

Document Overview/Description

A. Document Overview and Description:

This is a list of flood related projects that were extracted from flood planning documents throughout the Chehalis River Basin. This list is not prioritized, and is meant to serve as a baseline of projects for potential future funding. In the course of the next two months, ranking criteria will need to be developed and used to prioritize the projects by a panel with local expertise on flooding. The prioritized list will be presented to the Chehalis River Basin Flood Authority in December for final approval.

B. How to Read This List:

The Sources are from where the projects originated. To date, there are 12 sources that were used, and have requested information from the Cities of Oakville, Pe Ell, and Montesano. Starting from the left, the first two columns depict a numbering system from this version (version 2) and the first version (Version 1) that were discussed at the 10/4 Project Subcommittee meeting. This list has grown from that meeting, adding an additional 35 projects from Grays Harbor and Lewis Counties, and the City of Chehalis. The Project Description, Project Type, Location, and Funding were taken directly from the Project Source. The WRIA is the Watershed Resource Inventory Area, as developed by the Washington State Department of Ecology.

C. Sources:

- 1 [CRBFA Project List May 2011.](#)
- 2 [New Projects Proposed by Flood Authority Jurisdictions \(11/22/2010\).](#)
- 3 [Confederated Tribes of the Chehalis Reservation CFHMP \(March 17, 2009\).](#)
- 4 [Chehalis River Basin Draft Comprehensive Flood Management Plan \(June 2010\).](#)
- 5 [Centralia Comprehensive Flood Management and Natural Hazards Mitigation Plan Annual Progress Report \(Updated April 2011\).](#)
- 6 [Thurston County Annual Progress Report - Implementing Flood Hazard Mitigation Initiatives in the Natural Hazards Mitigation Plan \(August 11,](#)
- 7 [City of Aberdeen Public Works Master Project List \(January 2011\).](#)
- 8 [ACOE Mitigation Projects in Chehalis Basin.](#)
- 9 [Grays Harbor County Draft Hazard Mitigation Plan 2001.](#)
- 10 [City of Chehalis - Bob Nacht.](#)
- 11 [Lewis County Comprehensive Flood Hazard Management Plan.](#)
- 12 [Grays Harbor County Draft Hazard Mitigation Plan - Lee Napier.](#)

CRBFA Project Subcommittee Master Project Compilation List (Ver. 2)

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
1	52	Cumulative downstream flood impact analysis	Planning and Data Collection	Non-structural	Lower basin	Remove	1,4	22

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
2	63	Flood Hazard Warning Policies	Emergency Response and Preparedness	Non-structural	Grays Harbor County	Remove	1,4	22
3	69	Manage Wynoochee dam for flood control	Emergency Response and Preparedness	Non-structural	Wynoochee dam	Local / Corps	1,4	22
4	128	Develop preliminary master plan	Plan Coordination and Implementation	Non-structural	Aberdeen		7	22
5	129	Begin phased implementation	Plan Coordination and Implementation	Non-structural	Aberdeen		7	22
6	136	Standby power system	Floodplain Protection	Non-structural	Aberdeen		7	22
7	139	Evaluate flooding impacts	Plan Coordination and Implementation	Non-structural	Aberdeen		7	22
8	140	Southside Dike certification	Floodplain Protection	Non-structural	Aberdeen		7	22
9	145	Revise Thurston County's Comprehensive Flood Hazard Management Plan	Plan Coordination and Implementation	Non-structural	Thurston County		2	22
10	162	Continue enforcement of existing land use regulations and permitting processes	Regulatory Programs	Non-structural	Grays Harbor County		9	22
11	163	Evaluate revisions to FEMA mapping	Planning and Data Collection	Non-structural	Grays Harbor County		9	22
12	164	Continue inter-jurisdictional coordination	Plan Coordination and Implementation	Non-structural	Grays Harbor County		9	22
13	165	Develop floodplain conservation easement program	Plan Coordination and Implementation	Non-structural	Grays Harbor County		9	22

