



REPLY TO

DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
441 G STREET, NW  
WASHINGTON, DC 20314-1000

- 6 JAN 2014

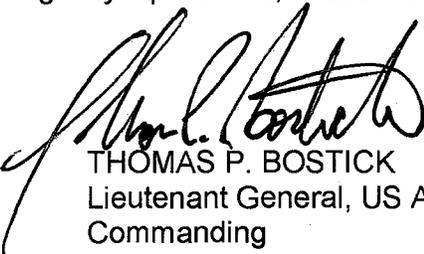
DAEN

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)  
108 ARMY PENTAGON, WASHINGTON, DC 20310-0108

SUBJECT: Willamette River Floodplain Restoration Study, Lower Coast and Middle Forks Subbasins, Oregon - Final USACE Response to Independent External Peer Review

1. An Independent External Peer Review (IEPR) was conducted for the subject project in accordance with Section 2034 of the Water Resources Development Act of 2007, EC 1165-2-209, and the Office of Management and Budget's Final Information Quality Bulletin for Peer Review (2004).
2. The IEPR was conducted by Battelle Memorial Institute. The IEPR panel consisted of four panel members with technical expertise in hydraulic, hydrology, and geomorphology engineering; cost engineering; environmental compliance/biology; and Civil Works planning.
3. The final written responses to the IEPR are hereby approved. The enclosed document contains the final written responses of the Chief of Engineers to the issues raised and the recommendations contained in the IEPR report. The IEPR Report and the USACE responses have been coordinated with the vertical team and will be posted on the internet, as required in EC 1165-2-209.
4. If you have any questions on this matter, please contact me or have a member of your staff contact Ms. Sharon Wagner, Deputy Chief RIT, Northwestern Division and Pacific Ocean Division Directorate of Contingency Operations, at 202-761-7094.

Encl



THOMAS P. BOSTICK  
Lieutenant General, US Army  
Commanding

**Willamette River Floodplain Restoration, Oregon  
Integrated Feasibility Report and Environmental Assessment**

**U.S. Army Corps of Engineers Response to Independent External Peer Review  
July 2013**

Independent External Peer Review (IEPR) was conducted for the subject study in accordance with Section 2034 of WRDA 2007, EC 1165-2-214, and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (2004).

The goal of the U.S. Army Corps of Engineers (USACE) Civil Works program is to always provide scientifically sound, sustainable water resources solutions for the nation. The USACE review processes are essential to ensuring project safety and quality of the products USACE provides to the American people. Battelle Memorial Institute (Battelle), a non-profit science and technology organization with experience in establishing and administering peer review panels for the USACE was engaged to conduct the IEPR of the Willamette River Floodplain Restoration, Oregon, Integrated Feasibility Report and Environmental Assessment.

The Battelle appointed IEPR panel reviewed the subject report and supporting documentation. The Final IEPR Battelle Report was issued on May 20, 2013. Overall, fifteen comments were documented, two were identified as having high significance, nine were identified as having medium significance, and four were identified as having low significance. The following discussions present the final responses to the fifteen comments.

The Willamette River Floodplain Restoration study is an ecosystem restoration study that is evaluating opportunities for restoring natural floodplain functions along the lower Coast and Middle Forks of the Willamette River. These functions include fish and wildlife habitat, groundwater recharge, flood storage, and sediment and erosion processes.

1. **Comment – High Significance: Certain design features of the recommended restoration plan may not be self-sustaining and may require perpetual maintenance.**

This comment includes two recommendations for resolution (recommendation #1 has two subparts); one was adopted as discussed below. The comment details the need for additional explanation of mechanisms that are expected to help sustain the design features over time and any costs and assumptions related to any maintenance anticipated.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended that the report identify any design features or other mechanisms not clearly evident that are expected to maintain woody debris and keep invasive species under control once established. For example, this may include naturally occurring upstream sources of wood that existing flows can deliver to the restoration reaches, planting of riparian areas that may in the future generate large wood, or identify any costs and associated assumptions required if perpetual maintenance of these design features is in fact anticipated.

The report was revised to include a new section (Section 6.12 Project Sustainability) to discuss how on-going efforts by other stakeholders includes the restoration of riparian areas upstream from the study area that will contribute large wood into the river systems in the future and that the recommended plan includes riparian restoration within the study reaches that will also contribute wood in the future. The report was also revised to provide more detail on the invasive species present and a management strategy

for control (Section 6.1.2 and new Appendix J). Maintenance has been proposed and included in the cost estimates from the earliest stages of plan formulation and includes continued invasive species management actions.

