

# Channel Migration: Planning & Implementation

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## CMZ one of required inventory elements...

WAC 173-26-201(3)(c): Inventory shoreline conditions.

- Local governments shall, at a minimum, and to extent information is relevant and reasonably available, collect the following information:
  - (ii) Information on freshwater critical areas
  - (vii) General location of channel migration zones and
    - flood plains.

# WAC 173-26-221: Flood Hazard Reduction

- **WAC 173-26-221(3)(b):** Failing to recognize the [channel migration] process often leads to damage to, or loss of, structures and threats to life safety

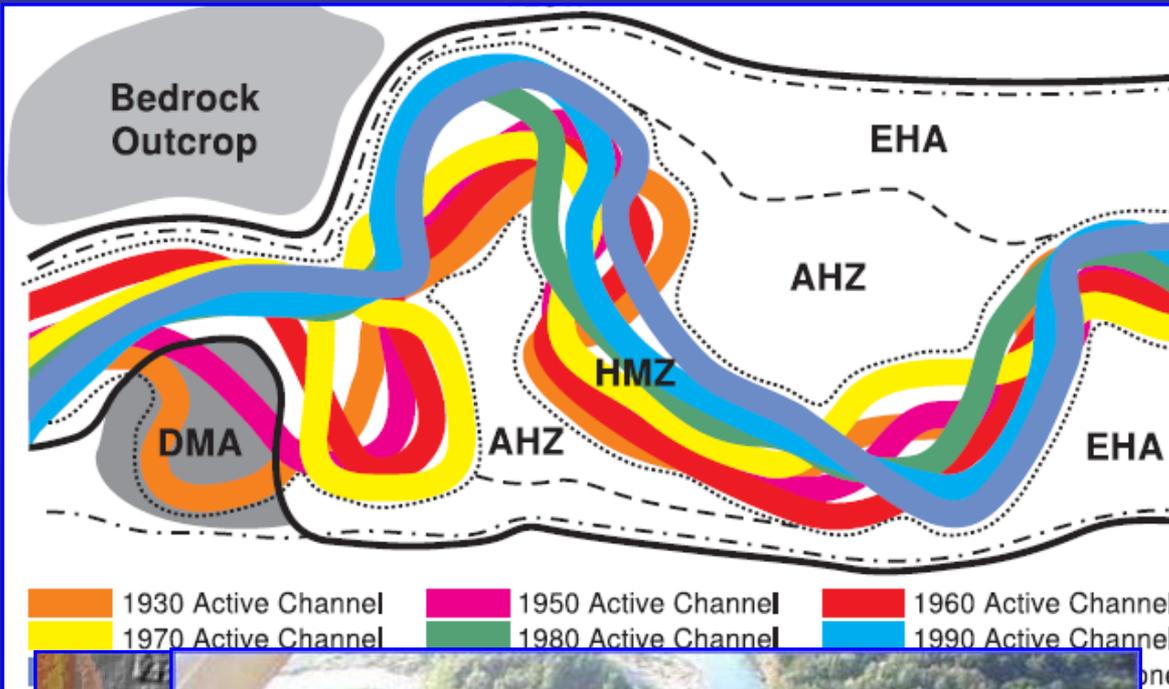


# Channel migration zone: Preferred definition

**WAC 173-26-020(6):** "Channel migration zone (CMZ)" means the area along a river within which the channel(s) can be reasonably predicted to migrate over time as a result of natural and normally occurring hydrological and related processes when considered with the characteristics of the river and its surroundings."



# Elements of CMZ



- HMZ= historic channel migration zone
- AHZ=Avulsion hazard zone
- EHA=Erosion hazard zone
  - CMZ=HMZ + AHZ + EHA
- DMA=Disconnected migration area



# WAC 173-26-221(3)(b): Exemptions (DMA)

Areas may be removed from the channel migration area if:

- Within incorporated municipalities and urban growth areas,
  - Legally existing artificial channel constraints
- All areas separated from the active channel by a legally existing artificial structure(s) that is likely to restrain channel migration, including transportation facilities, built above or constructed to remain intact through the one hundred-year flood, should not be considered to be in the channel migration zone.
- In areas outside incorporated municipalities and urban growth areas, channel constraints and flood control structures built below the one hundred-year flood elevation do not necessarily restrict channel migration and should not be considered to limit the channel migration zone unless demonstrated otherwise using scientific and technical information

