WELCOME

May 17, 2022

Chehalis Basin LAND Alternatives Values Planning Workshop

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May 17, 2022

Chehalis Basin LAND Alternatives Values Planning Workshop

VALUES PLANNING WORKSHOP

MAY 17, 2022

DEPARTMENT OF ECOLOGY
State of Washington
OFFICE OF CHEHALIS BASIN

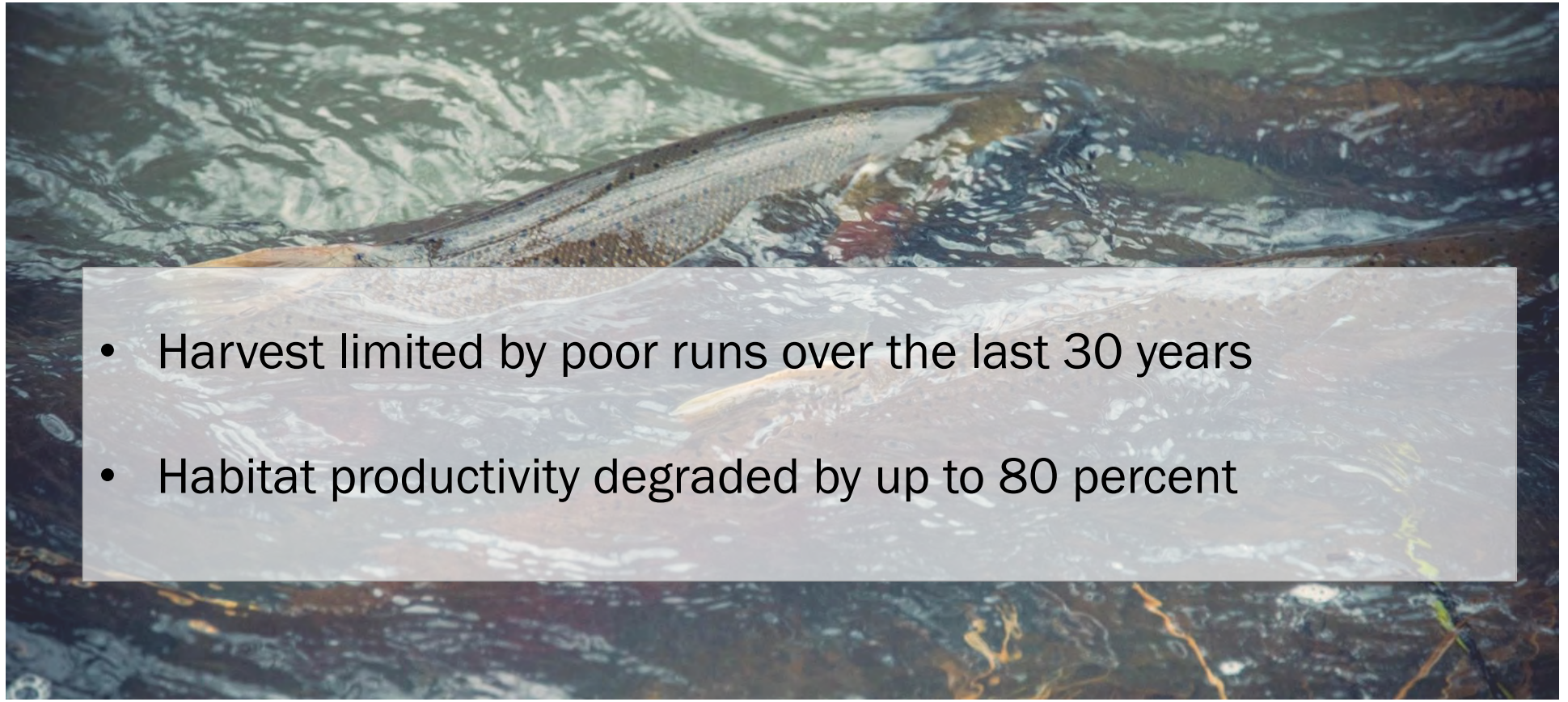
ABOUT THE BASIN

Distinct communities and vast landscapes

An Abundant River Basin...

… With Extreme Flooding

Aquatic Species are Struggling



- Harvest limited by poor runs over the last 30 years
- Habitat productivity degraded by up to 80 percent

HISTORY OF FLOOD DAMAGE

History of Flood Damage

March 1910


December 1933

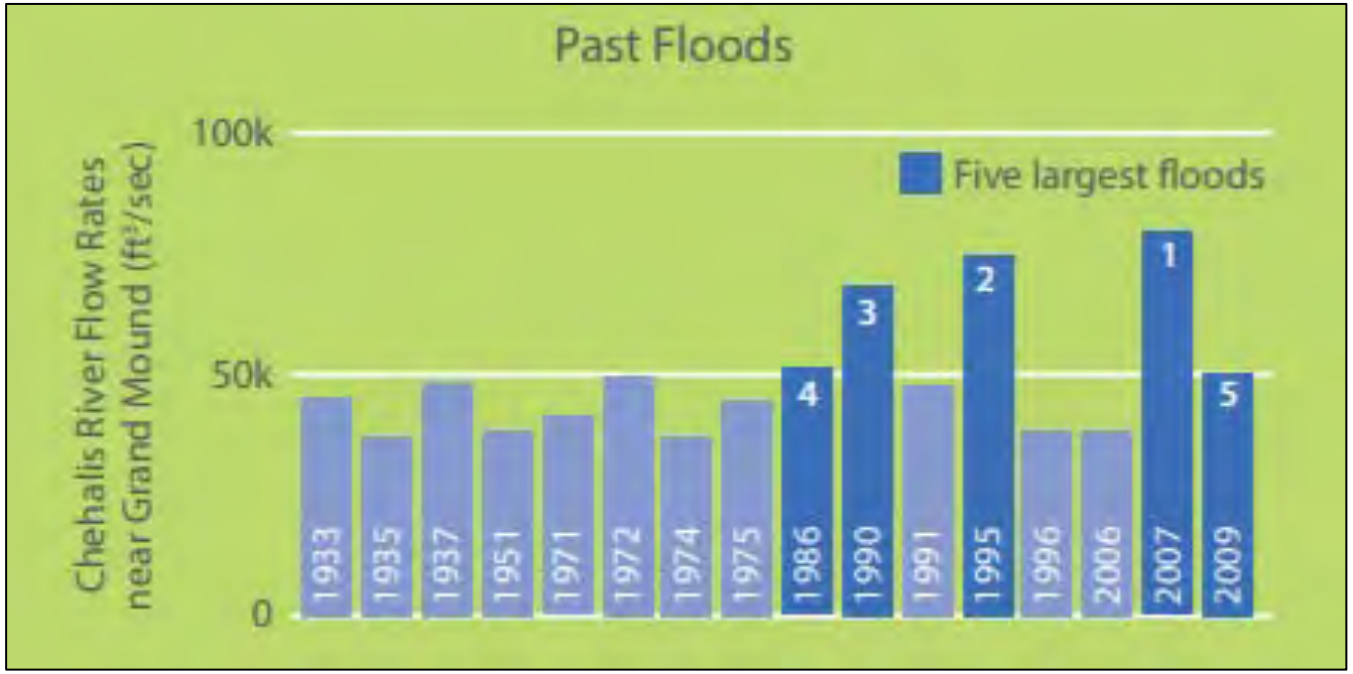

January 1974


November 1990

HISTORY OF FLOODING IN THE BASIN

5 largest floods in the history of the Basin occurred in the last 30 years

- 2007, 1995, 1990, 1986, 20 09
- 2007 and 2009 floods occurred only 13 months apart
- 14 federally declared disasters in the Basin from flooding since 1971
- I-5 closed in 1990, 1996, 2007, 2009



Impacts to transportation – 2007 flood

Exit 77 (I-5) in Chehalis
STEVE RINGMAN / SEATTLE TIMES

Washed out roadway and bridge near the Chehalis River
MIKE SALSBURY / THE CHRONICLE

Blocked road in West Lewis County
ROLLINGBAY WORKS PHOTO

Impacts to communities – 2007 flood

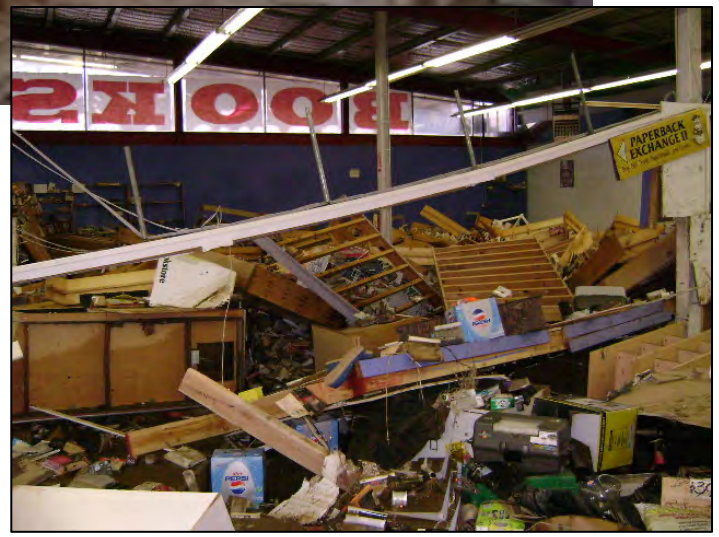
Boistfort Valley
MIKE SALSBURY / THE CHRONICLE

City of Centralia
STEVE RINGMAN / SEATTLE TIMES

Chehalis Centralia Airport
ROLLINGBAY WORKS PHOTO

Impacts to HOMES AND BUSINESSES – 2007

LEWIS COUNTY, EMERGENCY MANAGEMENT DIVISION



Sunbirds, post 2007 flood
RON STURZA

Rooftop of home in Adna destroyed by flood waters
ROLLINGBAY WORKS PHOTO

Chehalis Tribe End of the Trail gas station
UNKNOWN

Impacts to Farms and Farmers – 2007 FLOOD

HOW WE GOT HERE

Brief history of Chehalis basin strategy

Governor Gregoire talks with Kathy Roberts of Curtis
UNKNOWN

Chehalis Basin Flood Hazard Mitigation Alternatives Report

December 19, 2012

Black River
ROLLINGBAY WORKS PHOTO

CHEHALIS BASIN STRATEGY

Governor's Chehalis Basin Work Group

2014 Recommendation Report

Final November 25, 2014

CHEHALIS BASIN STRATEGY

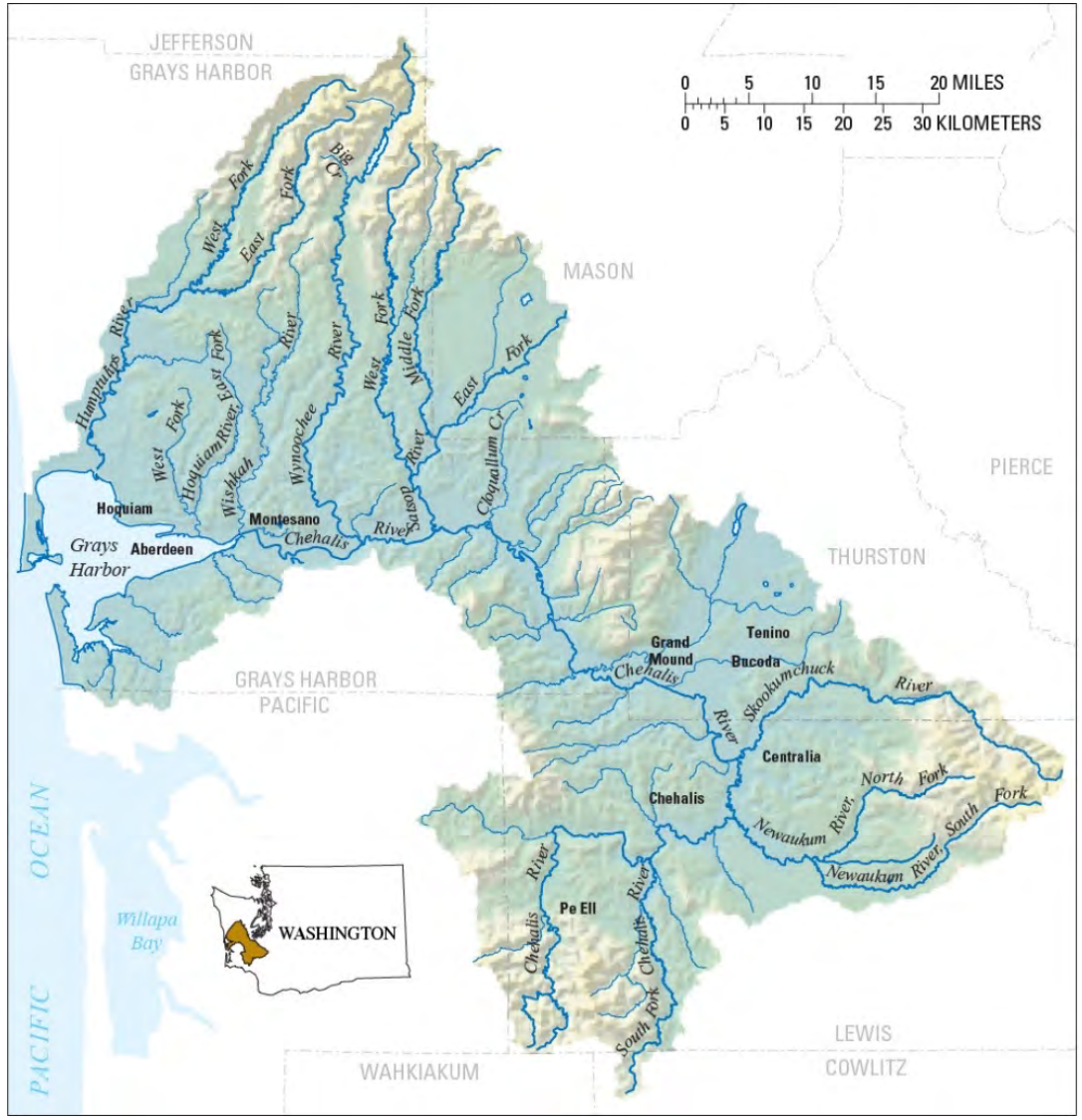
Office of Chehalis Basin

OFFICE OF CHEHALIS BASIN
DEPARTMENT OF ECOLOGY
State of Washington

Office of Chehalis Basin mission:

To aggressively pursue an integrated strategy and funding for:

- Long-term flood damage reduction
- Aquatic species habitat restoration



CHEHALIS BASIN STRATEGY

Chehalis Basin Board

Appointed by Flood Authority:

- Vickie Raines, GHC Commissioner
- Edna Fund, former LC Commissioner
- Jay Gordon, Dairy Farmer

Appointed by Governor:

- J Vander Stoep
- Steve Malloch

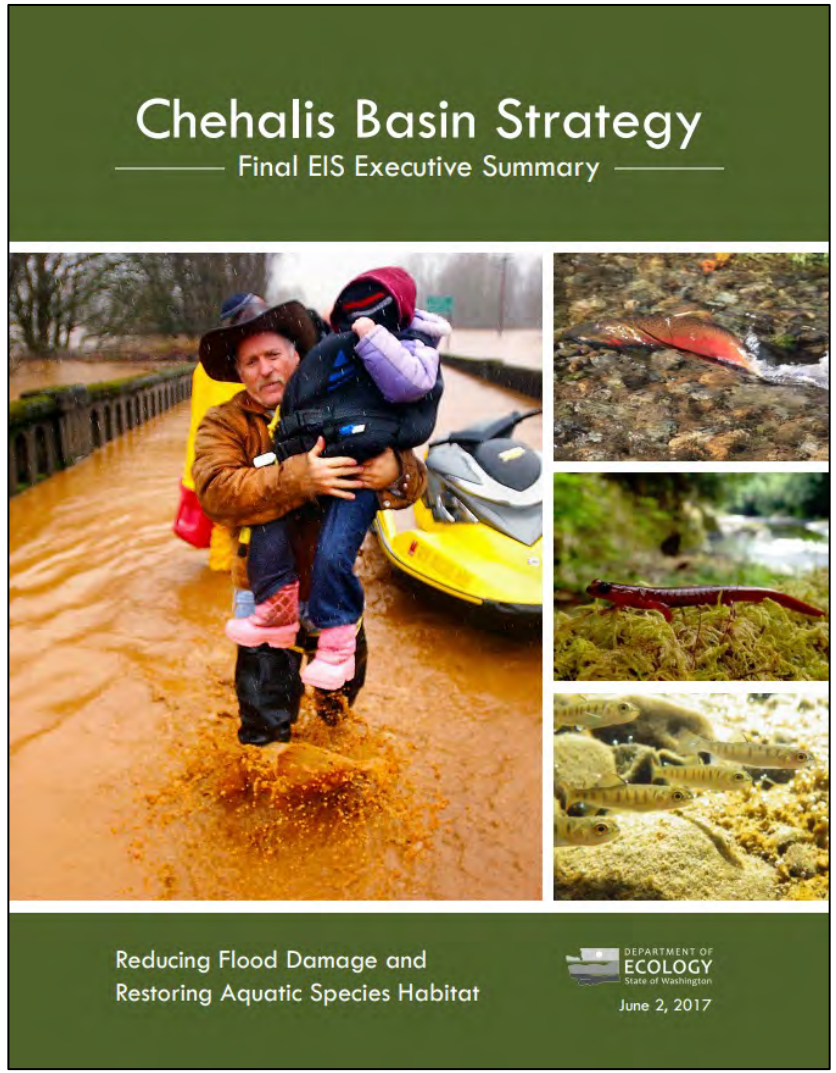
Appointed by Tribes:

- Harry Pickernell, Chehalis Tribe
- Tyson Johnston, Quinault Indian Nation

Programmatic EIS (2017)

Purpose:

Evaluate potential actions and alternatives for long term, basin-wide flood damage reduction and aquatic species habitat restoration.



