Agenda Item E.1
Situation Summary
March 2014

CURRENT HABITAT ISSUES

The Habitat Committee (HC) will meet on Friday, March 7, 2014, to discuss groundfish essential fish habitat, the Integrated Ecosystem Assessment report, California drought and salmon issues, the Pacific Marine Estuarine Fish Habitat Partnership, and other issues.

At the November Council meeting, the HC proposed writing a letter on habitat concerns related to KZO Sea Farms. The letter is attached (Agenda Item E.1.a, Attachment 1). Although the KZO Sea Farms project has moved forward quickly since the November Council meeting, and the California Coastal Commission's comment period has passed, the HC believes that the letter provides useful information to the California Coastal Commission and U.S. Army Corps of Engineers.

In addition, the Habitat Committee received a Council request for background information on the Pacific Marine Estuarine Fish Habitat Partnership. Some background information is attached (Agenda Item E.1.a, Attachment 2) and further information will be provided in the HC report.

Council Action:

Consider comments and recommendations developed by the HC.

Reference Materials:

1. Agenda Item E.1.a, Attachment 1: Letter on KZO Sea Farms.
2. Agenda Item E.1.a, Attachment 2: Background information on Pacific Marine Estuarine Fish Habitat Partnership.
3. Agenda Item E.1.b, Supplemental HC Report.
4. Agenda Item E.1.d, Public Comment.

Agenda Order:

a. Agenda Item Overview — Jennifer Gilden
b. Report of the Habitat Committee — Joel Kawahara
c. Reports and Comments of Advisory Bodies and Management Entities
d. Public Comment
e. **Council Action:** Consider Habitat Committee Recommendations

PFMC
2/13/14

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March XX, 2014

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Dear Mr. Lester and Dr. Swenson,

Please accept the comments below from the Pacific Fishery Management Council regarding potential aquaculture/mariculture projects. Although the KZO Sea Farms Mariculture Project comment period has passed, we see this project as a template to inform you of our concerns regarding aquaculture and mariculture projects in general. The Council's meeting schedule does not always allow us to comment during your comment periods.

As you may know, the Council is one of eight Regional Fishery Management Councils established by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976, and recommends management actions for Federal fisheries off Washington, Oregon, and California.

The MSA includes provisions to identify, conserve, and enhance essential fish habitat (EFH) for species managed under a Council fishery management plan. The MSA requires the Council to identify and describe EFH and recommends designating "habitat areas of particular concern" (HAPC) for its managed species. EFH is the habitat necessary for every life stage of Federally-managed species, which is designated using the best available scientific information; HAPCs are considered high priority areas for conservation, management, or research because they are rare, sensitive, stressed by development, or important to ecosystem function. Each Council is authorized under the MSA to comment on any Federal or state activity that may affect the habitat, including EFH, of a fishery resource under its authority.

The Council is concerned that the KZO Sea Farms project has the potential to alter marine habitat in the vicinity of the sea farm. For example, moored shellfish farms have been shown to reduce current speeds; currents within sea farm structures can be as little as 25 percent of the outside flow (Stevens et al. 2008). The project also has the potential to alter circulation patterns and disrupt stratification in and around the project.

Specific Essential Fish Habitat Concerns

The Council is concerned with aspects of the KZO Sea Farms project that may affect EFH for some of its managed species. The project is proposed as a 100-acre shellfish mariculture farm to be located approximately 8.5 miles offshore of Long Beach, California near the Edith Platform. As proposed, the project configuration would include 45 lines measuring 500 feet in length, spaced 100 feet apart, anchored on both ends at depths of 110 and 150 feet and hovering approximately 20 to 30 feet below the surface. Anchors will be weighted and embedded in the seafloor. The lines will support 60 lantern nets used to grow Pacific oysters (*Crassostrea gigas*) and Mediterranean mussels (*Mytilus galloprovinciallis*) on 1,800 feet of looped fuzzy rope that is supported by the lines. This large-scale web-like configuration has the potential for attracting and entangling several forms of wild marine life, and displacing other uses of the area.

An analysis of the potential impacts of project design should occur prior to project designation and buildout for any mariculture project. Further, all proposed projects should provide data on the seasonal abundance and known breeding and feeding areas used by Federally-managed species, as well as the location of designated EFH Conservation Areas in the vicinity of the project. Adverse impacts to these special EFH areas should be avoided to the greatest extent practicable. The Council is aware that the KZO Sea Farms project proponents consulted the National Marine Fisheries Service on EFH for this project, and urges such consultations for any future similar projects.

Monitoring

In its Coastal Consistency Determination, the California Coastal Commission has noted that a well-developed monitoring plan is a necessary component of any mariculture project. Since the project is a relatively new ocean use in the California Current Ecosystem, the Council strongly agrees with this assessment. The Council recommends a robust monitoring plan that begins with the collection of baseline information on existing ocean conditions, species abundance, and seafloor characteristics at both the proposed project site and a comparable control site not affected by the project or influenced by the project's footprint. In addition, the monitoring plan should include, but not be limited to, evaluating impacts to fisheries, living marine resources, seafloor habitat, and water quality, plankton distribution, and changes to physical ocean conditions such as currents and sediment deposition. To account for the natural variation in the

environment, baseline information should be gathered over multiple seasons. Monitoring would occur during and after project construction, and throughout the duration of the project, in both the project area and the control site. The project should also monitor the effects of sedimentation and oxygenation from mussel and oyster culture on the seafloor and the potential for changes in nutrient distribution in the surrounding area (Wilding 2012).

The Council encourages the inclusion of these components in the Coastal Commission's final approval of the monitoring plan for the KZO sea farm and future projects.

Invasive Species

The Council is concerned about the introduction of invasive species resulting from sea farm operations. Of particular concern is the likelihood that invasive species will ride along with brood stock during shipment or on vessels transiting in the vicinity. In addition, the physical structure of the sea farm will create artificial substrate upon which non-native species could colonize. Non-native species can be detrimental to native species and can alter habitat. The Council recommends a monitoring program specific to the assessment and control of invasive species and supports the Hazard Analysis and Critical Control Point (HAACP) plan required by the Coastal Commission for the KZO sea farm. The HAACP is appropriate for any future sea farms as well.

Decommissioning

A decommissioning plan should include provisions for removing all structures associated with the sea farm. A bond or other mechanism for financial security for this phase should be a requirement in the event of default or bankruptcy.

Marine Spatial Planning

Using marine spatial planning tools, KZO Sea Farms should identify important ocean use areas near the project, such as commercial, recreational and tribal fishing grounds; marine sanctuaries and marine protected areas; recreational areas; navigational channels; oil and mineral extraction areas; military training areas; and approved dredge material disposal sites. To avoid these areas to the greatest extent possible, the project should meet with all stakeholders who have interests in the area. The Council recommends that future mariculture interests be considered in the broader context of responsible marine spatial planning, prior to specific project proposals.