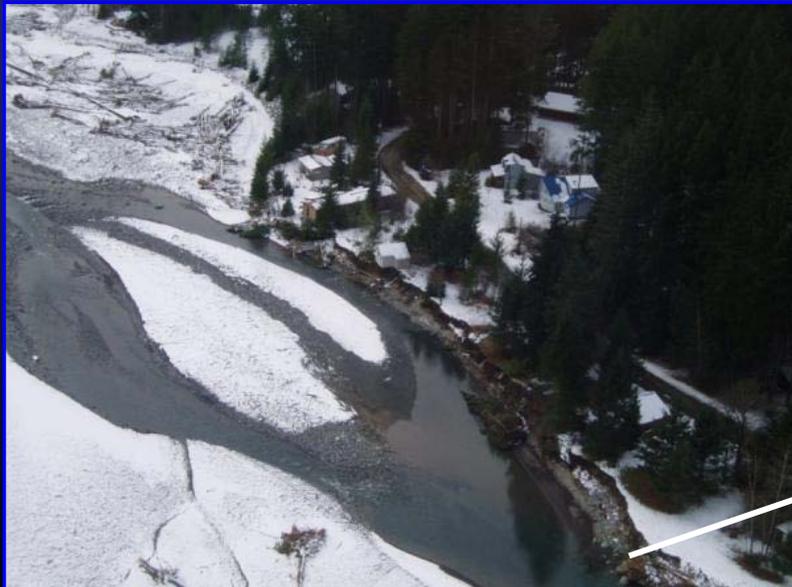
# Policy interpretations on exemptions

- Publicly maintained structures based on SMA floodway definition (RCW 90.58.030)
  - Exempted only where flood control devices are maintained by or maintained under license from government
    - Commitment to continue to maintain
- Transportation facilities that limit
  - Railroads and public paved roads built above or maintained to withstand 100-yr flood with commitment to maintain
- Transportation facilities that are not considered limits
  - Private roads
  - Unpaved roads, whether public or private
  - Paved roads without a commitment to hold the line

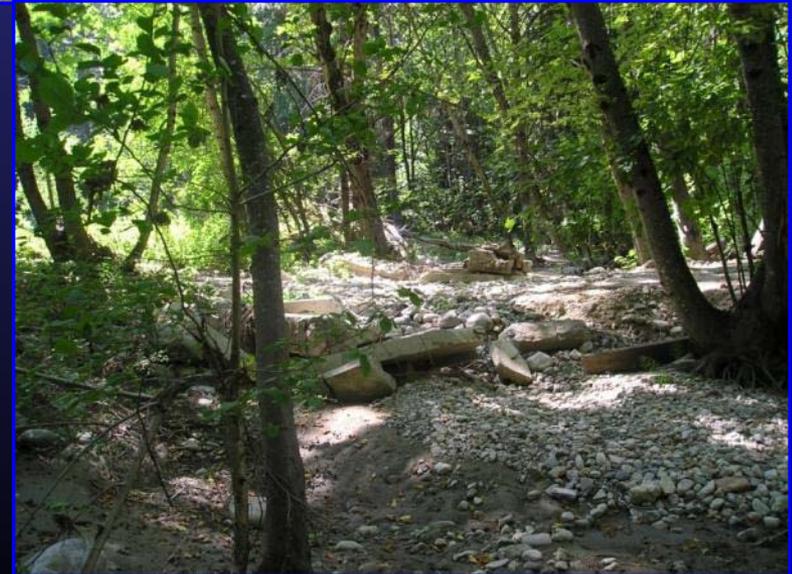


Does experience show that policies make sense?

