

The background image shows a rural landscape with a large body of water in the foreground. In the middle ground, there is a barn and a silo. The background is filled with trees, some of which are bare, suggesting a late autumn or winter setting. The sky is overcast. The text is overlaid on this image.

Chehalis Basin Strategy Local Actions Program Technical Advisory Group Meeting #5

January 8, 2021

Agenda

- Welcome
- Receive feedback from TAG since December 14 Technical Advisory Group meeting
- Introductions (small groups again in breakout rooms)
- Continue discussion of the near-term approaches for:
 - Criteria and approach for bank protection
 - Providing structural flood protection

Tech Advisory Group Schedule

Meeting #6: January 13, 2021

- Discussion and follow-up from meetings

Meeting #7: February 8, 2021

- Discussion and follow-up from meetings



Summary of December 14th Technical Advisory Group Meeting

Dec 14th Summary

Floodplain Storage

- 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,

Dec 14th Summary

Floodplain Storage

- 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.

Dec 14th Summary

100 Year Event Focus

Clarify statement Board outcome, “Flow attenuation at the 100-year flood level or reduction of flood damage”.

Dec 14th Summary

Discussed potential bank protection techniques and hypothetical bank erosion and protection scenarios

- Careful consideration of upstream and downstream impacts of armoring banks.
- Strong criteria for when and how public funds are used for bank protection on private land.
- Look for opportunities to tie bank protection with other enhancement projects in the vicinity
- Alternatives analysis should be conducted to find least impactful option

Today's Discussion - Bank Protection

Review draft bank protection criteria, including which types of techniques would be promoted

Overview of Lower Satsop and East Fork Satsop Early Action Reach Projects

Obtain input on draft protection criteria for the Local Actions Program

Bank Protection Questions

Questions for the TAG:

- Are there other elements that should be considered in evaluating an erosion hazard area or elements listed above that are not critical?
- Are the criteria sufficient to determine whether a bank protection project should be considered in the context of the Chehalis Basin Strategy? Meaning, a bank protection project that incorporates bioengineering (or a combination of bioengineering and harder armoring elements).

Today's Discussion - Potential Structural Flood Protection Actions

- Review and obtain input on potential options for structural flood protection
- Questions for TAG:
 - What technical questions/suggestions do you have for the ranking criteria?
 - From a technical perspective (e.g., design, engineering, hydrology and hydraulics) do you think the top five areas in Table 1 in the supporting document (or additional areas) warrant further investigation for structural flood protection solutions?

Introductions

- Breakout rooms of three members
- Introduce yourself
 - Name and affiliation
 - Do you think we are addressing the important technical issues for a local actions program to reduce flood damage? What is on target, what is missing?



CHEHALIS BASIN STRATEGY LOCAL ACTION PROGRAM

January 8, 2021

Board Desired Outcomes

- **Reduce number of locations where migrating river channels and bank erosion pose a high risk of near-term damage to valuable structures or loss of economically productive land uses** by an average of X per year over up to 30 years, while protecting ecological processes (Outcome 4A “Farmland and Rural Structures Protected”).
- **No new structures would have been developed that are vulnerable to channel erosion or mainstem or tributary flooding from 2080 predicted 100-year flood levels...** (Outcome 8: Prevent New At-Risk Development).

Questions for TAG

1. Are there other elements that should be considered in evaluating an erosion hazard area or elements listed above that are not critical?
2. Are the criteria sufficient to determine whether a bank protection project should be considered in the context of the Chehalis Basin Strategy? Meaning, a bank protection project that incorporates bioengineering (or a combination of bioengineering and harder armoring elements).

Draft Bank Protection Strategy

- Recommend that [bank protection] projects included in the Chehalis Basin Strategy should be developed and implemented in the context of reach-scale conditions and geomorphic processes...and promote the use of bioengineering techniques

Elements to Consider/ Evaluate

- What is at risk from erosion?
- What damage has already occurred?
- Is the risk immediate (within the next year or two) from erosion?
- Is the erosion problem caused by or exacerbated by frequent flooding?
- Can at risk structures/infrastructure be relocated further from the eroding bank/shoreline? Would relocation also reduce future flood damages?
- Is there already riprap or other hard bank protection present?
- What other structures/infrastructure are present in the reach and what other areas may have also been experiencing erosion or deposition (or frequent flooding)?
- Is there already mapped erosion hazard information or an estimated rate of erosion for the site/reach? Is the site also in a mapped floodplain?
- What are contributing factors to the erosion?
- Is the reach within an ASRP priority area?
- What habitats are present within the reach?
- Could a reach-scale approach be pursued with multiple landowners? Are landowners willing to consider bioengineered elements?
- What could be affected upstream or downstream from actions taken in this reach?