Thank you for considering our comments. The Council looks forward to future opportunities to comment on the KZO Sea Farms Mariculture Project and on this emerging use of our shared ocean. Please feel free to contact us with any questions.

Sincerely,

[Signature block]

Citations

Stevens, C., D. Plew, N. Hartstein, and D. Fredriksson. 2008. The Physics of Open-Water Shellfish Aquaculture. Aquacultural Engineering, 38(3):145-160.

Wilding, T.A. 2012. Changes in Sedimentary Redox Associated with Mussel (*Mytilus edulis L.*) Farms on the West Coast of Scotland. PLoS ONE 7(9):e45159. doi:10.1371/journal.pone.0045159

Pacific Marine Estuarine Fish Habitat Partnership
PACIFIC COAST JUVENILE FISH HABITAT ASSESSMENT
Project Update for the Pacific Fishery Management Council

At the request of Council designee Ms. Marci Yaremko (California Department of Fish and Wildlife), the Habitat Committee has prepared an update on the assessment that the Pacific Marine Estuarine Fish Habitat Partnership (PMEP) is coordinating for west coast juvenile fish habitat use of estuaries.

QUICK SUMMARY: This coastwide assessment focuses on the role of estuaries as nurseries for important managed species (commercially and culturally important, state or Federal species of concern, food sources for larger fish), and impacts to these systems. The assessment is designed to complement other current west coast fish habitat assessments by NOAA and the National Fish Habitat Partnership. The PMEP will shortly be releasing a data call looking for types of habitat and fish information relevant for the assessments. To improve efficiency, and to reduce potential compilation burdens on already busy scientists, the first data call will be more of an inventory than an actual request of data.

BACKGROUND: The PMEP is a voluntary collaboration of local, state, tribal, and Federal governments and nongovernmental and private organizations in California, Oregon, and Washington with one paid coordinator (funded primarily from the National Fish Habitat Partnership, U.S. Fish and Wildlife Service, and The Nature Conservancy). PMEP is one of 18 nationally recognized partnerships that seeks to advance regional and national goals relating to fish habitat conservation and restoration. It is guided by a steering committee and advised by a science and data committee. See http://www.pacificfishhabitat.org/ for a listing of members.

Within the Council, a number of staff and committee members coordinate with PMEP participants. These include Jennifer Gilden, Council staff; Habitat Committee members Correigh Greene (NOAA) and Fran Recht (Pacific States Marine Fisheries Commission); former Habitat Committee member Vicki Frey (CDFW), future Habitat Committee member John Stadler (NOAA), and alternate Habitat Committee member Korie Schaeffer (NOAA).

PACIFIC COAST JUVENILE FISH HABITAT ASSESSMENT GOALS:

- Update wetland delineation and habitat types in west coast estuaries, and classify systems consistent with the Federal Geographic Data Committee's Coastal and Marine Ecological Classification Standard (CMECS).
- Advance understanding of the nursery requirements of 15-20 fish and shellfish species representative of different assemblages across the west coast.

- Review the current state of science concerning nursery functions of west coast estuaries.
- Describe juvenile fish habitat use of estuaries in a way that helps inform and prioritize restoration and protection.

- Complement other fish assessments: PMEP will assure that our efforts are compatible with, support, and add value to other west coast assessments that are being done:

    - The National Fish Habitat Partnership's National Estuary Assessment—assessing threats to habitats of recreationally and commercially important fish stocks in all aquatic systems.
    - The National Marine Fisheries Service's nearshore forage fish assessment—focusing on habitat-related changes over time in distribution and abundance of species of forage fish inhabiting estuary and nearshore habitats.

PRODUCTS:

- A spatial framework of estuary habitats in Washington, Oregon and California. The framework will provide extent of estuaries and salinity zones from riverine tidal areas to the seaward boundary and classify all systems following the CMECS classification system.
- A geo-referenced database of information on the juvenile fish use of west coast estuaries .
- A literature review of key estuarine-dependent species on the Pacific Coast and nursery functions of estuaries for these species.
- Reports and peer-reviewed publications.

In addition to supporting the other west coast assessments, the PMEP assessment and its estuarine classification and spatial framework will provide information that will:

- increase understanding of the contribution of estuarine habitats to recruitment of commercial stocks to offshore fisheries.
- support analysis of habitat indicators in estuaries needed by the National Marine Fisheries Service' California Current Integrated Ecosystem Assessment for the Habitat ecosystem component.
- provide new information on habitat use and importance that could better inform EFH designations for these species.

LIST OF SPECIES FOR WEST COAST FISH HABITAT ASSESSMENTS

YELLOW INDICATES SPECIES TO BE INCLUDED; GREEN SPECIES UNDER CONSIDERATION FOR PMEP NURSERY ASSESSMENT

COMMON NAME	Scientific name	PMEP Nursery Assessment	Forage Fish Assessment	NFHP Assessment	
1. DUNGENESS CRAB	*Cancer magister*	X		X	
2. GREEN STURGEON	*Acipenser medirostris*	X		X	
3. STEELHEAD	*Oncorhynchus mykiss*	X		X	
4. COHO SALMON	*Oncorhynchus kisutch*	X		X	
5. CHINOOK SALMON	*Oncorhynchus tshawytscha*	X		X	
CHUM SALMON	*Oncorhynchus keta*			X	
6. BROWN ROCKFISH	*Sebastes auriculatus*	X		X	
7. SHINER PERCH	*Cymatogaster aggregata*	X		X	
8. CALIFORNIA HALIBUT	*Paralichthys californicus*	X		X	
9. ENGLISH SOLE	*Parophrys vetulus*	X		X	
10. STARRY FLOUNDER	*Platichthys stellatus*	X		X	
SPECKLED SANDDAB	*Citharichthys stigmaeus*			X	
PACIFIC SANDDAB	*Citharichthys sordidus*			X	
TOPSMELT	*Atherinops affinis*	X	X	X	
11. PACIFIC HERRING	*Clupea pallasi*	X	X	X	
12. LEOPARD SHARK	*Triakis semifasciata*	X			
STAGHORN SCULPIN		X			
BAY SHRIMP		X			
BAT RAY	*Myliobatis californica*				
PLACEHOLDER (CA species)		X			
PLACEHOLDER (CA species)		X			
PLACEHOLDER (CA species)		X			
PLACEHOLDER (CA species)		X			

THE FOLLOWING FISH ARE NOT IN THE PMEP SURVEY BUT ARE IN BOTH THE FORAGE FISH AND NFHP SURVEY

American shad, Alosa sapidissima; Deepbody anchovy, Anchoa compressa; Slough anchovy, Anchoa delicatissima; Northern anchovy, Engraulis mordax; Threadfin shad, Dorosoma petenense; Surf smelt, Hypomesus pretiosus; Longfin smelt, Spirinchus thaleichthys; whitebait smelt, Allosmerus elongates; Eulachon, Thaleichthys pacificus; Dellta smelt, Hypomesus transpacificus; Night smelt, Spirinchus starksi; Jacksmelt, Atherinopsis californiensis; California grunion,Leuresthes tenuis; California killifish, Fundulus parvipinnis; Threespine stickleback, Gasterosteus aculeatus; Pacific sand lance, Ammodytes hexapterus