**USACE Response: Not Adopted**

The IEPR Panel recommended that if resident Canada goose populations are present in or near the proposed project area to include the potential impacts from goose herbivory and management strategies in the adaptive management plan. This item was not adopted as Canada geese are not present in large numbers in the study area. While resident Canada geese use urban lawn areas (particularly golf courses), the recommended plan area will be revegetated to promote native emergent, shrub, and forested wetlands and forested riparian areas that are not preferred habitat for resident Canada geese.

2. **Comment – *High Significance*: The long-term benefits of floodplain connectivity and natural processes cannot be determined because the degree to which the sediment, gravel, and wood supply has been reduced and the importance of this supply to meeting project objectives are not clear.**

This comment includes five recommendations for resolution; none were adopted as discussed below. The comment details recommended further analyses of sediment and wood supply conditions relative to the upstream dams and incorporations of the transport of wood and sediment as a project alternative to be evaluated. Additionally, the comment suggests including further explanation of the potential for channel incision and how the long-term benefits of the project will be achieved with respect to sediment and wood supply.

**USACE Response: Not Adopted**

The IEPR panel recommended conducting an analysis of current and historic sediment and wood supply conditions (pre and post-dam conditions). Further analysis was not conducted; however, the report was revised to include additional explanation of predicted sediment supply upstream of the dams as extrapolated from a nearby watershed (Santiam River), in Section 3.2.2 Geomorphology. The IEPR panel also requested that the relevance of sediment and wood supply be factored into the alternative evaluation process and discuss how long-term benefits of the project will be achieved with respect to sediment and wood supply. As the project purpose is focused on restoring floodplain functions and reconnecting floodplain habitats this was not considered to be a key element to be included in the alternatives evaluation. However, the sediment and wood supply could affect the long-term benefits of the recommended plan. Thus, the report was revised to include more discussion of project sustainability in the new Section 6.12 Project Sustainability. The IEPR panel recommended a discussion of likely channel incision under existing and proposed conditions. The report was revised to include additional explanation of separate work being conducted through the Corps-TNC Sustainable Rivers Program to conduct flow pulses and monitor geomorphic responses that is demonstrating that geomorphic changes can be observed on localized scales (i.e. at the study reach scale) from actions such as flows and the placement of large wood. Further, the Corps is also conducting a draw-down of the Fall Creek Reservoir to allow downstream fish passage that also provides for sediment passage downstream. The Corps will be considering other such actions separately from this study that will reduce the sediment deficit from the upstream dams and promote more natural sediment conditions. Finally, the IEPR panel recommended including the transport of sediment and wood past the dams as a restoration measure. The report was modified in Section 5.2 to make more explicit that the placement of gravel downstream of the dams was considered as a restoration measure. However, because of the multi-species evaluation model, these measures did not rank highly in the overall alternatives evaluation as they primarily benefit only salmon species.

3. **Comment – *Medium Significance*: The transport of wood and gravel from above the dams is identified as a restoration opportunity but not carried forward into the development of restoration alternatives.**

This comment includes one recommendation that was adopted as discussed below. Additional explanation for the decision to eliminate the transport of wood and gravel from above the dams is requested.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended that additional discussion be added to the report detailing why the transport of wood and gravel from above the dams was not recommended as a restoration measure. The report was revised in Section 5.2 to identify why the transport of wood and sediment from above the dams was not carried forward as a potential restoration measure. It was not carried forward due to concerns about the potential for inducing flooding and large scale channel migration. Separate from this study, the passage of sediment through the dams is being conducted at Fall Creek Reservoir and is also being considered at other upstream dams.

4. **Comment – *Medium Significance*: It is not clear why certain alternatives, such as modifying dam operations, were removed from consideration for this study.**

This comment includes one recommendation that was adopted as discussed below. Additional explanation for not considering modifying dam operations in this study was requested.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended that the rationale for not considering the modification of dam operations in this study be included in the report. The report was revised to include a statement on the assumptions of this study in Section 4.4 Constraints and Assumptions that the modification of dam operations was not included as a potential restoration measure in this study. However, the recommended plan has been designed to account for the potential of future changes in dam operations that may occur separately from this study, such as through the Sustainable Rivers Program.

