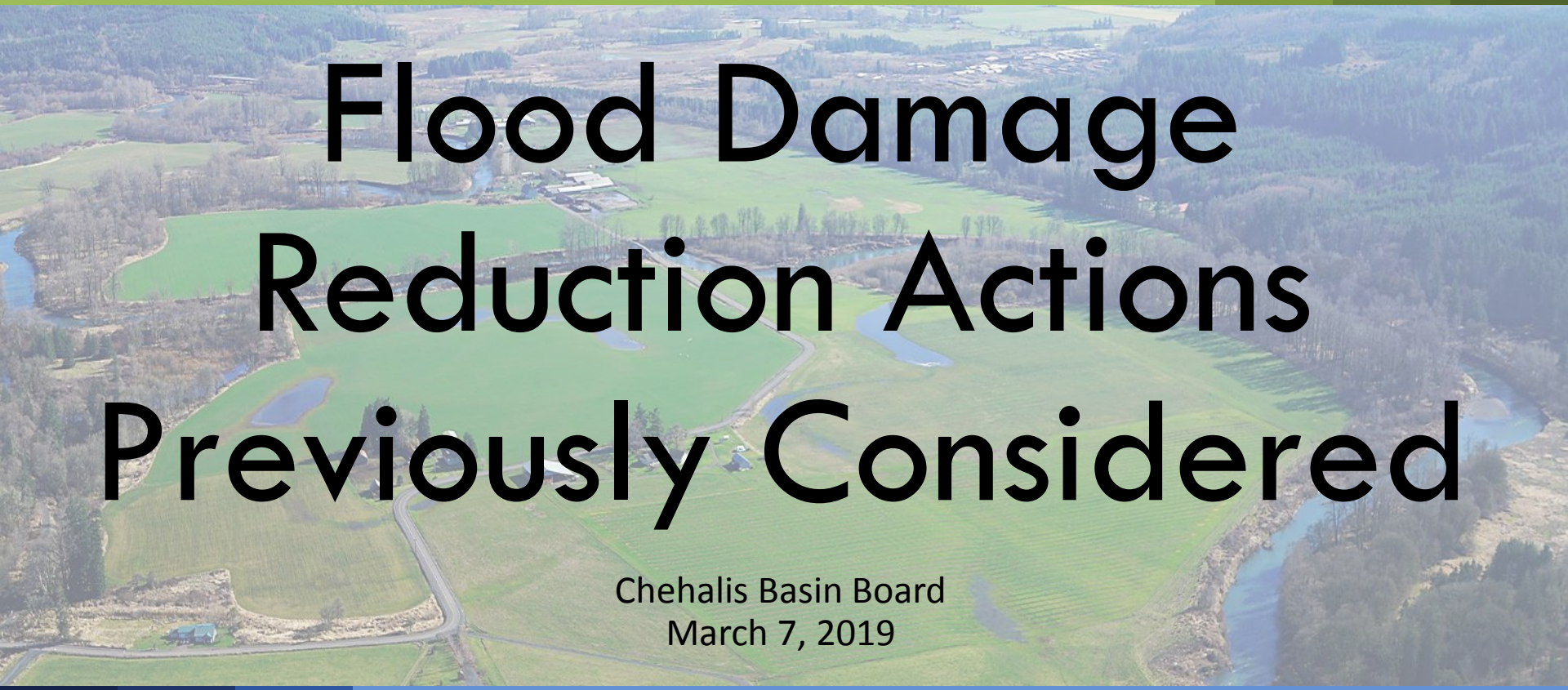


Flood Damage Reduction Actions Previously Considered

Chehalis Basin Board
March 7, 2019

Overview

- At Feb. 7, 2019 meeting, Board members requested OCB staff summarize:
  - How location for proposed flood retention facility was determined
  - Other large scale flood damage reduction actions that have been analyzed but not pursued as part of Chehalis Basin Strategy development