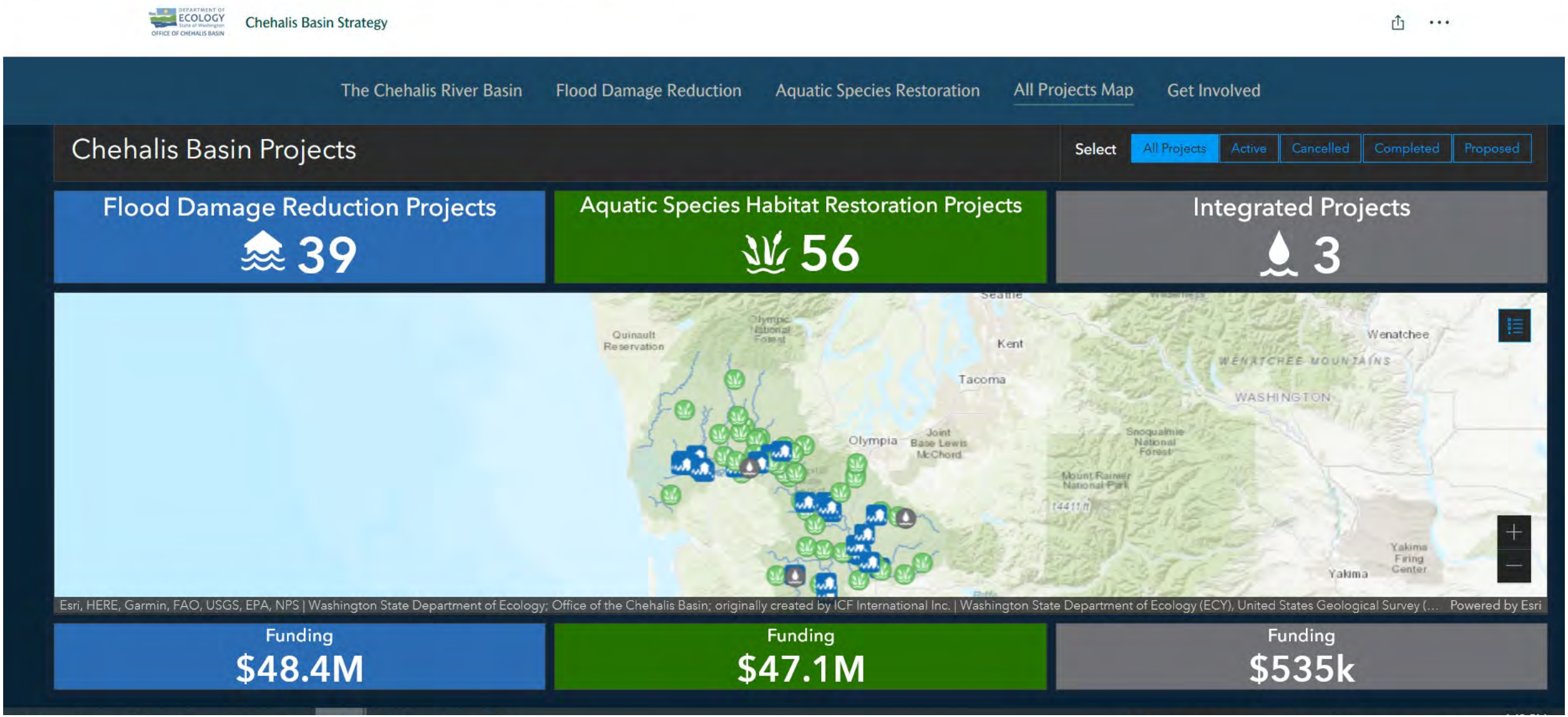
Comprehensive Suite of Actions Needed

There is **no single, simple solution** to meet the dual goals of improving aquatic species habitat and reducing damage from major flooding disasters.

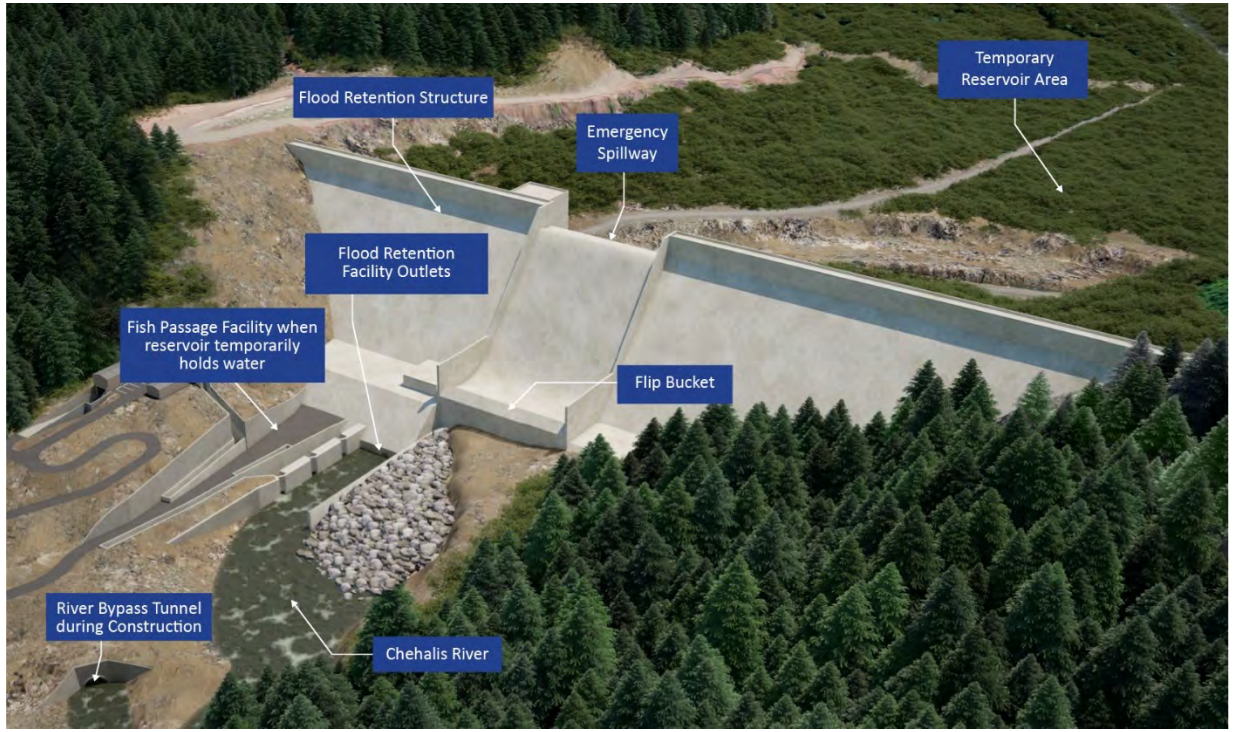
The Chehalis Basin Strategy must employ **multiple reinforcing actions** to meet the needs of our communities and the natural environment.

CHEHALIS BASIN STRATEGY

Accomplishments So Far



"develop and evaluate a basin-wide, non-dam alternative"



JAY INSLEE
Governor

STATE OF WASHINGTON
Office of the Governor

July 22, 2020

Dear Members of the Chehalis Basin Board:

I value the important work that you do to advance consensus-based, win-win solutions for flooding and fish in the Chehalis Basin. The complex challenges facing our communities require science, collaboration, and innovative thinking to forge lasting solutions.

Recent work evaluating a proposed large-scale flood retention project in the upper Chehalis River has brought additional and significant questions and concerns about impacts and alternatives. In light of these concerns, I am requesting that the board work together to:

- Define a process and timeline for developing and evaluating a basin-wide non-dam alternative to reducing flood damage.
- Continue evaluating the issues raised regarding the retention project and other flood risk reduction projects and the potential to avoid, minimize, and mitigate the identified impacts.
- Deliver a consensus recommendation on the process back to me no later than the end of **September 2020** that will lead to a long-term strategy for consideration by me and the legislature in the first quarter of 2021.

Since the Board's recommendations will have implications for the State Environmental Policy Act (SEPA) process currently under way, I have requested that Ecology pause the Environmental Impact Statement (EIS) process through at least the end of the year. I am also directing Ecology to use available funding within the Office of Chehalis Basin budget to assist the Board in its development of a non-dam alternative.

Climate change poses a significant risk to aquatic species and increased flood damage in the basin, and I believe that we will need the best scientific evaluation of options to preserve and restore salmon runs and protect the basin's human communities. Time is of the essence as climate change is already impacting the basin.

I look forward to hearing back from you soon. If you have questions, please contact my Senior Policy Advisor, Jennifer Hennessey at Jennifer.hennessey@gov.wa.gov. Thank you again for your dedication and hard work.

Very truly yours,

Jay Inslee
Governor

CC: Laura Watson, Director, Department of Ecology

P.O. Box 40002 • Olympia, Washington 98504-0002 • (360) 902-4111 • www.governor.wa.gov

CHEHALIS BASIN STRATEGY

Local Actions Non-Dam (LAND) ALTERNATIVE

Board directed creation of LAND Steering Group to:

- **Build on previous efforts** and
- **Recommend an alternative approach** to reducing flood damage that:
  - Does **not** include proposed flood retention facility/airport levee project, and
  - Best achieves the Board's desired outcomes

CHEHALIS BASIN STRATEGY

LAND Steering Group

Glen Connelly,
Chehalis Tribe

Todd Chaput,
Economic Alliance of
Lewis County

Norm Chapman,
Centralia Planning
Commission

Steve Malloch,
Western Water
Futures LLC

Tyson Johnston, Quinault
Indian Nation

Jess Helsley, Wild
Salmon Center

Dan Maughan,
Maughan Family
Farm of Adna

Brandon Parsons,
American Rivers

Brian Stewart,
Conservation
Northwest

Our Purpose . . .

To bring a consensus recommendation to the Board by fall 2022 identifying the best and most feasible alternative(s) for meeting the board's targeted measurable outcomes without the proposed dam/airport levee project

FIND MORE INFORMATION AT:

CHEHALISBASINSTRATEGY.COM

CHEHALIS BASIN STRATEGY


CHALLENGES AND OPPORTUNITIES | MAY 16 - 18, 2022
Chehalis Basin
LAND*
*LOCAL ACTIONS NON-DAM ALTERNATIVE


CHALLENGES AND OPPORTUNITIES | MAY 16 - 18, 2022
Chehalis Basin
LAND*
*LOCAL ACTIONS NON-DAM ALTERNATIVE
PLANNING PROCESS

OVERVIEW

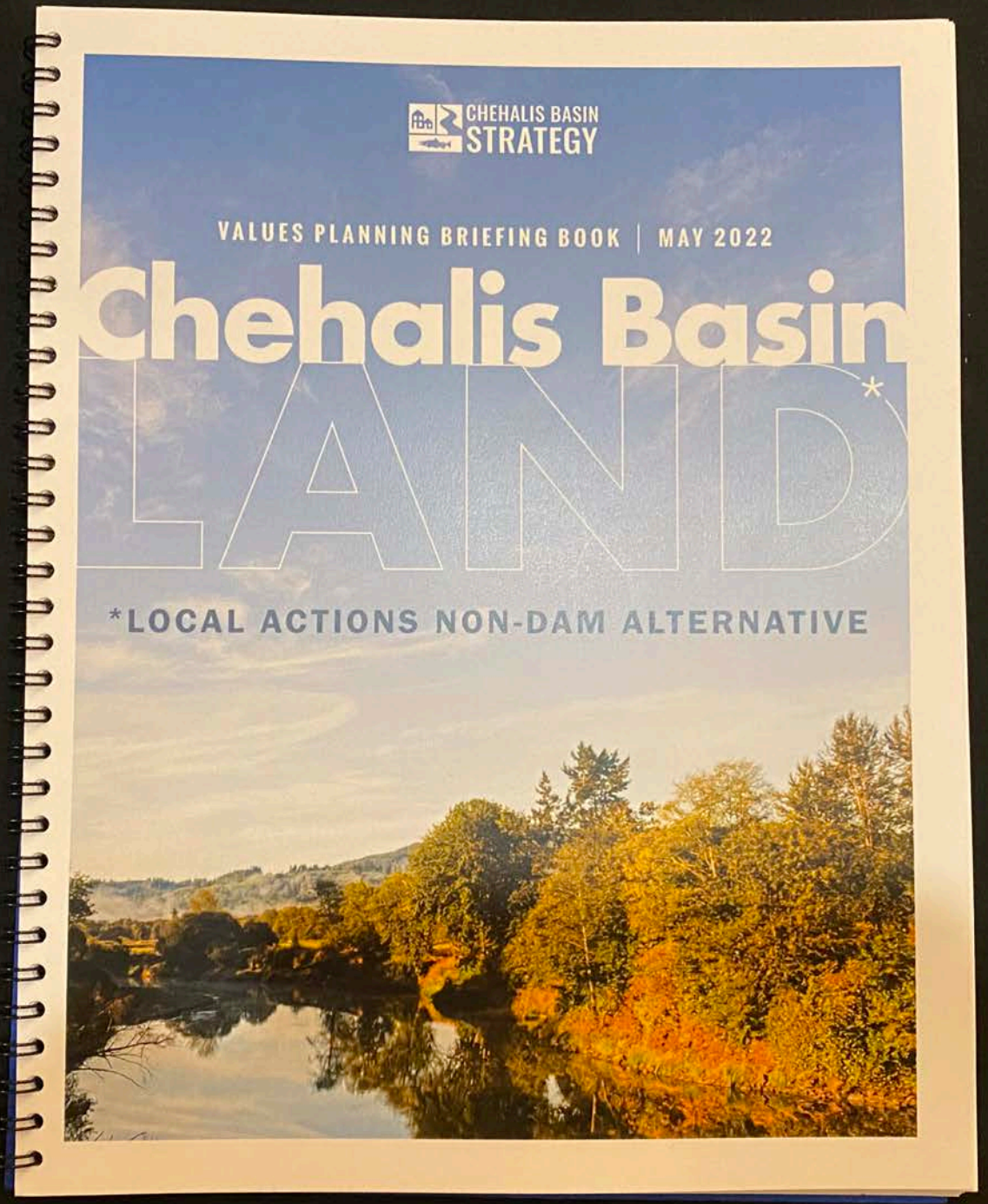
Chehalis Basin LAND

OVERVIEW

- Setting the Context
- Briefing Book Data and Maps
- Case Studies
- Catalog of Potential Solutions