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
14	166	Provide educational materials on flood hazard management	Education and Public Information	Non-structural	Grays Harbor County		9	22
15	167	Improve flood monitoring system		Non-structural	Grays Harbor County		9	22
16	168	Use new design, construction, and maintenance standards		Non-structural	Grays Harbor County		9	22
17		Assess and evaluate alternative solutions to address flooding between MP 1 and MP 5.	Planning and Data Collection	Non-structural	Grays Harbor County		12	22
18	8	Open old migration channels to allow river braiding	Floodplain Protection	Structural	Wynoochee and Satsop Rivers	Local with regional support	1,4	22
19	9	Culvert projects on Hiram Hill	Floodplain Protection	Structural	Grays Harbor County	? (Local)	1,4	22
20	10	Montesano WWTP protection	Floodplain Protection	Structural	Montesano	Local	1,4	22
21	13	Wellhead and water treatment protection	Floodplain Protection	Structural	Montesano	Local	1,4	22
22	18	Wynoochee River bank stabilization	Bank Protection	Structural	Montesano	Remove	1,4	22
23	20	Mary's River Lumber bank protection	Bank Protection	Structural	Montesano	Remove	1,4	22
24	22	Open migration zone of the Satsop	Conveyance Capacity	Structural	Satsop River	Remove	1,4	22
25	23	Dredge Lake Sylvia	Conveyance Capacity	Structural	Montesano	Local	1,4	22
26	24	Open relic channel at Marys River oxbow	Conveyance Capacity	Structural	Grays Harbor County	Local	1,4	22
27	64	Improve gauge system in Grays Harbor County	Emergency Response and Preparedness	Structural	Grays Harbor County	Local	1,4	22
28	65	Acquire generator for City Hall	Emergency Response and Preparedness	Structural	Montesano	Local	1,4	22

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
29	66	Construct drinking water reservoir	Emergency Response and Preparedness	Structural	Montesano	Local	1,4	22
30	71	Install generator at Grays Harbor Fairgrounds	Emergency Response and Preparedness	Structural	Grays Harbor Fairgrounds	Local	1,4	22
31	79	Protect access to Satsop Development Park	Reduction of Damage to Existing Structures	Structural	Grays Harbor County	Local	1,4	22
32	82	Camp Creek drainage improvements	Natural Resource Protection	Structural	Grays Harbor County	Local	1,4	22
33	90	Mill Creek dam in Cosmopolis	Floodplain Protection	Structural	Cosmopolis	Local / Regional	1	22
34	169	Chehalis River Bank Restoration near Oakville		Structural	Grays Harbor County		9	22
35	170	Chehalis River Bank Restoration near Porter		Structural	Grays Harbor County		9	22
36	171	Satsop River Bank Stabilization near Satsop		Structural	Grays Harbor County		9	22
37	172	Satsop River Bank Stabilization near Satsop Rivera		Structural	Grays Harbor County		9	22
38	173	Keys Road Chehalis River Bank at Boat Launch near Satsop River		Structural	Grays Harbor County		9	22
39	174	West Satsop River Bank Restoration at Boat Launch		Structural	Grays Harbor County		9	22
40	175	Wynoochee Tracts		Structural	Grays Harbor County		9	22
41	176	Humptulips Dike Road		Structural	Grays Harbor County		9	22
42	177	Walker Bottom Area		Structural	Grays Harbor County		9	22
43	189	Widen Stream channel at MP 8.2 of the South Bank Road.	Floodplain Protection	Structural	Grays Harbor County		12	22
44	115	Remove road embankment fill under Baich Road approach (abandoned)		Structural	Grays Harbor County		3	22
45	116	Install culverts under South Bank River Road along approach to Sickman-Ford Bridge		Structural	Grays Harbor County		3	22