Flood Retention Facility Locations

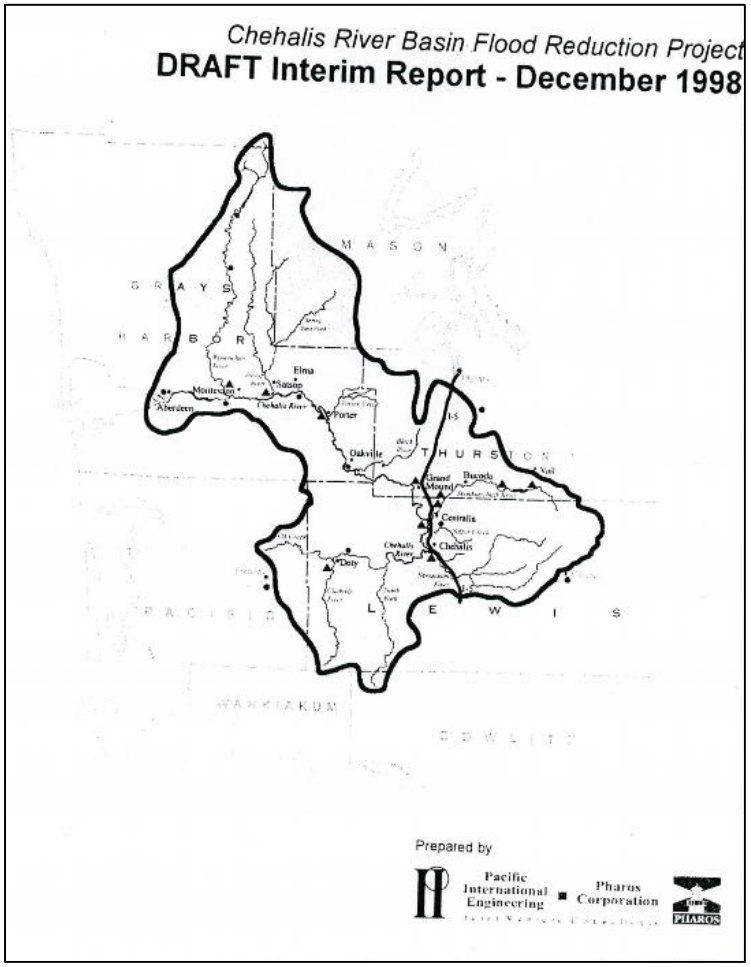
- 1931/1935, USACE evaluated potential flood storage reservoirs and channel improvements at:
  - Centralia-Galvin
  - Oakville
  - Malone
  - Porter
- USACE concluded flood control improvements were not economically justified

Flood Retention Facility Locations

- In 1982, USACE evaluated feasibility of large-scale flood storage at six sites:
  - 2 sites on Newaukum River
  - South Fork Chehalis River
  - 2 sites on mainstem Chehalis River upstream of Newaukum confluence
  - Modification of existing Skookumchuck dam
- USACE concluded *new* flood control structures were economically infeasible[1]

Flood Retention Facility Locations

- In 1998, Lewis County retained Pacific International Engineering (PIE) to continue community based effort to identify a comprehensive solution to regional flooding.



Flood Retention Facility Locations

- PIE evaluated eight retention sites[2], including:
  - The five sites studied by the USACE
  - Two additional sites on the mainstem Chehalis, upstream of those studied by the USACE
  - One site on Elk Creek
- Not cost-effective in comparison to other options for same magnitude flood stage reduction

- In 2003, USACE completes general reevaluation of the previously authorized Skookumchuck project.[3]

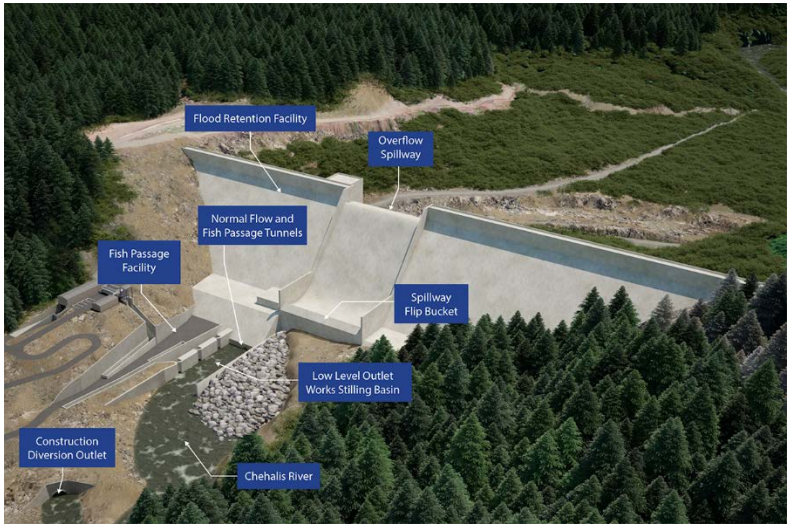
Flood Retention Facility Locations

- Post-2007, mainstem Chehalis River site upstream of Pe Ell location continued to be evaluated due to:
  - Hydrologic impact
  - Favorable geology
  - Located upstream of all communities (i.e., would not displace humans)

Flood Retention Facility Locations

- 2011 Flood Water Retention Project Phase II Feasibility Study[4] (EESC, Flood Authority)
- Examined:
  - Single purpose structures
  - Multi purpose structures

- Found that Upper Chehalis project may be cost effective



Rendering of Flood Control Zone District's proposed Chehalis River Basin Flood Damage Reduction Project

