
OCB BOARD MEETING: AUGUST 4, 2022
Chehalis Basin
LAND*
*LOCAL ACTIONS NON-DAM ALTERNATIVE

BUILDING THE LAND ALTERNATIVE

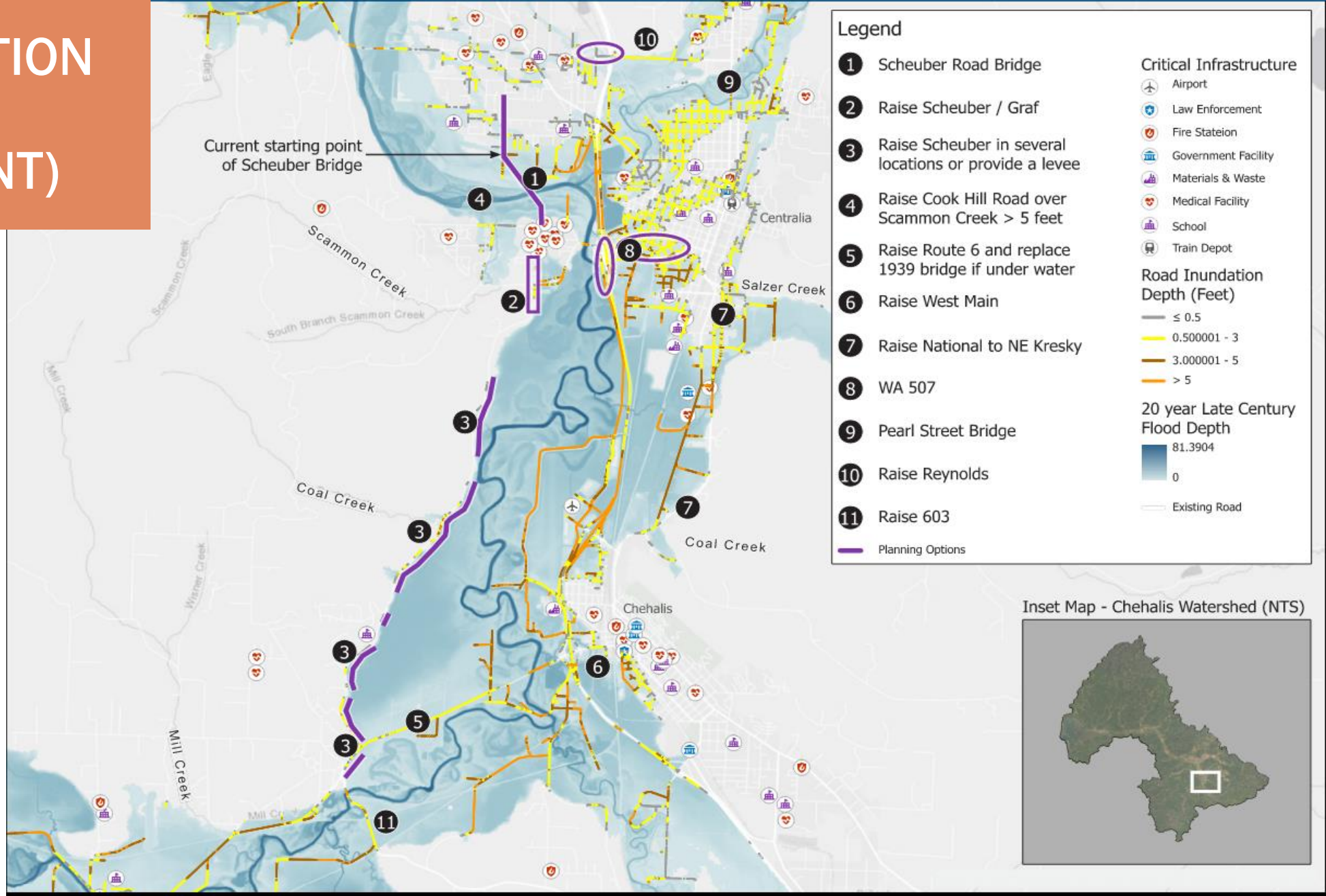
Chehalis Basin LAND

PRELIMINARY FRAMEWORK

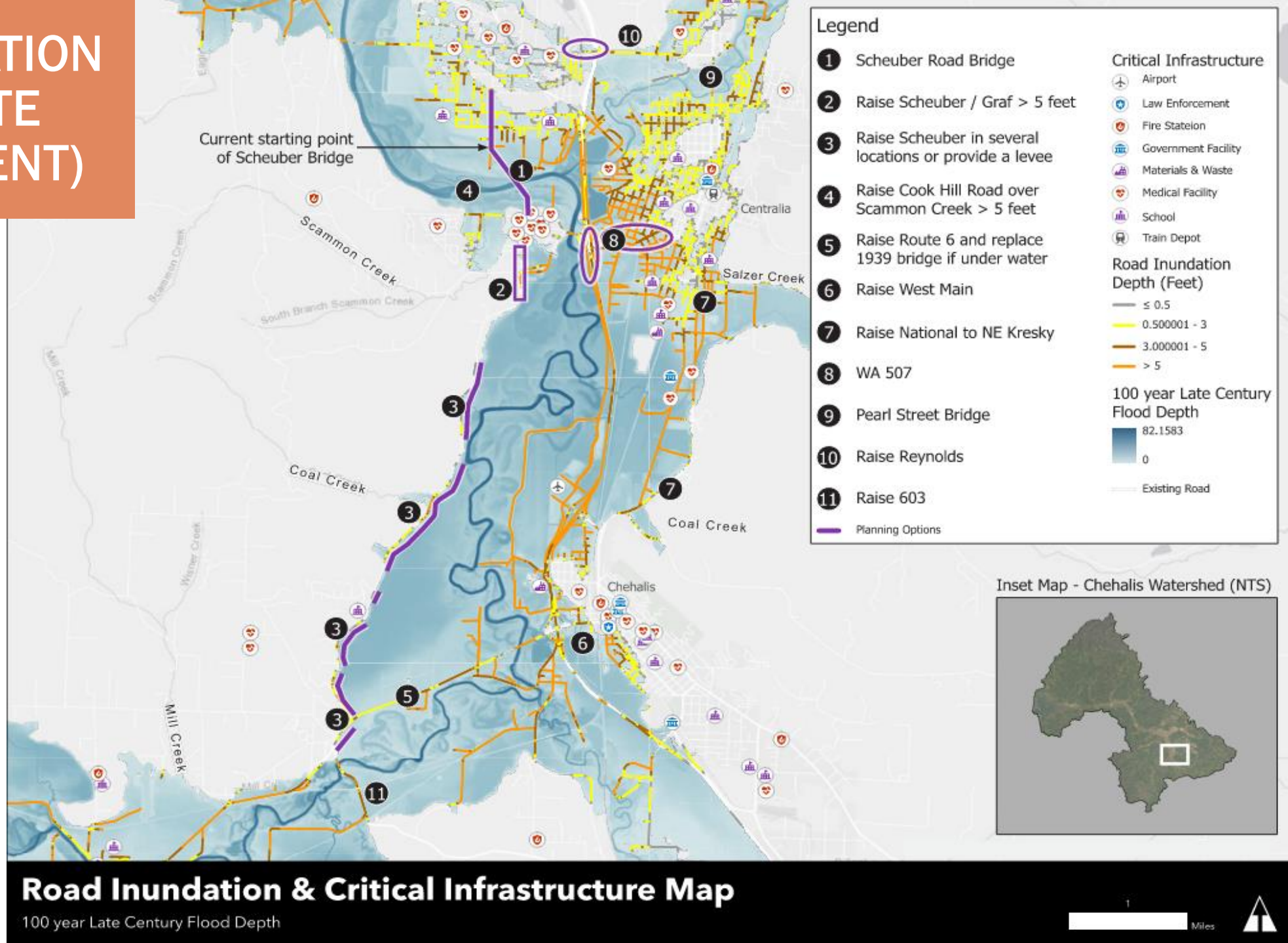
A. **Flood Safe Structures**
B. **Infrastructure Protection and Resiliency**
C. **Floodplain Restoration**
D. **Community and Economic Development**
E. Agriculture and Forestry
F. Community Education
G. Policy
H. Funding
I. Implementation and Governance

