

Washington DNR
Aquatic Resources Program
HCP Science Review Panel
Final Report

Comments and Recommendations on
Covered Species and
Potential Effects Analysis

January 2007

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Acknowledgements

DEPARTMENT OF NATURAL RESOURCES

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WASHINGTON STATE DEPARTMENT OF
Natural Resources

January 2006

The Washington State Department of Natural Resources (Washington DNR) reached the decision to institute a review of the material developed in support of its Habitat Conservation Plan (HCP) for state-owned aquatic lands in early 2006. Members for the panel were recruited based on recommendations from science and environmental advocacy staff at federal and state agencies, academia and non-governmental agencies.

The Science Review Panel (the Panel) was formally convened in July of 2006 and consisted of scientists from the Puget Sound Action Team; Washington Sea Grant; US Forest Service; National Oceanographic and Atmospheric Administration, Northwest Fisheries Science Center; University of Washington; South Slough National Estuarine Research Reserve (Oregon); TetraTech; and the Washington Departments of Fish and Wildlife and Natural Resources. Their comments and recommendations are based on a series of technical papers developed in support of the HCP and describing the:

- Distribution, life history, population trends, and threats of 87 species (Covered Species White Paper, 2005);
- Habitats that occur on state-owned aquatic lands (Covered Habitat Technical Paper, 2005);
- Activities authorized by Washington DNR on state-owned aquatic lands, as well as the legal authorities surrounding the activities (Covered Activities Technical Paper, 2005); and
- Potential effects of the activities on identified species and expected outcomes from identified conservation measures (Potential Effects and Expected Outcomes Paper, 2006).

Due to the sheer volume of the material developed, the papers were excerpted from the original documents and presented to the Panel along with supporting spreadsheets, and other material either deemed relevant or requested by the Panel (Appendix A). The meetings were lead/facilitated by the Lead Scientist for

Washington DNR's ESA Compliance Team with support from other Team members. All materials were disseminated to the Panel two weeks prior to each meeting, with the meetings consisting of a presentation by the Panel Lead on the defined topic and open discussion. Meeting notes were kept and circulated to the entire Panel, along with the results of any additional research requested by the Panel (Appendix B).

While the ESA Team staff defined a charge for the Panel, as well as a series of questions to be used in focusing their comments (Appendix C), the Panel redefined both its charge and the questions over the course of their work. This Final Report is the work of the Panel themselves, with comments refined by the entire Panel in their final meeting, compiled for publication by individual Panel members, and edited for consistency by a professional editor. The Panel Lead's responsibilities were limited to facilitating the process and typesetting/formatting.

Carol Cloen, Panel Lead

Executive Summary

The Washington Department of Natural Resources (DNR) assembled a Science Review Panel (Panel) to review the process and scientific information guiding the development of DNR's Aquatic Resources Habitat Conservation Plan (HCP). The purpose of this review was to assess whether DNR is using sound scientific principles and information in its development of the HCP. In a slight variance from the original Panel charge stipulated by DNR, we contend that our deliberations were constrained to information available to it at the time, and specifically only the process and products developed to prepare the HCP, not the future design and implementation of conservation measures and other elements of a HCP. Thus, the Panel cautions that it could not "ensure" that a series of existing technical papers addressing species, habitat, potential effects and expected outcomes met the scientific criteria necessary for the ultimate HCP. However, the Panel has provided input and guidance on potential consequences of specified actions or inaction (non-actions) given the present HCP design.

The Panel commends DNR for venturing into virtually unknown territory—development of a large-scale, multi-ecosystem, multi-species aquatic HCP. Generation of the large-scale HCP for aquatic lands would be a phenomenal challenge without any constraints, and this HCP is beset by numerous, consequential constraints. Throughout the course of the presentations and discussions, the Panel has been generally impressed by the quantity and quality of the efforts that have been invested to develop the database and modeling analyses to be used for the HCP. We believe that this process should lead to a reasonable likelihood that the final HCP can produce effective conservation measures for targeted habitats and at-risk species. However, DNR's existing governance structure and legal interpretations make any conventional HCP approach even more difficult. We believe that in many cases these complex governance and jurisdictional constraints severely limited the methods and information sources that DNR could utilize in developing the technical basis for the HCP document. In particular, the Panel believes that DNR's evaluation of "practicality, political will or cost" should not be part of the initial calculation of the Conservation Measure Rank, and any other application of non-technical evaluations that have nothing to do with best available science should be removed from the Model.

Despite these constraints, the fundamental information adopted or gathered for the HCP appears to be scientifically sound, with acknowledgements of some technical caveats and advice about the appropriateness of inclusion or exclusion of certain datasets. However, the organization of these data and their application in the Potential Effects Model do not necessarily take advantage of the best available science and may jeopardize the ultimate scientific credibility of the HCP irrespective of the validity of the conservation measures. In particular, the Panel was most concerned about the:

- Logic involved in selection of species to be covered.
- Grossly illogical simplification of life stage categories.

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- Incongruous habitat classification scheme.
 - Coarse resolution of DNR's lease activity dataset, which may limit spatially-explicit linkages to stressors and management actions, and ultimately impair a landscape perspective in the HCP.

Given the apparent lack of basic natural history knowledge for many of the covered (or should be covered) species, the Panel is impressed by the potential utility of the intriguing Potential Effects Model (Model) to provide the critical template for HCP actions and assessment. But, the Panel is equally concerned that the Model architecture and input is based on qualitative science at best, incorporating parameters based on rankings, professional opinion, and equations using scorings and indices. We believe that the Model should be considered provisional, contingent on an evaluation procedure that explores accuracy and precision of the Model outputs based on both empirical data/field testing and statistical sensitivity analyses. We also believe DNR should at least consider outputs of other models with similar objectives when projecting the likely outcome of alternative management actions.

Whether it is a reflection of the Model's architecture and outputs, or the strategic intent of DNR, the Panel was concerned that the HCP will ultimately depend simply on best management practice (BMP) approaches to reducing take of target species and loss of their habitats. Most of the conservation measures implied by the Model are neither new nor comprehensive. Although we could not review the actual HCP, we are concerned that it will fall short of advancing the conservation of these species and their habitats by implementing BMP guidance over increased DNR leasing activity. Given that existing DNR leases are likely to sustain and perhaps increase their "take" through direct or habitat impacts without being regulated under the HCP, the combined effects of the grandfathered lease activities, and the increased take, however miniscule, of re-negotiated and new leases, may very likely be "lowering the bar" for conservation.

The Panel specifically recommends the following:

- Incorporate into the HCP planning goals/process, strategies, and data acquisition, more information from regional aquatic conservation planning, such as Limiting Factors Analysis, Technical Recovery Team (TRT) plans, Shoreline Management Plans (SMP), Watershed Planning Process, Total Maximum Daily Load (TMDL), Puget Sound Nearshore Ecosystems Restoration Project (PSNERP), The Nature Conservancy's Aquatic Resource Conservation Plan, and Pacific Northwest Aquatic Monitoring Partnership (PNAMP).
- Broaden the scope of the HCP to explicitly include aquatic lands and species and their habitats within the state-owned lands currently managed under Port Management Agreements and leases involving wave/erosion control and aquaculture activities.

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- Make DNR policy precautionary in relying on the outcome of the Model used during development of the HCP until the Model is more completely evaluated empirically and statistically.
 - Incorporate more ecosystem concepts into the planning process and Model, including a greater focus on ecosystem processes than ecosystem structure, adoption of ecoregions in the organization of data and planning strategies, and ecosystem goods and services.
 - Adapt the Model to explicitly address cumulative (not simply additive but synergistic as well) effects and include monitoring and other feedback processes into an adaptive management component in the ultimate HCP.
 - Facilitate communication between scientists and managers by developing a formal institutional mechanism for synthesizing scientific results and clarifying the interpretation of the potential effects model for the policy makers implementing the HCP, as well as provide an accessible Internet version of the model and geospatial data for testing conservation hypotheses and plans.
 - Initiate an independent science review group and process at some future date to critique the final HCP document and to offer suggestions for improvement.
 - The implemented HCP should be rigorously monitored, evaluated, adaptively modified as results emerge, and explicit about what types of monitoring will take place.

Report

INTRODUCTION

Overview & Adaptation of the Panel's Charge

The Aquatic Resources Habitat Conservation Plan (HCP) Science Review Panel (Panel) was created by the Washington Department of Natural Resources (DNR) to review development of DNR's Endangered Species Act (ESA) Compliance project. The purpose of this review was to assess whether DNR used sound scientific principles and information in its development of a HCP for state-owned aquatic lands. In creating the Panel, DNR had three goals: first, to provide a selected group of scientists with a venue for reviewing the documents and methods developed; second, to identify potential additional relevant information; and third, to increase the transparency and credibility of scientific materials.

The Panel members were recruited based on recommendations from academia, non-governmental organizations (People for Puget Sound, The Nature Conservancy), and natural resource management agencies (NOAA, US Fish and Wildlife, Washington DNR).

The Panel convened in July of 2006, and meetings were held monthly through December of that year. Each meeting was organized around a particular topic. At July's meeting, the Panel looked at the background of the project, including DNR's management authority, the history of the ESA Compliance Project, the Panel's objectives and timeline, and the limitations of the data. In August, the Panel focused on the species and activity selection process and habitat definitions. September's meeting was a day-long workshop at which experts addressed the interactions of species, habitat, and activities. At the October meeting, the Panel considered the development and overview of the Potential Effects Model. At the final meeting in November, potential effects and conservation strategies were examined.

Over the course of the Panel review, the Panel adapted the original charge presented to it (see Original Panel Charge text box, below) to better reflect the eventual process and documents to which it was exposed. Specifically, deliberations were constrained to information available to the Panel at the time. The Panel's activities were thus limited to evaluation and critique of the datasets and analyses that will be used as the basis for development of the HCP. The Panel could not review the conservation measures and other elements of a HCP that had not yet been developed and did not have an opportunity to review the *final HCP document itself*. The comments presented by the Panel should be considered strictly within the context of their evaluation of the foundational datasets and numerical modeling process. The Panel also cautions that it could not "ensure" that a series of existing technical papers addressing species, habitat, potential effects and expected outcomes met the scientific criteria. Finally, the Panel provided input and guidance on potential consequences of specified actions or inaction (non-actions).

The Panel was encouraged to create consensus statements and reports, with minority reports allowed only when the entire Panel agreed to such a report and the description of

Original Panel Charge

The Panel convened in July of 2006, and was charged with operating as an advisory body for the review of scientific documents and materials developed in support of Washington DNR’s Habitat Conservation Planning efforts for state-owned aquatic lands. The intent of the review was to ensure that a series of existing technical papers addressing species (Table 1), activities (Table 2), habitat, potential effects and expected outcomes:

- Were consistent with existing regional conservation/restoration plans and efforts.
- Adhered to accepted scientific methods and principles.
- Incorporated the best available science for the identified species, habitats and activities.
- Identified conservation strategies and goals that were reasonable and achievable.

Table 1 – Potentially covered species.