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
46	117	Install large-diameter culverts beneath State Road at Harris Creek		Structural	Grays Harbor County		3	22
47	118	Replace U.S. Highway 12 Black River Bridge		Structural			3	22
48	124	Trail/Dike behind Burger King	Floodplain Protection	Structural	Aberdeen		7	22
49	125	Dike bank of Wishkah north of Hwy.	Floodplain Protection	Structural	Aberdeen		7	22
50	126	Wilson Creek flooding of highway	Floodplain Protection	Structural	Aberdeen		7	22
51	127	Tide gates	Floodplain Protection	Structural	Aberdeen		7	22
52	130	Raise portions of Young Street	Floodplain Protection	Structural	Aberdeen		7	22
53	131	Market Street Dike	Floodplain Protection	Structural	Aberdeen		7	22
54	132	Arthur/Randal bank of Wishkah	Floodplain Protection	Structural	Aberdeen		7	22
55	133	Raise flood gate thresholds	Floodplain Protection	Structural	Aberdeen		7	22
56	134	Mill Creek overflow kike on Schey	Floodplain Protection	Structural	Aberdeen		7	22
57	135	Mill Creek flooding	Floodplain Protection	Structural	Aberdeen		7	22
58	137	Frye Creek flooding	Floodplain Protection	Structural	Aberdeen		7	22
59	138	Sea Level Rise Problem	Floodplain Protection	Structural	Aberdeen		7	22
60	141	Chehalis Basin Project	Plan Coordination and Implementation	Structural	Aberdeen		7	22

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
61	144	Install four three-sided structures in the northerly approach to the Sickman-Ford bridge	Floodplain Protection	Structural	Oakville		2	22
62	29	Remap high groundwater areas	Planning and Data Collection	Non-structural	Thurston County	Local	1,4	23
63	32	Augment Chehalis Tribe Flood Plan with 2-, 5-, and 10-year recurrence interval maps	Planning and Data Collection	Non-structural	Chehalis Reservation	Remove (completed)	1,4	23
64	35	Berwick Creek Drainage Plan	Planning and Data Collection	Non-structural	Chehalis and Lewis County	Local (probably to be done by DOT)	1,4,11	23
65	36	China Creek Drainage Plan	Planning and Data Collection	Non-structural	Lewis County and Centralia	Local / Twin Cities Project	1,4,11	23
66	37	Rochester Stormwater Plan	Planning and Data Collection	Non-structural	Rochester	Local	1,4	23
67	46	Study of fill adjacent to Harris Creek to determine if it should be removed	Planning and Data Collection	Non-structural	Harris Creek, Chehalis Reservation	? (Local)	1,4	23
68	47	Independence Road Bank Realignment Feasibility Study	Planning and Data Collection	Non-structural	Thurston County	Local	1,4	23
69	48	Skookumchuck River scour potential study	Planning and Data Collection	Non-structural	Skookumchuck River	Twin Cities project	1,4	23
70	50	Construct a 2-D flow model	Planning and Data Collection	Non-structural	Chehalis Reservation specifically and basin-wide	Remove	1,4	23
71	51	Model effects of removing/modifying the Sickman-Ford Bridge Approach	Planning and Data Collection	Non-structural	Sickman-Ford Bridge	Local with regional support	1,4	23
72	67	Improve flood notification and response program	Emergency Response and Preparedness	Non-structural	Bucoda	Remove	1,4	23
73	70	Manage Skookumchuck dam for flood control		Non-structural	Skookumchuck dam	Twin Cities project	1,4	23

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
74	78	Lincoln Creek floodplain purchase	Reduction of Damage to Existing Structures	Non-structural	Lincoln Creek Road area in Lewis County	Local	1,4	23
75	92	Lower-basin Hydraulic Model	Planning and Data Collection	Non-structural	Upper-basin		4	23
76	102	Develop evacuation plans for communities and residents situated downstream from the Nisqually and Skookumchuck River Dams.	Hazard Damage Reduction	Non-structural	Thurston County		6	23
77	103	Draft a prioritized list of road segments and bridges that should be elevated above the 100-year floodplain and culverts that will fail under flood flow. Upgrade these structures if state or federal monies become available.	Hazard Damage Reduction	Non-structural	Thurston County		6	23
78	104	Develop a southeast flood detour plan for the Thurston County Comprehensive Emergency Management Plan	Plan Coordination and Implementation	Non-structural	Thurston County		6	23
79	105	Remap the floodplains for all rivers, streams, and high groundwater areas and update the Flood Insurance Rate Maps (FIRMs)	Data Collection and Mapping	Non-structural	Thurston County		6	23
80	106	Acquire MIKE 11, a three-dimensional hydrological modeling software package and AQUARIUS, a USGS standard stream flow modeling software package.	Data Collection and Mapping	Non-structural	Thurston County		6	23
81	107	Develop mapping products to achieve all flood maps and data sets so they can be reused at a later date.	Data Collection and Mapping	Non-structural	Thurston County		6	23
82	108	Map the channel migration zones for all rivers in the region and the extent of high quality riparian habitat.	Data Collection and Mapping	Non-structural	Thurston County		6	23