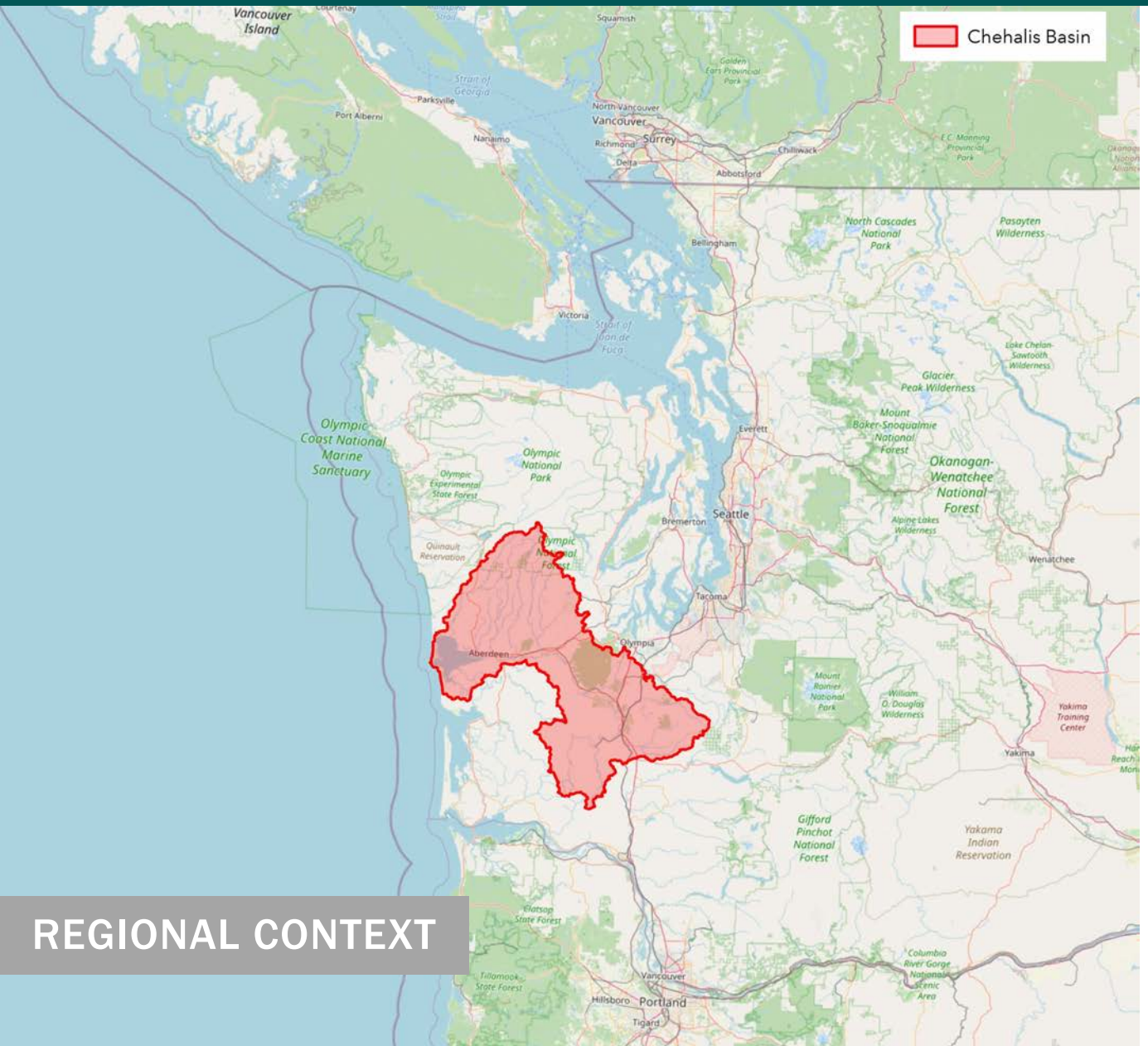
SETTING THE CONTEXT

Chehalis Basin LAND

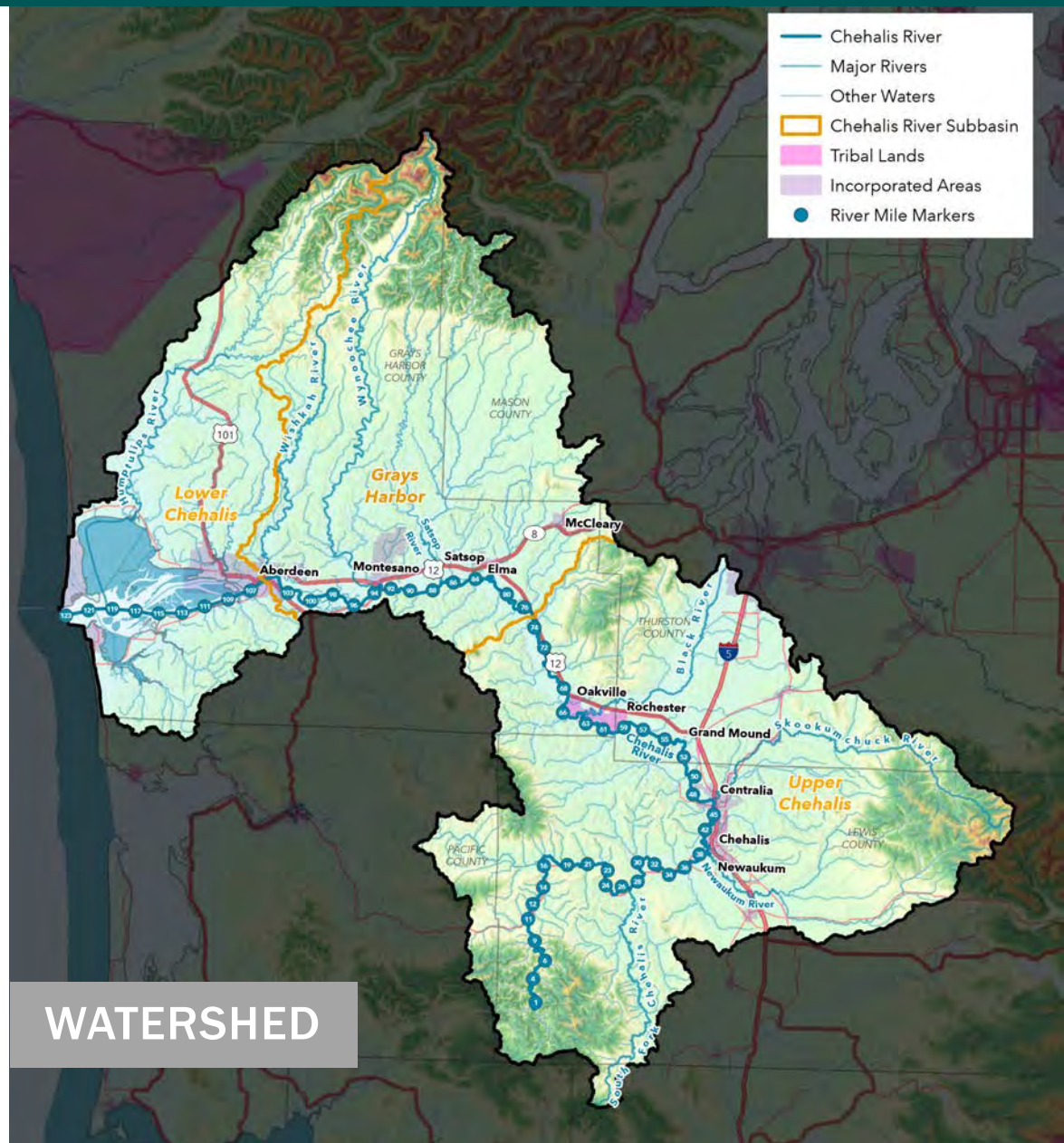


Chehalis Basin LAND

THE CHEHALIS RIVER WATERSHED



REGIONAL CONTEXT



WATERSHED

ADDRESSING THE SEVERE FLOODING . . .

Source: Office of Chehalis Basin

. . . WHICH HAS OCCURRED OVER TIME

Source: Chronicle

SEEKING SOLUTIONS FOR PRESERVING . . .

Source: Chronicle

. . . COMMUNITY, CULTURE, AND WAY OF LIFE . . . NOW!!!

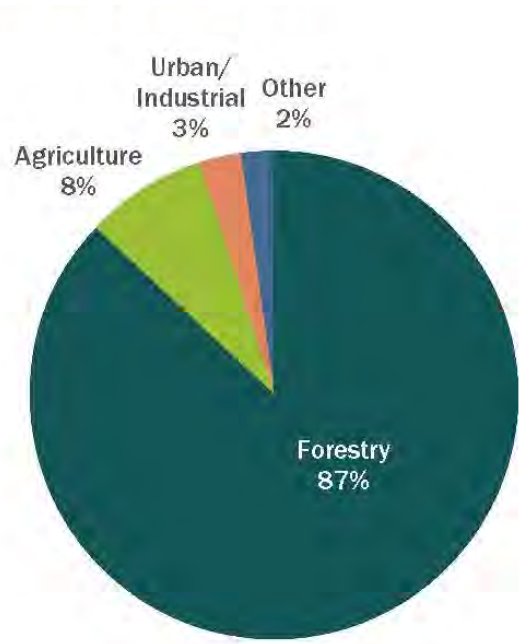
Source: Chronicle

DATA AND MAPS

Chehalis Basin LAND

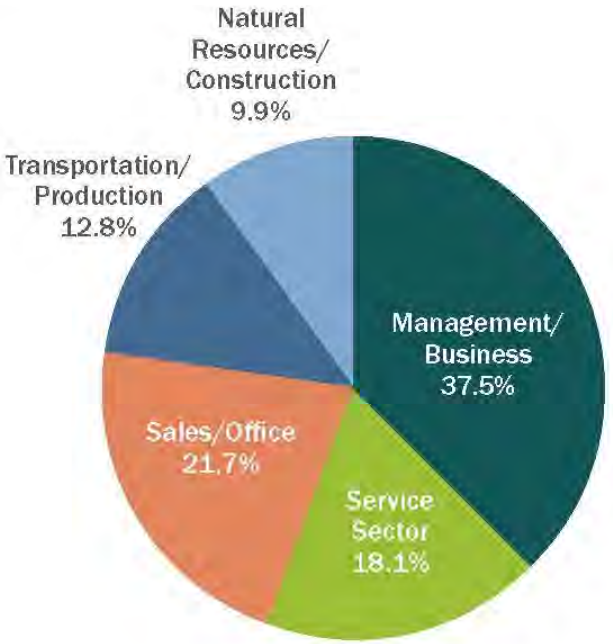
REGIONAL EMPLOYMENT

Percentage of Basin Lands



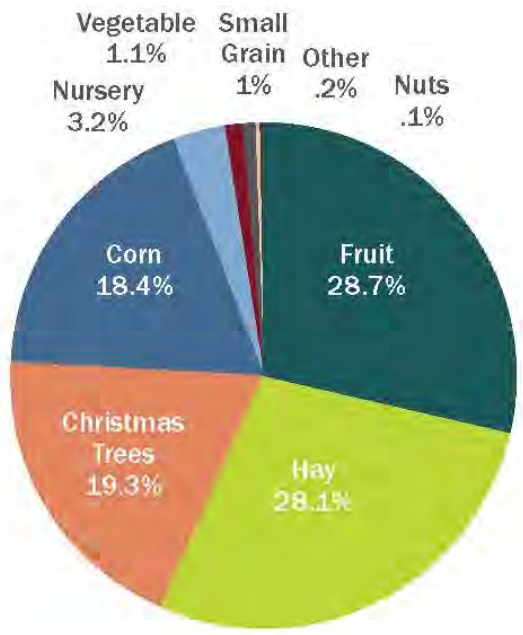
Source: Office of Chehalis Basin

Employed Population in the Basin



Note: Civilian sector, 16 years and older.
Source: Resource Dimensions, 2020 (USCB, 2019c)

Agricultural Crops



Source: Office of Chehalis Basin

A RESOURCE-BASED ECONOMY

Timber Production by County, 2017

	Grays Harbor County	Lewis County	Pacific County	Thurston County
Total Harvested (board feet)	311,600,000	370,977,000	176,167,000	78,510,000
Private/public ownership (volume)	86%/14%	87%/13%	86%/14%	75%/25%

Source: Office of Chehalis Basin

Economic Value Per Fish, 2016 Dollars

Species	Chinook Salmon	Coho Salmon	Chum Salmon	Steelhead
Ocean Commercial	$48	$10	$5	N/A
Ocean Sport	$86	$53	N/A	N/A
Grays Harbor Commercial	$51	$10	N/A	N/A
Grays Harbor Sport	$104	$65	$32	N/A
River Sport	$165	$147	$73	$94
Tribal Commercial	$26	$10	N/A	N/A
Passive Use Value	$2,232	$2,232	$2,232	$2,232

Source: Chehalis Basin Economic Study, 2016

Agriculture Sales by County, 2017

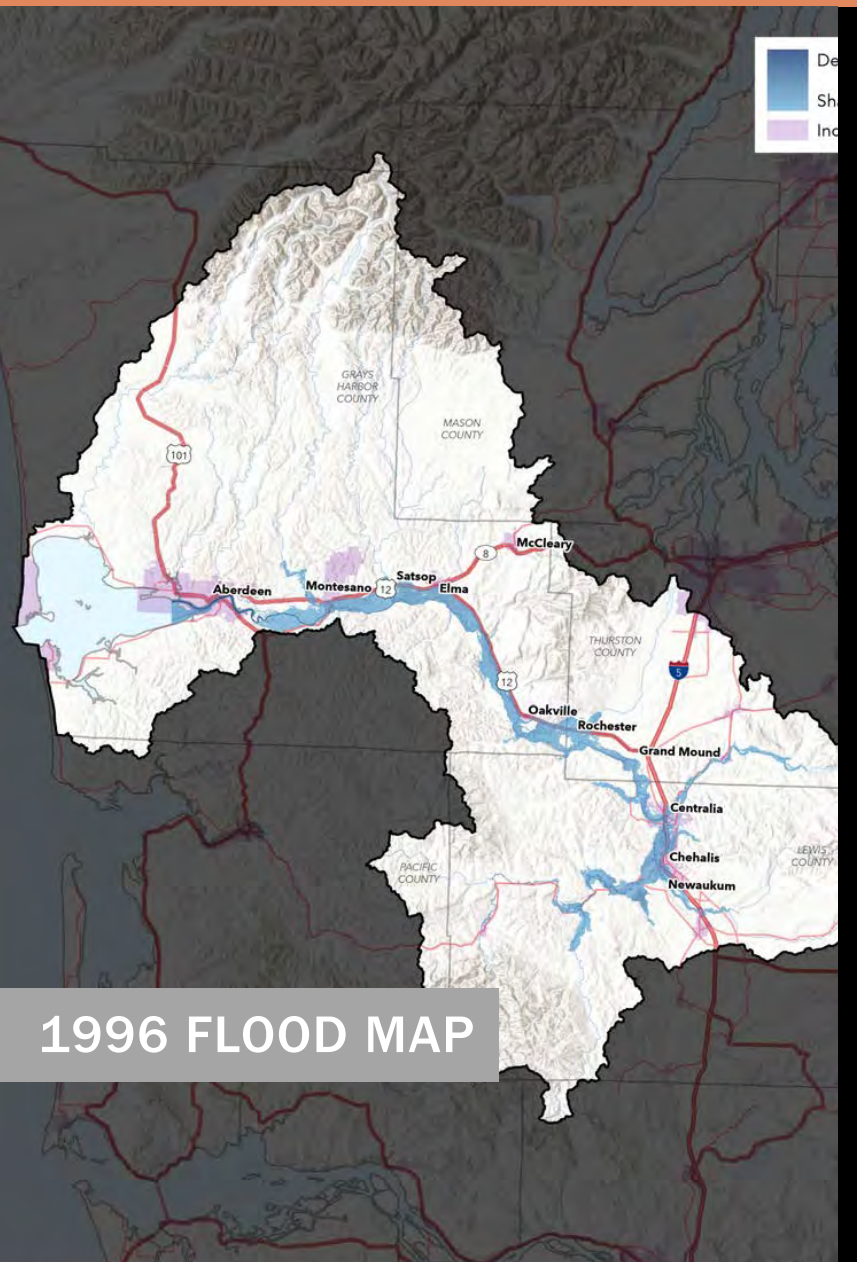
	Grays Harbor	Lewis	Pacific	Thurston
Market Value	$33,598,000	$136,345,000	$38,877,000	$176,090,000
Percent Value Crops/Livestock	52%/48%	26%/74%	19%/81%	32%/68%