Amphibians and Reptiles	Columbia spotted frog; Northern leopard frog; Western pond turtle; Western toad
Birds	Bald Eagle; Black tern; Common loon; Harlequin duck; Marbled murrelet; Western snowy plover
Fish	Bull trout/Dolly Varden; Chinook salmon; Chum salmon; Coastal cutthroat; Coho salmon; Pink salmon; Sockeye salmon (inc. kokanee); Steelhead
Marine Mammals	Killer whale

Table 2 - Potentially covered activities.

Activity Group	Activity Sub-groups
Overwater Structures	Boat ramps, Launches, Hoists; Docks and Wharves; Rafts & Floats; Floating homes; Mooring buoys; Nearshore buildings
Aquaculture	Netpens; Shellfish
Miscellaneous Nearshore	Public access; Commercial sand and gravel removal; Recreational mining; Log booming and storage
Complex	Marinas; Terminals and Shipyards

The Panel was encouraged to create consensus statements and reports, with minority reports allowed only when the entire Panel agreed to such a report and the description of the nature of the disagreement. Current or proposed Washington DNR policies; lease management and business procedures; and other policy recommendations were beyond the scope of the Panel.

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Review Process Recommendations

Carol Cloen and the Washington Department of Natural Resources (DNR) Endangered Species Act Compliance (ESA) Team have done an exemplary job in coordinating the science panel review of background information, numerical data, and modeling process that will be used to generate the Habitat Conservation Plan (HCP). In addition, the DNR staff was extremely cooperative in attempting to answer unresolved questions that arose during each monthly meeting, and they promptly provided additional background material whenever it was available.

Throughout the course of the presentations and discussions held between DNR staff and the members of the Science Review Panel, we have been impressed by the quantity and quality of the up-front work that was completed to develop the database and modeling analyses that will be used to generate the Habitat Conservation Plan (HCP) for Washington's state-owned aquatic lands. We believe that the underlying database and planning process have a reasonable likelihood to contribute to a final HCP that may include effective conservation measures for targeted habitats and at-risk species. Because the Panel reviewed only the process and products developed to prepare the HCP, however, **it is our recommendation that a second Science Review Panel be convened at some future date to conduct a review of the final HCP document and to offer their critique and suggestions for improvement.** The Science Review Panel identified three primary constraints that placed boundaries on the scope of information that was ultimately included in the database and HCP planning process:

1. Up-front imposition of subjective political, governance, and economic criteria by DNR as a proprietary agency into an objective scientific evaluation process. The Panel identified that these pre-existing value judgments constrained the range of management scenarios that were considered.
2. A sincere interest by highly competent technical staff to employ scientific rigor and incorporate biologically sound information into the planning process. However, it was not clear that the participating staff had close familiarity with recovery planning efforts that are currently underway for some of the targeted species.
3. Insufficient time allocated for revision of the HCP planning documents to fully incorporate substantive comments received previously from outside experts who reviewed biological information for the habitats and target species. Consequently, the HCP planning documents include ecologically valuable and relevant information, but they may also contain some fundamental deficiencies that can be compounded during subsequent analysis. Lack of incorporation of the substantive comments can lead to significant omissions in the numerical database and flawed conclusions in key recovery areas. This is of particular concern given that the future intent of the resulting HCP was not clear.

The Science Review Panel applauds DNR for their ambitious undertaking and remarkable initiative to attempt what we believe has rarely been accomplished: development of a large-scale, multi-ecosystem, multi-species aquatic HCP. Generation of the large-scale HCP for aquatic lands would be a phenomenal challenge without any constraints. However, the Department's existing governance structure and legal

limitations make any conventional HCP approach even more difficult. We believe that in many cases these complex governance and jurisdictional constraints severely limited the methods and information sources that DNR could utilize in developing the technical basis for the HCP document. This, in turn, may ultimately influence the effectiveness of the final HCP.

It was also apparent to the Science Review Panel that DNR was constrained by the *status quo* in their proprietary authority and unable to fully incorporate the best available science into the full geographic extent of aquatic lands addressed by the HCP planning process. For example, the scope of the DNR HCP planning process did not address conservation for sensitive species on state-owned aquatic lands held in Port Management Agreements (PMAs). This approach is problematic because it questionably ignores culpability and eliminates a large segment of the state-owned shorelands that could be enhanced through application of the HCP. The problem is further exacerbated by the difficulties in obtaining technical datasets from the private industry located within the PMAs, resulting in a lack of information about the status and condition of aquatic habitats and target species within aquatic lands that are under the ultimate authority of the DNR. This “our hands are tied” approach not only threatens the eventual options and potential effectiveness of the resulting HCP, but also sends a signal to the responsible ESA agencies that DNR has purposefully elected not to address some of the larger segments of state-owned aquatic lands that are and will continue to impact public resources.

The Panel encourages DNR to examine the assumptions and legal framework associated with the identified conservation measures, and to take deliberate steps to delineate what changes to laws (RCW) or rules (WAC) may be required to realize the full benefits from the measures. The agency should also give serious consideration to the questions concerning the jurisdictional scope of the conservation measures as they currently reside within the agency’s mandate to “balance public benefits.” It is not clear to the Panel whether the agency considered the possibility that some of the conservation measures could be based on limits to growth or zoning restriction, rather than solely upon best management practices (BMPs) or improved construction standards. The Panel is also troubled by the long-term impacts of continued residential and industrial growth along the shoreline, and by the collective and cumulative effects of all of our actions. These concerns highlight the need for concurrent development of specific site-based management plans as well as the broader-scale HCP.

It is also our recommendation that the scope of the final DNR HCP should be broadened whenever possible to include consideration of the aquatic lands, habitats, and species that occur within the state-owned properties that are currently managed through existing Port Management Agreements. In addition, the Panel recommends ongoing scientific peer review of HCP products.

The Science Review Panel was in agreement that the final HCP document should provide policy makers with cautionary remarks about some of the potential pitfalls that derive from excessive reliance on models, particularly a single model, in evaluating management alternatives for at-risk species (see pages 17-19 for further discussion). **It is therefore our recommendation that policy makers exercise caution in their reliance**

on the outcomes of the predictive model used during development of the HCP planning documents, and that they guard against singular commitment to actions for species, habitat, and ecosystem recovery that may be based upon unrealistic expectations.

CONSISTENCY WITH EXISTING REGIONAL CONSERVATION/RESTORATION PLANS AND EFFORTS

While a thorough review of other planning and recovery processes was not included within the scope of this Science Review Panel, several Panel members are familiar with these efforts and offer views on the relationship between DNR's HCP planning process and those efforts. The Panel also offers recommendations to DNR on how to improve the HCP in relation to each point.

Conservation measures for recovering species have been addressed by watershed and regional scale salmon recovery plans prepared by NOAA Fisheries and other natural resource organizations. There are a number of regional salmon recovery efforts, Shoreline Master Program and Growth Management Critical Areas Ordinance updates underway whose broad ecosystem restoration goals would greatly benefit the aquatic HCP planning process. Some recovery plans are better than others; however, the landscape assessment and analysis tools used in these plans could inform the DNR HCP. Those recovery plans that acknowledge process/habitat linkages in particular were identified by the Panel members.

The HCP will need to address the influence of other organizations' actions in species recovery plans and clearly enunciate the HCP's relationship to those plans, including any limitations on jurisdiction or authority to deliver plan recommendations while implementing the HCP. For example, goals of the Total Maximum Daily Load (TMDL) program include improvement and protection of clean surface water, as well as improvement in biological conditions resulting from implementation. DNR clearly lacks jurisdiction to address water quality issues through this HCP. Similarly, efforts to avoid, minimize and compensate for impacts related to the construction of shoreline facilities permitted by state and local regulatory programs should complement actions taken under the HCP, but are not expected to duplicate or interfere with regulatory conditions imposed as part of a permit.

The DNR HCP planning work appears to be highly complementary to the broad marine ecoregional conservation planning effort undertaken recently in the Pacific Northwest by The Nature Conservancy in cooperation with the state natural heritage programs and several federal and state agencies. Staff members from DNR participated in some capacity during the Pacific ecoregional planning work, but it was not clear how the habitat classification scheme, habitat prioritization process, modeling work, and identification of conservation targets were coordinated between the two planning activities. The Nature Conservancy's Aquatic Resources Conservation Plan for Washington is a useful species conservation and recovery plan that focuses on itemizing,

recovery planning, and evaluating outcomes for endemic aquatic species. This effort has already developed and used a selection model that optimizes for success in recovery efforts. This effort may be a useful strategy for improving connectivity of important aquatic habitats.

The inclusiveness of activities evaluated and species potentially affected in the HCP is applauded by the Panel as a step in the right direction compared to single species management plans. Inconsistency in the spatial resolution and classification schemes between the HCP planning process and other recovery planning processes could pose problems in making comparisons, however.

The technical supporting information about target species and habitats, the GIS database, and the final DNR HCP document can provide a valuable contribution to the database available to regional planning efforts for the conservation of aquatic habitats and species. This HCP is limited to state-owned aquatic lands and to renewing existing leases, but it may be of limited value to some other planning efforts that require finer scale information or that depend on different shoreline classification schemes. The HCP is also based primarily on a site-level analysis and does not consider landscape issues, cumulative and synergistic impacts, or historical, existing, or future (build out) scenarios at this time. However, the level of information compiled on species distributions, locations and size of overwater structures, and the effects model architecture and other data sources could be useful if made available on a public web site.

Recommendations

- The DNR HCP should consider the goals of the planning processes described above, but acknowledge that many are specific to currently listed species. However, at least in Puget Sound and within some watersheds, landscape ecology and restoration of habitat forming processes for the benefit of multiple species have been overarching goals of those plans and informative to the HCP process.
- The planning process should also consider recovery plans for at-risk species that are not included in many salmon recovery, shoreline or critical areas plans.
- The information compiled and organized by DNR should be considered as supplementary to the overall recovery plan for at-risk species, and the conservation measures and perspectives identified by the final HCP document should be given serious consideration wherever and whenever they are applicable to the state-owned properties that are managed by DNR.
- Given the time span of the proposed long-term HCP relative to shorter-term regional planning efforts, DNR should implement a process to link their leases with regional conservation planning efforts, particularly in regard to adaptively managing leases and incorporating new scientific findings into management approaches.
- The HCP could also facilitate the exchange of current data between DNR and local/regional recovery groups, such as results from surveys of eelgrass distribution.

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- The DNR HCP should complement the monitoring initiatives in Washington that are the focus of the Governor’s Monitoring Forum, Forest and Fish Agreement, and the Comprehensive Monitoring Strategy (CMS). Each of these monitoring strategies considers important information generated from: status & trends monitoring, validation monitoring, and implementation (intensively monitored watersheds) monitoring. The DNR HCP should also carefully examine goals of the Pacific Northwest Aquatic Monitoring Partnership (PNAMP), which is a federal, state, and tribal consortium that recognizes the value of monitoring for the purpose of recovering endangered and threatened species, and determine how to build a program on a convergent path with this regional monitoring initiative.

ADHERENCE TO ACCEPTED SCIENTIFIC METHODS AND PRINCIPLES

Species selection

Covered species selection should result in selection of representatives from each guild, function, etc. in the biological community. Omission of any component of these biological representatives in the ecosystem will reduce the assessment capacity of the analysis and the effectiveness of the management plan.

