

# Habitat Restoration and Protection in the Yakima River Watershed

Yakama Nation Fisheries – Yakima/Klickitat Fisheries Project – Habitat  
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2017 Yakima Basin Science and Management Conference  
Thursday June 15





**GOT WOOD?!**





# Yes, We have wood!





# How much Wood do we need?





# Loads and Loads and Loads of Wood!!!!!!



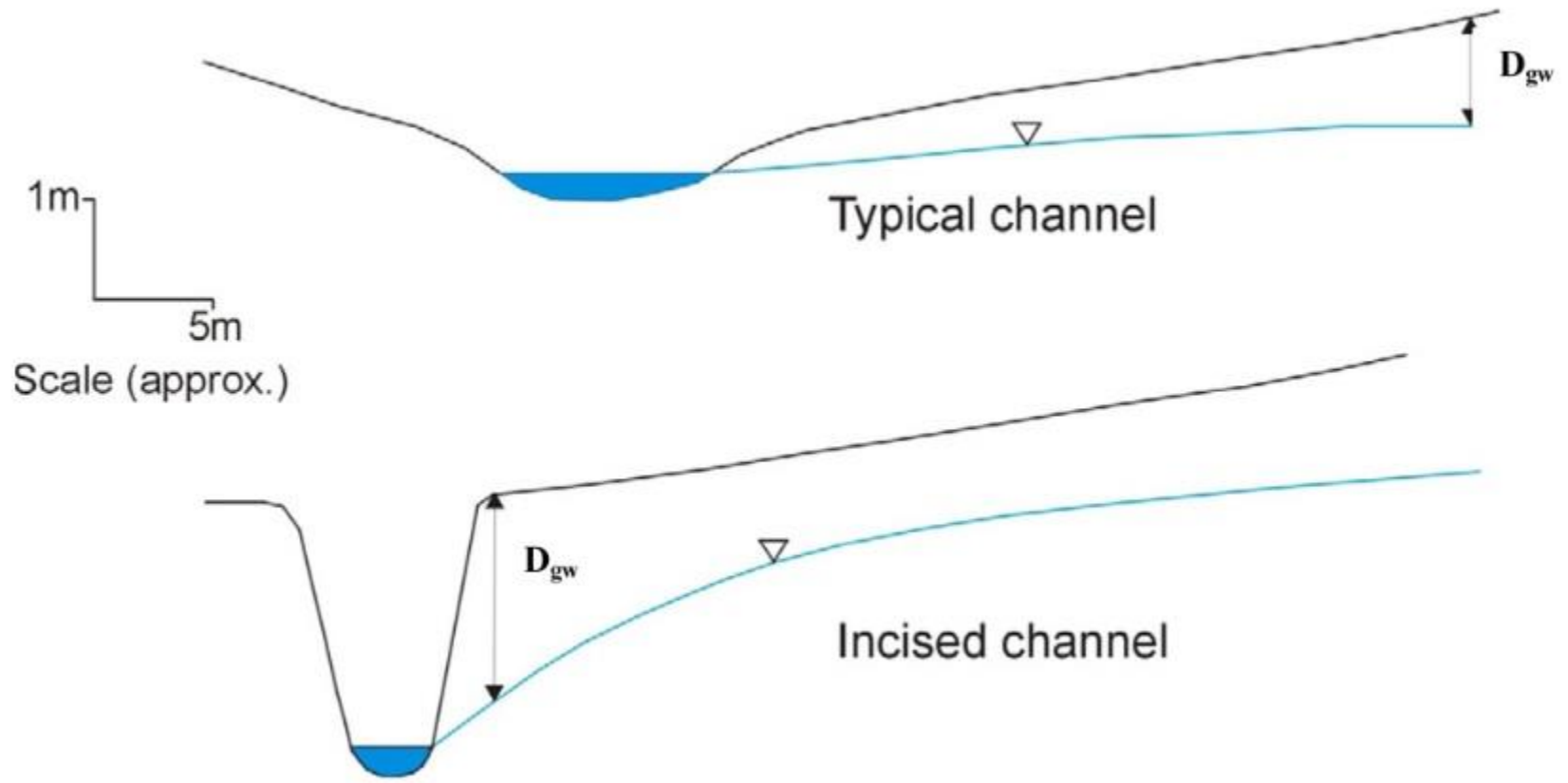
**Natural Log Jam in Middle Fork Teanaway River, circa 1900,**  
Ponderosa forest on East slope of Cascades, Washington

Source: Russell, I. C. 1909. Rivers of North America. G.P. Putnam's Sons, New York. 327pp.  
Figure B, Plate XII, page 239. (Scan by T. Abbe)









