

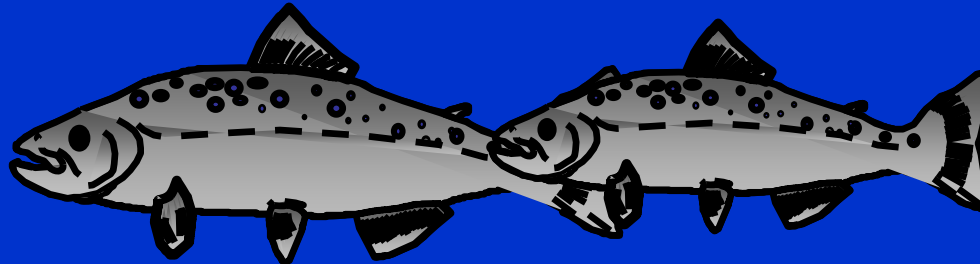
# 2009 Science and Mgmt Conference

## Flood Panel Discussion

**Nancy Lillquist**  
Mayor  
City of Ellensburg

**William Meyer**  
Habitat Biologist  
WDFW

**Scott Nicolai**  
Habitat Biologist  
Yakama Nation - YKFP



# Checkmate!









2006 - Upper Cle Elum  
River





2005 - At the Central Regional Office  
of the Department of Ecology...