The lack of information on estimating cumulative effects and formulating effective monitoring and feedback programs in the current HCP planning process constitute significant impediments to adaptive management. Additionally, the subset of species selected for coverage in the HCP will be subject to much debate, and the HCP planning process does not make clear how helping one covered species may affect other non-covered species.

The Science Review Panel thought the final selection of species to be covered appeared inconsistent and somewhat arbitrary in a few cases (see page 15; and Appendix D for additional comments by species experts). Perhaps the exclusions of most concern were the fishes Pacific herring (evaluation species), surf smelt (watch species) and other forage fishes (e.g., Pacific sand lance) that have very high potential of being impacted because of their intertidal spawning habitat, although none of these species is ESA listed at this time. Including provisions for protecting herring, surf smelt and sand lance in the conservation measures is warranted, particularly in those areas that are documented spawning areas for these species (WDFW has data layers for this). Recognition of potential impacts to shoreline processes and substrate characteristics that support forage fish spawning habitat would be an important first step, followed by measures to ensure sustainability of the habitat forming processes present in, or adjacent to, a proposed project site.

The lack of coverage for forage fish species indicates that trophic interactions have been overlooked in some instances. In contrast, pink salmon, which is also not ESA listed and whose stocks are presently considered healthy, is listed as covered under exactly the same screening criteria. The rationale provided for the recommendation to include pink salmon

(“Similarity to Chinook, chum, coho, and sockeye would provide benefits with little to no additional effort or cost to appropriate conservation measures.”) is entirely inconsistent with the rationale to exclude any of the forage fishes. Furthermore, expert knowledge of the life history requirements of pink salmon versus the juvenile stages of the other covered salmon species (e.g., Chinook and chum salmon) and the forage fishes should have informed this process. The existing Pacific salmon, trout and char life history/stage categories may inappropriately lump life history stages and obscure direct association and assessment of vulnerability of impact to DNR covered activities. Dividing Pacific salmon life history stages into (1) adult, (2) incubation/emergence, and (3) freshwater rearing/outmigration fails to consider the habitat requirements of all the different life history stages of salmon and misrepresents their vulnerability to DNR covered activities in very different habitats. For instance, merging freshwater rearing with outmigration (and estuarine/marine rearing and migration) obscures the many differences and variability in habitat utilization in freshwater as compared to subsequent estuarine residence and nearshore marine rearing and migration. There are also tremendous differences in the types and potential impacts of DNR activities in freshwater versus estuarine and nearshore marine habitats of juvenile Pacific salmon. Given the extensive state of scientific literature on Pacific salmon life histories, we see no obvious rationale for this coarse-scale life history classification. There was much repetition in the species narratives that did not capture the important ecological differences between these fish species.

Recommendation

The Oregon spotted frog (*Rana pretiosa*) is listed as a State Endangered species, Federal Candidate species, and as globally (G2) and critically imperiled within Washington (S1) by the Natural Heritage Program. It occurs in the Nisqually River watershed (Thurston Co.), which may be navigable water. If there is any potential for DNR authorized activities in this area, the Oregon Spotted Frog should be included as a covered species.

Habitat Classification

The habitat classification scheme that was developed for DNR’s aquatic lands HCP is sometimes obscure and in some cases appears to be inconsistent with contemporary, published scientific and management classifications.

It is unclear why DNR chose to develop a different classification scheme at all, given the existence of the excellent, highly accepted 1990 “Dethier Classification” (Dethier, M.N. 1990. *A Marine and Estuarine Habitat Classification System for Washington State. Natural Heritage Program, Washington Department of Natural Resources. 60 pp.*), not to mention the prior, extensively adopted Cowardin Classification (Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States. US Fish Wildl. Serv., FWS/OBS-79/31, GPO 024-010-005254-6. Washington, D.C. 103 pp.*) or more comprehensive NOAA Marine and Estuarine Ecosystem and Habitat Classification (Allee, R.J., M. Dethier, D. Brown, L. Deegan, R.G. Ford, T.F. Hourigan, J. Maragos, C. Schoch, K. Sealey, R. Twilley, M.P. Weinstein, and M. Yoklavich. 2000. *Marine and estuarine ecosystem and habitat classification. U.S. Dept. Commerce, NOAA/NMFS, NOAA Tech. Memo. NMFS-F/SPO-43, Washington, D.C. 43 pp.*).

Given the hierarchical structure of Dethier (1990), the level of habitat resolution can be adjusted to fit the needs of the DNR data and HCP requirements. There appear to be many inconsistencies between DNR's scheme and Dethier, or other schemes for that matter; for example: (1) open, exposed inland shoreline beaches do not appear to be explicitly identified; (2) what most ecologists would consider "estuarine wetlands" fall under both Saltwater-Nearshore/Inland/Unconsolidated and Estuarine Wetlands ecosystems/region/classes; and (3) it is not evident where tidal freshwater occurs in DNR's classification or if it does at all. The benefit of this approach remains unclear and, unless it is verified by land cover data (most of which is typically classified in conformity with one of the accepted classification schemes), this classification system may contain sufficient inaccuracies as to threaten the utility and acceptability of the HCP upon which it depends.

Recommendations

- A similar classification system should be developed for habitat support processes in areas that support marine vegetation (eelgrass, macroalgae, and marsh vegetation) and a suitable analytical procedure employed to determine how those processes could be affected by proposed projects.
- DNR should incorporate a process-based approach to this HCP through requiring assessment of impacts to these processes by actions proposed on state-owned aquatic lands. Location may be an important factor—for example, areas with dynamic characteristics such as river deltas or feeder bluffs that provide sediment to adjacent areas should be required to be included in impact analyses.

Resolution of differences in spatial data

The approach that the DNR staff has chosen to take, which is extensively dependent on utilization and, to some degree, additional development of spatial data for Geographical Information System (GIS) documentation and analysis, is to take advantage of the most modern technological tools. This approach, however, tends to let the available GIS data constrain the extent and quality of the information used. For instance, much of the data for the spatial location of DNR leasing activities and associated features (e.g., docks) appeared to be limited to a township-range identifier, which is hardly the resolution desirable for identification of critical DNR impacts and application of site specific management measures. Furthermore, many of these data are not at the resolution that will allow spatially-explicit application or assessment of the necessary conservation measures, e.g., even DNR's considerable advancement in Puget Sound eelgrass monitoring will not inform the HCP about a DNR-lease impact on a specific eelgrass population (patch, bed). Moreover, because the spatial data set used to measure characteristics for lease lands is at a coarser scale than the scale used for species habitat/environmental assessments, predicting biological outcomes makes adequately describing relationships between habitat variables and biological responses problematic.

The resolution between these data sets is of less importance than a more fundamental issue: DNR's lease spatial data base is inadequate to base its future HCP on. This is illustrated by the very small acreage of impacted areas generated by the model. The species presence, habitat, and leasing analysis was exhaustive, but in many cases inconsistent, and the conclusions were not scientifically based. Actions that were not

adequately considered included shoreline armoring and process based impacts-widely accepted as fundamental issues to recovery planning process in Puget Sound.

Potential Effects Model

Although the Potential Effects Model was intriguing, the Panel agreed that certain components needed to be reevaluated.

Given the lack of basic natural history knowledge for many of these species, the approach outlined in the Potential Effects Model is potentially very useful and the initial steps to select species are straightforward. In the steps that follow, the model or analysis begins to incorporate parameters based on rankings, professional opinion, and equations using various scorings and indexes. Unfortunately, it is unclear how small changes in ranking and other parameters will alter outcomes for a single species or group of species or for estimates of the effectiveness of conservation measures. Moreover, based on the information provided, it is not possible to examine the accuracy or precision of indices used in the analysis or outputs of the analysis. Thus we are unsure what inherent bias exists in each index or ranking used in various analysis and how narrow or wide is the range of variation.

To address the above concerns, an evaluation procedure that explores accuracy and precision of model outputs is needed. Model accuracy could be estimated through field testing or by having experts estimate what they believe the intensity of effects of several actions at real sites might be, and then compare that predicted by the model or analysis. Ideally, sensitivity analysis examining the precision could be done through some Monte Carlo simulations or simply by examining the outcomes or shape of curve of various outcomes when one varies a parameter like effects intensity through a range of values.

In terms of specifics of some of the equations used, the multiplication and use of ratios (division) is problematic from a statistical perspective. For example, the inverse of integrated Aggregate Effects Function is divided into the effects index. This produces an entirely new function that likely does not behave anything like the integrated aggregate effects and may not respond in the manner intended. Thus simply computing the final outcome for a range of values and examining the shape of the curve would help determine whether the effects intensity is accurate.

In addition, the Panel felt that an ecosystem based analysis of limiting physical and biological processes, widely accepted and used in Puget Sound recovery planning, should have been at the base of the potential effects modeling. Specific processes to consider include habitat-forming processes and water/sediment quality (creosote is a significant factor; non-point and point source are another).

The Panel also feels that the scientific basis for the model's Aggregate Effects Function appears to be both vague and lacking documented scientific rationale and literature to support it. As multiple activities may have interactive and/or synergistic effects that are additive, subtractive, multiplicative, etc., it is uncertain how this function was formulated and, perhaps more importantly, how it affects the subsequent model predictions. Moreover, the function may not be meaningful given the coarseness of DNR's leasing dataset (see page 15). While many impacts of DNR lease activities are likely magnified

in aggregation, it appears at this stage that the model does not account for cumulative effects, and the data does not support that capability. As a result, the estimate of the area of alteration should be reexamined to ensure that it adequately addresses cumulative effects and interactions, as well as habitat requirements for each life stage of the species covered.

The Panel was concerned that a best management practices (BMPs) approach will not really address the net loss of target resources and that the existing conservation measures will not be adequate to compensate for increased DNR leasing activity. The HCP planning process at this stage does not predict a specific amount or percent of “take” for listed or other species, and so the level of effort needed to avoid, minimize or compensate for that “take” will be difficult to quantify.

Although the potential effects analysis for Aquaculture included subgroups for Netpens, and Shellfish, it does not appear that commercial use of intertidal areas for geoduck culture is included in the activity group. Given that DNR has developed plans to lease up to 250 acres of intertidal habitat for geoduck culture activities (tubes, predator netting, harvest), and the obvious overlap of these activities with covered species, this oversight should be addressed. The current paucity of data on impacts from intertidal geoduck aquaculture suggests the need to be cautious in allowing use of these techniques, and makes it difficult to justify allowing such actions until sufficient data are obtained.

If not augmented with additional conservation measures, , the information reviewed could lead to ineffective conservation and as a result. This is particularly true in that the model and covered species list does not specifically include important species recognized by resource management agencies as the base of the food chain (e.g., herring).

The Potential Effects Model provides equal weight to political elements, which is inappropriate for a science-driven model. If these elements are to be included, they must be applied later, in a socio-political analysis, not in the technical one. Moreover, both terrestrial and submerged lands managed by DNR should have been included in the analysis.

The model analyses were based on the expert opinions of a very limited set of experts. Although the experts undoubtedly had considerable experience with certain species, we believe that the number of experts whose assumptions populated the models was insufficient to capture the range and certainty of knowledge about the various target species within the broader scientific community. The Panel did not have time to examine model assumptions in depth, even for one covered species. In order to follow “accepted scientific methods and principles,” it would be helpful to enlist more experts to re-examine the current assumptions of the potential effects model. Some expression of confidence in the certainty of outcomes (e.g., Bayesian statistics) would also be helpful. There was no way to tell whether species data is empirical or derived.

