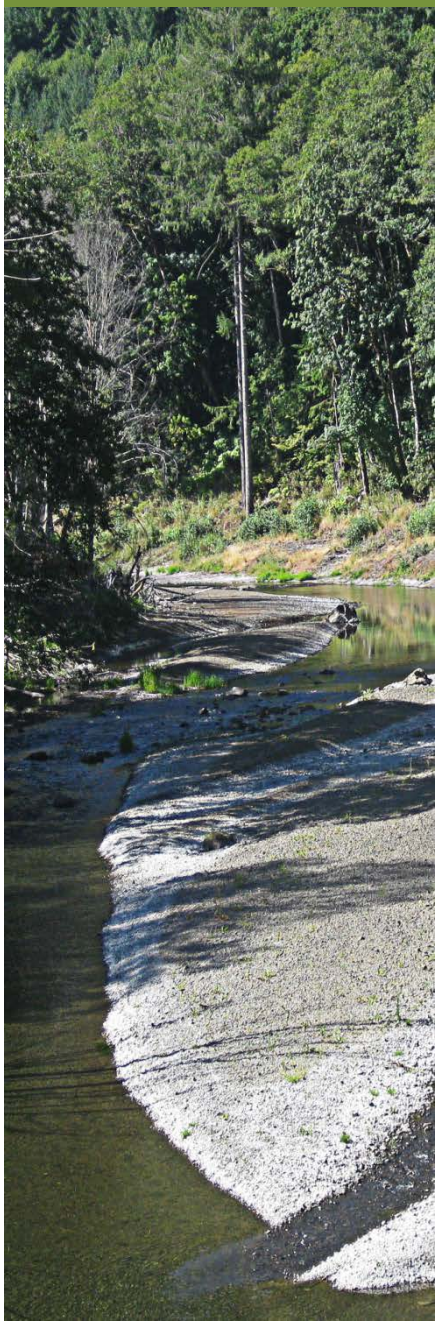
Chehalis Basin Strategy

Policy Workshop

Small Projects and Floodproofing

May 23, 2014



Purpose

- Identify small scale projects to consider for reducing flood damage in the Chehalis Basin. The list of projects identified will serve two purposes:
  - Provide flood damage reduction as an alternative to or in combination with large projects (Dam, I-5 Alternative)
  - Provide a list of recommendations to the legislature for funding as part of the 2015-17 Capital Budget

Process

- Identified a long list of projects through review of past reports and meetings with communities
- Developed criteria to prioritize projects
- Prepared a short list of 37 projects most likely to meet criteria
- Consultant team evaluated projects using criteria
- Project Committee reviewed evaluation, agreed with final list of 11 projects for additional design analysis now
- Floodproofing is also being evaluated in this task