Draft Criteria

1. Landowner is interested in a bioengineered solution and willing to maintain a bioengineered solution as part of a funding agreement.
2. Erosion area is within a delineated CMZ or erosion hazard area, or other erosion priority area identified by local jurisdiction.
3. Erosion risk is immediate or near-term (within next 5 years) that that would cause significant damage to valuable structures, infrastructure, or productive agricultural land (e.g. “significant” loss or damage).
4. Landowner is willing to consider relocation that would provide long-term reduced erosion (or flooding) risk (either with or without an associated bioengineered or habitat solution).
5. Opportunities exist for a reach-scale approach to reduce velocities through reconnecting former channels/swales, placement of large wood, riparian revegetation, bank sloping/terracing, or other elements that would benefit the reach and maintain or restore natural processes and/or habitats.
6. A local project sponsor is willing to develop a reach-scale project with multiple landowners.
7. A reach-scale project could be leveraged with ASRP funding for habitat restoration and enhancement in addition to erosion management.
8. In situations where riprap or other hard bank protection elements are existing, landowner(s) are willing to incorporate bioengineered elements into existing bank protection or will support a reach-scale solution that may incorporate both bioengineered and harder elements, or habitat restoration/protection.

Questions for TAG

1. Are there other elements that should be considered in evaluating an erosion hazard area or elements listed above that are not critical?
2. Are the criteria sufficient to determine whether a bank protection project should be considered in the context of the Chehalis Basin Strategy? Meaning, a bank protection project that incorporates bioengineering (or a combination of bioengineering and harder armoring elements).

QUESTIONS?





CHEHALIS BASIN STRATEGY LOCAL ACTION PROGRAM

January 8, 2021

Outline of Presentation

- Board desired outcomes
- USACE and WSDOT previously proposed flood protection facilities
- Initial ranking of areas that could be considered for flood protection facilities
- Questions for TAG

Local Flood Facilities, 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**, because they are protected by localized infrastructure, floodproofed/elevated, or the structure has been removed (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**, because they are protected by localized infrastructure, elevated/floodproofed, or relocated (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**, and alternative routes would be available to minimize negative effects of closures on freight mobility and commerce (Outcome 6A: Transportation Routes Protected).

Questions for TAG

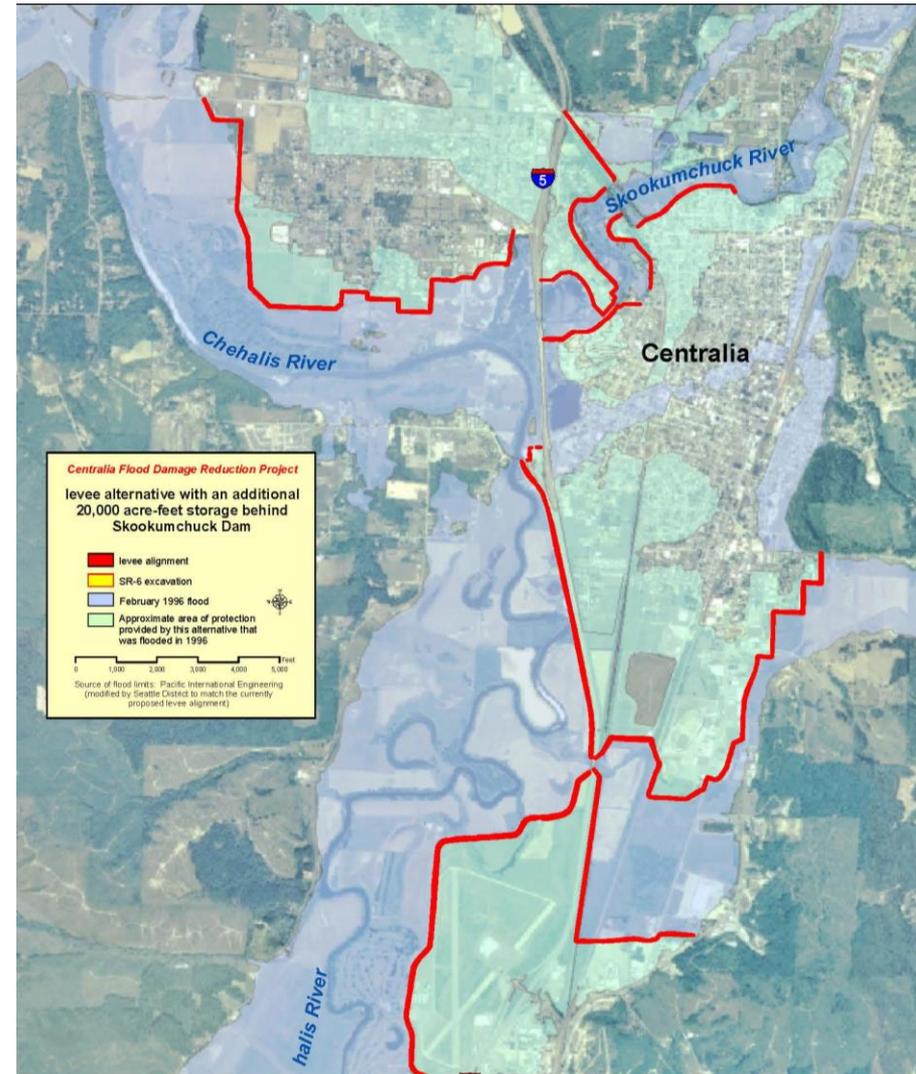
- What technical questions/suggestions do you have for the ranking criteria?
- From a technical perspective (e.g., design, engineering, hydrology and hydraulics) do you think the top five areas in Table 1 in the supporting documentation (or additional areas) warrant further investigation for structural flood protection solutions?