In general, the concept appears to be sound, but we have no way to validate, even using best professional judgment the adequacy or accuracy of the model. Without any idea of the quantification of the error associated with any of the predictions, DNR will not be able to use this model to forecast trends, and it may be of little value for monitoring, other than to suggest testable hypotheses.

The present preparation of the HCP very minimally addresses how this methodology will enable monitoring, assessment and adaptive management to ensure that the HCP is achieving its intended purpose. The Panel was not presented with any information that established how the various elements of the methodology, and particularly the model upon which the conservation measures are based, establishes a baseline for monitoring and assessment. Nor was the Panel provided with a description or example of how these data would be used to formulate an alternative action if monitoring did indicate insufficient performance by a conservation measure. Given that many of the targeted (covered) resources are impacted by more than just the DNR lease activities, it would be unreasonable for DNR to use monitoring of the status of these species to infer the DNR contribution to their take, so the burden would seem to be on DNR to establish a HCP that incorporates effectiveness monitoring that assesses changes in habitat metrics that could be linked unambiguously to diminished impact and species take.

Cautionary Statements

The HCP planning process could be improved by providing policy makers with some of the pitfalls of excessive reliance on models, especially a single model, in evaluating management alternatives. Consider the following general comments about the role of models in policy formulation:

- *No one model presently in use is complete enough to serve as a sole decision support tool for the region.* Models available to support decisions serve different functions and all have strengths and weaknesses. They differ in the problems they are attempting to address, the analytical approaches to the problems, the assumptions underlying each of the approaches, the quantity and quality of the available data, and the rigor with which they deal with the complex life cycles and habitats of the species.
- *Models are best at ranking the expected effects of management alternatives.* The general conclusions of models are often in close agreement with respect to the predicted rank of management alternatives when addressing similar problems and using the same data sets. Models, however, are not good at giving absolute numerical predictions and they do a poor job of accurately estimating what the policy-makers may need most, namely, a credible scientific analysis of the probability (feasibility) that some measurable degree of ecosystem recovery will be achieved with any particular management action. Scientists can help environmental decision processes to cope better with uncertainty by explicitly quantifying the relevant uncertainty. Statements of the respective probabilities of alternative scenarios are a natural way to communicate uncertainty when the decision is essentially placing a bet about which scenario actually will materialize.
- *All modeling efforts are severely constrained by lack of data.* Many modeling controversies in the natural resource arena have largely been an unproductive distraction from the real scientific problem of inadequacy of the available data for addressing many important management questions. Some of the debate that now centers on competing models could be resolved with the right data. The present paucity of data creates more scope for alternative assumptions in the models. Sophisticated, responsible modeling takes all the plausible alternative

assumptions into account with weighting according to their respective concordance with the data that are available. This need not lead to "modeling wars." Where scientific leadership and institutional innovation needs to be exercised is in the prioritization, design, and implementation of large-scale monitoring linked to management experiments. There is at present no clear center of authority for addressing the prioritization, design and coordination issues for large-scale monitoring linked to management experiments in the HCP planning process.

- *Decision-makers would be well served by drawing on all available analytical tools.* Decision-makers would benefit by focusing on areas of consensus among the models or the weight of evidence provided collectively by the models. Areas of disagreement among the models may pinpoint uncertainties that require further investigation. In considering how results of models make their way into the decision-making process, it is helpful to recall the roles of models. They provide ways of organizing and communicating information, generating hypotheses, and pinpointing the crucial gaps in information. Modeling efforts are not ends in themselves; they are not final, definitive answers, but rather they are ongoing processes for continuously increasing knowledge.
- *Effective communication between decision-makers and scientists is essential if scientific results are to play an integral role in the decision-making process.* To prevent scientific debates over the models from encumbering the decision process, it is crucial for decision-makers to understand both the capabilities and limitations of models. Without an understanding of model capabilities and limitations there is the danger that decision-makers will develop unrealistic expectations of the models. Models constitute a way of organizing and communicating information. They provide a systematic way of predicting outcomes of management interventions, identifying what cannot be reliably predicted and quantifying uncertainty. Models can generate useful hypotheses and identify crucial gaps in knowledge. These functions provide a valuable guide for setting priorities for data collection and suggesting new experiments to resolve critical uncertainties. Scientists need to comprehend the needs of the decision-maker and understand that, although science plays a critical role in formulating decisions, decision-makers also must weigh the social, cultural, and legal implications of a pending decision. Scientists need to inform decision-makers of the full suite of management alternatives that address a particular question or problem and the uncertainty associated with each alternative. The nature and extent of the uncertainties have to be explained in language that is meaningful to the decision-maker. This is especially important when the uncertainty is large, as is common in natural resource management problems. If decision-makers are not adequately informed, their expectations are not met, or they are faced with uncertainty that is a consequence of strong disagreement among scientists over appropriate courses of action for recovery, the decision-making process could be driven largely by social, legal, and economic factors, to the possible exclusion of much of the available science, or a decision will be deferred pending further research.

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- *To facilitate communication between scientists and managers, a formal institutional mechanism for synthesizing scientific results and clarifying the interpretation of the potential effects model for the policy makers should be developed.* If a modeling effort is motivated by a desire to contribute to a particular decision, it is especially helpful to invest initially in enough communication to ensure that the model really is addressing the right question. Scientists can work with decision-makers in crafting decision rules that get formalized before the analysis is undertaken. Decision rules define what measurements will be made, what statistical operations will be performed on the data, and what threshold magnitudes of estimated quantities at specified levels of certainty will serve as criteria for the decision. Such specifications help remove ambiguity from the way science is used in the decision process. Committing to these specifications in advance helps dispel suspicions that the analysis may be manipulated to achieve a particular outcome. If institutional trust does not embrace a particular model, the need to establish credibility can stand in the way of getting a model's results considered in the course of a decision.

Recommendations

- Provide references to similar models upon which this model was built, or an explanation of how it was determined that existing models are inadequate. An assessment of how well this model performed in comparison to other existing peer reviewed models would also increase the Panel's confidence in the method chosen.
- Improve the documentation of both the assumptions used in the Potential Effects model and the supporting materials used in for best professional judgment in assigning effects.
- Conduct a sensitivity analysis to ascertain where the model could be improved. For example, while DNR explained that the Species/Activity Overlap and Coincident Habitat ranks were ordinal ranks (high = 3, medium = 2, low =1), they did not explain why the averaging of the 2 ranks to create the Potential to Effect rank did not follow accepted rules for rounding. For example, when there is a High (3) rank for Species/Activity Overlap, and a Medium (2) rank for Coincident Habitat, the Potential to Effect Rank becomes Medium (2.5). Couldn't this just as well be a High rank (0.5 is commonly rounded up)? Therefore, is an averaged score of 2.5 really a Medium rank?
- The HCP planning process must include a technical analysis of the potential effects of aquaculture practices when contemplating leases for aquaculture activities that may cause adverse impacts (substrate modification, introduction of non-native species, loss of marine/aquatic vegetation).
- Develop conservation measures that consider trophic level interactions, such as protecting forage fish spawning habitats and the physical processes that maintain them.
- Monitor the implementation and efficiency of the final HCP conservation measures, and develop and apply adaptive management approaches to utilize the

data gained through this monitoring and to implement new Best Management Practices (BMPs).

- Within the context of monitoring, data obtained from monitoring activities should be readily accessible to other agencies and the public through an easy to use database or timely summary reports.
- Develop avoidance measures that are both activity and habitat specific.
- Include riparian habitat modifications, bulkheads, and channelization and further investigate the effects of shoreline habitat modification..
- Add derelict net removal as mitigation. Identify and rank potential future conservation measures to be consistent with currency of the effects model.

ADEQUACY OF THE SCIENCE USED

DNR has provided and built on as much of the critical data for development of this HCP as would seem feasible given the time and funding level. While we may take issue with some of the methodological approaches to using that data, we believe it was thoroughly consistent and scientifically credible. However, we would disagree that the Panel was provided sufficient information to identify the conservation strategies and goals to which those data would be applied, i.e., the Panel's last charge. While we were provided with a detailed report and presentation on Conservation Measures and Expected Outcomes, there has been little information about how the data will be employed to apply these Measures strategically to eliminate or reduce take of at-risk species. What was presented to the Panel was basically a best management practices (BMPs) planning prescription, rather than a spatially-explicit, comprehensive plan that is associated with an estimate of the (theoretically positive) response by the targeted resource. For instance, the DNR staff stated that, although cumulative effects were not explicitly addressed in the Conservation Measures and Expected Outcomes, they would address them in formulation of the Conservation Plan; but, it is uncertain how, if at all, the data sufficient for the Conservation Measures and Expected Outcomes analysis would serve a cumulative impact analysis, especially at the coarse resolution of the existing DNR data. Thus, what was difficult or impossible for the Panel to evaluate was not the quality of the data, but its appropriateness for the development of the conservation plan itself. Given the general lack of spatial resolution of DNR lease activities, impacts and resources/habitats, it is very uncertain how DNR will be able to set priorities and locations of where they will implement HCP actions.

Addressing the adequacy of the defined habitats is difficult without the Panel having actually run the model and seeing the results. The coarseness of the leasing data, and the fact that the Panel was not thinking about or comparing the amount and location of those activities that are historic, in trespass/unauthorized, or new, make it impossible to determine what, if any, effects the few activities have. It will be very hard to separate these.

Certainly there is a need for additional data on several of the covered species in the HCP. While this lack of data should give good reason for a more cautious approach in decision-making, it could also be used to justify the need for additional resources (staff, money for studies, etc.). A major goal of the HCP should be to reduce the uncertainty related to impacts to covered species from permitted activities on state-owned aquatic lands.

Measuring biological condition and response to management decisions at landscape scales requires natural regional delineation like “ecoregions”. Aggregating information based on naturally occurring regions and making assessments based on these regions results in reduced uncertainty when determining difference over space and time. Past research demonstrated that ecoregions are the strongest landscape descriptor for predicting biological expectations. The ecoregion strategy is constructed of data layers that are directly related to elements for organizing biological communities.

The Panel is concerned about the absence of information for amphibians and reptiles regarding patchy habitat use, and fidelity to breeding and overwintering sites. Even with the conservation measures, some DNR covered activities that occur in these areas could be detrimental to a population, potentially resulting in local extirpation. The same activity in a different area of a lake or wetland may have little or no impact on the population. In addition, it was not always apparent that the biologists doing the species evaluations were in fact experts on the species being evaluated. For example, in the case of the amphibians, the literature cited a total of 15 amphibian papers – an amount the Panel finds inadequate to make the evaluations. For this analysis to be accurate, a herpetologist is required. The Panel recommends that the Experts provide references to literature and datasets to substantiate their rankings for Effects Indices in the model

DNR’s decision to exclude erosion control structures (dikes, dams, jetties, breakwaters, fill, and bank armoring) from the HCP appears to be based on the conclusion that those occurring on state-owned aquatic lands do not have “significant impacts”. This is not justified by additional comments, documentation, or citations, leaving significant unanswered questions regarding the impacts of these structures and is in contrast to many widely accepted plans for improving conditions in Puget Sound. Several recovery and restoration plans within the Puget Sound basin specifically address the need to remove aquatic fill and armoring as an important step in the recovery process.