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
83	109	Undertake a study of repetitive public cost losses, this would include residential structures, but also include properties such as livestock, out-buildings and rescue costs not already identified by FEMA	Hazard Damage Reduction	Non-structural	Thurston County		6	23
84	110	Revise shoreline regulations to encourage 'shoreline protective structures' to be "bioengineered".	Development Regulations	Non-structural	Thurston County		6	23
85	111	Reevaluate land uses and zoning based upon new floodplain maps.	Development Regulations	Non-structural	Thurston County		6	23
86	112	Work with others to determine the width and conditions of buffers along river and stream shorelines	Development Regulations	Non-structural	Thurston County		6	23
87	113	Draft a Comprehensive Plan policy which encourages the creation and use of wetland mitigation bank.	Development Regulations	Non-structural	Thurston County		6	23
88	114	Prepare new drainage basin in priority areas such as Salmon and Yelm Creeks	Data Collection and Mapping	Non-structural	Thurston County		6	23
89	121	Implement Comprehensive Emergency Management Plan		Non-structural			3	23
90	155	Develop a community-wide flood hazard educational outreach program	Education and Public Information	Non-structural	Chehalis Tribe		2	23
91	194	Update Hazards Data Sets/Maps, Identify Data Gaps and Collect Missing Data Sets	Planning and Data Collection	Non-structural	Lewis County		11	23
92	195	Public Assistance	Planning and Data Collection	Non-structural	Lewis County		11	23
93	196	Headwaters Warning and Flood Alleviation	Planning and Data Collection	Non-structural	Lewis County		11	23
94	1	Salzer Creek backwater control	Floodplain Protection	Structural	On Salzer Creek in Lewis County	Local / Twin Cities Project	1,4,5,11	23

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
95	3	Overtopping levee on the north end of town	Floodplain Protection	Structural	Bucoda	Local / Twin Cities Project	1,4	23
96	4	Twin culverts under Main Street at 11 th	Floodplain Protection	Structural	Bucoda	Local	1,4	23
97	5	Relief culvert for north side runoff	Floodplain Protection	Structural	Oakville	?	1,4	23
98	6	Harris Creek fish enhancement	Floodplain Protection	Structural	Oakville	In progress (Remove from list)	1,4	23
99	7	Sickman-Ford Bridge culvert	Floodplain Protection	Structural	Oakville	Remove	1,4	23
100	11	Adna levee improvement	Floodplain Protection	Structural	Adna	Local with regional support	1,4	23
101	14	Tilley Road culvert replacement	Floodplain Protection	Structural	Thurston County	Local	1,4	23
102	19	Streambank stabilization	Bank Protection	Structural	Bucoda	Remove	1,4	23
103	21	Independence Road bank protection	Bank Protection	Structural	Thurston County	Remove (completed)	1,4	23
104	76	Regrade Main Street	Reduction of Damage to Existing Structures	Structural	Bucoda	Local	1,4	23
105	77	Raise elevation of Moon Road/East 188 th Roadway	Reduction of Damage to Existing Structures	Structural	Thurston County	Local	1,4	23
106	97	Regional Transportation Flood Alleviation Project Along I-5 in Lewis County	Floodplain Protection	Structural	Lewis County and Centralia		5,11	23
107	99	Regional Stormwater Detention Facilities	Stormwater	Structural	Lewis County and Centralia		5,11	23
108	100	USACE Centralia Flood Reduction Project	Floodplain Protection	Structural	Lewis County and Centralia		5	23