# 1996 Flood



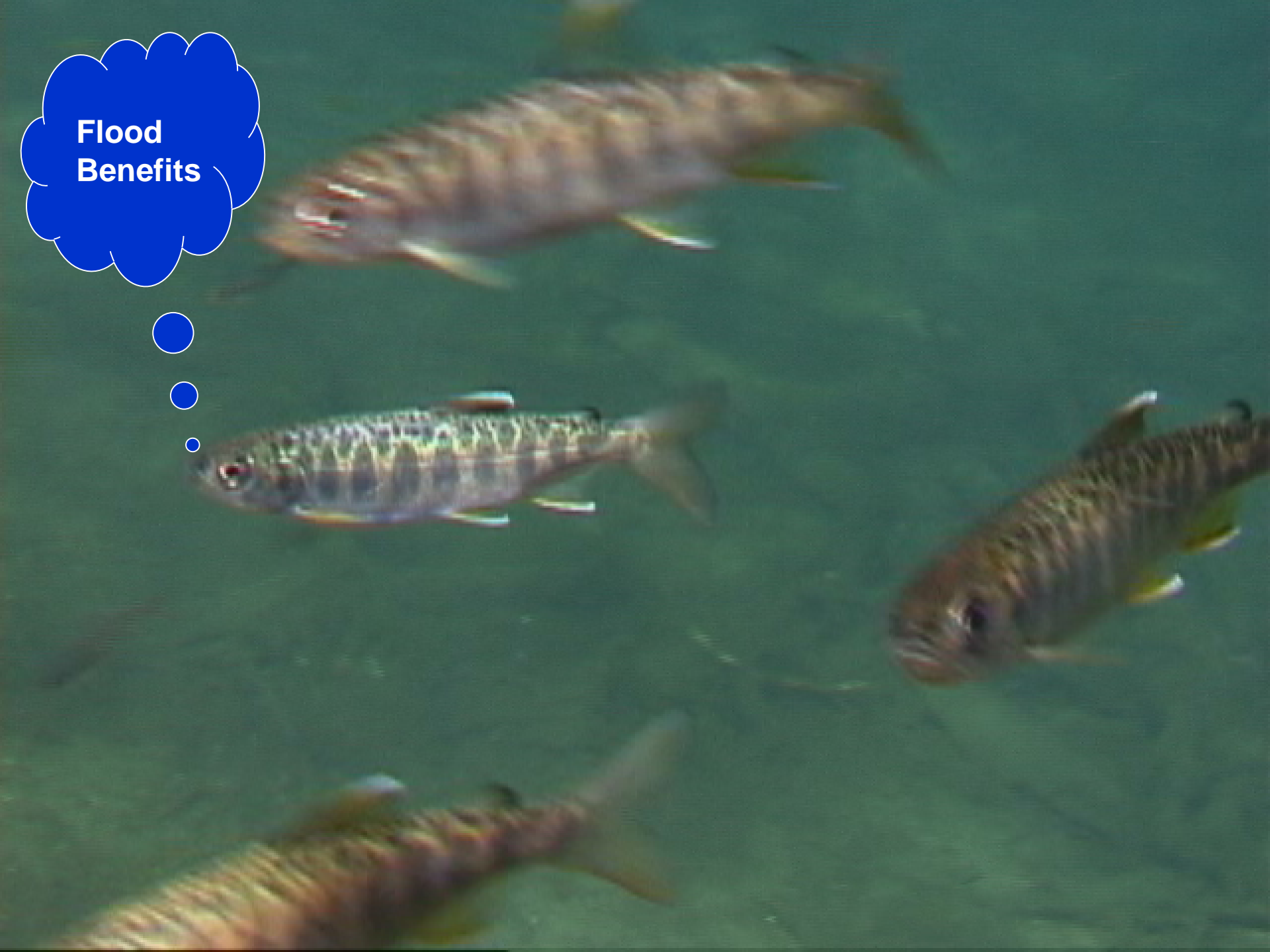


2009 Flood

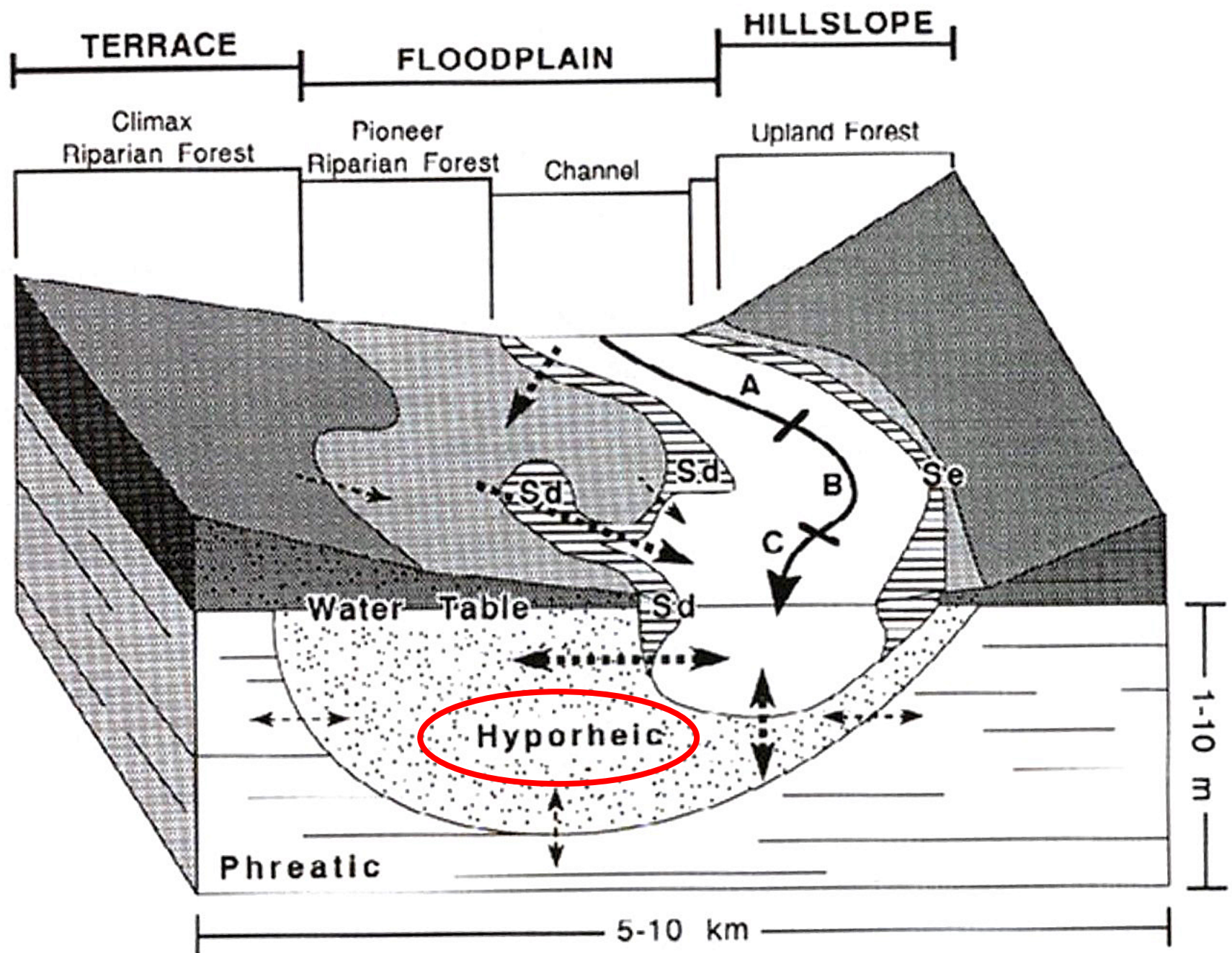




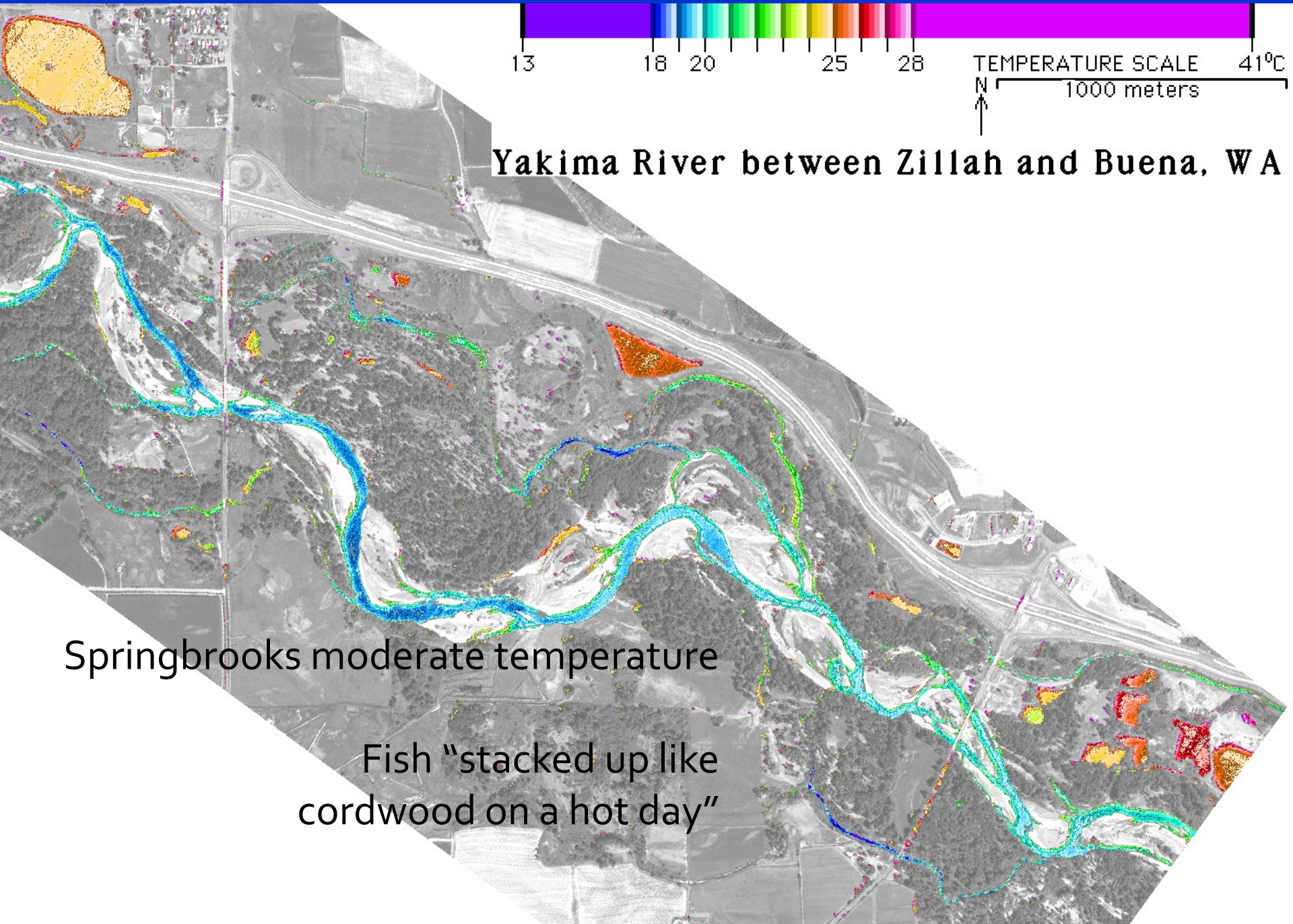
**Flood  
Benefits**











**Yakima River between Zillah and Buena, WA**

Springbrooks moderate temperature

Fish "stacked up like cordwood on a hot day"





# City of Ellensburg - Early Settlement



*Ellensburg*

*Jan - 1900*

*Wash.*



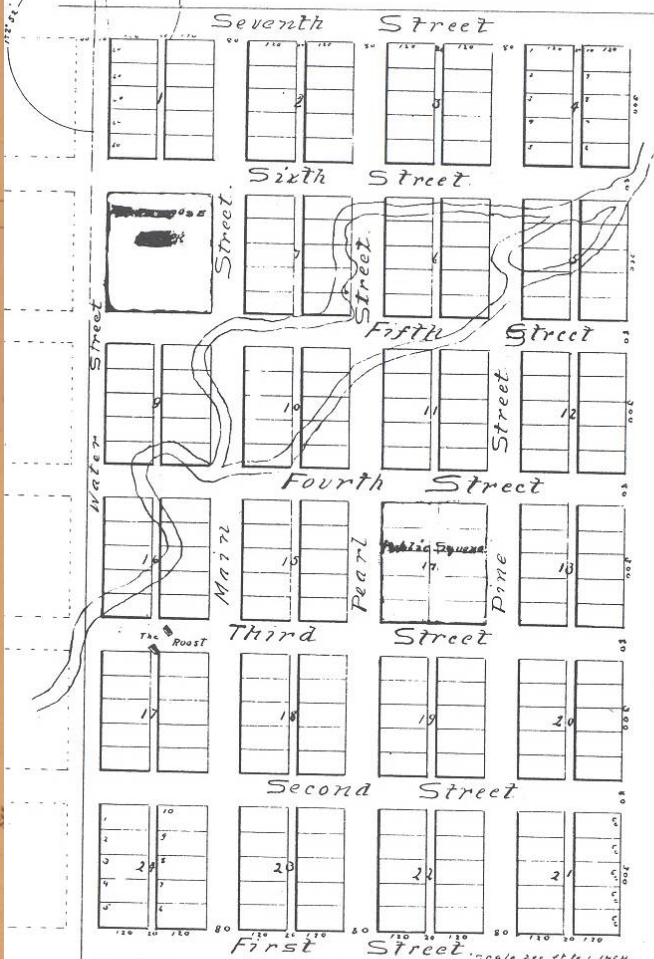


# ELLENSBURG

KITTITAS YAKIMA CO. W.T.

SEC. 35 T15N. R16E. SURVEYED 1873. BY ALKNOWLTON, C.E.

one quarter post  
 section 2  
 Located in the N 1/4 - E 1/4 of Sec. 2, T15N. R16E. W.M.  
 Yakima Co. Washington Ter.



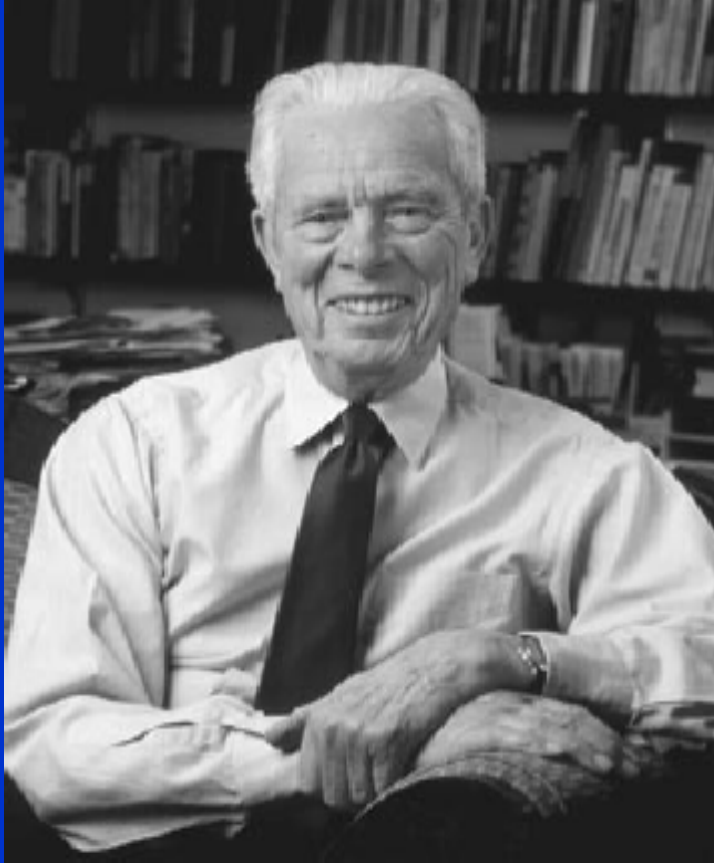
I hereby certify that the foregoing Township was recorded in  
 Book A of the Record of Townships on page 132 July 20<sup>th</sup> 1875  
 Ed Whitson  
 Auditor of Yakima Co W.T.







# Human Adjustments to Floods



Gilbert White, Geographer

1. Elevation
2. Flood Abatement  
(watershed mgt)
3. Flood Protection  
(levees, channels, etc)
4. Emergency Measures
5. Structural Alterations  
(floodproofing, codes)
6. Land Use (zoning)
7. Relief (public or private)
8. Insurance (indemnification)