Further rationale for this omission included the necessity of a review by the Corps (Section 7 consultation) for new construction and improvements/reconfiguration projects. DNR should recognize that the Corps has limitations on requiring modifications to existing structures relative to maintenance activities. Whereas, the HCP could include language that addresses requisite upgrades for facilities “with opportunity” to improve conditions for covered species during maintenance activities (e.g., bank repair in marinas – could require riparian plantings), thus providing advance notice to project owners to improve the baseline condition when opportunities are present. This seems like an obvious conservation measure, and should be considered as an “early implementation conservation measure” to maximize potential benefits.

Recommendations

- References in the amphibian summary accounts in the Covered Species White paper Summary are weak (ex. NatureServe, B.C. Frogwatch Program, Johnson

and O’Neil 2001 etc.). Use of secondary literature for this type of document seems inappropriate, especially when the primary literature is available.

- Additional information provided by the “species experts” should be incorporated into the descriptions for the covered and evaluation list species within the HCP.
- The Panel acknowledges the challenges of the scientific literature and the challenge that presents to DNR. We recommend targeted filling of these data gaps as part of the comprehensive HCP.
- The disparity in scale for leasing activities (Section Township Range) from habitat scale and species use appears to be huge, but the implications of this need to be analyzed for a subset of species and determine the sensitivity of scale for the output.
- Activity definitions tend to overlap and be inconsistent- separating the overwater structures group and complex groups into their component would be helpful.
- The Panel recommends developing guidance to specify how new agreements are fit into categories.
- The Panel recommends clarifying the distinction between activity (e.g., boating) from structure (e.g., marina)
- Recent changes in taxonomy should be integrated into the HCP. For example, the scientific name for Columbia spotted frog (listed in table as *Rana pretiosa* (ssp. B)) is now well accepted as *Rana luteiventris*. The taxonomy for the western pond turtle has changed from *Clemmys* to *Actinemys* based on molecular and morphological evidence. Although there has been some debate (see NatureServe for comments), it does look like *Actinemys* will be the preferred name. The common name has also been changed to Pacific Pond Turtle.
- There are important contributions for autecology of aquatic species at the regional universities (Western Washington; Institute for Watershed Studies, Central Washington University; Department of Biology, and Eastern Washington University; Department of Biology). These ancillary data sets could be particularly important to update information on “watch” species such as freshwater mussels, etc. We recommend contacting:
 - Dr. Bruce Lang (Eastern Washington University; Professor Emeritus-a resident of Spokane)
 - Dr. Robin Matthews (Western Washington University; Director Watershed Institute)
 - Dr. Stamford “Skip” Smith (Central Washington University; Professor Emeritus-currently a resident of Bainbridge Island)
- Consider reversing the decision to not include flood wave and erosion control (breakwaters, fill, armoring, etc.) as a covered activity. This could prove to be particularly important when leases are up for renewal and/or significant

maintenance is proposed for existing projects and improvements to existing conditions (armoring, etc.) could accrue benefits to covered species.

Appendices

APPENDIX A – MATERIAL PROVIDED

July

- DNR Managment Authority_2006-07-07.pdf
- SciPanel Mtg 1_2006-07-21.ppt

August

- Activities Selection Process.pdf
- Activity selection recommendations_2006-08-04.doc
- Copy of Draft FreshW Preliminary Assessment_1dec04_battelle.xls
- Copy of Draft Marine Preliminary Assessment_1dec2004_battelle.xls
- Covered Habitat Charecteristics Table.pdf
- Covered Habitat Paper.pdf
- Species Selection Process_2006-08-01.pdf
- Species Selection Screens_2006-07-31.xls
- Species-Activity Methods.pdf
- SciPanel Mtg 2_2006-08-02.ppt

September

- Activities paperOutfalls_Etc_2006-08-23.pdf
- ActivityEffects References_2006-08-23.pdf
- Covered Activities Summary_2006-08-23.pdf
- Covered Species Summary_2006-08-21.pdf
- Current list_2006-08-24.pdf
- DroppedSpeciesList_2006_08-24.pdf
- Potential Effects_Sections_2006-08-23.pdf
- SciPanel Mtg 3_2006-09-12.ppt

October

- Effects Indices Aquaculture_2006-09-26.pdf
- Effects Indices Complex_2006-09-26.pdf
- Effects Indices Guidance_2006-09-19.pdf
- Effects Indices Misc Nearshore_2006-09-26.pdf
- Effects Indices Overwater_2006-09-26.pdf
- Potential Effects Model Summary_2006-09-26.pdf
- SciPanel Mtg 4_2006-10-09.ppt

November

- Conservation Measures Summary_2006-10-30.pdf
- ConsMeasure Rank Instructions_2006-10-27.doc
- ConsMeasures_2006-10-27.xls
- DFW DNR Conservation measures ranks_2006-10-27.xls
- SciPanel Mtg 5_2006-11-08.ppt

APPENDIX B – SCIENCE REVIEW PANEL MEETING NOTES

Meeting 1 Notes (7/21/2006) – Comments/statements highlighted in blue need additional clarity/direction from the panel.

Present

Carol Cloen – 360-902-1098, carol.cloen@wadnr.gov

Randy Carman – 360-902-2415, carmarec@dfw.wa.gov

Charles (Si) Simenstad – 206-543-7185, simenstad@u.washington.edu

Phil Roni – 206-860-3307, phil.roni@noaa.gov

Pete Bisson – 360-753-7671, pbisson@fs.fed.us

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Lisa Hallock – 360-902-1670, lisa.hallock@wadnr.gov

Doug Myers – 360-725-5451, dmyers@psat.wa.gov

Jim Brennan – 206-616-3368, jbren@u.washington.edu

Absent - Anne Shaffer (WDFW), Tom Mumford (DNR)

Notes:

1) Operating Principals

- Too early to characterize - Revisit at a future meeting
- Separate consensus building meeting in November to outline report and recommendations. Group would not include Panel Chair, but would need to have a recorder/facilitator familiar with the work.
- Purpose of separate meeting would be to provide a short list of recommendations.
- Opportunity for minority report to be used as a tool to illustrate areas of uncertainty.
- Rather than providing written comment on all documents reviewed, panel will bring concerns to the monthly meetings for discussion/clarity. Outstanding issues would be passed along formally.

2) General comments

- Monthly meetings should include **lots** of discussion time.
- Define the strategy behind DNR's Aquatic Resources HCP
- ESA Compliance policy changes will be addressed by DNR Executive managers during negotiations with the services. Not part of the panels work.

-
- Document legal changes made to state's authority since statehood in the HCP.

3) Carol's to do

- Set a goal for each meeting.
- Distribute map of aquatic region & districts.
- Clarify shoreline ownership in Lake Washington.
- Clarify how NRDA money gets distributed.
- Define terminology used in the work (e.g., conservation measures are what)

4) Next meeting

- Provide information on why species dropped off
- Update status of Covered Species

Meeting 2 Notes (8/9/2006)

Present

Carol Cloen – 360-902-1098, carol.cloen@wadnr.gov

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Anne Shaffer – 360-457-2634; shaffjas@dfw.wa.gov

Absent – Julia Parrish (University of Washington), Tom Mumford (DNR)

Notes - Any action to be taken is indicated in parenthesis, *with responses to the item in italics*

For future meetings

- Send/e-mail only those items that need to be reviewed in advance. Pass out examples and/or work products at the actual meetings and walk the panel through them.
- Use an example for each process (e.g., species selection) and walk the panel through the entire process.

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- Be specific in what we're asking for as a review and the questions we want answered.

Suggestions

- Create a graphic/box diagram of species and activity selection process.
- Provide a key and/or the guidance used in the species and activity selection process.
- Explore removing bulkheads, fill, etc as part of the restoration component of the HCP.
- In light of the potential ecological damage from recreational/personal harvest of seaweed (10 pounds/day/person, RCW 352-32-356), suggest changing the law/
- Because some riparian habitat does exist on state-owned aquatic lands, the discussion of the habitat type and its function should be expanded.
- The HCP should address activities as part of a process based discussion.
- For future conditions analysis, assume buildout conditions for covered activities and develop a predictive model based on Shoreline Planner GIS data.
- DNR's habitat definitions may not be similar to existing regional ones, especially Dethier's. For example estuarine wetlands are called out as a separate ecosystem on the work done by ENTRIX, but are nested within marine systems by Dethier.
 - Consider using the definitions used in the region's salmon recovery efforts.
 - Current definitions mix criteria (saltwater – depth and substrate; freshwater – geomorphic; lakes – depth, trophic) – could they be blended to increase similarity?
 - Adding categories that are the same for all ecosystem might be helpful – they could be noted as NA or unknown until more robust data is developed.
 - Perhaps trophic status could be used for the Sound as well.

Questions and Items of concern/interest

- Why forage fish (pacific herring); Oregon spotted frog; and gray whale were dropped from the list of covered species. (Carol will provide)
- Rationale for including pink salmon does not appear to be consistent with exclusion of pacific herring.
- How do we authorize seismic testing for oil and gas exploration. (Carol will provide)

-
- Even if a authorized activity is not a major source of stress for an organisms, it could push the species over a health/ecological threshold. This should be considered/addressed as part of/in the HCP.
 - How did we conclude that most armoring is not an state-owned aquatic land? (Carol will provide)
 - Changes in sea level as a result of climate change may lead to existing bulkheads that are currently consider to be on private land, being within state ownership. Consideration should be given to addressing this.

Our understanding of the law regarding state ownership and the movement of water bodies would indicate that a slow and “natural” rise in sea/water levels would change the state’s ownership of submerged land. As a result it is possible that existing bulkheads could become located on state land. However, given the uncertainty surrounding the extent of sea/water level rise and the possibility of court challenges to changes in the state’s ownership, this is a difficult future to plan for and will likely be dealt with under the Unforeseen Circumstances and/or Adaptive Management section of the HCP.

- Who manages harvest/removal of beach woody debris?
Per RCW 76.42.030 (Removal of wood debris), non-merchantable wood debris may be removed from state-owned aquatic lands for an individual’s “...own personal use.” In instances where the debris on state-owned aquatic lands is to be sold (merchantable), a sale of valuable materials contract would need to be applied for and issued by the appropriate Aquatic District.
- What state law says recreational docks are free?
RCW 79.105.430- Private recreational docks — Mooring buoys.
- The dynamics of coastal systems make defining where ordinary high water is difficult – is OHW still the upper limit of DNR’s ownership along the coasts? (Carol is working on the answer)

Next meeting

- **Brief** example of selection process for 1 species and 1 activity
- Discussion of species/habitat/activity interactions and the adequacy of the science used

Additional Research Requested

- 1. Why forage fish (pacific herring); Oregon spotted frog; and gray whale were dropped from the list of covered species?**

- Per guidance provided by the Services, the primary species that “trigger” the need for an incidental take permit (Section 10(a) of ESA) are federally Threatened or Endangered species. The Services also encourage the inclusion of unlisted species (proposed and candidate species as a minimum) that are likely to be listed within the foreseeable future or within the life of the permit. Our selection of species was based on the criteria defined in Section 1-1.2 of the Covered Species White Paper and discussed at our last meeting. Species were ranked as Covered, Evaluation or Watch species based on their listing status; the adequacy of available biological information in developing conservation measures; the perceived level of threat from Covered Activities; spatial overlap with authorized activities and state-owned aquatic lands; and the species listing status.