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
109	101	Port of Centralia/City of Centralia Partnership Project	Floodplain Protection/Fish and Wildlife Habitat Enhancement	Structural	Chehalis River		5	23
110	158	Complete storm and surface water utility projects at Meridian Heights, Mallard Pond Phase 2, and Evergreen Terrace (scheduled 2009)	Floodplain Protection	Structural	Thurston County		2	23
111	178	Bank regrade, low bench, and riparian revegetation in lower 10 miles of Newaukum River, South Fork Chehalis and mainstem at River Mile 66-80 ?	Restoration and Enhancement	Structural			8	23
112	179	SR 6 Oxbow Restoration	Restoration and Enhancement	Structural			8	23
113	180	Horseshoe Lake Oxbow Restoration	Restoration and Enhancement	Structural			8	23
114	181	Pheasant Farm Fords Prairie Restoration	Restoration and Enhancement	Structural			8	23
115	182	Salzer Creek from Mouth to Fairgrounds Restoration	Restoration and Enhancement	Structural			8	23
116	183	Sewage Treatment Plant near Dillenbaugh Creek demolition	Restoration and Enhancement	Structural			8	23
117	184	Newaukum Valley Golf Course enhancements	Restoration and Enhancement	Structural			8	23
118	185	North Fork Newaukum riparian and floodplain restoration	Restoration and Enhancement	Structural			8	23
119	186	Skookumchuck River upstream of river mile 10 wetlands, side channels, and floodplain restoration	Restoration and Enhancement	Structural			8	23
120	187	Mainstem Chehalis downstream of Ground Mound Enhancement	Restoration and Enhancement	Structural			8	23

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
121	190	Enhance the existing Airport Dike	Floodplain Protection	Structural	City of Chehalis		10	23
122	191	Realign Dillenbaugh Creek	Floodplain Protection - mitigation for Twin Cities project	Structural	City of Chehalis		10	23
123	192	Scheuber Road Bypass	Floodplain Protection - mitigation for Twin Cities project	Structural	City of Chehalis		10	23
124	193	Elevate Main Street	Floodplain Protection	Structural	City of Chehalis		10	23
125	119	Remove push-up level downstream of Sickman-Ford Bridge		Structural			3	23
126	120	Install floodplain roughening along left bank of Chehalis River downstream of Sickman-Ford Bridge		Structural			3	23
127	122	Acquire facilities and equipment		Structural			3	23
128	142	Add gauge just below the Wynoochee Dam	Emergency Response and Preparedness	Structural	Grays Harbor County		2	23
129	143	Consider adding rain gauges	Emergency Response and Preparedness	Structural	Grays Harbor County		2	23
130	25	Floodplain conservation easement program	Regulatory Programs	Non-structural	Basin-wide	Local / Regional	1,4	22-23
131	26	Improve floodplain regulations	Regulatory Programs	Non-structural	Basin-wide	Local / Regional	1,4	22-23
132	27	Tax breaks for removing structures from floodplain	Regulatory Programs	Non-structural	Basin-wide	Remove	1,4	22-23

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133	28	Penalization for building in the floodplain	Regulatory Programs	Non-structural	Basin-wide	Remove	1,4	22-23
134	30	Channel migration zone mapping	Planning and Data Collection	Non-structural	Basin-wide	Local / Regional	1,4,11	22-23
135	31	Channel migration analysis	Planning and Data Collection	Non-structural	City of Chehalis to Grays Harbor County	Remove	1,4	22-23
136	33	Survey of river cross-sections	Planning and Data Collection	Non-structural	Basin-wide	Local / Regional (may be done by Corps or FEMA)	1,4	22-23
137	34	Remap floodplains	Planning and Data Collection	Non-structural	Basin-wide	Local / Regional (Being done by FEMA)	1,4	22-23
138	38	Reevaluate land uses and zoning based on new mapping	Planning and Data Collection	Non-structural	Basin-wide	Local	1,4	22-23
139	39	Study of woody debris in conjunction with flooding	Planning and Data Collection	Non-structural	Basin-wide	Local / Regional	1,4	22-23
140	40	Study of aggregates	Planning and Data Collection	Non-structural	Basin-wide	Local / Regional	1,4	22-23
141	41	Evaluate sediment management	Planning and Data Collection	Non-structural	Basin-wide	Local / Regional	1,4	22-23
142	42	Study of failed riprap	Planning and Data Collection	Non-structural	Basin-wide	Remove	1,4	22-23
143	43	Conduct studies needed to design proposed mitigation strategies	Planning and Data Collection	Non-structural	Basin-wide	Local / Regional	1,4	22-23
144	44	Investigate conditions near Wickett levee	Planning and Data Collection	Non-structural	Chehalis Reservation	Remove (completed)	1,4	22-23
145	45	Determine cause of water backup over Highway 6	Planning and Data Collection	Non-structural	Highway 6	State / DOT	1,4	22-23