# National Flood Insurance Program

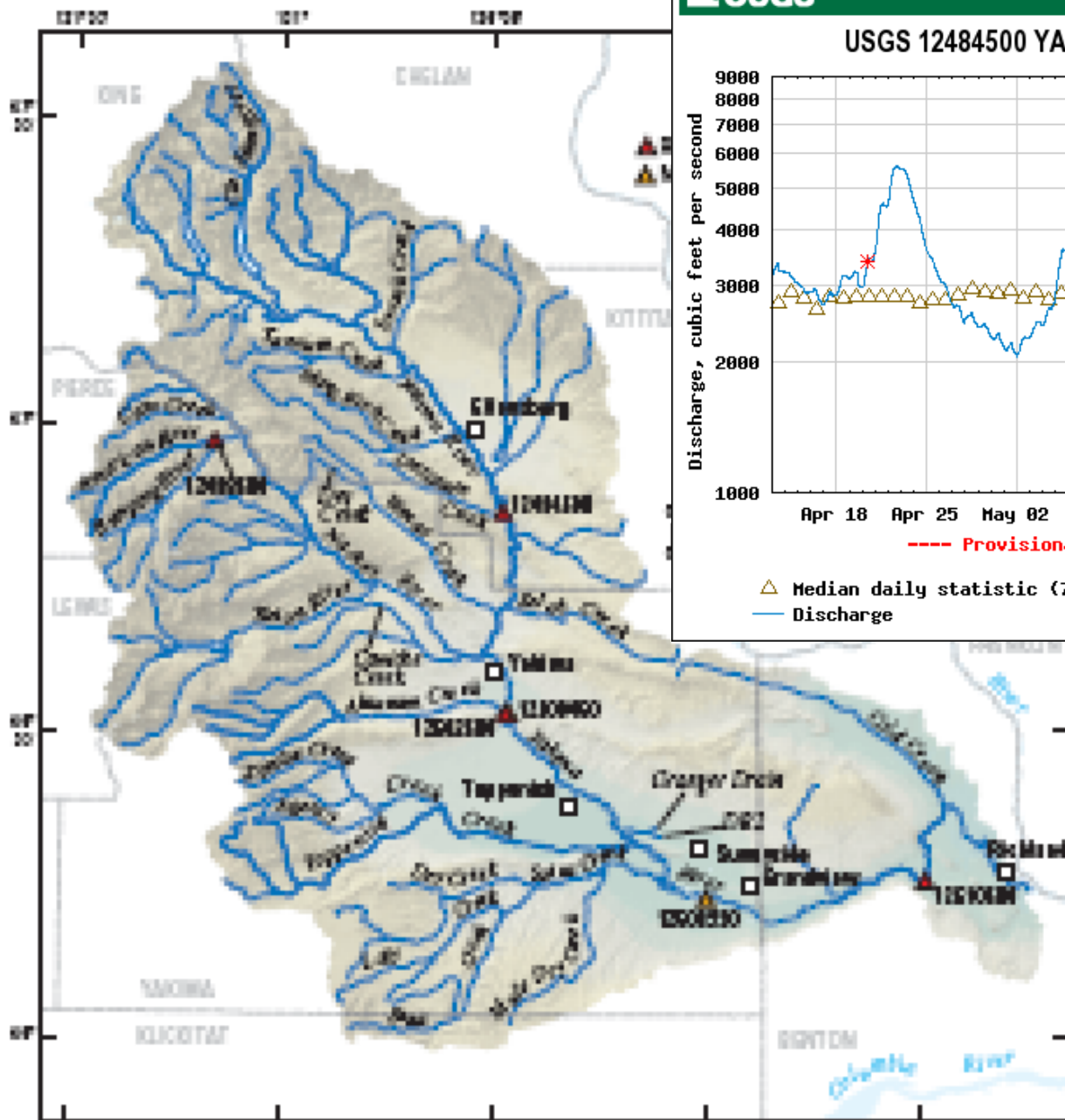
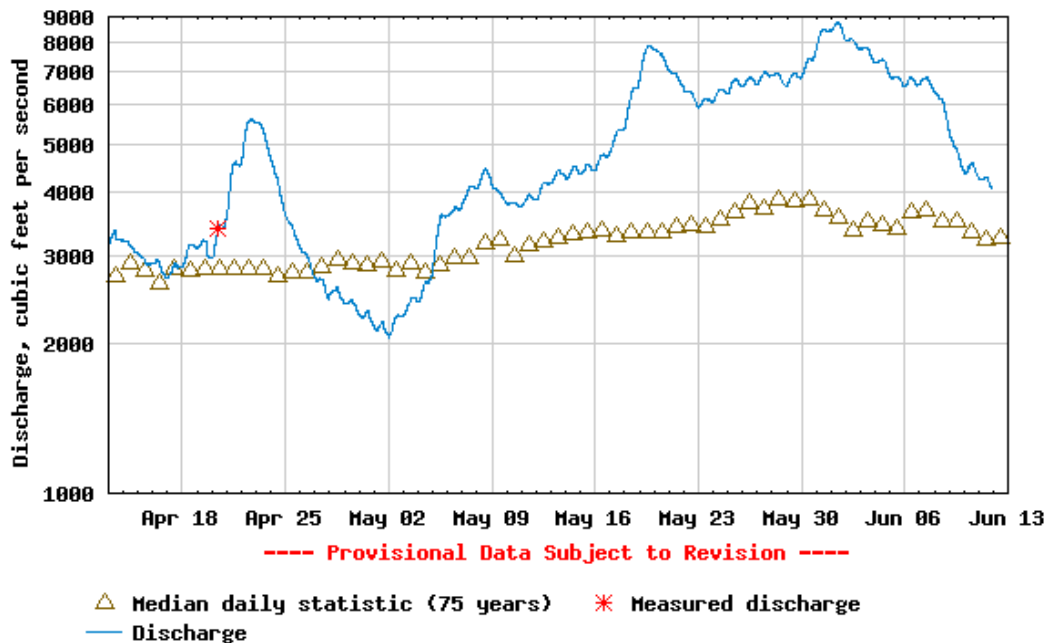
- Federal role:
  - Identify flood-hazard areas and calculate risk
  - Set flood insurance premium rates
  - Establish criteria for construction in floodplains
- State role: Authorize and assist locals
- Local role: Adopt regulations that meet NFIP standards to make insurance available
- Private: Market and service flood insurance policies



# Mapping flood hazard areas



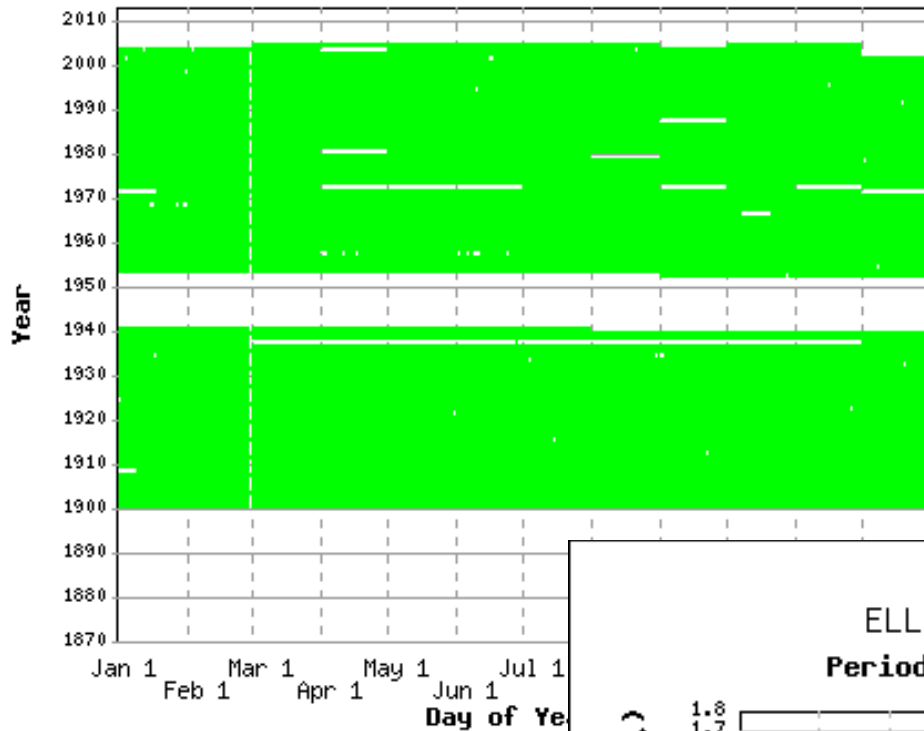
### USGS 12484500 YAKIMA RIVER AT UMTANUM, WA



River  
flow  
records

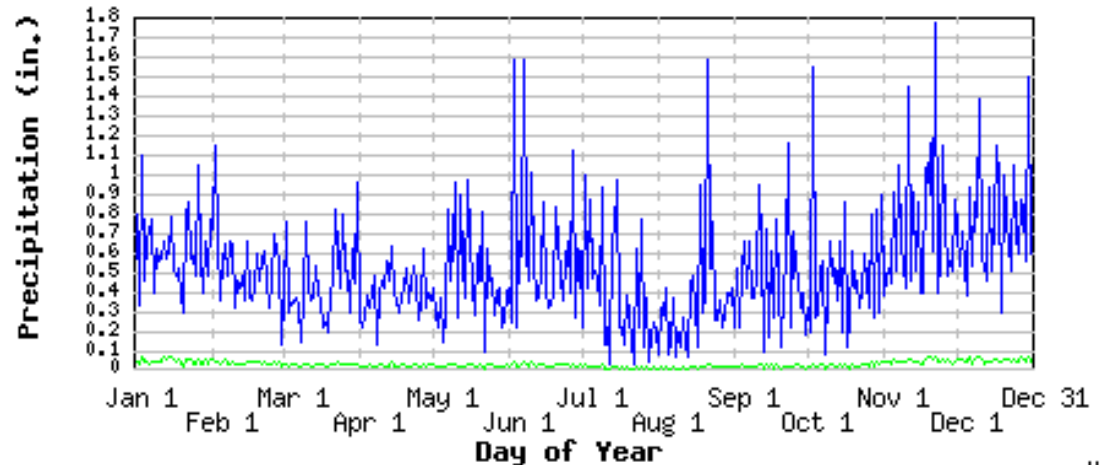


ELLENSBURG, WASHINGTON (452505)  
Observed Element : Daily Total Precipitation



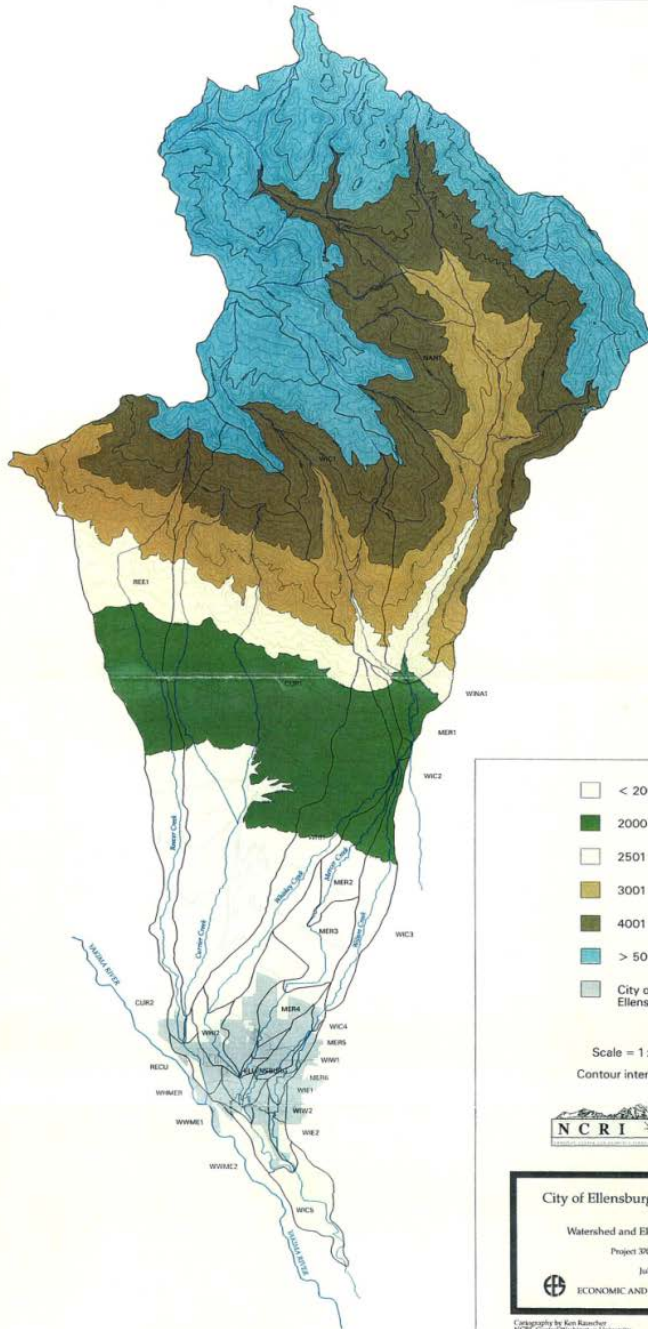
# Rainfall Records

ELLENSBURG, WASHINGTON (452505)  
Period of Record : 1/ 1/1901 to 11/30/2005



— Extreme — Average

# Runoff hydrology



- < 2000 ft
- 2000 - 2500 ft
- 2501 - 3000 ft
- 3001 - 4000 ft
- 4001 - 5000 ft
- > 5000 ft
- City of Ellensburg