THE FOLLOWING FISH/SHELLFISH ARE ONLY IN THE NFHP SURVEY (AND NOT IN THE PMEP SURVEY OR IN THE FORAGE FISH SURVEY)

Olympia oyster,Ostreola conchaphila; Blue mussel, Mytilus spp; Pacific littleneck clam, Protothaca staminea; Bay shrimp, Crangon franciscorum; Leopard shark, Triakis semifasciata; Coastal cutthroat trout; Oncorhynchus clarkii clarkii; Bay pipefish, Syngnathus leptorhynchus; Copper rockfish,Sebastes caurinus; Grass rockfish, Sebastes rastrelliger; Lingcod, Ophiodon elongates; Pacific staghorn sculpin, Leptocottus armatus; Kelp perch, Brachyistius frenatus; Bay goby, Lepidogobius lepidus; White seabass, Atractoscion nobilis; Spotted sandbass,Paralabrax maculatofasciatus; Diamond turbot , Hypsopsetta guttulata

Individuals and Contact Information						West Coast Assessments		
First	Last	email	phone	Affliation	State	NOAA Forage Fish	PMEP Nursery	NFHP National Estuary
Correigh	Greene	correigh.greene@noaa.gov	(206) 860-5611	NWFSC	WA	X	X	X
Joshua	Chamberlin	joshua.chamberlin@noaa.gov	(206) 302-2472	NWFSC	WA	X		
Bob	Emmett	robert.emmett@noaa.gov	(503) 861-1818 x31	NWFSC	OR	X		
Hiroo	Imaki	hiroo.imaki@noaa.gov	(206) 898-0457	NWFSC	All	X	X	X
Brent	Hughes	bbhughes@ucsc.edu	(831) 459-5783	SEASPATIAL	CA		X	
Dan	Shively	dan_shively@fws.gov	(503) 231-2270	USFWS	OR		X	
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Korie	Schaeffer	korie.schaeffer@noaa.gov	(707) 575-6087	NOAA	CA		X	
Kristan	Blackhart	kristan.blackhart@noaa.gov	(206) 302-2479	NOAA	WA			X
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Walter	Heady	wheady@TNC.org	(831) 333-2044	TNC	CA		X	
Ken	Pierce, Jr	kenneth.piercejr@dfw.wa.gov	(360) 902-2564	WDFW	WA		X	
Laura	Brophy	brophyonline@gmail.com	(541) 752-7671	IAE	OR		X	
Eric	Grossman	egrossman@usgs.gov	(206) 526-6282, ext. 334	USGS	WA		X	
Curt	Mycut	cmycut@du.org	(360) 885-2011	DU	WA		X	

HABITAT COMMITTEE REPORT ON CURRENT HABITAT ISSUES

KZO Sea Farms Mariculture Project Letter

The Habitat Committee (HC) heard an update on the KZO Sea Farms Mariculture Project. The project proponents are in the process of finding a new location for the project, given the U.S. Coast Guard's objections to the close proximity of the current proposal to shipping lanes. While a new site has not been identified, the HC believes the letter remains relevant and even more timely.

Additionally, the HC suggests two minor changes to the letter before it is sent, based on feedback from California Coastal Commission staff:

1) On page two, under the "Monitoring" section, in the first sentence change "determination" to "consistency."
2) On page two, under the section titled "Specific Essential Fish Habitat Concerns" (first paragraph), change the description of the anchors from weighted (moored) to a description of anchoring by helical screws.

Coleman National Fish Hatchery (NFH) Fall Chinook Release Strategy

The HC heard a briefing on the Coleman NFH release strategy for 2014 from Tim Roth (U.S. Fish and Wildlife Service [USFWS]). The continuing severe drought in the Central Valley of California is expected to produce conditions in the Sacramento River and Delta detrimental to the survival of juvenile salmon. The conditions anticipated in 2014 could lead to the loss of an entire year class of juvenile fall Chinook salmon from Coleman NFH.

To address this situation, and in coordination with National Marine Fisheries Service (NMFS) and California Dept. of Fish and Wildlife, the USFWS has developed a contingency release plan based on a number of environmental criteria and triggers that will be used to inform decisions on the release strategy to be implemented in 2014. These criteria and triggers were developed based on a review of water temperature, river flow, Delta Cross Channel Gate operations, and salmon return data from 1988-1992, a period representing the most recent extended severe drought in the Central Valley. These criteria are designed to minimize the risk of exposing Coleman NFH-produced salmon to river conditions that could result in extremely low survival.

Each of the criteria are intended to be independent of the others, meaning that if any one or more of the criteria are expected to be met, then Coleman NFH-produced salmon would be transported to the acclimation net pens for release into the west Delta. If none of the triggers are forecast to be met, then juveniles will be released into Battle Creek, as per standard operational protocol at Coleman NFH. The USFWS and CDFW have developed a schedule for the delivery (trucking) of hatchery production from the five state and federal hatcheries to acclimation net pens in the west Delta, if trucking is triggered for Coleman releases.

The full USFWS report to the HC on the Coleman NFH trucking issue for 2014 is attached to our HC report for Council information (Attachment 1).

The HC notes that trucking of the Coleman releases is likely to occur in 2014 unless there are major rainstorms during the normal emigration period of April through May. In addition, natural fall Chinook from the upper basin will suffer whatever outmigration conditions occur in 2014.

Draft HC California Drought Report

The Habitat Committee heard a presentation from Garwin Yip from the NMFS California Central Valley Area Office on current NMFS drought management in California. The status of the drought in California is constantly changing, but current reports and projections remain grim.

NMFS is focused on species listed under the Endangered Species Act, and the HC is concerned that there is no active management of non-listed species. However, it is encouraging that state and Federal agencies are intensely managing Bay/Delta habitat, flows, and allocations in real time, and NMFS is using the Contingency Plan from their 2008 Biological Opinion.

The HC is concerned that reductions in flows allowed during the current drought could be proposed in the future, and stresses that although these reductions are currently necessary, they should not set a precedent for the future. The HC is also concerned that projected water delivered from the Bureau of Reclamation's Trinity River Division will violate its Biological Opinion (BO) requirements for end-of-year carryover storage. The Trinity River Division BO requires a minimum storage of 600,000 acre feet, and the present forecast estimate for the Trinity River Division predicts storage on October 1 to be 457,00 acre feet. This will cause problems controlling temperature within the Trinity River, which also has ESA-listed fish.

Columbia River Spill Study

Recently the NWPCC asked its Independent Scientific Advisory Board (ISAB) for guidance concerning proposed spill studies. On Feb 20 the ISAB released a report acknowledging the importance of better information on the value and best uses of spill. The ISAB also raised several concerns about issues related to spill testing and evaluation. Their main conclusion, however, was that they needed a more complete proposal before they could conduct a true scientific review.

