Chehalis Basin Local Actions Program • Technical Advisory Group

MEETING 5 SUMMARY

Date: Friday, January 8, 2021
Time: 8:00 am – 12:00 pm PST
Location: Zoom online meeting

Purpose of Meeting

The purpose of the Local Actions Program (LAP) Technical Advisory Group (TAG) Meeting 5 was to continue discussion of:

1. Criteria and approach for bank protection
2. Providing structural flood protection

Meeting Notes

These meeting notes are intended to be a public record of key points, questions, and discussion topics raised during the meeting. They are not intended to be transcripts. The meeting was recorded on Zoom.

Technical Advisory Group Schedule

Jim Kramer (meeting facilitator) reviewed upcoming meetings (January 13 and February 8, 2021). These meetings will focus on follow-up from previous meetings. An additional meeting with the TAG will likely be scheduled in March.

TAG Meeting 3 Debrief

Jim summarized feedback on the technical information provided for TAG Meeting 4.

Key takeaways and follow up questions regarding floodplain storage included:

- 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 many 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 significant reduction in large flood flows or flood damage in modeled current and modeled future 100-year flood events.
- However, there are potential benefits along tributaries, especially smaller tributaries.
- Adding floodplain storage should continue to be considered to address flood damage in tributaries as one of 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.

Andrea noted that the Board requested clarity on the Restorative Flood Protection Alternative regarding water surface elevation reductions at Mellen Street.

Key takeaways and follow up questions at TAG Meeting #5 regarding the focus on the 100-year flood event include:

- Clarify statement of the Board's outcome: "Flow reduction at the 100-year flood level or reduction of flood damages."
    - TAG members asked whether there should be discussion of other flows besides a 100-year flood event in 2080.
    - Jim noted that the Board's focus is on reduction of flood damages (current and future) during a 100-year flood. They are not excluding looking at flood damage reduction at lower flood levels.
- Andrea clarified that when the Board discussed the Local Actions Program (LAP) outcomes, they discussed the role of addressing lower flows (e.g., Flood Authority's focus on local projects addressing damage from lower flow events). The Board acknowledged that the Chehalis Basin Strategy (as a whole) has a place for addressing flood damage from flood events smaller than the 100-year flood. The focus of the LAP, as compared to the Flood Retention Expandable (FRE) facility, is to evaluate the effectiveness of potential local flood reduction actions for the projected higher level 100-year flows in 2080.
- The Chehalis Basin Board is interested in input from the TAG on what could help reduce flood damage during high flow events, as well as what could help during lower flow events.
- The Board did not make a distinction between erosion risk versus flood damage from inundation. The Board's understanding of erosion problems is at an initial stage – as we develop more understanding of the causes of erosion risks and what solutions could be, the lower flow issue will come up.

The group also discussed potential bank protection techniques and hypothetical bank erosion and protection scenarios at TAG Meeting #4:

- 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 to other enhancement projects in the vicinity
- Alternatives analysis should be conducted to find least impactful option

Introductions

The TAG divided into breakout groups to discuss the following questions:

- 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?

The following is a summary of TAG input on these questions:

- Some members suggested there are limitations in the hydraulic modeling that become more important if we are shifting to assessing specific projects and recommendations for projects.

Some TAG members felt that the model is not detailed enough to assess all the effects of all possible local projects.

