Changes to Part 4(J) OP TR 3 Land Use and Land Cover Report

Comments Incorporated

NMFS Comment: The overall tone of the review that came forth in several comments was that the paper covered too many topics, without sufficient detail on methods, and without enough references to support statements.

- ✓ ODF: We agree that the flow of the paper was poor. As such we have deleted all material on environmental setting, land use change data, and harvest rate data. This may be a loss for the public record, but increases the readability of the paper. Although many of the cut analyses were unique to the ESU, the same data are available at a state level in other published documents. This leaves only the riparian land use and land cover and the upland land cover analyses that were performed for the ESU. We feel these are the most important for this project.

NMFS Comment: There were a number of comments about organization and the need to keep methods separate from results etc.

- ✓ ODF: We agree and have edited accordingly.

NMFS Comment: There were several comments concerning a lack of documentation of data sources, and description of methods.

- ✓ ODF: We added more detail on data sources including more specific references to the GIS data layers that we used and methods and rational for upland vegetation classes. We provided web links that provide detailed methodologies and accuracy checks of the public GIS layers.

NMFS Comment: The reviewer questioned the assumption that forest activities (logging) have a lower impact on riparian areas than agricultural or urban activities. The reviewer seemed to interpret our discussion in this regard to mean the authors are assuming little or no effect of "logging" on riparian areas.

- ✓ ODF: A brief rational had already been provided. However, we added more discussion on this assumption and references that support the approach we used.

  We added discussion throughout the paper to improve the clarity of the messages regarding (1) differences in protection measures and (2) what is known about the relative effect of forestry versus other land uses. For example, we added a reference to research that has shown that median adult coho salmon densities in forest-dominated areas were 1.5–3.5 times the densities in rural, urban, and agricultural areas. Relationships between these habitat characteristics and adult coho salmon abundance were consistent over time and explained almost half of the variation in the annual distribution of adult coho salmon (Pess et al. 2002). The abstract and full reference are provided below and added to the paper.

  Finally, ***we in no way assumed that harvesting has no effect on riparian and aquatic resources***. We have clearly stated this in the paper now and added references to Part 4D (Dent 2005a, 2005b, Mills et al. 2005, and Dent et al. 2005) of the coho assessment for a detailed discussion in this regard.

NMFS Comment: "How was the 200 foot buffer generated"

- ✓ *ODF:* We added a description of this GIS process.

Comments Not Incorporated

NMFS Comment: There were several comments regarding material that has now been cut out of the document.

- ODF: Obviously no changes were made to cut material. We cut material for two reasons:
  - We agreed that the flow of the paper was hard to follow with the breadth of material provided.
  - Most of the material that we cut, while unique to the ESU, is available in other references that address state trends. Again this is an overall loss for the public record, but better for the readability of this paper.

NMFS Comment: NMFS questioned the use of the CLAMS intrinsic potential model because it has not been published. The reviewer claims that the approach ignores all of the published literature on this topic.

- ODF: We have not changed the approach. This model is the only tool available that provides an index of habitat potential at the scale of the ESU. We did add references to draft papers from CLAMS that may help address some of NMFS concerns in this regard. We used the same approach in our evaluation of fish passage, and NMFS reviewers didn't raise such concerns in that context.

  NMFS Southwest Fisheries Science Center has applied the coho and the steelhead IP models for various purposes throughout California. For example, the IP models are part of the foundation used by the SONC TRT to determine independent coho salmon populations. Both applications are documented on the Southwest Fisheries Science Center's website.

  Scientists at the Southwest Fisheries Science Center (SWFSC) thoroughly reviewed the IP models before deciding to use them with only minor modifications. For example, they map IP for steelhead up to 12% rather than 10% as CLAMS does for the Coastal Province and they add a summer air temperature mask. Where summer air temperature exceeds a threshold, then they set IP to zero. Otherwise, IP is calculated, as it is in this CLAMS model, based on gradient, constraint, and flow. CLAMS used the SWFSC approach to map the summer air temperature threshold for the entire Umpqua and the rest of the CLAMS area. Nowhere did air temperature exceed their threshold, so CLAMS didn't consider it further. We added this discussion to the paper.

  Finally, we request specific references for "all of the published literature" on intrinsic potential habitat for coho, in the coastal coho ESU, available for the entire ESU, in a spatial format that can be combined with land use and land cover data, and reflects streams that approximate the 1:24K scale.

