Mark Powell

REPORT OF THE HABITAT COMMITTEE

The Habitat Committee (HC) met Monday and Tuesday to discuss matters related to essential fish habitat, marine reserves, the letter to the Federal Energy Regulatory Commission (FERC), Klamath and Trinity River flows, Columbia River dredging, rebuilding plans, and other matters. The HC will comment separately on agenda items F.1 and F.2 (marine reserves), C.5 and C.6 (groundfish).

FERC Letter

The letter to the Federal Energy Regulatory Commission regarding dam relicensing was sent on May 13, 2002. The Council has not yet received a response.

Klamath River Flow Issues

The National Marine Fisheries Service (NMFS) draft biological opinion (BO) on the effects of the U.S. Bureau of Reclamation's Klamath Project on coho salmon and its critical habitat in the Klamath River was released on May 16, 2002. Comments on the draft BO were due by May 24, and the final BO was released on May 31. This very short comment period precluded the development and review of the fast-track comment letter that was approved by the Council at the April 2002 meeting. The Habitat Committee recommends a letter be drafted for Council consideration at the September meeting that addresses the potential deleterious effects of the final BO on Council-managed anadromous fish species and their habitat.

The final BO covers Klamath Project operations for the ten-year period from June 1, 2002 through March 31, 2012. It guarantees full irrigation deliveries for all months during all water year types at the expense of sufficient flows below Iron Gate Dam to support the biological needs of coho salmon and other salmonids. To avoid jeopardy to coho, the final BO includes a "reasonable and prudent alternative" that provides monthly flow targets that are less than the flows recommended by the Hardy Phase II Flow Study for 78% of the water year time steps. (The Phase II flow study was commissioned by the Department of Interior to determine flow needs in the Klamath River to meet Endangered Species Act (ESA) and tribal trust needs for salmonids). Furthermore, the long-term flow targets would be gradually phased in, so that full attainment would not occur until 2010 or 2012. The BO holds the Bureau of Reclamation responsible for only 57% of the target flows at Iron Gate Dam, based on the percentage of total irrigated acreage in the upper Klamath Basin served by the Klamath Project. However, Reclamation will not be able to provide its full share of target flows until 2007. Long-term flow targets will only be met by the development of new water sources, annual leasing of water, or conservation measures during the ten-year period, so the attainment of these flows is uncertain and highly speculative. At least for the next few years, the BO will essentially allow the average monthly minimum flows attained during the 1990-1999 period. For perspective, NMFS required a flow of 2,100 cubic feet per second (CFS) in June 2001, which was a much drier water year. This June, the flow rate is about 1,000 CFS—half the 2001 rate. The Council has previously expressed its concerns regarding such low flows in letters to the Bureau of Reclamation.

The BO states that implementation of the reasonable and prudent alternative and the incidental take statement would adequately conserve coho essential fish habitat. NMFS will reconsult on chinook EFH after finalization of the Hardy Phase II Flow Study Report. We do not believe that coho salmon EFH will be conserved by the prescriptions provided in biological opinion.

Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC)

Mr. Jon Kurland, the National EFH Coordinator for NMFS, briefed the committee on the National EFH Rule and the National Environmental Policy Act (NEPA) process for EFH. The Committee also heard a report on the National EFH Workshop held this spring in La Jolla, California.

Also, Mr. Steve Copps updated the Habitat Committee on the EFH environmental impact statement (EIS). He outlined the need to conduct a risk assessment to help focus the federal decision-making process regarding EFH. A coastwide habitat map, combined with fishing effort information and biological information,

is currently being developed as part of this process. Ms. Fran Recht is also coordinating a description of gear types that will contribute to the EFH EIS effort. The HC also discussed its involvement in a workshop to describe gear types. Work on all of these activities is expected to intensify this fall.

The Habitat Committee would like to commend Mr. Copps, Mr. Jim Glock, and Ms. Marija Vojkovich for their extensive, high-quality work on the EFH and programmatic environmental impact statements.

Report on Trawling and Dredging Impacts

Dr. Susan Roberts from the National Research Council gave a very informative presentation on the National Research Council's (NRC's) report on trawling and dredging impacts. (A final version of the NRC report will be released in the next ten days. An executive summary of the draft report is attached). The study, which was done at the request of NMFS, summarized existing knowledge about the effects of bottom trawling on seafloor habitats. While more information is still needed, the report concluded there is enough information on these effects to make informed decisions about trawling and dredging impacts. Given the implications of this information for essential fish habitat, the Habitat Committee recommends the Council hear this report at either the September or November Council meeting.

Columbia River Dredging

In October 1999, the Council sent a letter on Columbia River dredging to the Army Corps of Engineers expressing concern about the effects of channel "improvements" on essential fish habitat in the Columbia and lower Willamette Rivers. The Habitat Committee reviewed this letter and received an update on actions that had been taken since the letter was written. Because it appears the Corps has not followed up on most of the letter's recommendations, the Habitat Committee would like to prepare a letter to the Corps to present to the Council at the September or November meeting.

Cruise Ships

The HC discussed the effects of cruise ship anchoring practices on marine habitat. This issue has been raised during the Magnuson-Stevens Act reauthorization process. The HC will track this issue and report on it at future Council meetings.

Habitat Committee Mission Statement

The HC discussed a draft mission statement that outlined its role in coordinating essential fish habitat issues. After much discussion, the mission statement was put aside, because essential fish habitat issues already fall within the HC mission. No additional HC time and effort, apart from the typical level of involvement in these issues, is currently anticipated.

PFMC
06/19/02

Full draft report online at
http://books.nap.edu/books/0309083400/html/

Effects of Trawling and Dredging on Seafloor Habitat

Prepublication Draft

Committee on Ecosystem Effects of Fishing:
Phase 1—Effects of Bottom Trawling on Seafloor Habitats
Ocean Studies Board
Division on Earth and Life Studies
National Research Council

National Academy Press
Washington, D.C.

