



CHEHALIS BASIN STRATEGY LOCAL ACTION PROGRAM

January 7, 2021

OUTLINE OF PRESENTATION

- Board desired outcomes
- Overview of Process
- Flood storage overview and summary of TAG input
- Local flood protection facilities overview
- Research on Buyout/Relocation Programs

OVERVIEW OF PROCESS

Technical Advisory Group

- Four meetings completed and 3 more
- Modeling, climate change, floodplain storage, structural options, bank protection

Implementation Advisory Group

- Two meetings completed, 5 more
- Land use recommendations, buyout/relocation programs, structural options, bank protection

The image shows a rural landscape where a large body of water, likely a river or lake, has flooded the surrounding fields. In the middle ground, a farmstead is visible, featuring a large barn with a red roof and a tall, white cylindrical silo. The water has reached the fields and is reflecting the sky. The background is a dense forest of bare trees, suggesting a late autumn or winter setting. The title text is centered over the image in a dark blue, sans-serif font. The image is framed by a green header bar at the top and a blue footer bar at the bottom.

FLOODPLAIN STORAGE AND STRUCTURAL OPTIONS

BOARD DESIRED OUTCOMES

- **X percent of all structures in each county that could be flooded by the 2080 predicted 100-year flood levels in the basin would no longer be vulnerable to flood damage...** (Outcome 1: Valuable structures protected from mainstem, catastrophic flooding).
- **X percent of all critical facilities that could be flooded by 2080 predicted 100-year flood levels would no longer be vulnerable to flood damage...** (Outcome 5: Critical Facilities Protected).
- **A substantial reduction in the overtopping and closure of Interstate 5 (I-5) and the BNSF rail mainline would be achieved for 2080 predicted 100-year flood levels...** (Outcome 6A: Transportation routes protected).
- **A substantial reduction in the closures of State Highways 6 and 12 due to flooding would be achieved, and alternative routes would be available...** (Outcome 6C: Transportation routes protected)

FLOOD STORAGE PREVIOUS STUDIES

General Reevaluation Report for the Centralia Flood Damage Reduction Study (USACE 2003)

- Options included distributed upstream storage, floodplain reconnections, enhanced floodplain storage and flow constriction
- Finding: Did not adequately reduce 100-year flood water levels

Restorative Flood Protection Alternative for Upper Chehalis Basin and Newaukum River (Abbe et.al. 2016 and 2020)