The HC made two observations on the controversy around this issue. First, the strong fall Chinook returns currently being experienced correlate with out-migrations during periods of unregulated spill and flow, as noted in the CSS analysis. Second, the spill tests advocated by Oregon call for tests at spills above the current gas cap (120% supersaturation), but there is little difference in total spill volume between the proposed study levels and levels from the full implementation of the Court-ordered spill program which called for spills to the gas cap for extended periods over the spring and summer.

A summary of ISAB comments on experimental spill is attached to this report (Attachment 2.)

Bay/Delta Conservation Plan

The HC received an update from Michael Tucker (NMFS Regional Office) on the Bay Delta Conservation Plan (BDCP). The simultaneous goals of the BDCP are to restore the Sacramento/San Joaquin Delta ecosystem and improve water supply issues. The plan, which encompasses numerous provisions, focuses on 1) habitat restoration, 2) re-engineered conveyance of Sacramento River water to reduce entrainment of fish and to restore the salinity regime, and 3) mitigation plans for other ecosystem stressors such as contaminants and other

decrements to water quality. Habitat restoration includes 65,000 acres of tidal wetland restoration, increased seasonal inundation of Yolo Bypass, and habitat improvements to 20 miles of leveed channels. Changes to water conveyance involve three large screened intakes north of the Delta to shunt water to underground tunnels, which would passively flow to the pumps at the south end of the Delta. The intakes would divert a maximum 9000 cubic feet per second (cfs), but only if river discharge surpasses 30,500 cfs. Below this level, diversions would be a proportion of river discharge. Overall, the volume of water diverted should stay the same compared to before implementation of the BDCP plan. Mitigation of ecosystem stressors include reductions of ammonia in wastewater, reducing agricultural and urban-based contaminants, and control of nonnative species. Notably, the plan calls for extensive adaptive management, including $100 M for research and monitoring. This is a complex and controversial issue, and there is much uncertainty associated with both modeling and potential impacts. A scientific review, including lifecycle modeling of salmon populations, is proceeding.

Pacific Marine Estuarine Project

The HC has provided the Council information on the Pacific Marine Estuarine Project (PMEP); see Agenda Item E.1.a, Attachment 2. In addition, the HC is providing Attachment 3 to this report, which updates the species lists for PMEP fish-habitat assessments and provides information on the range and management status of the focus species.

Wanapum Dam

Wanapum Dam on the Columbia River is reported to have a crack in the concrete in a structural pier. Wanapum dam is owned by Grant County Public Utility District (PUD) and is situated between Priest Rapids and Rock Island dams. As a precautionary measure, Grant PUD has lowered the reservoir levels 26 feet below normal operating level. The reduced stress allowed the crack to close, and engineering analysis is being conducted. The analysis and future repair will take months. Power generation will be shifted to other dams across the Columbia Basin.

There are at least four possible impacts to salmon essential fish habitat:

1. Fish ladders on Wanapum dam will be perched above reservoir level, and fish ladders crossing Rock Island dam will be stranded from the river.
2. Juvenile passage structures for Wanapum dam may be high and dry, and passage will be through the turbines, leading to increased mortality.
3. Dissolved nitrogen levels below Rock Island may be increased as water falls farther, particularly during the spring freshet.
4. Overall operation of the Columbia and Snake River dams may be altered to make up the generation capacity; there is some concern that reasonable and prudent alternatives included in the Columbia River Hydropower Biological Opinion may be violated.

The HC will continue to track this issue and will report back to the Council in April.

Offshore Energy Development

Pacific Marine Energy Center / Southern Oregon Test Site

At the November meeting, the Habitat Committee informed the Council of the Oregon State University Pacific Marine Energy Center/Southern Oregon [wave energy] Test Site off the central coast of Oregon, which is considering routing cable to shore through or under a nearshore rocky reef. The Council approved the HC drafting a letter to the Bureau of Ocean Energy Management (BOEM) for the March briefing book, with the intention of responding to BOEM's Notice of Intent (NOI) for this project. However, the NOI has yet to be published, and the HC feels it is premature to send this letter without the NOI. Also, it has yet to be determined which Federal agency, BOEM or the Federal Energy Regulatory Commission, will be the lead agency for cable permitting. The NOI is expected in April. If relevant and timely, the HC may provide the Council with a draft letter in April.

Reedsport Ocean Power Technology Wave Energy

Ocean Power Technology has surrendered its preliminary permit for Phase III of its project off Reedsport, Oregon, which involved developing a 100-buoy array. Phase III was dependent on the successful implementation of Phase II (a 10 buoy array) and Phase 1 (one buoy), along with the required baseline and monitoring work. Several aspects of the project are behind schedule, including the deployment of the Phase 1 single buoy. The project still intends to complete Phase II.

PFMC
03/08/14

USFWS Report to Habitat Committee on Coleman NFH Fall Chinook Releases, Trucking, and Drought Conditions in the Central Valley

Background

The fishery management agencies (USFWS, CDFW, NMFS) and USBR have held several meetings with representatives of the salmon fishing community (GGSA, CSPA, PCFFA, Coastside Fishing Club, and others) and congressional representatives. The purpose of these meetings was to identify issues and concerns and come to a common understanding of scientific information related to strategies for releasing salmon from the Coleman NFH. USFWS staff developed and shared a power-point presentation titled, "Review of Strategies for Releasing Juvenile Salmon from the Coleman National Fish Hatchery" and also distributed an Interim Project Report February 2014 titled, "Comparison of ocean harvest, returns to Battle Creek, and straying for Coleman National Fish Hatchery fall Chinook released at Battle creek and San Pablo Bay, 2008-20011" as part of this information exchange. These documents display the benefits and risks of variable release locations relative to Coleman NFH program goals and generally argue biologically for maintaining the standard protocol for releasing juvenile salmon at the hatchery site on Battle Creek except under extreme out-migration conditions as may occur in 2014.

Although contribution to ocean fisheries is enhanced by off-station releases, homing fidelity is greatly impacted by downstream releases resulting in much lower return rates to Battle Creek for brood stock collection and much higher stray rates to non-local streams and spawning areas. A summary of the most recent 2008-2011 San Pablo Bay (SPB) versus Battle Creek (BC) release strategy information indicates the following: 1) SPB releases were harvested at a rate 2.7 times that of BC releases. 2) BC releases returned to Battle Creek at a rate 12 times that of SPB releases. 3) SPB releases were recovered as strays at a rate 19 times that of BC releases. Ensuring adequate returns to Battle Creek to provide Coleman's brood stock and fully seed the natural production area in Battle Creek below Coleman NFH and reducing detrimental impacts to natural stocks by minimizing straying of Coleman's hatchery production to areas outside of Battle Creek are two of Coleman NFH's primary goals along with contributing significant catch to ocean and freshwater fisheries.