## Some examples supporting policies

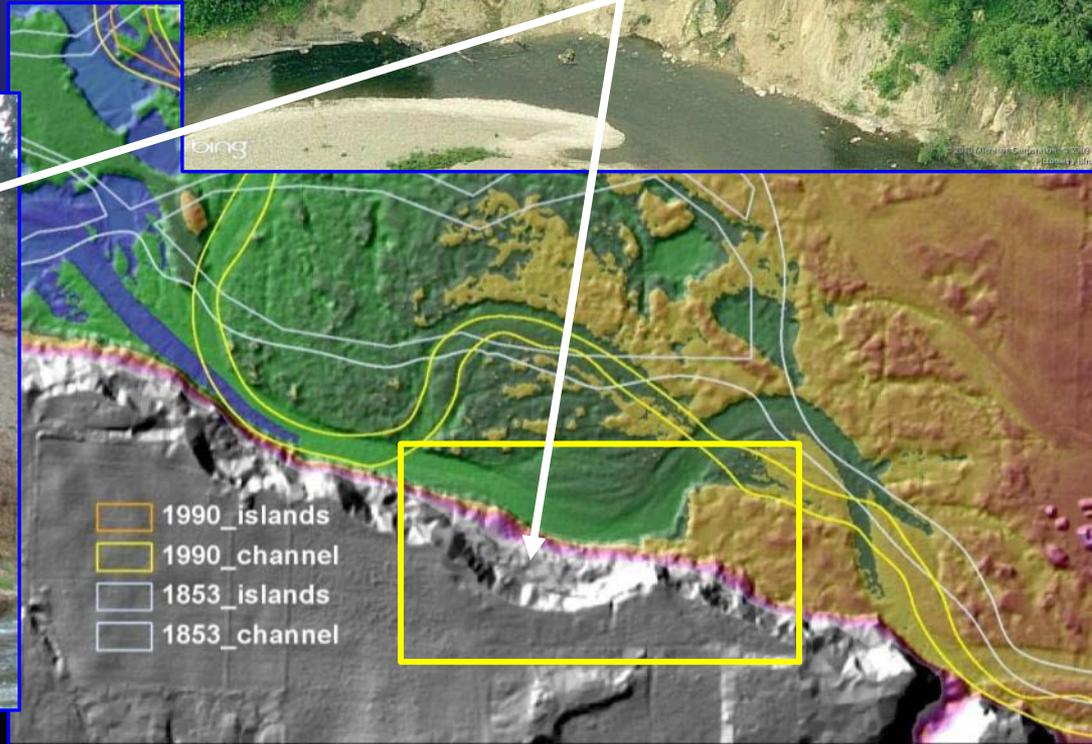


# Example transportation