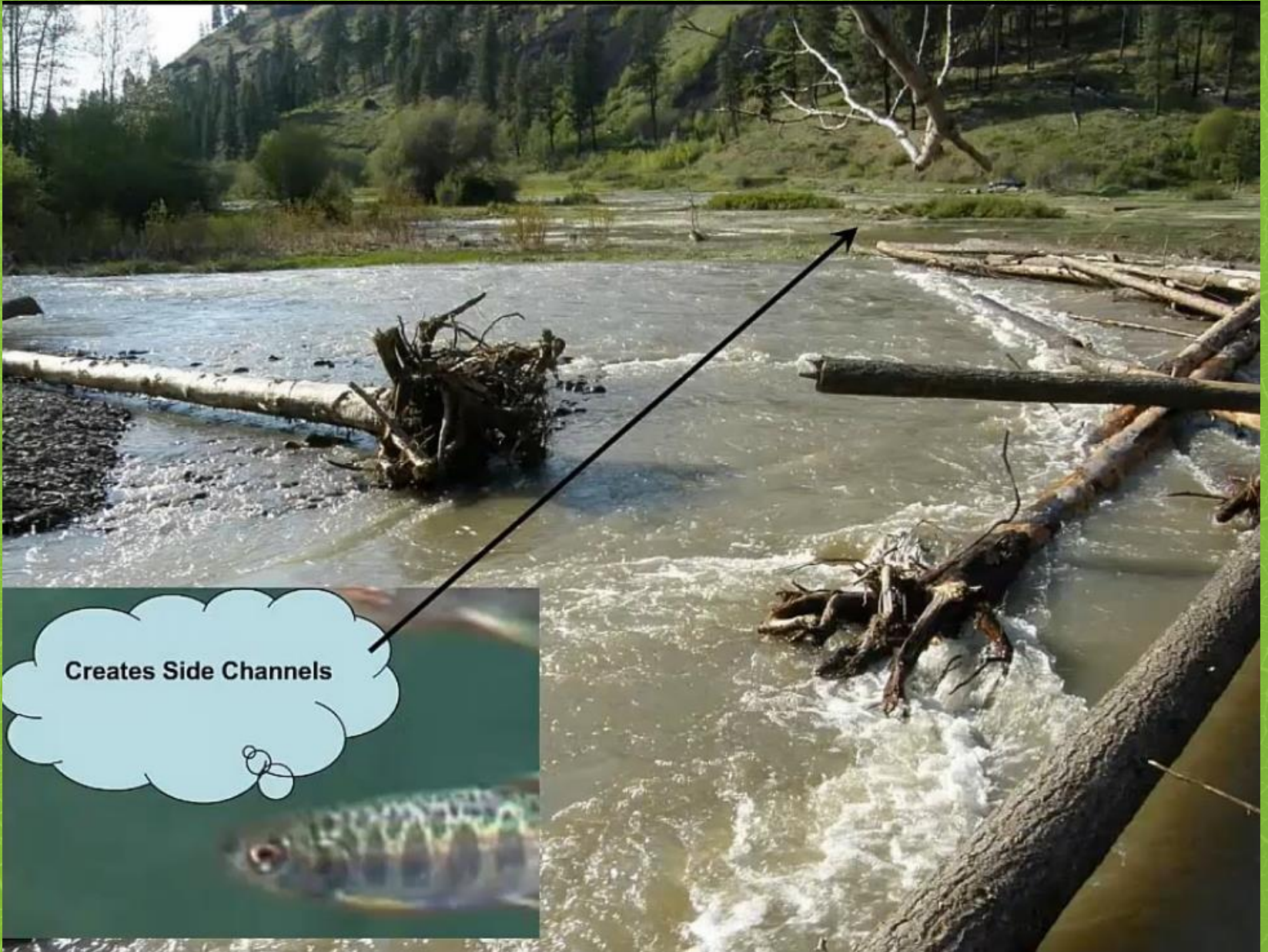




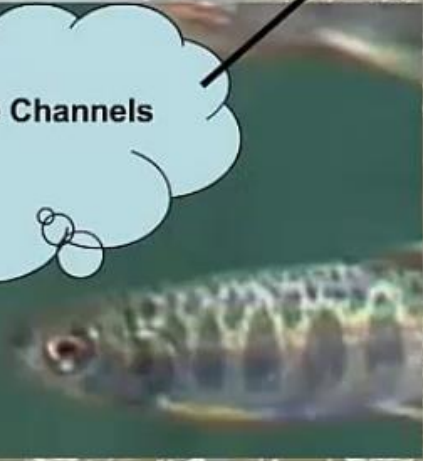
A Reconnected  
Floodplain







**Creates Side Channels**





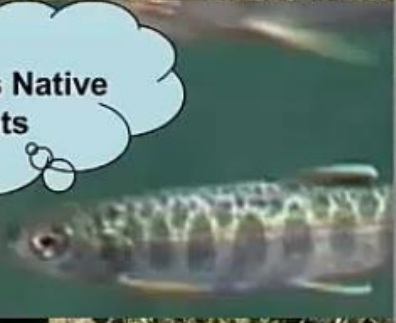
New Beaver Dam, on Side Channel that formed after Wood Replenishment







