. For example, wild native salmonids, many of which are now listed as federal protected species, are dependent upon a healthy and productive ecosystem that is food rich and abundant.

The Native Fish Society recommends that the PFMC not expand forage fish fisheries and quotas and use the precautionary principle in allocating quotas for forage fish.

There are numerous scientific and policy statements supporting the protection of forage fish to benefit productive and viable ocean and freshwater ecosystems. I have provided a few of these statements below for reference.

ISAB Comment

“Food web structure and processes associated with them determine how system components act collectively – sometimes synergistically – to underpin the resilience and productivity of the larger ecosystem. Further, when a predator impacts its prey, the influence can extend well beyond the prey, reverberating throughout the entire food web as a “cascading trophic interaction.” (ISAB 2011)

WDFW Comment

“It shall be the policy of the department to maintain healthy populations of forage fish species and individual stocks of forage fish while assuring the integrity of the ecosystem and habitat upon which marine resources depend. If insufficient information exists or the condition of the resource is poor, a conservative approach to fisheries will be taken. Fishery management plans will consider the role of forage fish in the marine ecosystem and the need to supply sufficient quantities of forage fish for ecosystem needs. A precautionary approach to resource management shall be utilized. The department shall consider the best scientific information available.” (WDFW 1998)

A recent report called “Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs.” estimates that forage fish worldwide generate \$5.6 billion as direct catch, but contribute more than double that - \$11.3 billion – by serving as food for other commercially important fish. The Lenfest Forage Fish Task Force is available <http://www.oceanconservationscience.org/foragefish/>

Based on these and other scientific and policy statements, the Native Fish Society supports the efforts of the PFMC to implement a management plan for forage fisheries that maintain the ecosystem services they provide.

References:

Independent Scientific Advisory Board (ISAB). 2011. Columbia River Food Webs: Developing a Broader Scientific Foundation for Fish and Wildlife Restoration. Document ISAB 2011-1.

Washington Department of Fish and Wildlife (WDFW). 1998. Forage Fish Management Policy, Fish and Wildlife Commission Policy Decision.

Sincerely,

A handwritten signature in cursive script that reads "Bill M. Bakke". The signature is written in black ink and includes a horizontal line extending to the right from the end of the name.

Bill Bakke

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MAY 15 2012

PFMC

Pacific Fishery Management Council May 10, 2012

Dan Wolford, Chairman

7700 NE Ambassador Place, Suite 101

Portland, Oregon 97220-1384

RE: Proposed quota expansion of forage fish

Dear Mr. Wolford,

I believe forage fish need to be protected from overharvest. We have been spending millions to protect salmon and bring them off the endangered species list. Let salmon have something to eat once their numbers increase. My understanding is recent surveys of forage fish show their numbers dangerously low. Allowing more commercial fisheries could make them extinct. This would have repercussions up and down the food chain. Please help us manage our fisheries.

Sincerely,



Roger Urbaniak

Member Puget Sound Hatchery Action Advisory Group, Puget Sound Anglers, F.I.S.H., Advisor Western Fisheries Research Lab, Permit, install, operate six remote salmon incubator sites Lake Washington, Master Docent Issaquah Hatchery.



May 21, 2012

RE: Public Input for June 24 Pacific Fishery Management Council Meeting

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 Friends of the San Juans has worked for over 33 years to defend natural spaces and wildlife that define Puget Sound. Recognizing the value of forage species such as herring, sand lance, and surf smelt as crucial components of a rich and productive marine food web, we have worked to conserve the spawning habitat on which these species depend.

Over 700,000 visitors come to the San Juan Islands to enjoy fishing and crabbing and watch our wildlife that depend on our regions rich and productive ecosystem. These visitors expect to see birds, salmon, and orca in the wild. Preserving forage fish species is vital to our tourist based economy. These visitors contribute over \$51 million annually to our economy. In addition over 600 jobs are created to support our recreational tourism based economy.

Forage fish are critical to supporting the Chinook salmon which are the primary food of the totemic southern resident Orca. These species (salmon and orcas) are the backbone of our economy and cultural icons for our county as well as the tribes in the US and British Columbia. The seven tribes with Usual and Accustomed Fishing Rights in the San Juans alone depend on forage fish to feed their salmon fisheries.

With only 16,000 residents in San Juans County, we ask our residents and visitors to be good stewards our natural resources. Now, we ask the Council to do its part, by protecting non-managed forage species such as sand lance by incorporating them into an existing fishery management plan.

PO Box 1344 Friday Harbor, WA 98250 Ph: 360-378-2319 Fax: 360-378-2324 www.sanjuans.org

Protecting the San Juans, preserving our quality of life

We note that our own state's Forage Fish Management Plan, adopted in 1998, prioritizes forage fish in state waters for its value to the marine ecosystem with catch considered only on a secondary basis. We are concerned that non-managed forage species are vulnerable to new fisheries in federal waters because of growing worldwide demand to convert wild-caught forage fish into secondary uses such as feeding farmed fish. The council's draft fishery ecosystem plan highlights this threat, pointing out that the "spectacular growth" of the global aquaculture industry – and its need for wild-caught forage as feed – is likely to make the market more attractive for lower-trophic-level species that aren't currently being fished on the Pacific coast.

A landmark report from the Lenfest Forage Fish Task Force, *Little Fish, Big Impact*, concluded that forage fish is worth twice as much in the water as it is in the net solely because of the commercial value it adds to predators like tuna, salmon and cod. This is a conservative estimate, because it does not include the value of recreational fishing, birding, or whale-watching.

In addition, the Lenfest scientists recommended that when we have little information about a forage species, we should not allow a new fishery to operate.

We encourage the Council to set aside non-managed forage species now, before a new fishery emerges. This would be a tangible step toward protecting a vibrant and durable marine environment of the Pacific Northwest coast and consistent with the Council's interest in moving toward ecosystem-based approach to management.

Sincerely,



George Lawson, Board President



Stephanie Buffum Field, Executive Director

South Coast Tours LLC

27436 Hunter Creek rd. Gold Beach, OR 97444
www.southcoasttours.net
541 373-0487



South Coast Tours LLC

Dear Chair Wolford and Council Members:

I am writing today to urge the council to consider the small, but so very important baitfish. As you know these little fish are vitally important to the more iconic fish that so many northwest anglers spend millions of dollars chasing in our amazing waterways. In the northwest we have dedicated a significant amount of resources to the protection and rebuilding of our Salmon and Steelhead stocks. Watershed councils, conservation groups, agencies and others have spent a vast amount of time and energy working on these highly popular and resilient heritage fish. Sometimes I'm amazed that we still have fishing opportunity considering how much habitat loss and depletion these fish have endured.

Knowing that we have lost habitat and understanding the current pressure on the stocks I worry that further removal of the base of their diet may be the final straw for these truly amazing fish. We can only make it harder for them for so long before they finally succumb to the pressures and we lose them forever.

As a kayak fishing and wildlife viewing business on the southern Oregon coast, I ask the council to consider a ban on any new forage fish fisheries until we truly grasp their importance in the whole ocean food web. If any new baitfish fishery were to be proposed, I hope the council would seek an ecosystem based approach to look deep into the issue to see if there is really a need for this new fishery and how this new fishery might impact the rest of the food chain as well as the many businesses and livelihoods that depend on healthy ocean ecosystems.

Please look carefully at the importance of the little guy in the ocean and please employ the precautionary principle and ecosystem-based management when addressing potential forage fish exploitation. We all don't want to end up like other places in the world (or even here in the U.S.) where one fishery after another collapses until there is little left but puny fish. So lets do the right thing and stick up for the little guy.

Thank you for your efforts,

Dave Lacey
Owner: South Coast Tours LLC

May 22, 2012

Pacific Fishery Management Council

Dear Management Council,

I write to you today asking for your support and leadership in emphasizing the conservation of forage fish as the key to a healthy ocean that benefits all of us on the Pacific coast. In light of increasing demands on our oceans and emerging science about the fragility and importance of forage fish, we need to ensure we leave enough in the ocean for marine life before we remove them as feed for fish farms, poultry and livestock.

I appreciate that the council has agreed to develop a fishery ecosystem plan. That plan should start by informing and guiding the protection of forage fish as the critical link in a productive and resilient marine ecosystem -- which will also protect the coastal fishing communities that depend on the ocean. The plan should include a process for making sure the needs of predators are met in all of the council's actions. In addition, I urge you to proactively prevent new fisheries on unmanaged forage species by incorporating them into a council management plan as quickly as possible.

Sincerely,

Mrs. Huron Wright-campbell
6115 Sringford Drive G-22
Harrisburg, PA 17111-4973

May 22, 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 Oregon Chapter of the American Cetacean Society (ACS) urges the Council to protect forage fish species that are not currently managed. ACS is a 501(c)(3) organization concerned with the welfare, protection, and safety of whales, dolphins, and porpoises (collectively known as 'cetaceans') and the ocean and riverine habitats in which they live. We accomplish our goals through developing public education initiatives, funding research projects, and implementing conservation actions aimed at protecting cetaceans in their natural environments.

Cetaceans enchant us with their grace, intelligence, and beauty, and have an exceptional ability to inspire people and serve as ambassadors for marine conservation. And yet these magnificent creatures face more threats today than ever before- from entanglement in marine debris and fishing gear, ship strikes, noise pollution, climate change, ocean acidification, contaminants, loss of habitat and whaling.

We need a balanced and productive food web to ensure the long term health and productivity of our oceans. The Pacific Coast offers some of the best whale watching in the world. However, whales and other cetaceans require a significant amount of forage to survive. For instance, the average humpback whale eats up to one and a half tons (1,361 kg) of food per day. If forage stocks are depleted, we will inevitably see a decline in cetacean populations as their food becomes scarcer. We ask the council to halt the development of new fisheries targeting unregulated forage species until we can account for their importance as prey to cetaceans and other marine life.

Sincerely,

Joy Primrose
President, Oregon Chapter American Cetacean Society
Certified Marine Naturalist
marine_lover4ever@yahoo.co
(541) 517-8754



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Coastal Conservation Association

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PFMC

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

^[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.

30 Years of Conservation

May 25, 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 Northwest Guides & Anglers Association's (NWGAA) mission is to protect, enhance, and promote healthy sport fisheries and the ecosystems they depend on in the Pacific Northwest. NWGAA was formed to address issues in the Northwest, including the Columbia River, that limit the capability of fully prosecuted sport fisheries.

We support conservation measures that are backed by credible science with fair public and professional input. We write today urging the Pacific Fishery Management Council to suspend the expansion of fisheries on unexploited forage stocks until an ecosystem-based approach can be implemented that conserves the prey base for all marine life including tuna, salmon, marine mammals and sea birds. This is a sensible action that is backed by scientists, fishermen and conservation groups alike.

The Pacific Northwest is still a relatively untapped resource as a sport-fishing destination. We can make the Northwest a destination location for sport anglers worldwide. With catch and release fisheries a recent trend, the Northwest has some very under-marketed opportunities available for tapping. However, without an adequate food supply in the ocean, we will not be able to catch many of the fish we love. Lack of forage fish has been linked to diminished salmon and steelhead runs and smaller fish size, neither of which is good for business for the hundreds of fishing guides on the Pacific Coast and Oregon's Rivers.

NWGAA strongly encourages the Council to consider the needs of sport fish when setting catch limits for forage fisheries and to set aside currently unmanaged forage populations as prey in the ocean. Thank you for the opportunity to comment on this important issue. We look forward to participating throughout this process.

Sincerely,

Bob Rees
President
Northwest Guides & Anglers Association

May 25, 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:

I write today urging the Pacific Fishery Management Council to suspend the expansion of fisheries on unexploited forage stocks until an ecosystem-based approach can be implemented that conserves the prey base for all marine life including tuna, salmon, marine mammals and sea birds.

I am a native Oregonian and have been fishing Oregon's rivers and the Pacific Ocean since 1978. As a fisherman and fishing guide, I make my living obsessing over salmon, steelhead, and sturgeon. My business depends on a healthy and vibrant ocean ecosystem that supports an adequate prey base.

Ocean conditions, including lack of forage, are the biggest non-human factor in salmon numbers. Researchers analyzed stomach contents of important predator species and discovered that small forage fish comprised 80 percent of the diet of albacore tuna on the Pacific coast. The same study revealed that forage fish account for nearly half of the diet of adult salmon in the ocean. As young salmon leave the Columbia River, thick schools of forage also serve as an alternative source of prey for predatory fish, seabirds and marine mammals. And yet, forage species are under immense pressure.

The rise in demand for protein out of the ocean has resulted in forage fish taken for pennies on the pound, processed into fishmeal or shipped overseas to feed pen-raised tuna. These are not high value uses of a valuable resource. The recent Lenfest Forage Fish Task Force Report highlighted this fact, finding that forage species are worth twice as much in the water as support to other commercial fisheries than as a direct harvest product. For the sake of all our Pacific fisheries, we must recognize the increasing threat to forage species and take a precautionary approach to managing prey in the ocean.

I urge the Council to ensure healthy fisheries for my daughter and future generations by setting aside unmanaged forage species and accounting for the needs of salmon and other marine life when setting catch limits for managed forage species.

Sincerely,

Bob Rees
The Guide's Forecast
& Bob Rees' Fishing Guide Service



A PROJECT OF THE NATIONAL COALITION FOR MARINE CONSERVATION (NCMC)

May 28, 2012

Dr. Donald Mclsaac
Executive Director
Pacific Fishery Management Council
7700 Northeast Ambassador Place, Suite 101
Portland, OR 97220

RE: Agenda Item G.1 – Consideration of Further Protection of Currently Unmanaged Forage Species

Dear Dr. Mclsaac,

The National Coalition for Marine Conservation (NCMC), 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 **Wild Oceans** 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 as it explores ways to give protection to unmanaged forage species. **We recommend that a list of unmanaged forage species be developed by the Ecosystem Plan Development Team, through the Fishery Ecosystem Plan, for approval by the council. We further recommend that the council add these species to the CPS FMP, either as part of the management unit or as ecosystem component species, and prohibit fishing for them.**

The forage base of the California Current is essential to the health and productivity of the ecosystem overall as well as to important commercial and recreational fisheries that target the many fish (tuna and salmon among them) that feed on lower trophic level (LTL) species. Several important forage species – sardine, mackerel and squid – are actively managed by the council or the State of California. Others are unmanaged and/or currently not the target of

**4 ROYAL STREET, SE ♦ LEESBURG, VA 20175
(703) 777-0037**

directed fisheries but could be in the near future. Pressures on limited ocean resources are increasing as our population grows. Ocean aquaculture is making unprecedented demands for aqua-feeds made from prey fish. Unexploited species will be sought and targeted to meet these demands. That's been the history of fishing and it will be the future.

Harvest of prey species competes directly with the needs of wild predators and associated fisheries. A new report by the Lenfest Forage Fish Task Force is only the most recent such report to urge a more cautious and conservative approach to managing forage fish, noting that LTL species, including those in the California Current, are worth twice as much left in the water as prey for commercially-valuable species as they are to the fisheries that harvest them directly.¹ The benefits of protecting forage fish are far greater when taking into account their enormous value to associated recreational fisheries and to the non-consumptive (*e.g.*, bird-watching, whale watching) and non-use benefits (*e.g.*, protecting the health of marine ecosystems).

It is critical that the council take regulatory action now to postpone development of any new fisheries for 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. This precautionary approach is a hallmark of ecosystem-based fishery management. The NMFS Ecosystem Principles Advisory Panel (on which I served) advised that Fishery Ecosystem Plans should consider “management actions with respect to all living marine resources, managed or not.” (emphasis added) The EPAP 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.²

The NCMC urges the council to consider protection for unmanaged forage species in this context. The council is not taking this action simply to conserve the individual species *per se* – although precaution demands that we do – but rather in order to preserve the health of the overall forage base. The council should bear in mind that it is currently re-evaluating the harvest guidelines in its Coastal Pelagic Species Fishery Management Plan to better account for predator needs and ecological sustainability and that it is developing a new Fishery Ecosystem Plan that will feature indices of ecosystem health, including forage species abundance and productivity. (The 4th National SSC Workshop, October 2011, noting that some FMPs feature species-specific cutoffs or thresholds, recommended that establishing an overall forage base biomass threshold was more important to serving ecosystem needs.³)

The Fishery Ecosystem Plan is the appropriate place to identify unmanaged forage species in need of protection (as it has begun to do with the working list of forage species

¹ Pikitch, E., Boersma, P.D., Boyd, I.L., Conover, D.O., Cury, P., Essington, T., Heppell, S.S., Houde, E.D., Mangel, M., Pauly, D., Plagányi, É., Sainsbury, K., and Steneck, R.S. 2012. Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs. Lenfest Ocean Program. Washington, DC.

² Ecosystem-Based Fishery Management. 1999. A Report to Congress by the Ecosystem Principles Advisory Panel. National Marine Fisheries Service/NOAA. p. 19.

³ 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.

contained in the draft FEP), while it develops an index for assessing the status of the west coast forage base. The CPS FMP is the appropriate place to take interim regulatory action to prevent new fisheries for these species – as the council did previously with krill - until such time as all forage fisheries can be conserved and managed consistent with the council’s goals and policies established through the FEP.

Sincerely,

A handwritten signature in blue ink that reads "Ken Hinman". The signature is written in a cursive, slightly slanted style.

Ken Hinman
President



Port Orford Ocean Resource Team

PO Box 679
351 W 6th Street
Port Orford, OR97465
P: 541.332.0627
F: 541.332.1170
info@oceanresourceteam.org
oceanresourceteam.org

May 28, 2012

Mr. Dan Wolford, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Mr. Wolford:

Our organization combines science, education, conservation, and local knowledge to help our community continue to access healthy, local fisheries. We believe that with proper management and conservation strategies there is a future in fishing at Port Orford and look forward to our children and grandchildren following in our footsteps.

