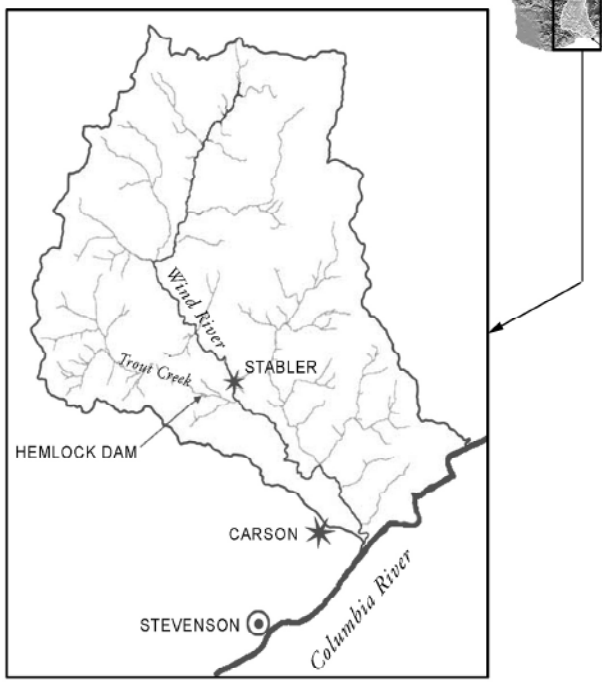
Hemlock Dam Removal

and

Lower Trout Creek Restoration

Presentation Outline

- Orientation
- Site history
- Project History
- Approach to dam removal
- Photo log



Wind River Watershed

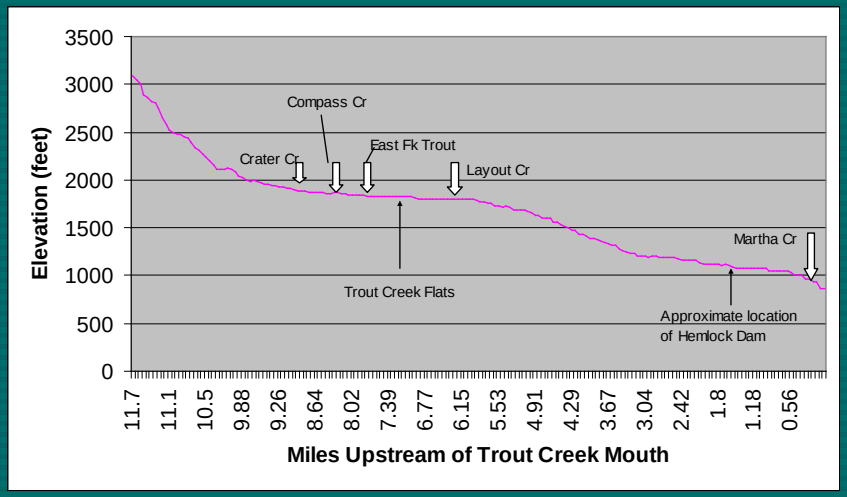
- 223 square mile drainage area
- 90% on national forest
- Steelhead – only native anad
- Tier I Key Watershed--NWFP
- Steelhead Recovery Plan: habitat over hatchery