**Promotes Native  
Plants**







**Reduces Flood  
Damage Downstream**





Captures Flood  
Debris



01 18 2011



Selective Thinning  
Promotes Fire Resiliency

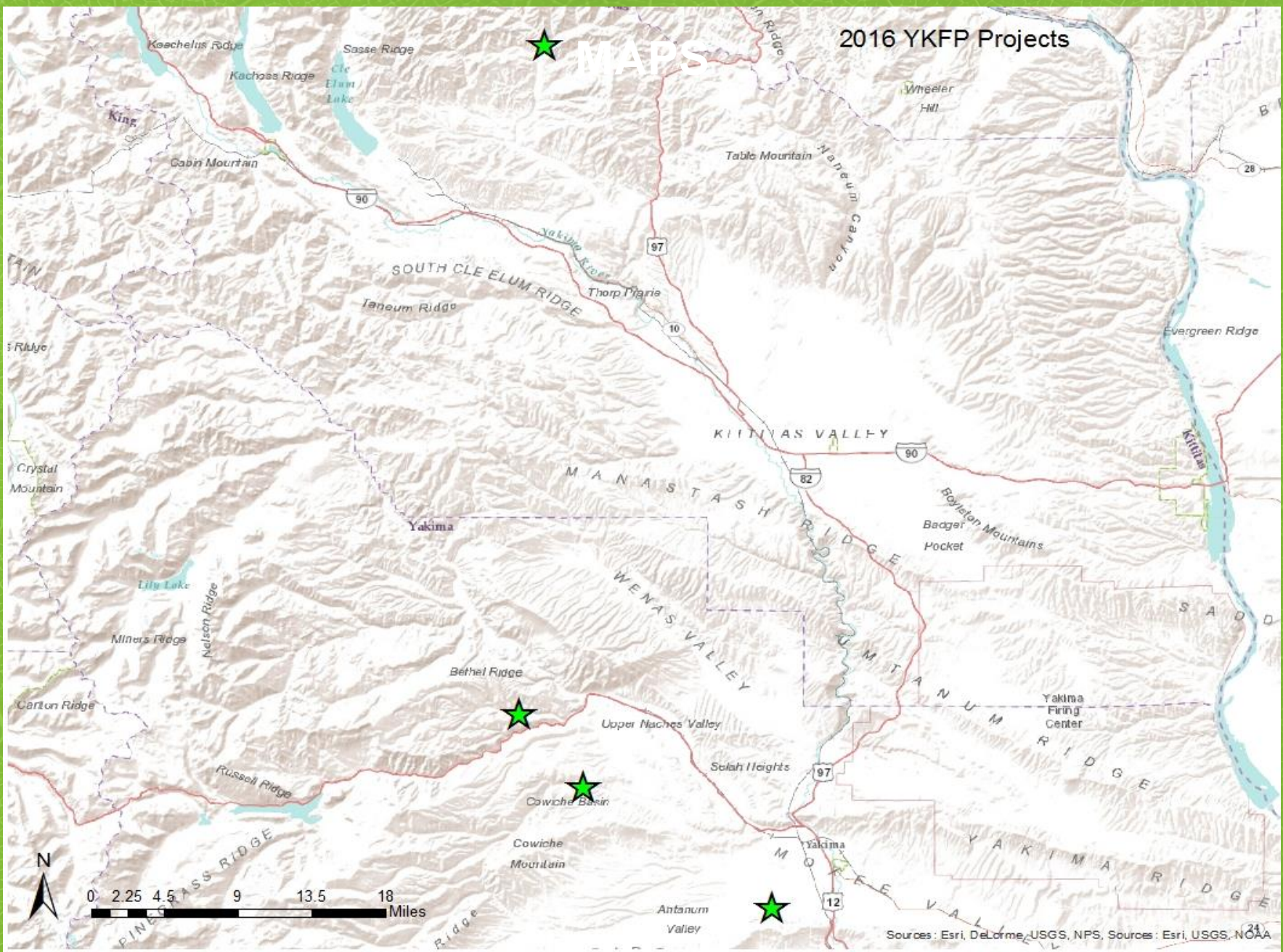


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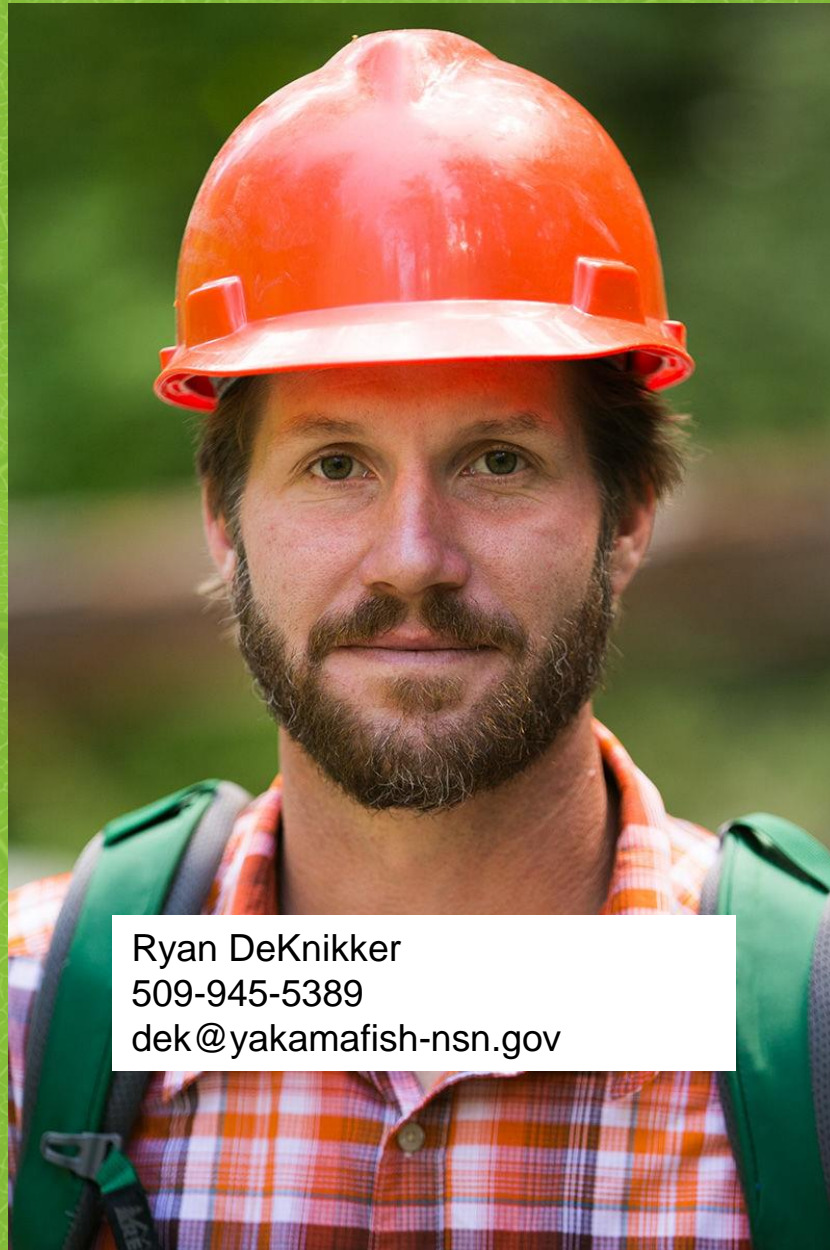
# MAPS

## 2016 YKFP Projects



Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA





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# Teanaway Community Forest Streams/Historic Railroad Interactions

-  Historic Railroads
-  Fish Habitat
-  Shorelines
-  Teanaway Basin
-  Teanaway Community Forest

Waterbody	Miles Miles of Potential Restoration
Teanaway Mainstem	2.2 miles
Teanaway North Fork	6.8 miles
Teanaway West Fork	6.6 miles
Teanaway Middle Fork	3.0 miles
Stafford Creek	1.5 miles
Jungles Creek	2.0 miles
Jack Creek	4.0 miles
Van Creek	3.8 miles
Hodan Creek	2.7 miles
Middle Creek	3.4 miles
Story Creek	2.7 miles
Mason Creek	2.8 miles
Musser Creek	1.6 miles
Camp Seventeen Creek	1.4 miles
Carlson Creek	2.4 miles
Singhal Creek	1.7 miles
Sandstone Creek	1.7 miles
Sik Creek	4.5 miles
Unnamed Creek	1.3 miles
Unnamed Creek	1.8 miles
Unnamed Creek	2.0 miles
Unnamed Creek	1.2 miles
Unnamed Creek	1.7 miles
<b>Total</b>	<b>61.1 miles</b>



Forest boundaries approximate

Copyright 2011, Teanaway Community Forest. All rights reserved. This map was prepared using GIS software and data provided by the Teanaway Community Forest. The map is for informational purposes only and does not constitute a warranty of any kind. The map is not to be used for any other purpose without the express written consent of Teanaway Community Forest.