NMFS Comment: The reviewer was surprised that we didn't attempt an historic habitat reconstruction as done for the nearby Willamette Basin.

- ODF: We don't see the relevance of Willamette Basin to the Coastal Coho ESU. The Willamette has entirely different geologic setting, stream characteristics, human history, and population pressures. No changes were made. Again, we feel the intrinsic potential tool is the best available science.

NMFS Comment: Reviewer stated that they couldn't evaluate rigor because no maps were included.

- ODF: No change was made. We chose to present the data in graphical format rather than a mapped format. We aren't sure how inclusion of the maps improves NMFS ability to evaluate rigor. However, future iterations can include maps. PDF files of maps showing land use and coho high intrinsic potential stream reaches may be found at: ftp://128.193.112.13/pub/rodgers/Coho%20Intrinsic%20Potential%20Maps/

NMFS Comment: NMFS states that because they could not evaluate the validity of the agriculture and urban classifications, they can't evaluate the credibility of the findings. They also state that the authors have insinuated that "agriculture and urbanization are good for coho."

- ODF: We described in the paper that the classifications are based on zoning designations. When the zoning layer classed an area as agriculture or urban, but the cover layer showed forest or shrub, we classed it as agriculture or urban. This was based on an assumption, which we have clarified in the paper, that urban and agricultural practices have a greater impact on streams than forest practices. We reference a paper that supports this assumption (Pess et al. 2002).

- ODF: W*e did not intend to suggest, as the reviewer states, that urbanization and agriculture are good for coho.*

- The findings don't seem controversial to us. We simply demonstrate what percent of the near stream area is in various land use and cover classes and how that varies with stream type. We have added a discussion and reference to a Burnett et al. (DRAFT 2005) paper that found similar trends. Perhaps the added data source documentation combined with draft findings from Burnett et al. will increase NMFS's confidence in our findings.

References

Burnett K., K. Christiansen. S. Clark, D. Miller, G. Reeves, K. Vance-Borland. 2005 DRAFT. ***Salmon potential in the coastal province of Oregon relative to landscape characteristics.*** Draft in review. 33 pp.

Dent L. 2005a. ***Certainty that the conservation effort will be effective: Riparian Areas. Oregon Plan Assessment Part 4D ODF B1***. http://nrimp.dfw.state.or.us/OregonPlan/

Dent L. 2005b. ***Certainty that the Conservation Effort Will Be Effective: Fish Passage, Roads, and Landslides Oregon Plan Assessment Part 4D, ODF B2.*** http://nrimp.dfw.state.or.us/OregonPlan/

Dent L., A. Herstrom, E. Gilbert. 2005. ***A Spatial Evaluation of Habitat Access Conditions and Oregon Plan Fish Passage Improvement Projects in the Coastal Coho ESU Oregon***

Plan Assessment Part 4J, OP Technical Report 2.
http://nrimp.dfw.state.or.us/OregonPlan/ 18 pp.

Mills K., L. Dent L., J. Paul , B. Riggors. 2005. ***Reducing Effects of Roads on Salmonids under the Oregon Plan. Oregon Plan Assessment Part 4J, Technical Report 1***.
http://nrimp.dfw.state.or.us/OregonPlan/

Pess, George R, David R. Montgomery, E. Ashley Steel, Robert E. Bilby, Blake E. Feist, and Harvey M. Greenberg. 2002. **Landscape characteristics, land use, and coho salmon (*Oncorhynchus kisutch*) abundance, Snohomish River, Wash., U.S.A.** Can. J. Fish. Aquat. Sci./J. Can. Sci. Halieut. Aquat. 59(4): 613-623

Abstract: We used temporally consistent patterns in the spatial distribution of returning adult coho salmon (*Oncorhynchus kisutch*) to explore relationships between salmon abundance, landscape characteristics, and land use patterns in the Snohomish River watershed, Wash. The proportion of total adult coho salmon abundance supported by a specific stream reach was consistent among years, even though interannual adult coho salmon abundance varied substantially. Wetland occurrence, local geology, stream gradient, and land use were significantly correlated with adult coho salmon abundance. Median adult coho salmon densities in forest-dominated areas were 1.5–3.5 times the densities in rural, urban, and agricultural areas. Relationships between these habitat characteristics and adult coho salmon abundance were consistent over time. Spatially explicit statistical models that included these habitat variables explained almost half of the variation in the annual distribution of adult coho salmon. Our analysis indicates that such models can be used to identify and prioritize freshwater areas for protection and restoration.