Other Flood Damage Reduction Actions Previously Considered

- Other large-scale flood damage reduction actions considered, but not advanced:
  - USACE Twin Cities project (2011)[3,5]
  - Floodwater bypass routes (2012)[2,6,7]
  - I-5 levees and walls (2014)[8,9]
  - Other I-5 protection projects (2014)[8]
  - Restorative flood protection (2018)[9,10]

USACE Twin Cities Project

- Beginning in '80s, USACE considered project consisting of 11 miles of new floodplain levees
- Levees were part of the recommended plan from USACE's 2003 reevaluation report[3]
- In 2011, USACE stopped work on project after determining[5]:
  - Project would not protect I-5 in 100-year flood event
  - Would not pass USACE benefit-cost test

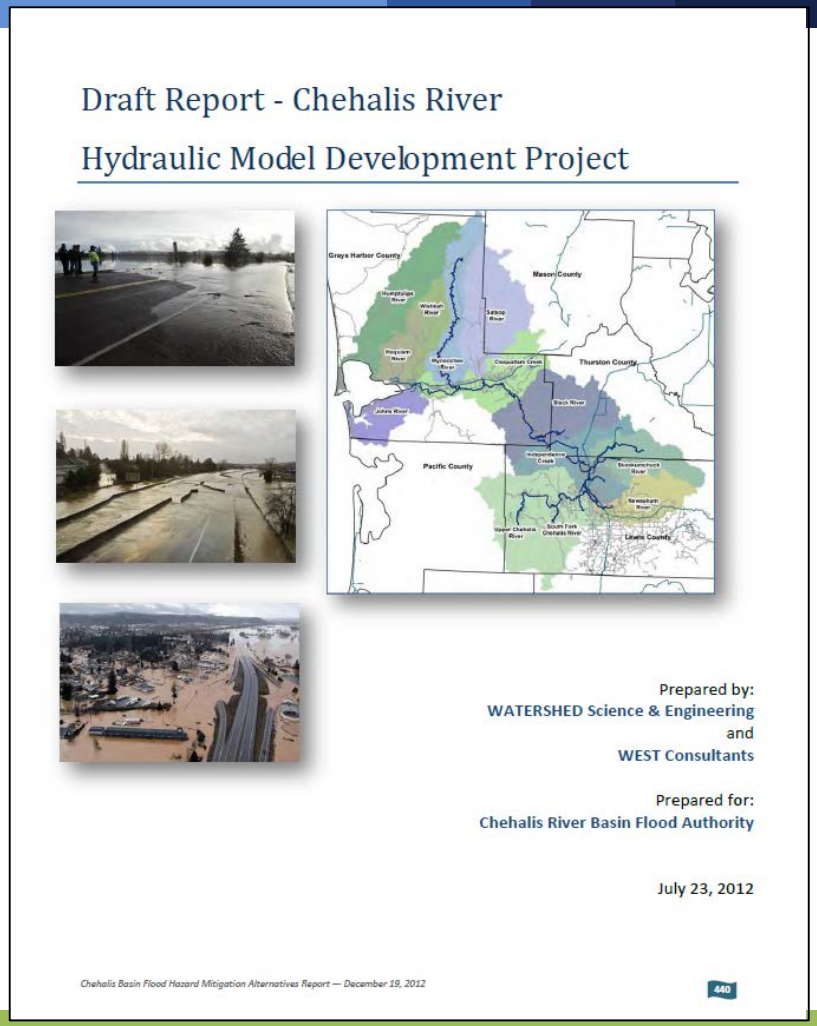
Floodwater Bypass Routes

- 1998 PIE report included evaluation of “hydraulic capacity improvements”:
  - River channel excavation
  - Floodway/floodplain excavation
  - Levee improvements
- Recommended combination of Skookumchuck dam modifications, floodway excavation in Mellen Street Bridge, and floodplain modifications in the vicinity of SR 6

Floodwater Bypass Routes

- In 2012, WSE/WEST Hydraulic Model report found floodwater bypass routes evaluated near Mellen Street and SR 6[6]:
  - Provide little flood reduction benefit and increase water levels downstream
  - Potential to become "fish sink"

- In 2012, Work Group decided to not move forward based on hydraulic model results/downstream impacts.[7]