Per the matrix below, a species was ranked as Covered if the potential to affect the species (perceived threat from covered activities) was high and the species was either currently listed as Endangered or Threatened or a Species of Concern.

Preliminary Selection Criteria	Species Status – Level that Federal ESA Protection is Warranted			
	Currently Listed	Species of Concern	Designated Imperiled	Not Designated
Potential affect				
High	Covered Species	Covered Species	Evaluation Species	Evaluation Species
Medium	Evaluation Species	Evaluation Species	Evaluation Species	Watch List Species
Low	Evaluation Species	Evaluation Species	Watch List Species	Watch List Species

Pacific herring are currently listed as Evaluation Species because they are a Species of Concern on the state and federal lists, and the screen analysis indicated a “high” potential for the species to be effected by authorized activities. However, a review of qualitative metrics indicated that there would be little direct effect to individuals or habitat as a result of authorized activities, and that most effects would be indirect and encompass a relatively small percentage of available habitat. In addition, a status review conducted by NOAA Fisheries concluded that although some Pacific herring populations are declining, others are stable or increasing, and there was no need for protection under the Endangered

Species Act. Therefore they are not currently under consideration for inclusion in the Incidental Take Permit application.

Although the Oregon spotted frog is a state and federal Species of Concern, and the potential for authorized activities to effect the species is considered to be “medium”, there does not appear to be any spatial overlap with the species habitat and state-owned aquatic lands. Because the state’s ownership evolves with adjudication of navigability, the species remains as an Evaluation Species.

The gray whale is considered a Watch Species because the Eastern North Pacific population has been de-listed, is considered a Sensitive Species by Washington, and is ranked as apparently secure by the Natural Heritage Program. In addition, the potential for authorized structures and activities to effect to effect the species is considered “low”.

2. How do we authorize seismic testing for oil and gas exploration?

Seismic exploration is authorized under a standardized Oil and Gas Lease by our Product Sales and Leasing Division, **not** the Aquatic Resources Program. The document includes language regarding a Plan of Operations for the types of testing to be done. Our geologists say that there is a “no surface occupancy” clause and that freshwater removal would need to be done via a bore from a terrestrial site and that no seismic testing is authorized in the Sound.

3. The dynamics of coastal systems make defining where ordinary high water is difficult – is OHW still the upper limit of DNR’s ownership along the coast?

Our surveyors say that: “...the upper boundary of state ownership on the coast is mean high tide, just as anywhere else. The management of coastal tidelands however, is...through the Seashore Conservation Act, (RCW 79A.05.600-695)...” and “... the legislature appointed the State Parks & Recreation Commission management authority over the coastal beaches.”

They also say that “The United States Supreme Court Case, Hughes v. Washington, established the line of Mean high tide as the upper boundary of state ownership, however many beach-front owners deeded their accreted lands to the state prior to and even...” after the case was decided “...creating a patchwork of State ownership that is referred to commonly as non-trust state owned accreted land. This non-trust ownership is also managed by State Parks.”

“DNR management on the coastal beaches begins at Extreme Low Tide and extends out to the western boundary of the State three miles offshore. Coastal bays such as Grays Harbor and Willapa Bay are also DNR managed, the ownership being defined the same as Puget Sound or any other “normal” marine lands.”

Meeting 3 Notes (9/13/2006)

Present

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Absent – Julia Parrish (University of Washington), Anne Shaffer (Washington DFW), Phil Roni (NOAA)

Questions/To Do (answers in italics)

- Will Megan Dethier's comments on the ENTRIX created habitat classification be shared with the Panel?

Yes

- Why were groins/breakwaters/jetties excluded from the list of Covered activities?

Because existing structures are considered baseline conditions and all new construction and improvements/reconfiguration would need to be permitted by the Corps of Engineers and therefore subject to Section 7 consultation.

- What is the aerial extent of aquaculture on state lands?

Water Body	Approximate Acreage Encumbered ¹			
	Clams	Mussels	Oysters	Total
Discovery Bay	1.2		5.7	6.9
Drayton Harbor			1.0	1.0
Eld Inlet			1.0	1.0

Grays Harbor			241.0	241.0
Henderson Inlet	2.0			2.0
Hood Canal	10.0	5.7	313.2	328.9
Lopez Island		3.7		3.7
Nisqually	1.0			1.0
Oakland Bay	3.0	0.2	1.0	4.2
Penn Cove		60.0		60.0
Pickering Passage			19.4	19.4
Puget Sound			6.2	6.2
Puget Sound - South Bay			134.0	134.0
San Juans		5.5		5.5
Sequim	1.2		2.6	3.8
Skookum Inlet	6.6		2.4	9.1
Totten Inlet		13.4		13.4
Westcot Bay			23.0	23.0
Willapa	69.3		1,109.7	1,179.0
Unknown	3.1	1.0	7,099.1	7,103.2
Total	97.4	89.5	8,959.6	9,146.5

¹ Acreage values are estimates only and are not valid for publication.

- What was the rationale for dropping the pinto abalone and Olympia oyster?

The Olympia oyster is currently considered an evaluation species due to not being listed; a low likelihood of direct effects; and indirect effects encompassing a relatively small percentage of available habitat.

Pinto abalone are also listed as evaluation species due to not being listed and a small proportion of available habitat being effected by Covered activities.

- Why were western pearlshells excluded from the analysis?

Insufficient information regarding the species.

Issues/Concerns

- Species:
 - The focus on listed species overlooks the importance of forage fish/preferred prey and trophic interactions. The importance of prey species and their habitat needs to be addressed, as well as the rationale

-
- for excluding them as covered species. In addition, the HCP should clearly address food web interactions in both the species descriptions and effects discussions, as well as how these species and their habitat will be protected.
- Presented material overlooks/minimizes Covered activities impact on herring, surf smelt and sand lance spawning locations.
 - Rational for including/excluding species isn't always consistent.
 - Sockeye do not use estuaries – documents should accurately reflect life history requirements and species habitat use.
 - Olympic mudminnow occurs in the Chehalis River basin – double check its use of state-owned lands.
 - Streaked horned larks have similar requirements to those of the western snowy plover and should be considered for inclusion.
 - Oregon spotted frog may have similar habitat use to Covered amphibians and should be re-considered as a Covered species.
 - Blue heron populations are fluctuating and not well understood – perhaps they should be included as a Watch list species?
 - Scoter and grebe populations are declining rapidly, increasing their chance of being listed. Effects:
 - Since the effects of activities can be both positive and negative, focusing only on negative effects overlooks the “net effect” of an activity.
 - Defining impacts on an ecosystem or township scale may mask the critical nature of local/site specific impacts.
 - Excluding cables as a covered activity overlook impacts to eelgrass and changes to substrate that may effect salmonids and bottom species such as cod.
 - The information presented to date does not include a spatially explicit analysis of effects. While impacts can vary between types of structure (e.g., a recreational dock vs a marina), the severity of an impact is also factored by the location of the structure.
 - Including area of scour for ferries but not boat ramps is inconsistent.
 - Structures slated for removal either as part of a restoration project or because they are derelict provide habitat for a number of species. The material presented overlooks the effect of their removal.
 - The HCP should consider the cumulative effects of aquaculture on public and private lands, as well as measures to limit its expansion into critical/important habitat.
 - Oyster culture in Willapa eelgrass may conflict with herring spawning.

-
- Habitat/Effects
 - Defined habitats exclude beaches.
 - Activities have a horizontal and vertical footprint (e.g., floating homes with basements).
 - DNR should be spatially explicit as to what may/may not occur in specific areas, regardless of conflicts with other agencies.
 - Townships are not very effective as a spatial organizing tool.
 - HCP should emphasize the importance of eelgrass to species, as well as areas of eelgrass decline.
 - The effects analysis should also consider upland effects from new activities.

Potential Improvements

- Species:
 - Clarify reasons for excluding species.
 - Double check listing status for species.
 - Clarify that although resident rainbow do interact/breed with steelhead, populations also occur that are geographically isolated from steelhead.
- Effects:
 - Include spatial quantification of potential impacts from new activities (e.g., geoduck aquaculture, artificial reefs) and/or increases in existing activities (e.g., recreational docks) in the analysis.
 - Controlling factors should be separated in tables by specific type of activity (e.g., shellfish vs netpens/finfish; freshwater vs saltwater predation and overwater structures).
 - Address controversy regarding carbaryl explicating and state that its use is specific to Willapa.
 - Netpen discussion needs to expand on indirect effects. (e.g., competition), direct mortality from use of chemicals.
- Activities:
 - Clearly address the reasoning behind including Public Access as a Covered activity.
 - Verify that construction effects are covered under section 7 and/or HPAs and address in the HCP.
 - Clarify whether the definition of Aquaculture includes natural populations and types of species cultured.

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- Break out aquaculture methods, effects and controlling factors, and discuss all types of disturbances associated with each process (tilling, seeding, harvest, etc).

Next meeting

- **Brief** update on Conservation Planning efforts
- Overview and discussion of the Potential Effects Model.

Meeting 4 Notes (10/11/2006)

Present

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Tom Mumford – 360-902-1079; tom.mumford@wadnr.gov

Absent – Julia Parrish (University of Washington), Doug Myers (PSAT)

Conservation Planning Update (responses/additional information in italics)

- Has the ESA Team had reviewed other multi-species HCPs for comparison? This is part of routine/ongoing work for the Team and although we've gotten some good ideas from some of the plans a direct comparison is difficult at best. To date there aren't any existing HCPs that are solely aquatic and large scale.
- Anne urged us to not simply focus on species and habitats (e.g., forage fish spawning areas) but to keep looping back to the processes that form the habitats.
- Recognizing that our strategy may be different than the uplands HCPs, where they set aside acres to compensate for impacts to other acres, Si asked what other types of conservation strategies we could consider? *We're continuing to explore the possibilities with our management and attorneys.*

Reporting Structure

- DNR prefers a structured report as evidence of an independent scientific review.