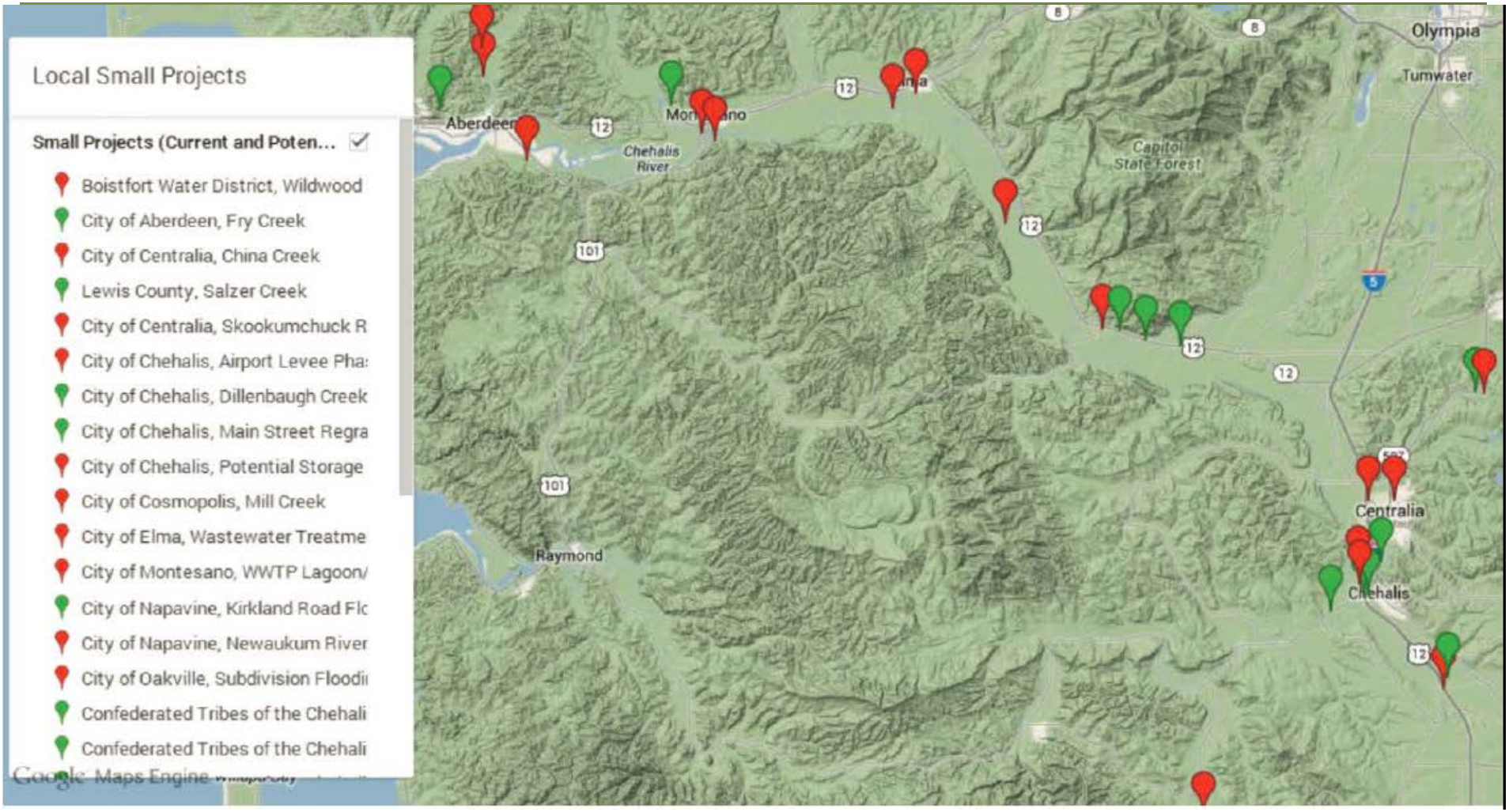
Criteria Used

- Primary
  - Ability to affect a broader area of the mainstem Chehalis River
  - Estimated flood damage reduction benefits
  - Size of human population at risk
- Secondary
  - Ability to permit and implement the project
  - The need and complexity the project will have for continued costs (O&M)
  - Ability to provide environmental benefits
  - Adaptability to provide benefits under climate change and in combination with other projects

Projects Selected for Additional Analysis Now

- City of Napavine, Kirkland Road Flooding
- WSDOT/Lewis County, SR 6 Overflow
- City of Chehalis, Dillenbaugh Creek Realignment
- City of Chehalis, Main Street Regrade
- Lewis County, Salzer Creek
- Town of Bucoda, Main Street Regrade
- Chehalis Tribe, Black River Bridge
- Chehalis Tribe, Roundtree Creek
- Grays Harbor County, Wynoochee Valley Road Regrade
- City of Aberdeen, Fry Creek
- Floodproofing all structures in floodplain

Project Locations



Floodproofing - Structure Survey Results

9,087 Structures Evaluated

Type of Structure	Lewis County	Thurston County	Grays Harbor County	Totals
Mobile Homes	363	98	0	461
Residential Structures	5,348	201	405	5,954
Commercial	1,567	34	470	2,071
Agricultural	10	161	430	601
Totals	7,288	494	1,305	9,087

5,512 “of significant value” structures; 3,575 others not assigned a value

Total Assessed Value $607 Million of the 5,512 structures

Estimated Costs for Floodproofing

Residential Structures

- $35 per square foot of floor area (roof area)
- 20% contingency for escalation, contractor profit, etc.

Commercial Structures

- $33 per lineal foot of perimeter
- $4.67 per square foot of wall area (to 3 feet above flood)
- $10,000 for other costs (backflow prevention, permits, etc)
- 50% contingency for escalation, contractor profit, etc.

Agricultural Structures

- Greater of either residential or commercial floodproofing costs

Floodproofing costs capped at value of structure plus land

Estimated Costs for Floodproofing

Baseline conditions 100-year event totals

Residential Structures - $57,000,000

Commercial Structures - $21,000,000

Agricultural Structures - $14,000,000

Total - $92,000,000

Floodproofing - Structures Affected

Summary of Structures At Risk of Flooding in Chehalis River Floodplain								
Number of Structures	**Baseline**					**With Dam and Airport Levee**		
	Dec 07	**500-Year**	**100-Year**	**20-Year**	**10-Year**	**Dec 07**	**500-Year**	**100-Year**
Flooded	2040	3645	1384	372	175	753	2031	821
>1.0 feet	1368	2743	829	167	83	432	1306	459
>2.0 feet	820	1926	489	76	28	241	762	241
>3.0 feet	470	1159	293	22	7	139	471	117
>4.0 feet	263	657	155	6	2	65	300	54
>5.0 feet	159	385	76	1	0	28	158	25
Assessed Value of Improvements Inundated ($Million)	$238	$411	$137	$30	$13	$64	$206	$73
Cost to Floodproof all Inundated Structures ($Million)	$146	$273	$92	$20	$9	$46	$149	$50
Residential ($ Mil)	$107	$205	$57	$10	$4	$28	$101	$28
Commercial ($ Mil)	$26	$44	$21	$6	$3	$11	$26	$12
Agricultural ($ Mil)	$13	$24	$14	$4	$2	$7	$22	$10

Floodproofing – with Climate Change

Summary of Structures At Risk of Flooding in Chehalis River Floodplain			
Number of Structures	Baseline	100-Year w Climate Change	
	100-Year	100-Year	Change vs Base
Flooded	1384	2202	59%
>1.0 feet	829	1462	76%
>2.0 feet	489	830	70%
>3.0 feet	293	481	64%
>4.0 feet	155	301	94%
>5.0 feet	76	161	112%
Assessed Value of Improvements Inundated ($Million)	$137	$255	86%
Cost to Floodproof all Inundated Structures ($Million)	$92	$161	75%
Residential ($ Mil)	$57	$110	93%
Commercial ($ Mil)	$21	$30	43%
Agricultural ($ Mil)	$14	$21	50%

Floodproofing

- No environmental impacts from this alternative
- Cost is preliminarily estimated to be $92 million – $146 million (100-year to 2007 event)
- Costs rise by 75% when climate change is accounted for (from $92 million to $161 million for 100-year event)

Next Steps

- Develop conceptual level designs for projects that don't already have this
- Assess the flood reduction benefit of a suite of potentially significant projects
  - With and without the water retention structure
  - With and without the I-5 alternatives
- Preliminary Estimate of Costs
- Reporting

Summary of Key Results used for Economic Analysis

- Cost of floodproofing homes and businesses
- Small project list does not have a significant, measurable effect on mainstem flooding
- There are no significant environmental impacts

Questions