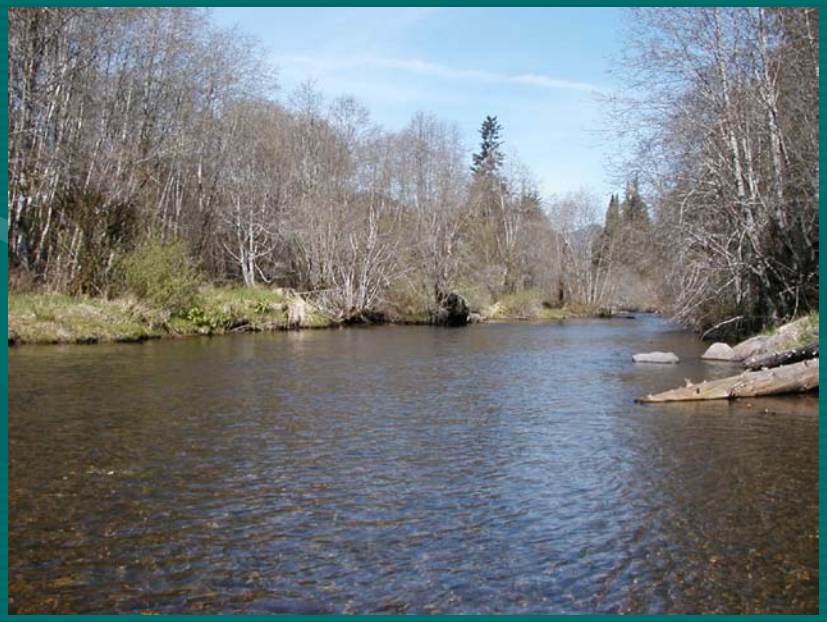
Trout Creek Subwatershed

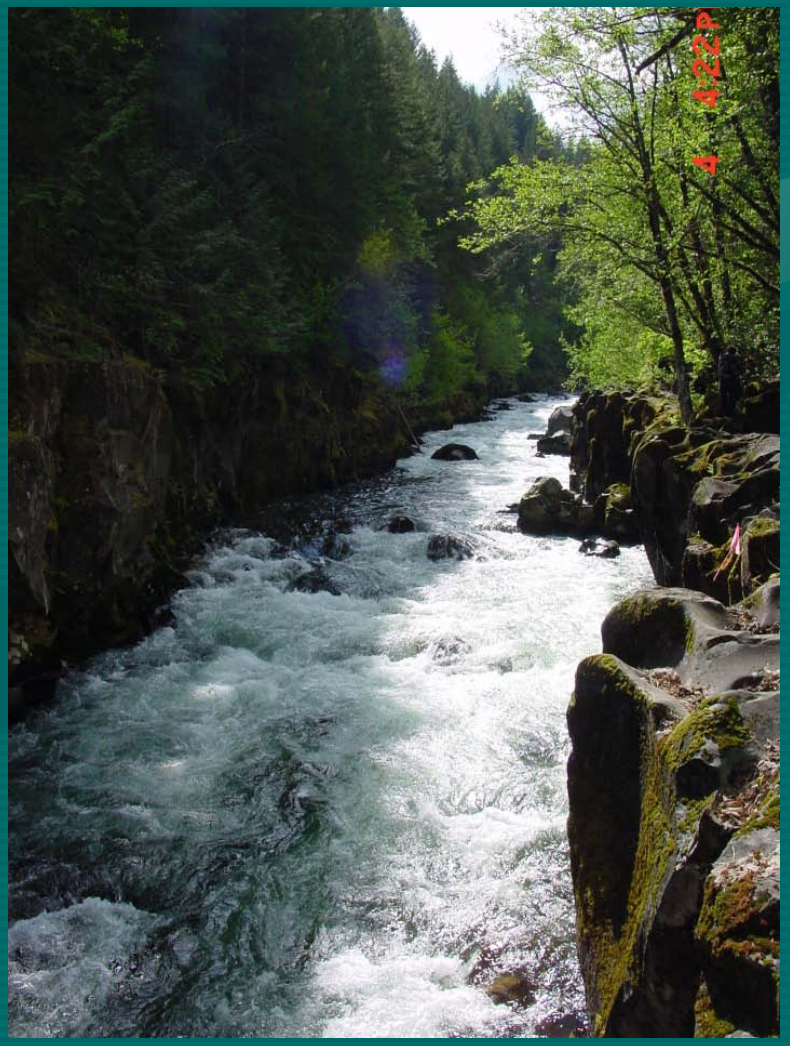
- 30 square mile drainage area
- Bankfull flow ~ 2,000 cfs
- Low flow ~ 20 cfs
- Annual adult steelhead return:

Historic estimates:	~ 1,000
Current average :	~ 60
Mid 1990's low:	~ 8

Profile of Trout Creek





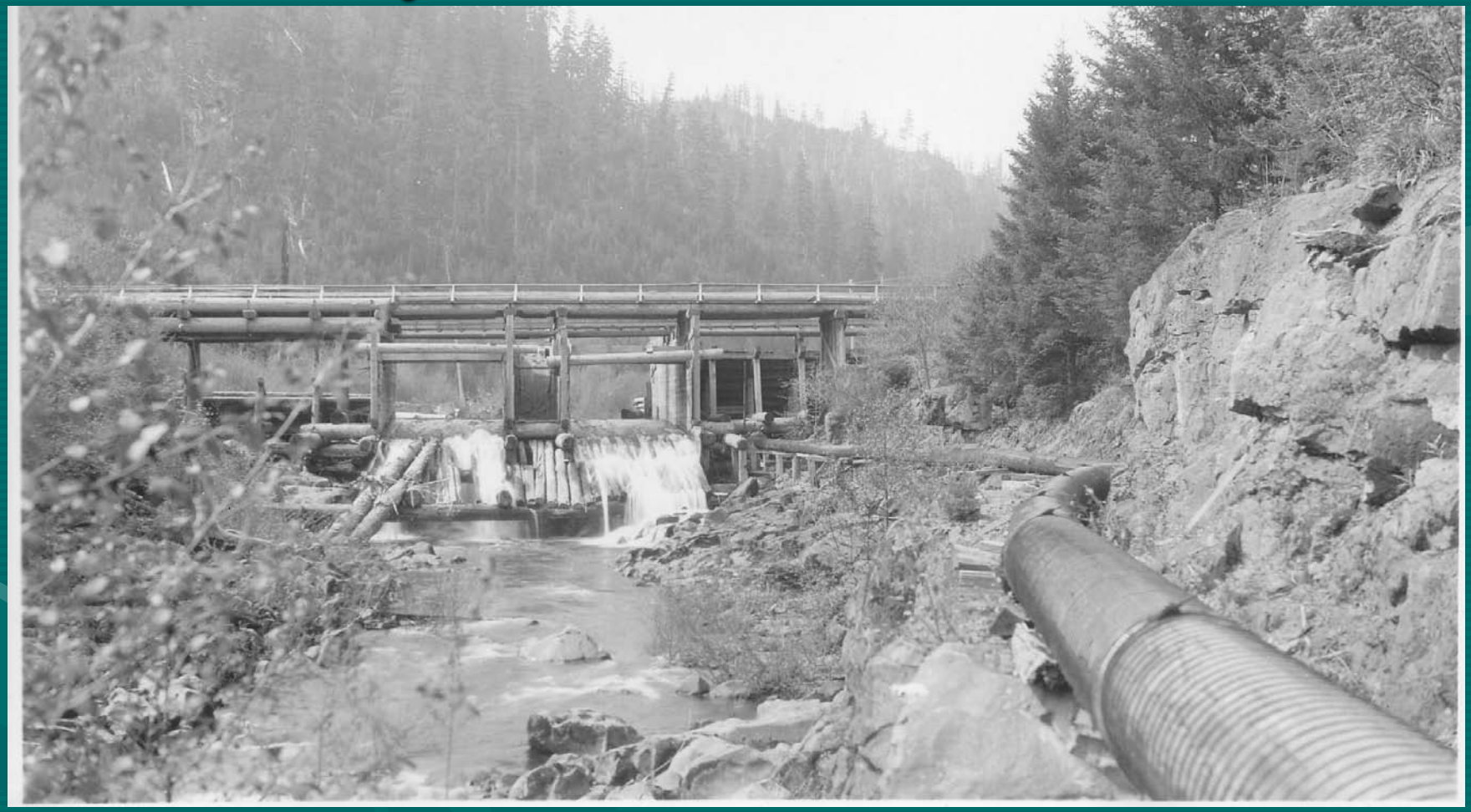


History of the Dam Site:

1909 Wind River Logging Camp

Splash Dam on Trout Creek (1902)