I am writing to you today to express my concern about maintaining abundant forage fish populations. Forage fish play a critical role in sustaining a vibrant Pacific Ocean and make up the cornerstone of ocean food webs. Forage fish are vital to well-functioning marine ecosystems. I am pleased that the Council will consider unmanaged forage species protection at the June Council meeting. I urge the Council to take action to ensure that forage fish are adequately protected so that they continue to provide essential food for the marine life we catch, eat and watch at Port Orford.

Our commercial fisheries depend on you taking action to adequately protect forage fish. Thank you for your attention to this important issue.

Sincerely,

A handwritten signature in black ink that reads "Leesa Cobb". The signature is written in a cursive, flowing style.

Leesa Cobb
Executive Director

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

May 29, 2012

Dear Pacific Fishery Management Council Chairperson Dan Wolford,

I am writing to support the protection of forage species—the foundation of the marine food web. Healthy and abundant populations of forage species like smelts and sandlance are critical to the sustainability of wild fish, marine mammals, and seabirds, and the recovery of key fish populations like Chinook salmon, yelloweye rockfish, sablefish, and white seabass.

"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

Specifically, I urge the Pacific Fishery Management Council to prevent the development of new fisheries for forage fish, and at its June meeting initiate a process to amend the Council's Fishery Management Plans to protect forage fish and ensure we have a healthy ocean food web.

"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

Most forage fish catch is not consumed directly as human food, but is sold to global aquaculture and agriculture markets where these fish are turned into fishmeal and feed. With the rapidly increasing demand for fishmeal and fish feeds to support the growing global aquaculture industry, there will be increasing commercial pressures to develop and expand fisheries for forage fish. Yet we know forage fish are actually worth more in the ocean, where they can fulfill their crucial ecological role as prey for whales, seabirds and other fish, than when they are harvested directly. Importantly, when populations of forage fish decline, the predators that depend on them also decline.

"Every man who appreciates the majesty and beauty of the wilderness and of wild life, should strike hands with the farsighted men who wish to preserve our material resources, in the effort to keep our forests and our game beasts, game-birds, and game-fish—indeed, all the living creatures of prairie and woodland and seashore—from wanton destruction. Above all, we should realize that the effort toward this end is essentially a democratic movement."

-- Theodore Roosevelt

Healthy fisheries and oceans depend on vibrant and diverse populations of forage species. These small schooling fish and invertebrates are clearly the foundation for the ocean food web and ought to be protected for both their ecological and economic importance. I strongly urge your leadership to ensure we have abundant and healthy populations of forage species. Please take the precautionary and proactive action of preventing the development of new fisheries for forage fish.

"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 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



May 29, 2012

Pacific Fishery Management Council
Dan Wolford, Chairman
7700 N.E. Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Agenda item: G.1.c.

Dear Chairman Wolford and Council Members:

We write today to urge the Pacific Fishery Management Council (hereafter 'the Council') to amend its fishery management plans to suspend the expansion of fisheries on unexploited forage stocks until an ecosystem-based management approach can be implemented that conserves the prey base for all marine life including tuna, salmon, marine mammals and seabirds. In addition, we write to express concern about the management of the ESA-listed eulachon and the proposed expansion of current forage fish fishery quotas. Finally, we urge the Council to protect those forage species in the ocean that are not currently managed, and ask the PPMC to analyze the effects of managed fisheries on these important prey species and on their seabird predators. As a group, seabirds are now recognized as the most endangered birds in the world.¹ Commercial fisheries, through direct competition for prey species and mortality on fishing gear, are a principal sea-based threat to seabirds.

The Audubon Society's mission in Oregon is to conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity. Along with the Audubon Chapters below and our 13,000 members, we are devoted to the conservation of Oregon's last remaining wild places. Our members volunteer on a range of activities working to protect and restore Oregon's diverse habitats critical to bird populations, in the hopes that we may pass along this natural heritage to our children and grandchildren. Our first articles of incorporation written in the early 1900's reflect this sentiment, "to use any and all lawful means for the protection of the wild birds and animals for the State of Oregon and elsewhere." We have taken this task very seriously over the years.

Oregon is an amazing place for birds. Nearly 500 bird species use Oregon for some part of their life cycle. Our state ranks 5th in the nation for bird diversity. However, many of our native bird species are in trouble. Nearly 25% of species found in Oregon are suffering long term declines and 11% of the species found in Oregon are either already critically imperiled or likely to become critically imperiled in the near future.

¹ Birdlife Conservation International (2012) 22:1-34.

Oregon has 97 designated Important Bird Areas (IBAs) that are overseen by the Audubon Society of Portland. Recognized internationally, these IBAs were selected for their outstanding habitat value and the critical roles they play in hosting birds for breeding, migrating, or over-wintering. One third of Oregon's IBAs are situated on Oregon's coast in rocky headlands, wetlands and estuaries – habitats that are key to many seabirds.

Audubon's Coastal IBA Program includes the Ten Mile Creek Sanctuaries, located at the heart of a recently designated Globally Significant IBA for the ESA-listed seabird, the Marbled Murrelet. The Sanctuaries are nestled between Cummins Creek and Rock Creek Wilderness, and the IBA encompasses approximately 100,000 acres from north of the Yachats River to south of Heceta Head. Additionally, this IBA, as you may be aware, includes the lower reaches of Ten Mile Creek, which are designated Critical Habitat for ESA- listed eulachon, a preferred prey species for the Marbled Murrelet and many other top marine predators.

Regarding eulachon, we are concerned that NMFS has failed to identify and designate Critical Habitat in all eulachon key habitats including rivers, estuaries, and ocean waters. We support the gear modification efforts and bycatch reduction measures in the Pink Shrimp fishery, and hope these efforts will reduce the incidental take of this threatened forage fish. Current estimates show the fishery took over a million threatened eulachon in 2010 alone.² We urge the Council and NMFS to work with the States to incorporate a robust observer program to assess the effectiveness of these measures. Additionally, state managers should consider adaptive management actions such as time-area closures, and the adoption of an overall hard cap on the amount of eulachon bycatch that can be taken.

The expansion of fishery quotas for forage fish impacts the entire California Current Large Marine Ecosystem and in turn ripples through freshwater aquatic and terrestrial habitats as well, affecting mammals, birds, salmon and other species of fish that rely upon forage fish for food, growth, reproductive success and survival. A recent report titled "Global Seabird Response to Forage Fish Depletion: One-Third for the Birds" estimates that we must keep one-third of the maximum prey biomass in the ocean in order to maintain seabird productivity³. Using a comprehensive global database, the report quantified the effect of fluctuations in food abundance on seabird breeding success. The report identified the one-third threshold below which seabirds experience consistently reduced and more variable productivity. This response was common to all seven ecosystems and 14 bird species examined within the Atlantic, Pacific, and Southern Oceans. This provides an indicator of the minimal forage fish biomass needed to sustain seabird productivity over the long term. Current minimum stock sized thresholds for

² Al-Humaidhi, A.W. 1, M.A. Bellman 2, J. Jannot 2, and J. Majewski 2. 2012. Observed and estimated total bycatch of green sturgeon and Pacific eulachon in 2002-2010 U.S. west coast fisheries. West Coast Groundfish Observer Program. National Marine Fisheries Service, NWFSC, 2725 Montlake Blvd E., Seattle, WA 98112.

³ Science Magazine, 23 December 2011: 1703-1706.

Pacific sardine and mackerel and far below this threshold and risk ecosystem-wide impacts should the populations be fished down to these current thresholds.

We are aware of the growing worldwide demand to harvest and convert vast quantities of forage fish into feed for farmed fish, pigs, other livestock, and domestic cats. The Council noted in its 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. The Audubon Society agrees with this finding and believes that the harvest management should not be driven by market demands, but rather err in favor of conservation and recovery of forage fish and the health of the Californian Current Large Marine Ecosystem.

It is important to note that forage fish provide far more value in their role in the ecosystem than they do as secondary products⁴. The fate of top predators such as seabirds, salmon, and marine mammals is directly linked to that of forage fish. Hence, we urge the Council to hold off authorizing any new fisheries targeting forage species, and also to refrain from expanding any existing forage fish fisheries such as the proposed quota increase for Pacific sardine off the west coast, until the science is in place to manage both the prey fish and the predators that depend on them.

Ever since 1996, when the Magnuson-Stevens Fisheries Management Act was reauthorized as the Sustainable Fisheries Act, the intent to implement a new era of ecosystem management in our ocean-based fisheries has been clear. The precautionary approach is a fundamental tenant of ecosystem management. Aldo Leopold said it best, "If the biota, in the course of eons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering."

The Audubon Society strongly recommends that the Council take the precautionary and proactive step of halting the development of new fisheries for forage fish until and when an ecosystem-based fisheries management plan has been implemented that can demonstrate that new fisheries can be managed without ecosystem impacts. Because the integrity of the California Current Large Marine Ecosystem and the health of top predators (such as seabirds, salmon, and marine mammals) are at stake, such an ecosystem-based approach must be guided by the precautionary principle. Until such time, the Council must focus management on recovery and conservation, with robust monitoring and conservative quota allocation for existing forage fish fisheries, such as West Coast sardines and the recovery of ESA-listed eulachon.

Thank you for your work on the Council and your efforts to protect both forage fish species and the ecosystem to which they belong. We look forward to providing further input as this process continues.

⁴ Pikitch, et al., (2012). *Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs*. Lenfest Ocean Program. Washington, D.C., 108 pp.

Sincerely,

Meryl Redisch
Executive Director
Audubon Society of Portland

Alex Maksymowicz
President - Rogue Valley Audubon Society

Diana Wales
President- Umpqua Valley Audubon Society

Debra Schlenoff
Conservation Chair - Lane County Audubon Society

Eric Clough
President – Cape Arago Audubon Society

Ann Vileisis
President – Kalmiopsis Audubon Society

David Harrison
Conservation Chair – Salem Audubon Society

Will Wright, Jim Fairchild
Co-Chairs Conservation Committee
Corvallis Audubon Society



STEELHEAD
and SALMON
CONSERVATION SOCIETY

3025 Angus Dr. SE, Tenino, WA 98589

May 29, 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:

I am enthusiastically supportive of PFMC's consideration of protecting currently unmanaged forage species during your June meeting. This wise step is a strong indication of the visionary leadership required to establish and maintain a healthy ecosystem and economy. Please assure that the Council hears from all constituencies as it commences this particular process.

Our Conservation Society represents the interests of our fishermen and others vitally interested in the sustainability of our environment and our economy. I applaud the Council for taking a proactive approach in recognizing the far-reaching importance of forage species to our overall ecosystem. Simply stated, without feed, the salmon, the ground fish and ultimately all life that depends on a healthy ecosystem will suffer.

We are well aware of the Lenfest Forage Fish Task Force study, which calculated that forage fish are twice as valuable left in the water as they are harvested. However, we do not believe this equates to all out closures of all fisheries. That important report recommends caution before initiating new fisheries on forage species given the limited knowledge currently available on these species. While the nation's primary law governing fishery resources, the Magnuson-Stevens Act, encourages the domestic development of fisheries, it also provides flexibility for regional councils to act with caution when sustaining existing fisheries. I wish to also acknowledge that the Constitutionally-defined "supreme law of the land," the (Indian) treaties, cannot be affected in any way without the mutual consent of the treaty tribes. It has been my experience that as long as these treaty rights are not challenged, the tribes have positively proved to be true to their long-standing legacies as outstanding managers who strongly support sustainability in their management practices.

There is a dire need for more, and better, cooperative and truly collaborative science dedicated to the measurement of forage fish biomass—science that supports the objective of truly sustainable recreational and commercial fisheries of currently managed stocks where they can safely occur. Such fisheries are, in fact, a desirable outcome of good management.

I thank you for your time and commitment to this important issue. It is efforts such as this which will help guarantee a healthy ecosystem and economy for many generations to come.

Sincerely,

Steve Robinson
Vice President
Steelhead and Salmon Conservation Society



TU Celebrates 50 Years of Protecting Cold, Clean, Fishable Water.

Oregon Council Trout Unlimited

May 30, 2012
Pacific Fishery Management Council
Dan, Wolford, Chairman
7700 N.E. Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Chairman Wolford and Council members-

The Oregon Council Trout Unlimited represents the members of our organization within Oregon. Trout Unlimited is a cold water non-profit conservation organization dedicated to a non-partisan approach to promote clean and free flowing rivers, teaching children about responsible stewardship and bringing scientific expertise to bear on problems such as pollution, habitat loss and climate change. Trout Unlimited members work hard to protect freshwater habitat for steelhead and salmon, but restoring these iconic species depends to a great degree on ocean conditions-including an abundance of forage fish.

That's why the Oregon Council TU urges the Council to step up protection of low-trophic level species along the West Coast, starting by incorporating currently non-managed forage fish into an existing fishery management plan.

Forage fish are the key transfer agent between planktons and the bottom of the food web and upper-trophic predators such as salmon and steelhead. The Oregon Council TU is concerned about rising global demand to convert vast quantities of wild-caught forage fish for secondary purposes such as feeding livestock, poultry and farmed fish. We note the Council's own draft fishery ecosystem plan highlights the threat of new fisheries developing because of the continuing growth of the global aquaculture industry and its need to extract large volumes of marine forage fish as food for pen-raised tuna and farmed salmon. We believe the Council should prioritize marine forage fish for its ecological importance to a healthy and resilient marine food web off the Pacific coast.

Oregon Trout Unlimited urges the Council to set aside non-managed forage fish now, before a new fishery emerges, in order to ensure that we leave enough prey in the ocean to sustain healthy runs of salmon and steelhead.

Sincerely,

Tom Wolf, Chair
Oregon Council Trout Unlimited

May 31, 2012

Mr. Dan Wolford, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, #101
Portland, OR 97220

RE: Agenda Item G.1 – Consideration of Forage Fish Management Issues

Chairman Wolford and Council Members,

We are writing to request that the Pacific Fishery Management Council (Council) take action at its upcoming June meeting under Agenda Item G.1.d to advance, in a concrete and meaningful way, the protection of currently unmanaged and non-targeted forage species. As a first step, the Council should vote to establish a management objective of protecting these species, which are critical to maintaining a healthy ecosystem and sustainable fisheries. In addition, the Council should formally initiate a public process to implement the chosen management objective.

Because the status quo policy for unmanaged forage species allows for unregulated and therefore unsustainable directed fishing, the Council should adopt an objective of preventing, through Fishery Management Plan (FMP) level regulations, new fisheries from developing on these stocks until sufficient scientific knowledge is available to manage an ecologically sustainable fishery. Taking action now to establish this management objective will facilitate the process of identifying and initiating the appropriate management vehicle.

The Justification and Need to Protect Unmanaged Forage Species

Changing the burden of proof

Ecosystem-based fishery management (EBFM) and its scientific underpinnings have been extensively reviewed and vetted within the Magnuson-Stevens Act context, with implications for management becoming clearer as the discussion and the scientific foundation evolves.

As early as 1998, the Ecosystem Principles Advisory Panel (EPAP), convened by the National Marine Fisheries Service at the request of Congress, produced a report which found that EBFM “will contribute to the stability of employment and economic activity in the fishing industry and to the protection of marine biodiversity on which fisheries depend.”¹ Since that time, the body of knowledge on EBFM has grown along with calls from government, scientists, fisheries managers and the fishing industry itself, lauding its merits and advocating its implementation. For example,

¹ National Marine Fisheries Service (NMFS). 1999. *Ecosystem-Based Fishery Management. A Report to Congress by the Ecosystem Principles Advisory Panel*. United States Department of Commerce, National Oceanic and Atmospheric Administration, NMFS, Silver Springs, Maryland.

in 2005 the Pacific States Marine Fisheries Commission convened a panel of scientists to identify a process to help Regional Councils “move forward in incremental ways, from the existing management approaches that generally consider ecosystem interactions in an implicit and often peripheral way, to a management system that, over time, would incorporate explicit EBFM considerations into the fishery assessments themselves.”²

Commonly found in much of the literature on the subject of EBFM is the recognition that while a lack of scientific knowledge is a barrier to full implementation, there are certain first steps and actions that can be taken under our current management framework and understanding of ecosystem science. According to the EPAP report and others, chief among those is to reverse the burden of proof on the development of new fisheries.³

The modus operandi for fisheries management should change from the traditional mode of restricting fishing activity only after it has demonstrated an unacceptable impact, to a future mode of only allowing fishing activity that can be reasonably expected to operate without unacceptable impacts.

For economically and ecologically critical forage species that support a healthy California Current ecosystem and all the benefits that we derive from it, the need to take this first step is even more paramount.

Protecting the food web

Taking a proactive approach that preserves ecosystem function by protecting forage species is another widely recognized and important component of EBFM, and one that has been a proven success in terms of implementation and outcomes. For example, the states of Washington and Alaska have both implemented Forage Fish Management Plans that recognize and prioritize the role of forage species as prey in the ecosystem and restrict directed harvest accordingly.⁴ In particular, the Alaska Board of Fisheries finds that “abundant populations of forage fish are necessary to sustain healthy populations of commercially important species of salmon, groundfish, halibut, and shellfish.”⁵ Other examples of specific federal FMP level protections for forage species are discussed below in Table 2.