EXECUTIVE SUMMARY

Fishing has a variety of effects on marine habitats and ecosystems, depending on the type of gear, the level of fishing effort, and the spatial extent of fishing. Expansion of U.S. domestic fisheries after passage of the Magnuson-Stevens Fishery Conservation and Management Act of 1976 fueled technological advances in gear and navigation that greatly increased the geographical extent of these effects. However, declining fish stocks have reduced fishing activities in some areas over the last decade. Attention became focused on the impacts of fishing on the seafloor following passage of the Sustainable Fisheries Act in 1996, which required that fishery management plans address the effects of fishing on habitat. The primary fisheries involved in the controversy are the trawl and dredge fisheries, which tow gear over seafloor habitats and communities. A complete consideration of the effects of fishing on ecosystems would require evaluation not only of trawl and dredge gear, but also stationary gear (e.g., traps, pots, longlines, gillnets) and other kinds of towed gear (e.g., pelagic trawls) on both target and non-target species.

As a first step in evaluating the ecosystem-level effects of fishing, the National Marine Fisheries Service (NMFS) asked the Ocean Studies Board to study the effects of bottom trawling and dredging on seafloor habitats. Specifically, NMFS asked the committee to undertake the following tasks: 1) summarize and evaluate existing knowledge on the effects of bottom trawling on the structure of seafloor habitats and the abundance, productivity, and diversity of bottom-dwelling species in relation to gear type and trawling method, frequency of trawling, bottom type, species, and other important characteristics; 2) summarize and evaluate knowledge about changes in seafloor habitats associated with trawling and the cessation of trawling; 3) summarize and evaluate research on the indirect effects of bottom trawling on non-seafloor species; 4) recommend how existing information could be used more effectively in managing trawl fisheries; and 5) recommend research needed to improve understanding of the effects of bottom trawling on seafloor habitats.

During the course of this study, the committee held public meetings in several regions with participation by fishery scientists and managers, the fishing industry, and environmental groups. Discussions at these meetings often centered on concerns that habitat protection initiatives would become avenues for the reallocation of resources among stakeholders, including various sectors of the fishing industry, recreational fishing groups, and conservation organizations. Resolution of these allocation considerations to meet ecological and socioeconomic goals has often been contentious.

The policy context for addressing the effects of fishing on habitat is found in the essential fish habitat (EFH) provisions specified by the 1996 Sustainable Fisheries Act amending the Magnuson-Stevens Fishery Conservation and Management Act. The amended act requires regional fishery management councils to describe and identify EFH for each fish stock managed under a fishery management plan, to minimize to the extent practicable adverse effects on such habitat caused by fishing, and to identify other actions to encourage the conservation and enhancement of such habitat. Most regional councils developed a single, overarching EFH amendment rather than amending each individual fishery management plan. The Secretary of Commerce approved most of the revised plans, but some environmental groups have mounted

legal challenges regarding the adequacy of some of the EFH amendments. A major complaint was that the regional councils did not sufficiently address the effects of fishing gear on benthic habitats.

The regional councils found it difficult to develop criteria for designating EFH due to gaps in existing knowledge on the distribution of benthic life stages of fishes and other species and the physical and biological characteristics of the seafloor. Similarly, the councils struggled with the requirement to assess the effects of bottom trawling and dredging because they had insufficient data on the spatial scale and extent of bottom fishing effort and lacked guidelines for generalizing the results of research on specific gears and habitats. These problems relate to the committee's task to recommend ways for using existing information in the management of the habitat effects of trawl and dredge fisheries.

A complete assessment of the ecosystem effects of trawling and dredging requires three types of information:

1) gear-specific effects on different habitat types (obtained experimentally);
2) the frequency and geographic distribution of bottom tows (trawl and dredge fishing effort data); and
3) the physical and biological characteristics of seafloor habitats in the fishing grounds (seafloor mapping).

This report summarizes the currently available data in these three areas and describes how the low spatial resolution and availability of the fishing effort and habitat mapping data restrict a full evaluation of the ecosystem effects of trawling and dredging.

Under the first category of information, many experimental studies have documented the acute, gear-specific effects of trawling and dredging on various types of habitat. The results confirm predictions based on the ecological principle that stable communities of low mobility, long-lived species will be more vulnerable to acute and chronic physical disturbance than short-lived species in changeable environments. Trawling and dredging can reduce habitat complexity by removing or damaging the biological and physical structures of the seafloor. The extent of the initial effects and the rate of recovery depend on the stability of the habitat. The more stable biogenic (i.e., of biological origin), gravel, and mud habitats experience the greatest changes and slowest recovery rates. In contrast, less consolidated coarse sediments in areas of high natural disturbance show fewer initial effects. Because these habitats tend to be populated by opportunistic species that recolonize more rapidly, recovery is also faster. Significant alterations to habitat can result in changes in the associated biological communities, potentially altering the composition and productivity of fish communities dependent on seafloor habitats for food and refuge.

The second category of information, the geographic distribution and frequency of trawling and dredging, suffers from limitations in the spatial resolution of the data and regional variation in reporting methods. For example, trawling effort data are averaged over reporting areas that range from 25 to 2,420 km^2 depending on the region. Although the data are imperfect, a few generalizations emerged from the analysis presented in this report. Estimates of the spatial extent and intensity of trawl and dredge fishing effort indicate that bottom trawling takes place over large areas of the continental shelf and slope. The level of effort varies greatly among

regions. The highest intensity of effort, based on rough estimates of the number of times a reporting area is swept (Table 3.1), occurs in the fishing grounds of the Gulf of Mexico and New England regions. In contrast, bottom trawling in the Mid-Atlantic, Pacific, and North Pacific regions is relatively light, with less than 1 tow per year in many reporting areas. Even in heavily trawled regions effort is not evenly distributed; as a consequence some areas may be trawled several times per year while other areas are trawled infrequently if at all. Throughout the 1990s and into 2001 there were significant reductions in the intensity and spatial extent of bottom trawling. These reductions reflect effort reductions, area closures, and gear restrictions instituted by managers in response to problems with declining fish stocks, bycatch, or interactions with endangered species.

The spatial distribution of different habitat types in trawled (or dredged) areas is the third category of information that must be integrated with the other two to assess the effects of trawling and dredging on ecosystems. Experimental studies on specific gear types in a few well-defined habitats provide small-scale estimates of ecological disturbance, but for most areas only coarse maps are available on habitat distribution.

