Klickitat Watershed Enhancement Project

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Yakama Nation Fisheries Program

Klickitat & White Salmon Rivers
Fisheries & Watershed Science Conference
March 10, 2009

Presentation Outline

- Background, Goals, and Priorities
- 2008 Project Implementation Highlights
  - Lower Klickitat Revegetation
  - White Creek / IXL Road Fish Passage
  - EF Tepee Creek / 175 Road Fish Passage
  - Swale Creek (River Mile 2)
- Other KWEP Functions
- Summary

KWEP - Background

The Klickitat Watershed Enhancement Project (KWEP) enhances and restores watershed health in the Klickitat River subbasin.

Project actions target stream reaches and watersheds that support steelhead (*Oncorhynchus mykiss*; ESA- listed as "Threatened") and/or spring Chinook (*O. tshawytscha*).

KWEP is:

- The principal project addressing salmonid habitat conservation and restoration in the Klickitat subbasin
- Implemented by the Yakama Nation Fisheries Program (YNFP)
- Funded by Bonneville Power Administration and matching grants
- Addresses Yakima-Klickitat Fisheries Project (YKFP) goals
- Addresses Columbia Basin Fish & Wildlife Program habitat goals

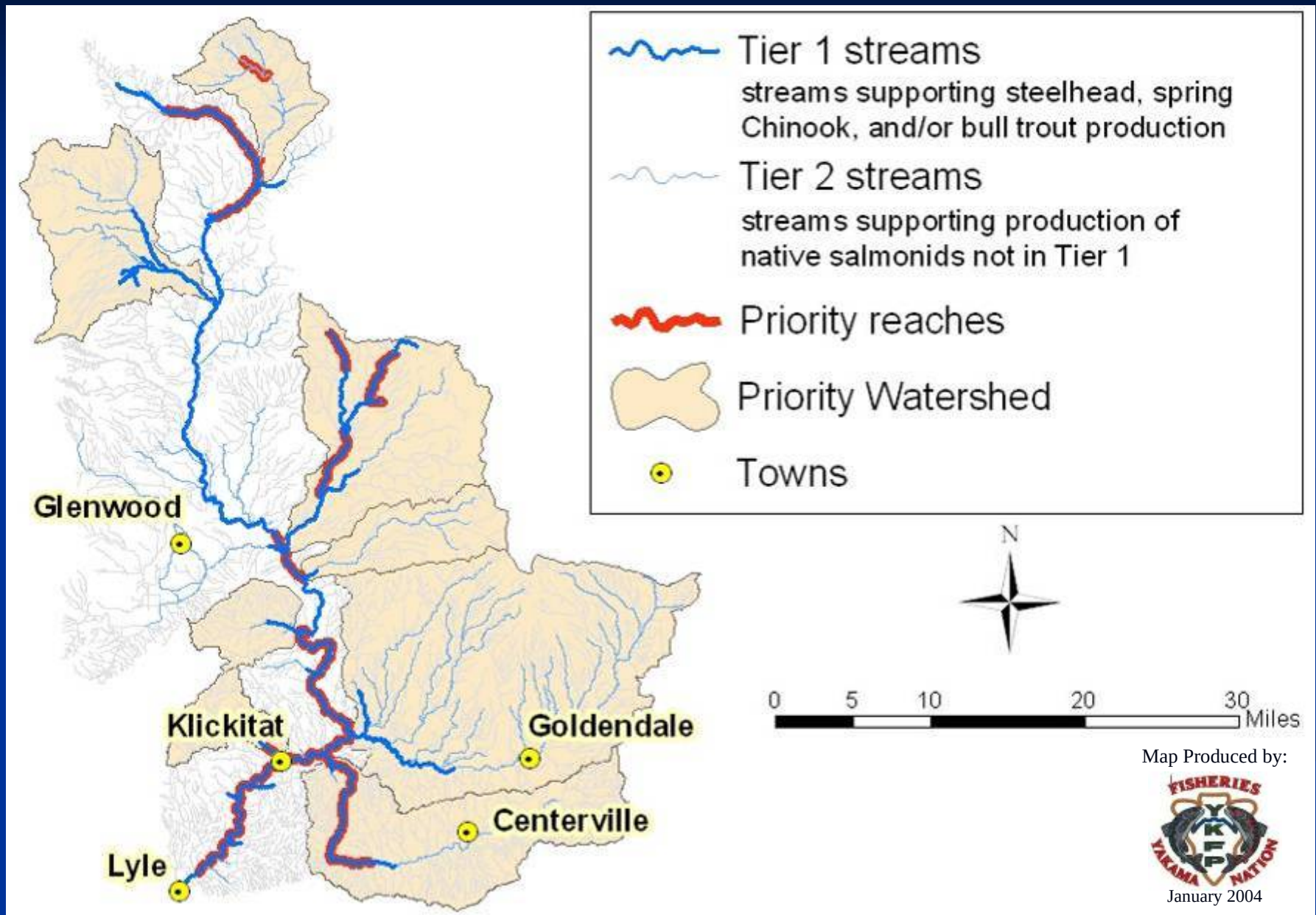
KWEP - Goals

The overall goals of the Klickitat Watershed Enhancement Project (KWEP) are to restore watershed health and aid recovery of native salmonid stocks in the 1350 square-mile Klickitat River subbasin.

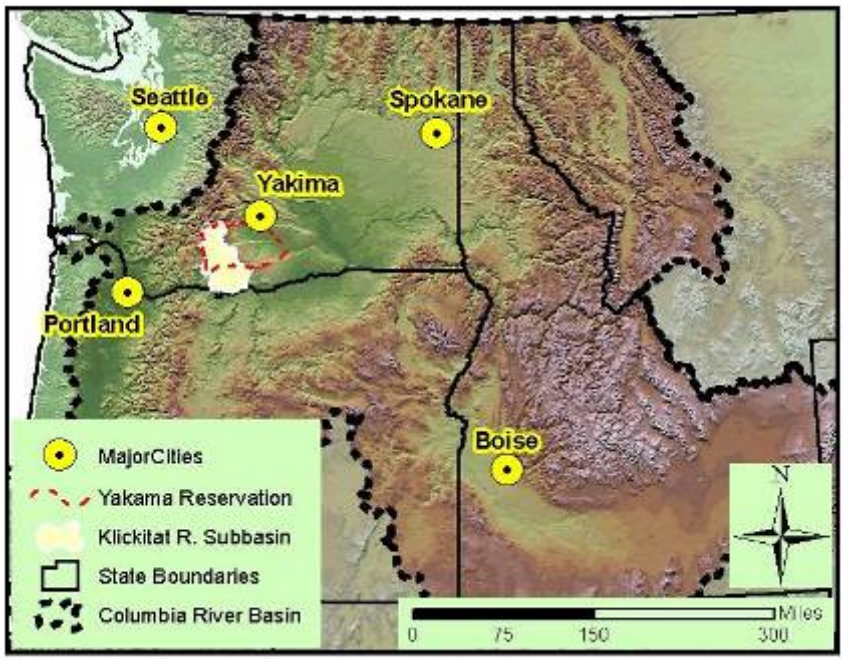
Three-pronged approach:

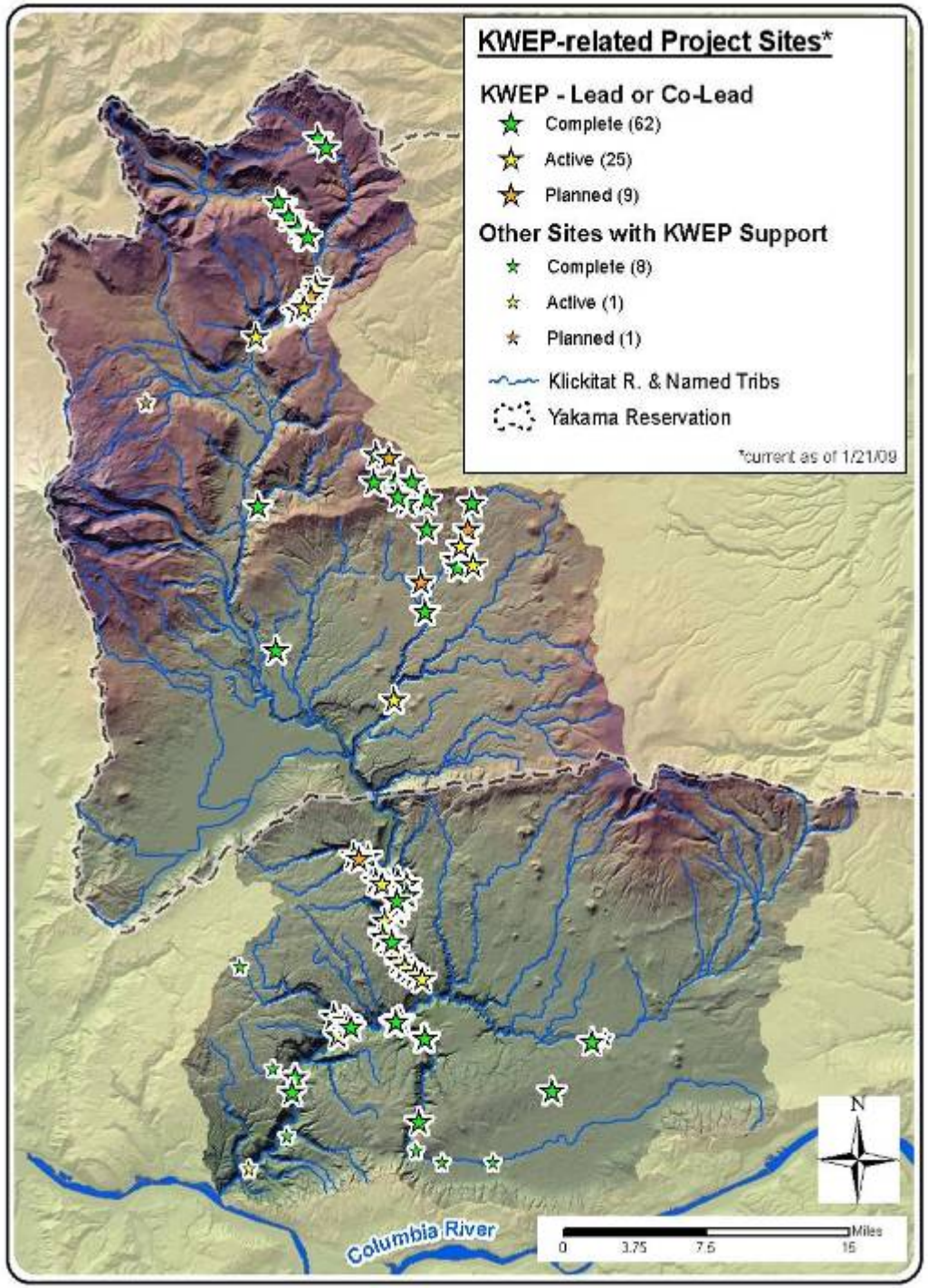
- **Assess** watershed and habitat conditions to **prioritize** sites for restoration activities.
- **Protect, restore,** and **enhance** priority watersheds and reaches
- **Monitor** to assess watershed conditions and effectiveness of restoration activities.

KWEP – Geographic Priorities



Project Sites





Lower Klickitat River Revegetation Project

Project Sponsor/Coordinator:
Mid-Columbia FEG (MCFEG)

Design & Construction Oversight:
KWEP

Construction Funding:
SRFB, NFWF, MCFEG

Plant Materials:
KWEP and MCFEG

Lower Klickitat River Revegetation Project

- Goal is to increase bank cover, woody debris recruitment, and potential for trapping fine sediment.
- Plant materials – combination of dormant hardwood cuttings and containerized (grown at KFO nursery)
- Installed using hydraulic stinger

Site 17.24

0.79 acres

Plant Species	Type	# Planted
Ponderosa Pine	Tall-one	206
Scouler's Willow	Cuttings	395
Scouler's Willow	Tall-one	151
Black Cottonwood	Cuttings	90
Black Cottonwood	Tall-one	9
Red Alder	Tall-one	0
Greyers Willow	Tall-one	0
Coyote Willow	Cuttings	75
Coyote Willow	Tall-one	15
Dogwood	Tall-one	16
Total Planted		**957**