Preservation of the marine food web is also explicitly listed in the goals and objectives section of both the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands (BSAI) Groundfish

² Pacific States Marine Fisheries Commission (PSMFC). 2005. *Strengthening Scientific Input and Ecosystem-Based Fishery Management for the Pacific and North Pacific Fishery Management Councils*. Suggestions from a panel discussion. July 19-20, 2005. Seattle, Washington.

³ See EPAP Report, Mangel, M. et al. 1996. Principles for the conservation of wild living resources. *Ecological Applications* 6(2):338-362., Sissenwine, M. P. 1987. Councils, NMFS, and the Law. Pages 203-204 in: R. Stroud (ed.) *Recreational Fisheries* (11). Sport Fishing Institute. Washington, D. C., Dayton, P. K. 1998. Reversals of the burden of proof in fisheries management. *Science* 279:821-822.

⁴ Bargmann, Greg. (1998) Forage Fish Management Plan. A plan for managing the forage fish resources and fisheries of Washington. Washington Department of Fish and Wildlife. Olympia, WA.

⁵ Alaska Board of Fisheries. 1999. 5 AAC 39.212. Forage Fish Management Plan

FMPs. These FMPs further specify that one general action to be taken under that objective is to “continue to protect the integrity of the food web through limits on harvest of forage species.”⁶

It is important to note that actions to protect the marine food web through the conservation of forage species have been undertaken with support from the commercial fishing industry. For example, a report commissioned in 2007 by the Marine Conservation Alliance, an organization of commercial fishing industry groups, finds that one of the 13 best practices for EBFM is to manage and protect food webs. A specific action included under this practice is “a ban on new fisheries for most forage species, designed to avoid potential depletion of prey needed by fish, seabirds and marine mammals.”⁷ Furthermore, in a public letter to the North Pacific Fishery Management Council (NPFMC), the Alaska Groundfish Data Bank states that “[H]arvesting both predators and prey is akin to burning a candle at both ends.”⁸

The best available science supports forage conservation

In the last year alone we have seen three seminal scientific reports highlighting the importance of conserving forage species. A study released in July 2011 by Smith et al. demonstrated that fishing on forage species can have significant negative impacts on marine ecosystems and in particular commercial and recreationally valuable species.⁹ These findings held true for the California Current ecosystem and the study went on to recommend management reference points and exploitation rates for existing forage fisheries that are twice as conservative as the traditional maximum sustainable yield approach.

In November 2011 a study was published by Cury et al. that found when forage fish biomass falls below one third of the maximum historical biomass, seabird populations respond by producing fewer chicks.¹⁰ Most surprising here is that the predator response was consistent across ecosystems and seabird species. Of importance to resource managers is that this study provides a threshold of minimum forage species biomass needed to sustain seabird populations and productivity over the long term.

In April 2012, the Lenfest Forage Fish Task Force, a group of 13 preeminent scientists from around the globe, released a report providing practical, science-based recommendations for the management of forage species, given their critical role in marine ecosystems and the need to transition toward an ecosystem-based approach to fisheries management. For data poor forage species, the Task Force recommends that no new fisheries be initiated until sufficient information is available to manage an ecologically sustainable fishery.¹¹ According to the Task

⁶ NPFMC. 2011. Gulf of Alaska Groundfish FMP & Bering Sea and Aleutian Island Groundfish FMP. Available at: <http://www.fakr.noaa.gov/npfmc/>

⁷ Warren, Brad. 2007. *Sea Change: Ecological Progress in U.S. Fishery Management*. A report jointly commissioned by the Marine Conservation Alliance and the Institute for Social and Economic Research and the University of Alaska Anchorage. July, 24, 2007.

⁸ See Alaska Groundfish Data Bank letter to NPFMC. April 9, 1997. Available at: http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Other_Resource/Alaska%20Groundfish%20Data%20Bank%20Testimonial.PDF

⁹ Smith ADM et al 2011. Impacts of Fishing Low-Trophic Level Species on Marine Ecosystems. *Science* 333 (6046): 1147-50, 26 August 2011 (published online July 21, 2011); available at www.sciencexpress.org.

¹⁰ Cury, P.M. et al. 2011. “Global Seabird Response to Forage Fish Depletion – One Third for the Birds.” *Science* 334:1703-06

¹¹ Pikitch, E., et al. 2012. *Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs*. Lenfest Ocean Program. Washington, DC. 108 pp.

Force, information needed to manage a sustainable forage fishery includes population status and trends, environmental drivers, identification of dependent predators and their status, and foraging patterns. Most, if not all, of the unmanaged species on the list of California Current Ecosystem forage species drafted by the Ecosystem Plan Development Team (EPDT)¹² do not meet these information criteria and thus according to Lenfest recommendations, should not become the target of new commercial fisheries.

Status quo policy is inadequate

The status quo policy under which new fisheries can proceed in the absence of a FMP is inadequate. As we have previously noted for the Council, the Council's List of Allowable Fisheries (List) includes a broad Non-FMP Category which currently allows new fisheries on unmanaged species to start up without Council approval.¹³ Furthermore, even if the List were updated to eliminate this catch-all authorization and exclude specific species or gear types, new fisheries would still be able to proceed after notification and a 90-day waiting period unless the Council successfully petitions the National Marine Fisheries Service to take a 6 month emergency regulatory action, and even then an FMP or FMP amendment would still need to be initiated to extend the emergency action another 6 months and implement permanent regulations.

The Council has an opportunity at this time to further establish itself as a leader in the transition towards ecosystem-based fishery management. It can take action now to manage fisheries for the long-term health of the ecosystem, or maintain the status quo under which it can only react to new and potentially harmful fisheries as they develop. We urge the Council to take the former course.

Demand is rising for new forage fisheries

The Council's own draft Fishery Ecosystem Plan (FEP) includes a market analysis which shows that, based upon their value in global commodity markets, many of the unmanaged forage species in the California Current Ecosystem could become the target of future fisheries. In particular, the analysis finds that:

Demand for LTL 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... Given limited potential for increased fishmeal production from traditional LTL species prices for fishmeal and fish oil will continue to rise. This makes the prospect for fisheries developing on the minor LTL species all that more attractive, as higher fishmeal prices are sure to translate into higher exvessel prices for the raw ingredients.¹⁴

¹² PFMC 2011. Draft Pacific Fishery Ecosystem Plan, Appendix A. Available at http://www.pcouncil.org/wp-content/uploads/H2a_ATT1_DRAFT_ECO_PLAN_NOV2011BB.pdf

¹³ See Pew Environment Group letter to PFMC. March 23, 2012. Available at: http://www.pcouncil.org/wp-content/uploads/H5c_SUP_PC2_APR2012BB.pdf

¹⁴ PFMC 2011. Draft Pacific Fishery Ecosystem Plan, Appendix A. Available at http://www.pcouncil.org/wp-content/uploads/H2a_ATT1_DRAFT_ECO_PLAN_NOV2011BB.pdf

As can be seen from this analysis, protecting unmanaged forage species is not just a philosophical or theoretical discussion about idealistic management scenarios. There is demonstrated potential for new fisheries to emerge on these species, with market pressures coming from non-consumptive uses such as fishmeal and fish oil. In fact, many of the unmanaged forage species off the West Coast are fished at industrial levels in other ecosystems.¹⁵ This potential, in combination with what we know about the ecological importance of these species to well-functioning marine ecosystems, constitutes a management vacuum that must be filled.

Protecting forage species has broad public support

To date the Council has received over 19,000 individual pieces of correspondence from engaged members of the public, urging it to take action to protect forage species for the sake of a healthy ecosystem, sustainable fisheries and vibrant coastal communities. Over 110 licensed commercial fishermen and women on the West Coast have written to the Council, urging it to prevent new fisheries from developing on forage species until adequate science is available. Additionally, a diverse list of both commercial and recreational fishing organizations have advocated for the Council to implement needed forage protections, including a reversal on the burden of proof for new forage fisheries. The regional fishery management council process encourages public participation, and we hope that this strong show of public support for protecting unmanaged forage species is helpful as the Council continues its deliberation on how best to proceed.

Council Action and Guidance to Date

The importance of forage species is not a new issue for fisheries management and forage conservation has been the impetus for previous federal actions (see Table 2 below), including the 2006 prohibition on krill fishing in the West Coast Exclusive Economic Zone (EEZ). In 2010, during the development of Amendment 13 to the Coastal Pelagic Species (CPS) FMP, there were requests from the public that the Council use that amendment as an opportunity to protect unmanaged forage species by including them in the CPS FMP as ecosystem component species with corresponding conservation and management measures. However, the Council chose not to take that opportunity and there were indications that an Ecosystem FMP would be a more appropriate vehicle for addressing non-FMP forage species.¹⁶

During the Council's deliberation on EBFM in June 2011, we testified in favor of adopting an Ecosystem FMP with the regulatory authority to establish protections for unmanaged forage species. However, as the Council did not take that opportunity to establish a regulatory Ecosystem FMP we were pleased that the Council nevertheless advanced the forage issue by directing the EPDT to develop a list of unmanaged species that could potentially be the target of a new fishery. It was our understanding that the purpose of this list was to identify forage species currently unmanaged in the West Coast EEZ that may warrant further protections.

¹⁵ *Ibid* p. 31

¹⁶ PFMC. 2010. Amendment 13 to the Coastal Pelagic Species Fishery Management Plan. Draft Preliminary Alternative and Analyses. Available at: http://www.pcouncil.org/wp-content/uploads/H2a_ATT1_NS1_GUIDE_CPS_MARCH_2010_BB.pdf

In November 2011, the Council was presented with a list of California Current forage species with corresponding management status and an analysis of the potential for new fisheries to develop on unmanaged forage species.¹⁷ Upon receiving this information the Council requested further analysis of the need and mechanisms for expanding protective measures for forage species.¹⁸

In response to the Council’s November guidance, the EPDT conducted work sessions in January and April 2012 whose purpose included further analysis of the need and mechanisms for expanding protective measures for unexploited forage species.¹⁹ We participated in both of these work sessions in addition to conducting our own analysis of the available regulatory pathways and concluded that:

- The justification for protecting unmanaged forage species is clear and compelling.
- Protections for unmanaged forage species must be housed in a regulatory FMP.
- There is ample precedent for successful FMP-level preclusions of new forage fisheries

The Council’s record on this issue includes an identified and discrete set of unmanaged forage species and a market analysis showing those species to be the potential target of future fisheries.²⁰ Given what we know about the critical ecological and economic importance of forage species, the accurate and comprehensive information in the Council’s record clearly demonstrates the need to protect these species from unregulated fishing in the absence of sufficient scientific knowledge.

Potential Mechanisms for Protecting Unmanaged Forage Species

Through our own analysis and our participation in the EPDT work sessions, several broad approaches to protecting unmanaged forage species have risen to the surface:

Table 1

Mechanism	Description	Pros	Cons
A. Bring unmanaged forage species into the Coastal Pelagic Species FMP	<ul style="list-style-type: none"> *Designate unmanaged forage species as Ecosystem Component Species (ECS). ECS would not be classified as “in the fishery.” *Adopt management measures for ECS to prohibit directed fishing. *Group species by highest taxonomic order for ease of management. 	<ul style="list-style-type: none"> *Precedent exists for NMFS approvability. (NPFMC, Krill) *Council can establish criteria for developing a new fishery. *Satisfies stated Council member preference for reversing burden of proof on new fisheries. *Council can manage these species before other, less appropriate entities. *Most closely in line with Council guidance from June 2011. 	<ul style="list-style-type: none"> *Position of CPS Management Team is unclear, having expressed that additional forage protection should be in a regulatory EFMP, that the EFMP should not be regulatory, and that species should be managed under the “appropriate” species FMP. *Workload, budget and urgency concerns from NMFS.

¹⁷ PFMC 2011. Draft Pacific Fishery Ecosystem Plan, Appendix A. Available at http://www.pcouncil.org/wp-content/uploads/H2a_ATT1_DRAFT_ECO_PLAN_NOV2011BB.pdf

¹⁸ PFMC 2011. November Decision Document. Page 5. Available at <http://www.pcouncil.org/wp-content/uploads/1111decisions.pdf>

¹⁹ PFMC 2011. Ecosystem Plan Development Team Work Session Announcement. Available at http://www.pcouncil.org/2011/12/17770/epdt_conf_call/

²⁰ PFMC 2011. Draft Pacific Fishery Ecosystem Plan, Appendix A. Available at http://www.pcouncil.org/wp-content/uploads/H2a_ATT1_DRAFT_ECO_PLAN_NOV2011BB.pdf

Mechanism	Description	Pros	Cons
B. Bring unmanaged forage species into respective FMPs	<ul style="list-style-type: none"> *Break up unmanaged forage species into groupings or complexes according to Council’s existing FMPs. *Designate as ECS in each respective FMP, with associated management measures. 	<ul style="list-style-type: none"> * Some Council members have expressed that forage species are best managed under primary FMPs in which they are encountered as bycatch. 	<ul style="list-style-type: none"> *Would require multiple FMP amendments or an omnibus amendment. *Council members have expressed preference to limit action to schooling pelagics which fit most within CPS. * May lead to disparate approaches by different management teams.
C. Develop a “hybrid” Fishery Ecosystem Plan (FEP)	<ul style="list-style-type: none"> *FEP would be largely advisory, with limited regulatory authority only over unmanaged, non-FMP forage species. *Unmanaged forage species could either become management unit species or ECS; with corresponding management measures. 	<ul style="list-style-type: none"> *Continuity of work with EPDT retaining primary responsibility for development of FEP and corresponding management measures. *May best allow for consideration of new forage protections in the context of ecosystem role of LTL species. 	<ul style="list-style-type: none"> *Unclear whether the Council can authorize even limited regulatory authority in an FEP, or if so, whether it can specifically limit regulatory authority to unmanaged forage species. *Unclear whether forage species would be “in the fishery” or ECS. *EPDT workload concerns if forage protection and broader EBFM work are both retained. *Uncertain timeline and future for FEP development.
D. Expand FEP into an Ecosystem Fishery Management Plan (EFMP)	<ul style="list-style-type: none"> *Full-scale EFMP with regulatory authority over non-FMP species and cross-FMP issues. *Abandon FEP and begin new process to develop an EFMP. *Require scoping, NEPA, public comment, etc. 	<ul style="list-style-type: none"> *May best allow for the development of forage protections within an ecosystem-wide context rather than a particular FMP. 	<ul style="list-style-type: none"> *Inconsistent with Council decision from June 2011. * Would require beginning again with new FMP development. *Uncertain timeline and future for EFMP development.
E. Refine MSA “List of Allowable Fisheries”	<ul style="list-style-type: none"> *Currently, non-FMP species are open to unmanaged fishing with no notice to or approval by the Council. *Removing non-FMP species category would mean that a prospective fisherman would only need to provide notice to the Council and then proceed with fishing after 90 days unless the Council has taken emergency action. 	<ul style="list-style-type: none"> *Provides ancillary benefits from process of examining and updating list to reflect current state of Council-managed fisheries. 	<ul style="list-style-type: none"> *Limits opportunity for public participation. *No explicit and established process for removing fisheries, species or gear from the list. *Even if the “non FMP” category was removed or modified, the Council would still need to take emergency action to block a new forage fishery within 90 days of notification. *Such action would be a petition for Emergency Action by the Secretary of Commerce, therefore approval is not assured. *Emergency action could only last a maximum of 360 days, dependent on initiation of an

Mechanism	Description	Pros	Cons
E. Refine MSA “List of Allowable Fisheries			FMP or FMP amendment. Thus an FMP action is ultimately required no matter what. *Because the Council is now aware of the potential for new forage fisheries, any proposed new fishery is not “unforeseen” and this may weaken any eventual Council petition.

Why CPS FMP Provides the Best Option for Protecting Unmanaged Forage Species

CPS FMP is the Council preferred option

To date the issue of protecting unmanaged forage species has been tasked to the EPDT, as protection of the food web and the conservation of forage species is a broadly recognized goal of ecosystem-based fishery management.²¹ However, the Council’s motion under the Ecosystem-Based Management agenda item in June 2011 stated:

“Additional management measures for forage fish species, if any, would be considered through the Coastal Pelagic Species (CPS) FMP, as the Council deems appropriate.”²²

While we agree that the justification and reasoning for protecting forage species is ecosystem-based, the Council’s Fishery Ecosystem Plan (FEP) is an inappropriate vehicle because without regulatory authority it lacks the ability to enact conservation and management measures. Furthermore, the timeline for establishing a fully developed FEP remains unclear and is inconsistent with the need to take action now, before capital is invested in developing new fisheries. For this reason, among others, we support establishing protections for unmanaged forage species within the CPS FMP, at least until such time as the FEP or an Ecosystem FMP becomes a viable option. In addition, there are likely significant benefits to existing CPS fisheries that will result from a preclusion on new fisheries on the unmanaged forage base. As there is a finite pool of high-quality forage biomass to support fisheries and predators, preserving the overall forage base and diversity will ensure that increased predation pressure does not shift to the managed stocks if a currently unmanaged species is depleted by a new, unregulated fishery.

Providing adequate forage is a goal of the CPS FMP

The Goals and Objective section of the CPS FMP includes the following goal/objective:

6. Provide adequate forage for dependent species.²³

²¹ For example see: 1) Amendments 36 and 39 to the GOA and BSAI Groundfish FMPs. [Fed Reg 63, No 51, March 17, 1998](#). 2) PFMC 2008. [Amendment 12](#) to the [CPS FMP](#). 3) PFMC 1998. [CPS FMP](#), Goals and Objectives, Page1-4.