The mismatch in the spatial scales of experimental results, habitat maps, and trawl effort reporting data makes it difficult to assess the ecosystem level effects of trawling and dredging. Although fisheries managers continually collect data to improve decision-making, limitations in resources and time require managers to assess the effects of fishing in the absence of complete information. In this context, comparative risk assessment provides a promising approach for evaluating the effects of bottom trawling and dredging. This method brings together the various stakeholders to identify risks to seafloor habitats and prioritize management actions within the context of current statutes. Because risk assessment requires full use of all available information on seafloor habitats, fishing methods, and effort distribution there is an immediate need to integrate the available data in a readily available format.

Recommendations

Although there are still habitats, gears, and geographic regions that have not been adequately studied and characterized, there is an extensive literature on the effects of fishing on the seafloor. It is both possible and necessary to use this existing information to more effectively manage the effects of fishing on habitat. The following recommendations fall into three categories: I) interpretation and use of existing data; II) integration of management options; and III) policy issues raised by existing legislation. These recommendations are intended to build upon the strengths of existing approaches to management rather than completely transform them.

I. Interpretation and Use of Existing Data

Recommendation: Fishery managers should evaluate the effects of trawling based on the known responses of specific habitat types and species to disturbance by different fishing gears and levels of fishing effort, even when region-specific studies are not available.

The lack of area-specific studies on the effect of trawling and dredging gear is insufficient justification to postpone management of fishing effects on seafloor habitat. The

direct responses of benthic communities to trawling and dredging are consistent with ecological predictions based on disturbance theory. Therefore, extrapolations from common trends observed in other areas provide useful first-order approximations of fishing effects for use in habitat management. These estimates should be revised, as more site-specific information becomes available on the fine scale distribution of fishing effort and habitat distribution.

Recommendation: NMFS should integrate existing data on seabed characteristics, fishing effort and catch to provide geographic databases for major fishing grounds.

Management decisions about the potential impact of fishing on habitats can be improved by the simultaneous and consistent presentation of all available data on the characteristics of the seabed and fishing effort. Data exist on different seabed types and habitats and on the location and intensity of fishing for much of the U.S. continental shelf. Available datasets have been collected by different agencies and currently exist in different formats, at variable levels of resolution, in separate archives. Integration of these databases into a single, geographic information system will assist managers in evaluating regional needs for habitat conservation.

II. Integration of Management Options

Recommendation: Management of the effects of trawling and dredging should be tailored to the specific requirements of the habitat and the fishery through a balanced combination of the following management tools:

1) Fishing effort reductions. Effort reduction is the cornerstone of managing the ecological effects of fishing, including, but not limited to, effects on habitat. Both of the other management tools (gear restrictions or modifications and closed areas) may also require effort reduction to achieve maximum benefit. The success of fishing effort reduction measures will depend on the resilience and recovery potential of the habitat.
2) Modifications of gear design or gear type. Gear restrictions or modifications that minimize bottom contact can reduce habitat disturbance. In addition, shifts to a different gear type or operational mode may be considered, but the social, economic, and ecological consequences of gear reallocation should be recognized and addressed.
3) Establishment of areas closed to fishing. Closed areas are necessary to protect a range of vulnerable, representative habitats. Closures are particularly useful for protecting biogenic habitats (e.g., corals, bryozoans, hydroids, sponges, seagrass beds) that are disturbed by even low levels of fishing effort. Because area closures may displace effort to open fishing grounds, effort reductions may be necessary in some cases to reduce habitat impacts.

The optimal combination of these management approaches will depend on the characteristics of the ecosystem and the fishery—habitat type, resident seafloor species, frequency and distribution of fishing effort, gear type and usage, and the socioeconomics of the fishery. Each of these characteristics should be considered during development of management plans for mitigating the impacts of fishing on the seafloor.

Recommendation: The regional fishery management councils should use comparative risk

assessment to identify and evaluate risks to seafloor habitats and to prioritize management actions within the context of current statutes and regulations.

Risk assessment, in general, is a scientifically informed way of clarifying public debates over environmental policy by making the environmental consequences of particular policy choices explicit. Comparative risk assessment provides the following advantages for the task of benthic habitat protection.

- It can be used even in the absence of scientific certainty because it relies on a combination of available data, scientific inference, and public values.
- It provides simultaneous analysis of a wide range of risks to benthic habitats. Mobile bottom gear is only one of many factors contributing to the degradation of benthic habitats. Other factors might include pollution, drilling and natural disturbance.
- It enables stakeholder involvement in the decision-making process.

III. Policy Issues Raised by Existing Legislation

Recommendation: Guidelines for designating EFH and habitat areas of particular concern (HAPC) should be established based on standardized, ecological criteria.

The underlying aim of EFH concept is valuable and appropriately emphasizes the need to place management of exploited fishes within the context of managing the total ecosystem. However, the present designation of EFH does not require the use of consistent criteria with respect to the assignment of habitat to each life stage of species covered by fishery management plans. Instead, the regional councils develop the criteria, often based on data availability. Typically, current EFH designations are too extensive to form a practical basis for managing fisheries. Although this approach may assist in mitigating some habitat threats, it provides little guidance for evaluating the impacts of trawling and dredging. EFH designations need to be based on a clear understanding of the population biology and the spatial distribution of each species.

HAPC form a sub-set of EFH based on the ecological value of the area, its susceptibility to perturbation, and whether it is rare or currently stressed (National Marine Fisheries Service, 1997). Because these areas are known to play a vital role in the life cycle of exploited fish populations, they require the strongest safeguards to assure habitat protection. Nevertheless, no such protection is afforded in the current policy structure. HAPC should be clearly and narrowly defined with specific guidelines for determining the types of activities allowed and a timetable for reviewing the effectiveness of the designation.

Recommendation: A national habitat classification system should be developed to support EFH and HAPC designations.

Efforts to inventory and construct regional or national habitat maps require a classification system with common designations. Such a system would facilitate tracking of changes over time and would provide the basis for determining functional links between seafloor ecosystems and fisheries production. A classification system would assist in: 1) ranking different habitats according to the resilience of their biological communities and associated

fisheries; 2) estimating the vulnerability of the habitat to disturbance; and 3) managing habitat impacts based on the generalized results of research conducted in other geographic areas.

Future Research

In the course of this study, many gaps were identified in the current understanding of the impacts of fishing on the seafloor. The following recommendations are intended to direct research towards filling these gaps. They have been organized into three primary areas of research—gear impacts and modification, habitat evaluation, and management—with some overlap between categories.