B. INFRASTRUCTURE/RESILIENCY
C. FLOODPLAIN RESTORATION

ROAD INUNDATION (20 YEAR LATE CENTURY EVENT)



ROAD INUNDATION (100 YEAR LATE CENTURY EVENT)

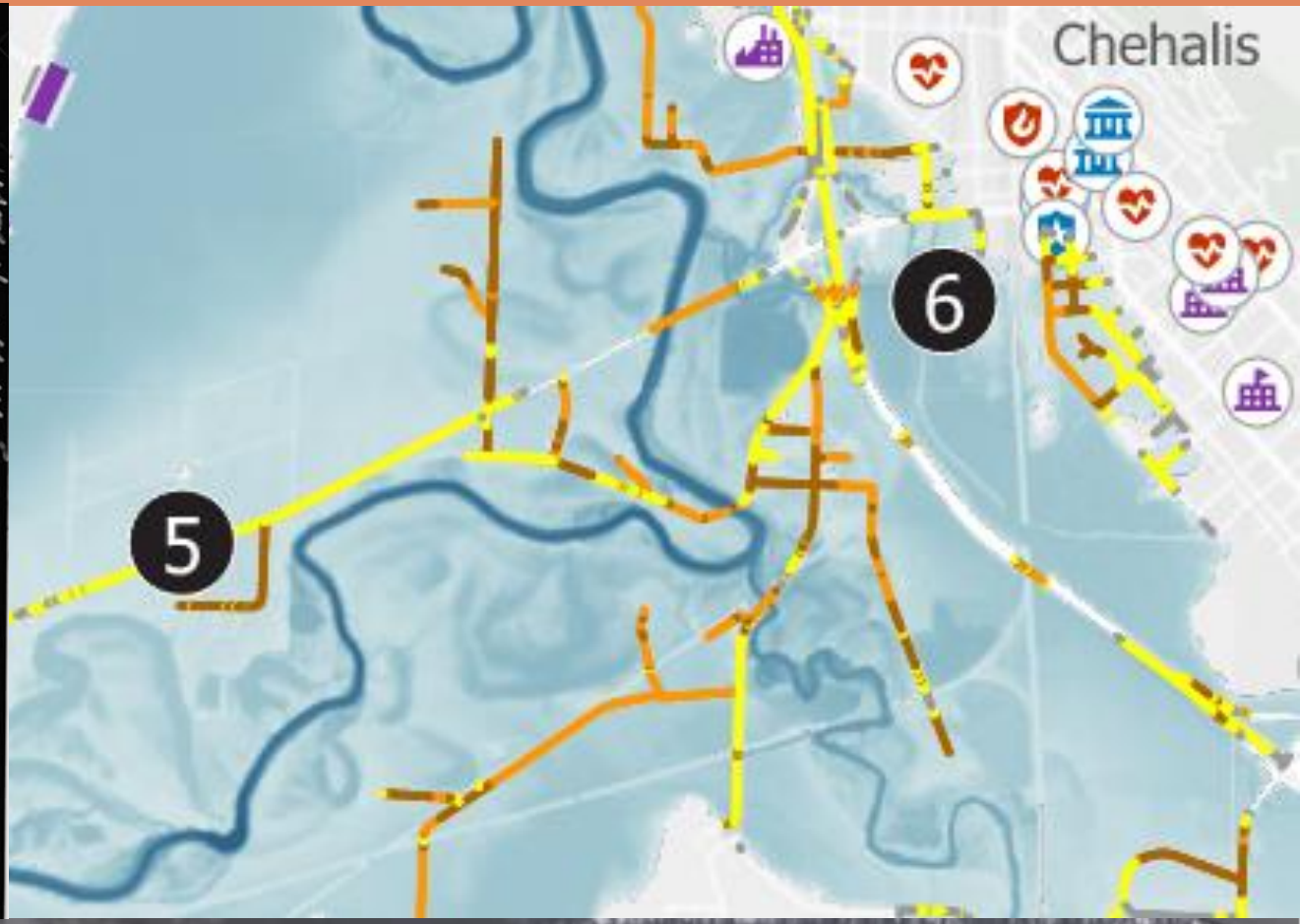


(3) S SCHEUBER RD

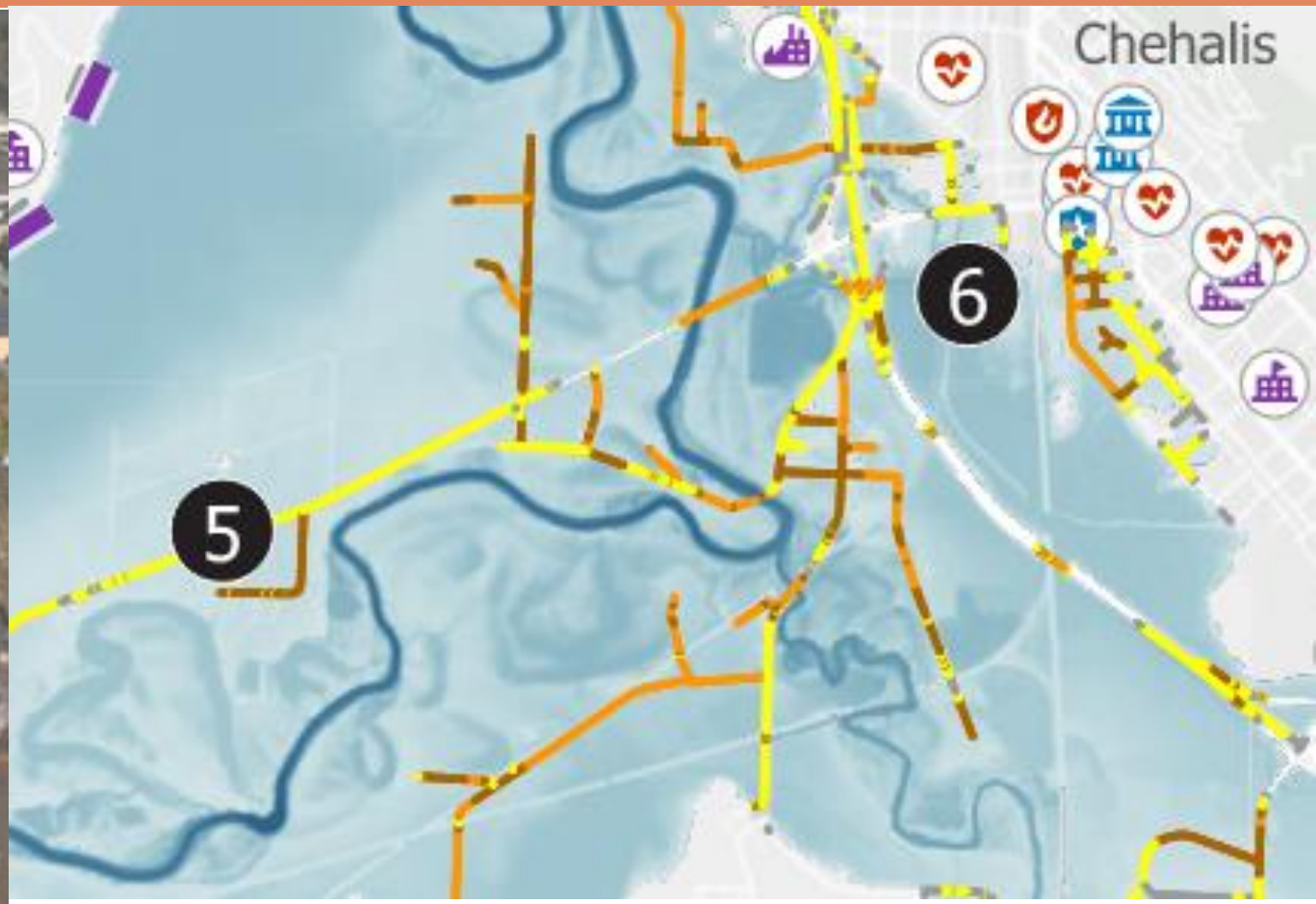
- Raise sections of road or provide levees
- Note fields immediately above Scheuber for potential animal evacuation partnership