- Another member noted that they were impressed with where we are going. Topics are relevant and we are on the right track, including the evaluation of structure relocation.
- The need to keep an open mind on options, even if the cost appears prohibitive, was reiterated by a TAG member. There will need to be a suite of actions that will cumulatively result in flood "damage" reduction, not flooding reduction.
- Comparison of the LAP and FRE was discussed at the Chehalis Basin Board meeting. The FRE focused on the upper basin, while the LAP is basin-wide. Several TAG members noted that this is important to keep in mind.
- When the hydraulic model was developed, input was obtained from local governments. One TAG member noted the importance of finding the right people from local governments to answer technical questions. May be helpful to have the counties develop a contact list that ensures input and questions are answered by the correct people.
- Another TAG member requested more engagement and collaboration on development of work products from the TAG.
- Another TAG member noted that it is important to help the board understand the foundational processes that are in place. For example, the processes that drive erosion and flooding are important foundational information and provide context.
- Another TAG member noted that there is a huge difference between flood reduction and flood damage reduction. It makes sense that the focus of flood reduction would be based on 2080 100-year. However, for flood damage it is typical that lower flows will show higher erosion risk (i.e., higher velocities) and that is why variable target flows should be evaluated and not just the 2080 flows and/or the 100-year flood events.
- Another TAG member asked if we are now thinking beyond what the intent of "The Project" is. Yes, all ideas brought up have merit and need to be addressed, but shouldn't other programs be developed for this? Reduction of flood flows in the mainstem is intended to reduce flood levels/damage on the Chehalis. Other programs could be developed (if not already in place) to address these other issues, especially on tributaries. Other "local projects" can be developed to address more localized issues as far as reduction of flood damage, but we still need to have something that addresses large mainstem flood events as a whole that will provide benefit to the entire mainstem river.
- If a landowner is open to selling or relocation (either moving at-risk structure on property or moving to another property), there should be a program to fund those actions.

Potential Bank Protection Strategies

Merri Martz (Anchor QEA) provided an overview of the Chehalis Basin Board's desired outcomes related to bank erosion and channel migration. In the *Draft Bank Protection Strategy Elements and Criteria* document provided prior to the meeting, context for this discussion is that we: "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."

Merri reviewed the elements to consider and evaluate as part of a bank protection strategy. This information was followed by bank protection criteria that could be considered or required for assistance from a Bank Protection Program. For more information, see the *Draft Bank Protection Strategy Elements and Criteria* sent out along with the meeting agenda on January 5, 2021.

- A TAG member noted it is important to convey that bank erosion is a natural process and can be beneficial by forming habitats.
- Another TAG member noted that the criteria are good and the types of considerations used for the ASRP Early Action Reaches. However, the Board could consider requiring projects to meet most or all of the criteria (4 or more might be too few).

Lower Satsop and East Fork Satsop Early Action Reach Projects

John Soden (Natural Systems Design) summarized information regarding the Lower Satsop and East Fork Satsop Early Action Reach Projects.

The focus of the presentation was in regard to the erosion and flood risk assessment undertaken for the Satsop River.

For the East Fork Satsop River Early Action (ASRP) reach:

- Started with ASRP habitat restoration goals and addressed channel erosion, avulsion and flood risk as part of the design.
- Developed geomorphic and landowner reach and subreach breaks to delineate the spatial extent of the study reaches.
- On the lower East Fork Satsop sub-reach, there are 5 property owners that are affected by flooding and erosion. A hydraulic and geomorphic analysis was completed along with a review of historical tracing maps, which confirmed that the low floodplain floods during moderate (>Q5) events, and that the river channel has migrated and avulsed in the past (and continues to meander through multiple time series up to today). It is a dynamic reach.
- Conducted the following erosion risk mapping steps:
    1. Used a modified approach and major principles from Rapp and Abbe (2003), by looking at aerials and mapping historical channel locations.
    2. Based on this information, they were able to map evaluate erosion rates. It was determined that forested land erodes slower than pastured land.
    3. Mapped high probability erosions risks to establish high probability erosion hazards
    4. Mapped channel avulsion risk. Looked at the large event in the 1990s
    5. Combine this information in a final erosion/avulsion risk map. Looked at historical occupation zones within this context.
- Overlaid 100-year flood over the erosion risk area. This information was provided to landowners to confirm.
- Based on this information, defined the restoration corridor. Represents an area of erosion and flood risk, and where accelerated rates occurred.
- The model also allowed NSD to talk with property owners regarding potential acquisitions and easements. In some cases, this also included identifying removing structures.

For the lower Satsop:

- The driver in this reach was primarily landowners, who had concerns about erosion.
- At Keys Road, it was important to slow erosion and to halt erosion to protect infrastructure and agricultural land.
- Opportunity to address damage and improve ecological function. Engineered log jams increased stability and habitat effects.

Regardless of whether a project proponent is trying to solve a single property owner's erosion issue or creating habitat restoration, it is important to apply reach-scale hydrologic and geomorphic principles as described for the Satsop River. To address erosion issues, there needs to be an eye towards what is natural or not, and how can we help landowners while maintaining habitat.