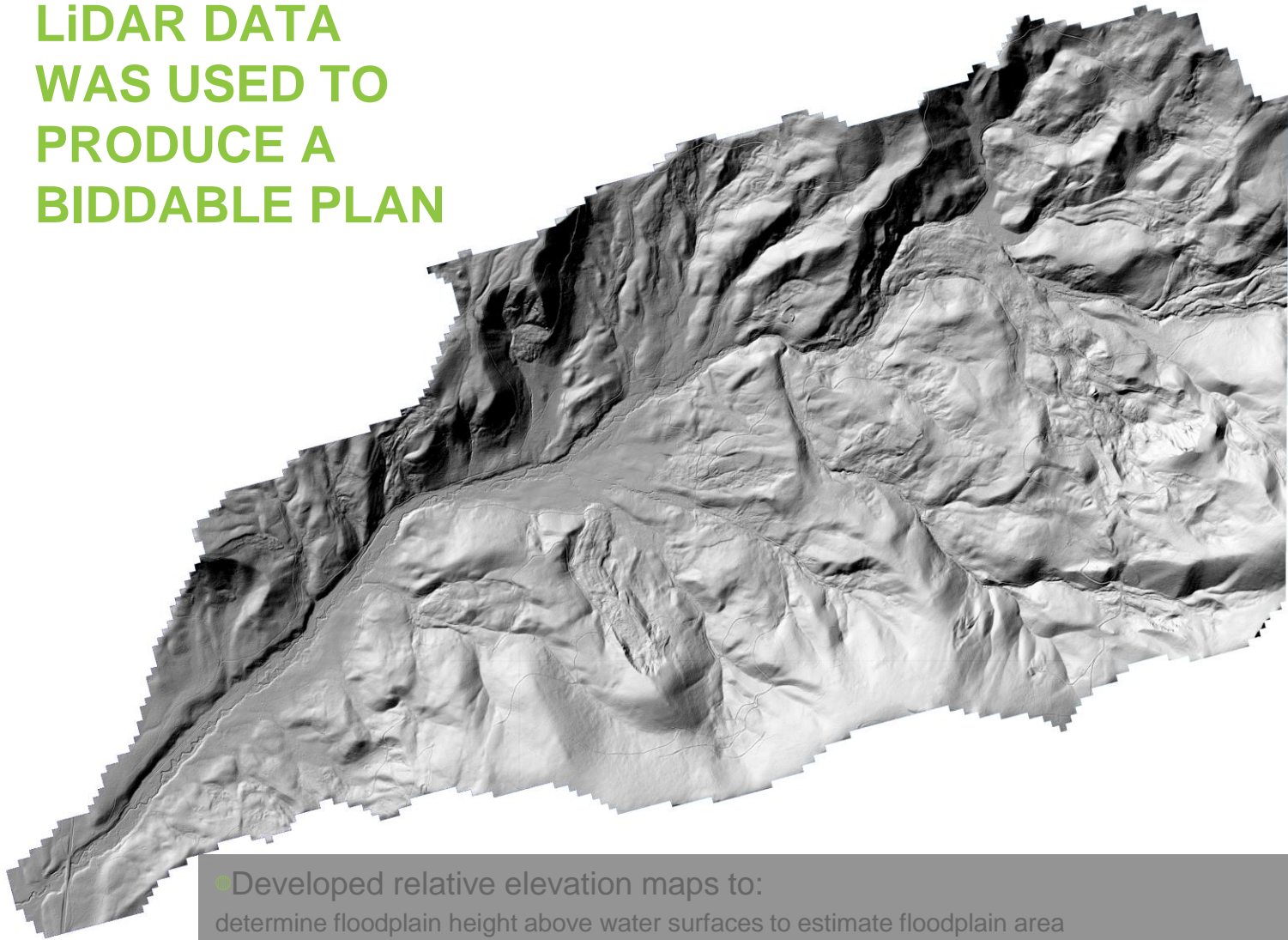
# TEANAWAY COMMUNITY FOREST AQUATIC RESTORATION, PHASE 1



- INDIAN CREEK: 1.8 miles of stream, 39 acres of floodplain
- MIDDLE CREEK: 1.1 miles of stream, 27 acres of floodplain
- FIRST CREEK: 0.5 miles of stream, 16 acres of floodplain
- JUNGLE CREEK: 1.4 miles of stream, 17 acres of floodplain



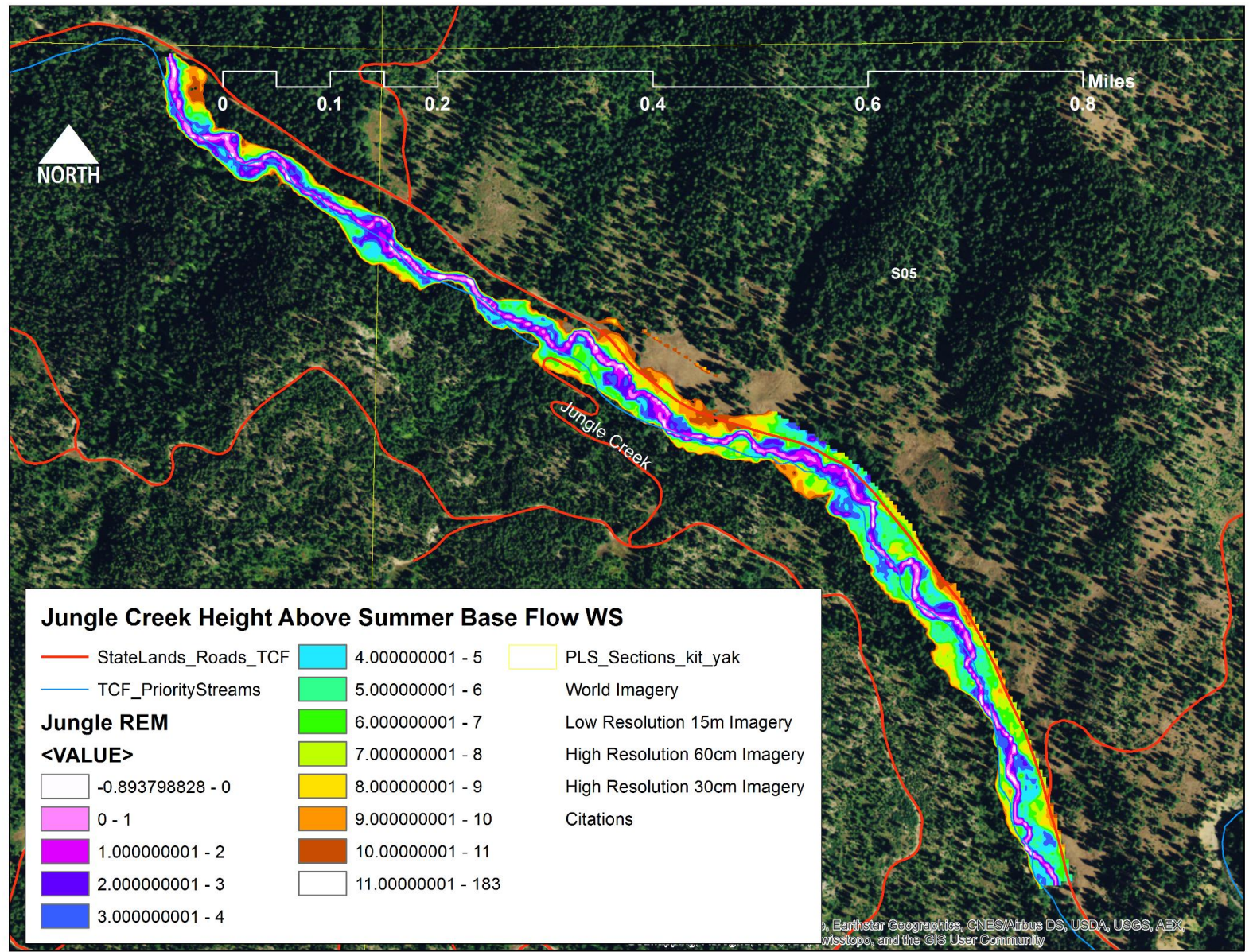
# LIDAR DATA WAS USED TO PRODUCE A BIDDABLE PLAN



- Developed relative elevation maps to:
  - determine floodplain height above water surfaces to estimate floodplain area
  - determine degree of stream incision/floodplain disconnection
  - develop wood loading intensity levels/material quantities based on degree of discontinuity



