

**Cedar River
Channel Migration Zone (CMZ)
Draft Study and Map**

Public Meeting

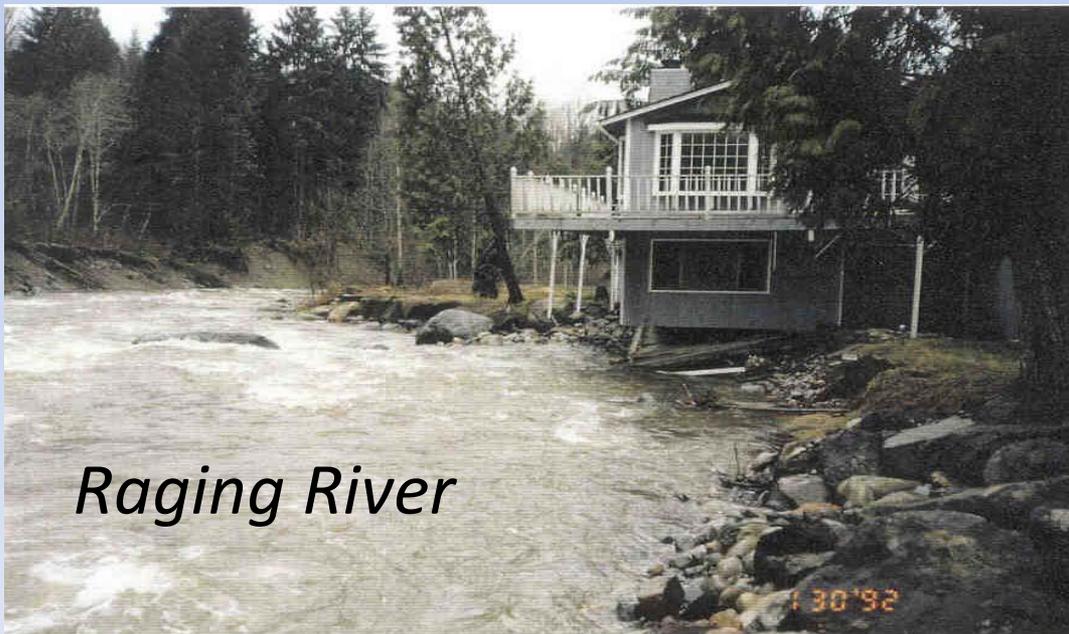
February 4, 2015

Presentation

- Why CMZs are mapped
- Study area
- How CMZ maps are used
- CMZ mapping on the Cedar River

Why Map Channel Migration Hazards?

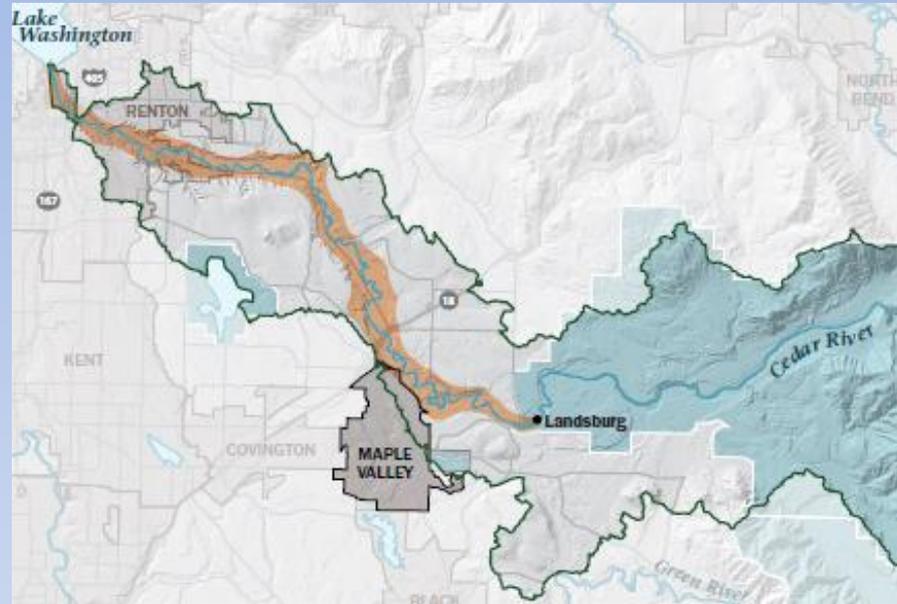
- Channel migration is a type of flood hazard
 - Differs from flood inundation hazard
- Identify hazard areas:
 - Inform public about potential hazards