Early Power Generation



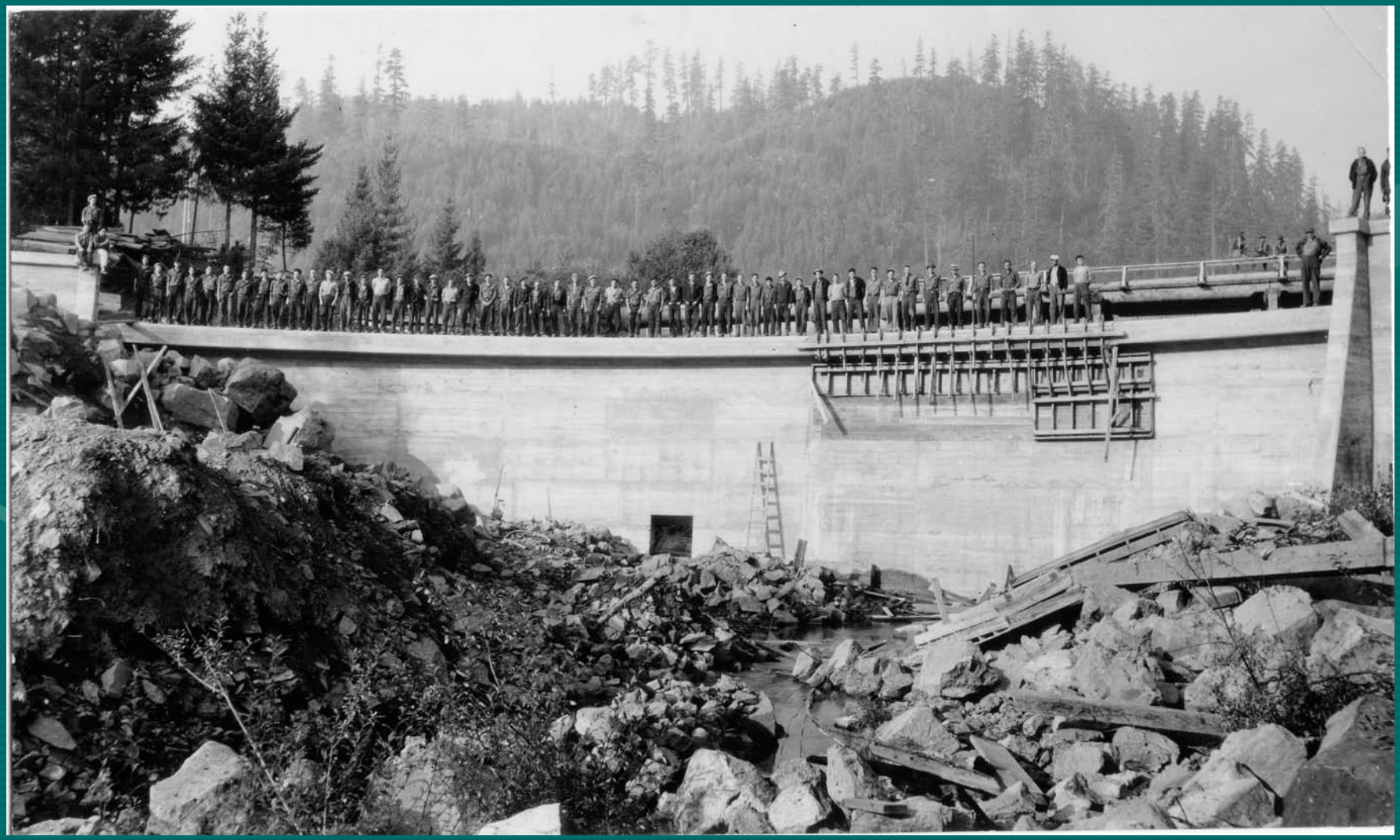
Morning Catch (ca 1910)

Hemlock Reach 1911

1930's Dam Construction

Dam Construction by the CCC

Dam Completion 1935



Hemlock Dam 2006

Hemlock Dam at Spring Flow

Hemlock Dam at 5-yr Flood Stage

Hemlock w/flood

Hemlock Lake

Hemlock Lake at Flood

Trout Creek downstream

Trout Creek below the dam

Goals and Objectives

Project Goal:

Improve habitat in Trout Creek to help restore the Wind River steelhead run

Aquatic Objectives:

1) Remove artificial impediment to improve upstream and downstream migration;

2) Reduce peak water temperatures;

3) Restore channel processes to permit coarse sediment movement into lower Trout Creek;

4) Increase diversity and complexity of habitat.