facilities that don't limit

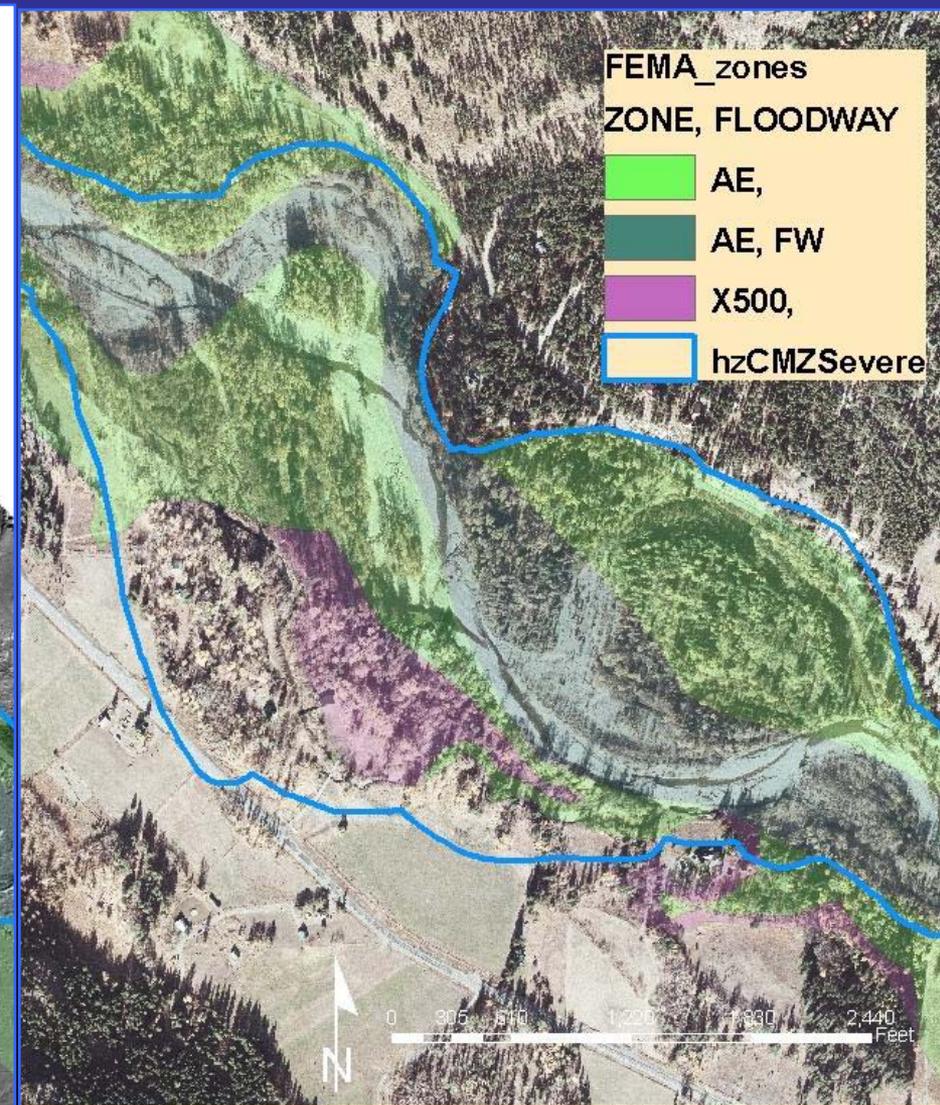
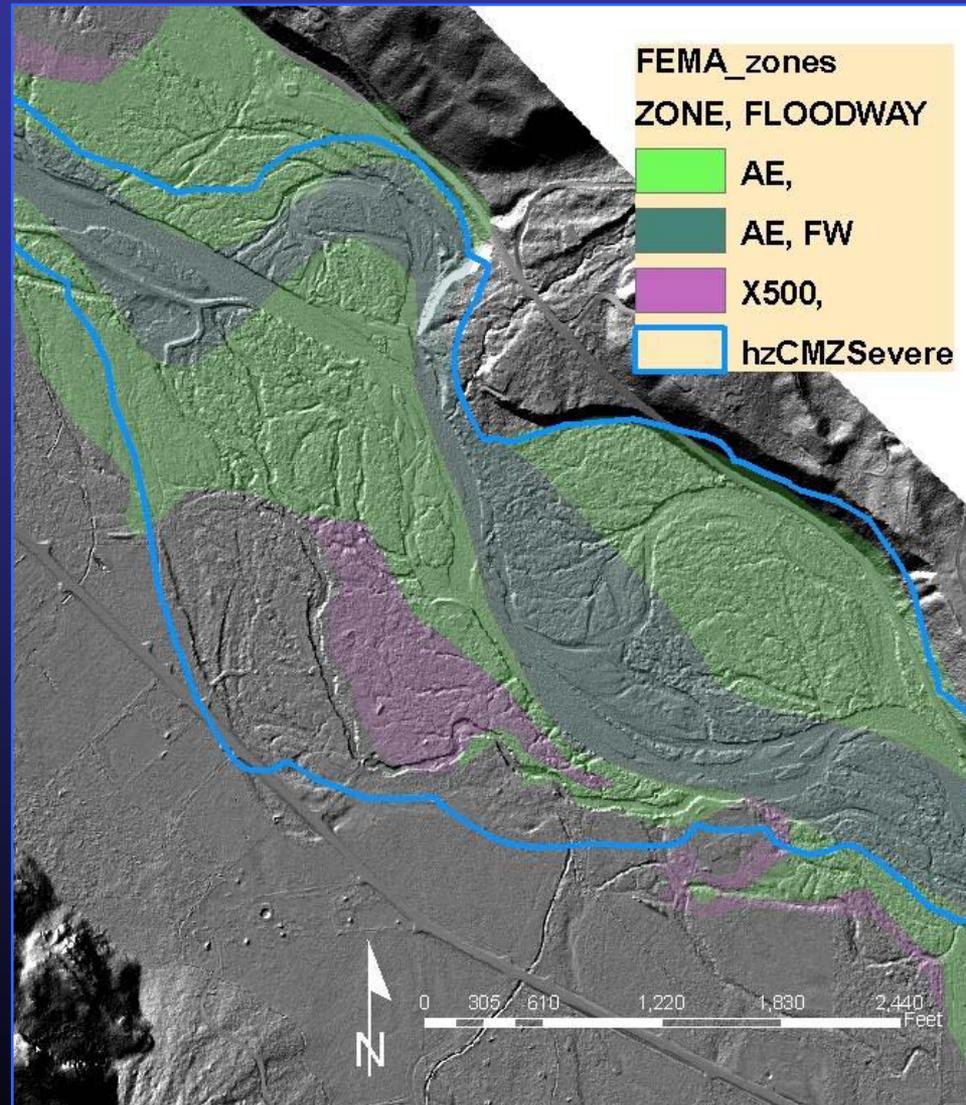