²² [June PFMC Meeting, Motion 20, #3](#) (Agenda Item H.1.d, Page 48)

While this goal/objective of the CPS FMP applies to the managed and monitored species currently “in the fishery,” it is consistent with the reasoning and justification for protecting unmanaged forage species. All of the species in the CPS FMP are forage species in that they are preyed upon by a wide variety of marine life. The fact that this FMP is the only one managed by the PFMC with an associated forage objective makes it the most appropriate of all the regulatory plans for including additional forage species as Ecosystem Components.

CPS FMP was created to manage for “Future Fishery Expansion”

Establishing a proactive and precautionary policy for currently non-targeted forage species is consistent with one of the Council’s primary reasons for creating the Coastal Pelagic Species (CPS) Fishery Management Plan in the first place - the need to proactively manage for future fishery expansion:

An important advantage in implementing and FMP with limited entry at this time is that future increases in capacity of the CPS fishery could be managed before problems arise.....It is likely that the CPS fishery will become overcapitalized faster than management authorities can react if sardine, or other CPS, increase in abundance or markets develop. Experience with the CPS and other fisheries indicate that the process of developing fishery management programs is slower than the rate at which a fishery can become overcapitalized. There is substantial excess capacity in the groundfish, herring and salmon fisheries (including the factory trawler fleet), for example, that could enter the CPS fishery in a matter of months if markets develop.²⁴

While the reasoning above excerpted from Amendment 8 to the Northern Anchovy FMP primarily addressed the species in the CPS fishery, it should also hold for the species in Appendix A of the Draft FEP, as similar market forces and geographic overlap would attract future fishery expansion. In particular and as noted in the Draft FEP, increasing demand from the rapidly growing global aquaculture industry²⁵ will continue to exert pressure to develop new forage fisheries.

Examples of Federal Forage Protections Enacted Elsewhere

It is important to keep in mind that protecting and conserving forage species in federal waters, and in particular those forage species that are not being fished, has been done before in several instances using differing approaches. All have been demonstrated successes, and they include innovative approaches that have shown that the burden of proof can be successfully reversed.

²³ PFMC. 1998. Coastal Pelagic Species FMP. Page1-4. Available at: <http://www.pcouncil.org/wp-content/uploads/a8fmp.pdf>

²⁴ PFMC. 1998. Coastal Pelagic Species FMP Amendment 8, Appendix B, p. B-3.

²⁵FAO (2011) State of World Fisheries and Aquaculture. Fisheries and Aquaculture Department. Food and Agriculture Organization of the United Nations. Rome, Italy.

Table 2

	NPFMC Arctic FMP	NPFMC GOA/BSAI Groundfish FMP	PFMC Coastal Pelagic Species FMP
General Description	FMP approved in 2009 whose primary purpose was to preclude new commercial fisheries in the Arctic Management Area, including for forage species, unless and until robust information was available and deemed sufficient to approve a new fishery	Twin FMP amendments (BSAI Groundfish FMP Am 36 and GOA Groundfish FMP Am 39) were originally approved in 1998 to prevent the development of directed commercial fisheries for forage species. Subsequent amendments enacted in 2011 to designate forage and prohibited species as Ecosystem Component Species (ECS).	FMP Amendment (Am 12) initiated in 2004 for the purpose of developing a formal prohibition on directed krill fisheries, and approved in 2009. Am 12 revised the CPS FMP to prohibit commercial fishing for all species of krill in the West Coast EEZ.
What specific management measures were enacted to protect unmanaged forage fish?	Commercial fishing on forage fish species was prohibited in the Arctic Management Area unless and until sufficient scientific information is available.	Prohibited directed fishing for select forage species at all times in Federal waters of the BSAI and GOA. Maximum Retainable Bycatch (MRB) allowance of 2% by weight of the retained groundfish on any given trip.	Implemented regulations stating that vessels in all EEZ fisheries may not “fish for, target, harvest or land” krill species.
Were the forage stocks designated as Management Unit Species (MUS) in the action?	No, forage stocks were not included in the MUS designation. Instead, three species (Arctic cod, Saffron cod, and Snow crab) were included in the MUS with <i>de minimis</i> OY’s.	No. Only “Target Stocks” were included in the MUS designation and forage stocks may not be targeted under the Alaska Groundfish FMP’s	Yes. Krill species are included in the list of MUS in the CPS FMP.
Were the forage stocks designated as “In the Fishery” (SIF) in the action?	No. Forage stocks are in the Ecosystem Component category, not in the fishery.	No. All forage stocks are either Prohibited Species or are in the Ecosystem Component category, and are thus not in the fishery.	Yes. Krill species are in the fishery under the CPS FMP.
Were the forage stocks designated as Prohibited Species (PS) in the action?	No. PS is a designation used in NPFMC fisheries for species encountered during commercial fishing. Since the Arctic FMP prohibits all commercial fishing, the designation is technically not used, even though fishing for forage stocks is prohibited	No. PS is a designation used in these FMP’s for some ECS encountered during commercial groundfish fishing, (i.e. salmon, crab, Pacific herring). While this action effectively prohibited directed fishing on the forage complex, the PS designation only applies to Pacific herring.	Not exactly. Krill species are considered “Prohibited Harvest Species” (PHS), a new designation created under Am 12 to describe species which may not be taken by any gear or fishery in the US EEZ, whereas PS may not be retained by CPS fishery participants, but are legally harvested under other FMP’s.
Were the forage stocks designated as ECS in the action?	Yes.	Yes. The 2010 update and reaffirmation of the forage fishery preclusion designated the forage complex as ECS.	No. While the CPS FMP does designate some forage stocks as ECS, the Krill species are not ECS.
Were forage stocks grouped into stock complexes in the action?	Yes. The ECS in the Arctic FMP include all “finfish,” “marine invertebrates,” and “other forms of marine animals and plant life” other than the three MUS.	Yes. The original action and the 2010 update group the forage stocks into nine (9) taxonomic families and include all species within those families.	Yes. Am 12 grouped the forage stocks in question at the taxonomic order level by protecting “all species of euphausiids that occur in the EEZ off the West Coast.”

Application of Examples to Current Situation

For the current consideration of implementing protections for unmanaged forage species in the West Coast EEZ, useful parallels can be drawn from the actions in both the GOA/BSAI Groundfish FMPs and the Arctic FMP.

- 1) The preclusion on directed fishing for forage species in the GOA/BSAI Groundfish FMPs was successfully implemented in an area where large-scale commercial long-line and trawl fisheries were being prosecuted. For this reason, the prohibition on directed fishing included a maximum retainable bycatch allowance of two percent, meaning that vessels fishing for other species in the region could retain a quantity of forage species up to two percent of the round-weight of the targeted species. In the West Coast EEZ, where groundfish fisheries are currently being prosecuted, action taken by the Council to protect unmanaged forage species should include a similar bycatch allowance so that existing fisheries are not unduly and negatively impacted.
- 2) For Arctic fish resources, the Arctic FMP “provides management measures to prohibit commercial fishing until information is available to support sustainable management of any future authorized fishery.”²⁶ The reason for adopting similar management measures for unmanaged forage species in the West Coast EEZ is to maintain the role they play in the California Current ecosystem and protect them from unregulated harvest unless and until information is available to support ecologically sustainable management of any future fishery.
- 3) The Arctic FMP has three management unit species with *de minimus* optimum yields (Arctic cod, saffron cod and snow crab) and designates all other species in the Arctic EEZ as ecosystem component species, including forage species. See the Table below:

	Finfish	Invertebrates	Other Marine Life*
Target Species	Arctic cod and saffron cod	Snow crab (<i>C. opilio</i>)	
Ecosystem Component Species	All finfish other than Arctic cod, saffron cod	All marine invertebrates other than snow crab (<i>C. opilio</i>)	All other forms of marine animals and plant life
*other than finfish, invertebrates, marine mammals, and birds			
<p>3.4.1 Forage fish species</p> <p>Commercial fishing on forage fish species is prohibited in the Arctic Management Area. Forage fish are prey for other marine ecosystem fauna including fish, birds, and marine mammals. Forage fish species other than the target species are included in the “Ecosystem Component Species” category.</p>			

Similarly, the Council should designate the list of unmanaged forage species from Appendix A of the draft FEP as ecosystem component species in the CPS FMP, enabling it to enact appropriate conservation and management measures as identified above in #1.

- 4) To accommodate the potential for future fisheries, the Arctic FMP provides a process by which a species can be moved from the ecosystem component category into the actively

²⁶ NPFMC. 2009. Arctic FMP. Page ES-4. Available at: <http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/Arctic/ArcticFMP.pdf>

managed category. Similarly, the Council can provide a process and criteria by which a CPS FMP ecosystem component species can be moved into the actively managed category if it wishes to consider authorizing a sustainable fishery on that stock.

5) While ecosystem component species are exempt from status determination criteria, they can have conservation and management measures enacted for them, even though they are not technically “in the fishery.”²⁷ Similar to the Arctic FMP, whose management measures prohibit commercial fishing until information is available to support sustainable management of any future authorized fishery, and consistent with section 303(b)(12) of the Magnuson-Stevens Act, the Pacific Council should adopt management measures to prohibit commercial fishing for or directed harvest of ecosystem component species.²⁸

Conclusion

The status-quo policy for unmanaged forage species does not adequately ensure protection of the marine environment upon which our valuable fisheries depend. Given what we know about their critical ecological and economic importance, action is need to protect them from unregulated new fisheries that would otherwise take place in the absence of adequate scientific information. In order to ensure the ecological role that unmanaged forage species play, permanent protections for them must be housed in an FMP with the regulatory authority to enact conservation and management measures. That is the only way to bring these unmanaged forage species into the Council’s jurisdiction, thereby ensuring that before any new fisheries begin, the appropriate science is conducted to make certain that any such fishery could be sustainable and not harm the marine ecosystem or other valuable fisheries.

The need to manage for future fishery expansion calls for proactive measures. The Council and its advisory bodies, along with state and federal agency staff have the knowledge and expertise necessary to develop a comprehensive suite of alternate management options from which the Council can choose. What they currently lack is clear direction from the Council that it wishes to protect this critical subset of forage species. Now is the time to take action and establish that direction, and to formally initiate a public process.

Thank you again for the opportunity to participate in this public process and share our concerns regarding ecosystem-based management and the protection of the California Current forage base. We look forward to working with the Council and all stakeholders to maintain healthy oceans and sustainable fisheries.

Sincerely,



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Pew Environment Group
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²⁷ NOAA/NMFS. 2011. Annual Catch Limits and National Standard 1 Q & A’s. Available at: http://www.nmfs.noaa.gov/msa2007/docs/acl_faq_may27_2011.pdf

²⁸ (See [74 FR 11 at 3186](#), and [Arctic FMP Environmental Assessment](#), Appendix VI - NMFS letter to NPFMC)

May 31, 2012

Mr. Dan Wolford, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220

RE: Agenda Item G.1. Protection of Unmanaged Forage Species

Dear Chairman Wolford and members of the Council:

The conservation and management of forage species has received increasing national and international attention in recent years given the crucial ecological role of these small schooling fish and invertebrates in marine ecosystems. The recent Lenfest Forage Fish Task Force report underscores this with the key findings that forage fish are highly ecologically and economically valuable as prey, and that when forage fish populations decline, so do dependent marine predators like salmon and humpback whales.¹ A management action recommended by the Task Force, and the focus of this letter, is that no new fisheries should be allowed to operate on forage fish where there is limited information on the stock dynamics of these species, their status, trends, or the dependencies of their predators.²

We are therefore pleased that the Pacific Fishery Management Council's ongoing discussions of forage species conservation will focus at this June meeting on initiating management action to protect currently unmanaged forage species. The global demand for forage fish in agriculture, aquaculture, and other industries will give rise to increasing pressures on wild forage fish stocks. Species not currently the target of commercial fisheries may become economical and exploited to supply these growing industries. We request that the PFMC act now, to stay ahead of this curve, by immediately adopting a clear objective and initiating an amendment process to the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP) at this meeting to incorporate those forage species not already in another Federal FMP into the CPS FMP. Further, we ask that directed commercial fisheries be prohibited from developing on these species unless and until an ecosystem plan is completed and appropriate management benchmarks are in place that would allow a sustainable fishery to commence without adversely impacting the functional role these species provide as prey to other marine life.

Background

As you know, the Council took unanimous action in 2006 to prohibit directed fishing for krill off the U.S. West Coast through an amendment to the CPS FMP. This action followed state prohibitions on fishing and landing krill in California, Oregon and Washington. The proposal was originally presented to the Council by the National Marine Sanctuaries who were interested in preventing fishing for krill in sanctuary waters. In November 2004, the Council chose from a

¹ Pikitch, E., Boersma, P.D., Boyd, I.L., Conover, D.O., Cury, P., Essington, T., Heppell, S.S., Houde, E.D., Mangel, M., Pauly, D., Plagányi, É., Sainsbury, K., and Steneck, R.S. 2012. Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs. Lenfest Ocean Program. Washington, DC. 108 pp.

² See attached three-tiered precautionary approach to the management of forage fish developed by the Lenfest Forage Fish Task Force.

range of regulatory options, and voted to prepare an FMP amendment to the CPS FMP with the objective of managing krill in a way that protected it from any developing fisheries throughout the West Coast EEZ. Following preparation of an Environmental Assessment and public review, the Council and NMFS made a final decision in 2006 with interest in

*preserving key trophic relationships between fished and unfished elements of the food web in order to maintain the integrity of the ecosystem and to minimize the risk of irreversible adverse impacts on managed fish stocks and other living marine resources from adverse impacts.*³

At this time, several Council members wondered why the focus was only on krill, as there are many other important and unmanaged forage species that should also be protected in a similar fashion. This fact was not lost on many people and hence, for the same reasons the krill prohibition was put in place, there has been a growing call over the past few years to identify and protect all of the unmanaged forage species in the California Current ecosystem.

Other examples of forage fish protection

In 1998 the NPFMC amended the Bering Sea/ Aleutian Islands and Gulf of Alaska Groundfish FMPs to prohibit directed fishing for forage fish.⁴ The action created a forage fish category in both FMPs, including nine taxonomic groups: the families *Osmeridae* (eulachon, capelin, and other smelts), *Myctophidae* (lanternfishes), *Bathylagidae* (deep-sea smelts), *Ammodytidae* (Pacific sand lance), *Trichodontidae* (Pacific sandfish), *Pholidae* (gunnels), *Stichaeidae* (pricklebacks, warbonnets, eelblennys, cockscombs and shannys), *Gonostomatidae* (bristlemouths, lightfishes, and anglemouths), and the Order *Euphausiacea* (krill). As stated in the Federal Register notice implementing this action:

*The intended effect of this action is to prevent the development of a commercial directed fishery for forage fish, which are a critical food source for many marine mammal, seabird, and fish species. This action is necessary to conserve and manage the forage fish resource off Alaska and to further the goals and objectives of the FMPs.*⁵

The NPFMC then built on this action in 2009 to protect all forage species from commercial fishing as part of its Arctic Fishery Management Plan. The Arctic FMP states:

*Commercial fishing on forage fish species is prohibited in the Arctic Management Area. Forage fish are prey for other marine ecosystem fauna including fish, birds, and marine mammals. Forage fish species other than the target species are included in the “Ecosystem Component Species” category.*⁶

³ PFMC 2008. Management of Krill as an Essential Component of the California Current Ecosystem. Amendment 12 to the Coastal Pelagic Species Fishery Management Plan. Environmental Assessment. February 2008, at page 1.

⁴ Amendment 36 to the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Amendment 39 to the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMPs).

⁵ Federal Register, Vol. 63, No. 51, Tuesday, March 17, 1998, page 13,009.

⁶ NPFMC. August 2009. Arctic FMP at 17.

In 2010 the NPFMC moved all forage fish to the Ecosystem Component species category and retained the prohibition on directed harvest for these species.⁷

A growing global aquaculture industry

As your Ecosystem Plan Development Team has emphasized, global finfish and shrimp aquaculture are increasing faster than any other food sector, and this industry is dependent on feeds derived from wild-caught forage fish (i.e., lower trophic level species). As stated in the PFMC Draft Ecosystem Plan:

Demand for LTL [lower trophic level] 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). The production of many aquaculture species depends on LTL 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 LTL species for pen fattening aquaculture operations (Zertuche-Gonzales et al. 2008)... Given limited potential for increased fishmeal production from traditional LTL species prices for fishmeal and fish oil will continue to rise (Figure A5). This makes the prospect for fisheries developing on the minor LTL species all that more attractive, as higher fishmeal prices are sure to translate into higher exvessel prices for the raw ingredients.⁸

It is only a matter of time before the ever-increasing demand for fish meal and fish oil from the rapidly growing global aquaculture industry increases the price of these raw materials, hence making any species from which these products can be extracted economically viable, even if they do not appear viable today. We can only postulate whether this will be next year or decades from now. Already, we are aware of international efforts to develop fisheries for some of the same forage species that are currently unmanaged off the U.S. West Coast (e.g., myctophids, saury, etc.). Prohibiting forage fish fisheries from developing before they start is much easier politically and economically than closing fisheries after capital investments are made. Such a prohibition also provides clarity to parties interested in potentially developing such fisheries. Therefore, no species should be excluded from a list of species for which fisheries could potentially develop.

Adopt a clear objective

Given the extensive work by the Council and its advisory bodies to date, we feel strongly that at this meeting, the PFMC must clearly articulate its intent to protect currently unmanaged forage species from new fisheries. While doing so does not lock the Council into any 'final action' a clear objective or statement of intent is necessary to guide development of the analyses and

⁷ NPFMC. 2010. 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. Environmental Assessment. September 2010

⁸ PFMC Agenda Item H.2.a Attachment 1. November 2011. Draft Fishery Ecosystem Plan, page 32.

process needed to get the Council and the agency to a final action. We recommend that the Council adopt the following objective:

In order to protect the critical ecological role of forage species in the California Current Ecosystem, and their role as prey for other managed fisheries, the Council intends to prohibit the directed commercial harvest of currently unmanaged forage species.