Source: US Department of Agriculture

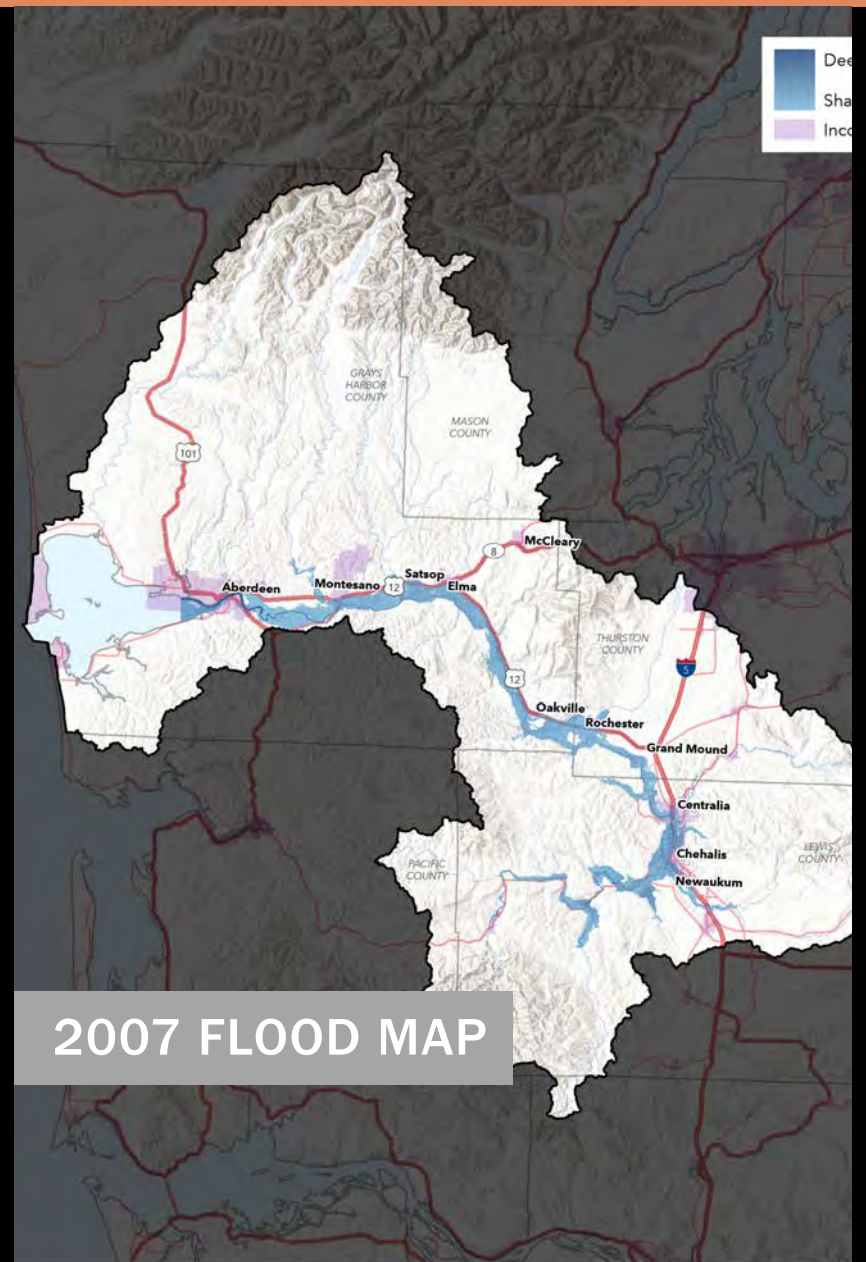
Source: Chronicle

Source: Office of Chehalis Basin

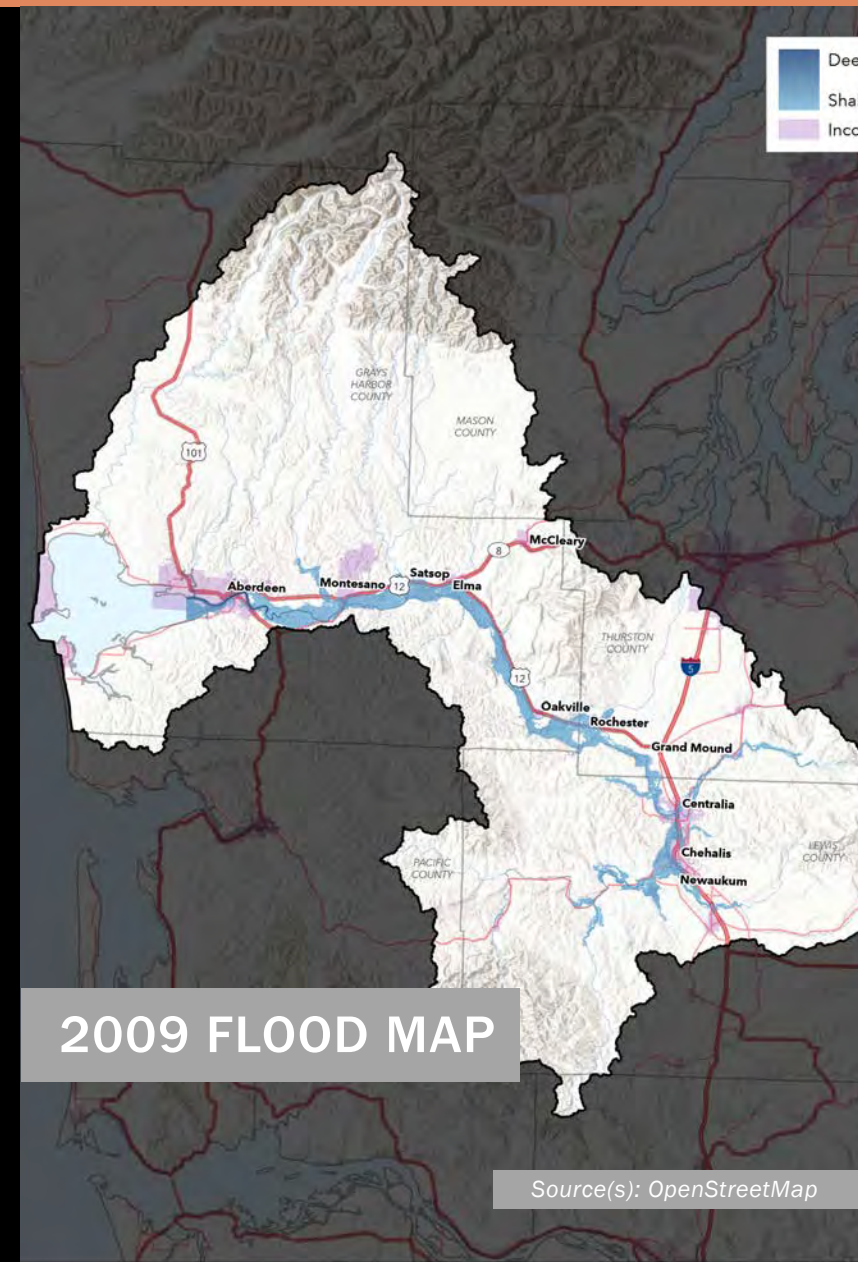
HISTORIC FLOODING



1996 FLOOD MAP



2007 FLOOD MAP



2009 FLOOD MAP

Source(s): OpenStreetMap

OCB FOCUS AREAS: THE UPPER AND LOWER BASINS

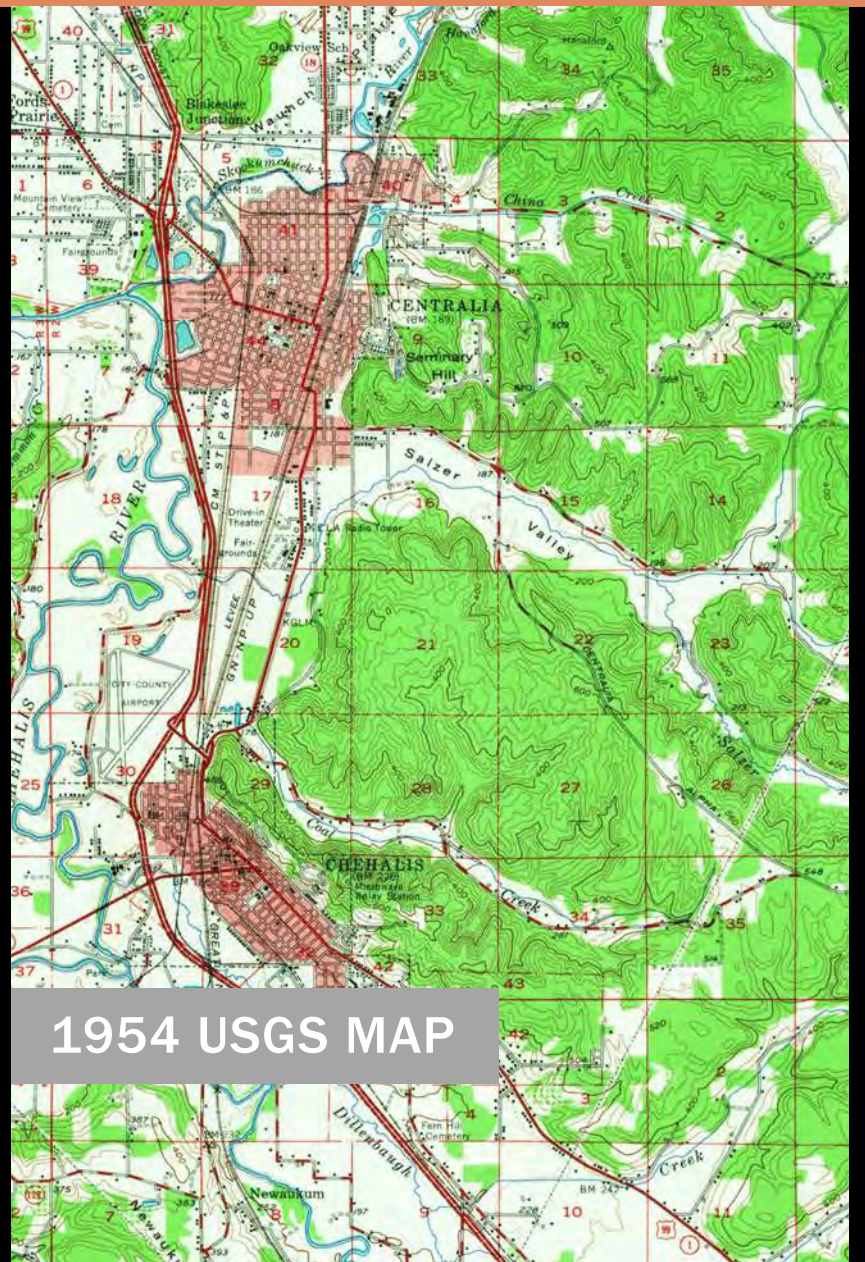
SECONDARY

PRIMARY

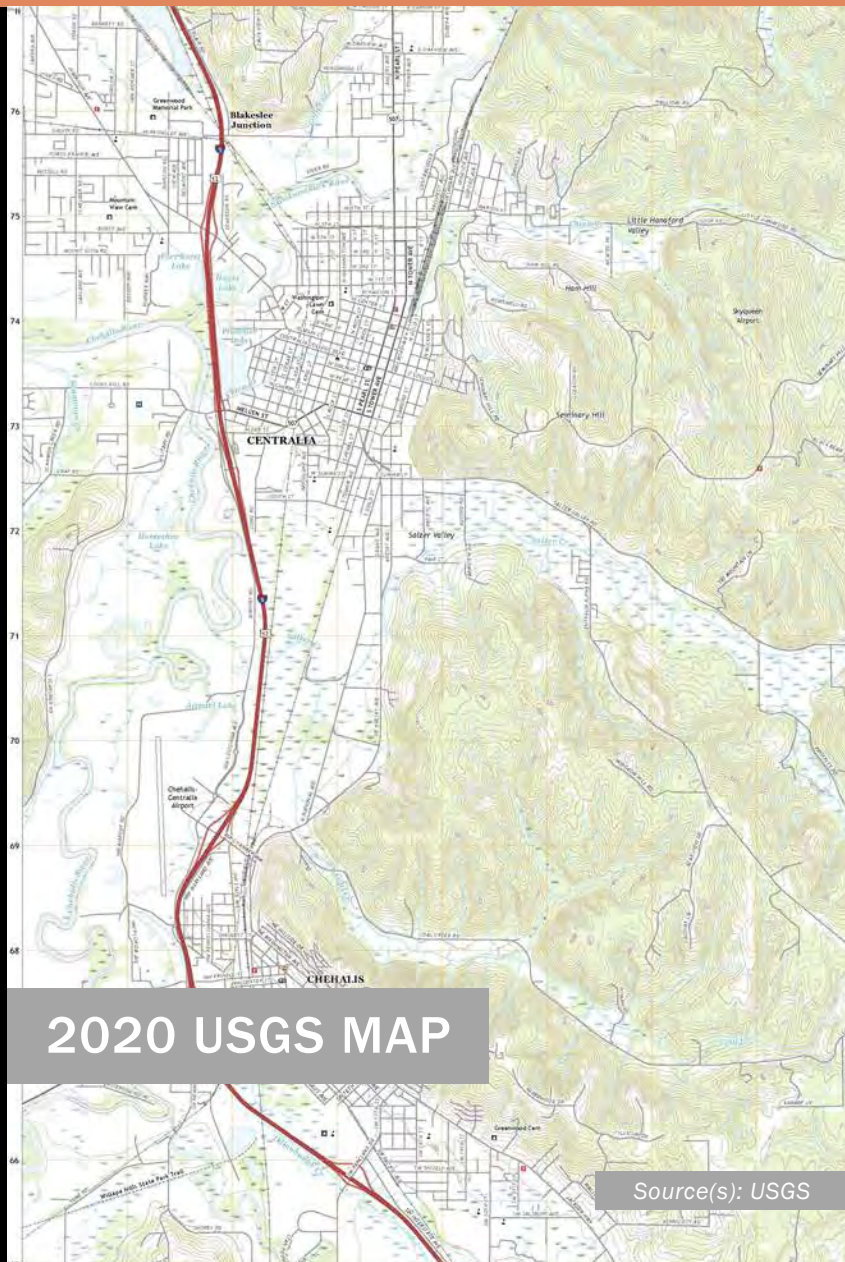
Source(s): OpenStreetMap

HISTORIC DEVELOPMENT PATTERNS

1916 USGS MAP



1954 USGS MAP

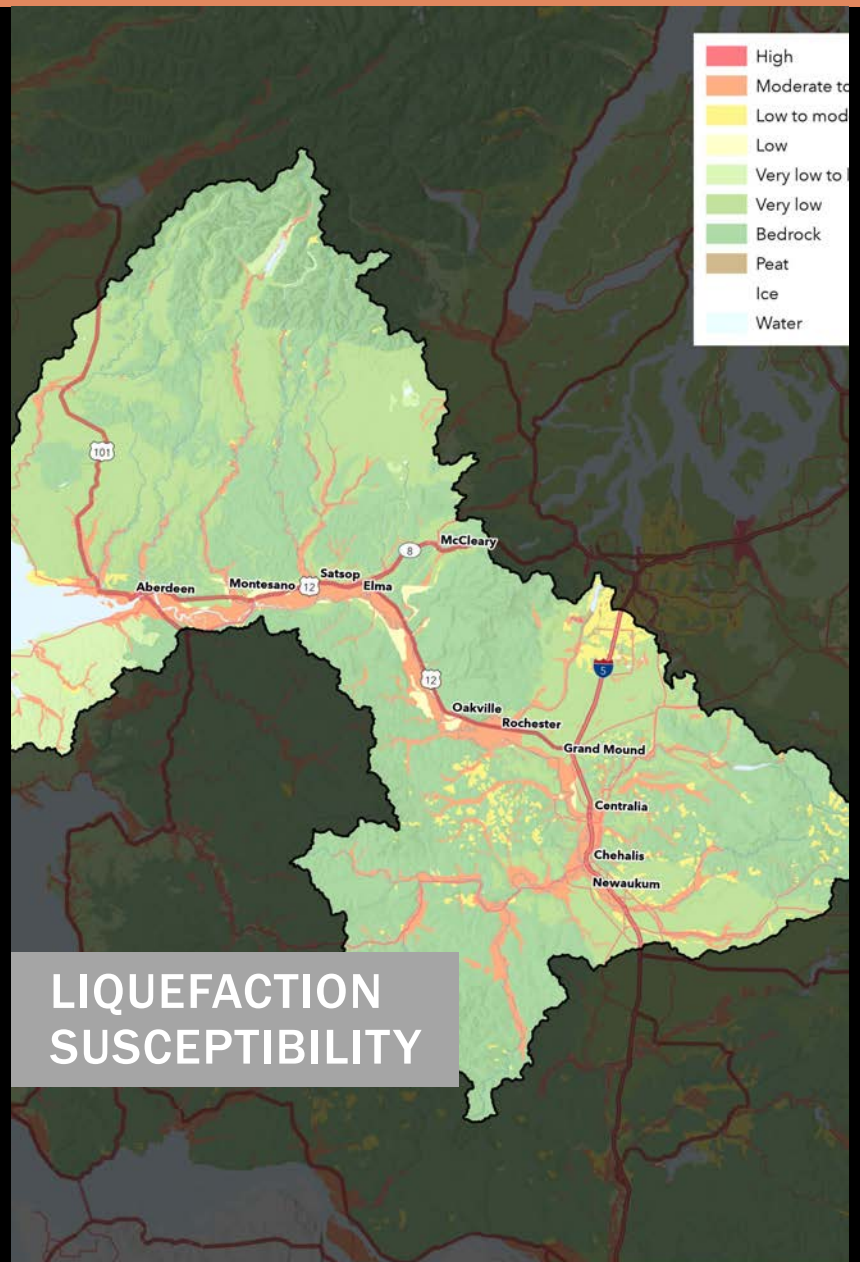


2020 USGS MAP

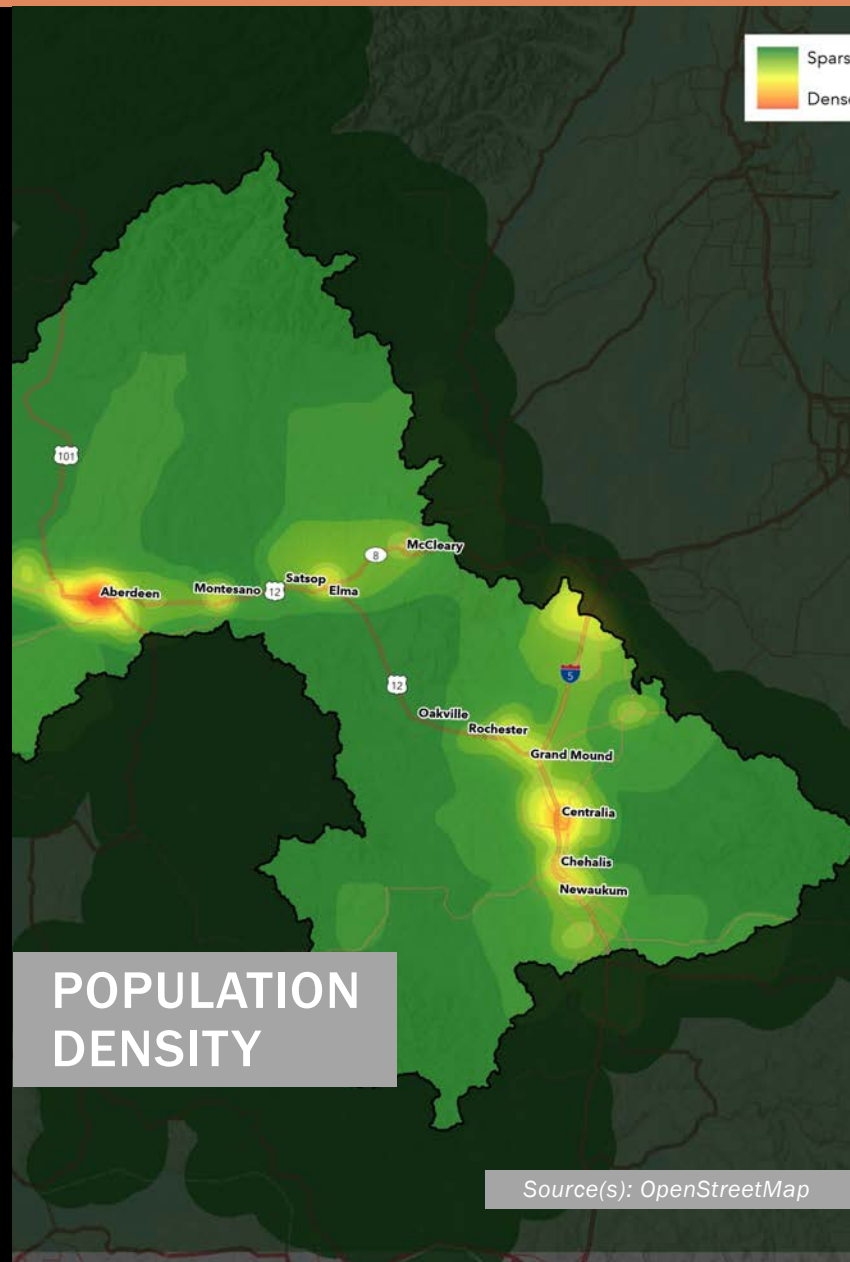
Source(s): USGS

ENVIRONMENTAL FACTORS

LAND COVER



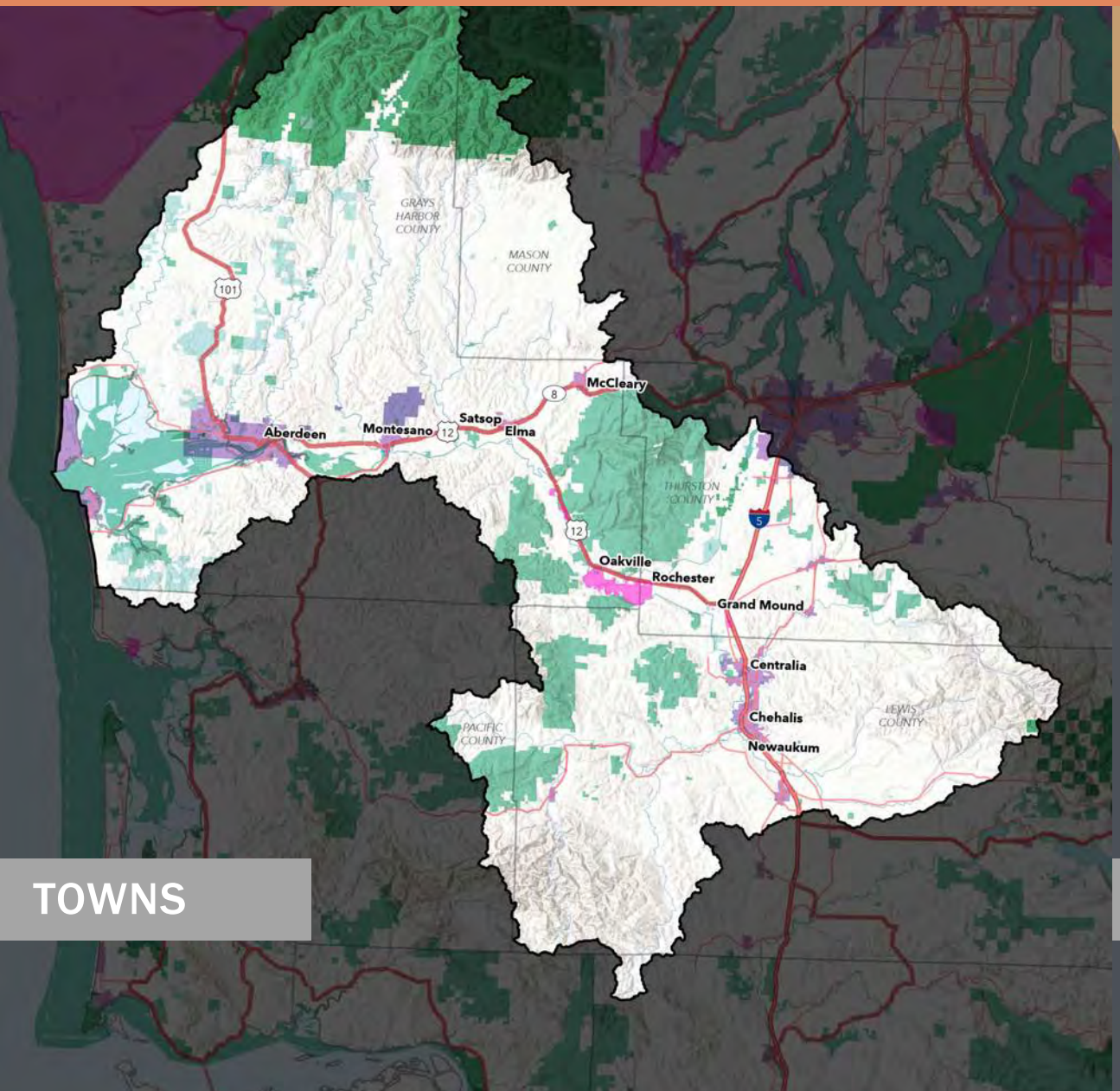
LIQUEFACTION SUSCEPTIBILITY



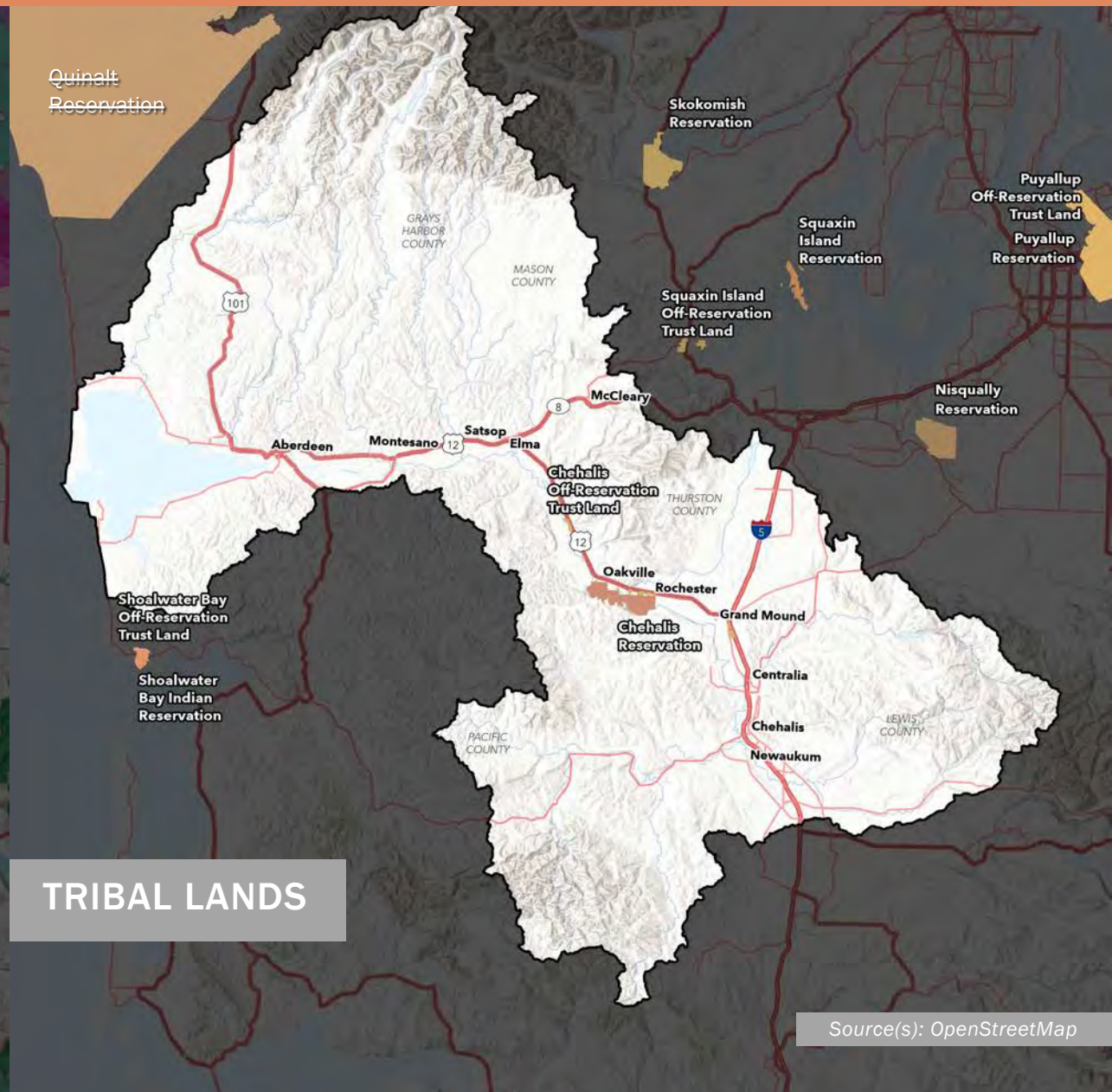
POPULATION DENSITY

Source(s): OpenStreetMap

TOWNS AND TRIBAL LANDS



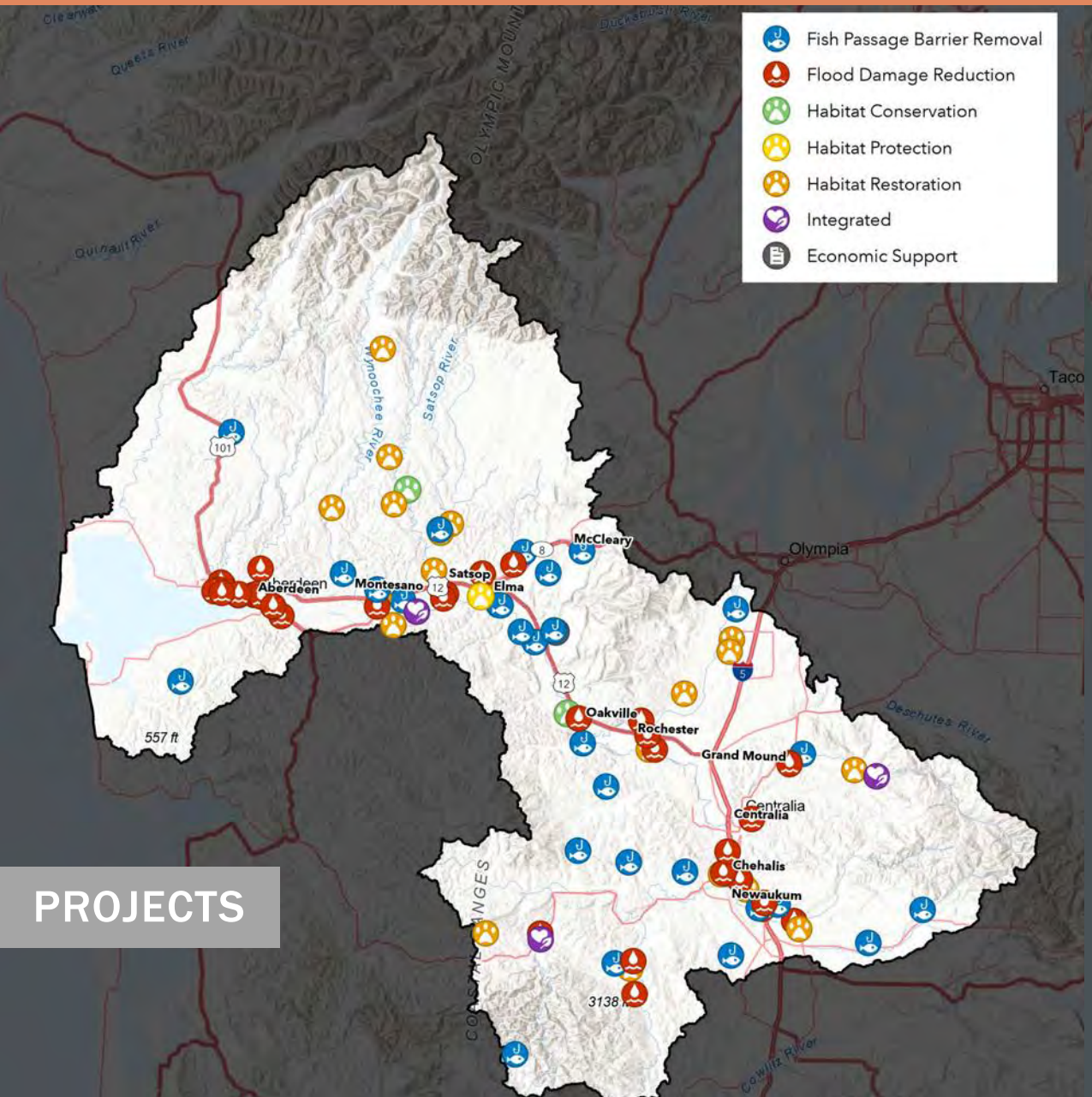
TOWNS



TRIBAL LANDS

Source(s): OpenStreetMap

PROJECTS AND TRAILS

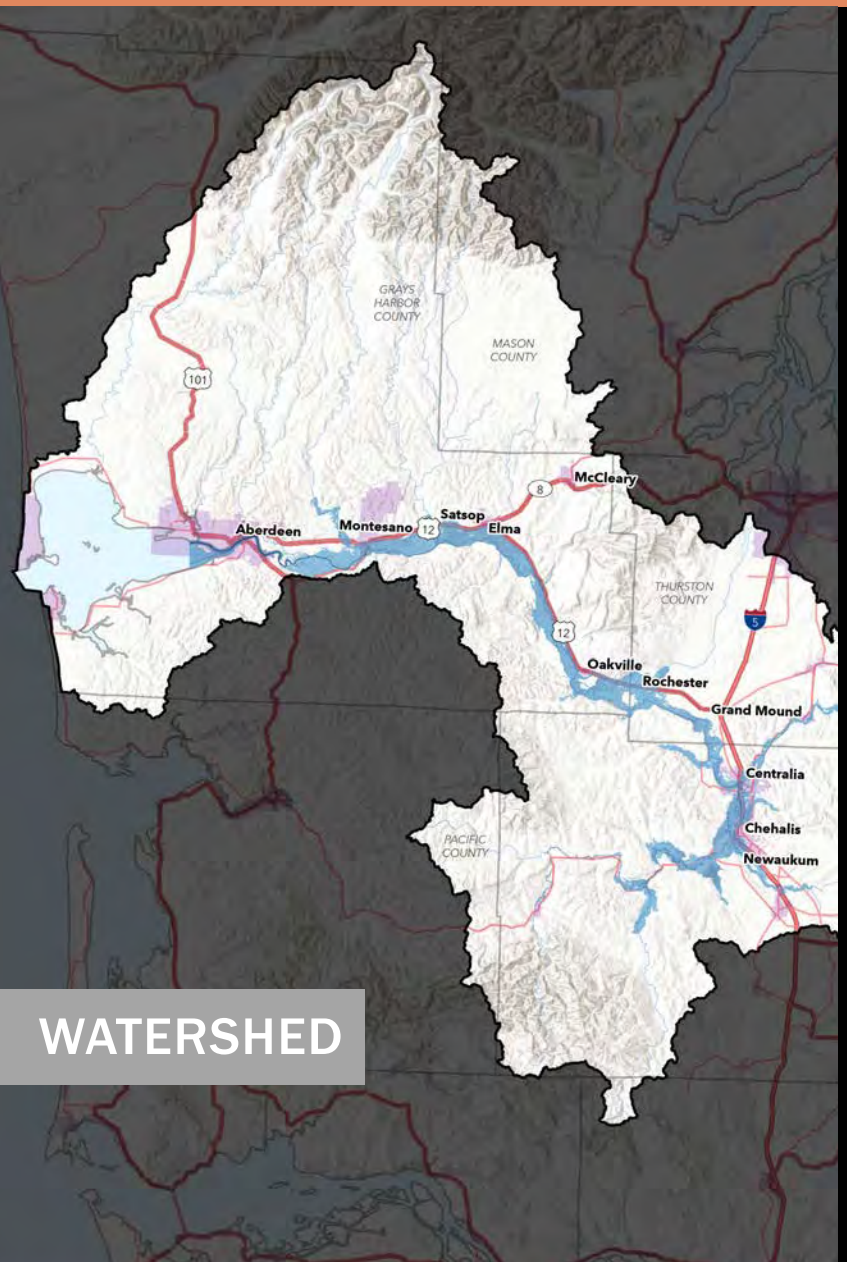


PROJECTS

TRAILS

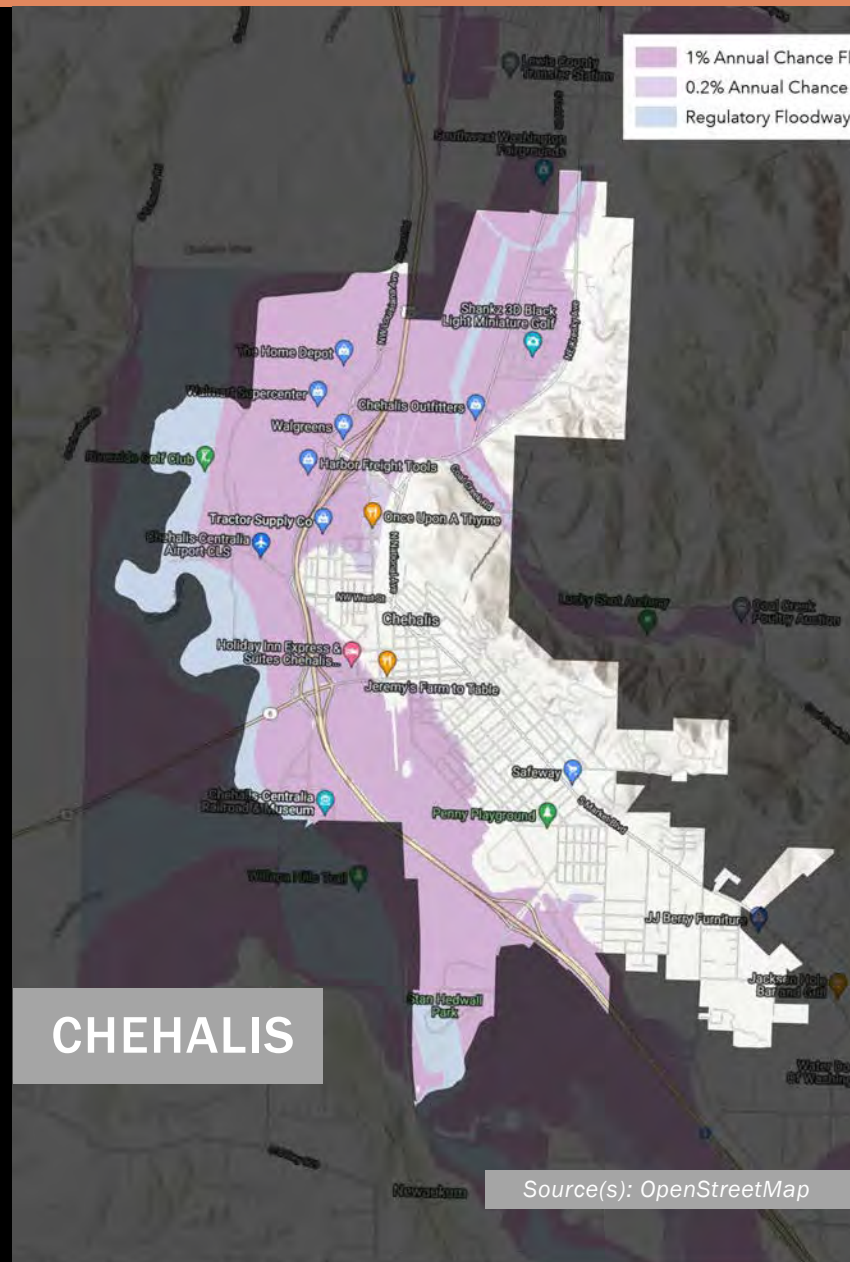
Source(s): OpenStreetMap

FEMA MAPS



WATERSHED

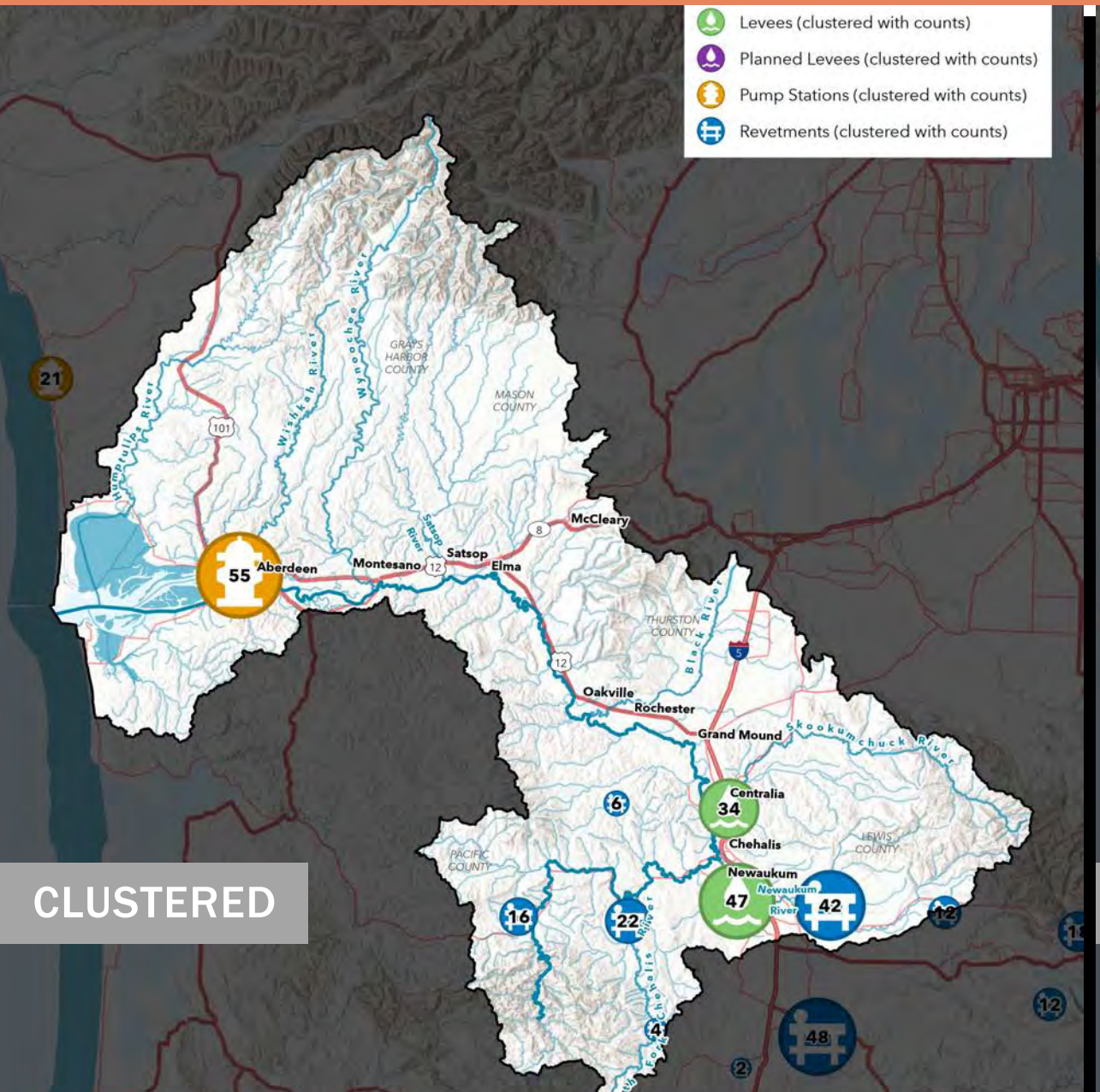
CENTRALIA

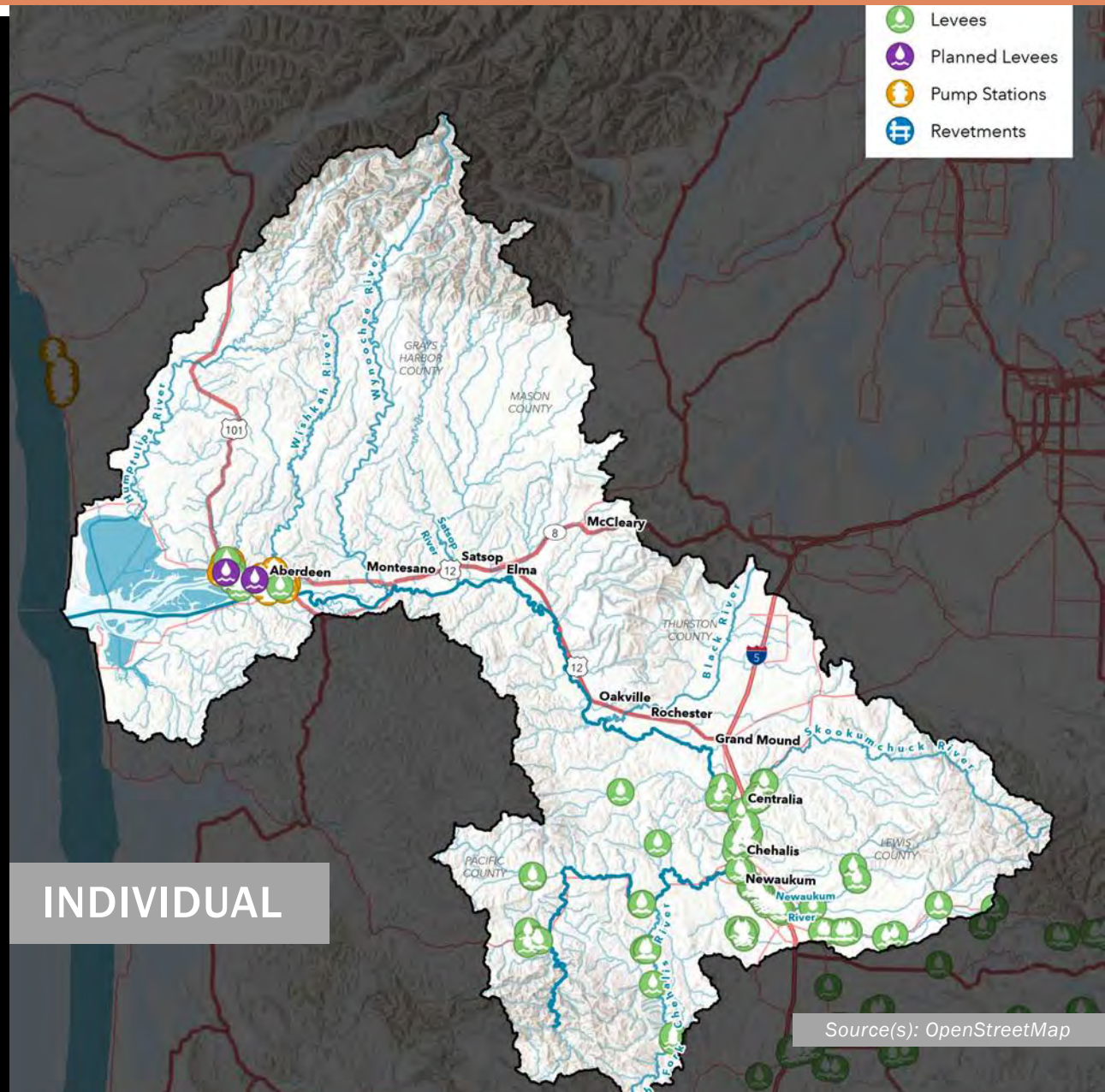


CHEHALIS

Source(s): OpenStreetMap

FLOOD PROTECTION FACILITIES





Source(s): OpenStreetMap

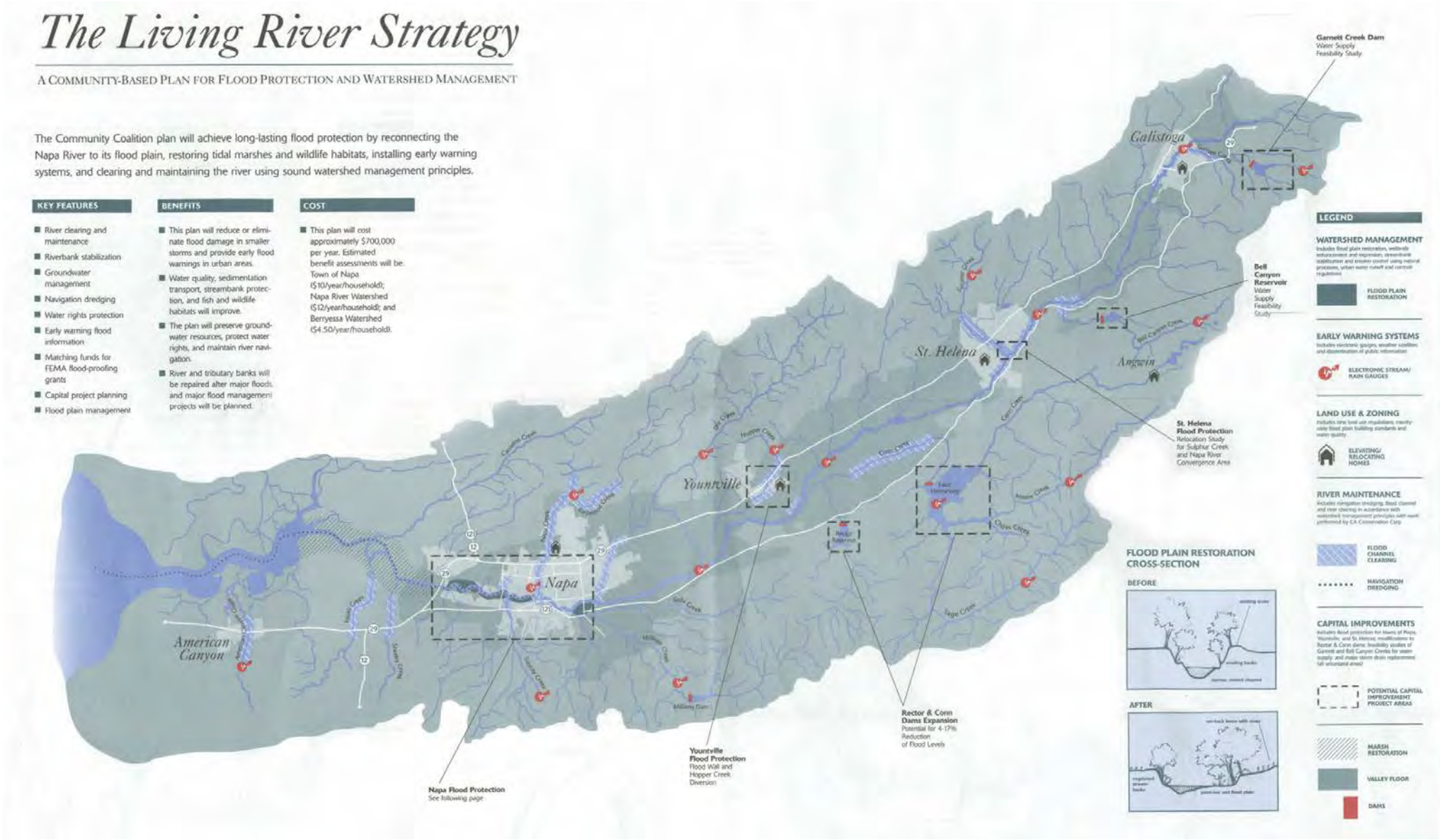
CASE STUDIES: NAPA RIVER

Chehalis Basin LAND

A CITIZEN'S GUIDE TO THE CITY OF NAPA, NAPA RIVER, & NAPA CREEK FLOOD PROTECTION PROJECT