Raging River

Study Area/Uses of CMZ Study & Map

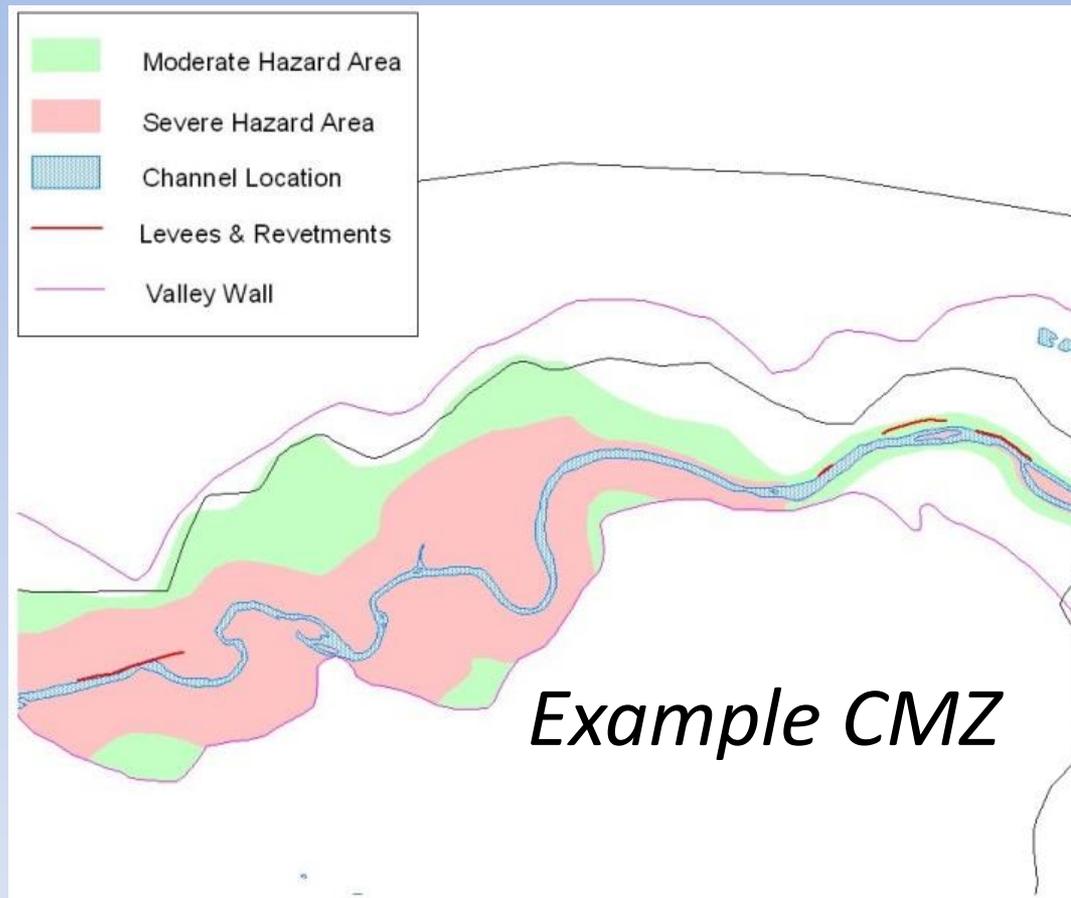
- Study area:
Landsburg
to mouth



- Support Cedar River Corridor process
- Serve as regulatory map in unincorporated areas
- For use by property owners in making land use choices