Scale = 1 : 24,000  
Contour interval 100 feet

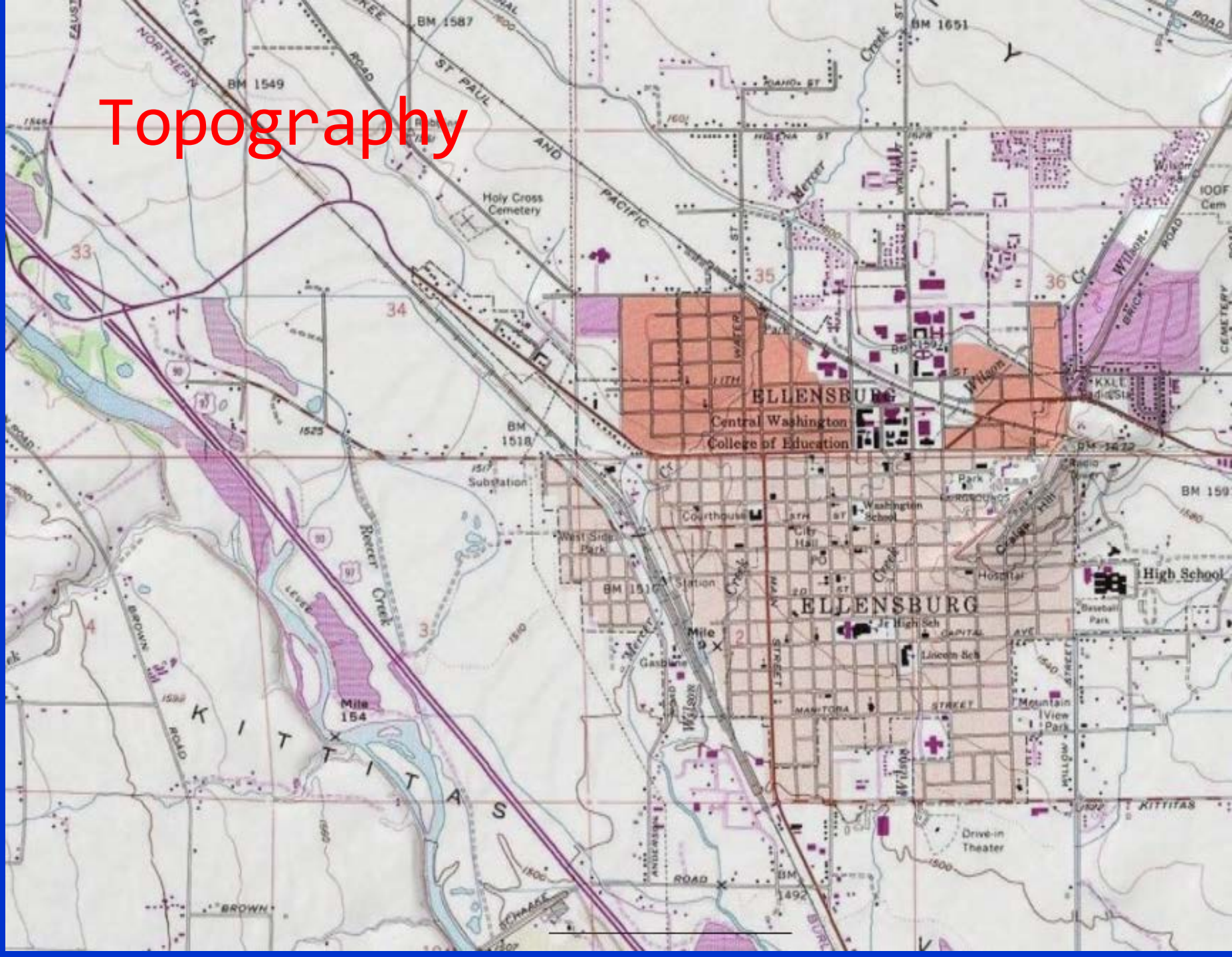


City of Ellensburg Flood Control Plan  
Watershed and Elevation Zones  
Project 3P015, 3P020  
July, 1998  
ECONOMIC AND ENGINEERING SERVICES, INC.

Cartography by Ken Rauscher  
NCRINW, Central Washington University



# Topography

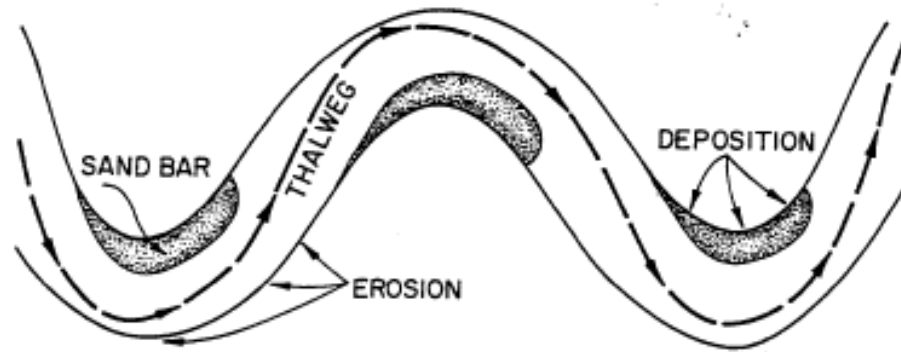




# Antecedent conditions





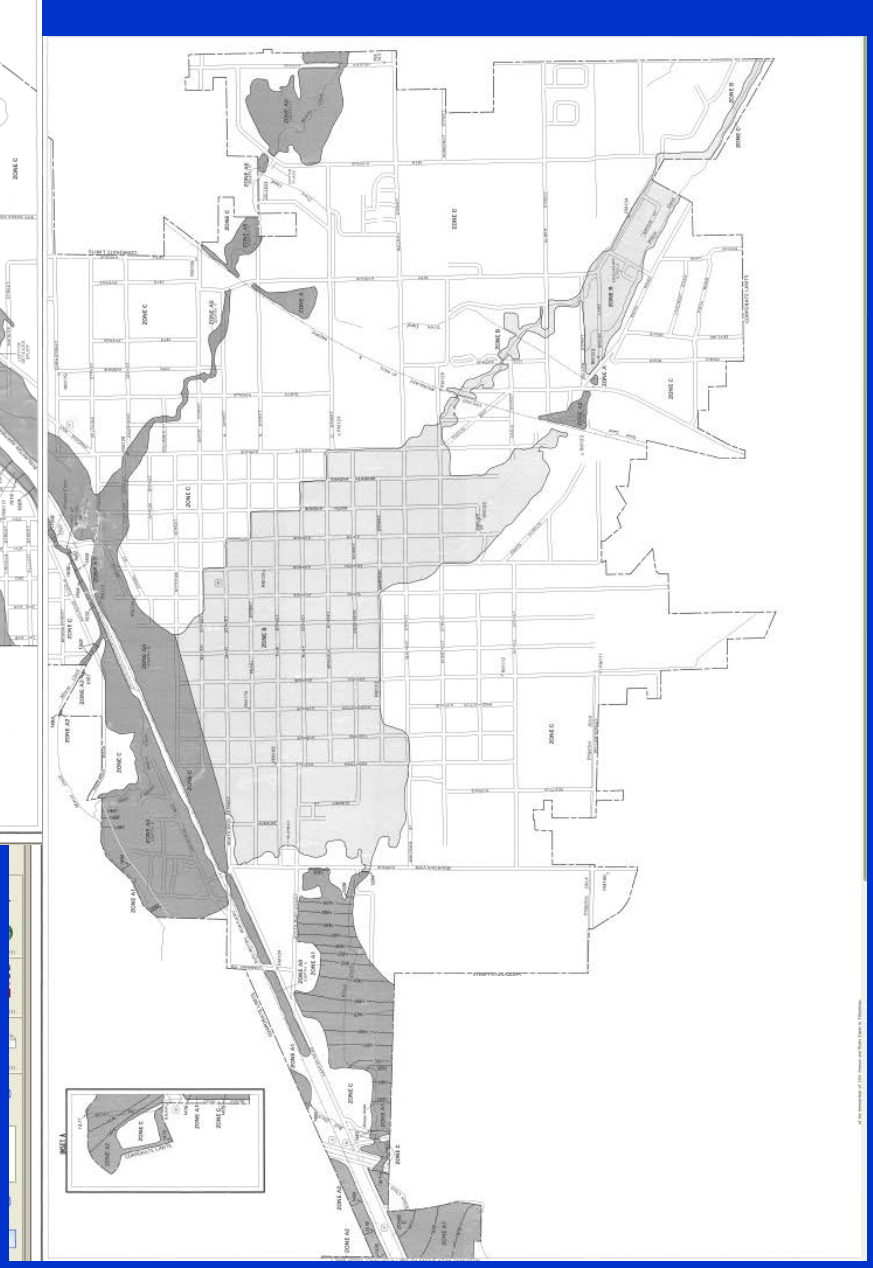
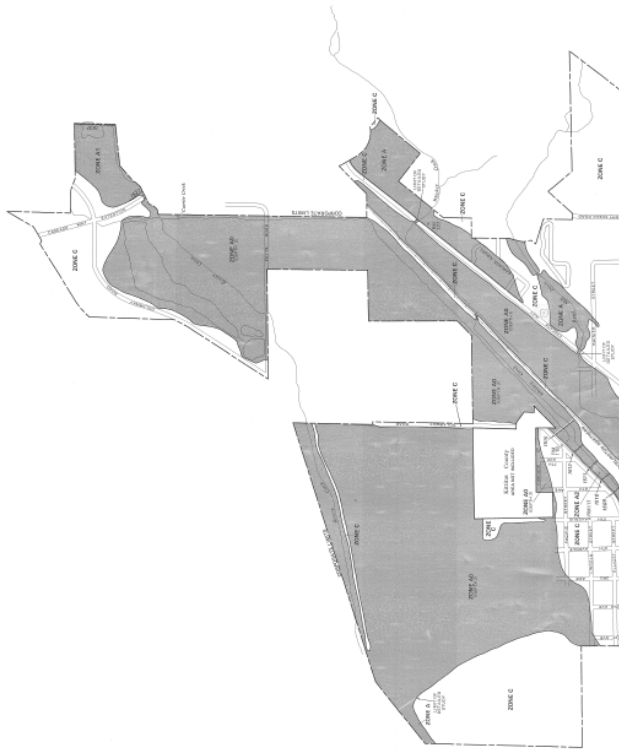


