PROPOSED FRAMEWORK FOR DISCUSSION
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NEXT STEPS FOR CHEHALIS BASIN FLOOD DAMAGE REDUCTION

Over the last century major floods in the Chehalis River Basin have occurred about twice per decade, causing damage to homes, businesses, farms, roads and railways, and loss of human life and livestock. Some of the worst floods on record have happened recently – in 1990, 1996, 2007 and 2009. The economic damages of the 2007 flood alone were estimated at over $900 million, with a third of that damage coming from the closing of Interstate 5. These recent floods prompted governments and citizens of the Basin to step up and re-commit to the task of preventing this level of devastation in future floods. There is broad agreement in the Basin that more needs to be done, and can be done, to reduce the damage of large floods.

Since the 2007 flood there has been active engagement of the leaders in the Basin to determine a program of flood damage reduction investments. Progress has been made in preparing for future floods, the knowledge base on potential flood damage reduction projects has been expanded, the flood warning system has been improved, and new tools and other information have been developed to better understand flooding in the Basin and the impacts of potential projects. Decisions are needed on the path forward to reduce flood risks for people that live along the Chehalis River.

The 2011 Legislature included language in its capital budget requiring the Office of Financial Management (OFM) to prepare a report addressing a series of technical questions and—in coordination with tribal governments, local governments, state and federal agencies—to recommend priority flood damage reduction projects. Based on the recommendations of Basin stakeholders, OFM and the Governor's Office asked the William D. Ruckelshaus Center at the University of Washington and Washington State University to coordinate development of the report, working with the entities mentioned above. A draft report – the Chehalis Basin Flood Mitigation Alternatives Report -- was made available in July 2012.

In August 2012, as a follow up to the technical information provided in the draft report, and in recognition that the time for decision making has come, the Governor tasked a small group -- David Burnett, Vickie Raines, Karen Valenzuela, J. Vander Stoep, Jay Gordon and Keith Phillips -- to develop recommendations for next steps for flood damage reduction projects in the Chehalis Basin. The group was asked to develop recommendations that the rest of the Basin leaders and the Governor could consider for endorsement and action. Each member also was asked to interact with their respective constituents to inform the small group's discussions. The group's recommendations are due to the Governor by mid November 2012 for consideration as she develops her capital budget request for the 2013-2015 state biennium.

This document is a framework for the group's recommendations to reduce flood damages. The group focused both on large-scale projects that would reduce damages from major floods like the 2007 and 2009 events as well as on more localized projects that would reduce damages from

smaller, more frequent flooding. The Governor's group is asking for feedback on this framework before they finalize their recommendations in early November. Over the next two weeks, they will be discussing specific actions and costs to implement this framework. Their final recommendations to the Governor will include revisions to the framework based on the input they receive and recommended state expenditures for the 2013-2015 biennium.

OBJECTIVES

Flooding from the mainstem of the Chehalis River and tributaries impacts people and communities throughout the Basin. Accordingly, a solution to reduce flood damages needs to be a Basin-wide solution. It needs to ensure public safety and significantly reduce flood damage for people and communities throughout the Basin by maximizing the benefits and minimizing adverse human and environmental impacts of flood damage reduction actions. It needs to protect key community infrastructure and maintain public services during emergencies. In particular, it can't solve one area's problems by making another area's problems worse.

A Basin-wide flood damage reduction solution must go hand in hand with improvements in the environmental health and resiliency of the Basin. Flood damage reduction projects must avoid or fully mitigate environmental impacts. Floodplains, water, and shorelines should be managed in ways that reduce future flood damage and enhance overall environmental conditions and habitat for aquatic species. Fish mitigation and enhancement projects should be implemented in concert with flood damage reduction projects.

Future development in the Basin should be done in a manner that does not put more people or development in harm's way, and should not increase damages or costs to people already living in and using the floodplain. By planning ahead, respecting what the river can do, and managing floodplains smartly, potential future flood damage can be reduced.

Flooding is a natural occurrence that will recur and communities need to be as prepared as possible with flood warning and emergency response systems.