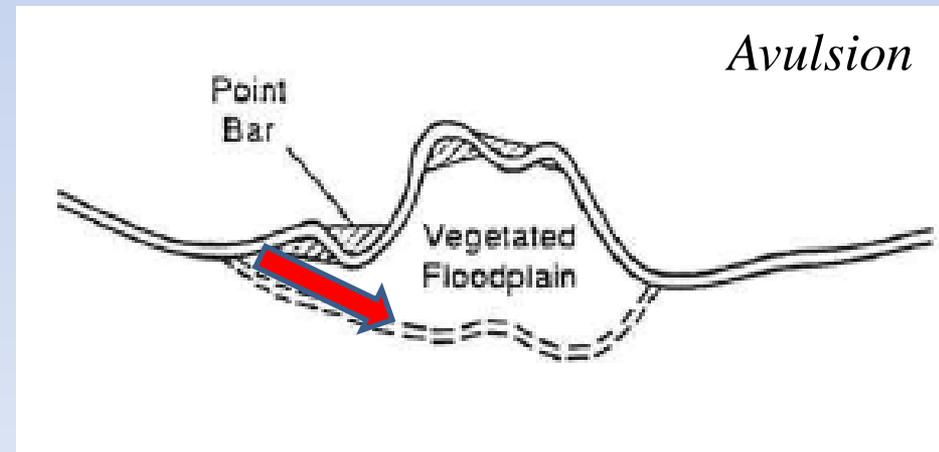
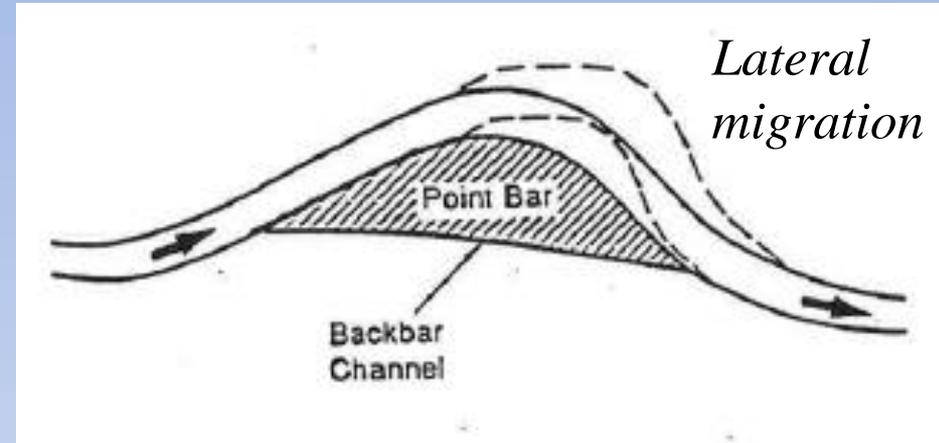
Channel Migration Terms

- **Channel Migration:**
The shifting of a river within a river valley
- **Channel Migration Zone (CMZ):** The area within which a river channel can be expected to migrate over time



Types of Channel Migration

- **Lateral migration:** Progressive channel movement across floodplain
- **Channel expansion:** Channel widening
- **Avulsion:** Abrupt shift of channel location



CMZ mapping on the Cedar River

- Evaluate present conditions & historical migration to predict future hazard
 - Geology, riverbank materials
 - Historical channels
 - Lateral migration rates
 - Avulsion pathways
- Field observations; computer analyses
- Map and combine CMZ components