5. **Comment – *Medium Significance*: It is not clear how the “bullfrog constraint” was used in the formulation of project alternatives, nor is it clear how maintaining a depth of less than 6 feet will minimize bullfrog habitat.**

This comment includes five recommendations, all of which were adopted as discussed below. This comment details the need for defining more clearly what bullfrog habitat needs are and how this was used in the plan formulation process.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended that bullfrog habitat be defined and also that more explanation be provided of how the bullfrog was used in the evaluation of alternatives. The report was revised to identify preferred bullfrog habitat conditions and describe how these parameters were used later in the design of the recommended plan to reduce bullfrog habitat while also enhancing habitats for native species, in Section 5.4 Evaluation of Alternatives. The panel also recommended that the relationship between the bullfrog and native species be discussed and which species bullfrogs may prey upon. The report was revised to include more discussion of the relationship of bullfrog to native species and which species (Oregon chub) use similar habitats and which do not in Section 5.4 Evaluation of Alternatives.

**6. Comment – *Medium Significance*: Potential limitations in channel bank or bedform survey data may yield hydraulic model results that are not representative of current conditions.**

This comment includes two recommendations, one of which was adopted and one of which was not adopted. This comment details describing how the channel bank and bedform data may have changed over time and how it has affected the hydraulic model results, and conducting additional confirmation survey data collection to ensure there are not major changes.

**USACE Response: Adopted**

**Action To Be Taken:** The IEPR panel recommended collecting additional confirmation survey data collection to ensure that the model results are representative of current conditions. Additional reach-scale survey data collection will be conducted during PED to support reach-scale hydraulic modeling at each project site within the recommended plan to refine channel elevations and grading quantities.

**USACE Response: Not Adopted**

The IEPR panel recommended further discussion of the channel bed and bankform data used in the hydraulic model. Appendix E Hydrology and Hydraulics details the source and year of the survey data that was collected over multiple years and also included a repeat survey in one reach to compare to a previous survey as head-cutting had been observed in the channel. At the feasibility level, the channel changes that have occurred are unlikely to significantly affect quantities and costs. The overall contingency is 33.8% that provides a sufficient margin for minor changes during PED.

**7. Comment – *Medium Significance*: The monitoring and adaptive management plan does not fully explain how project targets were derived or if successfully meeting targets is an indication that the proposed project benefits are being achieved.**

This comment includes two recommendations, one of which was adopted and one of which was not adopted as discussed below. This comment details describing project targets and how this relates to project objectives and how it will be determined if project benefits are being achieved.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended providing more explanation of how the targets in the monitoring plan were developed and how each relates to the projected outputs of the recommended plan and its objectives. The report was revised to include more discussion in Section 10 Monitoring and Adaptive Management Plan on the basis of each target, most of which were derived from the parameters in the habitat evaluation model used to project the benefits that could accrue from the alternatives. The monitoring targets are categorized by project objective and directly relate to each.

**USACE Response: Not Adopted**

The IEPR panel recommended providing more discussion on how it will be determined that project benefits are being achieved. Section 10 in the report identifies that the targets are directly related to the project benefit projections and that if the targets are not met that adaptive management actions would be considered and implemented to achieve the targets.

**8. Comment – *Medium Significance*: Monitoring and evaluating the biological and physical responses may not be possible based on the proposed monitoring plan protocols.**

This comment includes two recommendations, one of which was adopted and one of which was not adopted as discussed below. This comment details potential monitoring protocols.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended adding survey cross-sections to document changes in floodplain and channel conditions and connectivity. The report was revised to include this information in Section 10 Monitoring and Adaptive Management Plan.

**USACE Response: Not Adopted**

The IEPR panel recommended identifying specific evaluation goals for biological and physical responses in the monitoring plan and how they are linked to restoration goals. The IEPR panel recommended using the Primary Constituent Elements of listed species habitats and link the success of the plan to salmon recovery documents. The targets in the monitoring plan were developed based on habitat parameters in the evaluation model. The Primary Constituent Elements are fairly general and do not provide much support in the development of monitoring targets. Monitoring of salmon relative to recovery planning is beyond the scope of the study; however, monitoring of the use of the restored habitats will occur.

**9. Comment – *Medium Significance*: Expected impacts on the existing fringe wetlands from implementing the recommended restoration plan have not been quantified, and there is no description of how these impacts will be addressed.**

This comment includes four recommendations, all of which were adopted as discussed below. This comment details specific wetland information that should be explained in more detail.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended providing more description of the existing wetlands and the proposed effects and whether changes in wetland classes or types are expected. The report has been revised to provide more detail on the acreage and types of existing wetlands and the proposed changes in both acreage and type resulting from the recommended plan, in Section 7.6 Wetlands. More area of wetland and other waterbodies will be created or restored than would be adversely affected.