Representatives from the fishing community likewise presented information on the trucking issue and indicated that on-station releases from the Coleman NFH do not contribute as much catch as releases into the Bay for programs conducted from the CDFW hatchery facilities. They highlighted the poor environmental conditions that are expected to exist in the Sacramento River and Delta during this spring's outmigration window. In light of the extraordinarily poor environmental conditions that are anticipated to result from the ongoing drought, the fishing community representatives have requested that a large portion of Coleman NFH fall Chinook be released downstream in 2014.

Most recently, the USFWS has coordinated with NMFS and CDFW to develop a draft alternative release strategy for Coleman NFH fall-run production that will be implemented based on a number of forecasted environmental triggers shortly before hatchery release time frames. This alternate release strategy document is titled, "DRAFT Contingency Release Strategies for Coleman National Fish Hatchery (Coleman NFH) Juvenile Fall Chinook Salmon Due to Severe Drought Conditions in 2014". The following discussion is taken directly from that document.

Continuing severe drought in the Central Valley of California is expected to produce conditions in the Sacramento River and Delta detrimental to the survival of juvenile salmon. The conditions being anticipated in 2014 could lead to the loss of an entire year class of juvenile fall Chinook salmon following their release from the Coleman NFH, thereby compromising the ability to achieve any of the hatchery's objectives. To circumvent unacceptably high levels of juvenile fish mortality that may result in 2014, the USFWS is considering an alternative strategy for releasing juvenile fall Chinook, involving transportation to acclimation net pens in the west Delta. This strategy is consistent with that used to release a large portion of Chinook salmon from Central Valley hatcheries operated by the CDFW.

Substantial data are available to show that transporting Coleman NFH fall Chinook salmon to the west Delta would likely produce substantial increases in ocean harvest opportunity but will also result in an increased rate of straying as they mature and return to freshwater. The levels of straying anticipated are likely to compromise some of the hatchery objectives, including contributions to harvest in the upper Sacramento River and the ability to collect adequate brood stock at the Coleman NFH in future years, particularly 2016. Although the levels of straying anticipated from releasing fish into the west Delta are unfavorable, this release strategy may in fact represent the best possible option when faced with the possibility of losing the entire 2013 production year. In future years, under less extreme conditions, the standard protocol for releasing Chinook from the Coleman NFH will continue to be on-site releases into Battle Creek.

Criteria and Contingencies

In coordination with the NMFS and the CDFW, the USFWS has developed the following criteria and triggers that will be used to inform decisions on the release strategy to be implemented in 2014. These criteria and triggers were developed based on a review of water temperature, river flow, Delta Cross Channel Gate operations and salmon return data from 1988-1992, a period representing the most recent extended severe drought in the Central Valley. At that time, the USFWS released nearly the entire production of fall Chinook to off-site locations to circumvent poor conditions in the lower Sacramento River and Delta. Conditions in the river and Delta were poorest during the spring of 1992 emigration season. Releases from the Coleman NFH into the west Delta in 1992 survived at a rate nearly 18 times higher than releases into Battle Creek, with a commensurate increase in ocean harvest. Owing to their markedly improved out-migration survival, west Delta releases from that same year also outperformed on-site releases in regards to returns to the hatchery. More than twice as many adult returns to the Coleman NFH in 1994 resulted from west Delta releases as compared to releases conducted into Battle Creek. If the Coleman NFH had released all production on-site in 1992 the hatchery would not have had sufficient returns of adults to meet production targets in 1994.

The criteria identified below are designed to minimize the risk of exposing Coleman-NFH produced salmon to river conditions that could result in extremely low survival. Each of the criteria indicated below are intended to be independent of the others, meaning that if any one or more of the criteria are anticipated to be met then Coleman NFH-produced salmon should be transported to the acclimation net pens for release into the west Delta. If none of the triggers are forecast to be met, then juveniles will be released into Battle Creek, as per standard operational protocol at the Coleman NFH.

Delta Cross-Channel Gates operations – Survival of juvenile salmon is significantly reduced when gates are open and increased numbers of fish are diverted into the interior delta.

- Cross-Channel Gates are forecast* to be open within 21 days** days of the date when the hatchery salmon are ready to be released.
- Cross-Channel Gate operations are forecast* to be modified per the "Matrix of Triggers for DCC Gate Operations" developed for the protection of natural origin spring Chinook. This trigger is designed to avoid rendering the triggers ineffective because unmarked CNFH-produced fall-run Chinook would preclude the ability to discern natural origin spring-run from hatchery fall-run.

North Delta Emergency Salinity Barriers – Survival of juvenile salmon would be significantly reduced since additional fish would be diverted back into the mainstem Sacramento River and then have an increased risk of being diverted into the interior delta.

- Salinity Barriers are forecast* to be operational within 21** days of the date when the hatchery salmon are ready to be released.

Water Temperature – Increased water temperatures above 70 degrees has been shown to be detrimental to juvenile survival.

- Sustained Daily Average Water temperatures are expected to be greater than 70 F at Wilkins Slough within 21** days of the date when the hatchery salmon are ready to be released.
- Sustained Daily Average Water temperatures are expected to be greater than 70 F at Freeport within 21** days of the date when the hatchery salmon are ready to be released.

Flow – Decreased flows in the Sacramento River lead to significantly reduced survival of juvenile salmon because of increased travel times exposing the fish to increased predation and increased risk of diversion into the interior delta where survival is significantly reduced.

- A Sacramento River flow at Wilkins Slough of less than 3,500 cfs is forecast* to occur within 21** days of the date when the hatchery salmon are ready to be released.
- A Sacramento River flow of less than 6,000 cfs at Freeport is forecast* to occur within 21** days of the date when the hatchery salmon are ready to be released.
- Delta outflow is forecast* to be less than 3,000 cfs within 21** days of the date when the hatchery salmon are ready to be released.

*The most recent Bureau of Reclamation 90% hydrology operations forecast and underlying modeling assumptions will be used to assess potential future flow conditions, Delta Cross Channel Gate operations, and North Delta Emergency Salinity Barrier configuration.
** 21 days is the time period in which the vast majority of the hatchery fall-run is expected to have moved out of the Sacramento River and the Delta.

Implementation and Contingencies

The USFWS and CDFW have coordinated a schedule for the delivery (trucking) of hatchery production from the five state and federal hatcheries to acclimation net pens in the west Delta. However, if a precipitation event occurs in March or April, environmental conditions/criteria may be re-assessed and if none of the criteria above are forecast to occur, then groups of Coleman NFH fall Chinook salmon juveniles meeting appropriate size criteria for an on-site release (i.e., at or about 90/lb) may be released into Battle Creek per usual procedures. Further, criteria are expected to be assessed during the three following periods: mid-March, first of April, and mid-April. If criteria above are not met or expected to be met within a three week window, then on-site releases of appropriately sized fish will also occur shortly thereafter. Criteria may also be re-assessed one to two weeks prior to scheduled trucking dates and, again, if criteria above are not met or not predicted to be met within a three week window, then on-site releases of those groups of fish will be considered to instead occur on-site shortly thereafter. If during any of these assessments, existing/predicted conditions are expected to meet the criteria triggering consideration of the alternative release strategy, then preparations will begin, continue, or be implemented to truck appropriate groups of fish to the acclimation net pens in the west Delta as scheduled.