Geology, riverbank materials - natural

Erosion-resistant bluff



Erodible alluvium

Riverbank materials - artificial



**Bank armoring: riprap
rock lining riverbank**

**SR 169 & Cedar R Trail
bridges & road prisms
constrain channel thru
much of valley**



Historical channel locations

Cedar River 2011 and 1964 channel locations



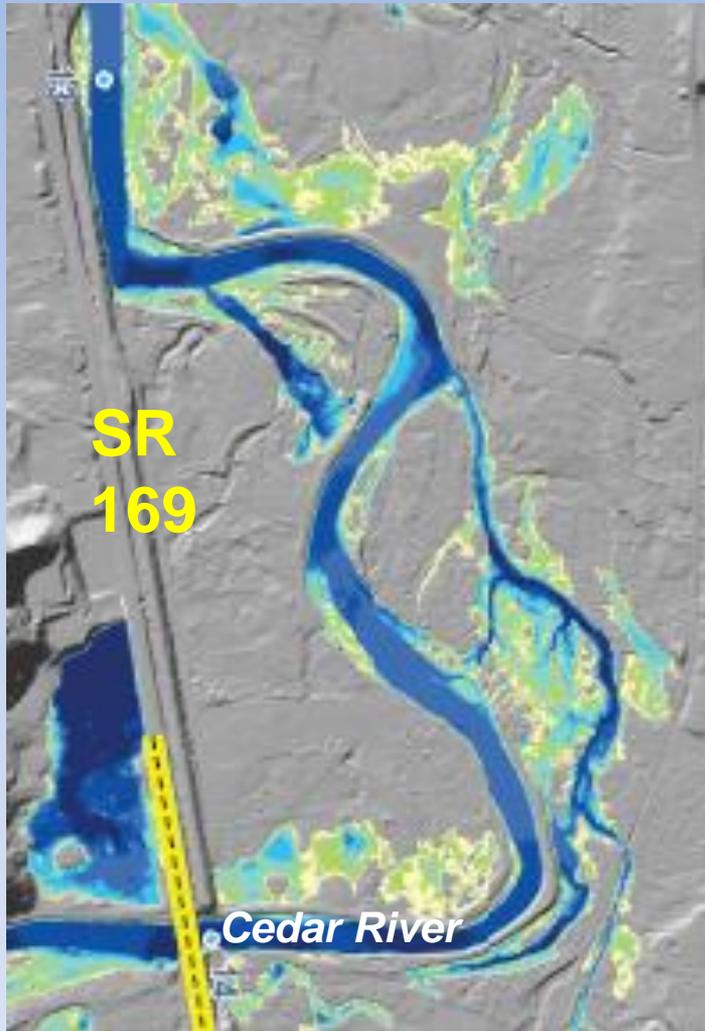
200 100 0 200 400 Feet

Aerial Photos

1936
1948
1959
1964
1970
1980
1989
2000
2011

Lateral migration rate = distance / time

Potential avulsion pathways



- Shaded relief map
- Colors: elevation difference between floodplain topography and in-channel water surface during a moderate flood event
- Indicates low-lying areas