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
146	49	Hydraulic model	Planning and Data Collection	Non-structural	Basin-wide	Regional (may be done by Corps of Engineers or FEMA)	1,4	22-23
147	53	Monitoring program on channel conditions	Planning and Data Collection	Non-structural	Basin-wide	Remove	1,4	22-23
148	54	Study of impact of recent development of trucking and warehouse facilities	Planning and Data Collection	Non-structural	Basin-wide	Remove	1,4	22-23
149	55	Evaluate how groundwater impacts flooding events	Planning and Data Collection	Non-structural	Basin-wide	Regional (in progress by USGS and Partnership)	1,4	22-23
150	56	Riparian habitat inventory	Planning and Data Collection	Non-structural	Basin-wide	Partnership	1,4	22-23
151	57	Develop a floodplain property acquisition program	Planning and Data Collection	Non-structural	Basin-wide	Local / Regional	1,4	22-23
152	58	Provide educational materials on flood hazard management	Education and Public Information	Non-structural	Basin-wide	Local	1,3,4	22-23
153	59	Provide flood proofing guidance to residents	Education and Public Information	Non-structural	Basin-wide	Local	1,4,9	22-23
154	60	Establish a Regional Flood Awareness Week	Education and Public Information	Non-structural	Basin-wide	Regional	1,4	22-23
155	61	Form a flood district	Governance and Management	Non-structural	Basin-wide	Local / Regional	1,4	22-23
156	62	Evaluate opportunities for flood warning systems	Emergency Response and Preparedness	Non-structural	Basin-wide	In progress	1,3,4	22-23

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
157	68	Develop and maintain a specific flood warning program	Emergency Response and Preparedness	Non-structural	Basin-wide	Local	1,4	22-23
158	72	Address loss of power and cell phone coverage	Emergency Response and Preparedness	Non-structural	Basin-wide	Local	1,4	22-23
159	91	Seamless LiDAR	Planning and Data Collection	Non-structural	Chehalis mainstem and major tributaries		4	22-23
160	93	Ecosystem Services	Planning and Data Collection	Non-structural	Basin-wide		4	22-23
161	95	Coordinated Study (data on the Twin Cities Project)	Planning and Data Collection	Non-structural	Basin-wide		4	22-23
162	96	Early Warning Program	Emergency Response and Preparedness	Non-structural	Basin-wide		4	22-23
163	146	Evaluate river channel responses to influx and deposition of sediment in vicinity of the Chehalis Reservation	Data Collection and Mapping	Non-structural	Chehalis Tribe		2	22-23
164	147	Conduct a study to determine volume, placement, and potential impacts of flood on failed riprap placed by Thurston County on the Chehalis River bank adjacent to Independence Road	Data Collection and Mapping	Non-structural	Chehalis Tribe		2	22-23
165	148	Identify and conduct studies that would need to be accomplished in order to design the proposed mitigation strategies (such as raising Moon Road)	Data Collection and Mapping	Non-structural	Chehalis Tribe		2	22-23
166	149	Coordinate with the Flood Authority to develop a dynamic model of the middle basin to assess effects of future basin development on the flood hydrology at the Chehalis Reservation.	Data Collection and Mapping	Non-structural	Chehalis Tribe		2	22-23