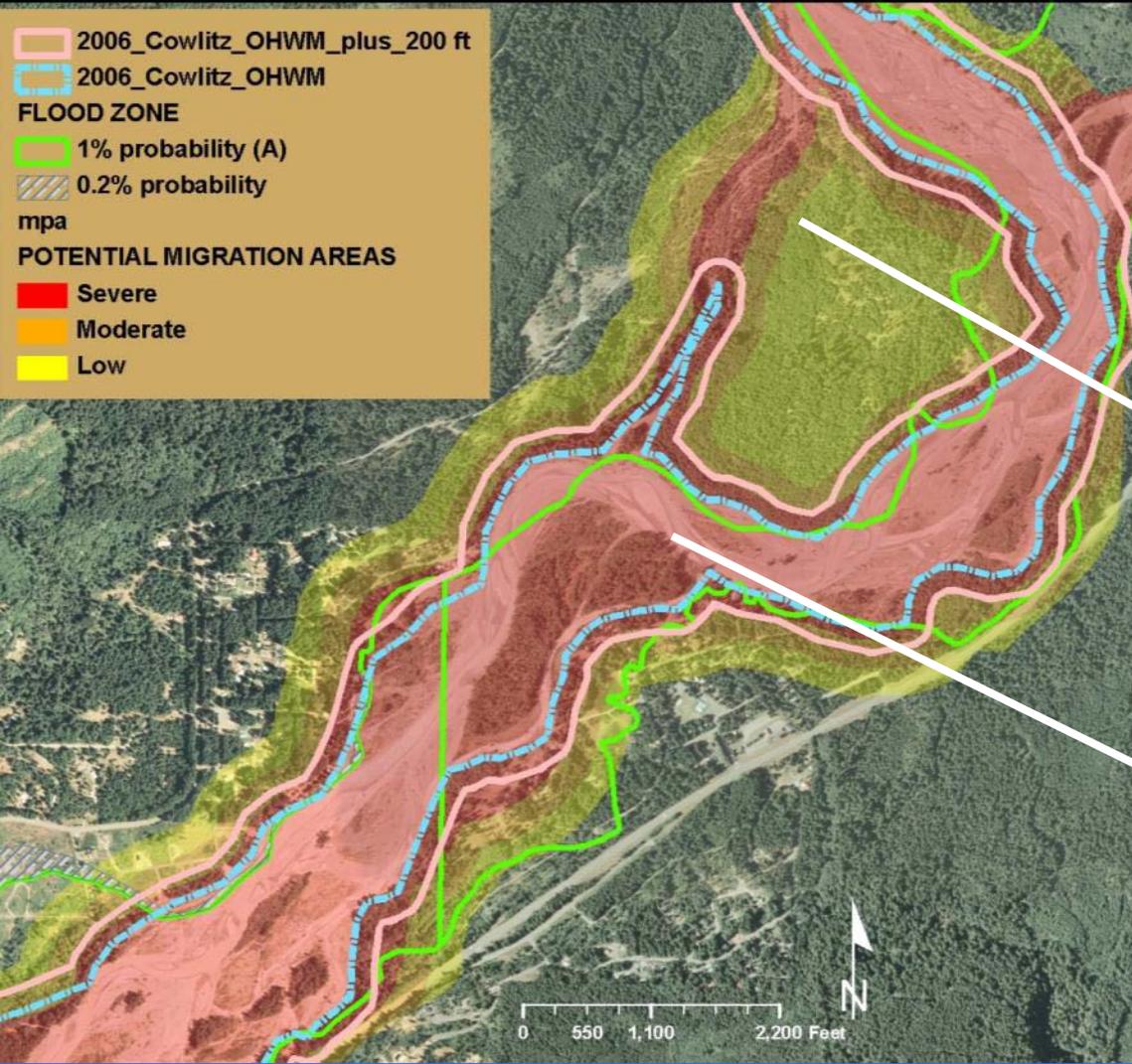
# Some things to avoid

- Assuming that artificial structure(s) less than exemption criteria limits channel migration
- Assuming that all bedrock stops channel migration