*Taylor Creek area,
Cedar River Mile 13-14*

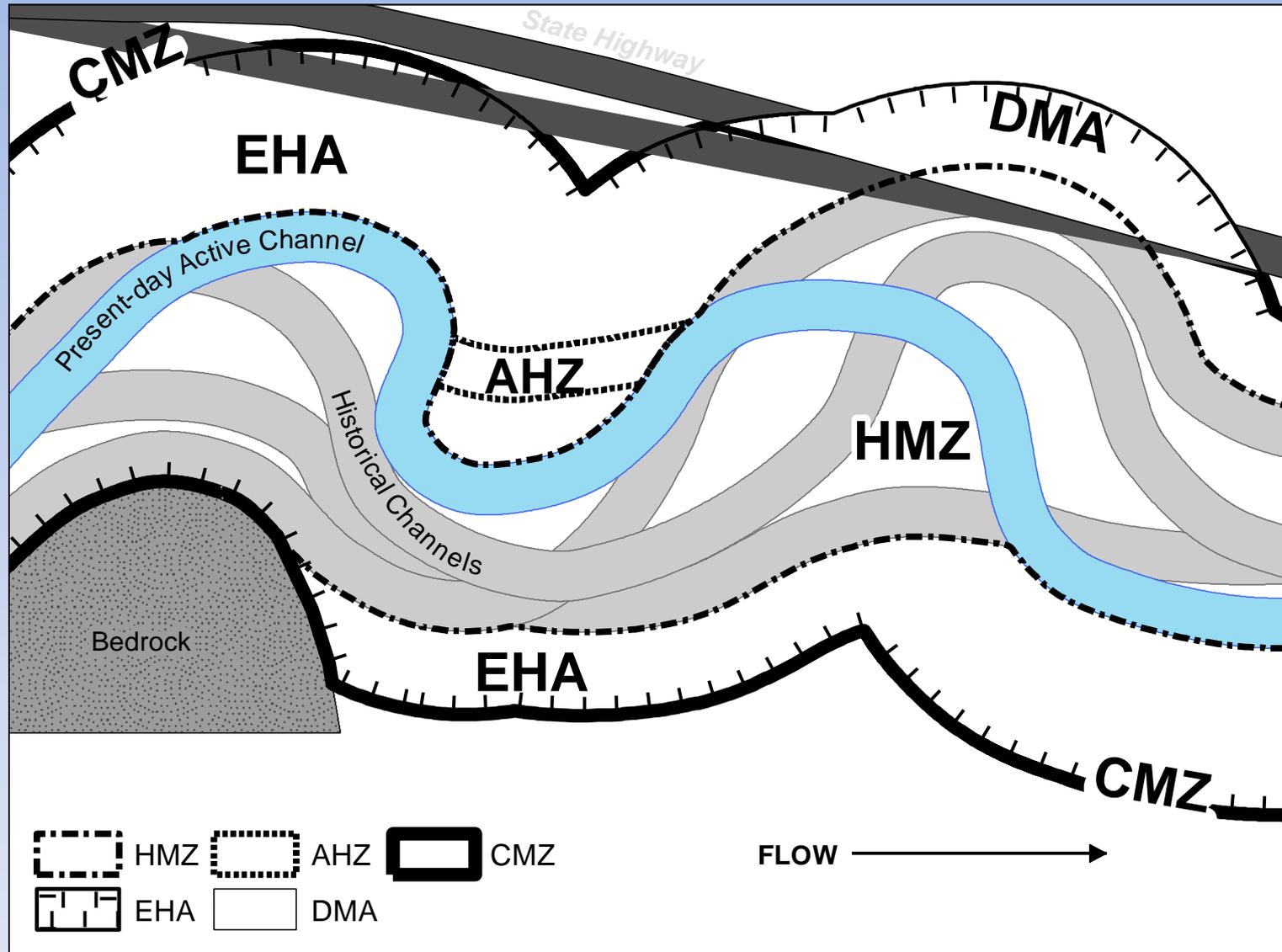
Channel Migration Zone Components

Map CMZ components (State Ecology)