This Guidebook has been prepared by the U.S. Army Corps of Engineers and Napa County Flood Control and Water Conservation District to provide information about the Napa River and Creek Draft Supplemental Environmental Impact Statement/Environmental Impact Report (Draft SEIS/EIR).

NAPA RIVER FLOOD MANAGEMENT PROJECT



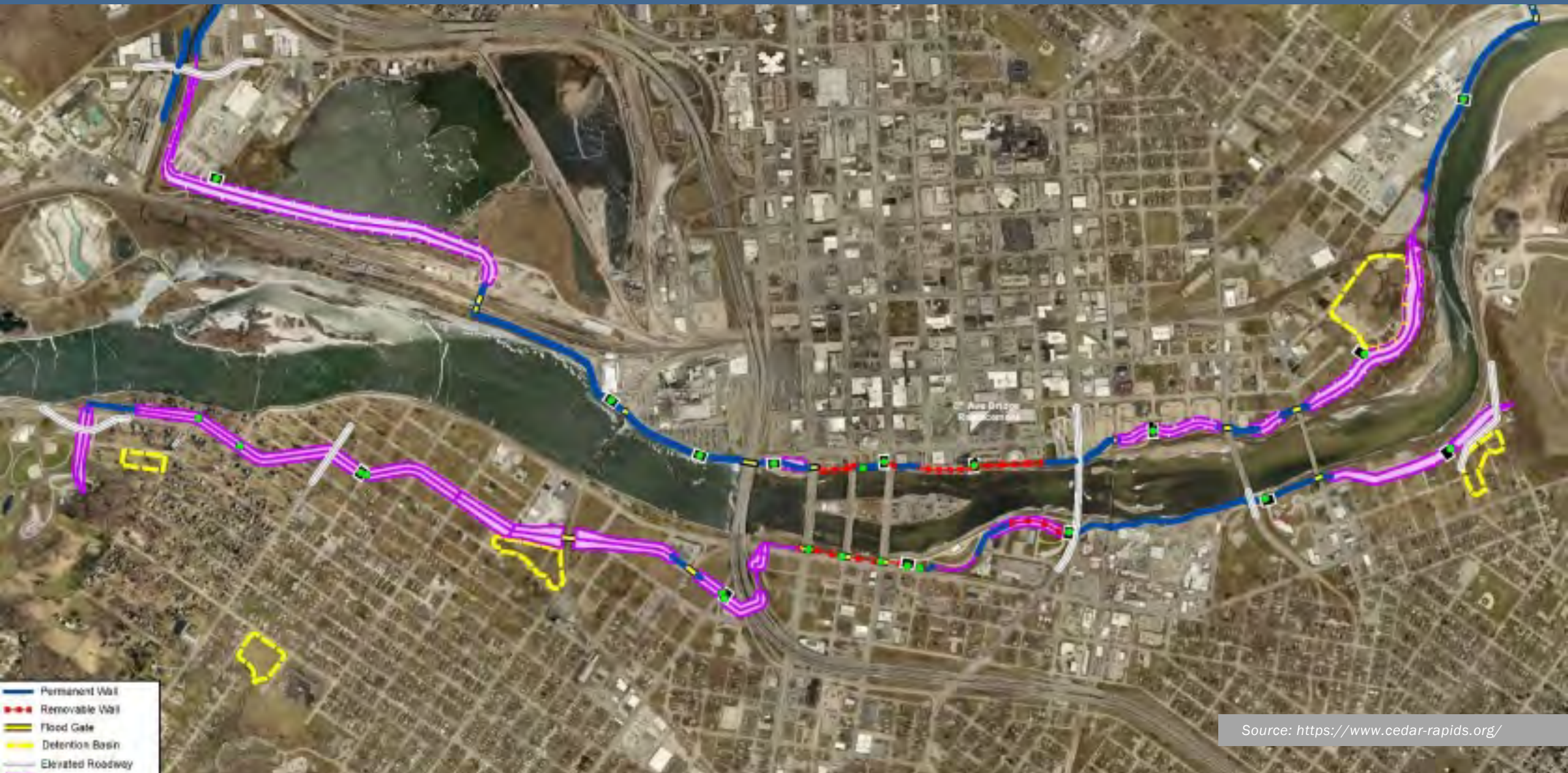
NAPA RIVER FLOOD MANAGEMENT PROJECT

NAPA RIVER FLOOD MANAGEMENT PROJECT

CASE STUDIES: CEDAR RIVER

Chehalis Basin LAND

CEDAR RAPIDS DOWNTOWN



Source: https://www.cedar-rapids.org/

CEDAR RAPIDS FLOODGATE

Source: https://www.cedar-rapids.org/

CEDAR RAPIDS WALLS & LEVEES

Source: https://www.cedar-rapids.org/

CEDAR RAPIDS FLOODABLE PARK

Source: https://www.cedar-rapids.org/

CEDAR RAPIDS FLOOD WALLS

Source: https://www.cedar-rapids.org/

CEDAR RAPIDS EXPANDED RIVER CHANNEL

CASE STUDIES: PÁJARO RIVER

Chehalis Basin LAND

NOVEMBER 2002

pájaro river flood protection

COMMUNITY PLANNING PROCESS

u.s. army corps of engineers planning process

This newsletter is intended to share with you the information presented at the U.S. Army Corps of Engineers Planning Process Meeting (Stakeholder Meeting #7) held on September 12, 2002 at the Watsonville Senior Center. The meeting was held to inform stakeholders and community members about the current status of the project alternatives for the mainstem Pajaro River and Salispuedes and Corralitos Creeks. The Army Corps' Consultant, Ada Squires, presented new information about the project alternatives including preliminary cost estimates.