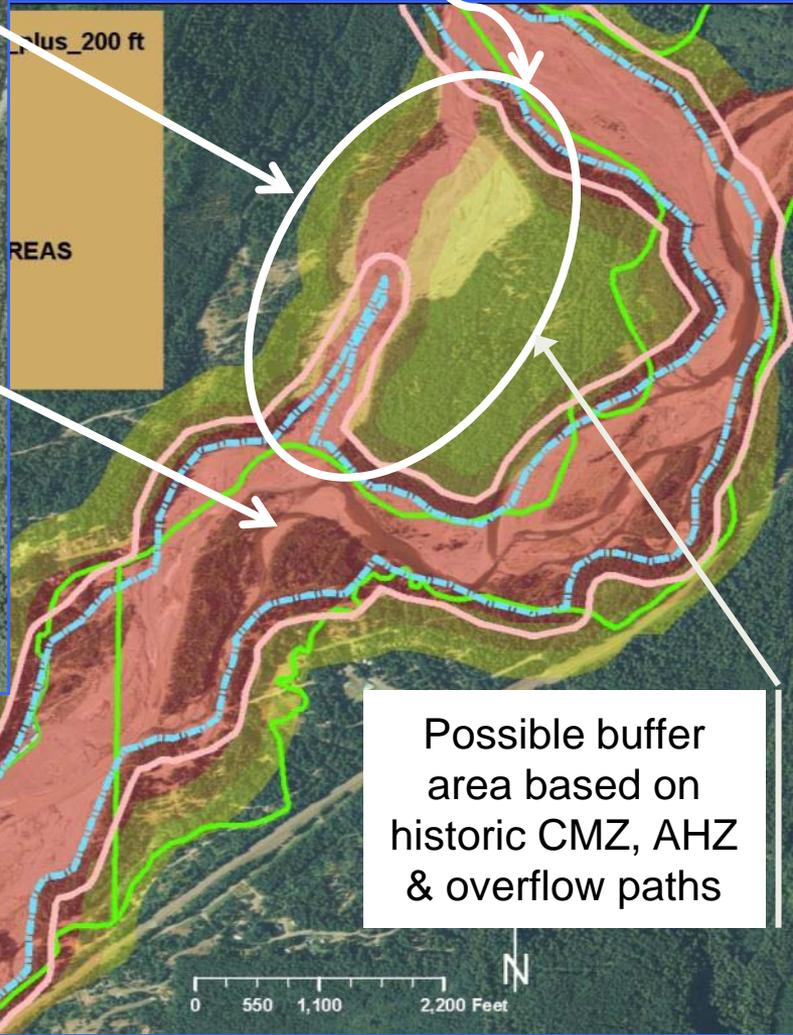


# Assuming that the floodplain and CMZ are synonymous





Outside jurisdiction



Assuming that minimum jurisdiction is sufficient to reduce flood/geologic hazards

Possible buffer area based on historic CMZ, AHZ & overflow paths

# Assuming that minimum jurisdiction is sufficient to reduce flood/geologic hazards

- Think about critical area buffers
  - **RCW 90.58.030 (SMA)**: Any city or county may also include in its master program land necessary for buffers for critical areas
- Jefferson County: "*...the limits of the floodplain, floodway, and channel migration zones...along with site-specific information on the location of the ordinary high water mark and associated wetlands, to determine the lateral extent of shoreline jurisdiction on a parcel-by-parcel basis.*"
  - *Increased Buffers: An increase in buffer width shall be required upon determination that the development would be:*
    - *ii. Susceptible to health and safety risks caused by ... channel migration;*
    - *iv. On steeply sloped (> 25%) land adjacent to the ordinary high water mark (EHZ)*