Gear Impacts and Modification

Fishermen's knowledge and experience should be used to study gear impacts and develop new gear technologies. Their active engagement in research will help ensure that mitigation strategies are practical, enforceable, and acceptable to the fishing community. Further research on gear effects will be required to develop a predictive capability to link gear type and effort to bottom disturbance, fish production, and recovery times in particular habitats. New research should be directed toward:

- identifying the forces that injure and dislodge a range of benthic organisms;
- developing fishing gear with lower impacts, in terms of both habitat and other conservation goals such as bycatch reduction and maintenance of biological communities; and
- determining the relationship between fish production and bottom disturbance, especially for areas that continue to support fish despite chronic impact by fishing gear.

Habitat Evaluation

Most previous research studies have addressed habitat disturbance at small spatial scales with observations of short-term, acute disturbance and have focused on animal communities rather than ecosystem processes (e.g., productivity, nutrient regeneration). Closed areas should be used as control sites to study the chronic effects of seabed disturbance by trawl or dredge gear. Future research should examine:

- cumulative effects of trawling on sites that have been trawled repeatedly;
- repeated disturbances by fishing gear to determine the dose-response relationship as a function of gear, recovery time, and habitat type;
- recovery dynamics, with consideration given to estimating large-scale effects at current fishing intensities;
- acute and chronic effects of trawling in deeper water (>100 m); and
- recovery rates in stable and structurally complex habitats for which the return time will be measured in years to decades.

Evaluation of the indirect effects of bottom trawling and dredging will require experimentation, modeling, and comparison of different habitat types to analyze trends in benthic production and community structure relative to trends in fisheries production. This evaluation should include:

- impacts of habitat fragmentation on biological communities and the productivity of exploited fish stocks;
- rates and magnitude of sediment resuspension, nutrient regeneration, and responses of the plankton community in relation to gear induced disturbance; and
- long-term trend data on benthic production versus fisheries production.

Management

Productive interactions among stakeholders and policymakers should be enhanced through increased participation in research on the effects of fishing on the seafloor and development of alternative gears and practices. Interactions can be facilitated through user group funding of research and collaborative research between scientists and fishermen.

Development of better quantitative data for risk analysis will require research on the habitats and population dynamics of non-target species, specifically:

- adequate baselines for particular habitats and regions to document the effects of various fishery practices;
- testable hypotheses about how communities in different habitat types will respond to fishing;
- quantitative models to predict fishing effects in areas that have not been studied; and
- mortality estimates for non-target species.

NMFS should establish protocols for studying existing trawl and dredge area closures to evaluate the ecological, social, and economic impacts of habitat management strategies. This will facilitate assessment of various management alternatives in other locations. Aggregation and analysis of existing information on habitats, fishing effort, and efficacy of various management measures will help the regional fishery management councils meet their mandate to protect EFH. Research that will facilitate management decisions include:

- analysis of community structure and life history parameters to validate the use of frequency dependent distribution approaches for designating EFH and HAPC; and
- collection and analysis of data on the social and economic characteristics of trawl, dredge, and non-mobile gear fisheries to assess the tradeoffs among various management alternatives.

Conclusion

Integration of the available data on the effects of trawls and dredges, level of fishing effort, and distribution of seafloor habitats can provide practical, initial evaluations for informing management decisions regarding EFH. Current and new management measures should be assessed regularly to provide a better understanding of how various restrictions affect fish stocks and habitats, and to determine the socioeconomic impacts on the fishing industry and local communities.

However, existing data are not sufficient for optimizing the spatial and temporal distribution of trawling and dredging to protect habitat and sustain fishery yields. Resolution of the different, and at times conflicting, ecological and socioeconomic goals will require not only a

better understanding of the relevant ecosystems and fisheries, but also more effective interaction among stakeholders.

A CALMED DOWN ESTUARY

I. The Columbia Rivers Natural Wind Tunnel. Man made by design with Dredging Necessary. Dredging spoils taken out of the main channel. Then placed in the shallows from the rivers edge out. Made into the form of a peninsula. Angled down river say about 3 degrees. Built up to a height of 30 feet, with a tapered angle of about 30 degrees. So when the wind hits the angled peninsula it will drive the wind that is blowing from the ocean inland. Upward and away from the water. Adding in a quarter moon roof concrete structure on top of the peninsula. Forces the wind to blow in a horizontal wind shear, above the calm water estuary. Multiple peninsulas placed the desired distance apart all the way up the rivers estuary. All built the same with colored concrete caps made to look like a natural rock face. Slanted 30 degrees on the down river wind side. With a shier vertical rock face cliff on the up river side, with trees planted on the up river side.

Under the peninsula a modular concrete membrane to seal in polluted dredging spoils, floated in place, then dropped in place with multiple culverts placed parallel with the river. To allow for tidal and river water flow. Made out of concrete made to look like natural rock.

Alternating strips of river rock and sand placed side-by-side, parallel with the river between the estuary peninsulas. With a shallow under water sandy berm perimeter around the outskirts of the estuary. So when the wind blows during the day an under water sand storm will churn up along the narrow sandy perimeter berm area, to keep the big fish out. When the wind stops at night, it will let the small fish swim over the shallow sandy berm area, into the natural estuary. No more wave wind current flow churning up the water, into a watery sand storm, all over the entire estuary, Killing Smolts. It can't be that tough to do.