The Army Corps and local sponsors (Santa Cruz and Monterey Counties) will host the next Stakeholder Meeting in February 2003. The National Economic Development (NED) Plan will be established in February and presented at the Stakeholder Meeting #8. In addition, the local sponsors will outline each of the County processes for obtaining public input and recommendations for the NED Plan or development of a Locally Preferred Plan (LPP). The approvals of both Monterey and Santa Cruz Counties will be needed prior to the forwarding of any recommended plan to Washington, DC. For additional information about the Army Corps' process, refer to the overview on the back page of this newsletter.

If you would like to provide comments for the alternatives being reviewed during the final development of the NED Plan, please forward your comments to:

David Patterson,
Project Manager
U.S. Army
Corps of Engineers
333 Market Street,
8th Floor
San Francisco, CA
94105-2197
(415) 977-8707

PAJARO RIVER FLOOD MANAGEMENT PROJECT

CASE STUDIES: TRUCKEE RIVER

Chehalis Basin LAND

THE TRUCKEE RIVER FLOOD MANAGEMENT COMMUNITY COALITION

The Living Truckee River

The Truckee River offers scenic views, recreation, rich habitats, diverse wildlife—and serenity. Our Community Coalition Plan will restore and maintain the natural beauty of the Truckee River while offering river-friendly flood management for Reno, Sparks, and the Truckee Meadows.

