Scott Boettcher

From: Scott Boettcher <scottb@sbgh-partners.com>
Sent: Wednesday, August 15, 2012 12:36 PM
To: scottb@sbgh-partners.com
Subject: Dept. of Ecology comments on Chehalis Basin Flood Mitigation Alternatives Report
Attachments: Flood Mitigation Alternatives Report (Ruckleshaus 8-12) Ecy comments.docx

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From: Hempleman, Christine (ECY) [mailto:chem461@ECY.WA.GOV]
Sent: Tuesday, August 14, 2012 10:23 AM
To: melissa.kuehne@wsu.edu
Cc: Jim Kramer; Pickett, Paul (ECY); Hoyle-Dodson, Guy (ECY); Bailey, Chrissy (ECY); Clingman, Tom (ECY); Nelson, Travis W (DFW); Donahue, John; TURLEY, CHUCK (DNR); Trefry, Stu (SCC)
Subject: Dept. of Ecology comments on Chehalis Basin Flood Mitigation Alternatives Report

Department of Ecology's comments on the Chehalis Basin Flood Mitigation Alternatives Report are attached. These comments are formatted to respond to your two basic questions: What priority flood hazard mitigation projects should be considered and why?; Suggestions for how to improve the information contained in the report.

This report does an impressive job of compiling an enormous wealth of personal and community experience, characterizing a wide range of viewpoints, and summarizing a growing body of technical study. It captures well the complex and difficult job the Flood Authority and community face in working to devise solutions. We thank you for the opportunity to review and comment.

Chris Hempleman
Senior Planner
WA Dept. of Ecology
360-407-0239

Chehalis Basin Flood Mitigation Alternatives Report, draft July 16, 2012
Ecology comments 8/14/12

Priority flood hazard mitigation projects

The Chehalis basin will continue to flood on the mainstem and tributaries and, as the report states, it appears that frequency and magnitude of floods are increasing. Current floodplain management science prioritizes methods that are generally non-structural and have multiple benefits to the watershed. Ecology favors this approach along with small capital projects targeted at localized problem areas.

The report uses the terms "flood mitigation" and "flood hazard mitigation" but the distinction and meanings need clarification. "Flood mitigation" may suggest that we could make flooding "go away." However, there are no projects that exempt areas from flooding. For example, some proposed projects focused on the mainstem may reduce impacts to some areas, in some situations, while providing no or minimal benefits to other areas of the basin - notably tributaries, including most of the South Fork, Newaukum, and major rivers in the lower basin.

"Flood hazard mitigation" recognizes natural watershed processes; it is based on the premise that it is most beneficial in some situations to move the water away from people, in others to move people away from water.

To move water away from people, current floodplain and watershed management science prioritizes methods that enhance natural functions such as:

- programmatic and regulatory measures
- restoring watershed functions, including wetlands and upland tributaries
- restoration of riparian zones and reconnecting flood plains
- improved forest management, especially forest road restoration.

To move people away from water, it may be most cost-effective to use early warning systems, buy-outs, flood easements, and raising houses.

The modern floodplain management, watershed-wide methods we prefer:

- offer a reduction of flood impacts to critical areas on the mainstem <u>and</u> on tributaries
- are more sustainable, providing a better cost/benefit ratio up-front as well as in long-term maintenance costs
- are adaptable to changing needs and conditions
- can be funded over time and distributed throughout the basin
- have multiple benefits to overall watershed function including improved groundwater recharge, more stable and predictable geomorphologic processes (e.g., erosion, aggradation, and impacts to Grays Harbor) and proven benefits to fish and aquatic ecosystems.

Information contained in the report

General comments:

1. Characterization of the 2007 flood and storm: The report should note that there is disagreement about the 100-year design flood used in the analysis. Ecology's analysis shows that floods at Grand Mound are associated with high flows both at Doty and from the Newaukum River. The methodology used for the current 100-year flood biases flow to the mainstem above Doty. The report should clearly explain the differences between calibration storm events and the design storms, and limitations and biases of each.

   Ecology recommends that a second design flood should be developed for a storm focused predominantly on the Cascade foothills rather than the Coast Range. Otherwise designs of downstream projects could be missing the potential impacts of a storm that is not consistent with the current design storm.

2. Retention project compliance with the Clean Water Act and State Water Quality Standards: The report makes no mention of these requirements. There are separate concerns for upstream impacts (the reservoir) and downstream impacts (below the dam).