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- The Panel felt that it should meet to talk about content without DNR staff present and that an independent editor should be found for the report. The Panel was also concerned as to how its review of the baseline/background work relates to future review of the HCP. *We will make every effort to address and incorporate the Panel's comments, suggestions, and criticisms in the draft HCP and EIS. While we cannot expect Panel members to continue their commitment to this project indefinitely, we would like to be able to utilize the members as their time allows to review portions of the Effectiveness and Validation Monitoring plans; Adaptive Management Plan; and the "Sciences" portion of the HCP.*
 - The Panel suggested that DNR provide a report template that includes clarification of the Panel's role and the expected scope of their review. In addition the Panel would like a structured list of questions and accommodation for additional input. A suggestion was made that the structure of the report parallel the meeting agendas and topics. *We have created a Report format (Review Panel Report_2006-10-26) and list of questions (Review Panel Questions FINAL_2006-10-26) for the Panel to consider. Additional suggestions are always welcome!*

Overview of Potential Effects Model

- Questions
 - Species distribution – Questions were raised regarding salmonid distribution in Puget Sound & how detailed the distribution maps were. *While the distribution shows salmonids occurring throughout Puget Sound, they are generally assumed to concentrate in the nearshore (photic zone). Our current version of the distribution maps are generalized for the entire state, but can be scaled for specific areas as the need arises.*
 - Who helped assign magnitude of effects? *Species specialists from Battelle and ENTRIX assigned the Effects Indices utilizing guidance provided by the project managers.*
- Concerns
 - The current grouping of species lifestages may not capture how severe impacts could be to certain life stages. For example, lumping of outmigrating and rearing salmonids into a single lifestage may de-emphasize the importance of estuaries as critical and sensitive habitat for juvenile salmonids. Also, freshwater salmonid lifestages get lumped with nearshore, estuarine habitat when we use "juveniles".
 - The coarseness of DNR leasing data is the weak point for defining species and activities overlap.
 - The spatial resolution of the Potential Effects Database is much coarser than that needed for conservation planning. The HCP should define methods for prioritizing/protecting finer scale habitat as well (e.g., eelgrass).

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- While the aggregate effects function **only** captures DNR-authorized activities, DNR will address cumulative impacts as part of our conservation strategy. This will influence the prioritization and locations of where we implement certain things.
 - The Potential to Effect rank use of high, medium and low may mask the severity of potential impacts on some species – since the rank is the result of an average of two values, is the rounding up valid. *The rank is the result ordinal ranks (species/activity overlap & coincident habitat as high, medium and low). As such we believe it's appropriate to continue the use of ordinal ranks.*
 - The Aggregate Effects Function lacks the hard science to support or refute its validity. It is also unclear how its use influences the subsequent analysis.
 - Potential Improvements/Suggestions
 - Consider picking some activity that we have good information on and running it through the model to see if it matches our expectations for the Intensity of Effect and Potentially Affected Acres).
 - Since effects are likely to be more intense/important in some areas, consideration should be given to the landscape context as part of the Intensity Distribution, (i.e. river mouths vs. other shorelines). Could be a valuable tool for determining where we apply conservation measures and how beneficial/valuable they would be.
 - In negotiations with Services, DNR should consider specifying where certain measures would be implemented. It is also possible that the importance of the location will vary by species - for example, Hood Canal is particularly important to chum salmon.
 - Perform some sensitivity analyses with conservation measures to determine how much change the model indicates for them.
 - Jim Brennan suggested putting the species distribution maps onto CDs for panel members, for ease of use. ***If there are Panel members who would like a CD of the existing maps, we will provide them – just let us know before the next meeting (11/8)!***
 - The break for the assigned rank values for the Species/Activity overlap seems arbitrary (low, medium, high). Consideration should be given to creating additional classes/ranks (4? 5?) and seeing how it plays out in the rest of the analysis.

Conservation strategy

- Questions
 - Has the ESA Team explored the possibilities of coordinating conservation measures with adjoining lands covered under DNR's other HCPs?
While this is always an option, it is slightly complicated by internal issues

related to the differences in the trust obligations for state-owned aquatic and terrestrial lands. Regardless, it is an option that we are looking at and will pursue where appropriate.

- Suggestions
 - A logical step in our conservation planning would be to explicitly develop a plan to address trespass situations. Recognizing that they are currently part of (degraded) baseline conditions, addressing them would show an improvement to the baseline.
 - Look at existing mitigation sequencing examples as we develop our conservation strategies.

Next meeting

- Conservation measures - Development and ranking; Integration in the Potential Affects model.
- Final Report

Meeting 5 Notes (11/8/2006)

Present

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Absent – Julia Parrish, Jim Brennan, Phil Roni, Rob Plotnikoff, Steve Rumrill

Conservation measures ranking and integration (*Answers/additional information in italics*)

- Clarifications
 - The Science Panel is not being asked to review the measures for effectiveness or appropriateness, they are being asked to review the *methodology* of the ranking exercise.
 - The initial ranking of the measures was a selection process used to identify those measures that would be used in the Potential Effects Model.

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- WDFW ranks were only assigned for the measures ability to avoid or minimize effects – the compensation strategy for the remaining effects is still being developed and will be part of the negotiation process with the services as well.
 - Washington DNR defined the category of “Cost” as the cost to the lessee to implement and *does not* include the cost of agency implementation (staff, monitoring, etc.), and “Practical” as the ease of implementation (e.g., developed technology, possible to do at the site).
 - The higher the rank, the more likely DNR would be to implement the measure and that it would be effective.
 - The Panel is being asked to address the process used to select measures for the model and how they were incorporated into the model, **not** whether they will avoid or minimize impacts or are practical, feasible, or politically acceptable.
 - The panel discussed the possibility of DNR implementing some of the defined conservation measures now rather than waiting until implementation. The Panel was invited to point out in their recommendations those measures that they believe should routinely be included in leases, with or without an HCP.
- Questions
- Can the model calculate the impact of not taking not implementing some measures? *The baseline that the model uses assumes that there are no current conservation measures and as such it already predicts the impacts of not implementing measures.*
 - How was best available science used to support the selection ranking for the conservation measures? *Although the reviewers were not asked to provide a rationale for their rankings or cite studies, the measures effectiveness at avoiding or minimizing the defined direct and indirect risk pathways (Net Conservation Measure Index) were based on available science and studies.*
 - How were the reviewers comments used? *The nature of the comments led to them being incorporated into programmatic measures.*
 - How will the HCP effect existing leases? Will both existing and new leases need to incorporate the negotiated conservation measures? *Under the limitations of contract law, we cannot apply the measures to existing/unexpired leases unless the lessee chooses to do so. However, we will be applying the measures and conditions to all new leases and renewals, as well as any lease that are re-opened due to violation of either the lease terms (default) or regulatory permits.*

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- What will DNR do in situations where you do not implement a certain conservation measure and you acknowledge an impact? *We will require or be required to compensate.*
 - Concerns
 - The issue of whether the measures are adequate to address impacts was raised. Monitoring coupled with adaptive management will be needed to answer this. Monitoring can be used to address areas of uncertainty.
 - Although staff ranked the measures as to political acceptability, the decision is more appropriate for agency managers.
 - As currently portrayed, only the avoidance and minimization components of mitigations reflected in the overall model for conservation outcomes. DNR will also need to address and implement compensation for unavoidable impacts.
 - There did not appear to be any process for reviewers identifying additional conservation measures. *Although WDFW staff did not avail themselves of the opportunity, they were invited to add measures as they deemed appropriate.*
 - As in earlier meetings, it was again pointed out that our limited understanding of where activities occur on state land may be underestimating the proportion of affected acreage. *DNR is aware of the issue and is working to improve our knowledge of the location and number of structures on state-owned aquatic lands.*
 - Conservation measures can be assessed two ways: 1. will it achieve the results intended (i.e., are they efficient) and 2. will it be implemented 100% (i.e., 100% compliance), both of which are filled with uncertainty. Members were uncomfortable and felt uncertainty regarding 100% implementation of the conservation measures, and the expected effectiveness of the measures
 - Although political filters have been applied since the very beginning of the HCP development process, and are continuing to be applied the science should initially be unconstrained and not biased by politics. First observe what the science tells you and then be transparent in disclosing the political realities. This comment applies to the overall HCP process, not just the conservation measure topic.
 - It was pointed out that most of the conservation measures weren't new - they were familiar, standard, current practices. Concern WAS expressed that if DNR makes the decision to not implement some of these, it causes a "lowering of the bar", or setting a lower standard than that which already exists within other agencies.
 - Keep in mind, when relying on Section 7 Federal ESA consultations that they only address listed species. DNR is accepting broader

responsibility by including unlisted species, and if we assume that one intent of the HCP is to prevent future listings we shouldn't rely entirely on Section 7 to implement the HCP for new activities.

- One weakness of the process for selecting conservation measures is that compensatory mitigation is not considered in the analysis.
 - The defined avoidance measures are really more programmatic, and not activity-specific. For example staying out of sensitive habitats, not using toxic materials.
 - WDFW reviewers were biased towards effects to fish habitat and likely ranked the measures in that context as opposed to a more inclusive (species-wise) ranking.
 - There appear to be two types of conservation measures; those that are spatially explicit, pertaining to the landbase, and those that are more BMP-like. Concern was raised DNR's ability to guarantee the implementation of BMP-type measures. *While we have yet to fully flesh out our implementation and compliance plans, it is likely that additional/new staff will be used to regularly inspect lease sites.*
 - A measures cost effectiveness or ability to be funded does not remove the impact. The HCP needs to address impacts by avoiding, minimizing or compensating for them.
- Potential Improvements/Suggestions
 - The panel was grappling with DNR's ability to apply conservation measures to existing leases v. new leases/construction. As the sufficiency of the measures may be different when applied to existing v. new activities, DNR should address where it will/can apply measures more clearly.
 - Panel members viewed the "practical" rank differently from the ability to implement a measure because of the political cost. Practical may be better considered in the context of the technical assessment, and should not be coupled with political cost and the formula revised.
 - DNR should point out conservation measures where converting effects to an area (of impact) is a good analogy for assessing impacts, and those where this isn't such a good comparison. Some impacts aren't necessarily related to area and reducing the area will do little to alleviate the actual impact. Recognize that the conservation measures address effects, not necessarily just area and that their feasibility, effectiveness, etc. would be site-dependent.
 - Fish migration pathways should be explored within the context of where uses are and prioritizing/identifying sites for conservation/restoration.

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- Consider documenting a strategic scenario with the conservation measures by first summarizing what DNR could do with no constraints, than describe the constraints (political, cost, etc.).
 - Utilize activity-specific worksheets and checklists to document and track implementation of measures.
 - DNR needs to be able to screen new projects and analyze whether other agencies regulatory conditions are inserting the conservation measures we are relying on. This will ensure our HCP measures are added and augment implantation.
 - Panel suggested DNR should consider doing paired studies where conservation measures are and aren't applied, in order to assess their effectiveness.
 - The Panel suggested having the science ratings clearly separated from the "feasibility" (political, cost) ratings. The two should be displayed separately in the document. Perform the science, biological assessment on the measures first, then overlay the other rankings.
 - The implementation plan for the HCP should include a lot of detail related to staffing and specific tasks; potentially including specifying what staff are in charge of compliance on existing activities vs new uses. This is critical for ensuring implementation - just writing language into an agreement isn't good enough.
 - An alternative to the existing ranking/selection formula might be simply adding the values instead of multiplying them. This may, or may not cause us to make different decisions about the measures.
 - DNR consider using a cost/benefit ratio instead of straight cost weighing the potentially high cost of implementing a measure against its environmental benefit. This can be done using available ranking numbers in a formula; by putting cost in denominator and benefit (WDFW rank) in numerator.
 - Management should be provided access to literature related to the success of compensation vs avoidance and minimization. This would clarify that avoidance and minimization are generally better options.
 - DNR should consider exploring the possibility of just using a unitless index for quantifying affected area. However, the utility of this may depend on how area is used in crafting and implementing the Incidental Take Permit and the HCP.
 - The existing issues with projects being permitted by regulatory agencies before the proponent has contacted DNR may lead to conflicts related to land use designations (e.g., reserves) or protections/conditions in the HCP and the Incidental Take Permit. DNR should consider interagency an d/or co-management agreements with the regulatory entities to address these issues.