Site 17.53

0.32 acres

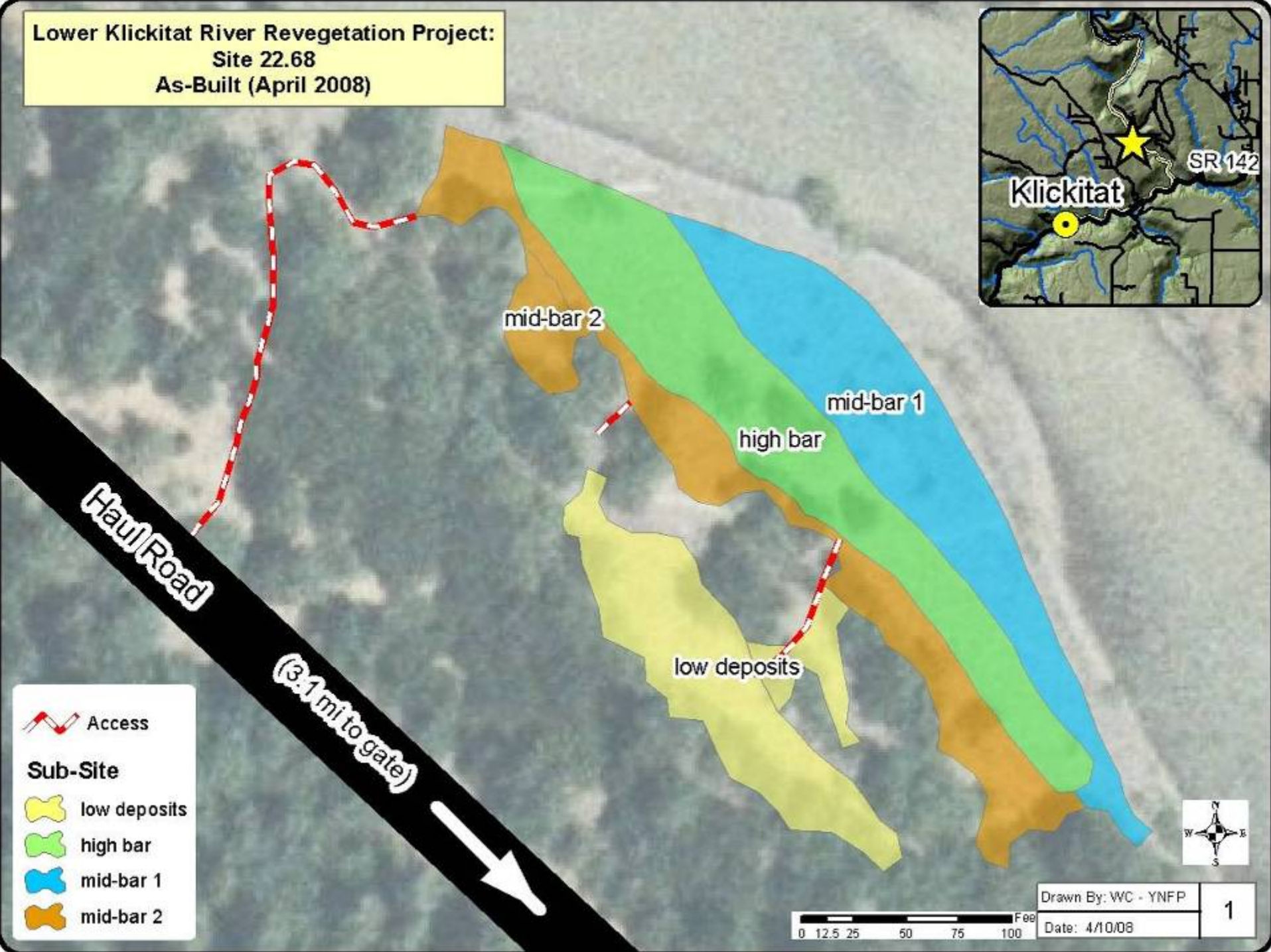
Plant Species	Type	# Planted
Ponderosa Pine	Tall-one	0
Scouler's Willow	Cuttings	95
Scouler's Willow	Tall-one	46
Black Cottonwood	Cuttings	36
Black Cottonwood	Tall-one	24
Red Alder	Tall-one	0
Greyers Willow	Tall-one	14
Coyote Willow	Cuttings	113
Coyote Willow	Tall-one	56
Total Planted		**384**

Site 22.06

1.05 acres

Plant Species	Type	# Planted
Ponderosa Pine	Tall-one	347
Scouler's Willow	Cuttings	381
Scouler's Willow	Tall-one	200
Black Cottonwood	Cuttings	170
Black Cottonwood	Tall-one	183
Red Alder	Tall-one	141
Greyers Willow	Tall-one	99
Coyote Willow	Cuttings	28
Coyote Willow	Tall-one	200
Oak	Tall-one	25
Total Planted		**1774**