Furthermore, we continue to be supportive of an ‘unless and until’ clause that would allow for future fisheries where there is sufficient information to demonstrate that any such fishing for these forage species could be conducted without harming the health of the marine ecosystem, impact dependent predators, or economically impact other fisheries whose target species rely on these forage species. Any such fishery must of course, have all required status determination criteria and highly conservative catch limits like the three tiered approach outlined by the Lenfest Forage Fish Task Force (attached).

Adopt and initiate a clear path forward through an FMP amendment

There is an obvious reason why the NPFMC and the PFMC chose to protect forage fish/ krill through Fishery Management Plan amendments. This is the only clear course of action that gives the Councils direct management and regulatory authority for these species. The species must be in an FMP either as species that are ‘in the fishery’ or as ‘ecosystem component’ with management measures for the Council and NMFS to have the ability to manage and protect them. If a forage species is not in an FMP, the Council simply does not have authority to manage or protect them from directed harvest.

Ideally, as many have suggested in the past, the Council would add the currently unmanaged species into an Ecosystem FMP with regulatory authority. However, since the Council chose not to pursue this path in June 2011, there is not currently an Ecosystem FMP in which to add these species. Therefore, the Council would need to establish an Ecosystem FMP with regulatory authority. We continue to believe that ultimately such an Ecosystem FMP is warranted and eventually would be the appropriate FMP from which to promulgate regulations to protect forage species. However, this should not prevent the protection of forage species now through an amendment to one of the Council’s four existing FMPs.

The PFMC has set the precedent of protecting a key forage group - krill - in the Coastal Pelagic Species FMP. One of the stated goals of the CPS FMP is to “[p]rovide adequate forage for dependent species” (CPS FMP Section 1.6, Goals and Objectives) and this goal is unique to this FMP. What is more, in June 2011 the PFMC passed a motion on the development of the Fishery Ecosystem Plan that stated that “additional management measures for forage fish species, if any, would be considered through the Coastal Pelagic Species FMP, as the Council deems appropriate.”⁹

Given the goal of the CPS FMP, the Council’s previous motion, and the need to have clear management authority for these forage species, we support amending the CPS FMP to add currently unmanaged forage species with the expressed intent of prohibiting directed commercial

⁹ PFMC. June 2011 Voting Log. Council Motion #20

harvest for them. When the Council does adopt an Ecosystem FMP with regulatory authority, we will support moving forage species management into this FMP.

Regarding the question of whether these unfished forage species would be management unit species or Ecosystem Component species (as defined in the National Standard One guidelines), we would be open to either approach, but we suggest that establishing them as EC species with a prohibition on directed commercial catch would allow the Council to achieve the desired objectives while minimizing the staff burden associated with adding new species to the Council's jurisdiction. In addition, we would hope that any such regulations or authority would not conflict with or supersede management currently in place by state fishery managers.

Amending the 'list of allowable fisheries' would not adequately protect forage fish

The National Marine Fisheries Service list of authorized fisheries does not provide a viable option to restricting the development of new fisheries targeting forage species. This list of authorized fisheries is compiled and managed pursuant to Section 305(a) of the Magnuson-Stevens Fishery Conservation and Management Act ("Magnuson Act"). Section 305 states that within 180 days of the publication of the authorized fisheries list, "no person or vessel may employ fishing gear or engage in a fishery not included on such list without giving 90 days advance written notice to the appropriate Council."¹⁰

Hence this provision does not prohibit participation in unlisted fisheries or use of new gear. It only requires that a person give notice and allow the Council and NMFS an opportunity to approve the new fishery or gear use before engaging in it. If an applicant has given proper notice of his or her intent to use a new gear or fish in an unlisted fishery, and the Council or NMFS does not act within the 90-day waiting period, the applicant may go ahead and use the new gear or participate in the new fishery.¹¹ In other words, absent some affirmative action by the Council and NMFS, the default assumption is that the new fishery or gear use may proceed.

The PFMC expressly rejected this approach in 2004 when considering management alternatives for krill. We similarly believe that the list would not be an effective mechanism for implementing a prohibition on new fisheries for forage species because, among other reasons, there is no explicit process for removing fisheries from the list, and it is not clear that the Council could do so in absence of an FMP amendment prohibiting that fishery. Furthermore, even if the list were amended in a way that clearly removed new forage species from the realm of authorized fisheries, further regulatory action would likely be needed to implement the prohibition. If the fishery is simply removed from the list but the prohibition is not enacted in regulation, an interested party need only give the Council and NMFS notice and wait 90 days before engaging in that new fishery. The Council would then have to amend the relevant FMP in order to make the ban permanent and prevent further attempts at opening the new fishery. Therefore, amending the list of fisheries without adding forage species to an FMP simply would not adequately accomplish the objective of prohibiting the directed harvest of currently unmanaged forage species.

¹⁰ 16 U.S.C. § 1855(a)(3).

¹¹ 64 Fed. Reg. 4030, 4033 (Jan. 27, 1999) ("Unless specifically prohibited by rulemaking, the individual who has served notice may use a gear in an existing fishery or may participate in a new fishery after the 90-day waiting period.")

Working list of currently unmanaged forage species

There have been several efforts to compile lists of important forage species of the California Current ecosystem. These include the list identified in the partial Draft Environmental Assessment for Amendment 13 to the CPS FMP,¹² forage species already protected by the North Pacific Fishery Management Council,¹³ the list Oceana provided to the Council at its November 2011 meeting, the list submitted by the Pew Environment Group to the Council at the September 2011 meeting, and the list in the Council's November 2011 draft Fishery Ecosystem Plan.¹⁴ Also relevant are several key data sources including: a NOAA Tech Memo elucidating diet guilds,¹⁵ California Current ecosystem models,¹⁶ and specific diet studies on seabirds, marine mammals, and key fish species. At this June meeting the Council certainly does not need come up with the definitive list of currently unmanaged forage species as such details will be worked out during the FMP amendment process, but doing so could offer additional guidance to help further the analyses and process.

Based on the lists and analysis already prepared by the EPDT and others, we support analysis of the following species/ groups, which are not currently managed in any PFMC federal FMP and are not currently the target of any commercial fisheries off the West Coast. The Council may also wish to remove shortbelly rockfish (*Sebastes jordani*) from the groundfish FMP and include it with this forage fish category, consistent with recent Council actions preventing directed fishing on this key forage species.

¹² PFMC 2010. Amendment 13 to the CPS FMP, Partial Draft EA. Agenda Item F.2.a, Attachment 1. June 2010, at 17.

¹³ NMFS 1998. Final Environmental Assessment and Regulatory Impact Review for Amendment 36 to the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Amendment 39 to the Fishery Management Plan for Groundfish of the Gulf of Alaska to Create and Manage a Forage Fish Species Category. National Marine Fisheries Service, Juneau, Alaska. 1998.

¹⁴ PFMC. November 2011. Pacific Coast Draft Fishery Ecosystem Plan. Agenda Item H.2.a Attachment 1, at 29.

¹⁵ Dufault, A.M., K. Marshall, and I.C. Kaplan. 2009. A synthesis of diets and trophic overlap of marine species in the California Current. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-103, 81 p.

¹⁶ Field, J.C., Francis, R.C., and Aydin, K. 2006. Top-down modeling and bottom-up dynamics: Linking a fisheries-based ecosystem model with climate hypotheses in the Northern California Current. *Progress in Oceanography* 68:238-270. AND, for example: Samhouri, J.F., Levin, P.S., and Harvey, C.J. 2009. Quantitative Evaluation of Marine Ecosystem Indicator Performance Using Food Web Models. *Ecosystems* 12:1283-1298. AND Horne, P.J., I.C. Kaplan, K.N. Marshall, P.S. Levin, C.J. Harvey, A.J. Hermann, and E.A. Fulton. 2010. Design and parameterization of a spatially explicit ecosystem model of the central California Current. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-104, 140 p.

Table. Suggested unmanaged forage species for analysis.

Round and thread herrings	<i>Etrumeus teres</i> and <i>Opisthonema libertate</i>
American shad	<i>Alosa sapidissima</i>
Mesopelagic fishes	Myctophidae, Bathylagidae, Paralepididae, Gonosomatidae; 100s of species in California Current
Pacific sandlance	<i>Ammodytes hexapterus</i>
Pacific saury	<i>Cololabis saira</i>
Silversides	Atherinospsidae; includes grunion, jacksmelt, topsmelt, perhaps 3-5 other rare spp.
Osmerid smelts	Osmeridae; includes eulachon, capelin, surf smelt, whitebait smelt, night smelt and other species
Pacific tomcod	<i>Microgadus proximus</i>
Small croakers	(<i>Sciaenidae</i>) e.g. white croaker and queenfish (excluding white sea bass and corbina)
Pelagic squids	boreal clubhook squid, <i>Onychoteuthis borealijaponica</i> , neon flying squid, <i>Ommastrephes bartramii</i>
Pricklebacks	Stichaeidae
Gunnels	Pholididae
Kelpfish	Clinidae
Sculpins	Cottidae
Surfperches	Embiotocidae
Midshipman	<i>Porichthys</i> spp.
Pacific anchoveta	<i>Centengraulis mysticetus</i>

Ultimately, while there has been ongoing discussion about ecosystem-based management within the Council process, this action would be a tangible step to an ecosystem approach to fisheries. This action would not adversely affect any existing stakeholder and much of the background work has already been completed. Given the threats to these forage species identified by the Ecosystem Plan Development Team, preemptive action is warranted now to protect the food supply for existing Council-managed species and other important predators in the California Current. We hope you will move this issue forward on the path indicated by the June 2011 Council motion by initiating this proposed CPS FMP amendment at the June 2012 Council meeting and adopting a clear objective. We appreciate your time and focus on this important matter.

Sincerely,








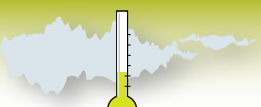





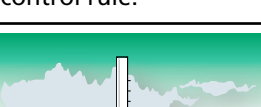
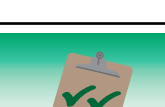
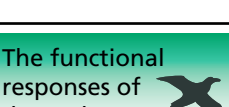

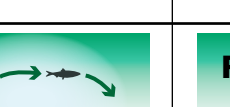


Ben Enticknap
 Pacific Project Manager, Oceana

Enclosure: pages from Lenfest Forage Fish Task Force, little fish BIG IMPACT (Pikitch et al. 2012).

A three-tiered precautionary approach to the management of forage fish developed by the Lenfest Forage Fish Task Force

(See Chapters 6 and 7 in the report for additional details)

INFORMATION TIER <i>Based on information needed to project fisheries impacts on forage fish and on the predators that feed on them.</i>	KNOWLEDGE OF . . . Forage fish stock dynamics and fisheries			Status, trends, dependencies of predators			RECOMMENDED MANAGEMENT ACTION
	Population status, trends	Environmental drivers	Monitoring, enforcement	Identification of dependent predators	Status of predators	Foraging patterns	
LOW	 Limited information on abundance, status, and trends such that there is little certainty about stock status, in particular as to whether the stock is above minimum biomass levels.	 Environmental drivers have not been examined sufficiently to enable precise predictions of forage fish production dynamics.	 Fishery monitoring and enforcement is not sufficient to ascertain whether catches are within specified limits.	 Dependent predators have not been identified on the basis of empirical evidence from the relevant ecosystem.	 Insufficient evidence to judge the status and trends of predators either known or likely to be dependent upon forage fish.	 Spatial patterns of foraging are not known.	RECOMMENDED MANAGEMENT ACTION <ul style="list-style-type: none"> No new fisheries should be allowed to operate. Severely restrict existing forage fisheries so that depletion from fisheries is no more than 20% of unfished population (B_0). Implement precautionary spatial closures to protect against localized depletion of forage fish, and to protect potential foraging areas of land-based predators. Initiate data gathering to reach intermediate tier.
INTER-MEDIATE	 Population abundance, status, and trends are monitored, so that catch control rules are likely to result in population levels within specified biological limits.	 Putative environmental drivers of forage fish productivity are identified, providing some ability to predict production dynamics and account for them in the harvest control rule.	 There is some monitoring and enforcement of fisheries so that catches are likely to be within specified limits.	 Dependent predators have been identified so that effects of forage fish on their abundance can be predicted on the basis of food web models or the PREP equation.	 Population status and trends of dependent predators are monitored but with considerable uncertainty.	 Spatial patterns of foraging are known and sufficient to support predictions about the effects of localized depletion.	RECOMMENDED MANAGEMENT ACTION <ul style="list-style-type: none"> Apply the "Predator Response to Exploitation of Prey" (PREP) equation, or use data or models specific to the ecosystem, to assess the impacts of forage fish depletion on dependent species (using 95% confidence interval). Apply a "hockey stick" harvest control rule with minimum biomass (B_{LIM}) $\geq 40\% B_0$ and fishing (F) not to exceed 50% of the natural mortality rate or 50% of the level that achieves MSY (F_{MSY}). Increase B_{LIM} and decrease F when the ecosystem contains highly dependent predators or when precision of diet dependencies is low. Use spatial management to protect predators likely to be adversely affected by localized depletion.
HIGH	 Population abundance, status, and trends are known sufficiently precisely and with sufficient lead time to adjust fishing levels according to a harvest control rule, resulting in a high likelihood of achieving management goals.	 Environmental drivers of forage fish productivity are well known and are accounted for in the harvest control rule.	 High ability to monitor and enforce fisheries regulations at-sea and/or dockside so that catches are highly likely to be within specified limits.	 The functional responses of dependent predators to forage fish abundance are well defined based on empirical evidence so that effects of fishing can be determined with a high degree of certainty. Models reflect what is known from the field and are tested and modified with new information.	 The population status and trends of dependent predators are measured with high certainty and at frequent intervals.	 Localized forage fish requirements of dependent predators can be estimated with high precision, so that effects of localized depletion on dependent predators are well described.	RECOMMENDED MANAGEMENT ACTION <ul style="list-style-type: none"> The harvest strategy must include an upper limit to F and a lower limit below which targeted fishing ceases (B_{LIM}), and F should be reduced as B_{LIM} approached. The harvest strategy must include precautionary buffers that account for limits on the ability to predict fisheries and food web dynamics. The harvest strategy must—by independent, realistic, quantitative testing—be shown to achieve the Dependent Predator Performance Criterion, protect the forage fish stock from impaired reproduction, and allow it to recover through periods of natural fluctuation in productivity. In any case, lower biomass limits should not be less than 30% B_0, and the maximum fishing rate should not exceed 75% F_{MSY} or 75% of natural mortality. Apply spatial management to account for localized depletion effects on spatially constrained predators.



May 31, 2012

Mr. Dan Wolford
 Pacific Fishery Management Council, Chair
 7700 NE Ambassador Place, Suite 101
 Portland, OR 97220-1384

RE: Protect Currently Unmanaged Forage Species (Agenda Item G.1)

Dear Chairman Wolford and Council Members:

We the below signed 6,431 residents of California, Idaho, Oregon, and Washington are writing to support the protection of forage species--the foundation of the marine food web. Healthy and abundant populations of forage species like smelts and sand lance are critical to the sustainability of wild fish, marine mammals, and seabirds, and the recovery of key fish populations like Chinook salmon, yelloweye rockfish, sablefish, and white seabass.

Specifically, we urge the Pacific Fishery Management Council to prevent the development of new fisheries for forage fish, and at its June meeting initiate a process to amend the Council's Fishery Management Plans to protect forage fish and ensure we have a healthy ocean food web.

Most forage fish catch is not consumed directly as human food, but is sold to global aquaculture and agriculture markets where these fish are turned into fishmeal and feed. With the rapidly increasing demand for fishmeal and fish feeds to support the growing global aquaculture industry, there will be increasing commercial pressures to develop and expand fisheries for forage fish. Yet we know forage fish are actually worth more in the ocean, where they can fulfill their crucial ecological role as prey for whales, seabirds and other fish, than when they are harvested directly. Importantly, when populations of forage fish decline, the predators that depend on them also decline.

Healthy fisheries and oceans depend on vibrant and diverse populations of forage species. These small schooling fish and invertebrates are clearly the foundation for the ocean food web and ought to be protected for both their ecological and economic importance. We strongly urge your leadership to ensure we have abundant and healthy populations of forage species. Please take the precautionary and proactive action of preventing the development of new fisheries for forage fish.