Project History

- 1996 Wind River Nursery Closes
- 1998 Steelhead listed under ESA
- 1998 Trout Creek exceeds state water quality stds
- 1999 Initiation of studies on the dam
  - Fish Passage Assessment
  - Dam Safety Assessment
  - Sediment Coring
  - Wetlands Delineation
  - Sediment Transport Analysis
  - Financial Analysis
- 2004 Draft EIS: "Blow and Go"
- 2005 Final EIS: Excavate seds, construct channel
- 2006 Skamania County appeals decision
- 2008 Skamania County files 2 FOIA's , appeals water quality permit issuance
- 2009 Project is implemented (June – Sept)

Main Project Elements

- Remove Hemlock Dam and associated facilities
- Mechanically remove 40,000-60,000 cubic yards of sediments from behind the dam
- Re-establish channel through the reservoir reach to mimic historic channel
- Incorporate woody debris in recontoured channel
- Revegetate areas surrounding the dam and reservoir
- Followup work at recreation site to fit the new channel
- Monitor physical and biological changes

Hemlock Dam and Vicinity

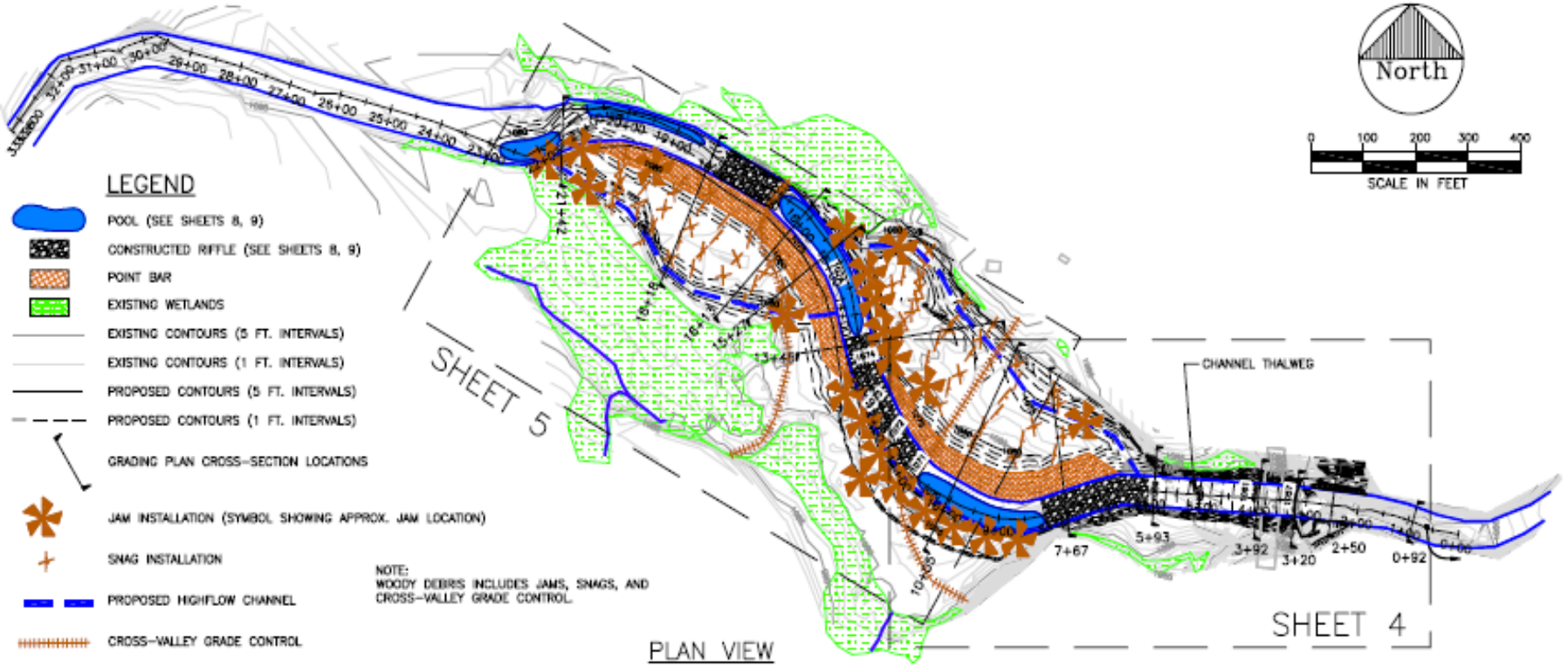
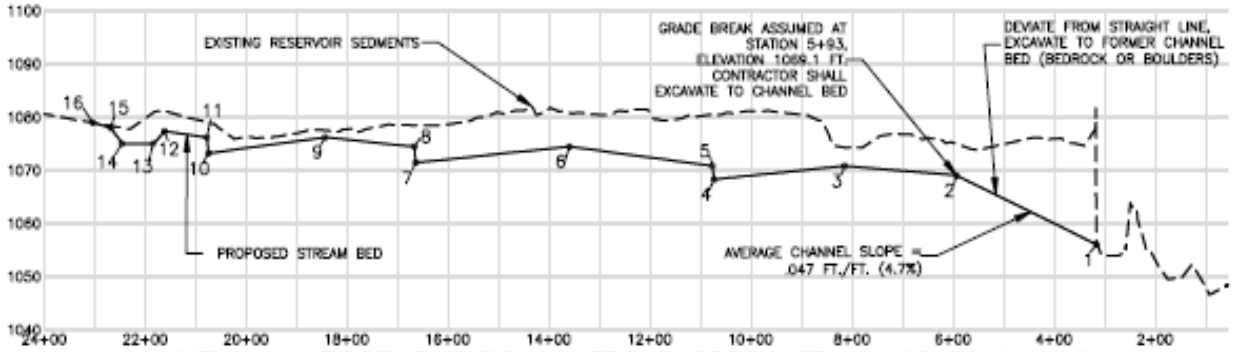