**10. Comment – *Medium Significance*: The Primary Constituent Elements of the targeted species that are listed under the Endangered Species Act are not specifically linked to elements of the recommended restoration plan.**

This comment includes two recommendations, neither of which were adopted as discussed below. This comment details that recovery of fish populations should be directly linked to the project goals.

**USACE Response: Not Adopted**

The IEPR panel recommended that the report discuss how the recommended plan will affect the Primary Constituent Elements for the listed species and incorporate the Primary Constituent Elements into the description of the recommended plan and monitoring strategy. The Biological Assessment (and subsequently received Biological Opinions from the National Marine Fisheries Service and U.S. Fish and Wildlife Service) describes how the recommended plan affects the Primary Constituent Elements. This

information is more detailed than appropriate for the main report, but is included as an appendix. The Primary Constituent Elements are fairly general and do not provide much support in the development of monitoring targets. Monitoring of salmon relative to recovery planning is beyond the scope of the study; however, monitoring of the use of the restored habitats will occur.

- 11. Comment – *Medium Significance*: The basis for the selected discount rate of 3.75% for the economic analysis and costing for the life of the project is not explained, and a sensitivity analysis is not provided to demonstrate potential differences in total project costs if the discount rate changes over time.**

This comment includes three recommendations, of which two were adopted and one was not as discussed below. This comment details questions on whether the cost engineering analysis is appropriate.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended explaining how the discount rate was selected and how annual costs were determined, as well as conducting a sensitivity analysis of using different discount rates. The report was revised in Section 5.5 Cost-Effectiveness and Incremental Cost Analysis to explain how the discount rate was selected and to correct an error regarding the explanation of the calculation of annual costs. A new section, Section 5.10 Sensitivity of Federal Discount Rate was added to explain how variations in the discount rate over a five year period would affect the overall costs.

**USACE Response: Not Adopted**

The IEPR panel recommended conducting a sensitivity analysis to show the impact of using different discount rates on total project costs. A sensitivity analysis was conducted for a five year period to show the relatively small effects on construction costs. Variations in discount rates over a longer time period would affect OMRR&R costs that are relatively low compared to the construction costs, thus the analysis was not conducted over a longer time period.

- 12. Comment – *Low Significance*: The basis for the contingencies applied in the cost analysis is not explained.**

This comment includes two recommendations, neither of which were adopted as discussed below. This comment involves discussing the cost and risk elements in more detail to reduce the contingency value.

**USACE Response: Not Adopted**

The IEPR panel recommended providing a breakdown of the cost elements and their percentages and how that results in the contingency value and providing further explanation on why the contingency value cannot be reduced at this time. The formal Cost Schedule Risk Analysis conducted for the study and included in Appendix C includes a detailed breakdown of thirteen primary risk elements and their expected cost and schedule effects were estimated based on recent bid information and other data. The recommended restoration plan has been designed to the feasibility level appropriate for decision-making. The contingency, while higher than “rule of thumb” is explicitly based on the identified risks and is appropriate at this stage of design.

**13. Comment – *Low Significance*: The Work Breakdown Structure in the Project Cost Summary does not provide enough detail to identify how the costs are being distributed across the different work elements.**

This comment includes one recommendation, which was not adopted as discussed below. This comment details a request for detailed cost information in the report.

**USACE Response: Not Adopted**

The IEPR panel recommended providing a more detailed presentation of the total project costs in the report. The summary level cost estimate is appropriate for a document that will be publicly available as a detailed cost breakdown could disadvantage the Government during the bid phase. The more detailed cost estimate breakdown was provided separately for the IEPR panel to review.

**14. Comment – *Low Significance*: The rationale for non-ecologically based decisions and whether they affected the selection of the recommended restoration plan is not discussed.**

This comment includes two recommendations, which were both adopted as discussed below. This comment details presenting information on the decisions to run the two Forks separately in the Cost Effectiveness and Incremental Cost Analysis and the decision to screen high cost sites out.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended further explanation of how analyzing the Coast and Middle Fork separately and then combining may have affected the results; and also explanation of how the sites were screened. The report has been revised to provide more discussion in Section 5.5.6 Guide to Interpreting Results to discuss how these decisions did not affect the results of the analysis and the selection of the recommended plan.

**15. Comment – *Low Significance*: There are inconsistencies in the presentation and discussion of project goals and objectives in the documentation.**

This comment includes one recommendation, which was adopted as discussed below. This comment details questions on project goals and objectives.

**USACE Response: Adopted**

**Action Taken:** The IEPR panel recommended that the goals and objectives be consistently presented throughout the document. The report has been revised to make the one project goal and three objectives consistent throughout the document.