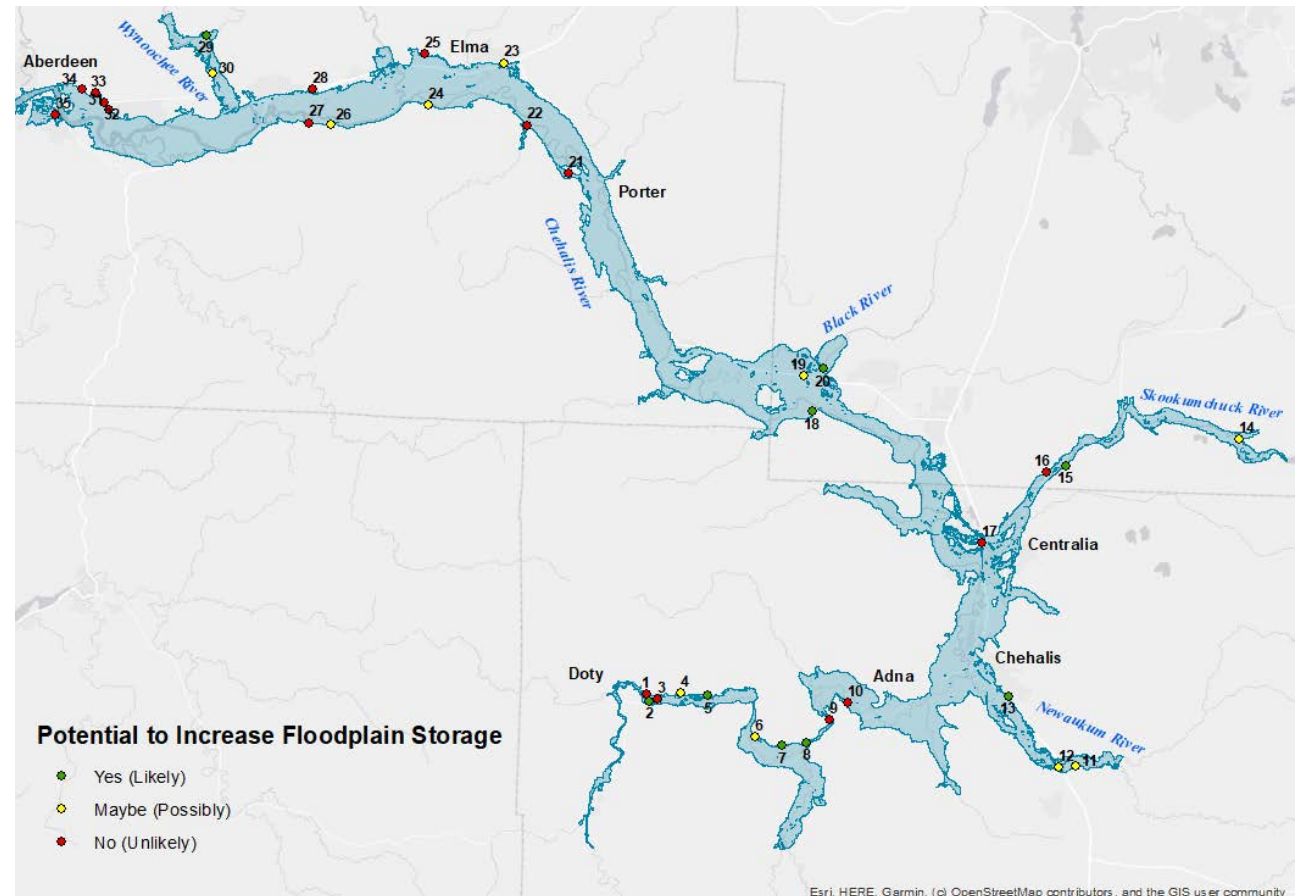
- Considered broad improved floodplain connectivity and floodplain “roughening” to enhance floodplain storage across wide range of flows from 2-year to 100-year late century conditions
- Finding: Benefits at lower flood levels, but limited reductions at 100-year flood water level

City of Chehalis Wastewater Treatment Plant Restoration and Flood Storage Master Plan (City of Chehalis, 2020)

- Habitat enhancement and flood storage on 156 acre site near Chehalis; excavates 1.5 million cubic yards (930 acre feet) of new flood storage volume along mainstem Chehalis

NEW EVALUATION OF FLOOD STORAGE

- Used latest 2D model results for 2080 100-year flood (WSE, 2019)
- Identified areas for new or augmented flood storage
- Quantified potential additional storage volume
- Total potential storage in 19 most viable locations is about 1,550 acre-feet (locations in tributaries outside of model not evaluated)



CONCLUSIONS

- The opportunity for additional floodplain storage along the mainstem Chehalis River in a 100-year flood events is limited. This is because flooding during a large event is, in most cases, already valley wall to valley wall.
- Past and recent analyses show that available additional storage along the mainstem Chehalis River and in the South and North forks of the Newaukum River would not provide any beneficial reduction in large flood flows or flood damage in modeled current and modeled future 100-year flood events.
- However, there are potentially significant benefits along tributaries, especially smaller tributaries,

CONCLUSIONS

- Adding floodplain storage should continue to be considered in addressing flood damage in tributaries as one of the several potential solutions for reducing localized flooding problems.
- Additionally, there is potential for a multi-benefit synergy when combining additional floodplain storage with habitat restoration. Although combining flood storage with a habitat project is not likely to have a noticeable effect on flooding during large flood events, it can provide localized benefits and enhance the value of the habitat project.

QUESTIONS?



LOCAL FLOOD PROTECTION FACILITIES (STRUCTURAL); PREVIOUS STUDIES

- USACE study 2003 – Authorized in 2007
- USACE design phase and re-evaluation of authorized project after 2007 and 2009 floods; study was terminated in 2012
- WSDOT evaluated a levee and floodwall protection alternative in 2014; 5 mile stretch of I-5 from 13th Street to Mellen Street
- Chehalis Basin Flood Hazard Mitigation Alternatives Report (Ruckelshaus Center 2012)
- Scenario of Small Flood Damage Reduction Projects (HDR and WSE 2014)
- Continuing Small Projects funding, etc.