**Figure 1- 4. Erosion changes the shape of channels**



**Figure 1-5. Riverine erosion can undercut structures**

# Ellensburg FIRMS map 1980





# FEMA criteria for construction in floodplains

# FEMA criteria for construction in floodplains

- Require local permit for construction in SFHA



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- Require local permit for construction in SFHA
- Floodplain building materials and methods
  - Residential to or above Base Flood Elevation
  - Non-residential floodproof
    - Watertight
    - Withstand hydrostatic, hydrodynamic, impact forces

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- Prohibit encroachments resulting in >1 ft increase in base flood elevation
- Allows map amendments -- fill to above BFE

# FEMA Flood Insurance



- Low participation rate
- \$\$\$ loss increasing



# Ellensburg Floodplain code



# Ellensburg Floodplain code



- **Critical Areas Ordinance June 2009**



# Ellensburg Floodplain code

A photograph showing a house partially submerged in floodwaters. The house is on the left side of the frame, with its lower portion underwater. The water is dark and reflects the overcast sky. In the foreground, there is a patch of snow-covered ground with some grass visible. The background shows a line of bare trees under a grey, overcast sky.

- **Critical Areas Ordinance June 2009**
- **Frequently Flooded Areas Report**
  - ▣ **Flood Hazard Assessment**

# Ellensburg Floodplain code

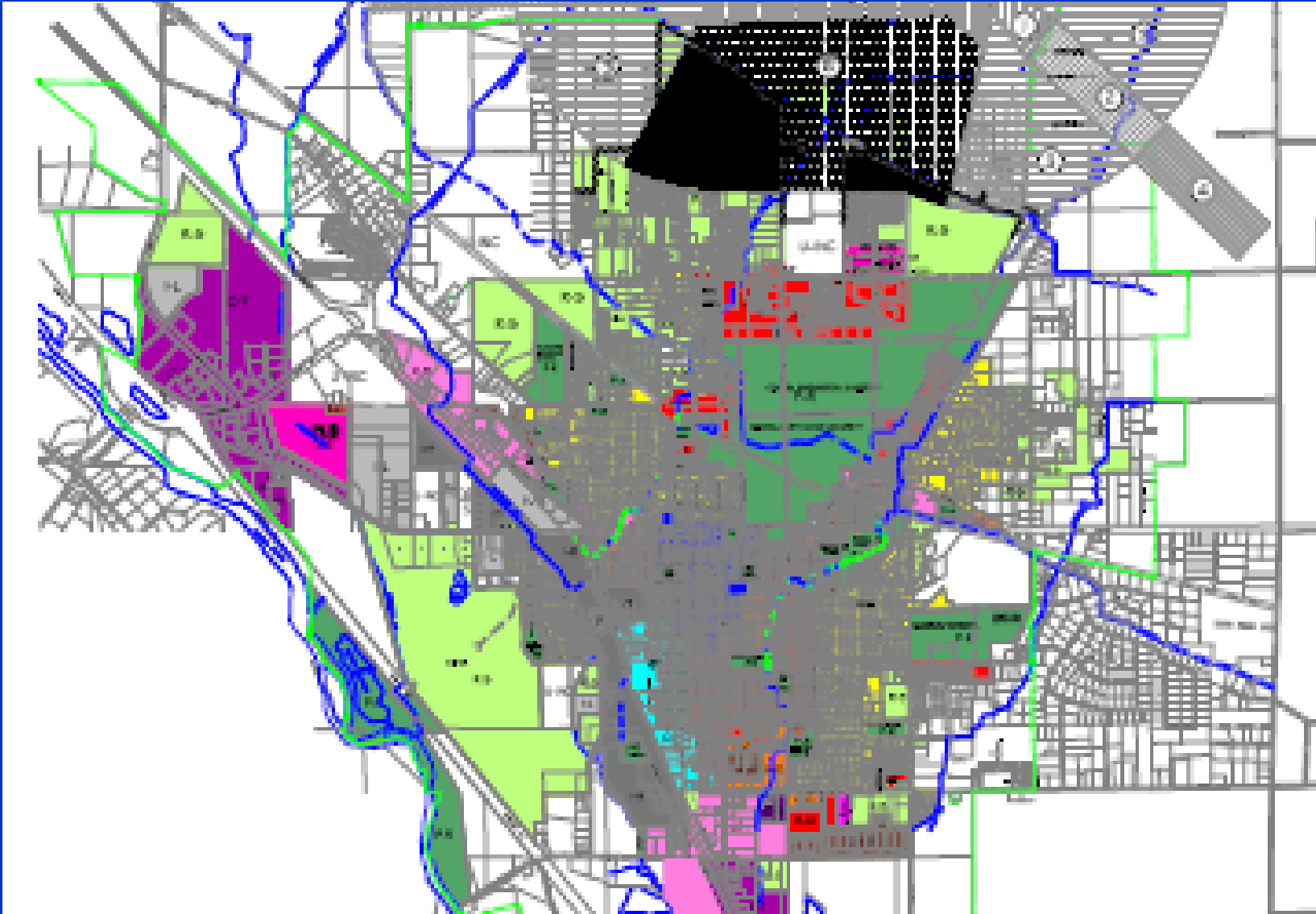
- **Critical Areas Ordinance June 2009**
- **Frequently Flooded Areas Report**
  - **Flood Hazard Assessment**
- **Construct one foot above BFE**



# Ellensburg Floodplain code

- **Critical Areas Ordinance June 2009**
- **Frequently Flooded Areas Report**
  - **Flood Hazard Assessment**
- **Construct one foot above BFE**
- **No net rise from encroachments**

# Zoning





# Stormwater detention

**Stormwater  
Management**   
FOR EASTERN WASHINGTON

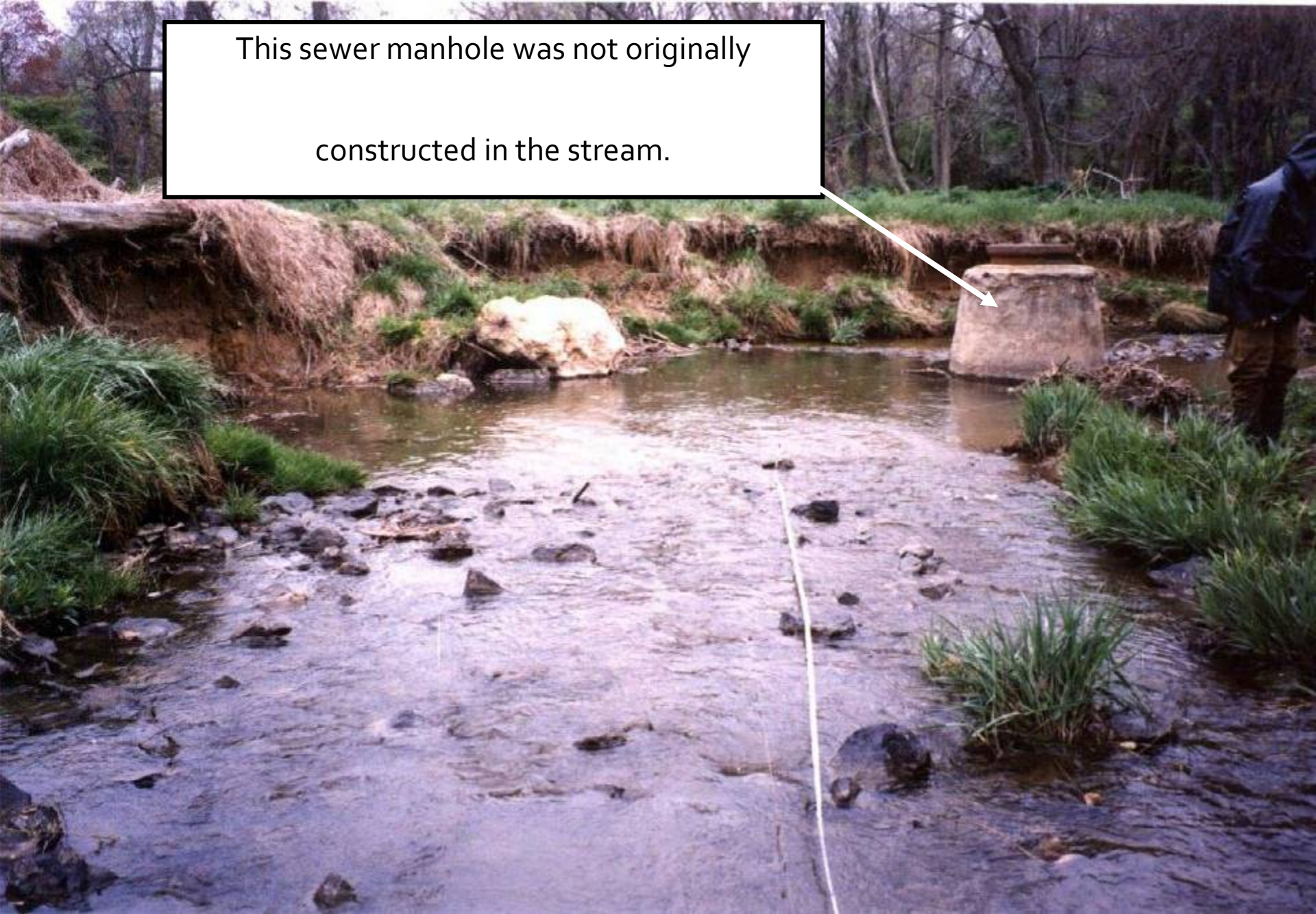
**Stormwater Management Manual  
for Eastern Washington**

---





This sewer manhole was not originally  
constructed in the stream.