# Assuming that one size method/solutions/management fits all

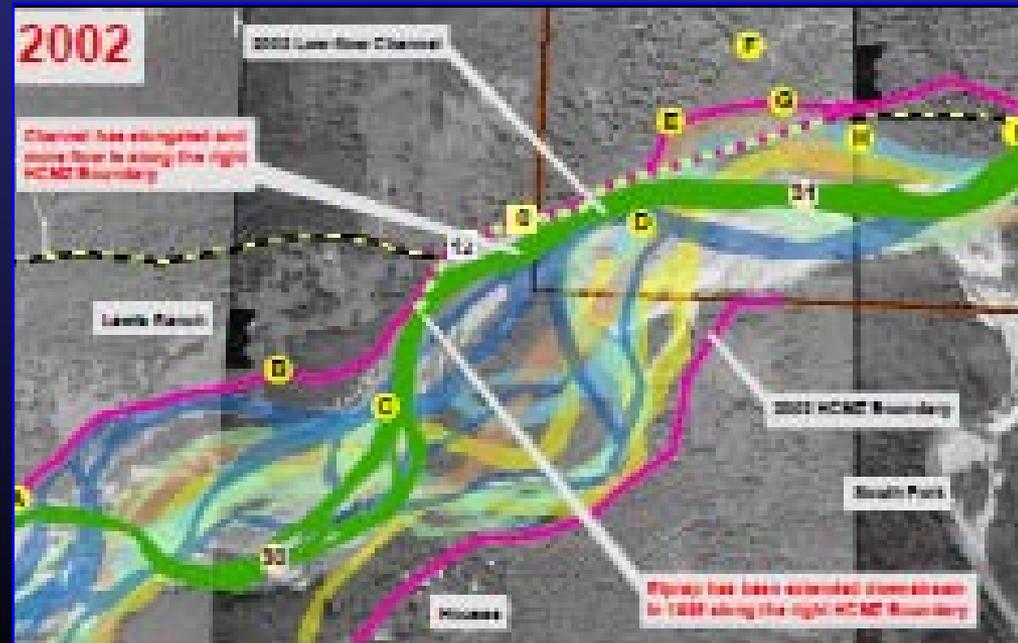
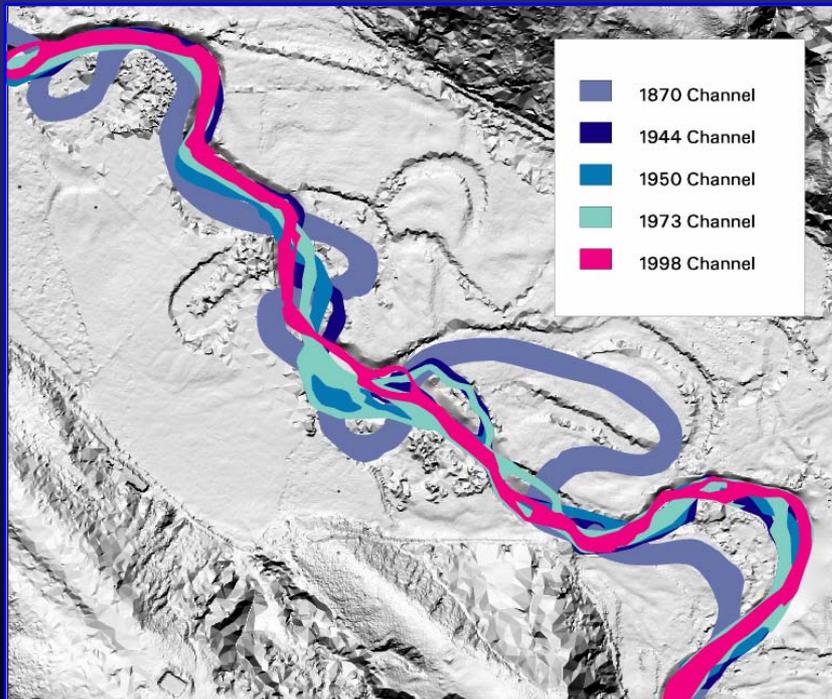
- WAC definition states that CMZ should be: “considered with the characteristics of the river and its surroundings”

Valley setting—  
Glacial Trough

Valley setting—  
Holocene Incised Floodplain

- Pool-riffle: single to multi-channel
- Valley bottom wetlands, oxbows
- Wide floodplains
- More predictable migration

- Few valley bottom wetlands, more floodplain sloughs, multiple channels
- FEMA floodplain may not coincide with main channel
- Changes can be rapid, abrupt—unpredictable, high migration rates