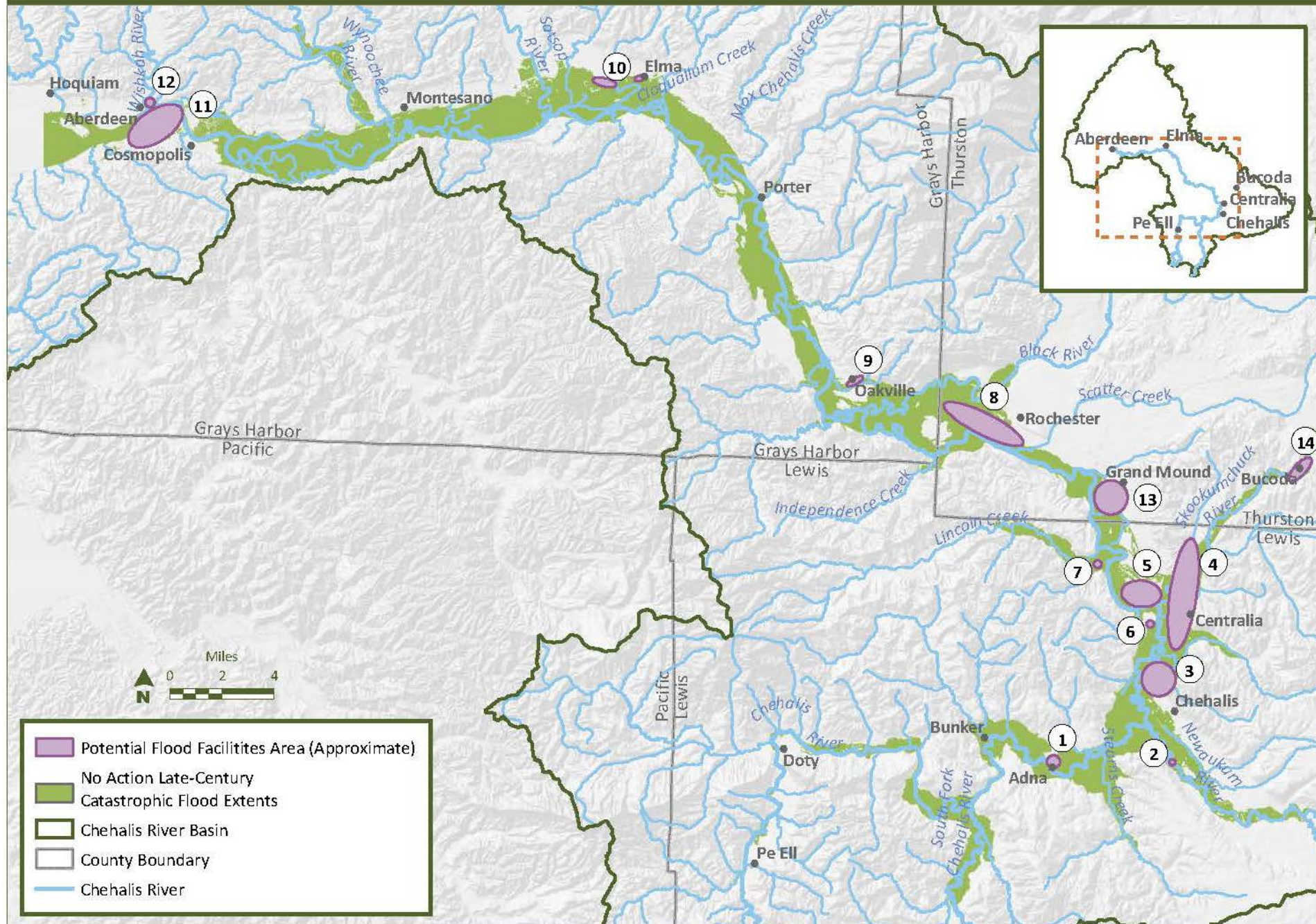
ADDITIONAL ANALYSIS

- Used most recent aerial photography and modeled 2080 floodplain extent to identify areas with a relatively high number of structures and density of development and then also overlaid economic damage mapping
- Identified example priority areas
- Overlaid example priority areas with structure database to identify number of structures in each area and critical facilities information
- Identified 12 potential priority areas (within modeled floodplain extent); added two additional areas per TAG input