Topographically complex

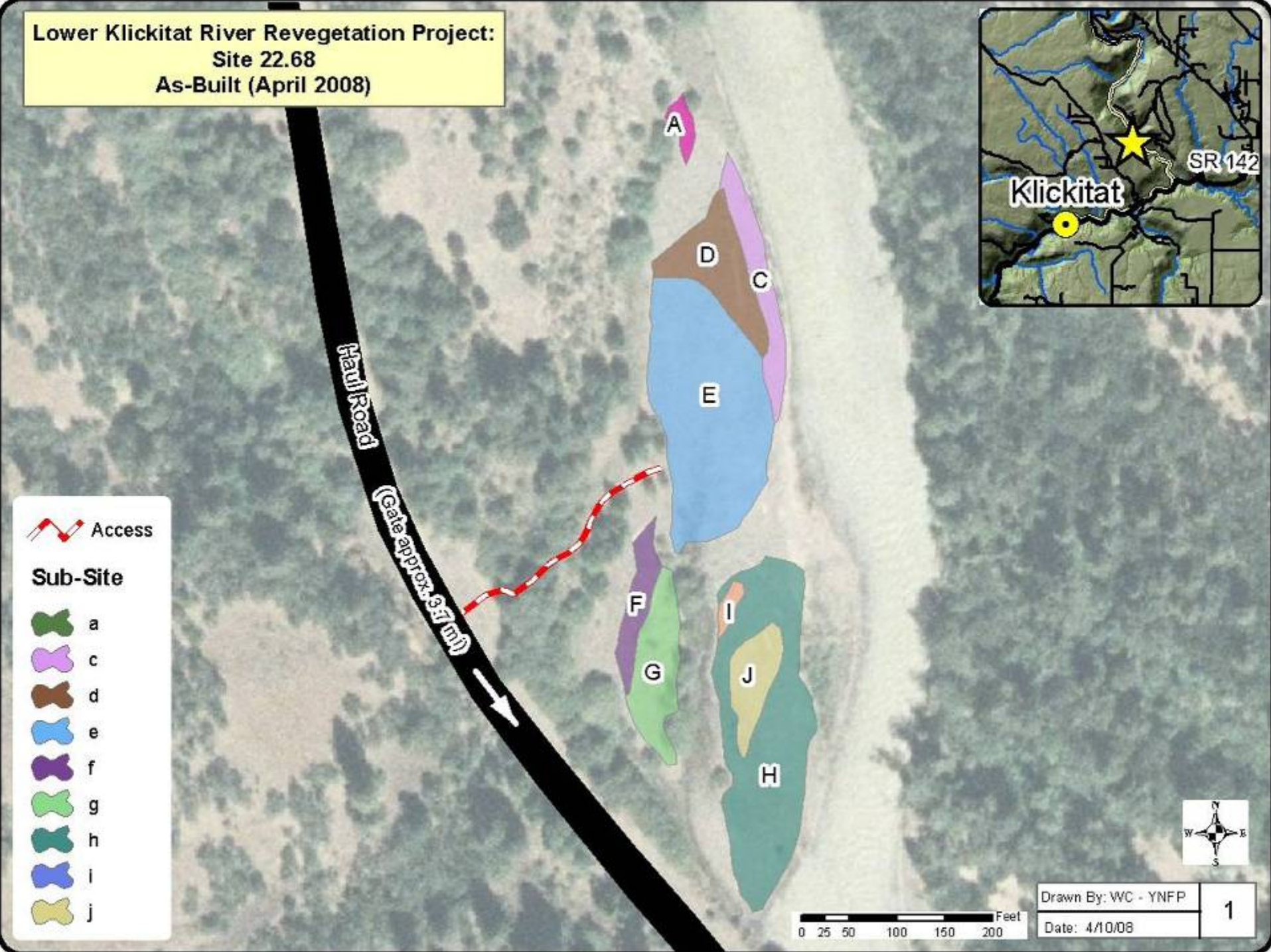

Lower Klickitat River Revegetation Project:
Site 22.68
As-Built (April 2008)
Klickitat
SR 142
mid-bar 2
mid-bar 1
high bar
low deposits
Haul Road
(3.1 mi to gate)
Access
Sub-Site
low deposits
high bar
mid-bar 1
mid-bar 2
0 12.5 25 50 75 100
Drawn By: WC - YNFP
Date: 4/10/08
1

Site 22.68

1.85 acres

Plant Species	Type	# Planted
Ponderosa Pine	Tall-one	305
Scouler's Willow	Cuttings	123
Scouler's Willow	Tall-one	90
Black Cottonwood	Cuttings	507
Black Cottonwood	Tall-one	235
Red Alder	Tall-one	167
Greyers Willow	Tall-one	84
Coyote Willow	Cuttings	700
Coyote Willow	Tall-one	110
Total Planted		**2321**

Topographically complex


Lower Klickitat River Revegetation Project:
Site 22.68
As-Built (April 2008)
A
D
C
E
F
G
I
J
H
Haul Road
(Gate approx. 2.7 mi)
SR 142
Klickitat
Access
Sub-Site
a
c
d
e
f
g
h
i
j
Feet
0 25 50 100 150 200
Drawn By: WC - YNFP
Date: 4/10/08
1

Ponderosa Pine Survival
(worst case scenario* - as of 3/9/09)

	RM 17.24		RM 22.06		RM 22.68	
Total Planted March and/or April 2008	206		347		305	
# Alive & Unbrowsed	**139**	**67%**	**311**	**90%**	**200**	**66%**
# Alive & Browsed	2	1%	24	7%	61	20%
# Dead & Unbrowsed	11	5%	1	0%	7	2%
# Dead & Browsed	0	0%	0	0%	6	2%

* initial planted count is from April, prior to May 2008 cattle depredation. Pines were subsequently replanted (by hand, in same holes) in late-May, but may not have equaled initial count

Ponderosa Pine Survival
(best case scenario* – as of 3/9/09)

	RM 17.24		RM 22.06		RM 22.68	
# Alive & Unbrowsed	**139**	**91%**	**311**	**93%**	**200**	**73%**
# Alive & Browsed	2	1%	24	7%	61	22%
# Dead & Unbrowsed	11	7%	1	0%	7	3%
# Dead & Browsed	0	0%	0	0%	6	2%

Hardwood survival will be assessed following leaf-out in April 2009

* Survival as a percent of plants that were located 3/9/09

Tepee Creek / White Creek Fish Passage Enhancement Project

Project Sponsor/Coordinator: Yakama Nation Fisheries (KWEP)