Independent Scientific Advisory Board Encourages Development of Detailed Spill Proposal

The Independent Scientific Advisory Board (ISAB) of the Northwest Power and Conservation Council (Council) makes three main points in its February 21 review of Oregon's proposal to test expanded spill. First, the ISAB concludes that the proposal's hypothesis has merit as a candidate for testing. Second, it encourages development of a more detailed study design. Finally, the board identifies a number of specific issues that a more detailed study design should address.

These recommendations will strengthen the proposal to test state, federal and Tribal scientists' findings that increased spill over Columbia Basin hydropower dams can help restore endangered Columbia and Snake river salmon stocks. The Council sought the ISAB review to inform development of the 2014 Fish and Wildlife Program, which is currently being drafted.

Below are several excerpts from the ISAB's review that provide additional context for the panel's main findings.

The ISAB concludes that the spill proposal has merit and could increase both salmon survival and our understanding of spill:

"Despite these concerns with the statistical analyses used to support implementation of the spill test, it appears that the increased spill hypothesis stands as a possible candidate for testing. Other changes to hydrosystem operations have so far been inadequate to meet SAR targets required to conserve endangered salmon populations, even with structural changes that have been made at the dams such as surface spill weirs. It appears that increasing the amount of water spilled at lower Columbia and Snake River dams has merit as a hypothesis to test, but additional review of literature and analysis of data would be worthwhile." (ISAB 2014-2 at 5)

"The proposed study offers an opportunity to use adaptive management that might improve SARs[1] [Smolt-to-Adult Return ratios] of threatened and endangered salmon ESUs [populations] and increase knowledge for future decisions. This situation seems to fit the criteria for true adaptive management..." (ISAB 2014-2 at 7)

"It is likely that a spill test would enhance knowledge about spill, juvenile passage survival, and SARs. A spill test could also increase knowledge in other ways if appropriate monitoring is conducted. The ISAB agrees with the 2013 CSS Workshop conclusion that the experimental design and implementation should 'focus on maximizing the amount of learning that can be achieved,' where 'learning' is the 'likelihood of detecting a response.' Here again, this situation seems to fit the need for true adaptive management as mentioned above." (ISAB 2014-2 at 11)

[1] Smolt-to-Adult Return ratio (SAR) is defined as survival from a beginning point as a smolt to an ending point as an adult. It is widely considered to be a highly robust measure of full lifecycle – or gravel-to-gravel – salmon survival.

"Currently, water quality standards and the desire to produce hydropower constrain the amount of water spilled over the dams. CSS [Comparative Survival Study] annual reports and published papers, however, suggest that increased spill will lead to higher survival of spring Chinook and steelhead. This is a reasonable hypothesis." (ISAB 2014-2 at 12)

The ISAB encourages the development of a more detailed study design:

"The proponents [of a spill test] should be encouraged to prepare a more complete and detailed proposal that addresses issues and concerns that have been put forward by the Action Agencies and stakeholders, partly because details of the study have yet to be described in a document. Several iterations of the proposal may be needed to fully vet issues while providing a rigorous scientific review." (ISAB 2014-2 at 8)

"Additional effort is needed to fully vet the experimental spill hypotheses and methodology. An action of this importance requires development of a complete description of the study design that addresses issues presented in this ISAB review and those raised by other stakeholders in the region." (ISAB 2014-2 at 4)

The ISAB raises a number of specific issues that a more detailed study design should address:

"This modeling effort, based on existing data, should be used to establish specific quantitative hypotheses for testing. The model simulations should be updated with recent years of data prior to beginning the potential spill test…. The extent to which results from the CSS simulation studies are consistent with the findings in other studies should be evaluated." (ISAB 2014-2 at 4)

"Alternative covariates and analytical approaches need to be identified and discussed. A preferred alternative action could be identified and applied, and then the models updated periodically, leading to learning that feeds back to management." (ISAB 2014-2 at 12)

The ISAB acknowledges that with precautionary monitoring, the potential biological effects of total dissolved gas can be managed effectively:

"Thus, it appears that the migratory behavior of juvenile and adult salmonids will help protect them from adverse effects of TDG [Total Dissolved Gas]." (ISAB 2014-2 at 10)

"Several studies indicated that aquatic invertebrates are much less sensitive to high TDG than are fish." (ISAB 2014-2 at 11)

"The proposed spill test should consider the potential impact on other species, such as fall Chinook and sockeye salmon, sturgeon, lamprey, and other aquatic life. Hypotheses should be developed on how spill maintained at 125% TDG for several months might affect each species and life stage, and a detailed biological monitoring plan should be developed to test the hypotheses." (ISAB 2014-2 at 9)

"…[If] adequate monitoring is implemented along with the spill, there should be increased knowledge regarding spill, juvenile salmonid dam passage survival, impacts on adult fish passage and other species, and total dissolved gas effects." (ISAB 2014-2 at 12)

Species lists for Pacific Marine and Estuarine Fish Habitat Partnership fish-habitat assessments

		Assessment			Distribution					
Common Name	**Scientific name**	**PMEP nursery**	**Nearshore forage fish**	**NFHP**	**Salish Sea**	**OR/WA coast**	**Central CA**	**S. CA bight**	**PFMC FMP**	**Management concern**
Dungeness crab	*Cancer magister*	X		X	X	X	X			
Bay shrimp	*Crangon franciscorum*	X		X	X	X	X			
Leopard shark	*Triakis semifasciata*	X		X			X	X	Groundfish	
Bat ray	*Myliobatis californica*	X		X		X	X	X		
Green sturgeon	*Acipenser medirostris*	X		X	X	X	X			ESA, sp of concern
steelhead	*Oncorhynchus mykiss*	X		X	X	X	X	X		ESA (some ESUs)
coho salmon	*Oncorhynchus kisutch*	X		X	X	X	X		Salmon	ESA (some ESUs)
Chinook salmon	*Oncorhynchus tshawytscha*	X		X	X	X	X		Salmon	ESA (some ESUs)
Pacific staghorn sculpin	*Leptocottus armatus*	X		X	X	X	X	X		
Brown rockfish	*Sebastes auriculatus*	X		X	X	X	X	X	Groundfish	
California halibut	*Paralichthys californicus*	X		X			X	X		
English sole	*Parophrys vetulus*	X		X	X	X	X	X	Groundfish	
starry flounder	*Platichthys stellatus*	X		X	X	X	X		Groundfish	
shiner perch	*Cymatogaster aggregata*	X	X	X	X	X	X	X		
Pacific herring	*Clupea pallasi*	X	X	X	X	X	X	X	CPS - Ecosystem	
Topsmelt	*Atherinops affinis*		X	X		X	X	X		
American shad	*Alosa sapidissima*		X	X	X	X	X			Nonnative
Deepbody anchovy	*Anchoa compressa*		X	X				X		
Slough anchovy	*Anchoa delicatissima*		X	X				X		
Northern anchovy	*Engraulis mordax*		X	X	X	X	X	X	CPS	
Threadfin shad	*Dorosoma petenense*		X	X	-			X		Nonnative
Surf smelt	*Hypomesus pretiosus*		X	X	X	X	X			
Whitebait smelt	*Allosmerus elongatus*		X	X	X	X	X			
Longfin smelt	*Spirinchus thaleichthys*		X	X	X	X	X			CA threatened