STRATEGY

A great deal of research has been completed on flooding in the Chehalis Basin and on options to reduce flood damages. Much has been learned since the 1996, 2007 and 2009 floods, and much work has been accomplished to protect people and property in the Basin from potential future damages. The purpose of these recommendations is to set forth a two-fold course of action over the next two years that: promotes real improvements through implementation of a series of known smaller-scale projects and investments to reduce flood damage in the Basin; and completes the analysis needed for decisions about the best mix of large and small-scale projects to significantly reduce flood damages.

Based on current knowledge, the group believes a combination of actions is needed in a Basin-wide solution to <u>significantly</u> reduce damages from major floods. The emphasis here is on substantial damage reduction from flood events like those in 1996, 2007 and 2009, although many of the projects contemplated also would reduce damages from more frequent, less severe

flooding. Actions needed include: (1) large-scale capital projects affecting a broad geographic area; (2) smaller-scale capital projects with more localized benefits; (3) land use management to reduce the potential that new development will increase flood damage; (4) environmental projects to enhance overall environmental conditions and habitat for aquatic species in the Basin; and, (5) an effective system of flood warning and emergency response.

There are significant differences amongst leaders in the Basin about the right balance for investment in each of the five categories of action, but there is broad agreement that some investment is needed in each category to substantially reduce flood damage. There also is agreement that we can act now with certainty to implement some actions, while others, including large-scale capital projects, need more feasibility analysis to make decisions about the best way to proceed.

A number of water retention alternatives have been investigated over the last two decades. Based on exploring large and small retention options, the only known single water retention project that is potentially feasible and could significantly reduce peak flood elevations (and thereby reduce flood damages) for both upstream and downstream communities during major flooding is a large upstream water retention or storage facility on the mainstem of the Chehalis River. Such a structure could hold back storm flows when the mainstem of the Chehalis is the principal source of major flooding, and it could hold back mainstem flows when tributaries like the Skookumchuck and Newaukum are flooding.

Preliminary feasibility studies on a water retention structure have been done; however, at this time, it is not yet known whether this type of water retention structure is actually feasible. The next steps are to refine the engineering designs, further study dam safety, and identify more specifically the implications for water quality, quantity, and aquatic species. With this additional information, the assessment of the economic benefits of such a facility weighed against its cost also will need further refinement.

We know from the studies done over the last year that there will be environmental impacts and there is the potential for environmental benefits from a large water retention structure. We need to know if the optimum structure is one that would remain open to the river (and to the passage of migrating salmon) except during flooding, or if the optimum structure would be one holding a permanent reservoir allowing for the release of water during summer months with the potential to improve water quality conditions for fish downstream. We need to know what it will take to fully offset any risks to fish and water quality in the river from water retention. In order to build the necessary coalition of support, we need to determine whether and how a large-scale water retention structure could be packaged with other investments to significantly improve the conditions for fish in the Basin.

Given the potential of large-scale water retention to significantly lower peak flood elevations during major floods and thereby provide Basin-wide flood damage reductions, answering these questions should be a primary task for the coming biennium.

Because it would lower peak flood elevations, an upstream water retention structure would make it easier to address flooding elsewhere in the Basin; however, Interstate 5 would still require

major flood protection investments in Chehalis and Centralia, though the investments would be smaller than otherwise would be needed. In addition, even with an upstream water retention facility, local conditions and tributary flooding will still require dedicated work to reduce localized flood damages. With or without large-scale water retention, smaller projects will be needed to protect key infrastructure, to control shoreline erosion, and to improve water conveyance and drainage at key points in the Basin. As with the water retention facility, preliminary work has been done to investigate alternatives to protect I-5, and on smaller projects to address local conditions.

As the evaluation of the water retention facility options is completed, there is also a need to concurrently complete our evaluation of I-5 alternatives, explore the benefits from a combination of smaller projects across the Basin, and continue to construct projects that can provide near-term local benefits. The projects will be needed with or without a water retention facility, at some scale.

There should be a continued effort to explore options for a range of actions that can serve multiple benefits of flood damage reduction and environmental enhancement. Much of the focus of studies in the past two decades has been on large-scale capital projects. More detailed exploration of smaller-scale opportunities could yield options that increase the benefits of large-scale projects, and provide flood damage reduction benefits if large-scale capital projects are determined not to be feasible.