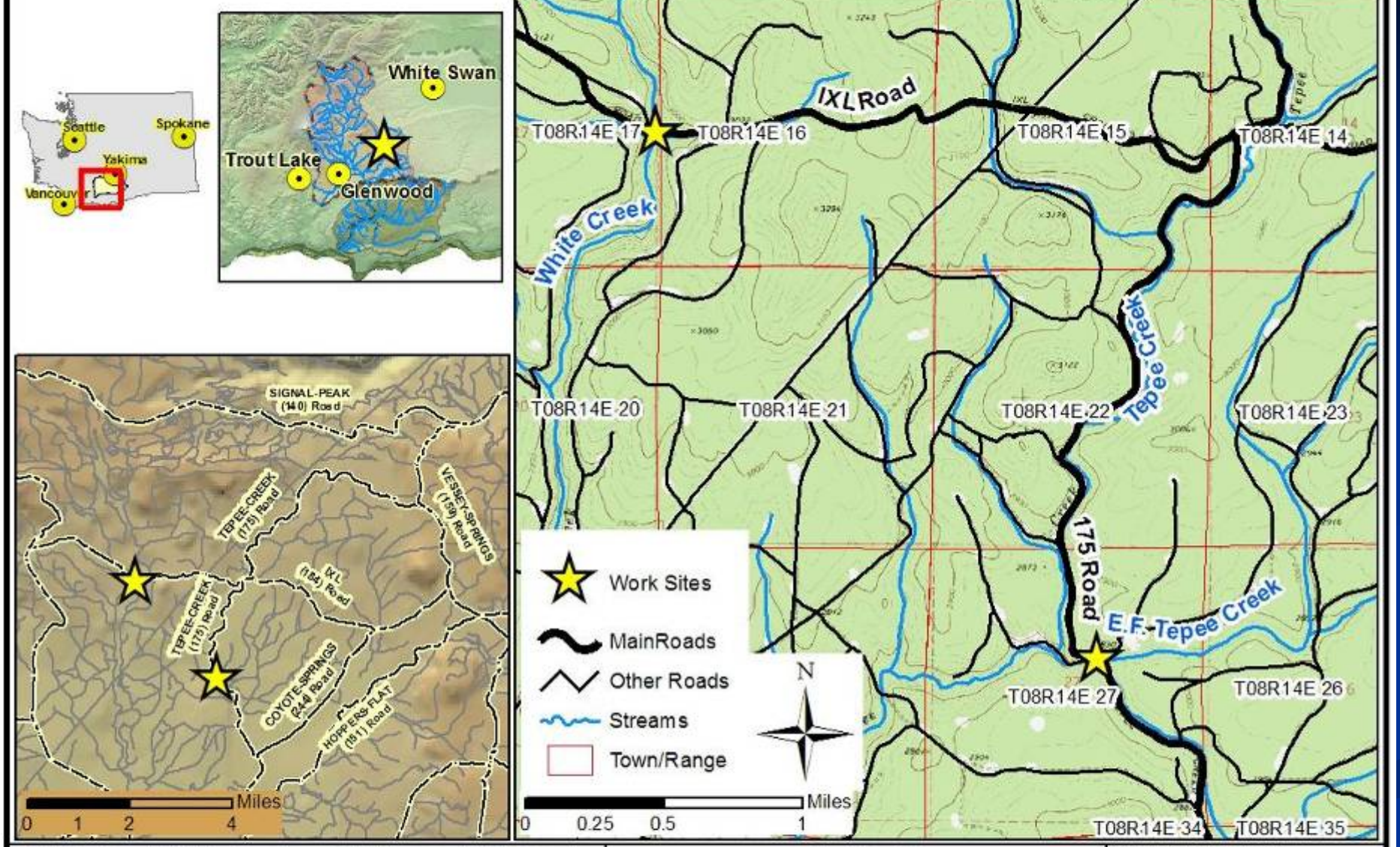
Design & Construction Oversight: KWEP

Construction Funding: SRFB

Structure Purchase: KWEP

Rock Materials: Yakama Nation (in-kind)

Plant Materials: KWEP



White Creek / IXL Road and EF Tepee / 175 Road Fish Passage Enhancement Project

Purpose: restore fish passage

Location: Yakama Reservation Closed Area
T8N R14E S17 and S27

Vicinity Map

Project Sponsor: Yakama Nation Fisheries Program
PO Box 151
Toppenish, WA 98948

Project Contact: Will Conley, Watershed Specialist
509-369-3183

Drawn By:	WC - YNFP
Date:	June 16, 2008
File:	WhtXL_EFTp175_loc.mxd
Sheet	1 of 1

Tepee Creek Fish Passage Enhancement Project:

White Creek / IXL Road

Before:

- two 7.8’ x 51’ pipe arches
- barrier: water depth & velocity
- restricted debris & bedload passage

After:

- 40’ x 16’ bridge (with relief)
- Native bed material on natural (2.2%) slope
- Access restored to 2.77 miles of habitat

Tepee Creek Fish Passage Enhancement Project:

E.F. Tepee Creek / 175 Road

Before:

- Two 6’ x 66’ CMPs
- barrier: water depth & velocity
- restricted debris & bedload passage

After:

- 17’-1” x 5’-6” x 47.5’ box culvert
- Roughened Channel with native bed material at 2.0% slope
- 150’ of instream construction
- Access to 1+ mi. of habitat

Swale Creek RM2 Enhancement Project

Project Sponsor/Coordinator: Mid-Columbia FEG (MCFEG)

Design & Construction Oversight: KWEP

Construction Funding: NFWF, Community Salmon Fund, MCFEG

Log Donations:

- Hancock Forest Management
- Klickitat County
- Yakama Agency - BIA
- USFS
- Private Developer