TABLE SHOWING STATION AND ELEVATION ALONG THALWEG

No.	Station	Elevation
1	3+16.07'	1058.000'
2	5+92.95'	1069.054'
3	8+15.20'	1070.832'
4	10+73.77'	1068.332'
5	10+76.27'	1070.832'
6	13+60.11'	1074.444'
7	15+64.12'	1071.444'
8	15+67.12'	1074.444'
9	18+44.24'	1076.224'
10	20+74.92'	1073.223'
11	20+77.92'	1076.223'
12	21+81.97'	1077.400'
13	21+84.47'	1075.000'
14	22+45.82'	1075.000'
15	22+55.41'	1078.000'
16	23+04.54'	1079.000'

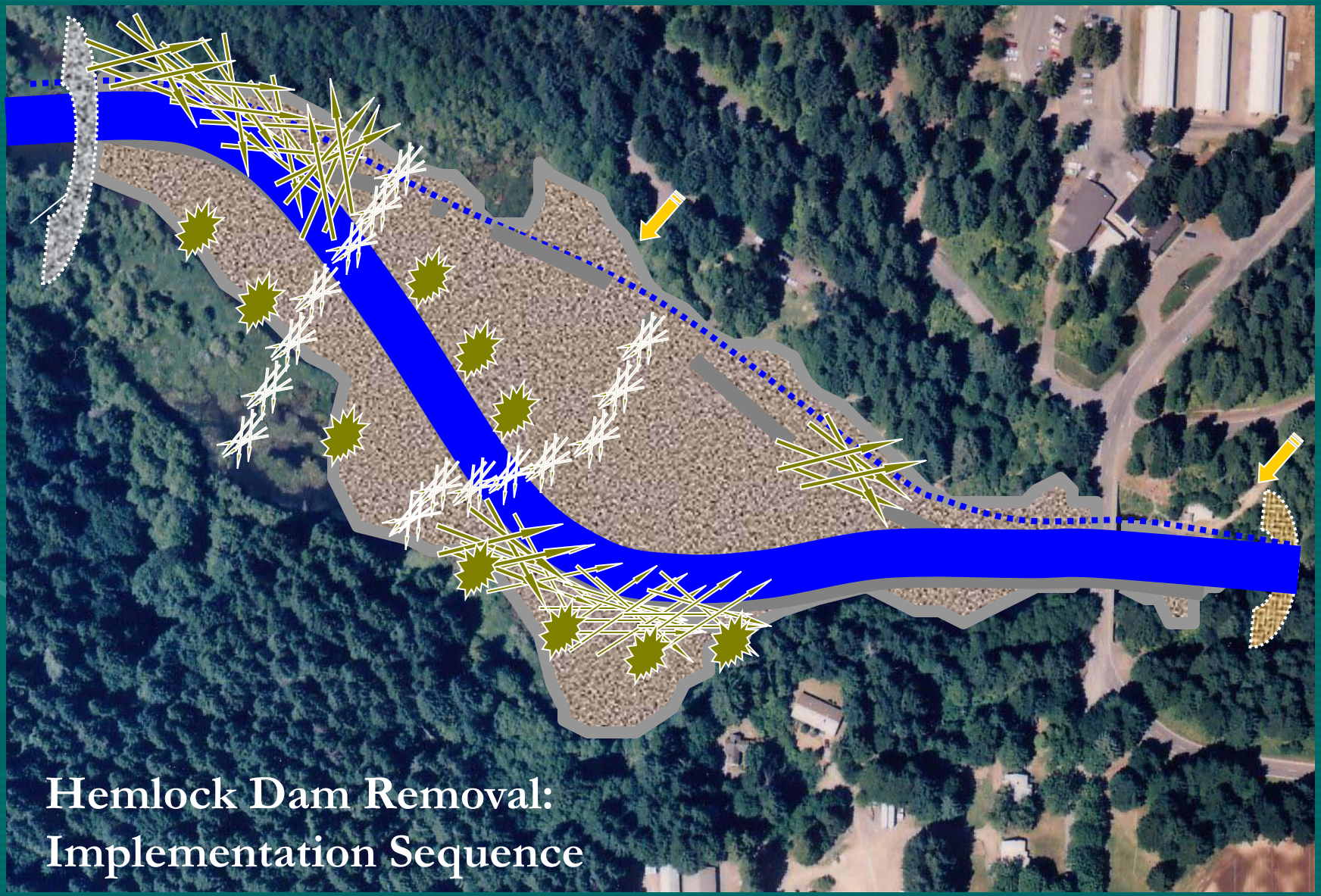
NOTE:
CONSTRUCTED RIFFLE SLOPES RANGE FROM 0.80% TO 1.40%



LONGITUDINAL PROFILE THROUGH TROUT CREEK STA 0+00 TO 24+00

			ARB,BRJ,REP DRAWN	JC, BN DESIGNED	MJM CHECKED	Gifford Pinchot National Forest Hemlock Dam Removal
			BN APPROVED	03-04-08 DATE	07-02-37 PROJECT	GRADING PLAN AND PROFILE

SHEET 3 OF 16


Hemlock Dam Removal:
Implementation Sequence

Project Partners

- Total project cost estimated at $2.7 million
- Funding partners:
  - Bonneville Power Administration
  - US Fish and Wildife Service
  - Salmon Recovery Funding Board
  - Ecotrust
  - Yakama Indian Nation
  - NOAA Restoration Center
  - American Rivers
  - Mid Columbia Fish Enhancement Group
  - USFS—Fisheries, Watershed, Engineering programs
- Implementation Partners:
  - Gifford Pinchot Task Force
  - University of Washington
  - USGS Col. River Research Lab
  - Underwood Conservation District
  - Smith-Root Inc.
  - Rosauers


735


Link-Belt


CAT


Link-Belt


CAT


CAT


8-22-09
USFS
1:4000 09054-GIP I-8


8-22-09
USFS
1:4000
09054-GIP
I-8