Working Solutions
Allan Vernon: Minor
C/O ALLAN V. MINOR©

Low Environmental Impact Dredging

Dredging allows for Shipping Commerce from Portland Oregon to all over the World. And CLEANS UP the bottom of the river polluted by mans past stupidity. Suggested Dredging Solution. Design build a water wall fish fenc turbine water tornado. By putting a round half moon metal pipe in a 360-degree circle on the river bottom, half moon facing up. Inner edge attached with chain or metal bands up to another half moon metal 360-degree pipe. Facing down, of a larger diameter than the bottom ring, with pressurized water hoses attached at an angle to the top ring, which has a water turbine blade inside of the top ring. Pressurized water drives the turbine, spinning the pressurized water wall down into the bottom smaller ring at an angle. Deflecting the spinning water off of the bottom ring out and away from the spinning water tornado. Keeping fish away from the dredging going on inside of the water tornado. Dredging done by another smaller water tornado being man made inside of the outer water wall tornado. The second inner water tornado will have no base metal ring on the river bottom. Allowing river bottom sediment of the river to be dug up at a cone angle in. A third smaller reverse water flow tornado inside of the two outer water tornados sucks up off of the bottom mud sand and silt off the river bottom, by using a reverse water flow tornado. The river bottom mud sand, and silt is then collected by a water hose suction method, filtering the water before its put back into the river. Dredging above the Dams also allows for more water storage capacity. Dredging along the riverbank allows for a cleaner water supply. By stopping wave wind current flow from churning up the bottom of the river into a sand silt sand storm in the water along the rivers shallow edge. Which is currently now the natural limiting factor for the Columbia River estuary smolt rearing capacity. You will never get a large increase in smolt rearing capacity in the Columbia River Estuary, until you solve this wave wind current flow shallow water sand storm problem. The Columbia River has always been a natural wind tunnel. An environmentalist never looks at the environment to make it better for all species including man. They just want nature to take its own coarse, it always changes, and sometimes it kills indiscriminately. Controlling it to survive is key!

Solutions For Survival

Allan Vernon: Minor C/O ALLAN V. MINOR©

FLOAT YOUR BOAT

Design build and install an air-compressor system on board ship. That pumps air bubbles under the outside of the under the hull. With lateral air tubes spaced evenly along the under side of the boat, from front to back. With air exit holes along the entire length of each tube. Each tube built into the hull of the boat, ship, or barge. In this way a cushion of air bubbles will always be between the boats hull in the water and the water itself. Creating a greater speed with less horsepower required. Along with an improved boat fuel economy. And when the boat, ship, or barge is up on plain and moving it will require less depth of the hull in the water. Because its floating on a cushion of air. Enhancing the fish's watery environment. Provided the system is designed not to pump too much nitrogen super saturation into the water. To meet the gas super saturation and temperature standards under the clean water act.

SAVE A WILD SMOLT THROUGH TECHNOLOGICAL INOVATION.

Allan Vernon: Minor
C/O ALLAN V. MINOR©

FISH, JOBS, MONEY, ECONOMIC IMPROVEMENT
SIMPLE SOLUTIONS

By redesigning and combining the water wall fish fence and the Salmon Steelhead spawning shelf system. One should be able to build these section by section in a module form. One section at a time, use the railway system to move the sections along the Columbia River. Then lift them out into the river by a crane. Which would also be on a rail car. Set them in place by a crane and or float them, and tow them in place by boat. If you don't want to support the water wall by driving pylons into the bottom of the river bottom. Float the water wall under a modular sectioned together floating dock. Two parallel floating docks, side by side a chosen distance apart. With the water wall fish fence attached to the parallel docks suspended underneath the docks. Also to simplify matters interconnect each module section by installing two water pipes horizontally above the water to each vertical end post. Install a platform between the horizontal pipes for each pump station. And a fishing boat tie up, camping platform. Made of lightweight artificial man made foam rock, matching the natural surroundings of the river. All buildings should be made the same way in the Columbia River Gorge. Like looking at a natural rock cliff outcropping, made out of artificial foam rock. Cold water pumped from the bottom of the impoundment lake in the river. To feed the water wall all the way up the Columbia River between the Dams, guiding the fish up to and through the Dams fish ladders. With an artificial Salmon, Steelhead, Spawning shelf system attached to the water wall fish fence. Man made round river rock gravel can be designed with a foam center. For lighter weight, to be put into the spawning bed shelf system. Put the unemployed to work, put the out of work Aluminum workers back to work. Put UNION LABOR to WORK Building this system now, WE NEED THE WORK! The pay back might just be in the billions of dollars put back into the economy. With the massive fish runs that should return with this system. Two-year cycle return for Steelhead, Three year, and five-year cycle return for Salmon. Guide the Fish to the fish ladder at the Dams with a water wall fish fence. AMERICA WORKS! Start at the mouth of the Columbia River, installing this modular system, the water wall, with spawning beads.

Working your way up the river seeding the spawning beds with wild fish eggs as you go. Problem Solved Economically and Ecologically Correct. Water pumps powered by electrical generators and or gravity feed water pumps.

AMERICA is in a constant state of WORK, not in a constant state of war.

Allan Vernon: Minor
C/O ALLAN V. MINOR©

ESSENTIAL FISH HABITAT ISSUES

Situation: The Habitat Committee (HC) will meet Monday, June 17, and Tuesday, June 18, 2002 to develop recommendations on the following agenda items:

F.1 Review of Proposal for Marine Reserves in State Waters of the Channel Islands National Marine Sanctuary (CINMS)
F.2 Update on Other Marine Reserves Processes
C.5 Adoption of Draft Rebuilding Plans for Public Review for Pacific Ocean Perch, Lingcod, Cowcod, Widow Rockfish, and Darkblotched Rockfish
C.6 FMP Programmatic Environmental Impact Statement (EIS)

Other issues on the HC agenda include a report on the national essential fish habitat (EFH) rule; a report by a member of the National Research Council on trawling and dredging impacts; a discussion of the groundfish EFH environmental impact statement; and a discussion of a mission statement for the HC regarding groundfish EFH. The HC's complete agenda is provided in Ancillary D.

Update on Klamath River Flows Fast-Track Letter

At the April Council meeting, the Council approved a fast-track letter to the Secretary of Commerce and the Secretary of the Interior regarding a National Marine Fisheries Service biological opinion (BO) on Klamath River flows. The opinion was delayed for several weeks, and the time allotted for public comment after the BO was issued was too short to allow the development of a fast-track letter. Therefore, no fast-track letter was sent.

Council Action:

1. Consider comments and recommendations developed by the HC at the April meeting.

Reference Materials:

1. Habitat Committee Agenda (Ancillary D).
2. Exhibit E.1, Supplemental Attachment 1 CDFG Letter. received 6/17/02
3. Exhibit E.1.d, Public Comment.