Credit Above: Google Earth
Credit Right: Fox News

(5) SR 6



(6) WEST MAIN



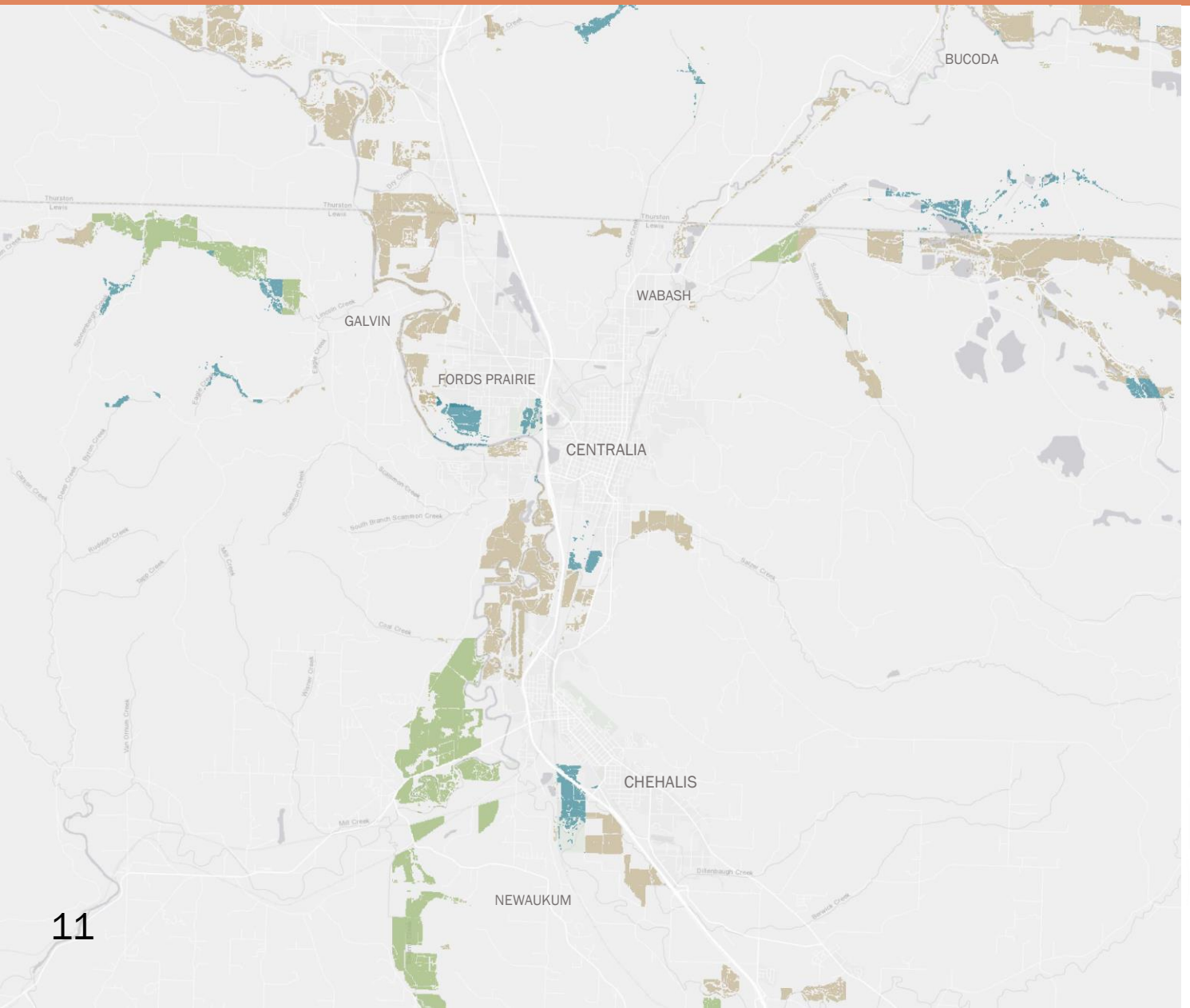
Credit Left: WSDOT Flickr 2007

(9) PEARL STREET BRIDGE (SR 507) JAN 2022

Looking East

Credit: Dale T Hylton via Storyful

FLOODPLAIN RESTORATION



Floodplain Restoration Tier Map:

This preliminary map shows floodplain restoration areas related to land use and zoning.

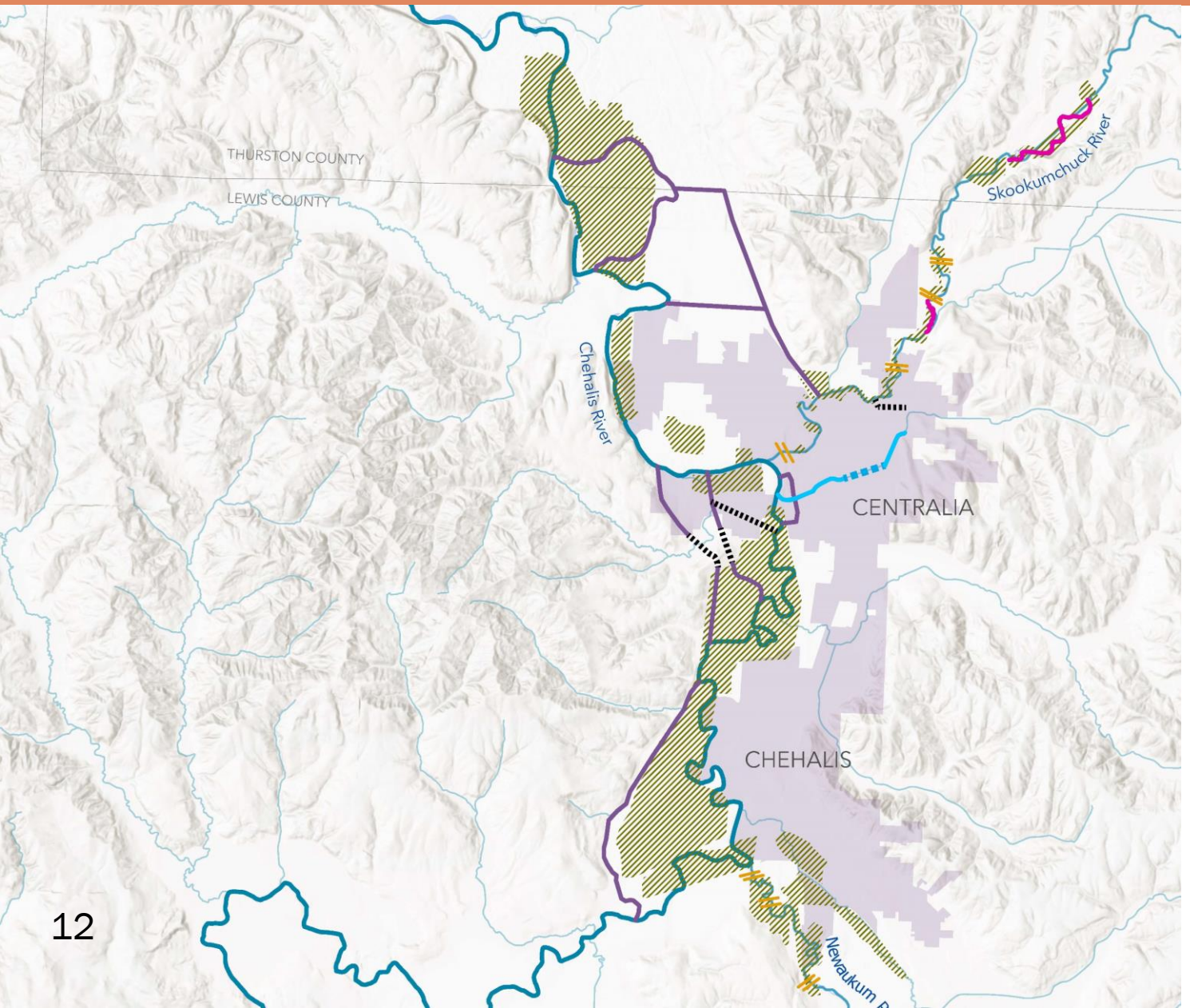
Areas with Restoration Potential:

1 Public Lands

2 Agricultural Lands

3 Private, Non-Agricultural Lands

POTENTIAL FLOODPLAIN PROJECTS



Potential Floodplain Projects:

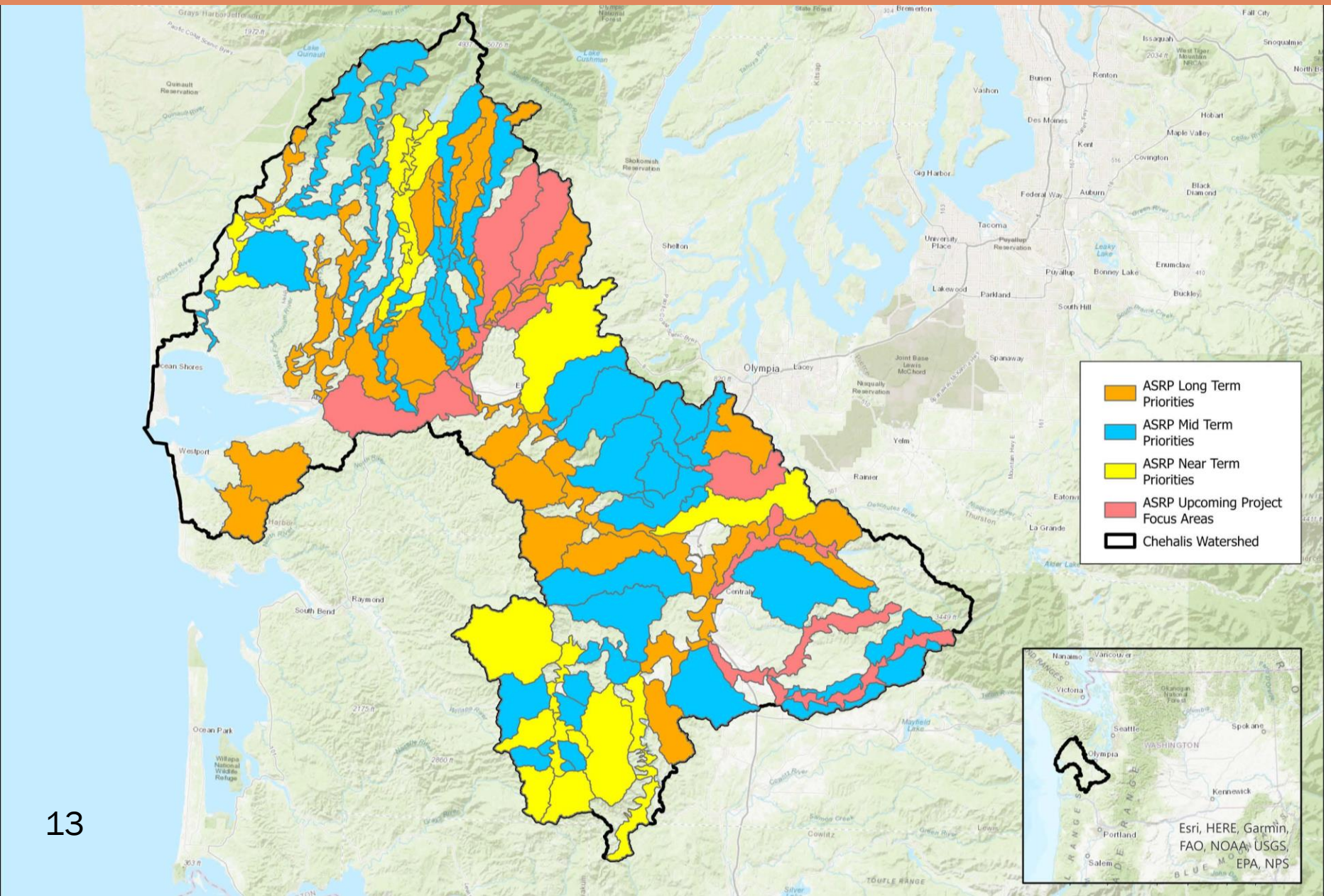
This conceptual plan Illustrates studies for moving water through the system.

Key Elements:

- Potential Diversion Channels (conceptual alignment)
- Floodplain Restoration Areas
- Potential Temporary Flood Control Device Locations

Incorporated Areas
Conceptual Restoration Areas
Conceptual Diversions
Closed
Open
Meander
Daylight China Creek
China Creek

ASRP



ASRP Priorities:

These show location and priority of the Aquatic Species Restoration Plan.

LAND projects could serve a dual benefit of flood mitigation, floodplain restoration, and storage.