Cable and Clamps: KWEP

Plant Materials: KWEP and MCFEG

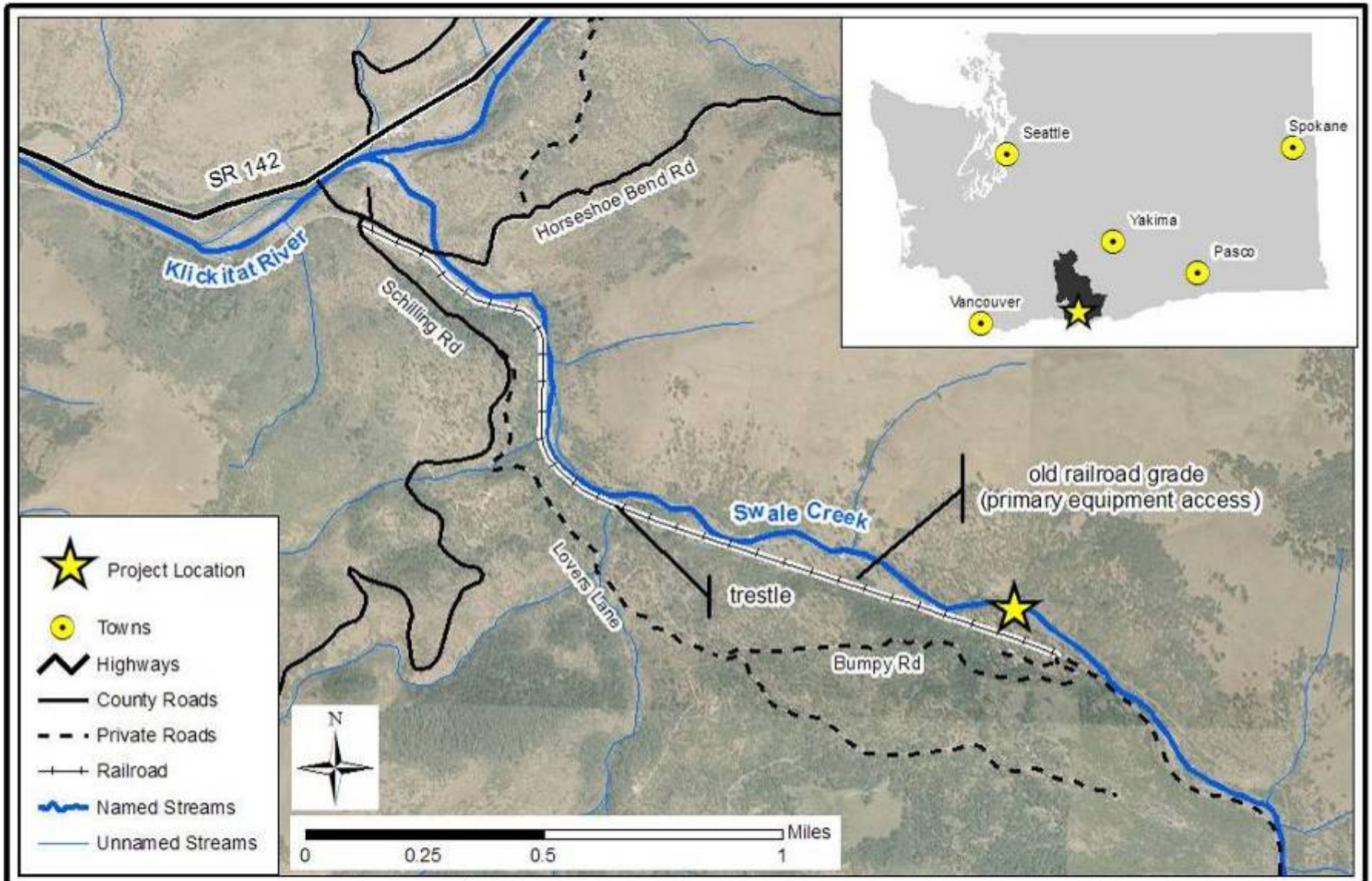
Planting labor assistance: landowner

Swale Creek RM2 Enhancement Project

- Railroad construction (1902) and subsequent operations have had a dramatic effect on channel conditions
- Lower Swale Creek has a pool frequency of 7 pools per mile (4.2% of the habitat by channel length).
- The bed has self-armored and has a simple, plane-bed morphology
- Riparian vegetation has become cyclical (dis-climax)
- **Goal**: re-introduce hydraulic and habitat complexity.

Treatment: pool enhancement at 5 sites along 600' of stream

- excavation of pools
- LWD jam construction to promote pool persistence and enhance primary habitat for salmonids



Swale Creek (RM2) Habitat Enhancement Project

Purpose: salmonid habitat enhancement

Location: portion of T4N R14E S21

Project Sponsor: Mid-Columbia Fisheries Enhancement Group
PO Box 1271, White Salmon, WA 98672 509-281-1322

Project Manager: Margaret Neuman, MCRFEG

Technical Contact: Will Conley, YNFP Restoration Specialist
PO Box 215. Klickitat, WA 98628 509-369-3183

Drawn By: WCC - YNFP

Date: June 16, 2008

File: SwaleRM2_location.mxd

Sheet 1 of 3

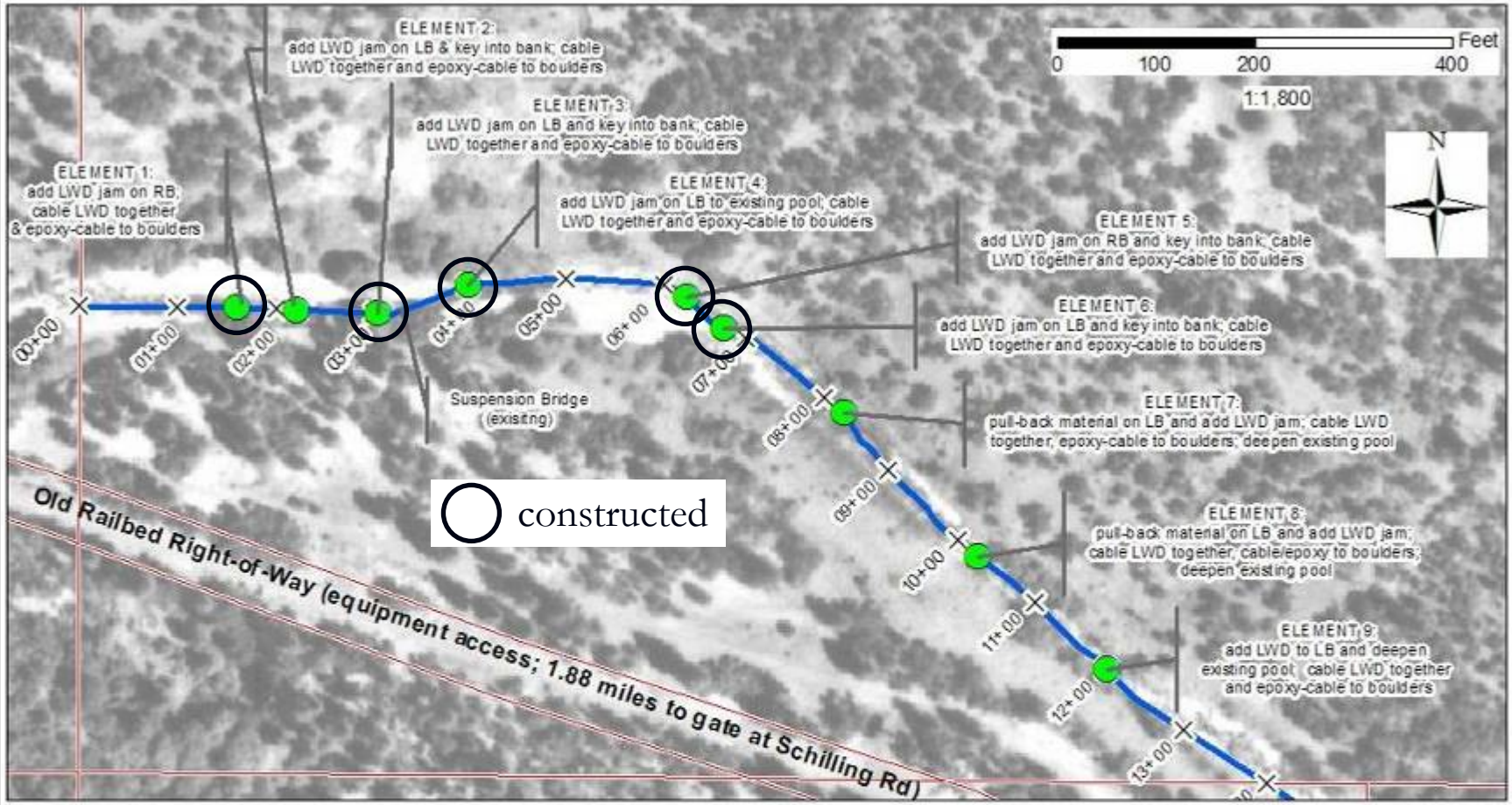
Swale Creek RM2 – Design Considerations

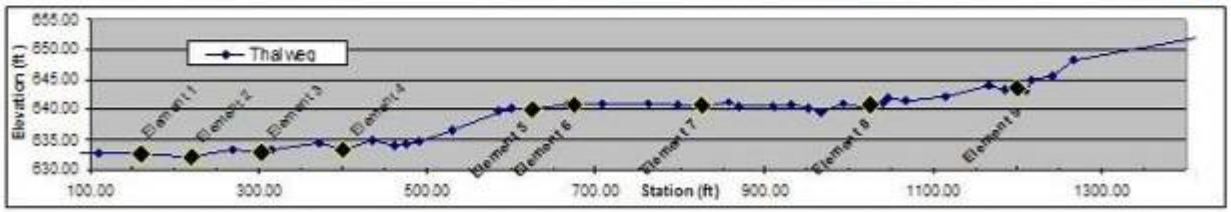
- hydrology – eastside low flow with westside peaks
  ($Q_2 : Q_{base}$ ~ 2,150 : 1 to 40,000 : 1)
- course substrate – limiting riparian recruitment
- minimize perturbance of knickpoint in proximity of E5
- minimal use of cable/anchoring above grade (aesthetics / landowner)