# RELATIVE ELEVATION MAP (Jungle Creek Reach)

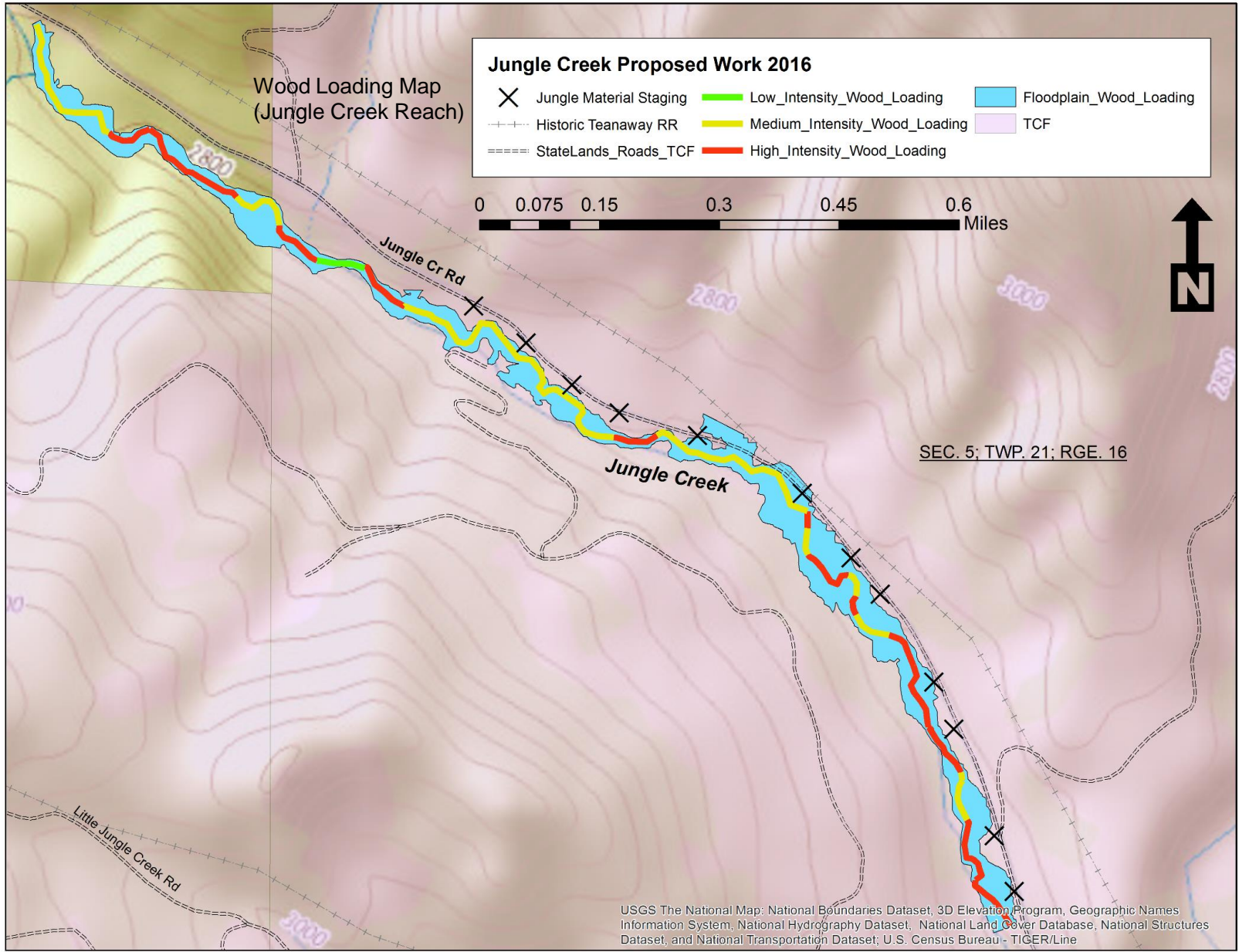
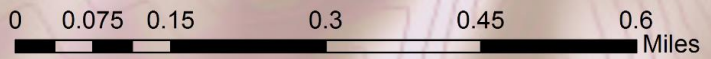




# Wood Loading Map (Jungle Creek Reach)

## Jungle Creek Proposed Work 2016

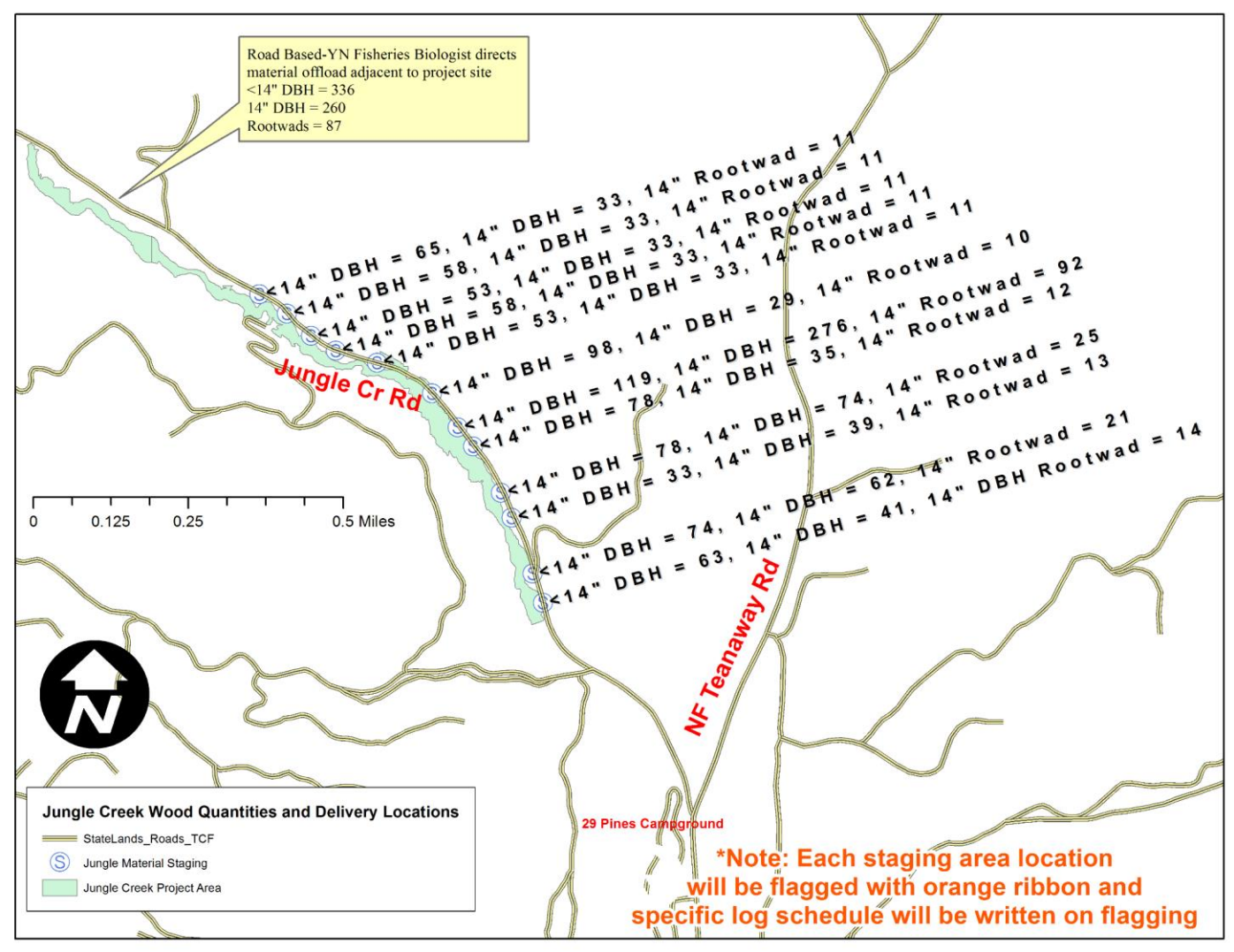
- X Jungle Material Staging
- Historic Teanaway RR
- StateLands\_Roads\_TCF
- Low\_Intensity\_Wood>Loading
- Medium\_Intensity\_Wood>Loading
- High\_Intensity\_Wood>Loading
- Floodplain\_Wood>Loading
- TCF