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167	150	Study the surface water and runoff impact of recent large trucking and warehouse facilities built in the Basin.	Data Collection and Mapping	Non-structural	Public Comment		2	22-23
168	151	Study groundwater/surface water interaction	Data Collection and Mapping	Non-structural	Grays Harbor - will submit form		2	22-23
169	152	Study impacts and feasibility of upstream storage on flood elevations and summer low flows.	Data Collection and Mapping	Non-structural	Lewis County PUD		2	22-23
170	153	A decision support tool for watershed planning	Data Collection and Mapping	Non-structural		Chehalis River Basin	2	22-23
171	154	Provide on-going public education regarding best management practice issues, flood hazard mitigation, water quality, stormwater	Education and Public Information	Non-structural	Centralia		2	22-23
172	156	Develop a floodplain conservation easement program	Regulatory Programs	Non-structural	Grays Harbor		2	22-23
173	157	Improve floodplain and stormwater regulations	Regulatory Programs	Non-structural	Centralia		2	22-23
174	159	Develop a technical assistance program for bank stabilization and/or debris removal	Bank Protection	Non-structural	Lewis County		2	22-23
175	2	Increased stormwater on-site detention and retention	Floodplain Protection	Structural	Basin-wide	Local	1,4	22-23
176	15	Bank stabilization / Biostabilization	Bank Protection	Structural	Basin-wide	Local or basin-wide	1,4	22-23
177	16	Debris removal after a flood		Structural	Basin-wide	Local or basin-wide	1,4	22-23
178	17	Biostabilization (bank stabilization with riparian vegetation)	Bank Protection	Structural	Basin-wide	Remove	1,4	22-23
179	73	Establish critter pads to reduce livestock loss	Emergency Response and Preparedness	Structural	Basin-wide	Local / agencies	1,4	22-23

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
180	74	Join the NFIP Community Rating System	Reduction of Damage to Existing Structures	Structural	Basin-wide	Local	1,4	22-23
181	80	Protect and restore critical areas	Natural Resource Protection	Structural	Basin-wide	Local / Regional	1,4	22-23
182	81	Provide habitat for wildlife and fish	Natural Resource Protection	Structural	Basin-wide	Partnership	1,4	22-23
183	83	Encourage longer rotations between tree cutting in forests	Natural Resource Protection	Structural	Basin-wide	Remove	1,4	22-23
184	84	Encourage improvement of forest management practices	Natural Resource Protection	Structural	Basin-wide	State / DNR / Ecology / Regional	1,4	22-23
185	85	Levees	Floodplain Protection	Structural	Basin-wide	Regional	1	22-23
186	86	Major water retention (dams)	Floodplain Protection	Structural	Basin-wide	Regional	1	22-23
187	87	Minor water retention	Floodplain Protection	Structural	Basin-wide	Regional	1	22-23
188	88	Off-Channel Storage (conservation easements)	Floodplain Protection	Structural	Basin-wide	Regional	1	22-23
189	89	Beneficial sediment management (dredging)	Conveyance Capacity	Structural	Basin-wide	Regional	1	22-23
190	94	Lewis County PUD Upstream Storage Phase 2 Studies	Floodplain Protection	Structural	Basin-wide		4	22-23
191	98	Regional Flood Detention Facilities	Floodplain Protection	Structural	Basin-wide		5,11	22-23
192	160	Establish reforested corridors along river and stream shorelines, working with landowners and others	Natural Resource Protection	Structural	Thurston County		2	22-23

Ver 2.	Ver 1.	Project	Project Type	Structural / Non-Structural	Location	Funding	Source	WRIA
193	161	Replace the existing culvert at Harris Creek under State Street with a three-sided structure	Floodplain Protection	Structural	Oakville		2	22-23
194	123	Evaluate or demolish homes subject to flood inundation		Structural			3	22-23
195	12	Wastewater outfall protection	Floodplain Protection	Structural	Basin-wide	? (Local)	1,4	23-24
196	75	Develop a home elevation and buyout program	Reduction of Damage to Existing Structures	Structural	Basin-wide	Local / Regional	1,4	23-24