Sincerely,

First Name	Last Name	City	State	Zip Code	First Name	Last Name	City	State	Zip Code	First Name	Last Name	City	State	Zip Code
Caroline	Ferguson	Stanford	CA	94305	Geraldine	Atos	Malibu	CA	90265	Dyana	King	San Francisco	CA	94107
Eileen	Karzen	Los Angeles	CA	90064	Rachel	Clarkeroberts	Riverbank	CA	95367	E	Carrico	Los Angeles	CA	90029
Sean	Curtice	San Diego	CA	92109	Lani	Hink	Vineburg	CA	95487	Vicki	Prince	Ukiah	CA	95482
Melanie	Gonzalez	West Covina	CA	91792	Deborah	Mott	Pasadena	CA	91104	Daniel	Btuno	La Jolla	CA	92037
Tracey	Tomtene	Vancouver	CA	90210	Ron	Sermenza	San Jose	CA	95119	Kelly	Christoffersen	Long Beach	CA	90808
Gwen	Huus-Henriksen	San Rafael	CA	94901	Scott	Smith	Oakland	CA	94609	Jay	Brewer	Westlake Village	CA	91362
Deborah	Sanchez	Hayward	CA	94544	Dana	Linder	San Jose	CA	95123	Nadeen	Nissley	Sherman Oaks	CA	91403
Rev. Edward	Salm	Los Angeles	CA	90026	Andrea	Bonnett	Altadena	CA	91001	Jamie	Weber	Anaheim	CA	92807
Ann	Gilbert	Los Angeles	CA	90025	Lynda	Johnson	Glendale	CA	91207	Courtney	Leblanc	Sacramento	CA	95818
Karen	Miller	Crestline	CA	92325	Emma	Pangelinan	South Pasadena	CA	91030	flynn	coleman	berkeley	CA	94709
Christine		El Cajon	CA	92020	DVM	Sharon Sprouse	San Diego	CA	92129	Stacey	McDonald	Thousand Oaks	CA	91361
Chaitanya	Diwadkar	Hayward	CA	94545	DE and RM	Salmon	Vallejo	CA	94590	Alexis Wray	Negele Miller	Santa Monica	CA	90404
Laura	Richman	Fountain Valley	CA	92708	Arthur	Alenik	Capistrano	CA	92624	Gabriel	Sheets	Merced	CA	95341
Lacey	Kammerer	Fresno	CA	93720			Beach			Eric	Ward	Encinitas	CA	92024
Jennifer	Niles	Moorpark	CA	93021	Dorian	Sarris	San Francisco	CA	94111	Noah	Youngelson	Venice	CA	90291
Irma	Guevara	Huntington Beach	CA	92648	Barbara	Boros	Santa Barbara	CA	93105	Aurea	Walker	Los Angeles	CA	90004
					Debbie	Gardinier	Santa Ana	CA	92704	john	fabris	Orinda	CA	94563
Kristen	Olafson	Sierra Madre	CA	91024	Brenda	Larson	Oakland	CA	94609	Teresa	Haller	Orangevale	CA	95662
Janet	Maker	Los Angeles	CA	90024	Kim	Stribling	Scotts valley	CA	95066	Ray	Bustos	Fullerton	CA	92832
Claudia	Wornum	Oakland	CA	94605	Joanna	Ramos	Los Angeles	CA	90029	Susan	Goldberg	Glendale	CA	91202
Jackie	Thompson	Shingle Springs	CA	95682	Lael	Jackson	Del Mar	CA	92014	Barnali	Ghosh	Berkeley	CA	94709
Ginette	Bariteau	San Diego	CA	92102	Ilona	Bray	Oakland	CA	94618	Sheedy	Dehdashti	Del mar	CA	92014
Sondra	Hunter	cazadero	CA	95421	Donna	Miller	N. Hollywood	CA	91605	Mary	Gorman	Fremont	CA	94536
Sharon	Heath	Los Angeles	CA	90048	Marshall	Brengle	Campbell	CA	95008	Elyse	Ashton	West Hollywood	CA	90069
Chris	Ashton	San Diego	CA	92119	Shelly	LaPointe	Carlsbad	CA	92009	Heather	Clough	ventura	CA	93003
Tom	Sanchez	Los Angeles	CA	90031	Mary	Learn	niagara falls	CA	90215	Marcia	Winchester	bonsall	CA	92003
Shannon	Hickey	Davis	CA	95616	Thomas	Hamcock	Los Angeles	CA	90068	Elizabeth	Grainger	Claremont	CA	91711

Thomas Nass Pioneer CA 95666	LI Jiang Redondo Beach CA 90278	Julie Whalen Martinez CA 94553	
Carrie Staton Santa Cruz CA 95060	e Grass Valley CA 95945	Lisa Schloss Los Angeles CA 90039	
Samantha Steinel Long Beach CA 90802	Kurt Breuning Irvine CA 92614	Alex Los Angeles CA 92637	
Angie Williams QUINCY CA 95971	Lee santa cruz CA 95060	Michael MacLafferty Berkeley CA 94703	
william cull CA 95428	Thomas Wargo La Honda CA 94020	Casey Bodden Citrus Heights CA 95610	
Ann-Marie Murphy San Francisco CA 94122	Anthony Burton Sylmar CA 91342	william stout montrose CA 91020	
Angela Jones novato CA 94947	Helen Pitton Cambria CA 93428	Heather Gamberg San Francisco CA 94117	
Angela Sirmenis Northridge CA 91325	Maret Ekner Nynashamm CA 93433	Melinda McBride Topanga CA 90290	
Greg Boreham La Canada CA 91011	Lark Levine Malibu CA 90265	Linda Law Carmel Valley CA 93924	
Carolyn Lilly San Diego CA 92120	Stephen Johnson San Diego CA 92117	Amanda G. Woodland CA 95695	
Andy Carman Santa Cruz CA 95060	Irene Kane Oakland CA 94602	Bruce Morgan Riverside CA 92504	
Isaac Blacksin San Francisco CA 94121	Joseph Hardin santa monica CA 90405	Marietta Hayes CA 91436	
Luke Asbury San CA 93003	richard ramirez fullerton CA 92831	Guy Cargulia san diego CA 92128	
	Kelsey Baker Novato CA 94945	Robert Anger Santa Monica CA 90403	
Janine Stokes Buenaventura RIVERSIDE CA 92507	Jamie Rosenblood los angeles CA 90049	David Carter Eureka CA 95501	
Shannon McDiarmid San Francisco CA 94117	Paula Hawkins San Diego CA 92104	Natalie Kovacs San Clemente CA 92673	
Reza Karkouti carlsbad CA 92009	Richard DeSantis Palm Desert CA 92260	Mary Riblett Culver City CA 90230	
Loren Abbey Roseville CA 95661	catherine eastman Echo Park CA 90026	Katherine Buttling San Marcos CA 92069	
Paul Vesper Berkeley CA 94703	Eileen Francisco SAN MATEO CA 94401	Dollie Spinks Concord CA 94520	
J Gurdin San Francisco CA 94122	Tracey Link Solana Beach CA 92075	Kevin Slauson alameda CA 94501	
coopier reaves berkeley CA 94707	Anthony Arata San Mateo CA 94401	April Lancaster La Habra CA 90631	
Astrid Giese-Zimmer Berkeley CA 94705	Patrick Kelly Glendora CA 91741	Gabriella Forrester Orange CA 92869	
Markie Price Los Angeles CA 90069	Debbie Deb Mountain View CA 94040	Karina upland campbell Rocklin CA 95765	
Elizabeth Jackson Elk Grove CA 95624	Pat Melody upland CA 91784	Linda Whitley San Mateo CA 94403	
Tracey Kleber Los Angeles CA 90049	Reza Azarmi San Jose CA 95112	Carol sangster malibu CA 90265	
Dennis Allen San Barbara CA 93105	Amanda G Woodland CA 95695	Brenda Hattisburg Oakland CA 94621	
Daniel Herbst San Mateo CA 94401	Nena Price Glendale CA 91203	Gayle Hawes Fresno CA 93702	
Joanne Avilla Benicia CA 94510	Jennifer Toth Santa Clarita CA 91350	Barbara King Los Angeles CA 90029	
Lisa Lynch Elk Grove CA 95757	Dendy Seaton Long Beach CA 90814	Margaret Davies Dana Point CA 92629	
Michael Rienstra Santa Cruz CA 95060	Heather Marie Redondo Beach CA 90277	Samuel Mills Grass Valley CA 95945	
Michael Terry Santa Monica CA 90402	Jennifer Martinez San Jose CA 95139	Pamela Kafton Sherman Oaks CA 91423	
Sandra Huerta hayward CA 94541	Alberta Mayo Sierra Madre CA 91024	Jeanne Arthur Topanga CA 90290	
Matthew Valenti San Francisco CA 94121	Jerry Oliver Sylmar CA 91342	Steven Felsovanyi Pescadero CA 94060	
Janet Ball Saratoga CA 95070	Rosy Morales rancho palos verdes CA 90275	Rob Cherwink Sonoma CA 95476	
Lisa Fredsti Venice CA 90291		Edith Ogella Santa Barbara CA 93111	
Pat Blackwell-Castro Valley CA 94552	Christina Power Sonoma CA 95476	Julie Svendsen Burbank CA 91505	
	Michael Dimattia Encino CA 91316	Julia MacPete San Diego CA 92104	
Marilyn Levine mountain view CA 94040	Carl Cartwright Whittier CA 90605	Eric Steffen Richmond CA 94804	
Hideka Tokai West Los Angeles CA 90025	Cheryle Steele Whittier CA 90604	Nancy Charles Santa Monica CA 90404	
	Rick Morales rancho palos verdes CA 90275	K Krupinski LA CA 90042	
Francesca Twohy-Haines Chino Hills CA 91709		Heather Rhine Tiburon CA 94920	
James Provenzano Los Angeles CA 90049	Suzanne Chun Berkeley CA 94710	R.M. Carreon Burbank CA 91505	
Alice Kelly Felton CA 95018	Gail Jarocki Richmond CA 94805	Aleta Wallach Santa Monica CA 90402	
Colleen Floyd San Diego CA 92120	Barbara Lowden Cypress CA 90630	Tim Oben Dublin CA 94568	
Jeffrey DiLallo La Mesa CA 91942	Melissa Kelley Oceanside CA 92054	Carol Changus La Jolla CA 92037	
Jack Preston Marshall Barstow CA 92311	Paul Jarocki Richmond CA 94805	Bayard Kessler Woodland Hills CA 91364	
Sara Beauchene Santa Cruz CA 95062	William Scott Santa Rosa CA 95404	Jonathan Chu Fremont CA 94539	
Greg Branam Thousand Oaks CA 91362	Evan Shamoon Los Angeles CA 90038	John Gasperoni berkeley CA 94703	
John Griesgraber Finley CA 95435	Cara Martin Los Angeles CA 90036	Teresa Arieta Mission Viejo CA 92691	
Sandra Fox fallbrook CA 92028	Roxanne Rankin Rancho CA 91739	Nino Petroni Hercules CA 94547	
Dana Lauritsen San Jose CA 95120		Kim Bacon San Diego CA 92123	
MP Crosson El Dorado Hills CA 95762	Joan Kramer Los Angeles CA 90026	Andrea Wolf Saint Helena CA 94574	
Karen C Venice CA 90291	Susaan Aram Laguna Beach CA 92651	Blaise Brockman Arcadia CA 91007	
Karen Knowles Walnut Creek CA 94597	j davis San Francisco CA 94102	BrendaLee Riley Long Beach CA 90802	
Pamela Scott Boulder Creek CA 95006	Patricia Baker Laguna Hills CA 92653	Donna Lewis Van Nuys CA 91401	
KATIE HANSON Eureka CA 95501	Michele Vinz Oceanside CA 92058	Sally Abrams san francisco CA 94110	
Michael Stewart Elk Grove CA 95624	William Messenger Los Angeles CA 90005	Roger Harrell Hermosa Beach CA 90254	
Henry Weinberg Santa Barbara CA 93110	Kenyon Donohew Oceanside CA 92056	Terri Eddings Burbank CA 91506	
Barbara Walker Escondido CA 92026	Melanie Henderson Los Angeles CA 90036	Pat Tierney Los Angeles CA 90077	
Nadereh Ovanessoff La Jolla CA 92037	Amanda Felt Covina CA 91722	Alice May Sonoma CA 95476	
Sarah Lehrer-Graiwler Los Angeles CA 90027	Scott Doyle San Luis Obispo CA 93401	Beatrice Sylves Moreno Valley CA 92557	
Sandi Taylor San Diego CA 92104	Ki Longfellow Ross CA 94957	MC Hagerty Carlsbad CA 92013	
Leslie Nieves Hayward CA 94544	Joel West Hollywood CA 90048	Joyce Johnson Burbank CA 91505	
Carmen Wyland Encinitas CA 92024	elizabeth saveri pasadena CA 91104	Chris PrinZ San Gabriel CA 91775	
April Ewasky Long Beach CA 90809	Carol Saulsbury Rio Dell CA 95562	Gerald Shaia Sun Valley CA 91352	
Kate Cassidy London CA 91910	wendy King Santa Cruz CA 95060	Megan Garrett Sacramento CA 95835	
Teresa Mims Murrieta CA 92563	Carol Anna Lind San Francisco CA 94117	Ann Lynette mayo san clemente CA 92672	
David Everett Poway CA 92064	Anitha Kankar Woodland Hills CA 91367	Reidun Carstens LA CA 90077	
Sylvia Marie sebastopol CA 95473	Alison Litton Los Angeles CA 90004	Eleanor Cuevas Sonoma CA 95476	
Ronald Partridge Simi Valley CA 93063	Deborah Giordano Castro Valley CA 94552	Thomas Giles Laguna Beach CA 92651	
Colleen Kandus Temecula CA 92591	Kathleen Presser Panorama City CA 91402	Laura Brink San Diego CA 92104	
Marita Mayer san anselmo CA 94960	Bascom Guffin Davis CA 95616	Kristen Weiss Oak Park CA 91377	
Susan San Clemente CA 92673	S Steuer San Francisco CA 94110	Georgia Kahn Novato CA 94947	
Cecil Davis Santa Rosa CA 95405	Lena Francis Sebastopol CA 95472	Katherine Cronin San Francisco CA 94131	
Cynthia Leeder San Jose CA 95124	John Black La Habra CA 90631	Linda Tabb North Hills CA 91343	
Catherine Curtis Santa Monica CA 90402		Kristen Haynie Woodland CA 95695	
Shari Long Sherman Oaks CA 91423	Elizabeth Ayala San Mateo CA 94402	Jennifer Dunham Chino CA 91710	
Tristan Daily Santa Ynez CA 93460	Angelina Bray Venice CA 90291	Monika Grant Mission Viejo CA 92691	
Lance Lew Mission Viejo CA 92691	Miguel Godinez Los Angeles CA 90049	William Los Angeles CA 90065	
Jeff Edeker studio city CA 91604	Lori Rawlins larkspur CA 94977	Paul Tujunga CA 91042	
Ian Cannon San Francisco CA 94132	Renee Kochevar San Jose CA 95132	Jose Medina Citrus Heights CA 95610	
Rod Macdermott Gridley CA 95948	Jamila Garrecht Petaluma CA 94952	Todd Irvine CA 92612	
Laura Laura Fullerton CA 92833	Josephine Polifroni Danville CA 94526	Lanier SAN CA 94159	
Anthony Montapert ventura CA 93004	Abigail Zoline Santa Cruz CA 95060		FRANCISCO Vallejo CA 94591
Chelsey DiPasquale-Hunton Monterey CA 93940	Neil Resico San Lorenzo CA 94580	Hera Donaldo Pope Valley CA 94567	
	Kim King Nevada City CA 95959	Holly Dowling santa monica CA 90404	
Michelle Maing Los Angeles CA 90024	Torah Alabidi RIVERSIDE CA 92507	Vicky Tsoi santa monica CA 90404	
MaryHelen Horeftis San Diego CA 92120	Margie Middleton San Diego CA 92123	Marisa Herrera Chula Vista CA 91911	
Lonna Richmond muir beach CA 94965	Betty and Michelozzi Aptos CA 95003	Ann Carr Watsonville CA 95076	
Judith Dupree Pine Valley CA 91962		Bridgette Garcia Laguna Beach CA 92651	
Anita Kreaeger Chula Vista CA 91910	Johanna kovacs Upper lake CA 95485	Daniel Nakaji San Diego CA 92122	
Mishel Fletcher San Diego CA 92117	Marcia Terry los angeles CA 90041	Marcia Dale-LeWInter Sab Francisco CA 94115	
Michael Mitsuda Fremont CA 94555	Dale Blecher Calistoga CA 94515	J Angell Rescue CA 95672	
Cara O'Neill Calistoga CA 94515	Prisca Gloor los angeles CA 90066	Gerald Alexander Windsor CA 95492	