DIVERSION EXAMPLES – VEGETATED WITH EMBANKMENTS

Source: www.safarek.com

DIVERSION EXAMPLES – VEGETATED WIDE CHANNEL

DIVERSION EXAMPLES – NAPA RIVER

Source: San Francisco Chroicle

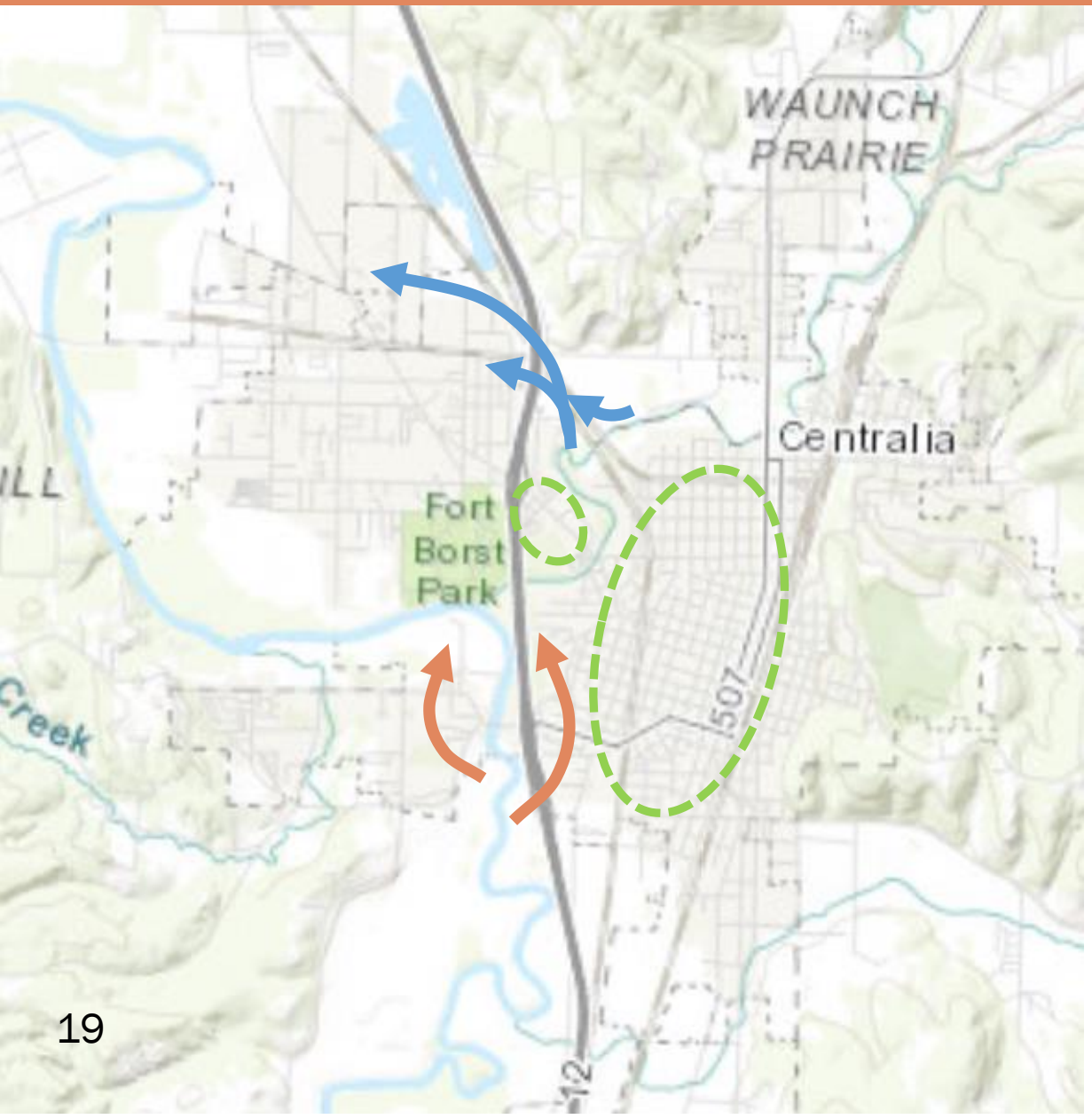
RESTORATION EXAMPLES – PARKS

Source: Balmori.com

STREAM DAYLIGHTING

Source: MIG

CONCEPTUAL ALTERNATIVES EVALUATED



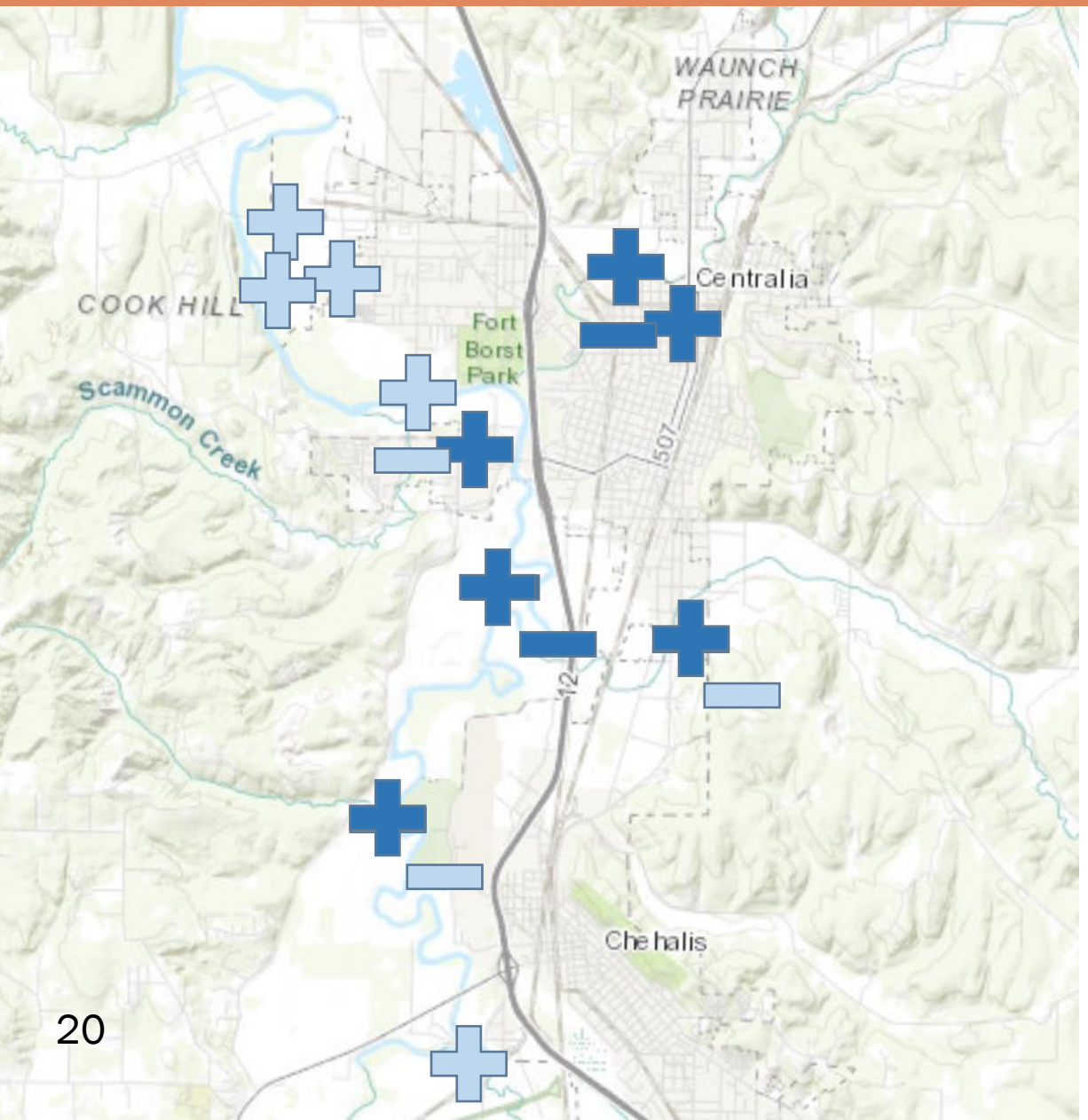
Current concepts evaluated:

- Mellen Street Diversions (orange line)
- Skookumchuck Diversions (blue line)
- Levees (green line)

Simulated:

- 20-year, 100-year, and late century (2080) 100-year flows

NEXT STEPS (MODEL EVALUATION)



- Refine concepts
- Detailed hydraulic analysis
  - Water level, inundated area, # of affected structures, etc.
- Alternative combinations
- Evaluate feasibility/costs