Reporting Structure

The members present decided to use the December meeting to create a draft Report as a group, with technical format issues dealt with by DNR. After the December meeting, a draft version of the Report will be distributed to Panel members for final approval, with the Report finalized and distributed by the first week in January.

In addition to the questions/topics outlined in report format circulated for the November meeting (Review Panel Report_2006-10-26.doc), DNR would like an Executive Summary and Conclusions section for the report and will be including the meeting notes as an appendix to the document.

For each question/heading there are two categories of input the overall, big picture view, addressing the process DNR is using to create the HCP (methods, concepts, etc.); and the technical details/comments.

The process agreed upon is as follows:

- Carol will use the meeting notes to create a list of issues/recommendations for each question/heading in the Report format. The list will be distributed to all panel members along with each month's notes.
- Between receiving the material and December 1st each member will focus on fleshing out her/his individual comments, with all comments due back to Carol by December 4th.
- The assembled comments will be compiled into the report format and distributed to the entire panel by December 6th. **They will not be edited.**
- During the December meeting the Panel will use the compiled material to create the report. Additional computers will be provided by DNR to facilitate people working in groups. The composition of the groups, structure of the comments (bullets or paragraphs or?) and designated typists will be determined at the meeting.
- Following the meeting, DNR staff will finish formatting the report and circulate both the original and formatted copy for final approval by the panel members. **The report will not be edited for content.**

Next meeting – Wednesday December 13th

- **Summary of work presented**
- **Final Report**

Note - To encourage brain function, DNR will be providing a continental breakfast, coffee and lunch!

APPENDIX C – FINAL REPORT QUESTIONS

ESA Compliance Science Review Panel Final Report

The Panel is charged with focusing on the following five (5) areas:

- Consistency with existing regional conservation/restoration plans and efforts.
- Adherence to accepted scientific methods and principles.
- Adequacy of the science used.
- Reasonableness/achievability of the identified conservation strategies and goals.
- Strengths and weaknesses of Washington DNR’s HCP planning process.

ESA Compliance staff recommend that individual Panel members volunteer to lead the authorship of each category, and that either a designated Panel member or a specified (and agreed upon) Washington DNR staff member serve as the compiler of the responses. Editing will be limited to improving common voice and syntax.

The bullets following each question are intended to provide focus to the Panel members responses - they are not meant to be all inclusive, nor are they meant to be required elements for the responses. Comments that cannot be reasonably interpreted as part of the defined categories will be presented separately under the heading “Additional Comments”.

Questions

1) Is the HCP planning effort consistent with existing regional conservation/restoration plans and efforts?

- Will Washington DNR’s HCP complement existing regional planning efforts and how?
- Does an aquatic lands HCP provide value for regional planning efforts? If so, how?
- Were there elements of the material presented that would be an impediment to existing planning efforts? If so, what?

2) Did the analyses adhere to accepted scientific methods and principles?

- Were the differences in resolution between the spatial data sets (species, habitat, leasing) adequately addressed? If not, how could the solution/s be improved?
- Did the development of the Potential Effects Analysis (Model) and its components (Effects Indices, Magnitude of Effects) follow accepted scientific methods and principles? If not, please identify where problems existed and how they could be resolved.

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- Given the limitations of Washington DNR's management authority, were there additional factors that could have been included in the Model? If so, what were they and why?

3) Did the background information developed for the HCP incorporate best available science for the identified species, habitats and activities?

- Did the species description adequately represent their life history and occurrence in Washington State? Why? Are there components that need to be clarified and/or elaborated upon?
- Were the species spatial distribution data sets adequate? Are there additional sources that may be of benefit to this work, and if so where can they be found?
- Do the defined habitats accommodate the uncertainty and variability of the broad geography of the planning effort, as well as the coarseness of Washington DNR's leasing data? If not, how could they be improved? Are the habitat definitions capable of being refined as our knowledge of lease and habitat location improve? If not, how could they be improved? Are the definitions compatible with existing regional/national definitions? If not, why?
- Are the definitions of covered activities and the discussion of effects clear? Is there additional information that should be included, and if so what?
- Was the selection process for covered activities and species clear/transparent? Are there improvements that could be made, and if so what are they?
- Does the expert-based approach used in developing the Potential Effects Analysis adequately incorporate existing best available science? If not, why?

4) Are the current methods of identifying conservation strategies and goals reasonable and achievable?

- Has the decision to pursue a HCP for state-owned aquatic lands been clearly addressed? If not, what would you suggest to provide more clarity?
- By limiting the species and activities to be included in the HCP, we may have overlooked critical trophic or habitat interactions. Should these interactions be addressed in our conservation planning, and if so how?
- Was the process for selecting conservation measures clear? If not, how could it be improved?
- Are there additional developed conservation measures (e.g., BMPs, siting restrictions) that should be incorporated? If so, what are they and where can they be found?
- Does the estimate of the area of alteration for activities and the resulting calculation of Potentially Affected Area provide an adequate representation of impacted habitat? Why?

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- Does the conservative nature of the estimates provide a “margin of safety” to support species conservation? Why?

5) What are the strengths and weaknesses of the presented HCP planning process?

Are there additional factors that should be incorporated? If so, what are they and why should they be considered? Could any of the overlooked components be categorized as a fatal flaw¹ and if so, why?

¹ An event or condition that could cause an unanticipated impediment to implementation of the HCP and contributing to recovery of Covered Species.

APPENDIX D - COMMENTS ON SPECIES REVIEWS FOR DNR HCP BASELINE MATERIAL

Kurt Fresh, NOAA Fisheries, NWFSC
10/11/06

General

I focused my review on writeups for five salmonids (Chinook, coho, chum, cutthroat, and sockeye). I have restricted my comments to content of the species writeups and not on why some species were selected and others categorized in certain ways (e.g., herring). In general, I found the reviews to be uneven. For example, the coho review had the most literature included while a great deal of references for chum and Chinook had been missed. The reviews read as if they were general species reviews as opposed to reviews specific to Washington, which is what I thought they should be. For example, sizes given are more general sizes over the range of the species as opposed to sizes in Washington. There is excellent information on population status in Washington that is available (TRT references from Columbia River and Puget Sound, SASSI and Shared Salmon Strategy Chapters) that was poorly used. Further, because many if not most DNR activities are focused on the marine/nearshore area, it would seem that much of the focus should be on information from this part of their life cycle. And, I found that a number of useful nearshore references had not been included. There was not much of a difference in the impact assessments. I think there are ways to brighten or sharpen the differences between species. For example, sockeye use of nearshore areas is extremely limited so affects of activities on this species are very limited while the most vulnerable to activities are chum and Chinook. Interactions involving the species and other species (e.g., eelgrass, herring, and Chinook; the roles of predation and disease; connections between salmon and marine mammals) were almost non-existent in the species reviews. Another interreaction story that is important potentially for all species and not just coho is the nutrient/carcass story.

Chinook Salmon

1. SASSI (www.wdfw.wa.gov) was not used to discuss status of stocks/populations.
2. Several excellent compendiums of information are the draft Shared Salmon Strategy Salmon recovery plan and several TRT documents such as their population id document in Puget Sound.
3. There is little discussion of ecological connections of Chinook salmon with other species such as eelgrass, herring, orcas. This section should be significantly reinforced.
4. Blackmouth or resident Chinook salmon are a very important life history type in Puget Sound both economically or ecologically. I found no mention of this type anywhere in the discussion.
5. I found that there was an over reliance on Whitney and Wydoski for a salmon reference. Their book provides adequate species descriptions. However, better

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- general sources on Chinook salmon are Healey (1991) and Tom Quinn's recently published book (which I did not see cited for Chinook).
6. My definitions of certain terms and the writeup's use of these terms were different in some cases. In particular, my definitions of life history type, race, and category are not the same as your review. In fact, I think the document missed on the concept of life history strategy and what this means to salmon populations.
 7. Note that there are winter run Chinook salmon populations that exist, for example in the Sacramento River.
 8. The average length of Chinook salmon *in Washington* is not, by anything I have ever seen, written or even measured myself 1 meter. In fact, an average sized Chinook in WA is much closer to 75-85cm.
 9. Rearing of Chinook salmon in freshwater for two years is very rare. This strategy is much more common in Northern BC and Alaska.
 10. The idea that ocean type juveniles move slowly downstream is not correct: some do and some do not.
 11. The document concludes that there is uncertainty over whether existing regulations are adequate. In my opinion, the condition of Chinook population should be obvious evidence that our land and water management and our enforcement of our land and water management has been wholly inadequate.

Chum Salmon

1. I have never heard of adult chum salmon entering streams to spawn *in this region* in June except perhaps in the Columbia River.
2. In Puget Sound, there are also winter run chum salmon (e.g., Nisqually).
3. Again, SASSI was not used especially effectively. There are both a 1991 and a 2002 survey of population status. SASSI provides good information on stock status and is a good general information source.
4. Adult chum salmon can also spawn in intertidal habitats.
5. It is true that marine survival depends on size. However, I cannot think of any information that supports the statement that chum salmon fry arrive in estuaries earlier than most salmon comes from and that chum reside longer in estuaries. In fact, juvenile Chinook salmon reside in estuaries longer than chum.
6. I have never seen or heard evidence that predation by adults on juveniles is a major source of mortality. When adults enter streams to spawn, few if any juveniles are present. Even by the time most adults enter Puget Sound, most chum salmon have left the main basin.
7. Page 73- Larger fish leave before lighter fish. Where is the evidence to support this statement.
8. Chum salmon hatcheries in Washington are not a major source of chum salmon production.

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9. One important ecological relationship involving chum salmon is the putative interaction between pink and chum salmon juveniles during early marine life (see Gallagher 1979, Masters thesis, University of Washington).

Cutthroat Trout

1. Where is the support for the statement that different life history forms of cutthroat spawn at different times and are reproductively isolated. That should be referenced.
2. I did not understand the discussion of use of consolidated vs neritic habitat. Why is this comparison made.
3. Where is the data to support depth distribution or use of different depths by juvenile cutthroat trout.

Coho Salmon

1. There is more recent information on beaver ponds and coho salmon which should be included. (see Pess, G. R., D. R. Montgomery, E. A. Steel, R. E. Bilby, B. E. Feist, H. M. Greenberg. 2002. [Landscape characteristics, land use, and coho salmon \(*Oncorhynchus kisutch*\) abundance, Snohomish River, Wash., USA.](#) Canadian Journal of Fisheries and Aquatic Sciences, 59:613-623. Pollock, M. M., G. R. Pess, T. J. Beechie, D. R. Montgomery. 2004. [The importance of beaver ponds to coho salmon production in the Stillaguamish River basin, Washington, USA.](#) North American Journal of Fisheries Management, 24:749-760.)
2. Note that almost all the references in this section are on freshwater use by coho salmon. For some more information on marine use see some of the references in accompanying bibliography, especially:
 - a. Tshcaplinski (1989)
 - b. Miller and Sadro (2003)
 - c. Miller and Simenstad (1997)

Sockeye Salmon

There is no evidence from this region that estuaries are significant in any way to sockeye salmon juveniles.