Agenda Order:

a. Agendum Overview — Jennifer Gilden
b. Report of the Habitat Committee (HC) — Paul Heikkila
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. **Council Action:** Consider HC Recommendations and Take Action as Necessary

PFMC
06/05/02

4. Exhibit E.1.b, Supplemental HC Report.

~~5. Exhibit E.1, Supplemental Attachment 1 CDFG Letter.~~

STATE OF CALIFORNIA – THE RESOURCES AGENCY GRAY DAVIS, Governor

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May 24, 2002

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Dear Mr. Sabo:

Comments on the National Marine Fisheries Service (NMFS) Draft Biological Opinion (BO) Regarding the Effects of Operation of the U.S. Bureau of Reclamation's (USBR) Klamath Project (Project) June 1, 2002, - March 31, 2012 Threatened Coho Salmon, Coho Salmon Designated Critical Habitat and Coho and Chinook Salmon Essential Fish Habitat (EFH)

Thank you for providing the Department of Fish and Game (DFG) the opportunity to comment on the NMFS May 16, 2002, draft BO which describes and evaluates the impacts of the USBR proposed operation of the Project for the ten-year period, June 1, 2002, through March 31, 2012, on federally-threatened southern Oregon/northern California coasts (SONCC) coho salmon (*Oncorhynchus kisutch*) and its designated critical habitat. Also, appended to the draft BO are the NMFS recommendations to the USBR for conserving EFH for the SONCC coho salmon evolutionarily significant unit (ESU), Upper Klamath-Trinity rivers chinook salmon ESU and the California Coastal chinook salmon ESU (misidentified in the BO as the SONCC chinook salmon ESU) as required under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The proposed action, as described in USBR's February 25, 2002, final biological assessment (BA), is to operate the Project to divert, store and deliver from storage water that would guarantee full irrigation deliveries for all months during all water year types for the ten-year period. Lake elevations and Klamath River flows are not part of the proposed action and are intended only as targets and not minimum operating rules; they are identified for planning purposes only (BO, pages 9 and 39). The USBR does not plan to release stored Project water for SONCC coho salmon ESA needs.

The DFG is providing these comments as the trustee agency for California's fish and wildlife resources. Our goal is to provide information and analyses that will assist the NMFS and the USBR in making sound management decisions that will avoid significant adverse impacts to California's fish and wildlife resources, lead to the timely recovery of SONCC coho salmon, protect SONCC coho salmon critical habitat and coho and chinook salmon EFH and comply with Federal and State laws. Of particular concern to us is the fact that coho salmon

north of San Francisco is presently a candidate species being considered for listing by the California Fish and Game Commission under the California Endangered Species Act (CESA). We previously provided written comments on the USBR January 24, 2002, draft BA (February 11, 2002, letter from D. Koch to M. Ryan) and comments on the U.S. Fish and Wildlife Service April 25, 2002, draft BO (May 9, 2002, letter from D. Koch to D. Sabo).

Based on a review of the current depressed status of SONCC coho salmon, information contained in the BO and our analysis of that information, it is the opinion of the DFG that the RPA contained in the BO, if implemented, will likely cause significant adverse direct and indirect impacts to SONCC coho salmon and their critical habitat and to coho and chinook salmon EFH. The DFG believes that Project operations sanctioned by the proposed RPA will likely "take" coho salmon, especially in dry and below average water years, by stranding and killing fry that have been displaced from favored stream margin edge-type habitat that is made unavailable by the proposed RPA flows. Since the flows in the RPA are so similar to those in the proposed action, at least for the first five years or so, we anticipate similar adverse impacts as we described in our February 11, 2002, comment letter on the BA. The net result will likely be a significant delay in recovery of coho salmon in the Klamath Basin.

The draft BO concludes that the proposed action is likely to jeopardize the continued existence of SONCC coho salmon; however, it is unclear whether the NMFS believes the proposed action is likely to adversely modify coho salmon critical habitat. For example, in Section 8.6. SONC (sic) Coho Salmon Critical Habitat, it is stated that "The level of potential adverse effects of Project operation on mainstem Klamath River habitat is greater under the proposed Project operation than during the 1961 through 1997 historical period of record and the 1990 to 2000 reference period. During the historical period of record, the status of Klamath River coho salmon declined and ultimately contributed to their listing under the ESA, in part, probably due to mainstem Klamath River habitat conditions. Therefore NMFS has determined that critical habitat within the mainstem of the Klamath River is <u>likely to be adversely modified</u>" (emphasis added) (BO, page 51). Yet, in Section 10. Conclusion, of the BO, it is stated "Based on the NRC report (2002a), NMFS <u>did not make a finding</u> that the action, as proposed, is likely to adversely modify critical habitat for the SONC (sic) coho salmon" (emphasis added) (BO, page 53). However, later in the BO in Section 11.5.0. Notification, NMFS states "Because this biological opinion has found jeopardy and <u>adverse modification of critical habitat</u>, Reclamation is...." (Emphasis added) (BO, page 74). The NMFS should clarify its position in the final BO regarding the effects of the proposed action on SONCC coho salmon critical habitat.

Reasonable and Prudent Alternative

To avoid jeopardy to SONCC coho salmon, NMFS proposes a reasonable and prudent alternative (RPA) consisting of five elements (BO, pages 53-54) that would be phased in over the ten-year period of Project operation (BO, pages 57-58, Table 8):

"1) specific water management measures over the next 10 years (2002-2012);

2) a water bank and water supply enhancement program to provide flows in the Klamath River below IGD to improve coho salmon habitat;

3) an agreed upon flow target to be achieved by 2012;

4) an intergovernmental task force to develop, procure, and manage water resources in the Klamath River Basin; and

5) an intergovernmental science panel to develop and implement a research program to identify and fill gaps in existing knowledge regarding coho salmon and their habitat requirements during various life history stages and water year types."

RPA Flows

The NMFS developed a tentative long-term flow target to be achieved by 2012 (BO, page 53) or 2010 (BO, page 71) for incorporation in the RPA by utilizing habitat-discharge relationships for coho salmon fry (as a surrogate for coho salmon smolts) contained in the draft "Hardy Phase II Flow Study Final Report" (Phase II Report), other information in the Phase II Report, results of numerous other studies on the Klamath River and elsewhere, and conclusions and recommendations contained in the National Research Council's (NRC) 2002 Interim Report "Scientific Evaluation of Biological Opinions on Endangered and Threatened Fishes in the Klamath River Basin" (NRC Report). According to the BO, the long-term flow target would be subject to change as new studies during the ten-year period provided compelling information to either increase or decrease flows for various times of the year. The long-term flow schedule is described in Table 9 (BO, page 72) and recommends flow releases at Iron Gate Dam (IGD) by five water-year types for monthly, biweekly or weekly periods. The BO does not state whether these are mean, median, average minimum or instantaneous minimum flows. The final BO should clarify this issue.