TAG questions:

- *Question: is the SR-12 bridge factored in?* It is a pinchpoint and a natural reach break in the system. *Answer:* Yes.

Breakout Session Discussion

The TAG divided into four breakout groups to discuss the following questions related to bank protection strategies:

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).

Feedback from the TAG is summarized, as follows:

- Focus on reducing erosion that is accelerated over natural rates that have destabilized the system. Focus should not be to stop erosion but reduce it to natural rates.
- Focus solutions on the fringes not in the middle of the corridor.
- Include protection of important existing habitat or spawning areas as part of the evaluation criteria. Evaluate whether erosion is contributing to habitat or creating an adverse effect to habitat.
- Consider adding cost-benefit criteria, including the cost to mitigate for any habitat impacts.
- Consider the type of critical infrastructure that we are trying to protect (for example, a sewer main that runs along the banks of the Chehalis serving the City of Centralia). That infrastructure may need to be protected with harder solutions.
- Should be proactively thinking about and prioritizing protection of infrastructure before it becomes a problem.
- There may need to be a time element related to a temporary measure in comparison to a permanent measure. For example, there may be an immediate need to address issues through hard engineering, followed by future design with more natural solutions (and removal of temporary measures).

- Potentially provide weighting of the criteria: protection of infrastructure that provides benefits multiple people is higher priority, compared to individual landowner and agricultural protection. All of the criteria are critical, but weighting would help with determining priority. This weighting would need to be determined with a multi-disciplinary group.
- Tighten up on how a project sponsor is defined (needs to be knowledgeable on geomorphic context, etc.). The project sponsor would need to understand the ramifications of the bank protection in the context of how it affects natural ecological processes and fits into the LAP and ASRP.
- A vulnerability assessment was completed by WSDOT and FHWA in regard to identifying assets, criticality of assets, and consequences of not protecting the assets. This could be a good example methodology to use. However, it is important to not just focus on monetary value of assets. Other considerations could include agriculture viability.
- Instead of using the term "bank protection strategy," other ideas provided in the meeting included: lateral migration resilience strategy and erosion hazard reduction strategy.
- Need definition of bioengineering, which is typically only vegetation plantings. Hard reinforcement needs to be included as well. (Note: Summary and Evaluation of Potential Bank Protection Strategies memo dated 10/23/20 and provided for TAG meeting #4.)
- Need to recognize that these are dynamic systems and that bank erosion is constantly in flux in both location and magnitude.
- Need to approach projects from a corridor standpoint (consider habitat, erosion, flooding, etc. together). Identify where people are within the corridor (e.g., at the fringes or in the middle of the problem area).
- Need to recognize and consider situations where public infrastructure may be contributing to erosion on private land.
- Landowner willingness to participate is a major consideration.
- Moving forward, threats to infrastructure together with willing landowners make for viable bank protection projects. However, the timing for obtaining permits often extends the timescale so far that these projects become emergency actions rather than well planned projects.
- Difficult to find a nexus for counties to work on private land, even if it benefits county infrastructure. This is often constrained by existing funding sources.
- May be important to add a priority to support local public works projects where there is an existing erosion problem and sufficient local funding to expand the solution up and downstream.

Potential Structural Flood Protection Actions

Merri Martz (Anchor QEA) provided an overview of the Chehalis Basin Board's desired outcomes related to protection of structures, critical facilities, and I-5 and other highways that could be flooded by the 2080 predicted 100-year flood levels in the basin. The purpose of the discussion was to review and obtain input on potential options for structural flood protection.

USACE and WSDOT proposed flood protection facilities in the past. Merri reviewed information from the USACE (2003, 2012) and WSDOT (2014) studies. USACE's proposed plan estimated direct impacts to 35 acres of wetlands, indirect effects to 235 acres of floodplain wetlands and 244 acres of undeveloped non-wetland floodplain. WSDOT's proposed plan resulted in increases in flood elevations west of I-5 and

decreases east of I-5; 494 structures would have a reduced depth of flooding; and 875 structures would have an increased depth of flooding (most all of these structures currently experience flooding).

There were also small projects identified in the 2012 Ruckelshaus report. While none of these projects have been implemented, Dillenbaugh Creek and Main Street are still being evaluated.