USGS The National Map: National Boundaries Dataset, 3D Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line



# Contractor Wood Delivery Map (Jungle Creek Reach)





## HI INTENSITY:

15 LOGS/100 FEET

1 ROOTWAD/ 3 CUT LOGS

## MEDIUM INTENSITY:

7 LOGS/100 FEET

1 ROOTWAD/ 3 CUT LOGS

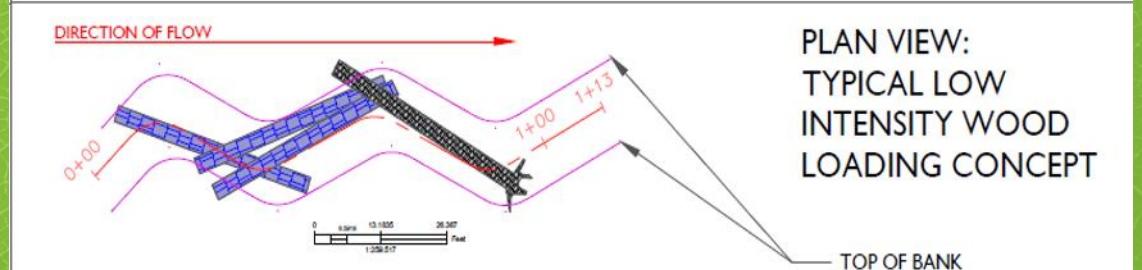
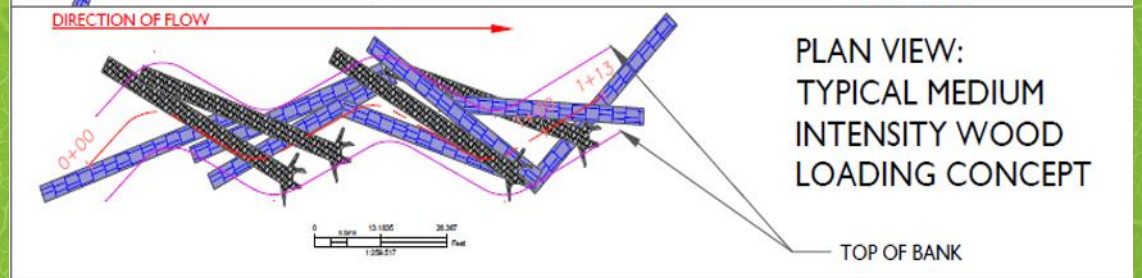
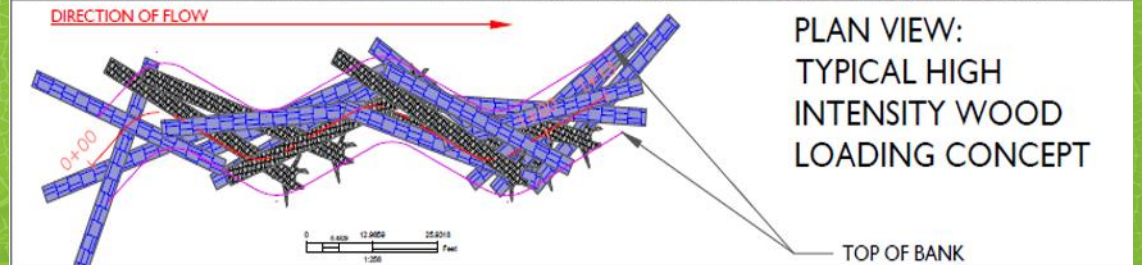
## LOW INTENSITY:

2 LOGS/100 FEET

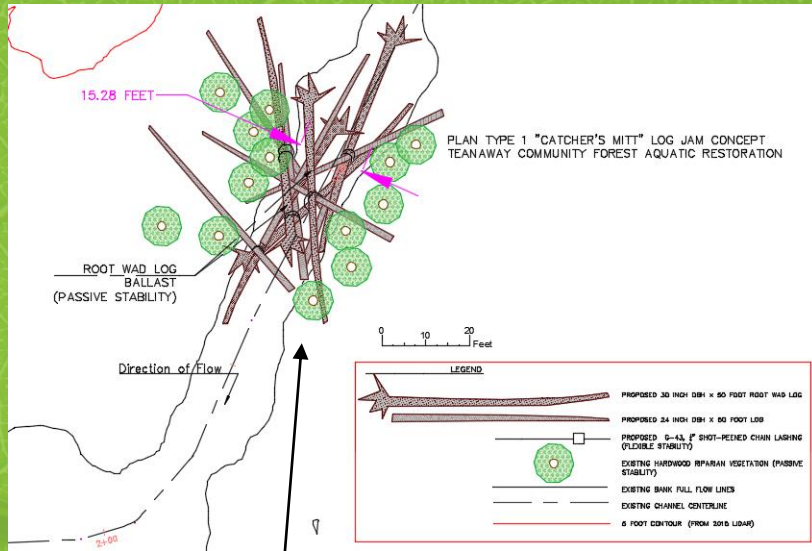
1 ROOTWAD/ 3 CUT LOGS

## FLOODPLAIN:

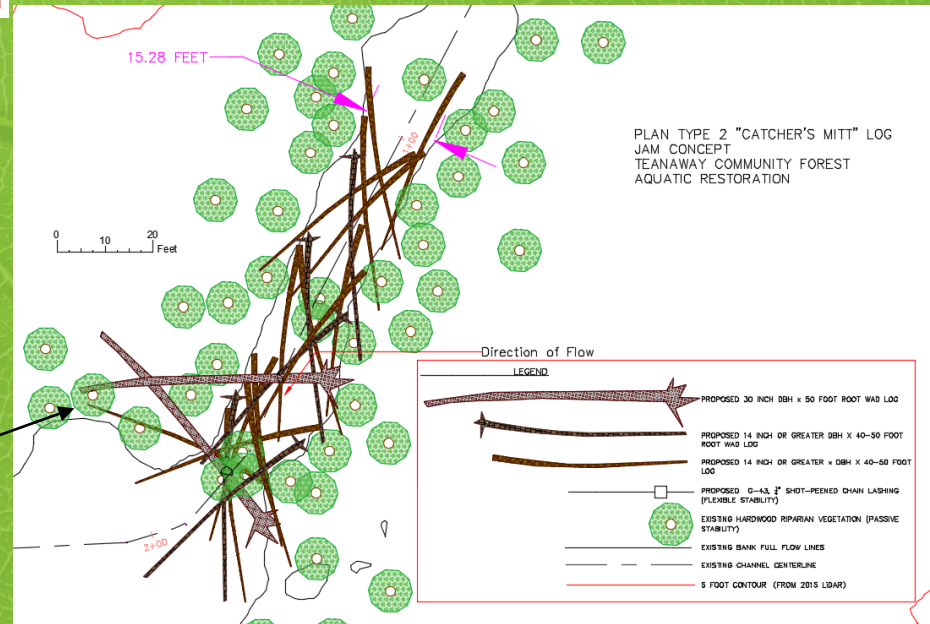
70 LOGS/ACRE







"TYPE 1"