   Above the reservoir are areas that have been designated for salmon spawning in the State Water Quality Standards. From a regulatory perspective, how to remove existing uses (including salmon spawning) from a waterbody is unclear and a regulatory pathway may not exist. Normally, to meet Clean Water Act requirements a project would have to show that it would not impact the current designated uses of the waterbody. Off-site fishery enhancements cannot be used as mitigation for loss of an existing use. How the proposed Chehalis River dam project would address this issue is uncertain.

   Below the dam, Ecology's analysis shows that water quality standards for dissolved oxygen and temperature are likely not to be met. The timing and severity of the impacts would depend on the final design of the reservoir, especially the depth of the outlet, and how the dam was operated. The design and operation of the dam will have to ensure that standards are met downstream. How this would be accomplished has not been determined, although it will likely add to the costs of the dam.

   One key limitation is the need for a numeric model of basin hydrology to support the hydraulic model, identify gaps in the understanding of basin hydrology, and aid in future decision-making.

3. Cost/benefit of the dam: The disparity of opinions and need for better information regarding the projected cost of the dam is not adequately characterized in the report. A number of potentially significant cost considerations have been raised in response to the Phase 2B report (Economic Feasibility), in subsequent studies, and in public comments. These considerations regarding the existing, conceptual cost estimates for the dam should be acknowledged in the report:

    - Water quality and Clean Water Act compliance
    - Additional construction and operation costs for dam hazard mitigation due to proximity of Pe Ell
    - Lack of detailed assessment of the dam site including key factors such as stability and haul distance to suitable construction material
    - The "life cycle costs" of a dam including refined operation and maintenance (with fish mitigation and sediment management), as well as decommissioning of the structure at the end of its useful life. (This life-cycle consideration should be factored into cost analyses of all capital projects.)
    - Updated fish mitigation construction and operating costs.

    In general, the report seems to overemphasize the possible benefits of the proposed dam and underestimate the possible costs in dollars as well as impacts to watershed functions. There remains a great deal of uncertainty about both.

4. Limitations to the modeling approaches: During review of the hydraulic modeling, Ecology identified a variety of limitations and concerns with the modeling. We recognize that this hydraulic model is a definite improvement over past efforts. However, the report should recognize that the model still has large areas of uncertainty and inaccuracy and that additional improvements should be considered for the future.

5. The report could better acknowledge the fact that the problems in the lower basin are less well defined than in the upper basin. Without this, the need for a solution doesn't seem well supported.

Specific comments:
(*underlined language is suggested add)

1. Page 4: In introducing the Fish Impact Study, take a more even-handed approach. Along the lines of: "According to (the study),* a dam may have mixed results for salmon species in the basin. A dam could provide..."

2. Page 4: Add available cost information, to make the section on the water retention project parallel with the others in this section – such as: "Conceptual cost estimate for construction of a multi-purpose dam is $245 million. This estimate is based on preliminary information. Potentially significant cost considerations have been raised

during studies conducted after the preliminary cost estimates, and in public comment."

On page 49, please include a summary of factors that could increase cost of the dam project as we have outlined above under "cost/benefit of the dam" in General Comments above.

3. Page 5, bottom of page: Bullet list of Corps options uses a set of terms that are meaningless to the average reader. It would be helpful to briefly describe what these are (i.e. General Investigation, General Reevaluation Report, etc.)

4. Page 7 Combo 2: "Because of the dam, Combination 2 would provide significant flood mitigation benefits in the *<u>lower</u> South Fork Chehalis and throughout the mainstem Chehalis….." There is emphasis in the report on the importance of the Boistfort Valley as an agricultural area – for example, page 32 – but our understanding is that the dam does not protect all these areas.

5. Page 7 Combo 3: Suggest this be revised to ensure clarity: "Outside of the Twin Cities area Combinations 2 and 3 would have very similar benefits to each other, with substantial water surface elevation reductions in most locations *<u>in the upper and middle mainstem</u>."

6. Page 8 and page 60 "Local Programs and Programmatic Approaches: There seems to be an erroneous distinction being made between structural options and programmatic approaches: "This kind of approach would be the less expensive to implement; *however the risk of flood damage to existing development in the floodplain would remain*." No project can eliminate the "risk of flood damage to existing development in the floodplain." And programmatic actions such as elevating houses and building critter pads can directly reduce the risk of flood damage to existing development. A more accurate statement would be, "This kind of approach would be implemented and funded over time throughout the basin. The scope of such an approach, as well as the associated flood hazard reduction benefits and costs, have not been evaluated."