# January 2009 Flood - Ellensburg





# January 2009 Flood - Ellensburg



**Newly Priced**

**FOR SALE**

76 +/- ACRES • ZONED - CG

GREG LAYCOCK  
JANE LANFORD

**206-388-3000**

**Grubb & Ellis.**  
Property Solutions Worldwide

**Grubb & Ellis.**  
Property Solutions Worldwide

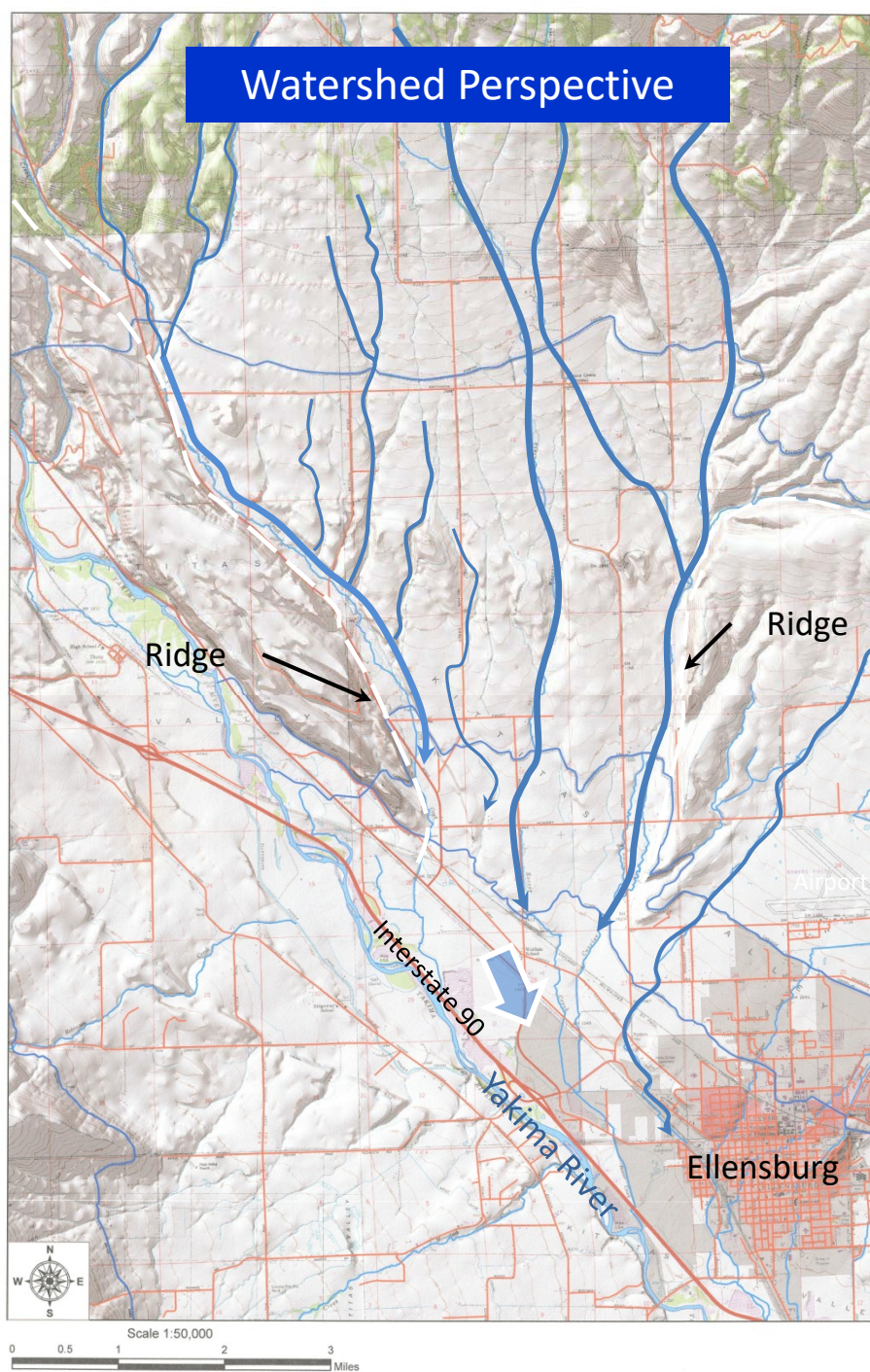
**308-388-3000**

JANE LANFORD  
GREG LAYCOCK

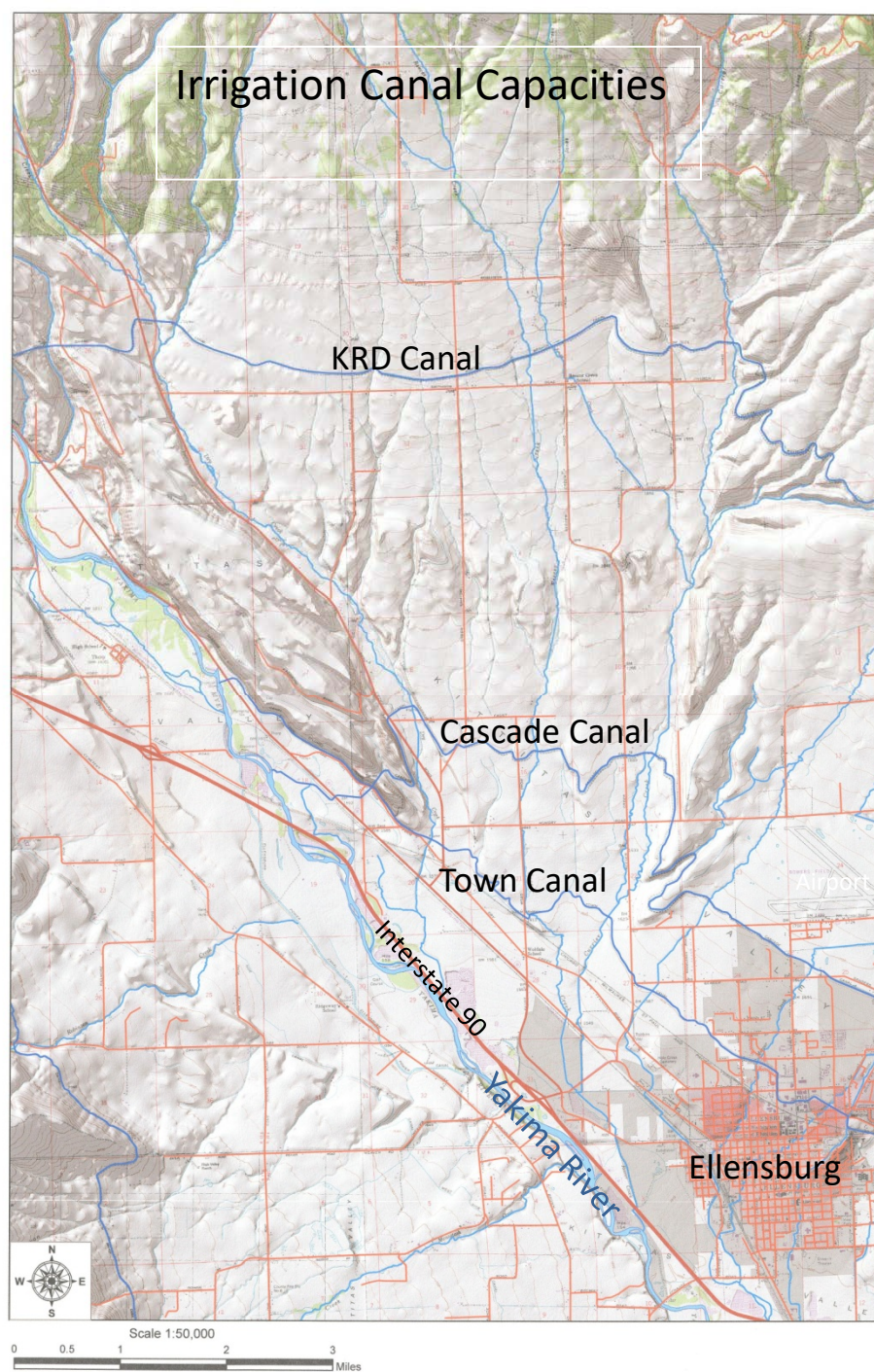
76 +/- ACRES • ZONED - CG



# Watershed Perspective



# Irrigation Canal Capacities







View

01.07.2009 15:01









Reecer Creek

Dry Creek Rd

Currier Creek

Town Canal