Carmen Kluczor Sunnyvale CA 94086	Cindy Belleau Forestville CA 95436	Dorcas Edge OCEANSIDE CA 92057
Robert Davis San Diego CA 92116	Robyn Zelmanovitz Culver City CA 90230	Kristina Fukuda-Schmid Culver City CA 90230
mary and Proctor fremont CA 94537	L Shilo Rcho Sta Marg CA 92688	Gudiel SUR SEINE CA 93380
Grady Tabitha Bakersfield CA 93305	Sudesh Prasad Oakland CA 94612	chris travers el cajon CA 92020
Brenda Jaime San Jose CA 95136	Barbara McGarvey Roseville CA 95747	Paige Nielsen westlake village CA 91361
Fran Watson Spring Valley CA 91977	Sylvia Drake Camarillo CA 93012	Michelle Oroz San Jose CA 95125
Julie Shaw Sebastopol CA 95472	Rhonda Kess Burbank CA 91506	Gregory Sandoval Bakersfield CA 93309
Lindsay Muggleston Berkeley CA 94705	Naoko Kimberley San Diego CA 92196	Eric Bratcher Hayward CA 95444
Richard Luke Los Altos Hills CA 94024	Jacque Forbess Tracy CA 95304	helen mcallister, phd clearlake oaks CA 94523
Jeff Gallegos San Francisco CA 94117	Carolyne Matini san diego CA 92124	sandra williams simi valley CA 93065
Kimberly Richard Napa CA 94558	Corinne Cather Sacramento CA 95820	and Lang sun valley CA 91352
Geirge Stockton CA 95205	Lisa Coffman Los Osos CA 93402	Kiilani Ocean Encinitas CA 92024
Sandra Schachter Carmel Valley CA 93924	Matthew Reola San Clemente CA 92672	Sophia Savich The Sea Ranch CA 95497
Michael Misquez Pico Rivera CA 90660	Maria D'Orsogna santa monica CA 90405	Robert Lee Rolling Hills CA 90274
Nicole Amato Vacaville CA 95688	Elza Angulo El Cajon CA 92021	Richard Kilfoyle Davis CA 95616
Catherine Kamas Westminster CA 92683	Elizabeth Alguire Middle Sackville CA 90210	Elizabeth Ramsey Davis CA 95616
Nancy Garca Hacienda CA 91745	Alicia Moore Berkeley CA 94710	Blakeley Kim San Francisco CA 94122
Ellen Sennewald Heights CA 94530	Judith Whitcomb Menlo Park CA 94026	Mark Maisonneuve Pasadena CA 91104
Frances Emanuel El Cerrito CA 94530	Dusti Hutchings Palmdale CA 93550	Rachel Longville San Diego CA 92115
Kim Emanuel Simi Valley CA 93063	Pam Nelson warner springs CA 92086	Alida Montanez-Salas Long Beach CA 90815
Jessica Hill Carlsbad CA 92013	Rachel L Schultz San Francisco CA 94134	Nancy Heck Santa Maria CA 93454
felicia Peters Hermosa Beach CA 90254	Laura Nardoza San Francisco CA 94121	Roger Levin San Francisco CA 94110
Jon Porter Petaluma CA 94954	Barbara Lapidus Petaluma CA 94954	Alison Peper Los Angeles CA 90069
Tim Bentley Rossmoor CA 90720	Philip Ohst Oakland CA 94608	Kelly Keane garden grove CA 92840
Nancy Watts Los Angeles CA 90022	Carol Blaney El Portal CA 95318	Wendy Aversano Newport Beach CA 92657
Deborah Walker San Luis Obispo CA 93401	Lynn Pavlik Laguna Niguel CA 92677	Martha Diaz Redondo Beach CA 90277
Lela Nishizaki Concord CA 94518	Bruce Grobman Santa Cruz CA 95062	Mark Feldman Santa Rosa CA 95401
Todd Hack Dixon CA 95620	David Comfort Santa Rosa CA 95404	Linda Ferland Ventura CA 93001
Jerry Mckee San Diego CA 92131	Scott Taylor santa maria CA 93458	Francesca Massarotto West Covina CA 91790
Kit Joel La Mesa CA 91942	Cassandra Taylor Porterville CA 93257	Donna Khoury FILLMORE CA 93015
Marie Ribatto santa barbara CA 93103	Blair Miller San Diego CA 92127	ROY Valencia CA 91355
Frank Seewester Palm Desert CA 92260	Camile Getter Sacramento CA 95819	Gloria Aguirre Castaic CA 91384
Shanae Martinez Fairfield CA 94533	Teri Jasman Berkeley CA 94705	Cindy Parker Sanat Monica CA 90405
Susan Maletsky Sacramento CA 95829	Paul and family San Diego CA 92110	Gertrude Gebin Daly City CA 94015
Margo Tenold Cupertino CA 95014	Joanna Gilbert Grass Valley CA 95949	Bruce Pettibone Carlsbad CA 92008
Abigail Cruz Rancho Santa Fe CA 92067	Janice Lisalda Los Angeles CA 90071	Nandine Hatvany Mill Valley CA 94942
Cathy Ziska Carlsbad CA 92011	Antal Kalik Redondo Bch. CA 90278	Jason Kapchinske San Diego CA 92154
Kevin Wang Turlock CA 95382	Susan enson Calexico CA 92232	Robert Carr Monterey Park CA 91754
Lisa Burke Escondido CA 92025	Bruce Jenkins Sunnyvale CA 94087	Leslie Rabb los angeles CA 90069
Wendy Derner Sacramento CA 95842	Daniella Culbert Sacramento CA 95826	Benita Cohen Los Angeles CA 90034
Linda Klein El Segundo CA 90245	Mike McNickle Joshua Tree CA 92252	Megan Ferry Anaheim CA 92805
David Wallen Santa Monica CA 90405	Armando Garcia Paramount CA 90723	Harvey Weinberg Ventura CA 93001
Robert Johnson El Segundo CA 90245	SiriSant Khalsa Chico CA 95973	Nicolette van Sluis Venice CA 90291
Breanna Bennett Torrance CA 90503	Nancy Burke Thousand Oaks CA 91360	Lucy Peixoto Los Angeles CA 90028
Melissa Bryn Half Moon Bay CA 94019	Timothy DeLorey Yucca Valley CA 92284	Steve Colton Glendale CA 91206
Dominique Ryba Vista CA 92083	Lauren Wood Los Angeles CA 90046	P Smith Playa del Rey CA 90293
Sharon Reynolds Napa CA 94558	Robert deFerrante la canada CA 91011	Andrea Bustos-Mason Trinidad CA 95570
SHARON DYSON fremont CA 94555	John Essman Healdsburg CA 95448	Jane August Topanga CA 90290
william sickmiller lodi CA 95240	Meghan Tracy Long Beach CA 90808	Susan Wishner Nipomo CA 93444
Adene Katzenmeyer weed CA 96094	Amy Purpura la CA 90026	Steven Fitzgerald Oakland CA 94610
Pauline Roche Oceanside CA 92054	Jeff Anderson santa rosa CA 95403	Esther Molina Salinas CA 93912
Meaghen Kidd Palo Alto CA 94303	Linda Dragavon San Francisco CA 94114	Maggie Harding San Francisco CA 94127
Ross Wilming San Francisco CA 94117	Susan Bittner Eureka CA 95503	Mary Boudreaux San Bruno CA 94066
Noah Grossman Santa Monica CA 90402	Vivian Penniman La Quinta CA 92253	daniel payne San Francisco CA 94109
Richard McCombs Big Bear City CA 92314	Virginia Collins San Leandro CA 94577	Donnal Poppe Northridge CA 91325
Raquel Baldocchi San Francisco CA 94123	Kyva Holman oakland CA 94606	SUE KREMER CARDIFF CA 92007
Diana Johnson Murrieta CA 92563	Andreas Wittenstein Woodacre CA 94973	Alexis Chacon sacramento CA 95814
wayne camardo san diego CA 92105	Ron Tragni Antioch CA 94509	Margaret Spak menlo Park CA 94025
Ulrike Silkey San Francisco CA 94117	RG Tuomi Thousand Oaks CA 91362	Marion Barry Loomis CA 95650
Reggie Melonson Culver City CA 90230	Megan Franklin Brea CA 92821	Laura Cuellar Alhambra CA 91801
Jeanne Greene Chico CA 95928	Peri Beller Oakland CA 94608	Dee gee north Hollywood CA 91601
Mary Savoia San Diego CA 92109	Ursela Rabe penn valley CA 95946	Kenneth Ubsdell Oakland CA 94611
Ray Anderson San Diego CA 92109	Diane Barbera Sonoma CA 95476	Sunday Leopard Rosamond CA 93560
Sharma Gaponoff Reedley CA 93654	danielle De Costanzo Corte Madera CA 94976	Natalie Audage Davis CA 95618
Anita Marlin Grass Valley CA 95949	Tasha Boucher Los Angeles CA 90066	Steven Shuler San Diego CA 92115
sandy diaz Belmont CA 94002	Russell Fletcher Ventura CA 93003	Aya I Venice CA 90291
Marisa Strange Long Beach CA 92311	Robert Slavik San Diego CA 92120	Ashley Hall Nevada City CA 95959
Alexios Kotsilinis Irvine CA 90803	Andy Sekara San Francisco CA 94112	Kx Bx Lancaster CA 93535
Dency Nelson Hermosa Beach CA 92620	Wendy Bauer San Francisco CA 94112	Jamie Pratt San Diego CA 92109
Linda Smith Hermosa Beach CA 90254	Deborah Lee Chill Burbank CA 91506	Lauren Parrott Laguna Niguel CA 92677
Ronald Peterson Carmel CA 93921	Lori Fedele Sun City CA 92586	Joanne Feldman Malibu CA 90265
Maureen Vanderbosch Stockton CA 95207	Kimberly kehl Canyon Country CA 91386	Peter Kaplan Los Angeles CA 90027
Amy Pierre Laguna Niguel CA 92677	Amir PIERREFITTE CA 93380	Matt Bachelder Kenwood CA 95452
Margaret Raynor Oakland CA 94609	Sherri Whittenburg SUR SEINE CA 94509	Arna Schutz West Hills CA 91307
Isabel ramirez Galt CA 95632	Barbara Fason Antioch CA 94509	Lisa Wayne Pacifica CA 94044
Eric Meyers Panorama City CA 91402	David Fears Campbell CA 95008	JoanSitnick Encino CA 91436
Howard Marcovitch canoga park CA 91306	David Fears Solana Beach CA 92075	Diane Carson-Huff Azusa CA 91702
Sally Berman Santa Clarita CA 91350	san diego CA 92126	Charlene Jones San Bernardino CA 92407
Danielle VALERIE San Jose CA 95126	Gilda Tafreshi San Diego CA 92115	Greta Montville San Francisco CA 94131
Carmen BUONO LOS ANGELES CA 90046	Priscilla Borquez Emeryville CA 94608	Robert Rector Encinitas CA 92023
aMANDA Buono San Jose CA 95123	Lloyd Canfil San Diego CA 92104	Cristina Novelo Veracruz CA 91910
Shirley Whalen santa maria CA 93458	elin clare tujunga CA 91042	Joseph Sellner Union City CA 94587
Barbara blairsdn CA 96103	Ronda Carter Beverly Hills CA 90210	Asali Johnson Cupertino CA 95014
angela Caton Avila Beach CA 93424	David Carico San Francisco CA 94102	Crystal Kim Pasadena CA 91107
Jason parent Long Beach CA 90802	Sara Graham Weed CA 96094	Susan Lilly Winnetka CA 91306
Eli Cantu Morro Bay CA 93442	bob Hucaipa CA 92399	Carol Rigrud Encino CA 91316
Ted Sentman Los Angeles CA 90039	Jennifer stonebraker n.yulls CA 91343	Shea Craver San Jose CA 95132
Loraine Wells Newport Beach CA 92660	Andrew Reyes Tipton CA 93272	David Harris Ventura CA 93001
Dixie Parson Fresno CA 93727	Mark Campbell San Francisco CA 94118	tina chang Hollywood CA 90028
Keith Fulton CA 95439	Mark Deakins Oceanside CA 92054	christine laporte Guerneville CA 95446
Jean Merritt Fulton CA 95439	Adam Bowers Los Angeles CA 90068	Anita Wucinic-Turner San Diego CA 92115
Deborah Taylor Valley Village CA 91607	Maria Vasquez Los angeles CA 90023	Kenneth Miller Topanga CA 90290
Isabella floridia CA 96014	Isabella floridia CA 96014	Kathleen Russler San Jose CA 95111

Mr. Dan Wolford

May 31, 2012

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Terry	Parkhurst	Seattle	WA	98115	Marilyn		Bothell	WA	98011	Stephen	Ekholm	Bainbridge	WA	98110	
Janet	Needler	Bellingham	WA	98225	Rebecca	Farvour	Kelso	WA	98626	Jennifer	Liu	Island	Seattle	WA	98104
Cory	McQuerry	Yakima	WA	98902	Patricia	Woods	Kent	WA	98032	K	Long	Sequim	WA	98382	
Chelsea	Belfield	Sedro-Woolley	WA	98225	Eileen and	Lamar	Lacey	WA	98516	John	Rowlette	Hoquiam	WA	98550	
Rand	Guthrie	SNohomish	WA	98290	Frank					Sue	Pfeiffer-Johnson	Seattle	WA	98107	
Susan	Bechtholt	Port Orchard	WA	98367	Angela	Kerr	Spokane	WA	99203	Wendy	James	Bellingham	WA	98229	
susan	schneider	Blaine	WA	98230	catherine	keys	gig harbor	WA	98329	Philip	Donlay	Lopez Island	WA	98261	
Connie	Northern	Bothell	WA	98011	Carole	Miller	Vancouver	WA	98661	Danya	Jablon	mercier island	WA	98040	
Jean	Allredge	Silverdale	WA	98383	Janice	Marshall	lacey	WA	98503	J	Chu	Wilson Creek	WA	98860	
Susan	Michaels	camano island	WA	98282	Ingrid	Erickson	Bellingham	WA	98226	Barbara	Rosenkotter	Deer Harbor	WA	98243	
Kelly	Whysong	Des Moines	WA	98198	Jane	Millard	Mill Creek	WA	98012	Stephanie	Erickson	Yakima	WA	98908	
Tika	Bordelon	Seattle	WA	98101	Karen	Pelletreau	Kingston	WA	98346	Ari	Kohn	Seattle	WA	98145	
Samantha	Novak	Bellevue	WA	98004	Cheryl	McAtee	Vancouver	WA	98682	Jeriann	Schriner	Olympia	WA	98502	
Dan	Schneider	Seattle	WA	98115	Brenda	Tate	Bellingham	WA	98226	Barbara	Bate	Ocean Park	WA	98640	
Laura	Huddlestone	Seattle	WA	98106	anne	hepfer	Seattle	WA	98112	Summer	Kozisek	Bonney Lake	WA	98391	
Sue	Harrington	Gig Harbor	WA	98332	Dorian	Bowen	Seattle	WA	98144	Maria	Kjaerulff	Gig Harbor	WA	98335	
Rebecca	Cook	Friday Harbor	WA	98250	Laurette	Culbert	Seattle	WA	98107	Rhona	Schwartz	Seattle	WA	98119	
dorothy	Powter	Shelton, WA	WA	98584	Patrice	Davis	Sequim	WA	98382	Taiya	Boni	Bremerton	WA	98312	
James	Cooke	Kennewick	WA	99337	Danny	Thorn	Kirkland	WA	98033	Bryna	Sweeney	Bellingham	WA	98226	
Lesley	Ahmed	Seattle	WA	98107	Jetta	Hurst	Auburn	WA	98001	Kelly		longview	WA	98632	
Veronica		Camas	WA	98607	Jennifer	Liu	Seattle	WA	98104	Jacque	Hoffman	Springdale	WA	99173	
Donna	Beckley	Issaquah	WA	98029	Stephen	klein	McKenna	WA	98558	Shannon	Jackson	Lopez Island	WA	98261	
Lisa	Taylor	Olympia	WA	98501	Joseph	and Diane	Lacey	WA	98503	Linda		Kenmore	WA	98028	
Dmitry	Erastov	Seattle	WA	98109	Sharmayne	Busher	VANCOUVER	WA	98662						
Lynn	Ziegler	Poulsbo	WA	98370	Deidre	Puffer	Tacoma	WA	98445						



California Wetfish Producers Association

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Mr. Dan Wolford, Chair
And Members of the Pacific Fishery Management Council
7700 NE Ambassador Place #200
Portland OR 97220-1384

May 31, 2012

RE: Agenda Item G.1.c: Recommendations regarding Unmanaged Forage Species

Dear Mr. Wolford and Council members,

The California Wetfish Producers Association (CWPA) represents the majority of coastal pelagic species 'wetfish' fishermen and processors in California. We have followed closely the mounting pressure from certain groups within the environmental community to develop an explicit management policy for 'forage' species in the California Current (i.e. restrict harvest), beginning with those stocks that are currently unfished and therefore unmanaged. The same groups are pushing the California Fish and Game Commission to adopt a similar policy to restrict fisheries before they start.

In light of the importance of these issues, the challenges posed to the CPS FMP and management team, and potentially to CPS fisheries in the future, we again asked Dr. Richard Parrish to review the issues, with particular reference to the EPDT work in Appendix A of the Council's Fishery Ecosystem Plan (FEP), and to help us develop a forage policy for California. The same general framework is appropriate to propose to the Council because virtually all the species range throughout the California Current Ecosystem, or may in the future due to climate change.

Before highlighting key recommendations, I want to **reiterate our opposition to placing this laundry list of unfished stocks in the CPS FMP**, as the species in question do not appear in our wetfish fisheries. This also reflects earlier statements of the CPS advisory subpanel and management team. As we and the CPS advisory bodies have recommended before, these species properly belong in the Ecosystem FMP (FEP).

It is important to understand that including these unfished stocks in the FEP in no way implies that they are more or less important than any other element of the forage pool. The FEP is simply an efficient place to track these stocks.

Earlier we recommended and supported the Council's initial action, approving the FEP as advisory, with no regulatory authority. However, we would be willing to reconsider and could support an Ecosystem Plan with limited regulatory authority, explicitly limited to provide flexibility for the Council and NMFS to regulate the prescribed list of unfished stocks, following guidelines similar to those proposed by Dr. Parrish, if no other control mechanism is available.

I am attaching for reference Dr. Parrish's forage species management concept, as well as his statement on the recently released Lenfest Forage Fish Task Force report, "Little Fish, Big Impact", and will summarize here some key facts and recommendations.

Re: Purpose and Need, we offer the following thoughts:

The current trend and mandate in both federal and CA state fishery management are to consider management decisions in a broader, ecosystem-based, "big picture" context. As we recommended earlier, considerable attention should be focused on developing valid estimates of the meso-pelagic, bathy-pelagic and neritic fish populations, including decadal temporal variability.