USACE and WSDOT Studies

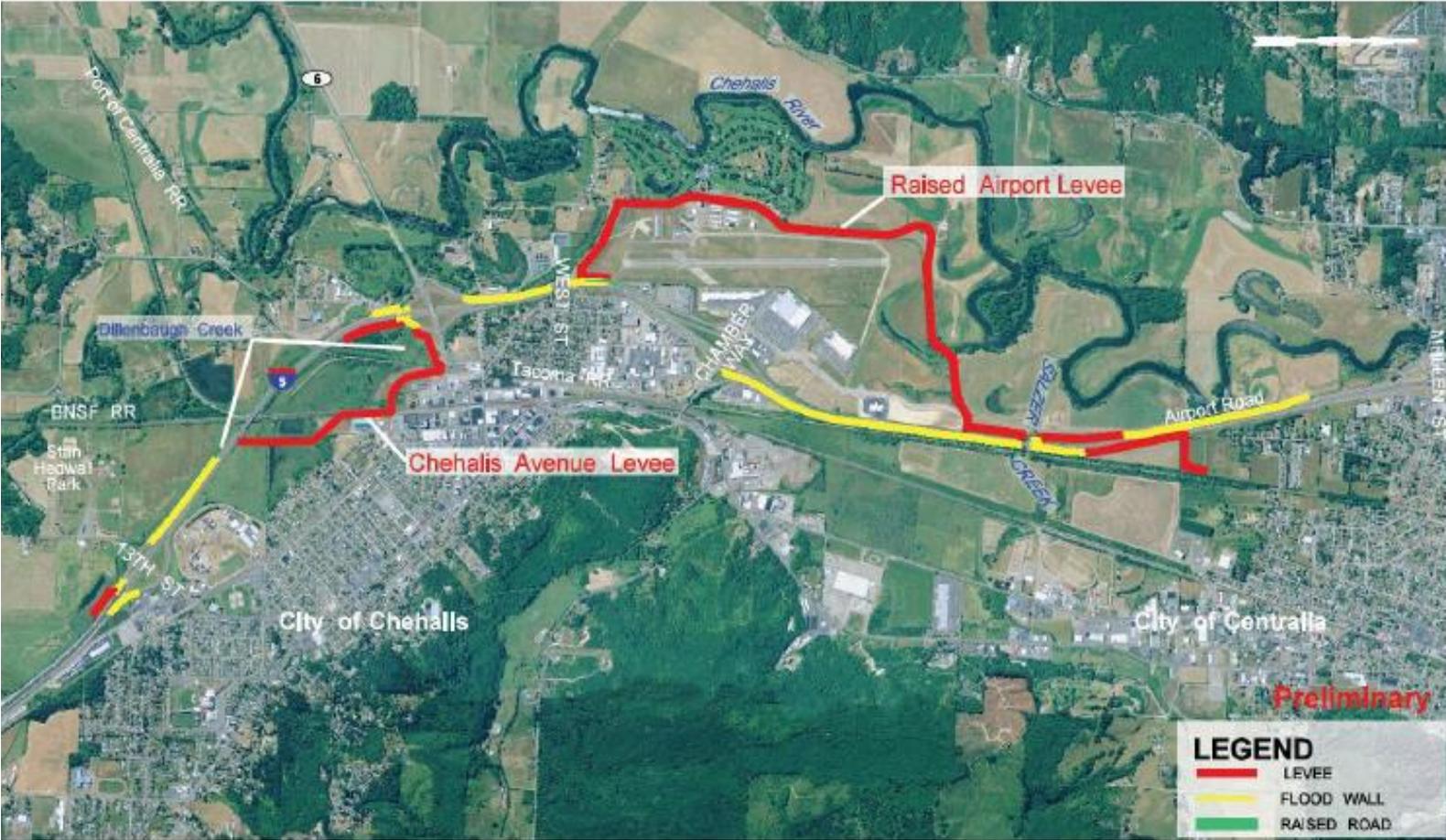
- USACE study 2003 – Authorized in 2007
- USACE design phase and re-evaluation of authorized project after 2007 and 2009 floods; provided wrap-up report in 2012 (study was terminated as it was no longer economically justified)
- WSDOT evaluated a levee and floodwall protection alternative (if a retention structure was not constructed) in 2014; 5 mile stretch of I-5 from 13th Street to Mellen Street