Reecer Creek Rd

01.07.2009 15:02



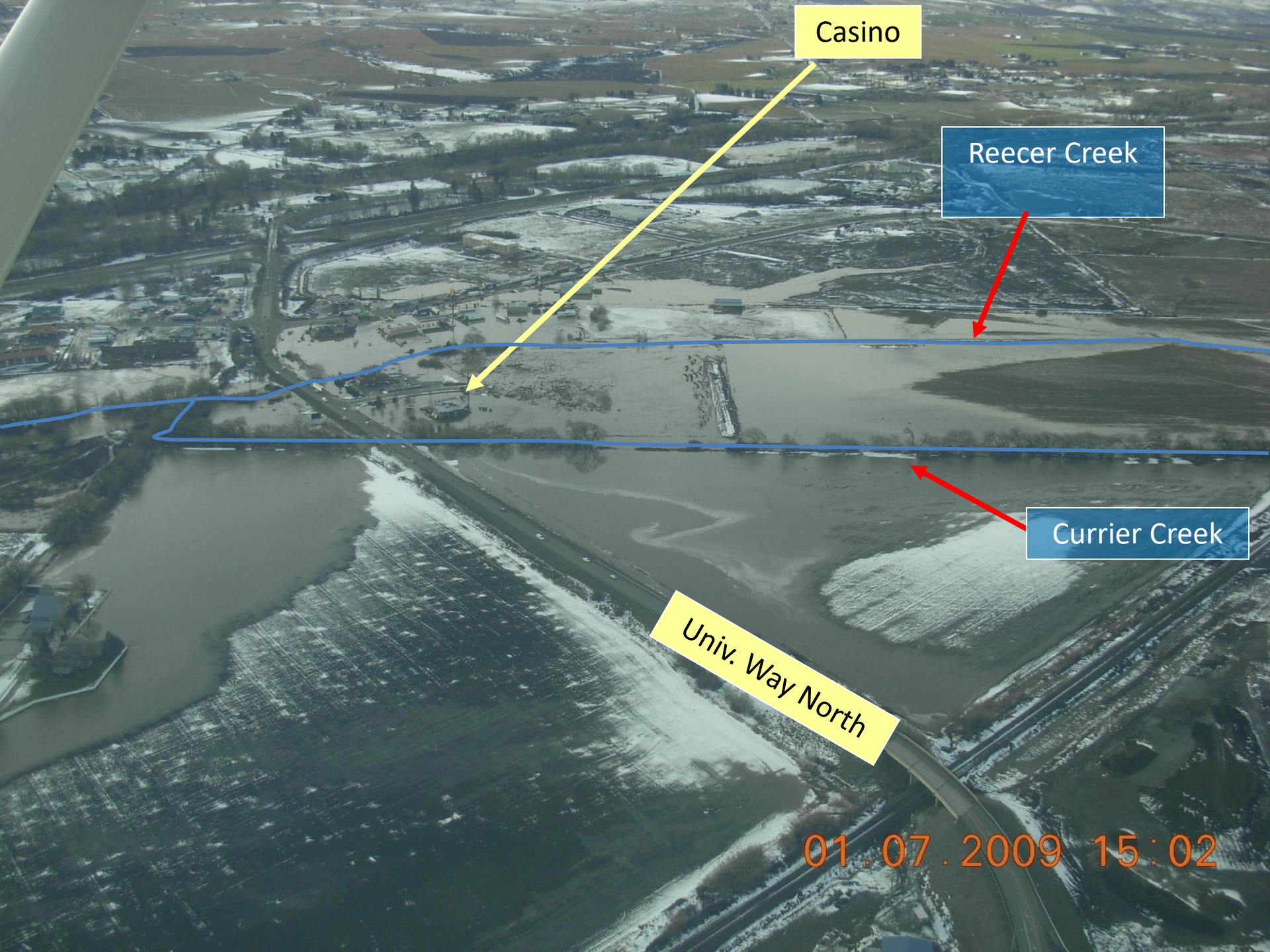
Casino

Reecer Creek

Currier Creek

Univ. Way North

01.07.2009 15:02







Reecer Creek

Dolarway Rd

Future Floodplain Project

Proposed City fill for industrial development

Calaway Trading

~ 900 feet

Center Point Business Park




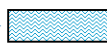

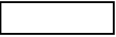




~ 1100 feet

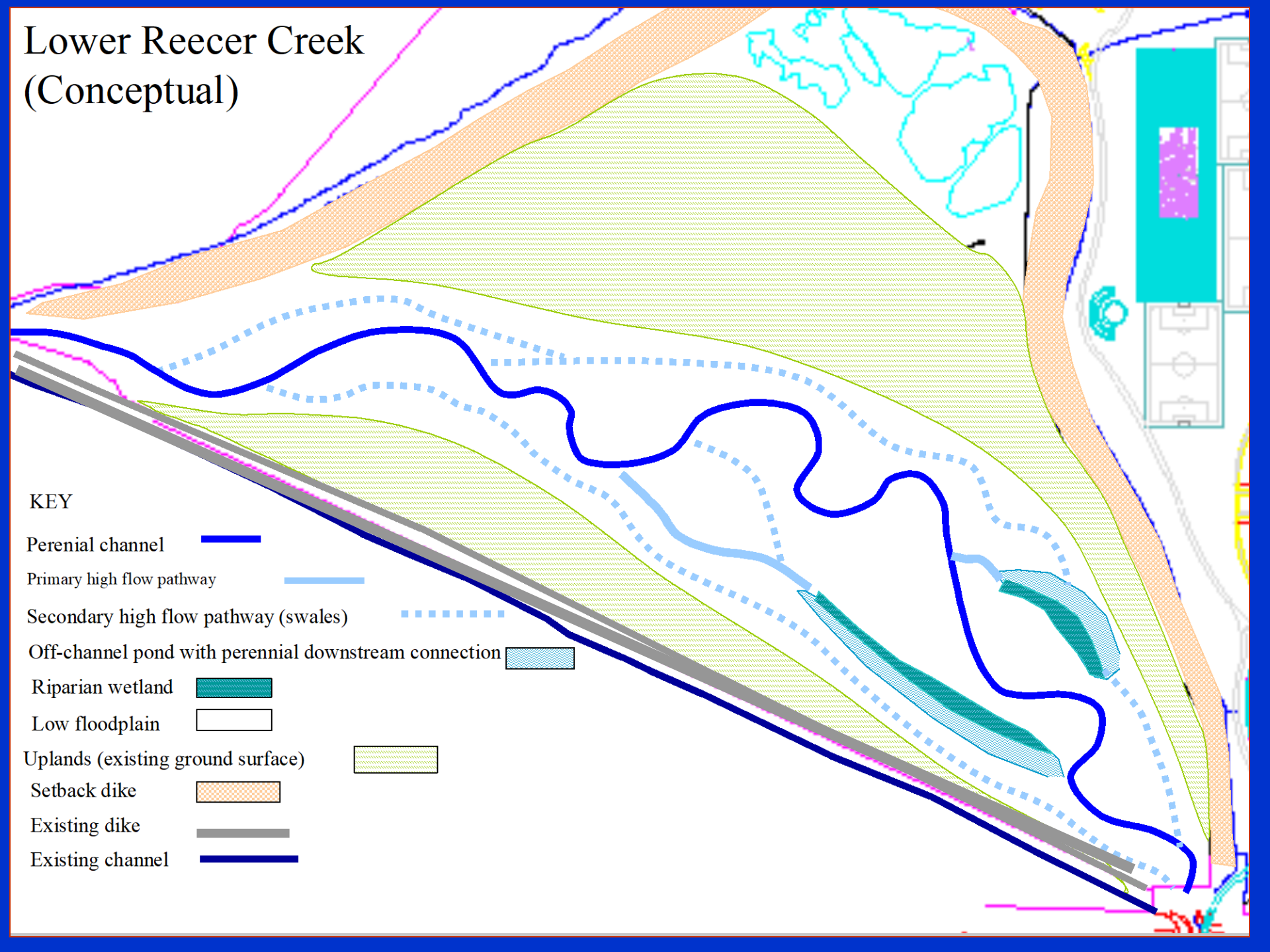
Pott Rd

01.07.2009 15:30

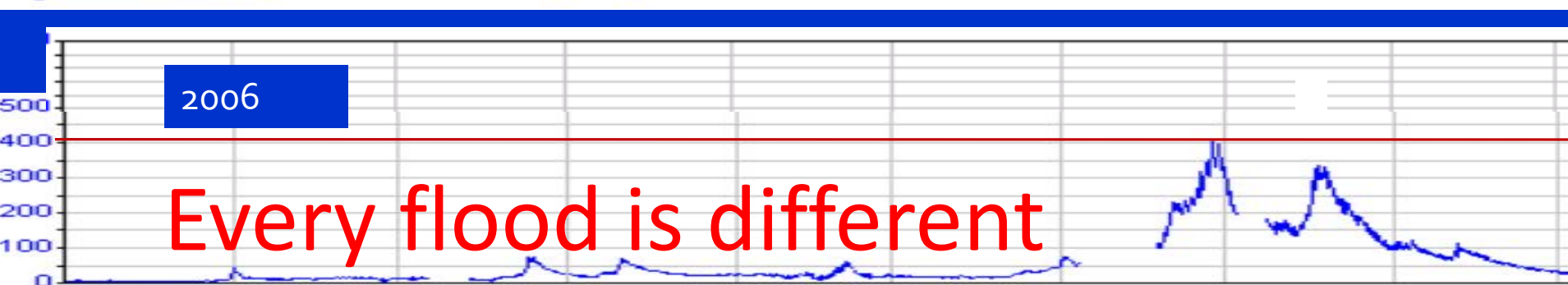
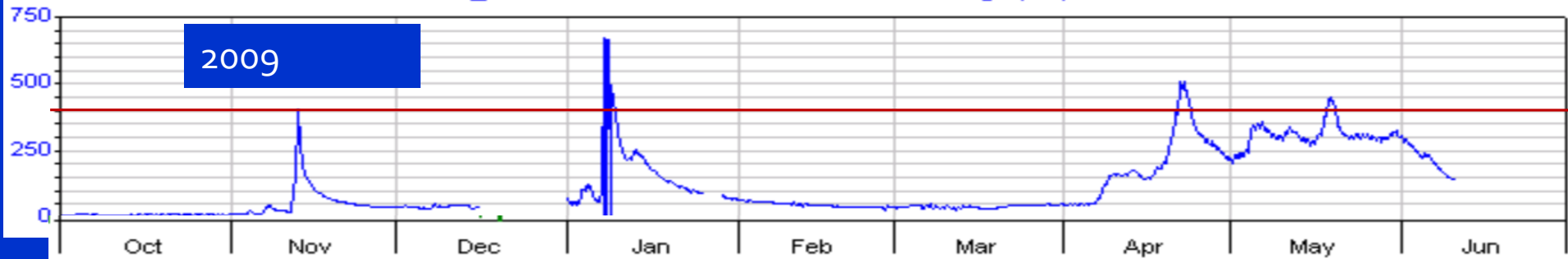
# Lower Reecer Creek (Conceptual)