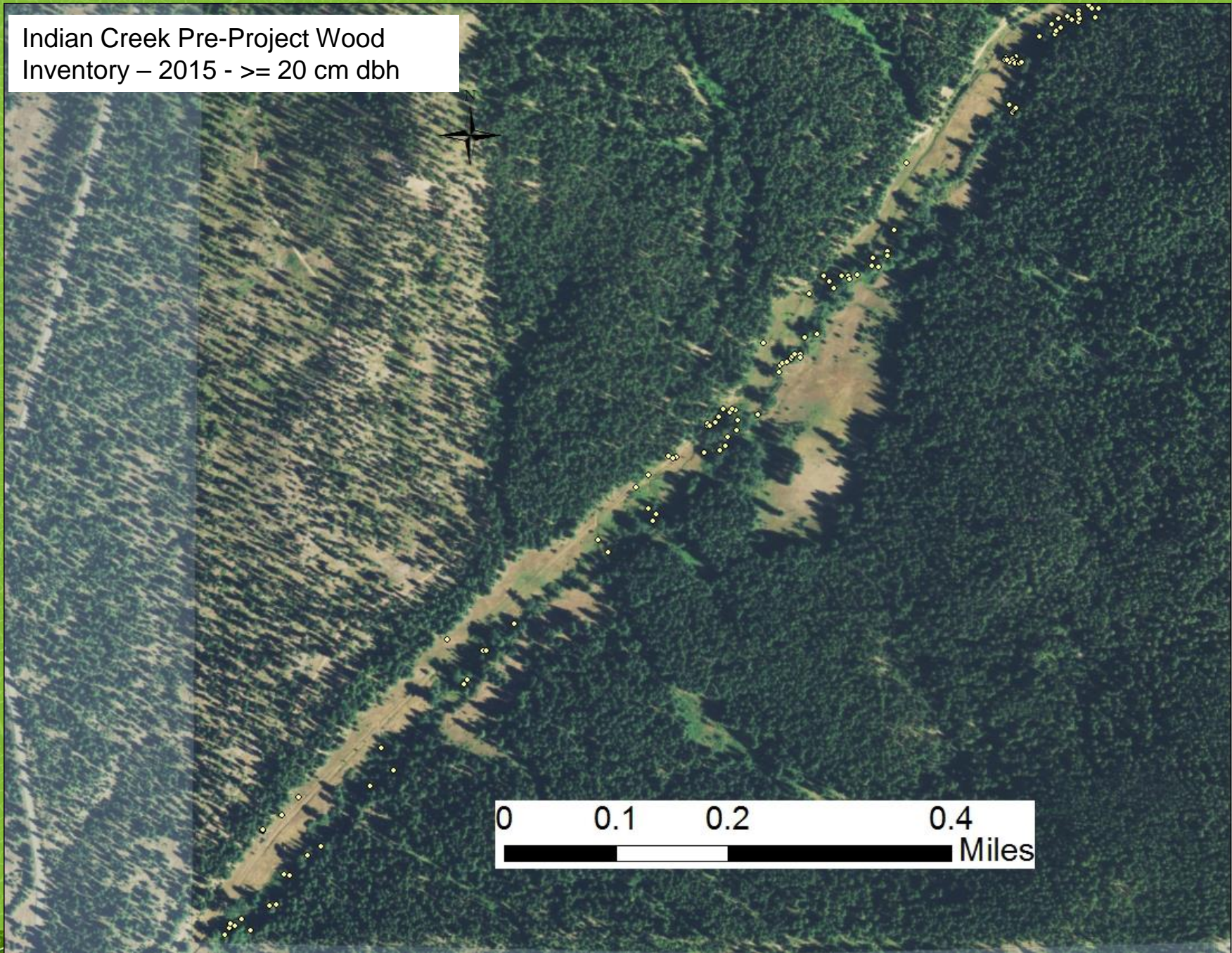
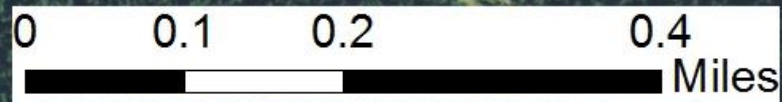


"TYPE 2"