Merri reviewed an initial ranking of areas that could be considered for flood protection facilities. For more information, see the *Draft Local Flood Protection Actions Ranking* sent out along with the meeting agenda on January 5, 2021. At this point, the approach is focused on evaluating where structural flood protection actions could make sense or not. Andrea underscored that the numeric ranking is not as important at this point. Instead, would like to focus on whether or not the screening criteria makes sense and if further technical investigation of structural actions could/should be completed for the most promising ideas.

Some initial questions on the presentation included:

- *Question: Has the criteria taken into account the flood level changes when implementing the structural flood protection actions?* The number of structures provided in the supporting materials is what could potentially be protected (at a high level). Levee locations have not been identified, nor has modeling been completed at this early planning stage to determine upstream or downstream impacts.
- *Question: It would be good to have clearer definitions such as what is considered high risk, what are deemed valuable structures, etc.* Definition of critical facilities was taken from the Draft SEPA EIS definitions. Agree that it could be helpful to reference WSDOT definitions of critical facilities.

The TAG provided feedback on the following questions:

1. What technical questions/suggestions do you have for the ranking criteria?
2. 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?

Feedback from the TAG Breakout sessions is summarized, as follows:

- Technical questions/suggestions:
    - Ranking should not be numeric, but instead categorized into high/medium/low, and be clear that these are preliminary screening tiers. Evaluate all high ranked sites first.
    - Suggest more investigation and research related to infrastructure noted for Bucoda: is water supply infrastructure protection regarding protection of private wells or other given that infrastructure was not identified? (*Note: this refers to Bucoda's municipal water supply facilities.)*
    - How did South Aberdeen become ranked as #1? How was this ranked or weighted given that there are more structures in Centralia and the setting on the landscape? Is this outside of the area of Aberdeen "protected" by the southside levee?
    - Factor in public input on the perceived need for flood protection in each of these areas. Some communities may be okay with periodic flooding. This could be either an initial criterion, or become a secondary screening method.

    - Suggest adding in criterion about how communities are affected by frequency of periodic flooding (5-, 10-, 20-year flood) versus only the 100-year flood in 2080. These smaller floods may cause more flood damage over time.
    - Consider future build out conditions in the floodplain during the 100-year flood in 2080.
    - If implemented, what would be the impacts to flood storage?
    - Feasibility analysis regarding ability to implement could be considered in the ranking criteria. A way to do this is by evaluating constraints and complexity of the projects.
    - Align the goals with how projects proceed with time
    - Need to consider long term maintenance as a ranking criterion. Also need to consider potential liabilities (including litigation).
    - Who will own the facilities and who will maintain these in perpetuity?
    - The criteria are confusing. Is there a companion document describing how the environmental effects were evaluated? Is there a definition of critical facilities? Were different critical facilities given different weights? Were the different criteria weighted?
    - WSDOT has ranking criteria for critical transportation facilities – can we use that?
    - Are some impacts acceptable (e.g., flooding of agricultural property) while other impacts are not acceptable (e.g., flooding of a critical facility) - this plays into the benefit/cost.
- Top 5 areas in Table 1 warrant further investigation:
    - Yes, these areas warrant further investigation (conceptual level next step). Based on further investigations, the ranking should be revisited.
    - Next steps could be to get details on structures/types, land uses, community impacts, preliminary alignment of levees, hydraulic modeling to assess benefits/effects.
    - Look at all of them over time, even the lower tiered options. Since the program is over a 30-year period, phasing or sequencing should be used to get a more detailed conceptual evaluation of all the options to re-rank and prioritize. As funding is available, prioritize again.

Next Steps and Summary of Follow-Up Actions

The next Technical Advisory Group meeting is scheduled for Wednesday, January 13, 2021, from 1:00 PM to 5:00 PM PST.

Below is a summary of follow-up actions identified during the meeting:

- OCB staff will come back to the TAG regarding input provided on the first topic of the meeting.
    - Develop a table or other method to show how each element feeds into the Board's desired outcomes.
    - Should the focus of the LAP be on the 100-year flood event in 2080, or also include smaller flood events that contribute to flood damage and erosion?
    - How to involve others in the development of information and recommendations?
- Follow up meeting will further discuss erosion protection and local flood protection actions.
- A briefing will be provided on the research on relocation and buyouts.