INSIDE

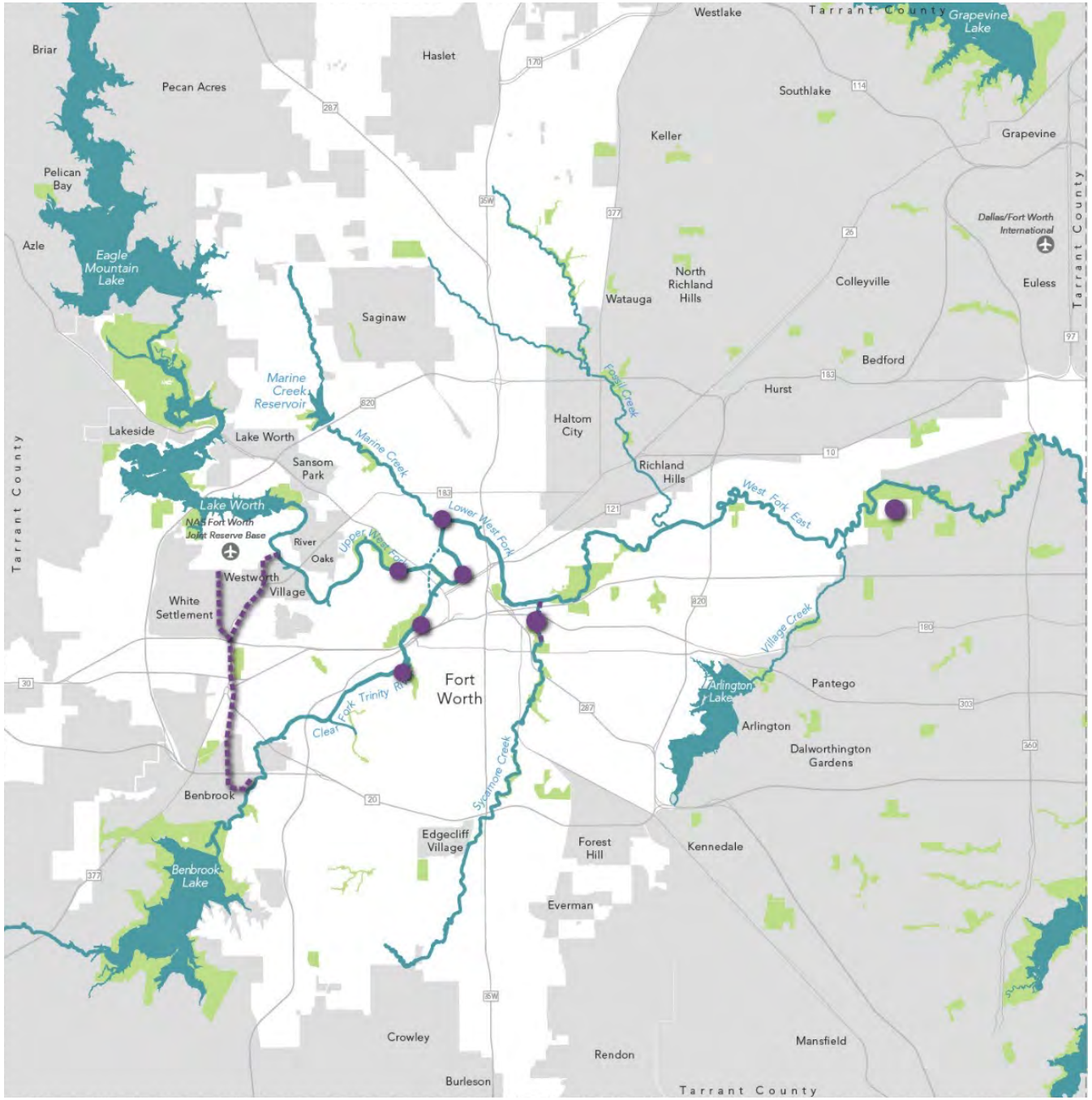
MIG

TRUCKEE RIVER

CASE STUDIES: TRINITY RIVER

Chehalis Basin LAND


Oklahoma
Red River
Sulphur River
Cypress River
Sabine River
Fort Worth
Dallas
Corsicana
Fairfield
Neches River
Waco
Brazos River
Temple
Huntsville
San Jacinto
Austin
Colorado River
Houston
Guadalupe River
Lavaca River
San Antonio
San Antonio River
Trinity River Watershed
Sources: North Central Texas Council of Governments, 2016; Texas Water Development Board, 2016.
Map prepared by MIG, Inc., 2016.


Briar
Pecan Acres
Haslet
Westlake
Tarrant County
Grapevine Lake
Southlake
Keller
Grapevine
Pelican Bay
Azle
Eagle Mountain Lake
Saginaw
Watauga
North Richland Hills
Colleyville
Dallas/Fort Worth International
Euless
Bedford
Hurst
Marine Creek Reservoir
Fossil Creek
Haltom City
Lakeside
Lake Worth
Marine Creek
Sansom Park
Richland Hills
Lake Worth
NAS Fort Worth Joint Reserve Base
River Oaks
Lower West Fork
West Fork East
Upper West Fork
Westworth Village
White Settlement
Village Creek
Fort Worth
Clear Fork Trinity River
Arlington Lake
Pantego
Arlington
Dalworthington Gardens
Sycamore Creek
Benbrook
Edgecliff Village
Forest Hill
Kennedale
Benbrook Lake
Everman
Crowley
Rendon
Mansfield
Burleson
Tarrant County

TRINITY RIVER – MARINE CREEK CONFLUENCE (EXISTING)

MIG

TRINITY RIVER – MARINE CREEK CONFLUENCE (PROPOSED)

TRINITY RIVER – KAYAK TRAIL (EXISTING)

TRINITY RIVER – KAYAK TRAIL (PROPOSED)

TRINITY RIVER – RIVER-ORIENTED DEVELOPMENT

CATALOG OF POTENTIAL SOLUTIONS

Chehalis Basin LAND

IMPROVING FLOW AND STORAGE

Chehalis Basin LAND

IMPROVING FLOW AND STORAGE - FRY CREEK EXISTING FLOW CONSTRICTION

Constricted Channel

Culvert Constrictions

Culvert Constrictions

Constricted Channel

Culvert Constrictions

Culvert Constrictions

Source: City of Aberdeen

FRY CREEK FLOOD REDUCTION PLAN

Source: City of Aberdeen

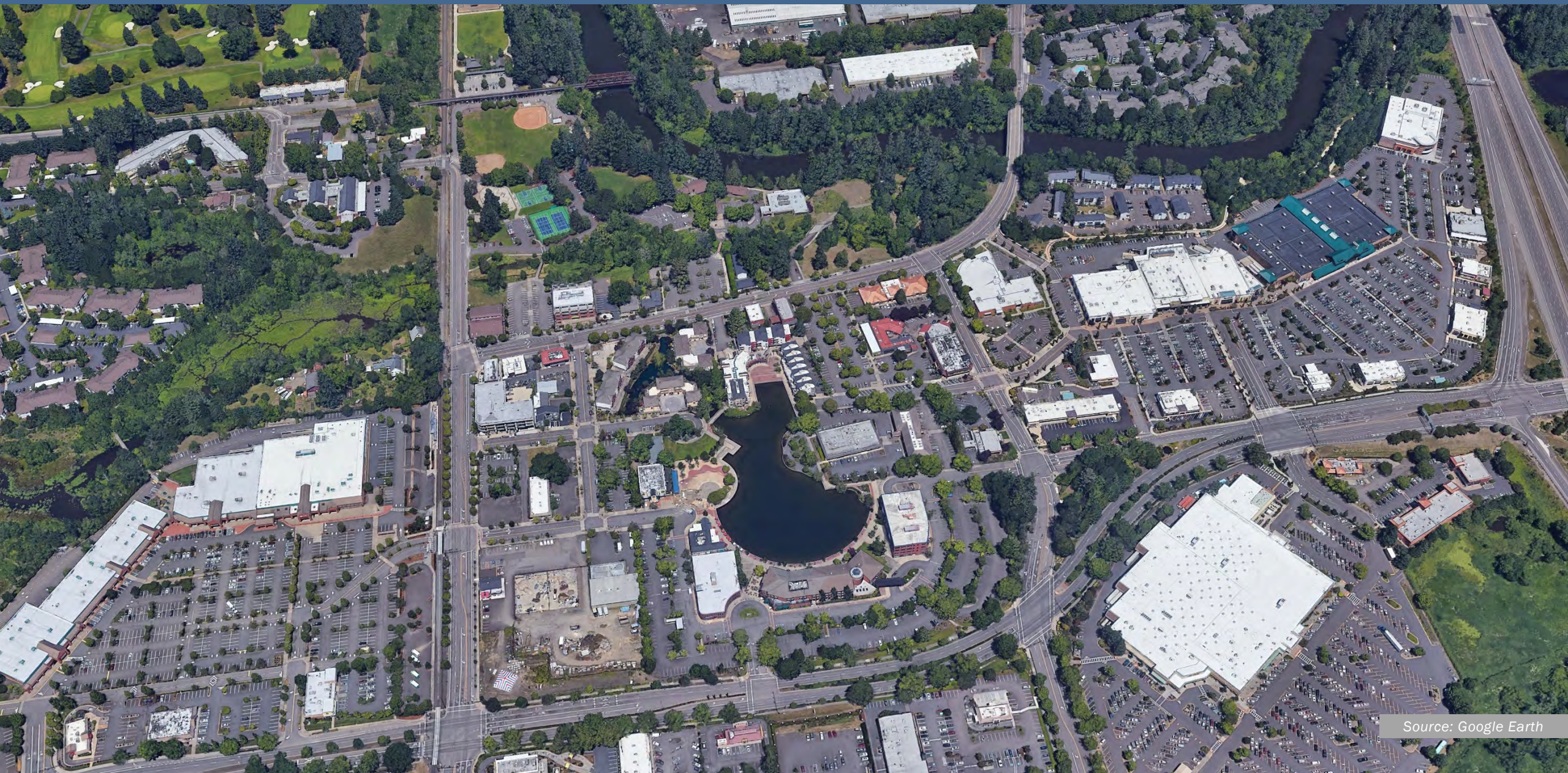
FLOODPLAIN RESTORATION, CHINA CREEK

Source: Chronicle

JOHNSON CREEK RESTORATION, PORTLAND, OREGON

Source: City of Portland

TUALATIN, OREGON



Source: Google Earth

TUALATIN, OREGON

Source: Portland Tribune

LEVEES & WALLS

Chehalis Basin LAND

LEVEE WALL

Source: Mario Tama Getty Images

LEVEE BERM

Source: US Army Corps of Engineers Seattle District

FLOOD WALL, MOUNT VERNON

Source: King 5 News

FLOOD WALL, MOUNT VERNON

Source: Seattle Times

FLOOD PROOFING

Chehalis Basin LAND

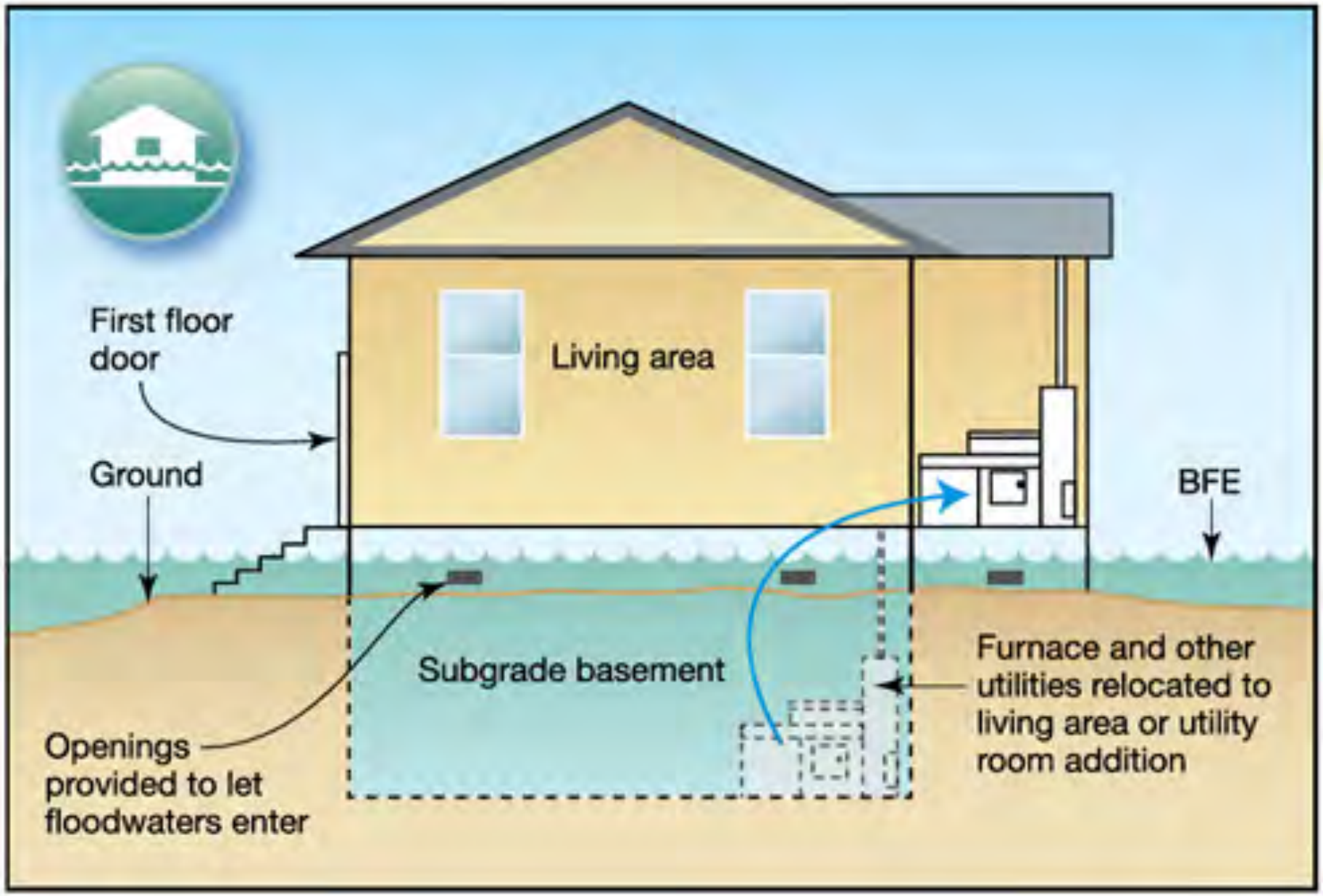
RITE AID, HOQIUAM

Source: Hoquiam Police Department / Facebook

DRY FLOODPROOFING

Source: USA Today

WET FLOODPROOFING



Source: FEMA

WORKING WITH NATURAL SYSTEMS

Chehalis Basin LAND

RESTORING THE NATURAL MEANDER

Source: BioHabitats

IMPROVING FLOW & INCREASING FREEBOARD

Source: BioHabitats

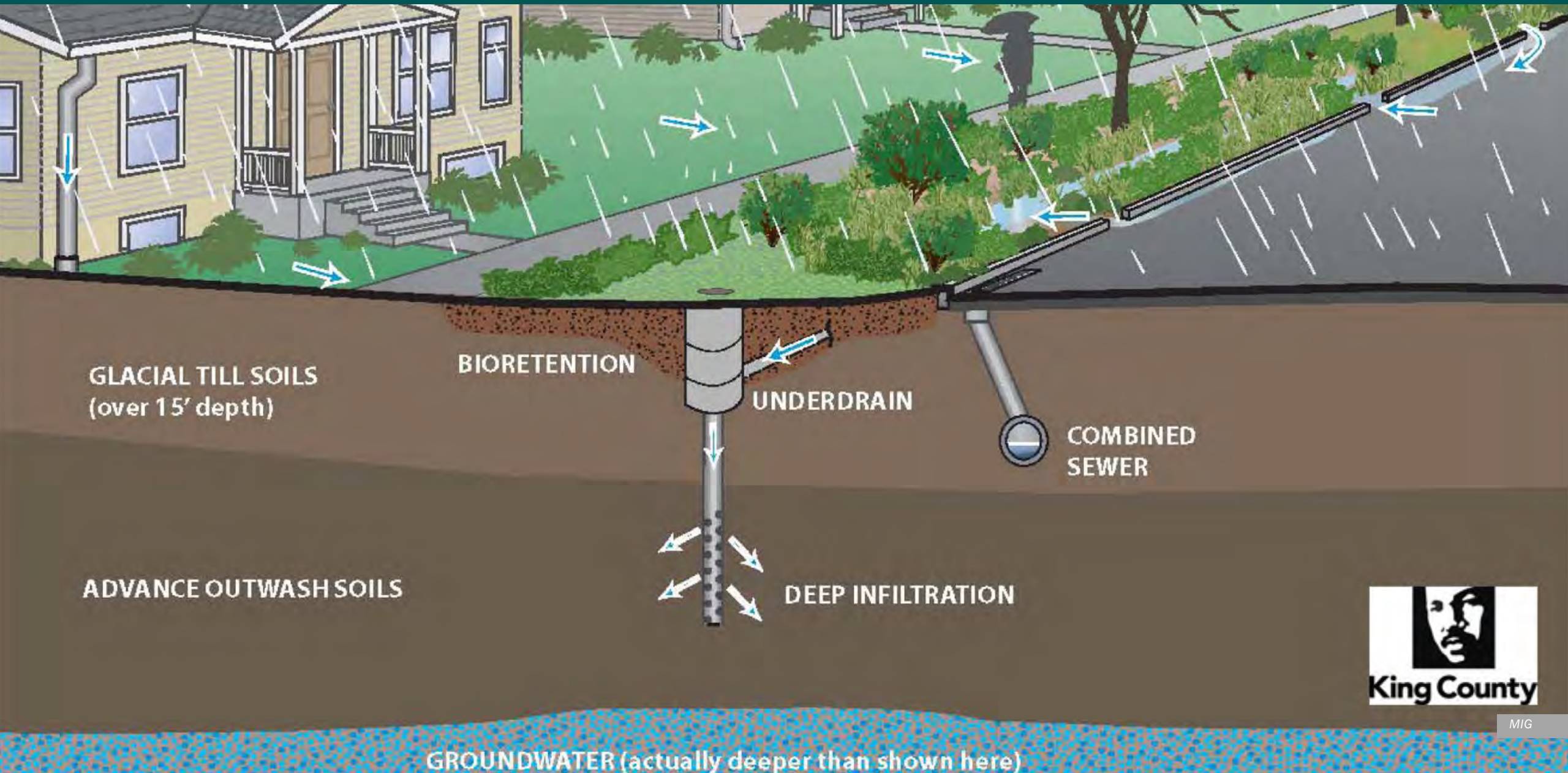
GRADING TO ALLOW FLOODING IN NATURAL AREAS