D. COMMUNITY AND ECONOMIC DEVELOPMENT

Chehalis Basin LAND

Population Growth Projections

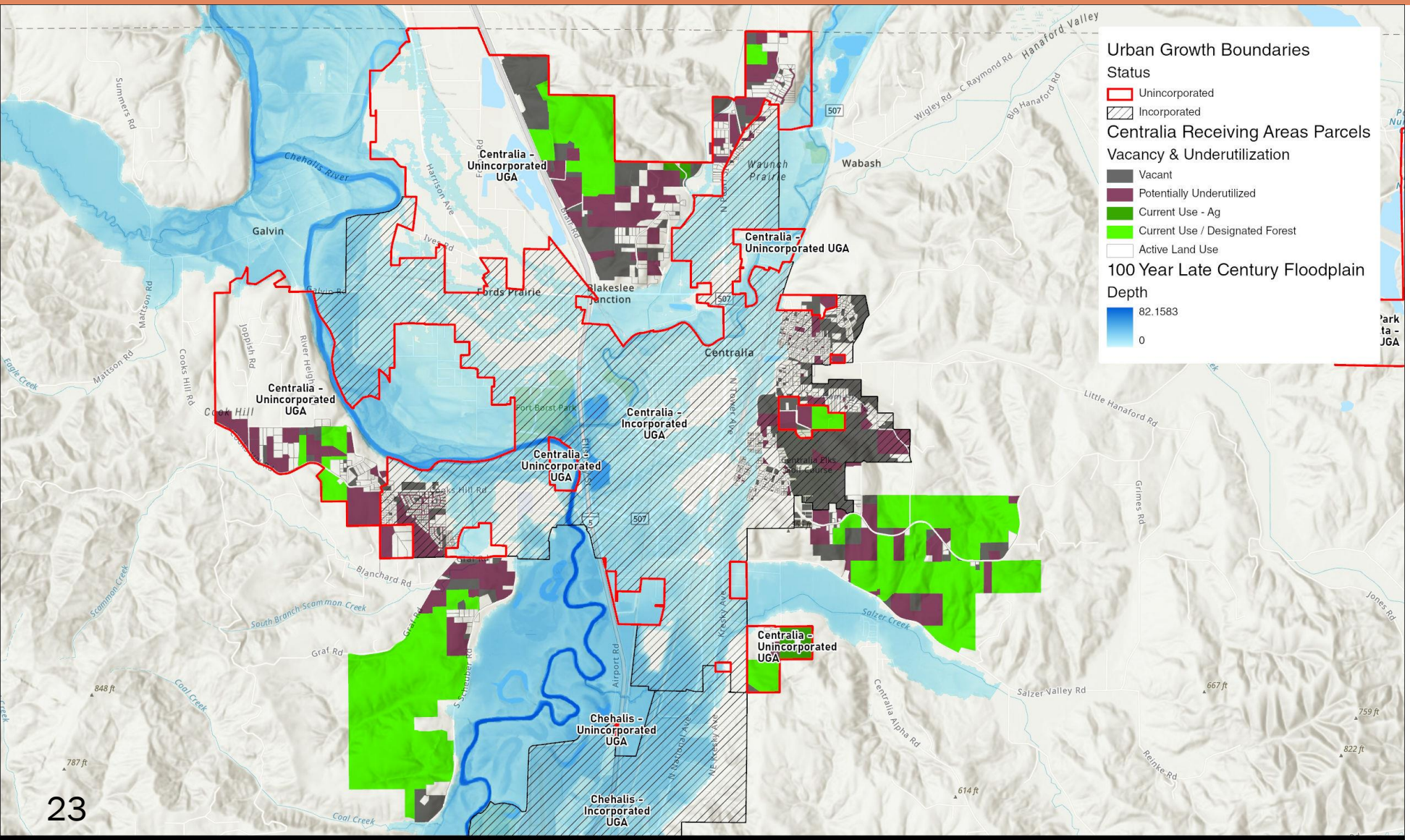
Cities	2011	2016	2021	2040	Growth	CAGR 2011-2021	CAGR 2016-2021	CAGR 2021-2040
Primary Study Area								
Centralia	16,580	17,344	18,280	26,280	8,000	1.0%	1.1%	1.9%
Chehalis	7,285	7,377	7,350	11,230	3,880	0.1%	-0.1%	2.3%
Tenino	1,704	1,815	2,010	2,760	750	1.7%	2.1%	1.7%
Napavine	1,768	1,815	1,895	4,500	2,605	0.7%	0.9%	4.7%
Oakville	688	705	710	790	80	0.3%	0.1%	0.6%
Pe Ell	634	633	640	814	174	0.1%	0.2%	1.3%
Bucoda	561	581	595	760	165	0.6%	0.5%	1.3%
Total Primary	**29,220**	**30,270**	**31,480**	**47,134**	**15,654**	**0.7%**	**0.8%**	**2.1%**
Secondary Study Area								
Aberdeen	16,888	16,836	17,050	18,981	1,931	0.1%	0.3%	0.6%
Hoquiam	8,670	8,716	8,785	9,780	995	0.1%	0.2%	0.6%
Ocean Shores	5,619	5,970	6,965	7,754	789	2.2%	3.1%	0.6%
Montesano	4,008	4,081	4,145	4,615	470	0.3%	0.3%	0.6%
Elma	3,125	3,210	3,450	3,841	391	1.0%	1.5%	0.6%
Westport	2,110	2,163	2,230	2,483	253	0.6%	0.6%	0.6%
McCleary	1,679	1,786	2,040	2,271	231	2.0%	2.7%	0.6%
Cosmopolis	1,641	1,616	1,655	1,842	187	0.1%	0.5%	0.6%
Total Secondary	**43,740**	**44,378**	**46,320**	**51,567**	**5,247**	**0.6%**	**0.9%**	**0.6%**

2040 population growth projections for cities located within the primary and secondary study areas.

Total 2040 Population:

- Lewis County: 104,722
- Thurston County: 370,700
- Grays Harbor County: 84,665

COMMUNITY & ECONOMIC DEVELOPMENT: CITY OF CENTRALIA



DRAFT Centralia Receiving Areas Analysis

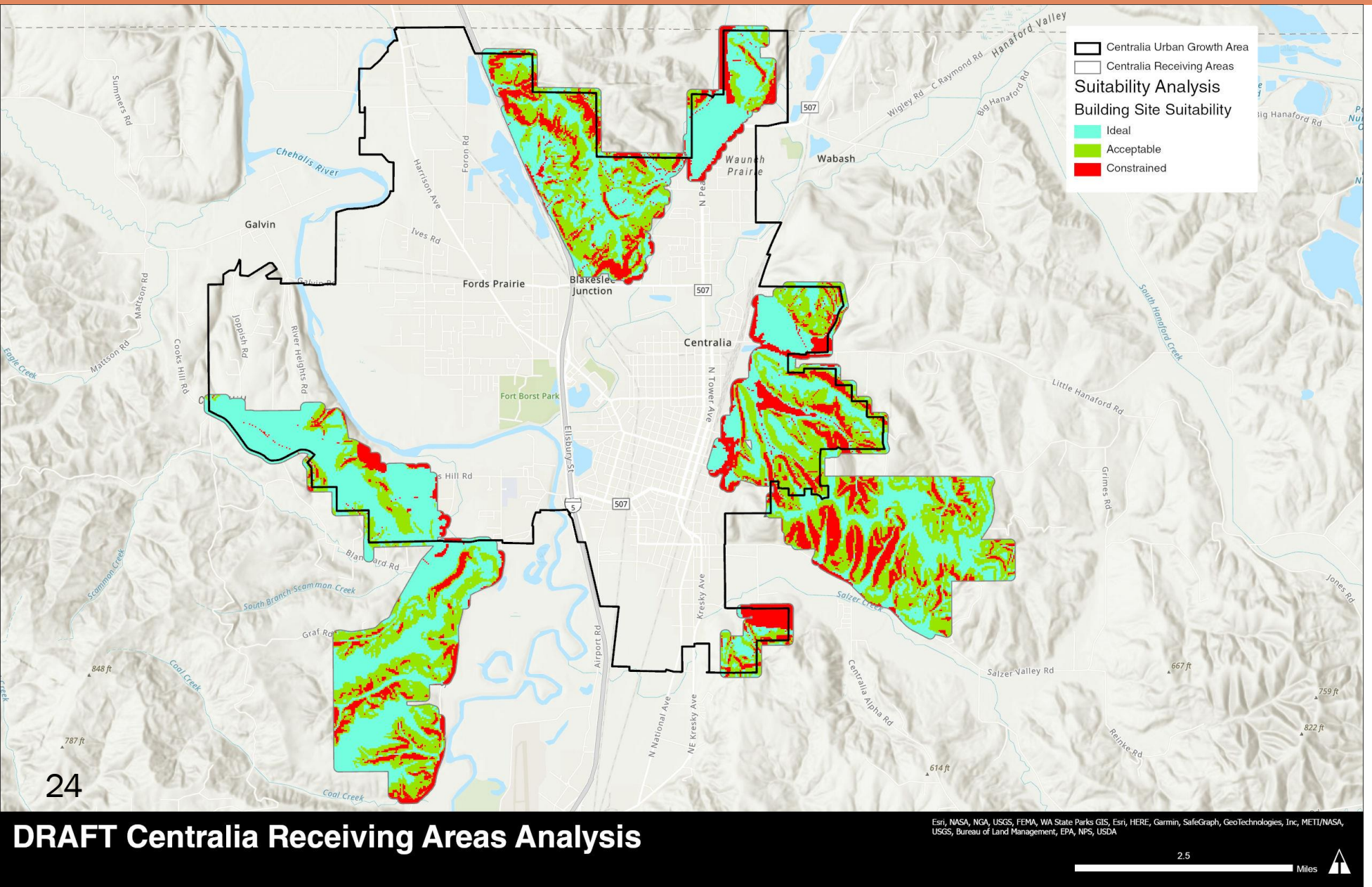
City of Centralia:

Combined across Centralia's potential receiving areas are:

- **740 acres vacant land**
- **839 acres potentially redevelopable land**
- 1,558 acres of current use property
- 626 acres active land uses

Next steps: Potential acreage + suitability.