Table 9 represents one hundred flow values based on five water-year types and twenty time periods; thirteen of these values exceed, nine are the same and seventy-eight are less than the corresponding flows recommended in the Phase II Report. We believe that the Phase II Report recommended flows, which are instantaneous minimums, represent the best currently available science regarding Klamath River coho salmon flow needs and should be implemented during 2002 Project operations and into the future until credible information indicates otherwise.

Project Contribution to RPA Flows

The RPA flows prescribed by NMFS were found to be not viable by the Department of Interior because they would result in deficiencies in deliveries of water to Project contractors (BO, page 55). To remedy this situation, NMFS and the USBR agreed to hold the Project

responsible only for that amount of water represented by the percentage of Project irrigated acreage in the upper Klamath Basin which apparently totals fifty-seven percent. Thus, the USBR "would be responsible for 57% of the releases at Link River Dam needed to result in the IGD flows described in NMFS' RPA flows or the flows that are identified in Table 5.9 of the BA, whichever are greater" (BO, page 56). At this time, the Project does not have the capability to meet its fifty-seven percent share of the RPA flows and still make full irrigation deliveries under all water year types. The BO allows the USBR to take a phased approach and schedule that would allow the development of a water bank that would be dedicated to Klamath River flows and make progress toward its fifty-seven percent share in four increasing annual increments such that by water year 2006 the USBR will have developed a water bank of one-thousand acre-feet. In years when the one-thousand acre-feet water is insufficient, the USBR would employ "other actions and measures" to ensure it meets its share of Klamath River flows although the BO does not define what these actions or measures would be. In addition, the USBR has agreed to convene a panel of scientific experts to assist in designing studies to improve the understanding of the relationship between flows and fish survival.

The position of the USBR that irrigation deliveries have priority over ESA needs and that the Project is responsible only for the release of fifty-seven percent of the flow at Link River Dam that is needed to attain RPA long-term target flows at IGD is unprecedented and contrary to past legal and policy decisions. Several court cases, a number of Department of the Interior Solicitor's memoranda, past operations plans and other documents have previously asserted that ESA needs and tribal trust rights have priority over agriculture for Project water. Most of the water use above the Project is private and the water rights of the upper basin have not yet been adjudicated. Thus, there is little ability for the USBR to solicit additional water from outside of the Project area to contribute to full RPA flows. Since the USBR is the only Federal agency empowered to manage upper Klamath Lake waters, has control over Link River Dam and is the single largest diverter of water in the upper basin, it has the legal obligation to identify and provide for the full flow needs of all listed species that are adversely impacted by Project operations.

Other Sources Contributing to RPA Flows

The BO suggests that the USBR will take the lead to establish a multiagency task force comprising Federal, State, tribal and where possible local agencies and interests to develop the other forty-three percent of the flows identified in the RPA. The water to achieve these flows would come from areas outside the boundaries of the Project. The BO suggests that most of this water would come from stepped up water rights and water laws enforced by California and Oregon and programs to improve tributary flow above and below the Project so that by 2010 NMFS would expect the RPA flows to be realized unless those flows were modified by the results of scientific investigation. We have little confidence that such a complicated undertaking can be completed in eight years and will result in sufficient water to satisfy the long-term RPA flow target.

A summary of the major components of the RPA and its implementation schedule is provided in Table 8. Proposed RPA Elements by Water Year (B O, page 57). The RPA implementation schedule indicates that, for the first few years, RPA flows are little different from the proposed action and that by the fifth year (2006) flows have only attained fifty-seven percent of the RPA long-term flow target assuming all proposed actions are successful. Not until year eight or ten are full long-term flow targets expected to be achieved and then only if all the actions, which have not yet even been identified, are successful. Because of all the uncertainties involved, this approach has an extremely high probability of not reaching the long-term flow target within the allotted ten-year time frame.

The "NMFS thinks that the (above) approach contained in this RPA sufficiently addresses the adverse effects of the Klamath Project to SONC (sic) coho salmon and its critical habitat by incrementally improving smolt migration habitat over conditions that would be achieved in the BA and those suggested in the NRC Report" (BO, page 57). Furthermore, NMFS believes that by implementing the RPA and the terms and conditions of the Incidental take statement the USBR will satisfy the conservation measures needed to protect both coho and chinook salmon EFH (BO, page 103).

The DFG believes that the RPA is vague and presents presents recommendations based on conjecture provided by USBR. The RPA will be extremely difficult to implement and, even if fully implemented, will not adequately protect SONCC coho salmon and its critical habitat. Any incremental increase in flows above those in the USBR's proposed action would only accrue if new sources of water, dedicated solely to the Klamath River, are developed either within or outside the Project. The USBR has not specified a mechanism for establishing a water bank. The ability to secure adequate and timely funding, cooperation among diverse interests and new sources of water is highly problematic. Under this RPA, many of the important new studies will take many years to complete and studies that indicate more water is needed to support coho salmon would not result in timely increases in flow.

The decision by the NMFS to delay full implementation of RPA flows by eight or more years, to not use stored water to meet coho salmon flow and habitat requirements and to give priority to agricultural water deliveries over the needs of listed species violates provisions of the ESA and is contrary to numerous past legal and policy decisions. Implementation of the proposed RPA will likely result in the reduced survival and abundance of several freshwater life history stages of coho salmon and would be expected to appreciably reduce the likelihood of survival and recovery of SONCC coho salmon. The approach that the NMFS has taken is to provide certainty for full irrigation deliveries at the expense of coho salmon habitat and flow needs and in so doing it has abandoned the conservative "precautionary approach" of giving the benefit of doubt to the species of concern. The "precautionary approach" is a risk management tool that is prominent in conservation biology that the NMFS has advocated (BO, page 7).

Although there is merit in some of the actions that the RPA proposes, these actions are more suited to a long-term basin restoration plan or a habitat conservation plan. An RPA has to be much more precise, fully protective, immediately effective and have a high probability of being implemented.