Source: BioHabitats

LOW IMPACT DEVELOPMENT (LID) - GREEN STORMWATER INFRASTRUCTURE (GSI)

Chehalis Basin LAND

LID / GREEN STORMWATER INFRASTRUCTURE



LID / GREEN STORMWATER INFRASTRUCTURE

Source: DeepRoot

LID / GREEN STORMWATER INFRASTRUCTURE

MIG

LID / GREEN STORMWATER INFRASTRUCTURE

LID / GREEN STORMWATER INFRASTRUCTURE

LID / GREEN STORMWATER INFRASTRUCTURE

MIG

LID / GREEN STORMWATER INFRASTRUCTURE

LID / GREEN STORMWATER INFRASTRUCTURE

MIG

LID / GREEN STORMWATER INFRASTRUCTURE

American Hydrotech

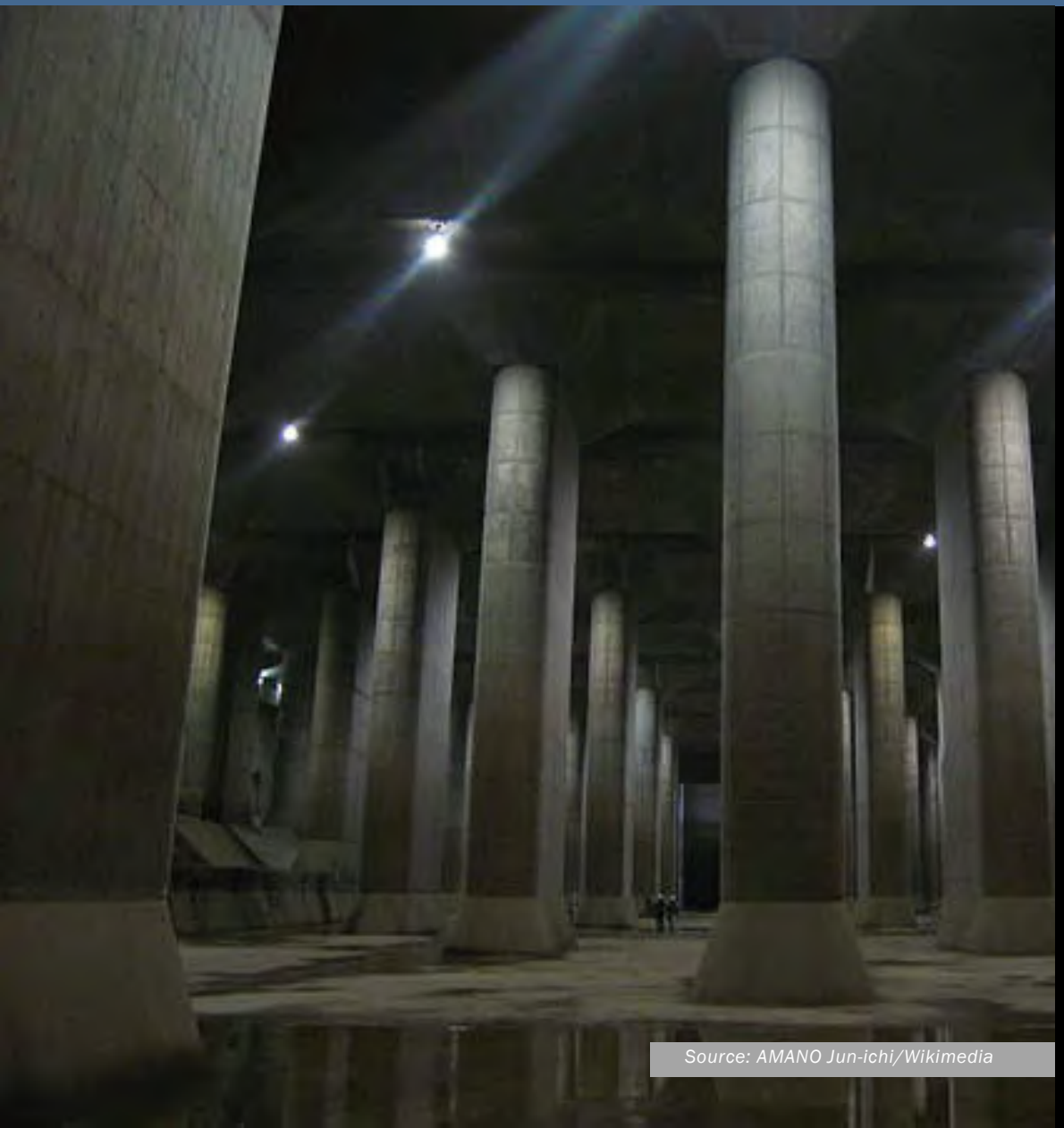
SUBSURFACE SOLUTIONS

Chehalis Basin LAND

DIVERSION SYSTEMS - TOKYO

Source: Edo River Office, Kanto Regional Development Bureau

DIVERSION SYSTEMS



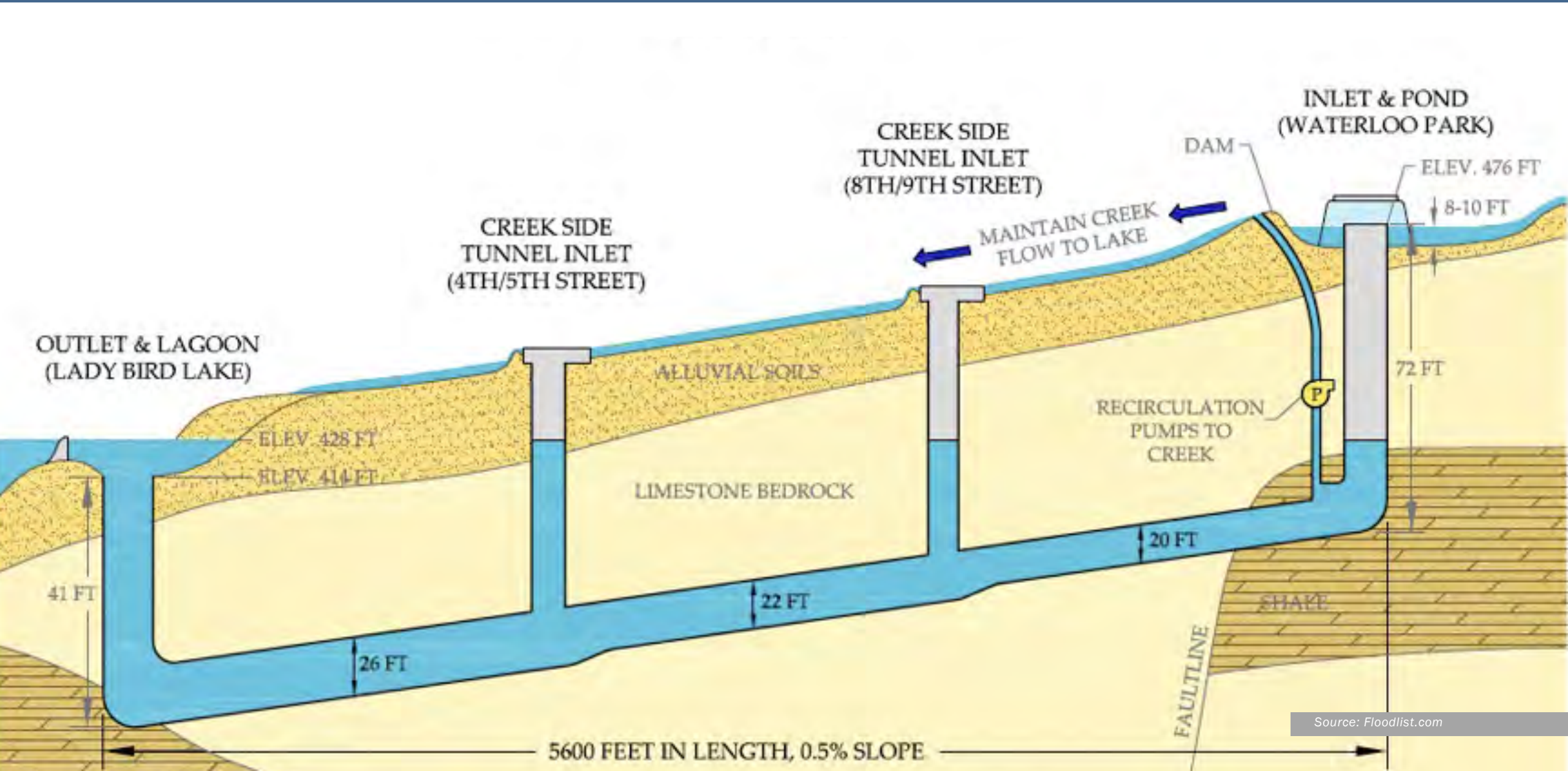
Source: AMANO Jun-ichi/Wikimedia

Source: Japan Times

LINEAR PARK SYSTEM - WALLER CREEK

Image Credit; Waller Creek Conservancy

WALLER CREEK TUNNEL PROJECT CONCEPTUAL PROFILE (NOT TO SCALE)



Source: Floodlist.com

WALLER CREEK

Source: Sitelinesmag.org

LINEAR PARK SYSTEM - WALLER CREEK

Image Credit; Waller Creek Conservancy

FLOODABLE OPEN SPACE

Chehalis Basin LAND

MAKING ROOM FOR RIVERS – THE NETHERLANDS

Image Credit: Johan-Roerink

FLOODABLE PARKS - CINCINNATI

Source: Sasaki Associates

FLOODABLE PARKS

Source: Sasaki Associates

FLOODABLE PUBLIC SPACE - COPENHAGEN

Image Credit: Tredje Natur

FLOODABLE PUBLIC SPACE

Image Credit: Tredje Natur

FLOODABLE PUBLIC SPACE

Image Credit: Tredje Natur

FLOODABLE PUBLIC SPACE

Image Credit: Tredje Natur

FLOODABLE PUBLIC SPACE

Source: Ministry of Environment of Denmark

FLOODABLE PUBLIC SPACE

Source: Wikimedia Commons

SPONGE CITIES – JINHUA CITY, CHINA

Source: Turenscape

SPONGE CITIES

Source: Turenscape

SPONGE CITIES

Source: Turenscape

SPONGE CITIES

Source: Turenscape

SPONGE CITIES

Source: Turenscape

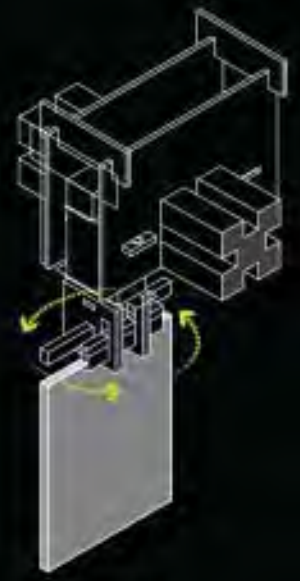
RESPONSIVE LANDSCAPES

Chehalis Basin LAND

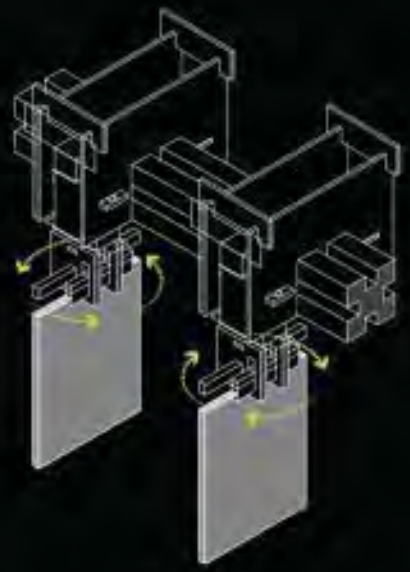
RESPONSIVE LANDSCAPES – RETENTION CELLS AND INFLATABLE WEIRS

Source: http://responsivelandscapes.com/

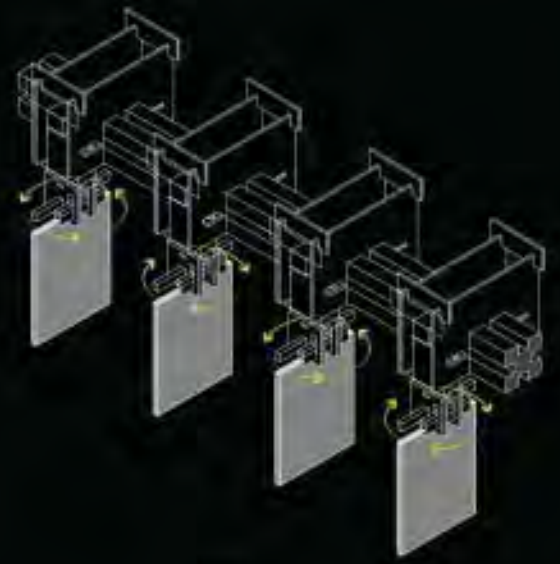
RESPONSIVE LANDSCAPES – AUTOMATED FINS



SINGLE FIN



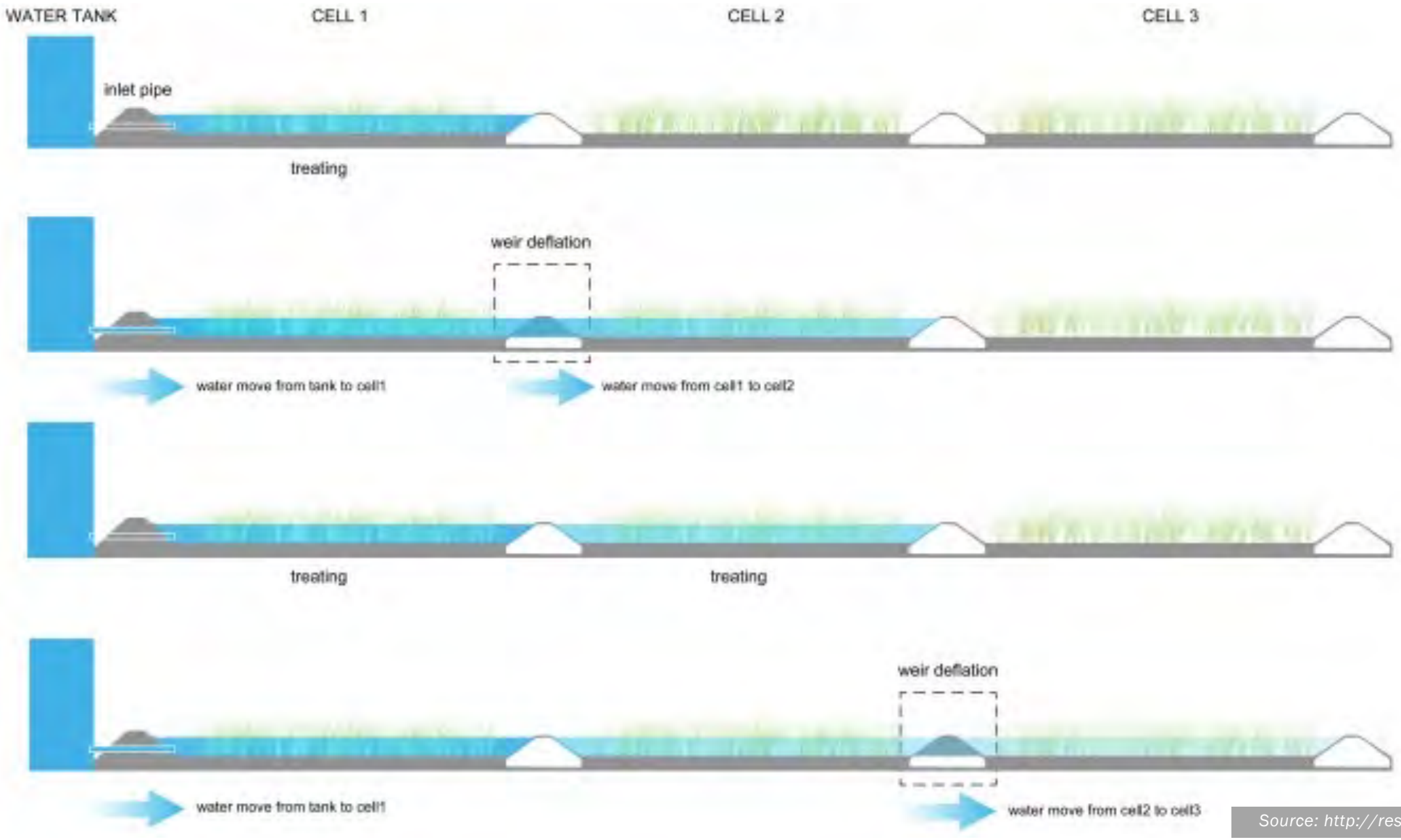
2 FINS



4 FINS

Source: http://responsivelandscapes.com/

RESPONSIVE LANDSCAPES – RETENTION CELLS AND INFLATABLE WEIRS



Source: http://responsivelandscapes.com/

MOVING FORWARD . . .

Chehalis Basin LAND


CHALLENGES AND OPPORTUNITIES | MAY 16 - 18, 2022
Chehalis Basin
LAND*
*LOCAL ACTIONS NON-DAM ALTERNATIVE