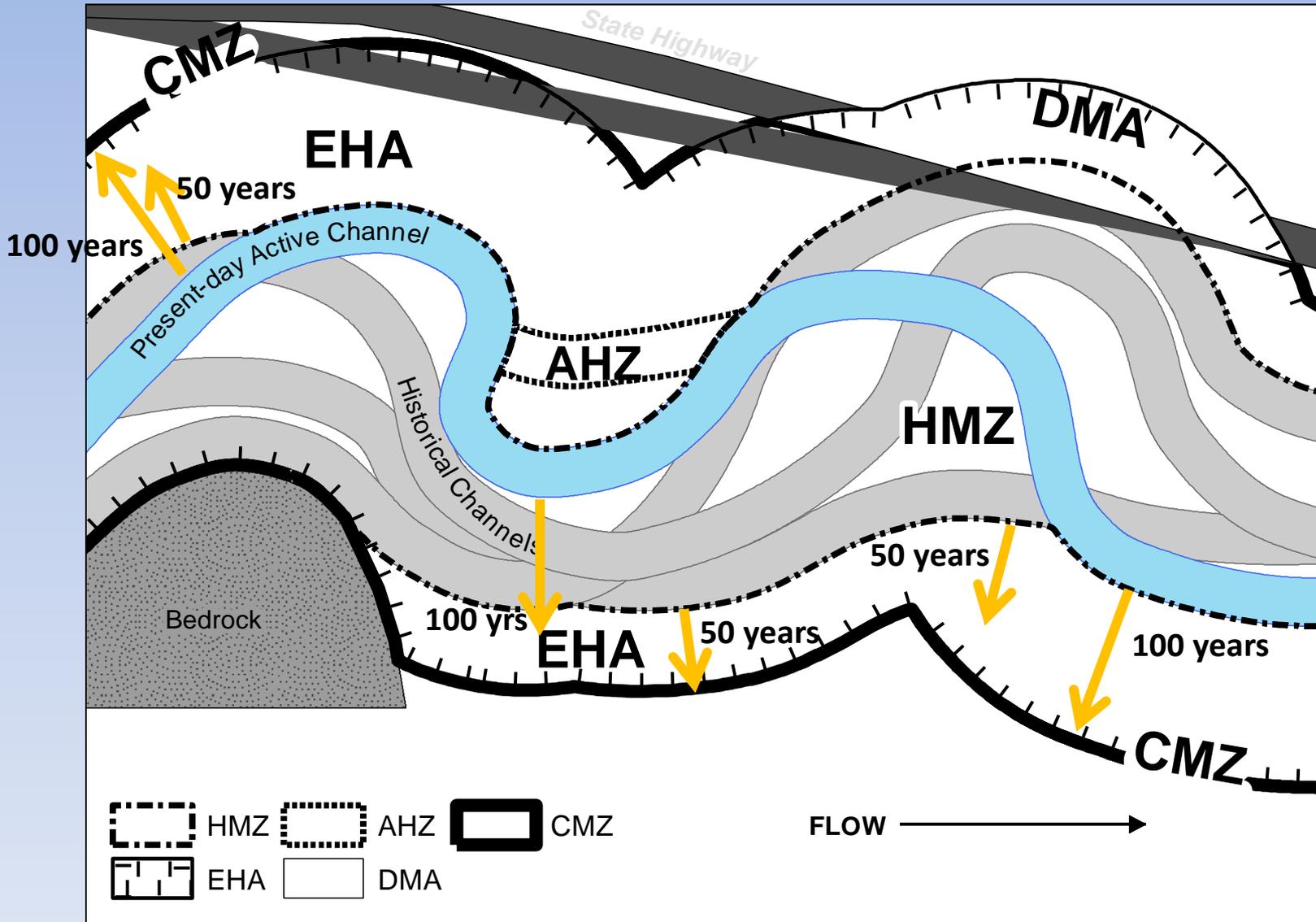
- Historical Migration Zone (HMZ)
- Avulsion Hazard Zone (AHZ)
- Erosion Hazard Area (EHA)
- Disconnected Migration Area (DMA)