## KEY

- Perennial channel 
- Primary high flow pathway 
- Secondary high flow pathway (swales) 
- Off-channel pond with perennial downstream connection 
- Riparian wetland 
- Low floodplain 
- Uplands (existing ground surface) 
- Setback dike 
- Existing dike 
- Existing channel 







Every flood is different

# 1956 Ellensburg @ 5<sup>th</sup> & Dolarway



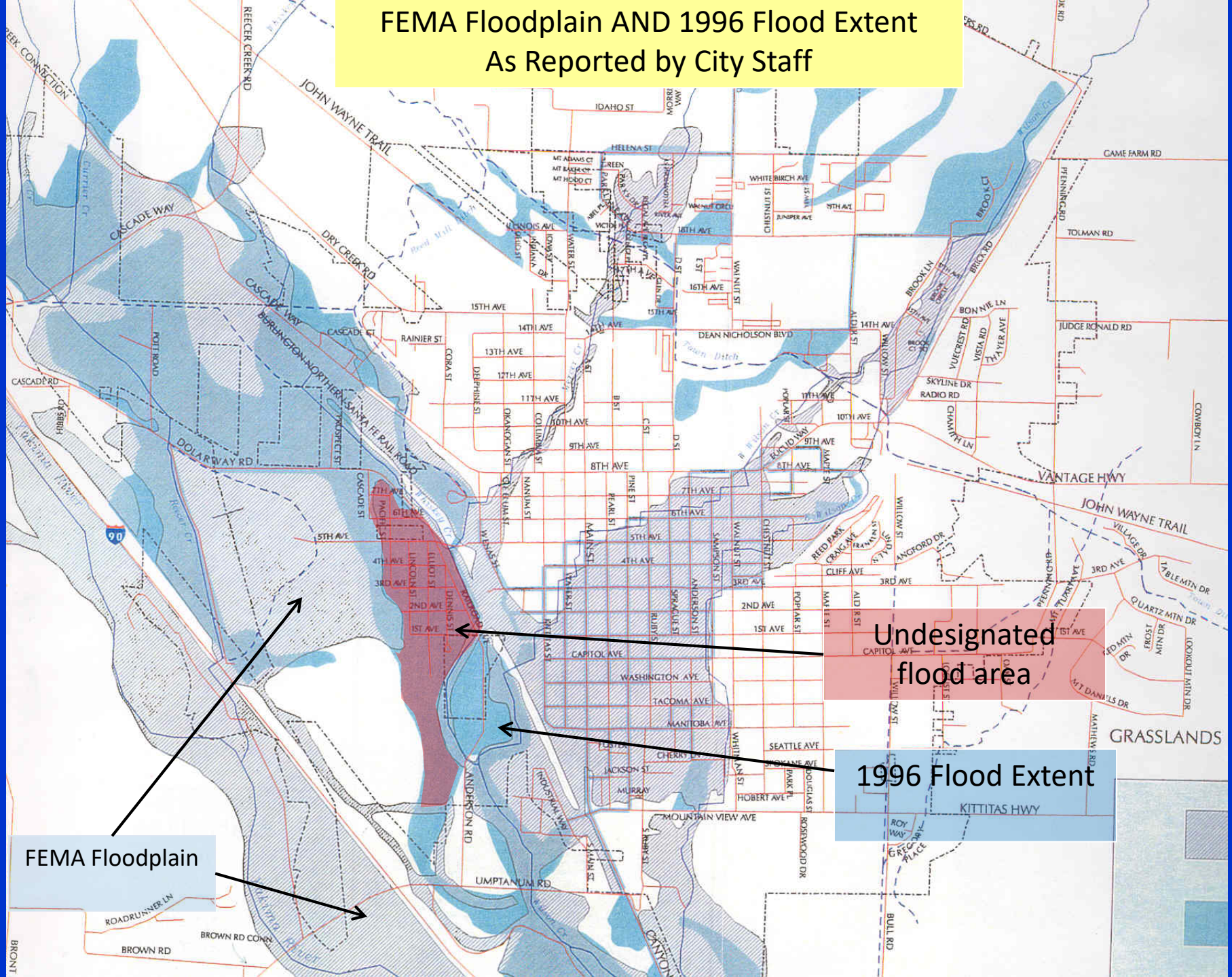


# 2009 Ellensburg @ 5<sup>th</sup> & Dollarway





# FEMA Floodplain AND 1996 Flood Extent As Reported by City Staff



Undesignated  
flood area

1996 Flood Extent

FEMA Floodplain





01.07.2009 15:11





01.07.2009 13:54

Dolarway Ponds Development



# Floodplain Success Stories

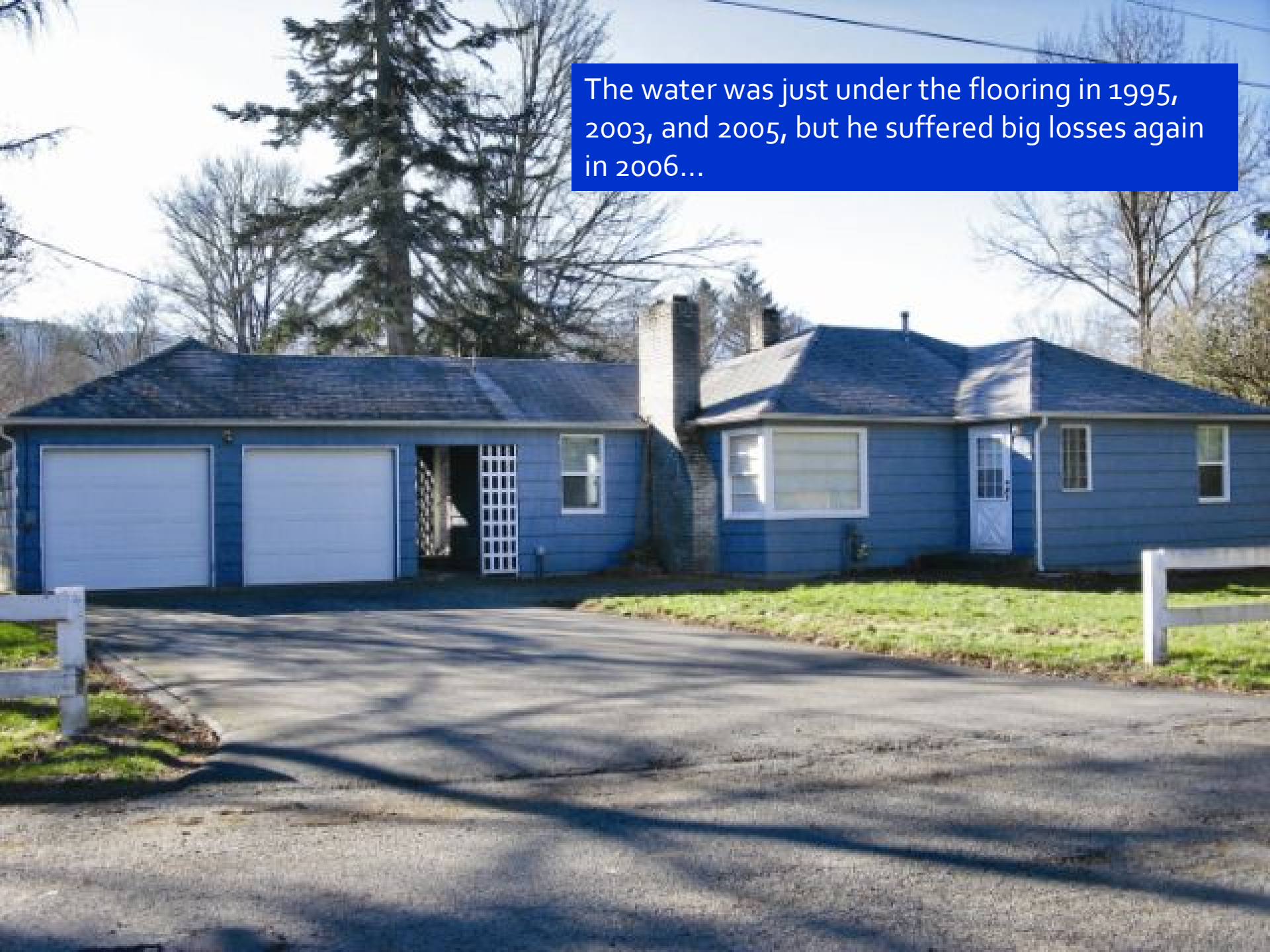
Not...

LOCAL  
ACCESS  
ONLY





The water was just under the flooring in 1995, 2003, and 2005, but he suffered big losses again in 2006...











A photograph of a wooded area with a blue text box overlaid. The scene shows a forest with many thin, bare trees. In the foreground, there is a large pile of dry, brown grass or straw. A blue rectangular box is positioned in the upper right quadrant of the image, containing white text. The background shows a dense forest of tall, thin trees, some of which are leaning. A small body of water is visible in the distance on the right side. The overall lighting is bright, suggesting a sunny day.

Hey, No Flood Damage...





Note floodwater leaves channel, and is routed toward high-density residential and commercial property

flood flow



01 07 2009 16:58





Location of Floodplain Restoration Project

North

01.07.2009 15:30



Boundaries for approved  
Planned Unit Development

stream  
flow

North

01.07.2009 15:30



Protected, so Bring on the  
Floodwater!





# The End...



Photograph by *T. Newsome Artistic Imagery*