7. The summary of hydrology on page 21 creates a somewhat inaccurate impression about how floods can occur in the basin. A large flow at Grand Mound can be predominantly from the Cascade foothills (Skookumchuck and Newaukum) or from the Coast Range (above Doty and S. Fork). Flood events have occurred that were predominantly from either of these two areas. (The percent of flow from Doty for all Grand Mound floods ranges from 17% to 40%, with 2007 as an outlier at 88%.) To focus solely on flood events focused on the headwaters above Doty introduces a bias that may neglect the impact of the significant flood events that focus on the Cascade foothills. The basin is large and complex enough to need multiple design storm events.

   Here is some suggested revised language:
   a. Flood events at Grand Mound are generally a combination of high flows from the Coast Range (mainstem above Doty and the South Fork) and the Cascade Foothills (Newaukum and Skookumchuck Rivers). Floods generally vary from

being roughly two-thirds from the Coast Range to two-thirds from the Cascade Foothills, including any proportion in between.

b. The 2007 flood event was an extremely unusual event with unprecedented flows concentrated to an extreme amount over the Coast Range.
c. A large flow at Doty or a large flow in the Newaukum River are reliable (although not perfect) indicators of a large flow downstream at Grand Mound.

8. Pages 42 and 89 conflict in reference to which communities are considering applying for the FIRM Community Rating System. Page 42 says Grays Harbor is considering applying, 89 says Grays Harbor and Napavine. Napavine does not participate in the NFIP at this time so cannot apply for the CRS.

9. The "Potential Programmatic actions" on page 47 and the discussion of Riparian restroration on pages 93-94 should also refer to the restoration of wetlands and floodplain storage and connectivity that can provide floodwater storage and habitat benefits.

10. The analysis of the dam on pages 48-49 should also mention uncertainty regarding Clean Water Act compliance and the adequacy of the design to protect Pe Ell.

11. Figure 5 on page 59 - Are combination A and combination 1 the same thing? It would be useful to understand the difference between 'significant' flood mitigation, 'some' flood mitigation and 'generally' protected, etc.

12. The summary on page 72 is misleading.
    a. The last sentence of the first paragraph under "Water Retention Project On The Mainstem Chehalis River" states:

       "A single-purpose flood storage structure has also been examined, but does not have the added benefit to fish and wildlife of providing additional water flow and cooler instream temperatures from water pulled from deeper parts of the reservoir during the summer months, to mitigate environmental impacts."

       We suggest:

       "A single-purpose flood storage structure has also been examined. While a single-purpose structure may not have the potential environmental benefits of the proposed multipurpose structure, it may help reduce some of the potential impact."

    b. Under the fourth bullet, releases from the dam can result in lower oxygen levels. Therefore this statement should say: "The Anchor QEA model predicts flow augmentation in the summer months can enable higher concentrations of dissolved oxygen at times, depending on how the dam is constructed and operated."
    c. Under the fifth bullet also is inaccurate. This statement should say: "The Anchor QEA model predicts the additional 65,000 acre-feet of storage can be used for

controlled release in the summer, which may reduce water temperatures at times, depending on how the dam is constructed and operated."

13. The "potential concerns" on page 73 are incomplete. The following should be included:
    a. The inundated area of the reservoir will eliminate salmonid spawning areas, which creates challenges both directly on the fishery and also for Clean Water Act Compliance.
    b. The Anchor QEA model predicts that dam releases at times may reduce concentrations of dissolved oxygen, depending on how the dam is constructed and operated. These reduced oxygen levels may not be incompliance with the State's Water Quality Standards.
    c. The Anchor QEA model predicts higher water temperatures at times, depending on how the dam is constructed and operated. These elevated temperatures may not be incompliance with the State's Water Quality Standards.
    d. Construction and operation of the dam to protect high hazard conditions because of the downstream proximity of Pe Ell may significantly increase the costs of the dam.

14. The last sentence on page 73 is unclear. Should the reference to the airport area be to I-5? In other words, would additional localized improvements be needed along I-5 to protect I-5, not to protect the airport area?

15. Page 96 - third sentence in the first paragraph. It is the Chehalis River, not the Mary River, that will cut through the oxbow and head directly at Mary's River Lumber in Montesano. In the fourth sentence (1st paragraph), it is unclear and counterintuitive how removing levees could <u>prevent</u> a river from moving. Should it state that removal of the levee would <u>allow</u> the river to meander? In the last sentence of the second paragraph, the Department of Ecology also needs to be involved in bank stabilization proposals.