USACE Proposed Plan

- ~20 miles of levees and floodwalls
- Modifications for flood storage at Skookumchuck Dam (11,000 ac-ft)
- Floodproofing of limited number of structures
- Authorized cost of \$94 million; updated cost of \$205 million



WSDOT Preliminary Plan



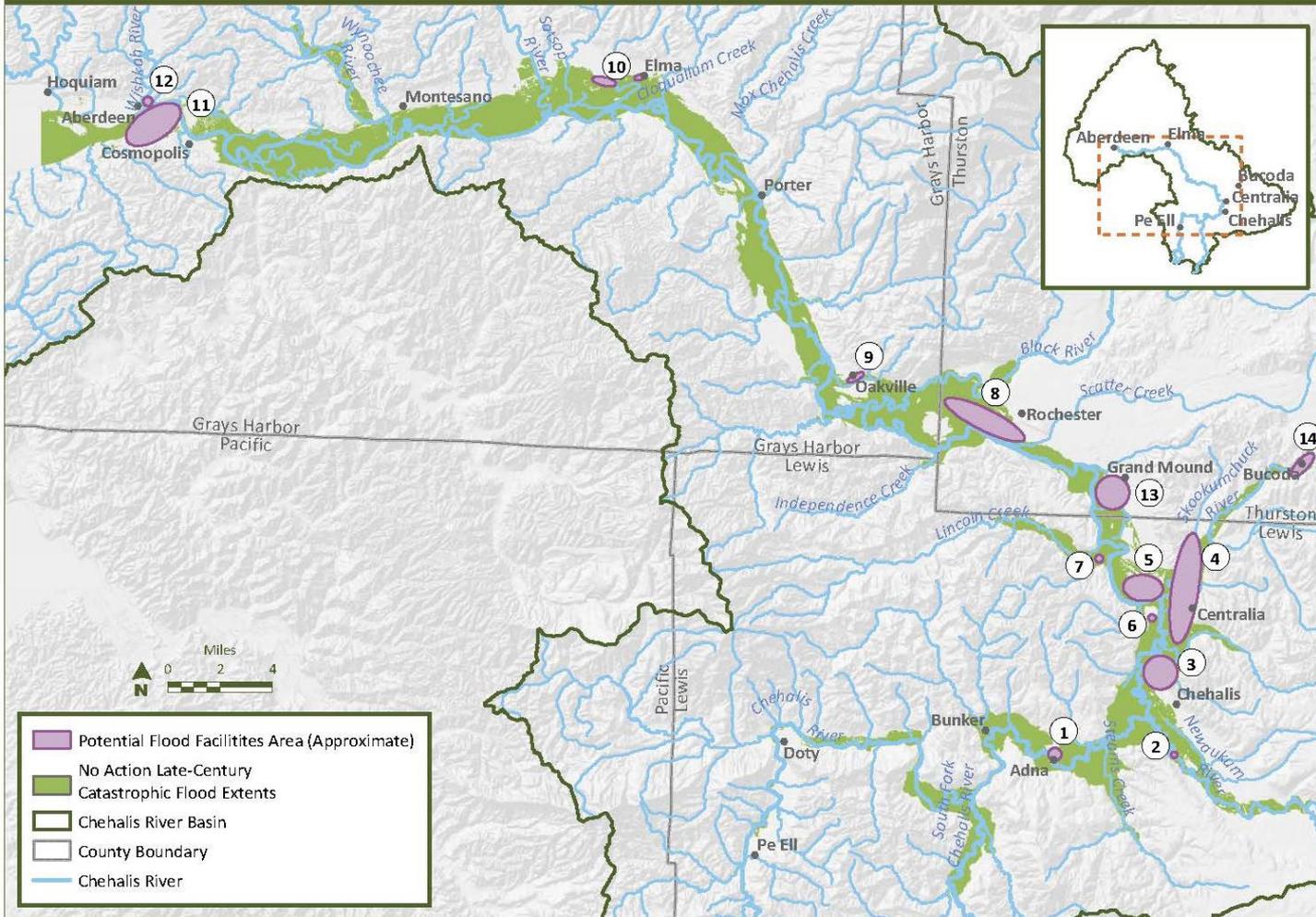
Small Projects that may Affect I-5



Expanded List of 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



Ranking Elements for Priority Areas

1. How many structures could potentially be protected by a local facility?
2. Is there any major infrastructure or critical infrastructure present in the priority area?
3. What are the relative number of structures that might need floodproofing or relocation outside of the priority area with a local facility (high, medium, low)?
4. 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)?
5. What is the relative number of structures protected per mile of facility such as a levee?
6. What else could be affected upstream or downstream from actions taken in this reach?

LOCATION	NUMBER OF STRUCTURES IN SELECTED AREA ¹	INFRASTRUCTURE PRESENT IN MODELED 2080 FLOODPLAIN?	STRUCTURES AFFECTED OUTSIDE PROTECTED AREA	IMPACTS TO NATURAL ENVIRONMENT	RELATIVE BENEFIT PER MILE OF FACILITY	RANK
1. Adna	83	High school Lewis County special education Highway 6	Low (~10)	Medium (Chehalis riparian)	Medium (~1.5 miles)	8
2. Lower Newaukum	20	None Identified	Low (~10)	Low (agricultural, residential)	Low (~1 mile)	12
3. Airport Levee and Chehalis	215	I-5, airport Washington State Patrol	High (hundreds)	Medium (wetlands, Dillenbaugh Cr.)	High (~4 miles)	4