Attachment 3

Eulachon	*Thaleichthys pacificus*		X	X	X	X	X			ESA
Delta smelt	*Hypomesus transpacificus*		X	X			X			ESA
Night smelt	*Spirinchus starksi*		X	X	X	X	X			
Jacksmelt	*Atherinopsis californiensis*		X	X		X	X	X		
California grunion	*Leuresthes tenuis*		X	X			X	X		
California killifish	*Fundulus parvipinnis*		X	X			X	X		
Threespine stickleback	*Gasterosteus aculeatus*		X	X	X	X	X			
Pacific sand lance	*Ammodytes hexapterus*		X	X	X	X	X			
Olympia oyster	*Ostreola conchaphila*			X	X	X	X	X		
Blue mussel	*Mytilus spp*			X	X	X	X	X		
Pacific littleneck clam	*Protothaca staminea*			X	X	X	X	X		
Pacific lamprey	*Entosphenus tridentatus*			X	X	X	X	X		
White sturgeon	*Acipenser transmontanus*			X	X	X	X			
Chum salmon	*Oncorhynchus keta*			X	X	X			Salmon	
Coastal cutthroat trout	*Oncorhynchus clarkii clarkii*			X	X	X	X			CA sp of concern
Bay pipefish	*Syngnathus leptorhynchus*			X	X	X	X	X		
Copper rockfish	*Sebastes caurinus*			X	X	X	X	X	Groundfish	
Grass rockfish	*Sebastes rastrelliger*			X		X	X	X	Groundfish	
Lingcod	*Ophiodon elongates*			X	X	X	X	X	Groundfish	
Bay goby	*Lepidogobius lepidus*			X	X	X	X	X		
Yellowfin croaker	*Umbrina roncador*			X			X	X		
White seabass	*Atractoscion nobilis*			X			X	X		
Spotted sandbass	*Paralabrax maculatofasciatus*			X			X	X		
Diamond turbot	*Hypsopsetta guttulata*			X			X	X		
Speckled sanddab	*Citharichthys stigmaeus*			X	X	X	X	X		
Pacific sanddab	*Citharichthys sordidus*			X	X	X	X	X	Groundfish	
Total Species		**15**	**18**	**50**	**33**	**37**	**45**	**32**		

COASTAL PELAGIC SPECIES ADVISORY SUBPANEL REPORT ON CURRENT HABITAT ISSUES

Members of the Coastal Pelagic Species Advisory Subpanel (CPSAS) and Coastal Pelagic Species Management Team (CPSMT) participated in a webinar on February 24, 2014 and discussed the draft Habitat Committee (HC) letter regarding the KZO Sea Farms project (Agenda Item E.1.a, Attachment 1). The CPSAS appreciates the Council's consideration of the following comments in support of HC recommendations.

By way of background, the KZO project was developed largely in the absence of consultation with commercial fishing interests in Southern California, and the proposed site is situated in the most productive fishing block for Coastal Pelagic Species (CPS) and market squid on the San Pedro shelf. Block 739 also has been shown to be the largest spawning grounds in Southern California for barred sand bass, an important recreational species.

The CPSAS concurs with the concerns raised in the HC letter, and encourages the Council to approve this letter to provide recommendations for a process to guide future aquaculture or other offshore development to avoid potential negative impacts to fisheries and/or fishery habitat.

We are not opposed to aquaculture generally, but do have grave concerns when the project is planned and submitted for approval before consulting with the fisheries stakeholders, as was the case with KZO Sea Farms. The CPSAS supports the recommendations in the HC letter to establish a policy framework for aquaculture (and other offshore development). The main points are:

1. Analysis of potential impacts of project design -- including impacts on habitat and fisheries - should occur prior to project designation. Marine Spatial Planning, including consultation with all stakeholders, should occur as the first step to identify areas suitable for aquaculture (and other offshore development).

2. Baseline information should be gathered over multiple seasons, both at the proposed site(s) and a comparable control site(s) not influenced by the project.

3. An ongoing independent monitoring program during project construction and throughout the duration of the project is mandatory, in both project area and control site.

4. A decommissioning plan should be included in any aquaculture proposal, including a bond or other mechanism for financial security in event of default or bankruptcy.

The draft HC letter provides details on baseline and ongoing monitoring data needs, that could be relevant to numbers 1, 2, and 3 above.

The CPSAS suggests one additional requirement, from a fisheries perspective:

5. An indemnity clause holding fishermen harmless from liability in the event of accidental contact with the project structure and a mitigation plan, i.e. Lost/Damaged Fishing Gear Compensation Program, should be required as a condition of plan approval.

Thank you for your consideration of these comments.

PFMC
03/08/14

Agenda Item E.1.c
Supplemental SAS Report
March 2014

SALMON ADVISORY SUBPANEL REPORT ON THE USFWS REPORT ON COLEMAN NFH FALL CHINOOK RELEASES, TRUCKING,AND DROUGHT CONDITIONS IN THE CENTRAL VALLEY

The Salmon Advisory Subpanel (SAS) has reviewed the USFWS Report to the Habitat Committee on Coleman NFH Fall Chinook Releases, Trucking, and Drought Conditions in the Central Valley. The SAS strongly urges the Council to request that the USFWS use every means necessary to expedite the survival of Fall Chinook smolts produced by the Coleman National Fish Hatchery in this critically dry year. We support the trucking of smolts to an appropriate site below the principal diversion points from the Sacramento River into the Delta.

In addition, we urge the USFWS to develop consistent policy that will determine Coleman National Fish Hatchery release strategies based on drought forecasts, flow criteria and water temperatures. Those strategies should be designed to maximize survival to adulthood and genetic integrity while minimizing , straying issues. The SAS believes, however, that reducing hatchery smolt survival during extreme drought conditions merely for the sake of genetic integrity is not wise policy.

HOOPA VALLEY TRIBAL COMMENTS ON
E.1 Current Habitat Issues

The Hoopa Valley Tribe (HVT) thanks the Council for its advocacy for supplemental Klamath flows in the past two water years. As you know, record returns of Klamath River Fall Chinook (KRFC) were realized in 2012 and 2013 thanks to the remarkable performance of 2009 brood. Safe passage of these strong returns of KRFC was assured by supplementing flows in the lower Klamath River by water stored in Trinity River Reservoir.