No project or set of projects will completely protect the Basin from all damage during major floods. Various analyses have shown that one or more large-scale capital projects could significantly reduce flood damages in the Basin in these kinds of events. Given the shape of the Basin, the location of river floodplains, and the amount of water that accumulates during a major flood, only a large-scale capital project can reduce peak water levels throughout the Basin. At the same time, reducing peak water levels during major flooding is not the only way to reduce flood damages. A program of smaller projects aimed at protecting key infrastructure and priority areas through the Basin may provide a measureable reduction in damages from major floods. Further analysis of such a program could help determine how much damage reduction is possible, and at what cost, and provide context for considering large-scale projects.

The Basin has significantly improved its flood warning system, and individual Basin governments continue to improve their emergency preparedness efforts. Progress on floodplain management policies and programs has also been made, though additional improvements are both needed and possible. Further enhancements to state and local land use policies will help ensure new development and other land management activities do not increase the risk of additional flood-related damages and, to the extent possible, reduce damages and costs to existing developments affected by flooding.

WORKPLAN FOR THE NEXT TWO YEARS (2013-2015 state biennium)

Determine the feasibility and select major capital projects that will significantly reduce flood damage across a large geographic area, including upstream water retention, I-5 improvements and lower Basin conveyance/protection.

- Determine the feasibility of upstream water retention. Determine the optimum water retention structure to meet the objectives of the goals of a Basin-wide solution, further define dam safety requirements and permitting feasibility, so that by December 2014 a policy decision can be made on whether to proceed to permitting a water retention facility as a preferred alternative. Determine the preferred water retention approach between a flood control only dam, multi-purpose dam or single-purpose dam that could be converted to multi-purpose in the future. (The Governor's small group is still discussing options for how these decisions can best be made.)

- Determine the best combination of walls, levees, pumps, bypasses and other structures needed to protect Interstate 5, the airport and key urban areas of Centralia and Chehalis, if a mainstem water retention facility is in place. Evaluate changes to the project that would be needed to secure comparable protection without a retention facility.

- Evaluate and improve levees and dikes across the Basin to determine their viability and enhance the safety and levels of flood protection for those that are needed.

Continue to invest in smaller projects that provide local flood benefits, where any adverse flooding or environmental impacts can be avoided or mitigated. This could include protecting water treatment facilities, protecting shorelines, improving existing local levees, and improving water conveyance at bridges. Continue to explore smaller-scale options that can provide flood damage reduction and environmental benefits, and implement high priority projects.

- Projects should be prioritized based on potential for flood damage reduction, potential to provide other benefits, community support and cost effectiveness.

- Projects could include:
    - Improved water conveyance under floodplain roads
    - Raising the height of levees provided there are no significant downstream impacts
    - Controlling bank erosion
    - Revetments to protect existing infrastructure
    - Critter pads and livestock evacuation routes

- To the extent it is not already summarized in the Alternatives Report by the Ruckelshaus Center, summarize existing information (and any new information) on what is known about the relative contribution to reduction in peak flood level elevations (and concomitant flood damage reduction) from various floodplain management practices, including channel dredging, riparian wetland restoration, forest practices, flood easements on farm lands, road maintenance, removing bridges and constrictions, and removing, protecting, or avoiding floodplain development. Evaluate the extent of flood damage reduction that could be possible through a Basin-wide program of smaller-scale projects.

Implement a strategy in conjunction with flood damage reduction projects for improving the conditions for fish and ecological function in the Basin. Identify and implement initial projects to improve:

- Water quality
- Water quantity
- Floodplain connectivity and function
- Fish habitat

Implement a strategic program of buyouts and flood proofing for structures that have recurring damage requiring frequent public and private expenditures for repairs after flood events.

- Use the Federal Emergency Management Agency's Community Rating System, improved geographic information (LiDAR) and damage curves to assess each local government's program and their ability to proactively protect existing development from floods and prevent new development from causing damage.
- Based on the assessments, provide funding for buyouts and flood proofing where the investment has the greatest certainty for long-term benefits.

Ensure flood warning and flood preparedness systems are ready and effective.

- Coordinate Basin-wide flood awareness and provide opportunities for people living and working in the floodplain to be aware of risks, warning systems, and emergency preparedness and response.
- Ensure emergency supplies and equipment are available and ready at the start of each flood season.
- Maintain the flood warning system.
- Conduct training and drills.