COMMUNITY & ECONOMIC DEVELOPMENT: CITY OF CENTRALIA



24

DRAFT Centralia Receiving Areas Analysis

Site Suitability

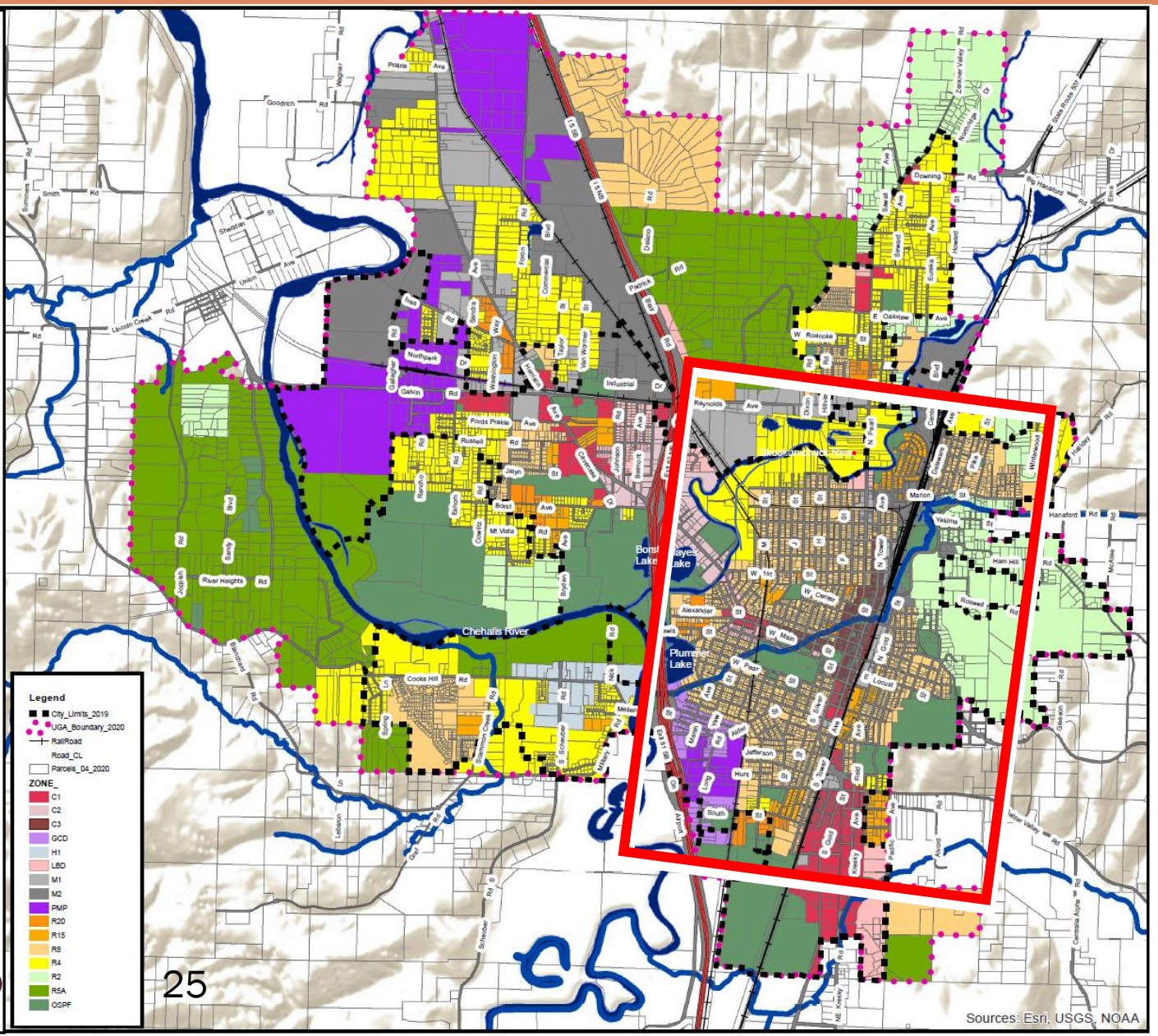
Site suitability modeled combining and overlaying key critical areas layers.

Ideal: No wetlands, floodplain, or landslide zone; <15% slope.

Acceptable: No wetlands, floodplain, or landslide zone; 15-30% slope.

Constrained: Wetlands AND/OR Landslide Zone AND/OR >30% slope.

COMMUNITY & ECONOMIC DEVELOPMENT: CITY OF CENTRALIA



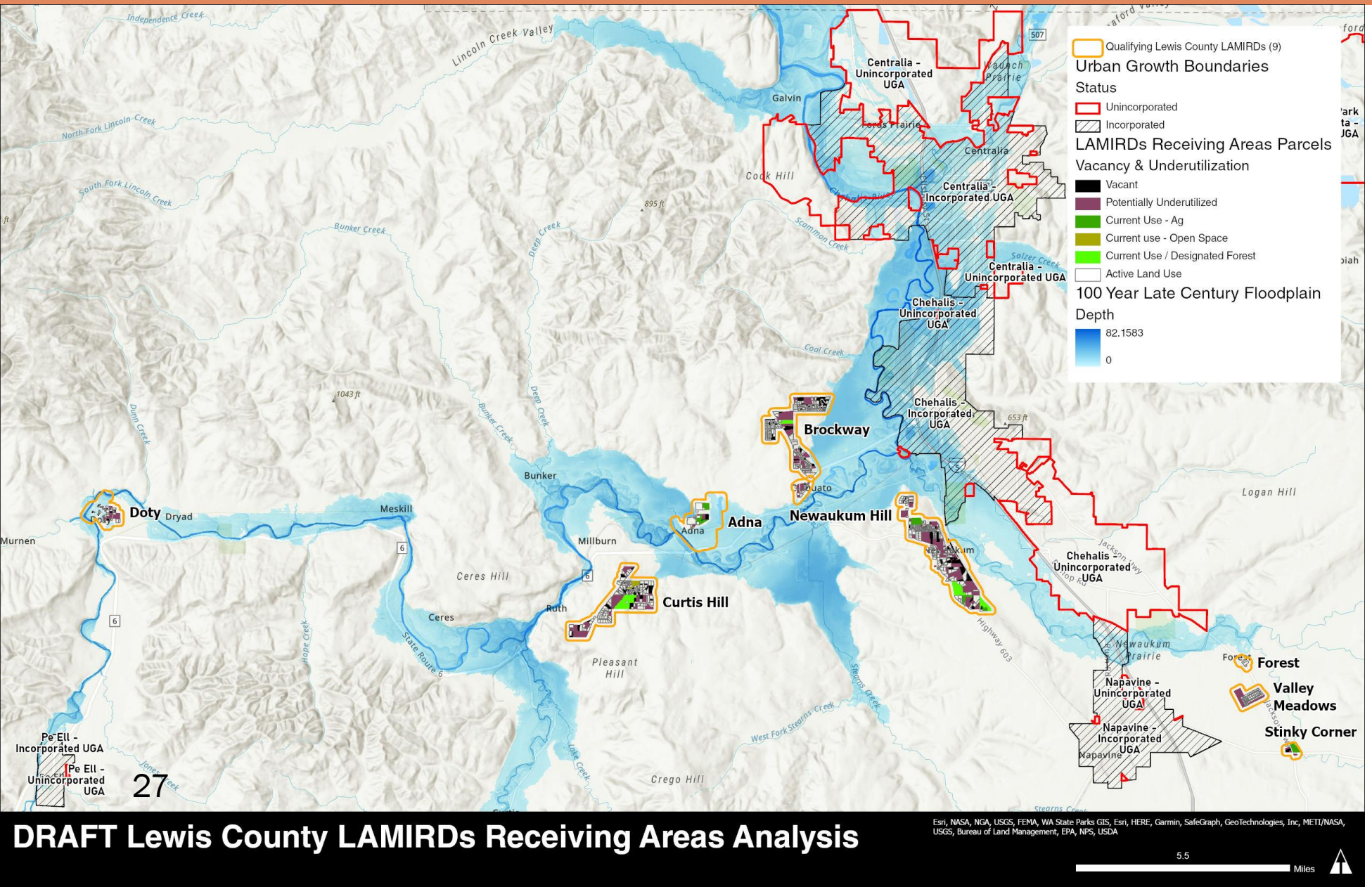
Questions and Policy Considerations

Do you think there is political will to provide for a variety of residential densities within the receiving areas or within city limits?