4. Centralia	5,527	Radio stations Valley View Health Center Washington Elementary School Centralia Community College Centralia Police Centralia City Light BPA Power Plant	High (hundreds)	High (wetlands, Skookumchuck and Salzer riparian)	High (~5 miles)	5
5. West Centralia	642	Centralia High School	Medium (dozens)	Low (agricultural, park)	High (~2 miles)	2
6. Military Road	34	Providence Centralia Hospital Valley View Health Center	Medium (dozens)	Low (residential)	Low (~2 miles)	13
7. Galvin	87	None identified	Medium (dozens)	Low (agricultural, residential)	Medium (~1.5 miles)	9
8. Independence Road / north floodplain	306	Highway 12	High (100+)	High (wetlands, oxbows)	Low (3-4 miles)	14
9. Oakville	172	None identified	Low (10-20)	Low (residential)	Medium (~1 mile)	6
10. West Elma	148	Highway 8 Elma High School	Low (10-20)	Low (highway raise)	Medium (~2 miles)	7
11. South Aberdeen	1,203	Stevens Elementary School	Low	Low (existing levee raise, pump station)	High (~2 miles)	1
12. East Aberdeen	4	Highway 101	Low (<10)	Medium (Estuary shoreline)	Medium (~1 mile)	10
13. Bucoda	260	Water supply infrastructure	Low (<10)	Medium (Skookumchuck riparian)	High (~1 mile)	3
14. Grand Mound	168	None identified	Low	High (wetlands, oxbows)	Medium (~2 miles)	11

Questions for TAG

- What technical questions/suggestions do you have for the ranking criteria?
- Should any of the higher ranked areas be considered for further analysis or included as a potential element of a Local Actions Program?
- From a technical perspective (e.g., design, engineering, hydrology and hydraulics) do you think the top five areas (or additional areas) warrant further investigation for structural flood protection solutions?

QUESTIONS?