$$\text{CMZ} = \text{HMZ} + \text{AHZ} + \text{EHA} - \text{DMA}$$

$$\text{CMZ} = \text{HMZ} + \text{AHZ} + \text{EHA} - \text{DMA}$$



Delineation of Erosion Hazard Area

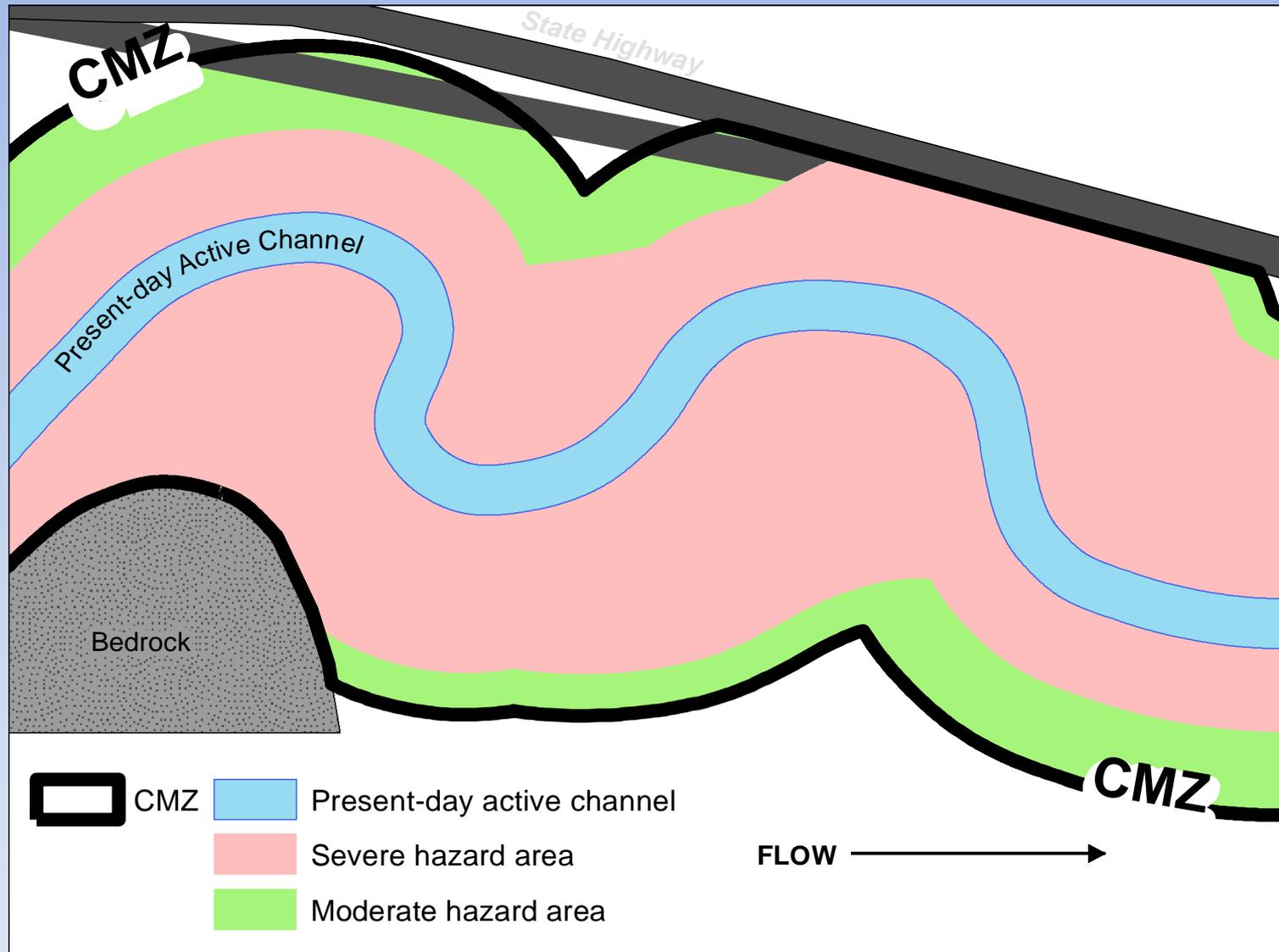


Delineation of Moderate and Severe Hazard Areas

- Widths are calculated as the average lateral migration rate times a certain number of years
- Width is delineated as the greater of two distances:

Hazard Area	Measured from Historical Migration Zone	Measured from Present-Day Active Channel
Moderate	50 years times average migration rate	100 years times average migration rate
Severe	25 years times average migration rate	50 years times average migration rate

Moderate and Severe Hazard Areas



Taylor Creek area, example maps



CMZ components



**Draft Cedar River
CMZ map**

Next Steps – Updated 2/11/5

- Public comment period ends, ~~3/6/15~~ 3/23/15
- DNRP reviews comments, revises study & map as appropriate, ~~3/31/15~~ 4/17/15
- DNRP sends final maps & study to DPER, ~~3/31/15~~ 4/17/15
- Final map becomes effective 30 days after adoption by DPER, ~~May~~ June 2015

DPER=Dept of Permitting and Environment Review

DNRP=Dept of Natural Resources and Parks

Contact Information

- Comments on Draft Cedar River CMZ study:
Terry Butler: terry.butler@kingcounty.gov
- Comments on channel migration public rule:
Steve Bottheim: steve.bottheim@kingcounty.gov
- CMZ study map & public rule amendment at:
 - www.kingcounty.gov/rivers
 - Dept. of Permitting and Environmental Review
 - Fairwood Library, 17009 140th Ave SE, Renton
 - Maple Valley Library, 20844 SE 248th St, Maple Val