While the 2014 anticipated run of KRFC is not forecast to be as strong as that seen in the prior two years, the Tribe is concerned the present extreme drought will persist and result in impaired hydrology in lower Klamath River. Moreover, Trinity River Reservoir has become depleted given the less than favorable hydrology and is predicted to fall below the Biological Opinion required volume of 600,000 acre feet by the end of the 2014 water year. Meanwhile, in Klamath River, where there is limited storage potential in any year, dry conditions will only further compromise any ability to manage desired lower Klamath hydrology as KRFC return this fall.

In 2012 and again in 2013, US Bureau of Reclamation (BOR) depended on water stored in Trinity Reservoir to provide supplemental flows for adult fish returns. The BOR is presently defending its prior actions in federal court and is joined by Hoopa Valley Tribe in that effort. However, given the potential for impaired hydrology for lower Klamath River in 2014, the Tribe has expressed concerns to BOR that this is not a year to provide assurances to water users in Klamath Basin or for CVP exports absent a full accounting of reserves that may become critical to the passage of KRFC this fall.

The reduced storage situation in Trinity Reservoir will also harm out-migrant Chinook and listed Coho salmon during the spring and summer of 2014. We continue to urge a long term comprehensive solution for fish migration needs that is inclusive of both Trinity and Klamath river contributions. Further, we caution state and federal water managers to prioritize limited water resources in 2014 to meet the needs of the fish first.

PFMC Comments - NOAA Service Account

Dec 17 (13 days ago)

Agenda Item E.1.d
Public Comment
March 2014

---------- Forwarded message ----------
From: **Dale N.** <daleneedsthis@gmail.com>
Date: Tue, Nov 26, 2013 at 12:02 PM
Subject: report on the radiation levels in the Pacific Ocean
To: pfmc.comments@noaa.gov

Seriously, the radiation that is pouring into the Pacific Ocean at about 400 tons a day should be your top priority, much of the atmospheric radiation gets into the ocean. Start doing more reports on this issue please. I know that I don't have to explain how this is going to effect the Ocean ecosystem to you guys.

Agenda Item E.1.d
Supplemental Public Comment 2
March 2014

Fwd: Ballast Water Treatment

PFMC Comments - NOAA Service Account <pfmc.comments@noaa.gov> Tue, Feb 18, 2014 at 4:17 PM
To: Chuck Tracy - NOAA Affiliate <chuck.tracy@noaa.gov>
Cc: Jennifer Gilden - NOAA Affiliate <Jennifer.Gilden@noaa.gov>

-------- Forwarded message --------
From: **Gary Shilling** <gshilling@cox.net>
Date: Tue, Feb 18, 2014 at 4:14 PM
Subject: Ballast Water Treatment
To: pfmc.comments@noaa.gov
Cc: Mo Husain <husainm@mhsystemscorp.com>

Dear Pacific Fishery Management Council,

I am currently engaged in the ballast water treatment industry, and I have recognized several issues that places our harbors and ports at great risk to an ecological disaster similar to the ecological disaster caused by the Zebra Mussels in the Great Lakes.

Let me review some background information on this issue.

- Commercial ocean going vessels must load tons of ballast water at ports where they offload cargo, and at ports where they take cargo on, the ballast water must be discharged to accommodate the change in the load of the cargo. This transportation of ballast water from port to port is spreading invasive species throughout the world, and in particular led to the introduction of the Zebra Mussels in the Great Lakes.

- The International Maritime Organization (IMO), a United Nations organization, has been engaged for several years to trying to get a worldwide treaty ratified that requires all large ships to install and use a ballast water treatment systems (BWTS) to kill all organisms in ballast water tanks before discharging ballast water. At this time there is no projected date for ratification of the treaty. In fact, the treaty my never be ratified. Clearly ship owners do not want the treaty ratified because it will cost upwards from $1.5 million to install a BWTS on each ship. So, ship owners are constantly lobbying to delay the treaty and to defer the dates of required BWTS on their ships.

- The U.S. Coast Guard (USCG) adopted the IMO treaty rules and began enforcing these rules in December of 2011. The USCG rules identify a schedule for all ships to have BWTS installed and operable over the next 6 years. Since nearly all large ships need to be able to transport cargo to U.S. ports, the USCG rules are in effect an international standard now.

Even with the USCG rules the following issues exposes our harbors and ports to great risks of yet another ecological disaster.

1. The USCG rules have no provision for verifying that a BWTS is operating properly. A ship's BWTS may have passed certification testing, but because of many reasons, when it is operating, it may not kill all of the organisms it is supposed to kill. For example, many BWTS use Ultra Violet (UV) radiation to kill organisms in the ballast water. This system will not work unless the water is crystal clear. This system will not work if organisms pass by the radiation in clusters, such that not all organisms receive the minimum dose of radiation to render it to not be a threat. In fact, there are research reports that question the viability of UV even in the best of conditions.

2. According to the USCG rules some ships are not required to have a BWTS for another 6 years. Meanwhile these ships are dumping ballast water into our harbors and ports regularly over the next 6 years. If this continues for another 6 years, BWTS may be of useless value as all organisms throughout the world will be mixed together. The game will be lost. Just as all it took was one ship dumping ballast water from the Baltic Sea to cause the Great Lakes disaster.

What can be done? Many will claim we are doing everything we can. In the first case, technology doesn't exist to inspect the huge amount of water in a vessel's ballast tank to ensure nothing is living. In the second case, it will just take 6 years to get BWTS installed on ships. It can't be done any faster. There aren't enough dry dock facilities to do it faster. These arguments are simply not true.

In the first case, protocol testing standards can be established and administered to ensure a BWTS on a ship has been operating properly. I envision a test protocol based on introducing living organisms into the input flow of ballast water being loaded onto a ship; then to sample the ballast water before it is to be discharged to verify that the test organisms have indeed been killed, as evidenced by their absence. If any of the test organisms are found in the ballast water, then clearly the ballast water treatment systems has failed during its operation, and the vessel should be prohibited from discharging any ballast water.

In the second case, ports can install onshore BWTS for processing ballast water discharged from ships without BWTS installed. All that is needed are large holding tanks for receiving discharged ballast water and treatment facilities for ensuring all invasive organisms are dead.

Is Pacific Fishery Management Council pursuing these issues now? If not, is Pacific Fishery Management Council interested in pursuing these issues? If not, would you direct me to an ecologically oriented organization that would be interested in this subject.

I would like to volunteer my efforts to helping get these issues addresses before another Zebra Mussel ecological disaster occurs.

Sincerely,

Gary Shilling

840 San Dieguito Drive

Encinitas CA 92024

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Thank you for your comments to the Pacific Fishery Management Council. Your comments have been received and will be forwarded to the appropriate staff member for processing.

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