Left: Highlighted area of Centralia zoning map in downtown Centralia containing Medium, Medium-High-, and High-Density Residential zones.

The sending areas for a relocation program - in Centralia in this example - may be zoned for greater density than the receiving areas.

COMMUNITY & ECONOMIC DEVELOPMENT



27

DRAFT Lewis County LAMIRDs Receiving Areas Analysis

Lewis County Local Areas of More Intense Development (LAMIRDs):

Nine of 34 LAMIRDs in the County contain parcels outside the floodplain, allow for housing, and are located within the sub-basin.

These contain a total of:

- **164 acres vacant land**
- **126 acres potentially redevelopable land**
- 25 acres of current use property
- 619 acres active land uses

A. FLOOD SAFE STRUCTURES

Chehalis Basin LAND

APPLYING AN EQUITY LENS TO LAND RELATED ACTIONS

An equity lens is both an outcome and a process:

- Identify who receives both benefits and incurs costs and how that distribution compares to historic distribution of services.
- Focused attention on race, ethnicity, and other markers of identity
- Targets how we identify research questions, collect and analyze data, and make recommendations

CONTINUUM APPROACH

- Structures will be evaluated, scored, and prioritized/grouped into the Flood Mitigation Measures based on identified Risk Assessment Criteria.

- Identify structures by areas that may pose a risk to life and human safety based on the following:
  - Current Floodway
  - Current 100-Year Floodplain (outside the floodway)
  - 2080 100-Year Floodplain (outside the current 100-year floodplain)

- Planning level cost estimates will be developed for proposed Flood Mitigation Measures. These measures and costs can then be evaluated alongside any engineered alternative (levee, floodwalls, pipe system, detention systems, etc.)

CONTINUUM APPROACH: CONCEPT

STRUCTURES

- Current Floodway
- Current 100-Yr Floodplain
- Future 100-Yr Floodplain

RISK ASSESSMENT CRITERIA

- Location of Structure
- Depth of Water
- Velocity of Water
- Repetitive Loss/Frequency of Flooding
- Cost Effectiveness (Type and condition of structure)
- Proximity to other mitigation projects
- Property adjacent to publicly owned land, trail, greenway, open space/buffer, park, buffer, historic preservation or cultural asset
- Community Goals and Preference

FLOOD MITIGATION MEASURES

- Level 1: Flood Insurance
- Level 2: Utility Relocation
- Level 3: Floodproofing
- Level 4:Elevation
- Level 5a: Acquisition/Demo
- Level 5b: Acquisition/Demo & Relocation

RISK ASSESSMENT CRITERIA: SAMPLE SCORE SHEET

	Risk Assessment Criteria		Flood Mitigation Measures					
	Primary		Level 1	Level 2	Level 3	Level 4	Level 5a	Level 5b
1	**Location of Structure**	**Base Points**						
1.1	Flood water is touching a portion of the building (likely crawlspace or unfinished basement being impacted)							
1.2	Property is completely surrounded by flood water (ingress/egress off of flooded property)							
1.3	Structure is completely surrounded by flood water (ingress/ egress from structure)							
1.4	Structure is completely surrounded by flood water AND is a Critical Facility							
1.5	Structure is completely surrounded by flood water AND is multi- family residential (additional people, vehicles)							
1.6	Flooding around area where single-family residential vehicles are typically parked (see separate guidelines)							
1.7	Flood water is touching a portion of the building AND has structural damage (subsidence, shifting, cracking) as a result of cumulative flooding							
	Sub-Total	**20**				13		
2	**Depth of Water**							
2.1	Flooding of electrical and/or mechanical equipment							
2.2	Dept of water is at foundation but below first floor of living space							
2.3	Depth of water is at first floor of living space							
2.4	Depth of water is more than 3 feet above foot first floor of living space							
	Sub-Total	**20**				15		
3	**Velocity of Water**							
3.1	Velocity of water is measured at more than 5 feet per second							
	Sub-Total	**20**				5		
4	**Repetitive Loss/ Frequency**							
4.1	Structure has been identified as repetitive loss property							
4.2	Structure is locacted in 50-year floodplain							
4.3	Structure is locacted in 10-year floodplain							
4.4	Structure is locacted in 5-year floodplain							
4.5	Structure is locacted in 2-year floodplain							
	Sub-Total	**20**				10		
5	**Cost Effectiveness**							
5.1	Cost of likely mitigation measures will be less than value of structure							
5.2	Condition of building allows for multiple stay in place protection mitigation measures							
	Sub-Total	**20**				5		
	Risk Assessment Criteria - Secondary							
6	**Proximity to Other Mitigation Projects**							
6.1	In a neighborhood with the majority of structures may also be candidates' for acquisition of elevation.							
	Sub-Total	**10**				5		
7	**Adjacency to Public Land**							
7.1	Adjacent to other public owned land							
7.2	Adjacent to public park, trail, open space, historic preservation or cultural asset							
	Sub-Total	**10**				5		
8	**Community Goals and Preferences**							
8.1	TBD							
8.2	TBD							
	Sub-Total	**10**				5		
	TOTAL	**130**				63		
	Floodway/Flood Plain Multipliers							
	Current Floodway	2				**126**		
	Current 100-year Floodplain	1.5				**94.5**		
	Future 100-year Floodplain	1				**63**		

PROJECT WEBSITE AND SURVEY

Project microsite: https://www.chehalisbasinland.com

Online survey: https://bit.ly/ChehalisBasinSurvey

PROJECT WEBSITE AND SURVEY: SOCIAL PROMOTION

Share your thoughts on how we can reduce flood damage in the Chehalis Basin. Take our map-based survey.

Share your ideas about how we can reduce Chehalis Basin flood damage. Take our short survey.

Share where and how flooding has affected you in the Chehalis Basin—using our map-based survey.

Share your ideas—take our survey!

How can we reduce flood damages and protect the things we value most? Take a short survey to share your ideas.

How can we reduce flood damages in the Chehalis Basin? Take our map-based survey today!

NEXT STEPS

Chehalis Basin LAND

LAND Alternatives for Flood Reduction: Draft Schedule

June 24, 2022

MEETINGS & ENGAGEMENT

ANALYSIS, PLANNING, DESIGN & DELIVERABLES

Project Scoping and Information Gathering

Project Kickoff and Values Alignment

Develop Basin Alternatives

Alternatives Refinement and Analysis

Recommendations and Implementation Strategies

Internal Project Kickoff

Meeting Window #1:
Stakeholder Meetings/Site Tour

Online Survey
Virtual Storefront

Online Survey:
Tradeoffs

LAND Steering Committee

LAND Steering Committee/OCB Board

LAND Steering Committee/OCB Board

Meeting Window #2:
Values Planning Workshop

LAND Steering Committee/OCB Board

LAND Steering Committee/OCB Board

LAND Steering Committee/OCB Board

LAND Steering Committee/OCB Board

Meeting Window #3:
Tradeoffs Workshop

LAND Steering Committee/OCB Board

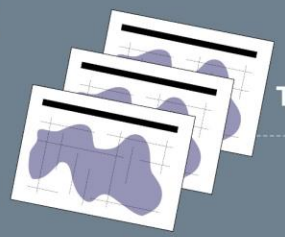
Information Transfer & Baseline Summary

Project Onboarding Meetings

Communications and Engagement Plan

Values Planning Briefing Book, Draft Metrics

Precedent Research



Draft Basin Alternatives

Technical Analysis

Refined Basin Alternatives

Final Alternative
(recommendations, visualizations, infographics, implementation strategies)

FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

2022


Chehalis Basin
LAND*
*LOCAL ACTIONS NON-DAM ALTERNATIVE
PLANNING PROCESS

37