Excerpt from our 2011 letter pertaining to the FEP:

- Identify and attempt to measure or estimate ALL the major components of the forage pool (not only CPS and krill) and provide research impetus and mechanisms to monitor and evaluate trends in the unfished and juvenile stocks, i.e. y.o.y. rockfish, 0-2 year hake, shortbelly rockfish, copepods and many other forage species, as well as those that are targeted by fisheries (and specifically, CPS fisheries).
- Re: scope, the Council's management authority in the California Current Ecosystem does not extend into Canada and Mexico, nor does it include state waters; however most of the forage species in the CCLME extend into those areas, thus the FEP should make a substantial effort to obtain and integrate data from those areas into ecosystem models. Examples of such transboundary issues include but are not limited to Pacific sardine and hake biomass estimates, and the network of MPAs established in nearshore state waters in California etc.

Stocks under current FMPs are best managed through the regulatory framework in existing FMPs. However, including currently unfished stocks under the Ecosystem Plan with expressly limited regulatory authority could provide the impetus to develop a more accurate estimate of biomass of the total forage pool, which will ultimately improve ecosystem-based management of all species.

The September 2010 EPDT document (H.1.b) contained a statement that encapsulates our perspective on EBM:

Ecosystem approaches to management are still about societal choice among competing objectives (Shepherd 2004). Fundamentally, ecosystem-based fishery management recognizes that fisheries both affect and are affected by the marine environment, and that what we do to address these effects via policy-making is a matter of societal choice. The purpose of the ecosystem approach is not to prescribe particular policy choices, but rather to promote better understanding of those policy choices. Ecosystem-based fishery management is meant to compliment current single-species approaches to fisheries management by providing additional information that may be used to expand the scope of these approaches into the future. Finally, ecosystem-based fishery management does not create additional mandates to protect the marine environment, but instead seeks to better understand fishery effects on the marine environment through improved information on ecosystem structure, processes and functions.

Existing laws provide authority to address most future fishery development that might emerge (and at \$4+/gallon fuel, expansion is highly unlikely!). It is critically important to acknowledge that fishery management in the CCE is recognized as one of the most precautionary in the world, with minimal impacts to the ecosystem. The latest independent study to validate this statement is the Lenfest "Little Fish, Big Impact" report.

Please also keep in mind the finding of the EPDT (reference Appendix A, FEP, PFMC October 2011): "...there is not a high level of unmanaged standing biomass for LTL species that could become subject to fisheries targeting over the short term and which are critical to large scale CCE functioning, energy flow or integrity."

Now for highlights of Dr. Parrish's forage fish recommendations:

Dr. Parrish divided forage species into three functional groups:

Forage species include:

[1] California Current forage species with annual commercial landings managed under fishery management plans or other active management programs,
[2] California Current forage species not under active management that have zero to moderate annual landings, and
[3] small pelagic species with centers of abundance and fisheries in tropical, subtropical and oceanic regions outside of U.S. territorial waters that have large international landings but little or no commercial importance [in California landings].

- [1] California Current species managed or monitored under state or federal fishery management plans, or are actively managed by other means, include: northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), Pacific herring (*Clupea pallasii*), market squid (*Doryteuthis opalescens*), krill (Euphausiidae), Pacific sanddab (*Citharichthys sordidus*) Pacific hake (*Merluccius productus*), and *shortbelly rockfish (Sebastes jordani)*.
- [2] California Current forage species that have zero to moderate commercial landings [in California], and are not actively managed, include: American shad (*Alosa sapidissima*), threadfin shad (*Dorosoma petenense*), mesopelagic fishes (Bathylagidae, Gonostomatidae, Melanostomiidae, Myctophidae, Paralepididae, Phosichthyidae, Scopelarchidae, Sternoptychidae and Stomiidae), argentines (Argentinidae), true smelts (Osmeridae), atherinid smelts (Atherinidae), speckled sanddab (*Citharichthys stigmaeus*), longfin sanddab (*Citharichthys xanthostigma*), Pacific tomcod (*Microgadus proximus*), medusafish (*Icichthys lockingtoni*), seniorita (*Oxyjulis californica*), white croaker (*Seripus politus*), yellowfin croaker (*Umbrina roncadore*) and pelagic squids (boreal clubhook squid, neon flying squid).

This enlarged group includes presently unexploited mid-water, benthic and littoral forage fishes that are among the top 50 abundant species in Table 4 of CalCOFI Atlas 34.

- [3] Small pelagic species that have their center of abundance outside of U.S. Territorial Waters, and little or no landings [in California], include: Northeastern Pacific population of round herring (*Etrumeus teres*), Pacific thread herring (*Opisthonema libertate*), Pacific saury (*Cololabis saira*), and Pacific anchoveta (*Centengraulis mysticetus*).
- * *Pacific eulachon Southern DPS is listed as threatened under the ESA*

Groups [2] and [3] are considered for potential inclusion in the FEP.

Policy recommendations:

- For species not included in a fishery management plan or other active management program but subject to a new or expanding fishery, the PFMC shall encourage the development of ecosystem-based management methodology and sustainable management.
- For the California Current forage species listed in [2], the Council shall not allow the total landings of this group of species to exceed the historical annual landings of the group until a Fishery Management Plan that considers forage needs and other ecosystem considerations is in place, with the exception below:

The Council supports and may allow limited experimental fisheries to obtain critical essential fisheries information necessary to develop a sustainable fishery management program for a specified forage species. Proposed fisheries should provide a research plan for a prescribed period for approval by the Council, subject to annual progress reports.

- For forage species with their centers of abundance outside of U.S. Territorial Waters, listed in [3] above, the Council shall not allow catch limits or catch rates beyond 1% of those attained in the International fishery during the period 2000-2009 until stock abundance estimates and/or data collection programs are in place, supporting development of Fishery Management Plans for such species.
- To the extent that data are available, the Council shall consider the forage needs of predators when making management recommendations and decisions regarding fisheries targeting forage species that are not already included in a fishery management plan. If insufficient information exists or the condition of the resource is poor, a conservative approach to fisheries management will be taken.

The Council supports and encourages collection of the best readily available information on:

- The population levels of specified forage species and their predators;
- The preferred diet of those predators;
- The status of other [fished or unfished] forage species that serve as similar prey items;
- The effects of fishing on these forage species on such predators, i.e. the effectiveness of existing regulations, including marine protected areas and fishing gear regulations, to provide adequate forage for ecosystem services.

Additional research and data needs:

- Advanced ecosystem modeling to better understand the forage needs of predators and the effects of fishing on forage species on trophic dynamics;
- Synthesis of diet composition studies for California Current predators
- Stock assessments to determine more accurately the status and trends of forage species, including unfished species, and their relative importance in the broader forage pool;
- The effects of oceanographic conditions on forage species' cycles of abundance, including the dynamics of decadal or long-term oceanic cycles, that affect populations of forage species, including those forage species subject to a fishery.

It is the policy of the Council to utilize the best available science, including the information collected above, in its management decisions.

Thanks very much for considering these comments.

Best regards,



Diane Pleschner-Steele
Executive Director.

Attachments: Discussion Draft 5/31/12; Forage Species Policy Adapted for Submission to PFMC,
By Richard Parrish, Ph.D
Little Fish Big Impact Editorial By Richard Parrish, PhD

DISCUSSION DRAFT: May 31, 2012
Forage Species Policy Adapted for Submission to PFMC

Part 1: Importance and Definition

Forage species are those lower trophic level species that contribute significantly to the diets of larger fish, seabirds, marine mammals, and/or sea turtles during some part of their life history, thus, transferring energy and nutrients from plankton to larger predators.

Forage species are an integral part of the California Current Large Marine Ecosystem and are of great environmental, economic, aesthetic, recreational, educational, scientific, nutritional, social, and historic importance to people.

Some forage species in the California Current are currently managed by multiple state and federal agencies; therefore coordination with other agencies is essential to an ecosystem-based approach to forage species management.

Forage species include: [1] California Current forage species with annual commercial landings managed under fishery management plans or other active management programs, [2] California Current forage species not under active management that have zero to moderate annual landings, and [3] small pelagic species with centers of abundance and fisheries in tropical, subtropical and oceanic regions outside of U.S. territorial waters that have large international landings but little or no commercial importance in landings.

1. California Current species managed under state or federal fishery management plans, or are actively managed, include: northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), Pacific herring (*Clupea pallasii*), market squid (*Doryteuthis opalescens*), krill (Euphausiidae), Pacific sanddab (*Citharichthys sordidus*) Pacific hake (*Merluccius productus*), and *shortbelly rockfish (Sebastes jordani)*.
2. California Current forage species that have zero to moderate commercial landings [in California], and are not actively managed, include: American shad (*Alosa sapidissima*), threadfin shad (*Dorosoma petenense*), mesopelagic fishes (Bathylagidae, Gonostomatidae, Melanostomiidae, Myctophidae, Paralepididae, Phosichthyidae, Scopelarchidae, Sternoptychidae and Stomiidae), argentines (Argentinidae), true smelts (Osmeridae), atherinid smelts (Atherinidae), speckled sanddab (*Citharichthys stigmaeus*), longfin sanddab (*Citharichthys xanthostigma*), Pacific tomcod (*Microgadus proximus*), medusafish (*Icichthys lockingtoni*), seniorita (*Oxyjulis californica*), white croaker (*Seripus politus*), yellowfin croaker (*Umbrina roncadora*) and pelagic squids (boreal clubhook squid, neon flying squid).

This enlarged group includes presently unexploited mid-water, benthic and littoral forage fishes that are among the top 50 abundant species in Table 4 of CalCOFI Atlas 34.

3. Small pelagic species that have their center of abundance outside of U.S. Territorial Waters, and little or no landings [in California], include: Northeastern Pacific population of round herring (*Etrumeus teres*), Pacific thread herring (*Opisthonema libertate*), Pacific saury (*Cololabis saira*), and Pacific anchoveta (*Centengraulis mysticetus*).

* *Pacific eulachon Southern DPS* is listed as threatened under the ESA

Part 2: Policy for Existing Fisheries for Forage Species

The PFMC recognizes forage species as important to the health and functioning of the California Current ecosystem, valuable in their own right and because they support populations of predators higher on the food web, of both consumptive and non-consumptive importance.

Regarding existing fisheries currently managed under state or federal FMPs or other active management, it is the policy of the PFMC to:

- Maintain healthy populations of forage species in order to help assure the integrity of the ecosystem and habitats upon which marine resources depend.
- Integrate with and complement relevant provisions of the California Current Fishery Ecosystem Plan (FEP) now being developed by the Pacific Fishery Management Council and other state and federal FMPs, so that overall, catch limits and other management measures consider the ecological benefits that forage species provide to the broader ecosystem and balance sustainable ecological services with sustainable fishing communities..
- Consider both recreational and commercial fishing interests as well as a range of other economic sectors such as tourism in achieving balance among ecological, economic and social values.

Part 3: New or Expanding Fisheries for Forage Species

Better science is needed to support new or allow expansion of an emerging fishery, including forage species listed under [2] and [3] above.

With regard to new or emerging fisheries, it is the policy of the PFMC that:

- For species not included in a fishery management plan or other active management program but subject to a new or expanding fishery, the PFMC shall encourage the development of ecosystem-based management methodology and sustainable management.
- For the California Current forage species listed in [2], the Council shall not allow the total landings of this group of species to exceed the historical annual landings of the group until a Fishery Management Plan that considers forage needs and other ecosystem considerations is in place, with the exception below..
- The Council supports and may allow limited experimental fisheries to obtain critical essential fisheries information necessary to develop a sustainable fishery management program for a specified forage species. Proposed fisheries should provide a research plan for a prescribed period for approval by the Council, subject to annual progress reports.
- For forage species with their centers of abundance outside of U.S. Territorial Waters, listed in [3] above, the Council shall not allow catch limits or catch rates beyond 1% of those attained in the International fishery during the period 2000-2009 until stock abundance estimates and/or data collection programs are in place, supporting development of Fishery Management Plans for such species.
- To the extent that data are available, the Council shall consider the forage needs of key predators when making management recommendations and decisions regarding fisheries targeting forage species that are not already included in a fishery management plan. If insufficient information exists or the condition of the resource is poor, a conservative approach to fisheries management will be taken.

Part 4: Scientific Needs related to Forage Species

The Council supports and encourages collection of the best readily available information on:

- The population levels of specified forage species and their predators;
- The preferred diet of those predators;
- The status of other [fished or unfished] forage species that serve as similar prey items;
- The effects of fishing on these forage species on such predators, i.e. the effectiveness of existing regulations, including marine protected areas and fishing gear regulations, to provide adequate forage for ecosystem services.

The Council recognizes the existing scientific efforts on forage species and supports the following additional types of scientific endeavor in partnership with other agencies, academic scientists and institutions, conservation interests and industry to improve management of forage species:

- Ecosystem modeling to better understand the forage needs of predators and the effects of fishing on forage species on trophic dynamics;
- Synthesis of diet composition studies for California Current predators
- Stock assessments to determine more accurately the status and trends of forage species, including unfished species, and their relative importance in the broader forage pool;
- The effects of oceanographic conditions on forage species' cycles of abundance, including the dynamics of decadal or long-term oceanic cycles, that affect populations of forage species, including those forage species subject to a fishery.

It is the policy of the Council to utilize the best available science, including the information collected above, in its management decisions.

Little Fish Big Impact Editorial By Richard Parrish, PhD

Publication of a scientific analysis of the biological production and fishery landings of forage fishes in 72 of the world's ecosystems has contributed to an international debate on fisheries for species like sardine, herring and anchovy. The authors of Little Fish Big Impact show that forage species in many marine ecosystems are being harvested at rates that leave only a small percentage of their annual production for the other fishes, birds and marine mammals that rely on them for food. The most productive ecosystem in the study, Sechura Bay Peru, produces about 246 tons of forage fishes per square mile per year; the fishery for forage fishes takes 97% of this production, leaving only 3% for other species. Chesapeake Bay is another example of the problem: this ecosystem produces about 60 tons of forage fishes per square mile and the fishery takes 81% of the production.

The authors of "Little Fish.." recommend that fisheries for forage fishes should not exceed half of the rate that produces maximum sustained yield. The central Chile ecosystem is a good example of the type of management recommended. The study shows that this ecosystem produces about 100 tons of forage fishes per square mile; however, in Chile the fishery harvests only 40% of the production, leaving 60% for the other species.

So how does the California Current rate in the study? The Northern California Current ecosystem is the second most productive ecosystem for forage species in the study; forage fish production is estimated at 163 tons per square mile with landings of 3 tons per square mile. **In the California Current only 2% of the annual production of forage fishes is taken by fishermen and 98% of the production goes to the other fishes, birds and marine mammals.**

Yes, the world's oceans are in trouble and fisheries for forage fishes are a large part of the problem; however, hopefully the facts and the information available where only the scientists go (Appendix E of Little Fish Big Impact) will not be ignored. The fact that many of the world's forage fishes are being overfished is valid. **However, according to the information in the study, the present management of forage species in the California Current is far more conservative than the standards that are being recommended for the rest of the world.** Increasing our forage fish landings by 50% would result in only 3% of the production going to humans. In Chesapeake Bay 81% is going to humans.

Locally, Oceana has spent more than a year 'debunking' the sardine management rule that reduced catches by a factor of three in coldwater periods. Now there is a 'new' study that predicts that the sardine is going to collapse due to cold water. After trashing the regulation that would automatically reduce catches in cold-water years, Oceana now cries 'sardine collapse'. The 'new' study is a hydro-acoustic survey, where a boat runs about counting fish with a fish finder. This type of survey can produce moderately accurate population assessments; however, a fish finder cannot determine a sardine's reproductive success, it cannot measure how many sardines will be out there two years from now, and it is surely the wrong instrument to predict next year's sea temperatures. Oceana also does not mention that the newest sardine population assessment shows that the population increased, after the 'new' study predicted collapse.

Richard Parrish, PhD is retired from the National Marine Fisheries Service, Pacific Marine Environmental Laboratory



Washington Wildlife Federation

May 31, 2012

RE: Forage Fish issue
Pacific Fishery Management Council

Donald McIsaac, Executive Director PFMC
7700 N.E Ambassador Place, Suite 101
Portland, OR 97220

Dear Chairman Wolford and Council Members,

The Washington Wildlife Federation has a long history of bringing together conservation-minded hunters, fishers and outdoor enthusiasts to advocate for state and federal policies that ensure healthy fish and wildlife populations for future generations. We believe a balanced and healthy marine ecosystem benefits all of us who live in the Pacific Northwest, and that is why we are writing to urge the Council to extend protection to non-managed forage species as soon as possible.

An abundance of forage fish forms the cornerstone of marine food webs, transferring energy from plankton and delivering it in the form of protein to iconic species such as salmon, as well as seabirds and marine mammals. A new global report from the Lenfest Forage Fish Task Force calculated that forage is worth twice as much in the water as it is in the net solely because of the commercial value added to bigger fish like salmon, tuna and cod. This is a conservative estimate, since it does not account for the value of recreational fishing or eco-tourism activities such as birding and whale-watching.

The Lenfest report recommends that when we have little or no information about a forage species, we should refrain from plunging ahead with a new fishery.

The Council's own draft Fishery Ecosystem Plan notes that the market is likely to become more attractive for lower-trophic-level species that aren't currently being fished due to the spectacular growth of the global aquaculture industry. Our own state prioritized the ecological value of prey fish when it adopted a Forage Fish Management Plan in 1998 that manages forage primarily for their value to the ecosystem with catch considered only on a

secondary basis. The Council would be wise to act now because, once a new fishery emerges, it will have a built-in incentive to maximize the harvest.

We commend the Council for taking up this important discussion, and ask that you act decisively to protect non-managed forage species by incorporating them into an existing fishery management plan.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Ronni McGlenn". The signature is fluid and cursive, with the first name "Ronni" being more prominent than the last name "McGlenn".

Ronni McGlenn, President
Board of Directors
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