Frequency	Flow (cfs)
Q_{base}	**0.02 to 0.37** (2006) (2008)
Q_2	**803***
Q_{10}	2310*
Q_{25}	3430*
Q_{50}	4430*
Q_{100}	5610*

Drainage Area (mi^2)	**119**
Site Elevation (ft)	640
Mean basin elev. (ft)	1860
Relief (ft)	2560
M.A.P. (in)	18.0
Avg. Stream Slope	0.014

* Indirect estimate based on USGS regressions





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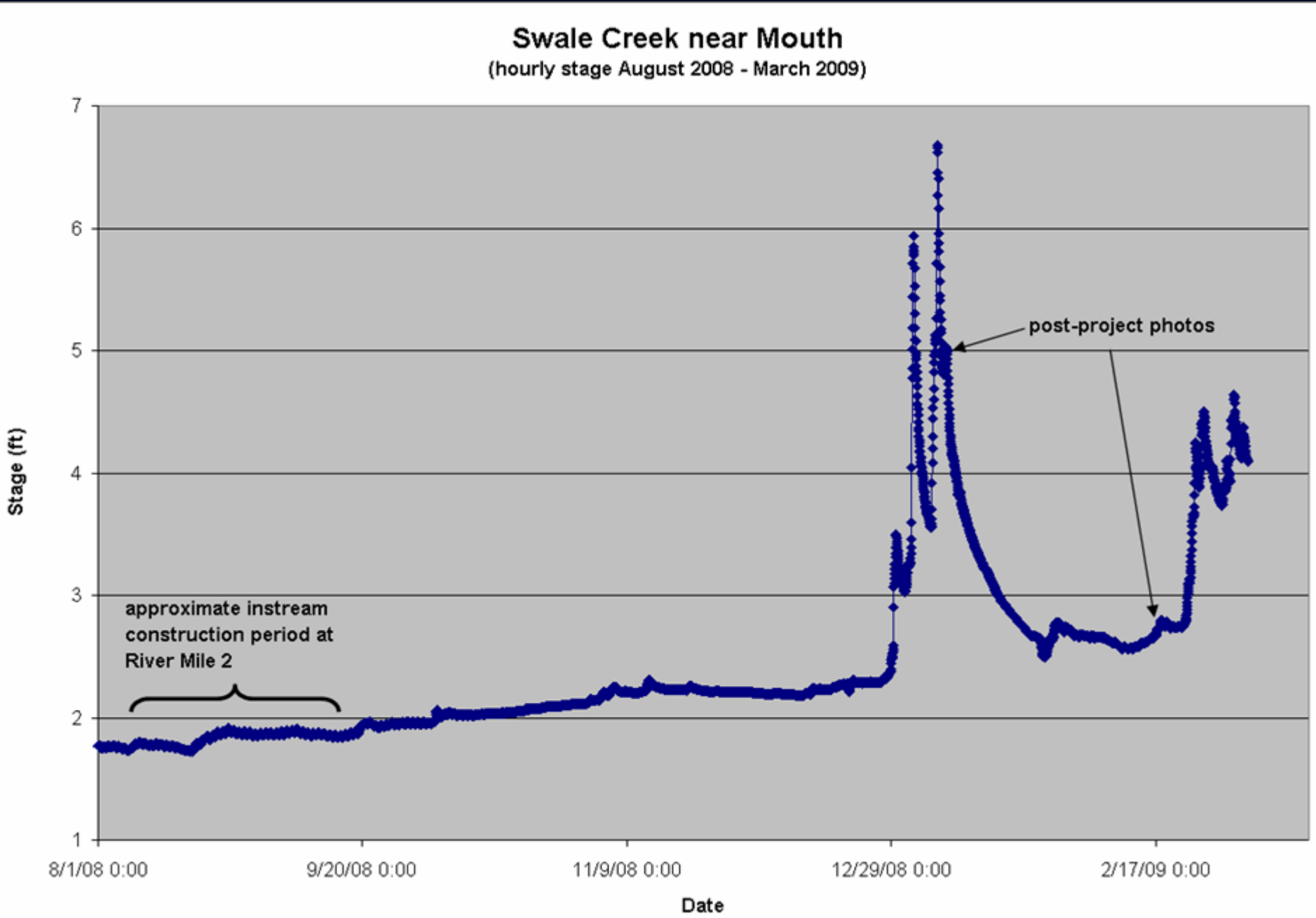
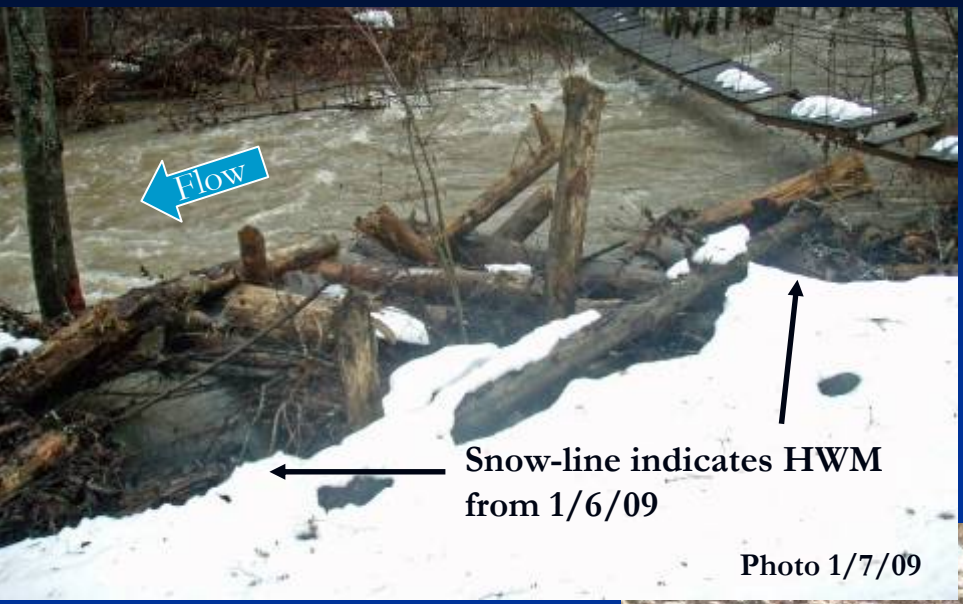
Drawn By: WCC - YNFP
Date: June 16, 2008
File: SwaleRM2.mxd