## Some other things to avoid

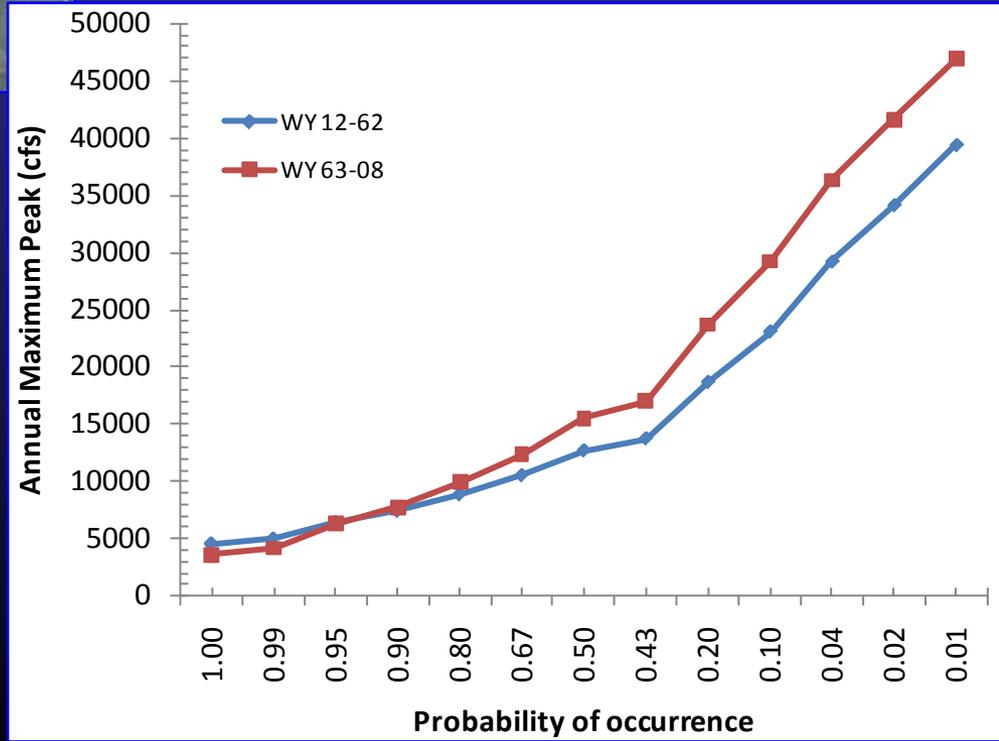
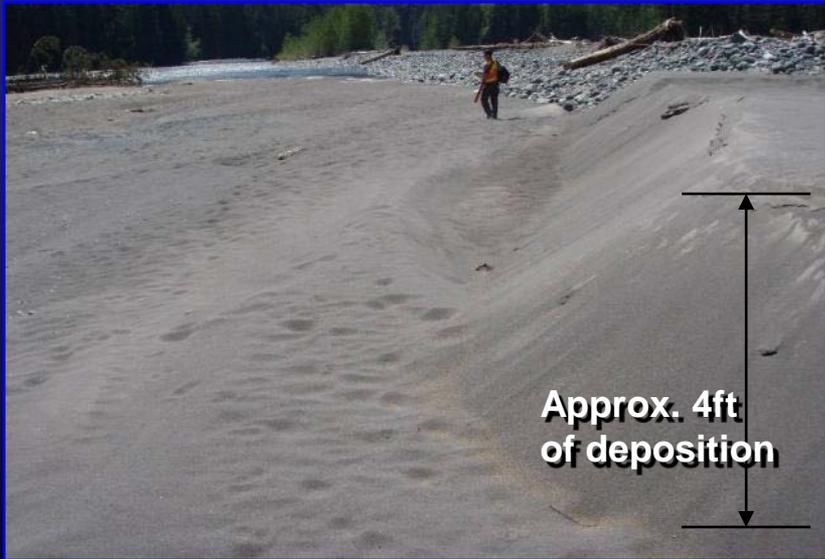
- Assuming that generally identifying CMZ is not a required element if mapping not previously done
- Assuming that smaller streams do not migrate
- Identifying reaches that may migrate but not putting reach on inventory and characterization maps
- Not providing a written description of methods and reach conditions

## Some things to consider

- Generally identify CMZ doesn't provide much information on processes and response
  - *"As a general rule, the less known about existing resources, the more protective shoreline master program provisions should be to avoid unanticipated impacts to shoreline resources." (WAC 173-26-201(3)(g))*
- Will likely require more detailed evaluations where contended
  - Evaluations should be done by a licensed geologist or engineer with at least 5 years experience in fluvial geomorphology
  - Example from Yakima SMP: *A qualified professional for channel migration zone reports must be a professional engineering geologist, civil engineer or geologist licensed in the state of Washington, with a minimum of five years of professional experience in geomorphology*



Climate change adaptations:  
 Past channel migration  
 controlling regimes may not  
 equal future regimes



## Contact Info

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