POTENTIAL PRIORITY AREAS FOR CONSIDERATION

1. Adna
2. Lower Newaukum
3. Airport Levee/Chehalis
4. Centralia
5. West Centralia
6. Military Road
7. Galvin
8. Independence Road and north floodplain
9. Oakville
10. Elma (south and west, Monte-Elma Road)
11. South Aberdeen Levee Area
12. East Aberdeen
13. Bucoda
14. Grand Mound

Figure 1
Potential Flood Facilities Areas



WORKING WITH TAG ON EVALUATING POTENTIAL

1. How many structures or critical infrastructure could potentially be protected in the priority area?
2. What are the relative number of structures that might need floodproofing or relocation outside of the priority area (high, medium, low)?
3. Is there a high likelihood of adverse direct impacts to wetlands, waterbodies or other natural habitats from a local facility (e.g., if filling in a wetland were required)?
4. What is the relative scale of structures protected per mile of facility such as a levee?

QUESTIONS?



The background image shows a rural landscape where a large body of water, likely a reservoir or a flooded field, dominates the middle ground. On the left side, a yellow barn with a red roof and a tall, white cylindrical silo are partially submerged. The water reflects the surrounding trees and sky. In the foreground, there are patches of green grass and some small trees. The background is a dense forest of bare trees, suggesting a late autumn or winter setting. The overall tone is somewhat somber due to the flooding.

BUYOUT/RELOCATION RESEARCH PLAN

TERMS

- Buyout
 - Home or business is purchased from owner; owner moves to where they want
 - Cheaper for purchaser
 - Breaks up community members
- Relocation
 - Multiple homes and/ or businesses relocated to a new site with the residents moving to new site
 - More expensive option
 - Keeps part or all of community intact

Note: Messaging around these terms (and related terms like “managed retreat”) is sensitive

These programs establish specific branding (e.g., “willing seller”)

BUYOUT/RELOCATION PROGRAMS CONSIDERED SO FAR

- Charlotte-Mecklenberg County, North Carolina
- Hamilton, Washington
- Harris County, Texas
- Johnson Creek, Oregon
- Tulsa, Oklahoma
- Valmeyer, Illinois
- Taholah, Washington
- National Case Studies



INITIAL GUIDING RESEARCH TOPICS

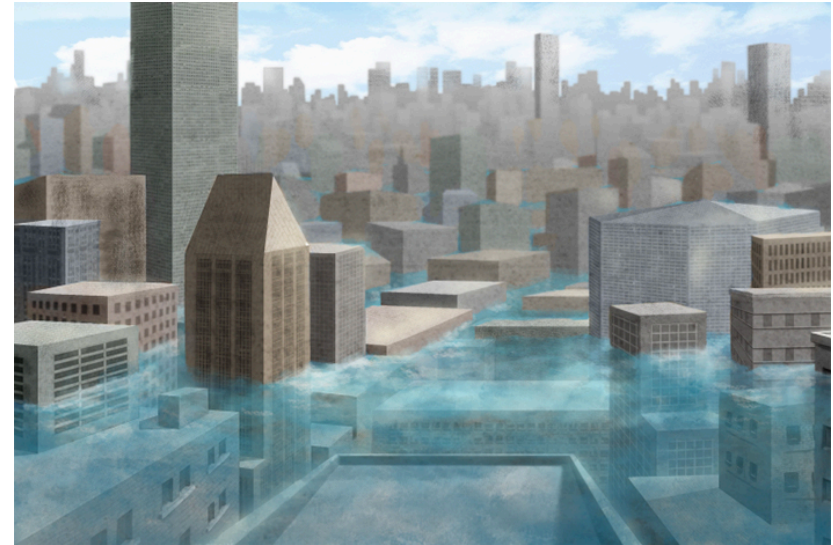
Program Characteristics:

- Magnitude of flood problem & acquisition/relocation program
- Program timeline
- Estimated costs

Implementation Challenges & Approaches:

- Landowner willingness
- Communication/outreach
- Policy or legislative changes
- Funding strategies/approaches
- Success factors/lessons learned
- Useful resources/tools

What else should we consider?



NEXT STEPS

- Interviews for more in-depth information
- Research update and panel discussion at Jan 11 IAG meeting
- Continued IAG discussions at future meetings on buyout/relocation program feasibility in the basin

QUESTIONS?