Sheet 2 of 3


Swale Creek near Mouth
(hourly stage August 2008 - March 2009)
Stage (ft)
7
6
5
4
3
2
1
post-project photos
approximate instream
construction period at
River Mile 2
8/1/08 0:00
9/20/08 0:00
11/9/08 0:00
12/29/08 0:00
2/17/09 0:00
Date

Swale Creek RM2 – Element 1

Swale Creek RM2 – Element 3



Swale Creek RM2 – Element 4

Swale Creek RM2 – Element 4

Swale Creek RM2 – Element 5

As-built Sept. 2008

Post-flood 2/18/09

High water 1/7/09

Swale Creek RM2 – Element 6

Swale Creek RM2 – Residual Pool Depths

- Pools over-excavated
- Expected to stabilize at RPD 2.0' to 3.0'

	Residual Pool Depth		
Element	**Pre-con**	**As-Built**	**March '09***
1	no data		
3	0.4	2.6	2.3
4	1.3	3.8	2.6
5	0.5	3.9	3.3
6	0.6	4.5	3.5

*** Preliminary value, pools not presently wadeable**

Swale Creek RM2 – Element 6

Monitoring and Data Management

KWEP works interactively with YKFP projects:

- Data, Management, and Habitat Project (BPA # 198812035)
- Monitoring and Evaluation Project (BPA #199506335)

Data collection & relational database development:

- Habitat data – 78 sites on 39 streams
- Water Temperature – 37 sites on 23 streams
- Sediment – 12 sites on 5 streams

GIS data acquisition and creation

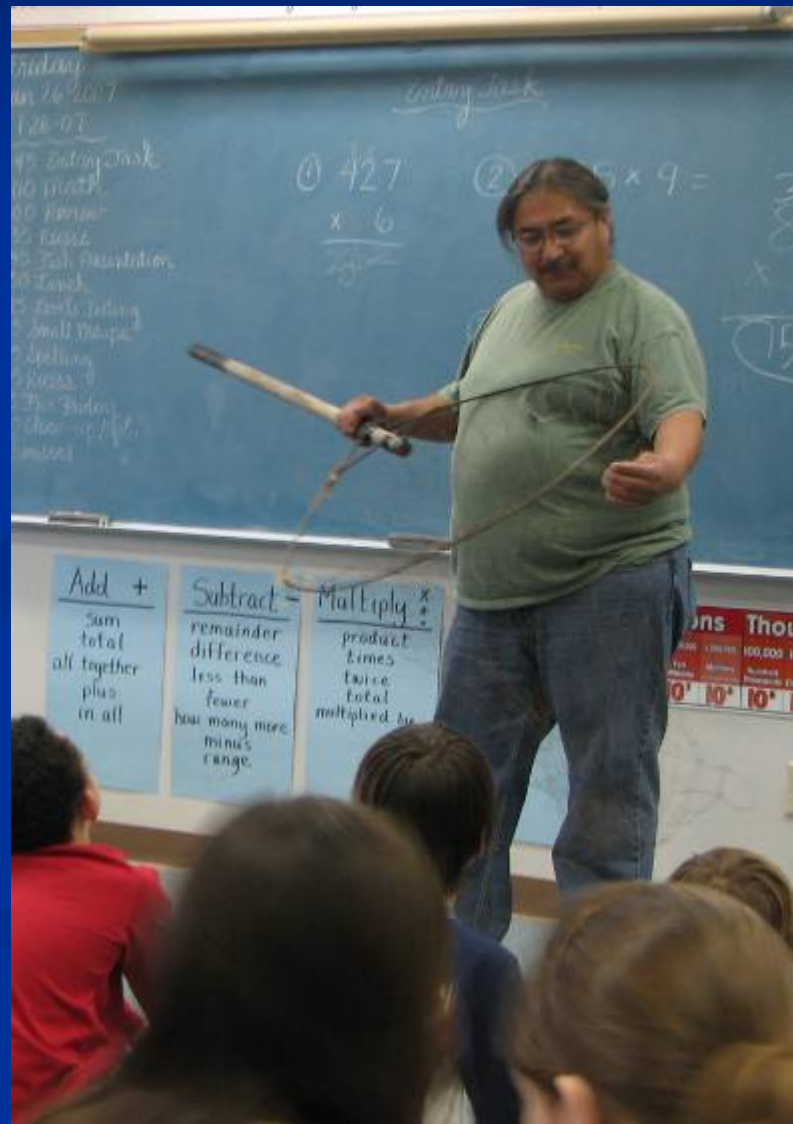
Technical Support

KWEP staff have provided technical support to:

- Private landowners
- Private non-profits
- Tribal Programs
- Conservation Districts
- Subbasin Planning (Northwest Power Council)
- Recovery Planning (NOAA Fisheries)
- Strategic Planning (WA Salmon Recovery Funding Board)
- Watershed Planning (WA Department of Ecology)

Outreach, Education, and Information Dissemination

- Professional meetings
  - River Restoration Northwest
  - American Water Resources Assoc.
  - American Fisheries Society
- Local schools
  - Dallesport
  - Klickitat
  - Goldendale
  - Lyle
  - Mosier
- Stakeholder education
  - White Salmon River Festival



KWEP Accomplishments

Since 2000, KWEP has sponsored or played a major role in 17 completed projects encompassing over 60 sites. Project highlights include:

- Restoration of fish, sediment, and debris passage at 10 sites restoring fish access to over 18.1 miles of habitat
- Enhancement of >12,600' of stream & floodplain including 62 LWD jams
- Revegetation of >13,000' of stream with over 25,400 plantings
- Drainage improvements on 10.5 miles of forest road
- Livestock fencing: over 10000' of stream
- Wetlands: Creation of more than 3500 square-feet of wetland
- Side Channels: Restoration of high-flow access to over 800 lineal feet
- Road treatments: drainage improvements on 10.5 miles of forest roads
- Morphologic and Habitat Assessment: over 74 miles of stream
- Road Assessment: over 145 miles of road and railroad

Acknowledgements

David Lindley
Ralph Kiona
Deanna Lamebull
Jamie Brisbois
Margaret Neuman

Funding:

- Bonneville Power Administration
- WA Salmon Recovery Funding Board
- Columbia River Inter-Tribal Fish Commission
- Mid-Columbia Regional Fisheries Enhancement Group
- Bureau of Indian Affairs – Watershed Program
- Yakama Nation

For More Information

http://www.ykfp.org/klickitat/KWEP_sites.htm

(currently under development)