Draft Report - Chehalis River

Hydraulic Model Development Project

Prepared by:
WATERSHED Science & Engineering
and
WEST Consultants

Prepared for:
Chehalis River Basin Flood Authority

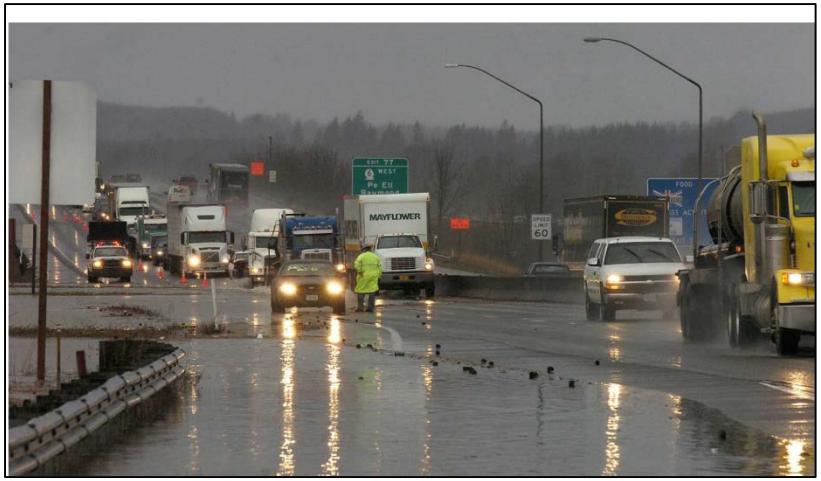
July 23, 2012

Chehalis Basin Flood Hazard Mitigation Alternatives Report — December 19, 2012

440

I-5 Protection Projects

- In 2014, WSDOT evaluated I-5 protection projects[8]: raise and widen; express lanes; temporary bypass; viaduct; relocation.
- In 2014, WSDOT did not recommend further evaluation of these projects, deeming them either:
  - Cost prohibitive
  - Negatively impactful to built and natural environment
  - Increasing flood elevations in urban areas

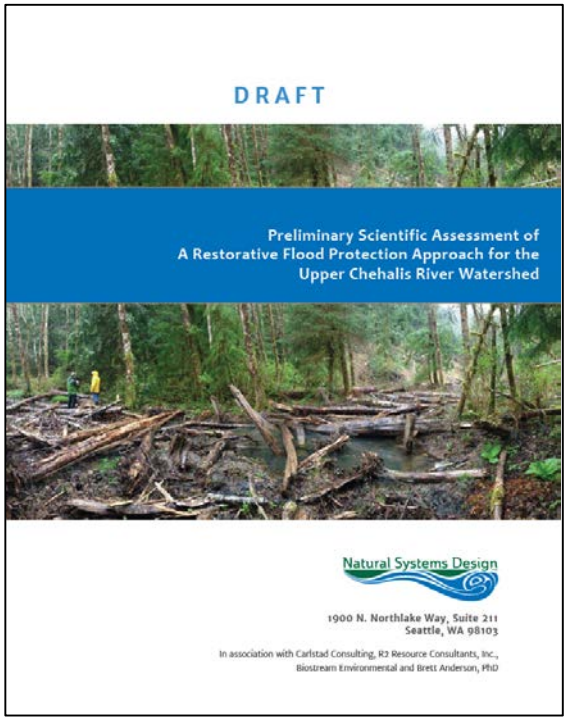


I-5 Walls and Levees

- In 2014, WSDOT evaluated I-5 levees and walls project,[8] including construction of:
  - Levees and floodwalls along I-5
  - New one-mile long Chehalis Ave. levee
  - Bridge replacements over Dillenbaugh and Salzer Creeks
- In 2016, Work Group recommended not moving project forward as part of Strategy [8,9]

Restorative Flood Protection

- In 2017, action evaluated that would rebuild natural flood storage capacity by reversing landscape changes that contribute to downstream flooding and erosion.[10]
- In 2018, preliminary results of pilot feasibility evaluation in Newaukum showed peak flood flow reductions ~1/4th of what was predicted in the PEIS in larger floods. Feasibility evaluation findings transferrable to other parts of Chehalis Basin.



- Fall 2018, Chehalis Basin Board elects not to move forward with further development of the RFP based on preliminary results.

References

1. 1982 Centralia Washington Flood Damage Reduction, USACE.
2. 1998 Chehalis River Basin Flood Reduction Project, Pacific International Engineering.
3. 2003 Centralia Flood Damage Reduction Project Chehalis River, USACE.
4. 2008-2011 Chehalis River Flood Water Retention Project Phase I, IIA, and IIB, Feasibility Study, EES Consulting.
5. 2011, Centralia Flood Risk Management Project, USACE.
6. 2012 Chehalis River Hydraulic Model Development Project, Watershed Science and Engineering and WEST Consultants.

References

7. 2012 Chehalis Basin Flood Mitigation Alternatives Report, The William D. Ruckelshaus Center.
8. 2014 Chehalis Basin I-5 Flood Protection near Centralia and Chehalis, Washington Dept. of Transportation.
9. 2017 Chehalis Basin Strategy Programmatic Environmental Impact Statement, Washington Dept. of Ecology.
10. 2017 Restorative Flood Protection Technical Report, Natural Systems Design.

Questions/Discussion