Length of the Proposed Action

The proposed action and the RPA are for a ten-year period, yet little justification is provided why this time period was chosen or is important other than the conclusions of the NRC Interim Report which suggests that there is no convincing scientific justification at present for deviation from flows derived from operational practices in place between 1990 and 2000, a ten-year period. We do not understand the relevance of or need for prescribing Project operations for a ten-year period. The DFG spent several years working with the USBR and a host of other stakeholders in scoping-out the elements of a Project long-term operations plan based on multiple water year types. The proposed long-term plan, which was never finalized, did not include a defined time period. It was intended that the long-term plan meet the requirements of the National Environmental Policy Act (NEPA) and would include the evaluation of a broad range of alternatives. We recommend that, given the present disagreement among various parties regarding the water requirements for threatened and endangered species in the Klamath Basin, that the NMFS provide BO coverage only for the 2002 Project operations. We believe that if a BO is finalized that covers multiple water year types and/or multiple years that the Project action should be subject to NEPA.

Water Year Determination

In the proposed action, the USBR proposes determining water year type by using a seventy percent probability of exceedence for upper Klamath Lake inflow forecasting. The BO concurs with this approach. The use of a seventy percent exceedence forecast underestimates inflows to Upper Klamath Lake seven out of ten years, leading to planning and management for drier water year types and lower Klamath River flows than actual inflows would warrant. Drier water year types are forecast more often and wetter years less frequently than would naturally occur. The result is that, due to procedural bias in planning, less water is provided for Klamath River fish needs. We recommend that a fifty percent exceedence factor for inflow forecasting be made an element of the RPA. This would result in an equal probability of under- or overpredicting inflow to Upper Klamath Lake. The fifty percent exceedence factor is an RPA requirement of the USFWS 2002 draft BO.

Water Year Types

The USBR proposed action includes categorizing water years into four types (above average, below average, dry and critically dry). This partitioning results in above average and below average water year types and corresponding flow regimes accounting for eighty percent

of all water supply forecasts and does not reflect the range of flow variability necessary to accommodate the needs of coho salmon. NMFS has included in its RPA the five water-year types proposed in the Phase II report. They represent wet years (10% exceedence), above average years (30% exceedence), average years (50% exceedence), below average years (70% exceedence) and dry years (90% exceedence). The DFG has long supported this change and agrees with this RPA element.

Ramping Rates

The USBR proposed action does not include criteria governing IGD down ramping rates to prevent potential coho salmon stranding. The RPA states that the USBR will operate the Project to provide the following down ramping rates: "(1) decreases in flows of 300 CFS or less per 24-hour period and no more than 125 CFS per four-hour period when IGD flows are above 1,750 CFS; or (2) decreases in flows of 150 CFS or less per 24-hour period and no more than 50 CFS per two-hour period when IGD flows are 1,750 CFS or less." We believe that this down ramping schedule is protective of anadromous fish and therefore support its inclusion in the RPA.

Essential Fish Habitat

The EFH regulations require that Federal action agencies obligated to consult with NMFS provide NMFS with a written statement on the effects of their action on EFH. Because an EFH assessment was not received from the USBR for the proposed action, NMFS relied on the draft BO and other sources of information in preparing its EFH conservation recommendations (Attachment A). The Pacific Fisheries Management Council, under Amendment 14 to the Pacific Coast Salmon Fishery Management Plan, has identified and described EFH for chinook and coho salmon in the Klamath River and its tributaries upstream to IGD. Upon receiving NMFS EFH recommendations, the USBR is required to provide a detailed written response within thirty days describing how they intend to avoid, mitigate or offset the impacts of the activity on EFH.

The NMFS determined that the proposed action "will adversely affect spawning, rearing and migratory EFH functions of Pacific Salmon currently or previously managed under the Magnuson-Stevens Act. Primarily, NMFS thinks that the proposed project would result in a continued decline in EFH conditions in the Klamath River over time, and thereby preclude rebuilding of the coho salmon population and reduce habitat required to support a sustainable chinook fishery" (BO, page 103). The NMFS concluded that implementation of the BO's RPA and the terms and conditions of the incidental take statement would constitute necessary conditions for conserving Klamath River chinook and coho EFH. The DFG disagrees based on our earlier discussion of the inadequacies associated with the proposed RPA. We believe it would be impossible to meet the mandates of the Magnuson-Stevens Act for EFH without providing flows in the Klamath River on a regular and long-term basis that are significantly greater than those proposed in the RPA. The proposed RPA will

likely cause significant adverse impacts to EFH and the anadromous fish this habitat supports. We believe full implementation of the Phase II report recommended flows will help USBR meet the mandate of not adversely affecting EFH.

Section 7.6 - Hatchery Programs

This section should be expanded to recognize the recent joint efforts of the DFG and NMFS to evaluate operation of the DFG's anadromous fish hatcheries and implement appropriate and effective changes when necessary to minimize their effects on naturally produced salmon and steelhead. This joint evaluation effort has already been completed for both Iron Gate and Trinity River hatcheries and changes are already being implemented. For example, release of the 4.9 million chinook salmon smolts produced this year was modified from a three-day forced release of all fish around the first of June to a phased approach beginning in mid-May. This year, four to five separate lots of 850,000 to 1.5 million fish averaging 90/pound will be volitionally released over a month long period. Each lot contains a group of 50,000 coded-wire tagged fish to enable the DFG to monitor the effectiveness of the program. This operational change is being implemented to minimize the effect of hatchery fish on naturally produced fish as well as each other.

Section 8.5 Summary of Effects

This section needs to be expanded to better reflect the likely impact of long-term Project operations that keep flows in the mainstem Klamath River at or below 1,000 cfs during dry and critically dry years. If the State's restoration efforts are successful at reducing overall sediment budgets in the tributaries, we would expect that the large gravel deltas at the confluence of the tributaries with the Klamath will also decrease. If this occurs, we would also expect improved conditions for coho fry forced within the mainstem to be able to access these tributaries to oversummer where habitat conditions, particularly with respect to water temperature, are better. If flows are too low in the mainstem, the ability of coho fry to access the tributaries will remain impeded as compared to higher flows. Thus, the significant financial commitment of the State to restoring tributary health may not be able to produce the expected and desired benefits for fish because mainstem flows are too low.

Again, thank you for the opportunity to comment on the draft BO. We look forward to reviewing the final BO when it becomes available. If you have any questions regarding our comments, please contact Habitat Conservation Program Manager Mark Stopher. He can be reached at the letterhead address or by telephone at (530) 225-2275.

Sincerely,

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