# "Catcher's Mitt" Concepts developed to mitigate risk to infrastructure

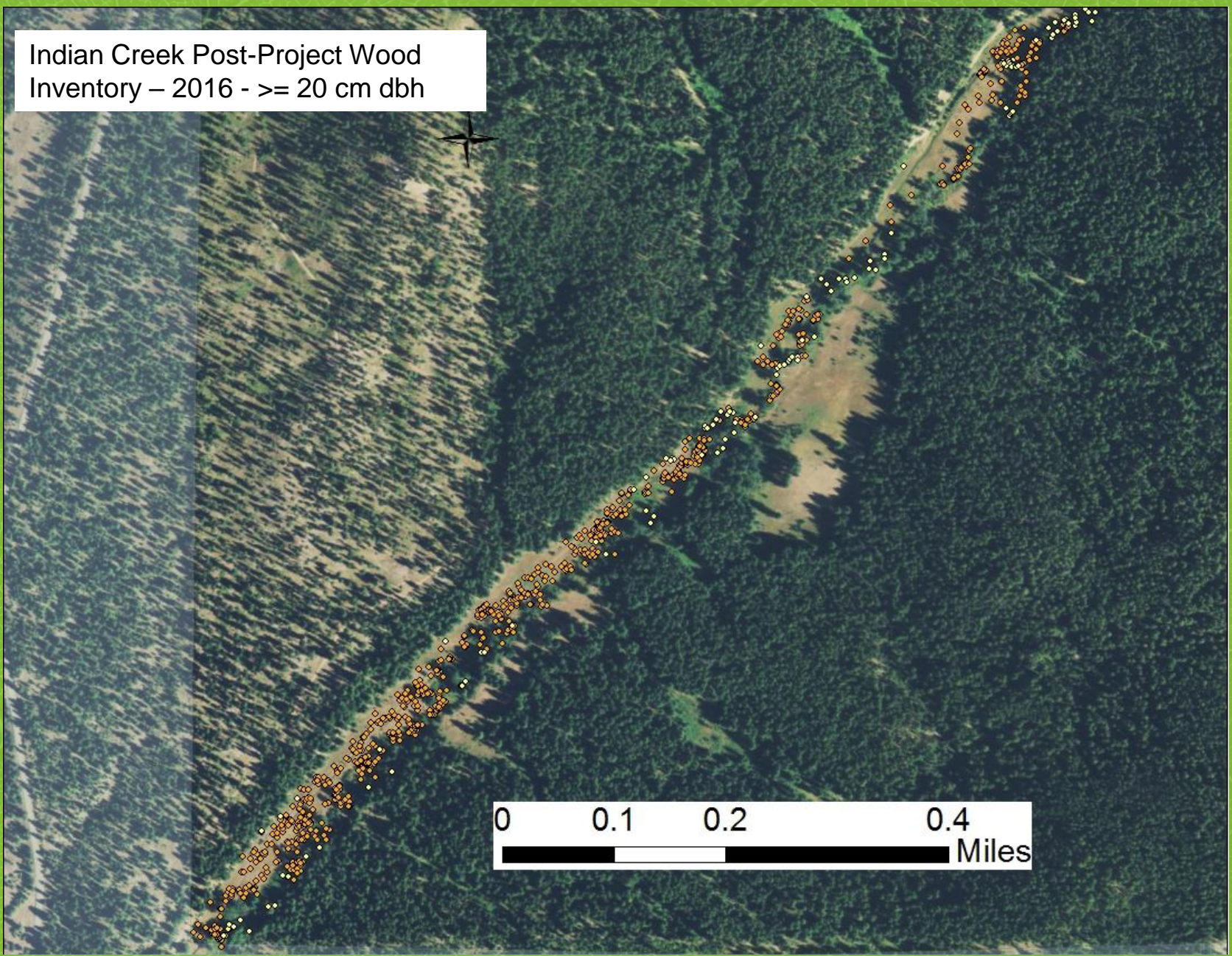
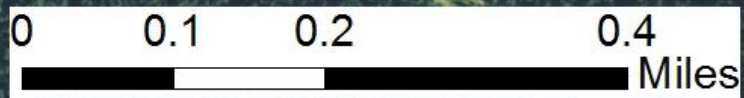


Indian Creek Pre-Project Wood  
Inventory – 2015 -  $\geq 20$  cm dbh





Indian Creek Post-Project Wood  
Inventory – 2016 -  $\geq 20$  cm dbh





## PHASE 1 (2017) OUTCOME

- PLACE 2158 PIECES OF WOOD >14" DBH AND 40' LENGTH IN STREAM
- PLACE 719 ROOT WADS > 14" DBH AND 40' LENGTH IN STREAM
- PLACE 6,930 PIECES OF <14" DBH LOGS ON FLOODPLAIN SURFACES
- **THEN WAIT FOR A FLOOD TO DO ALL THE WORK....**

COST: ~\$310,000.00, TIME AND MATERIALS CONTRACT FOR MATERIAL HARVEST AND PLACEMENT



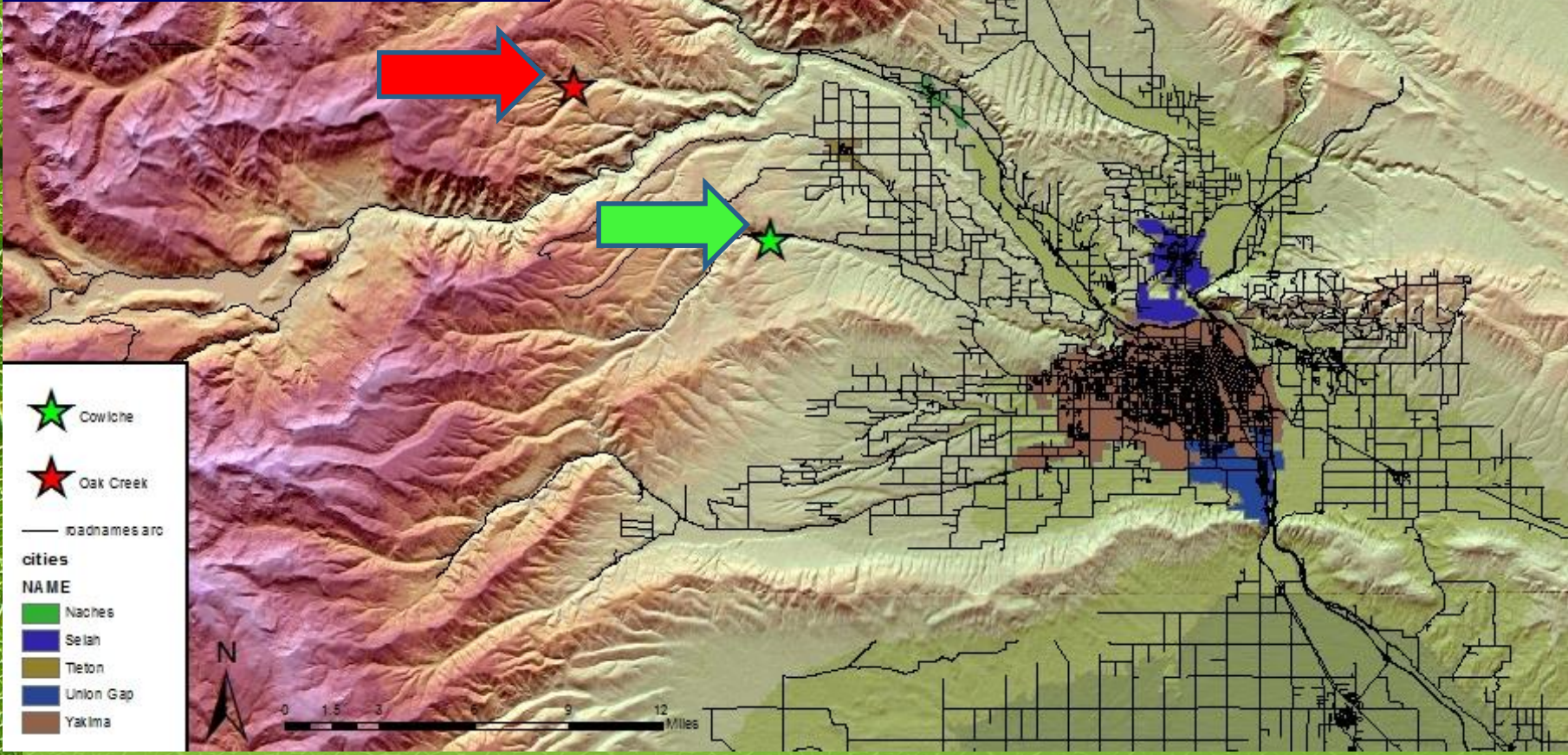


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# South Fork Cowiche Creek Restoration Project

Wood locally harvested from the Oak Creek drainage, under the Tapash Sustainable Forest Collaborative and transported to SF Cowiche Creek.



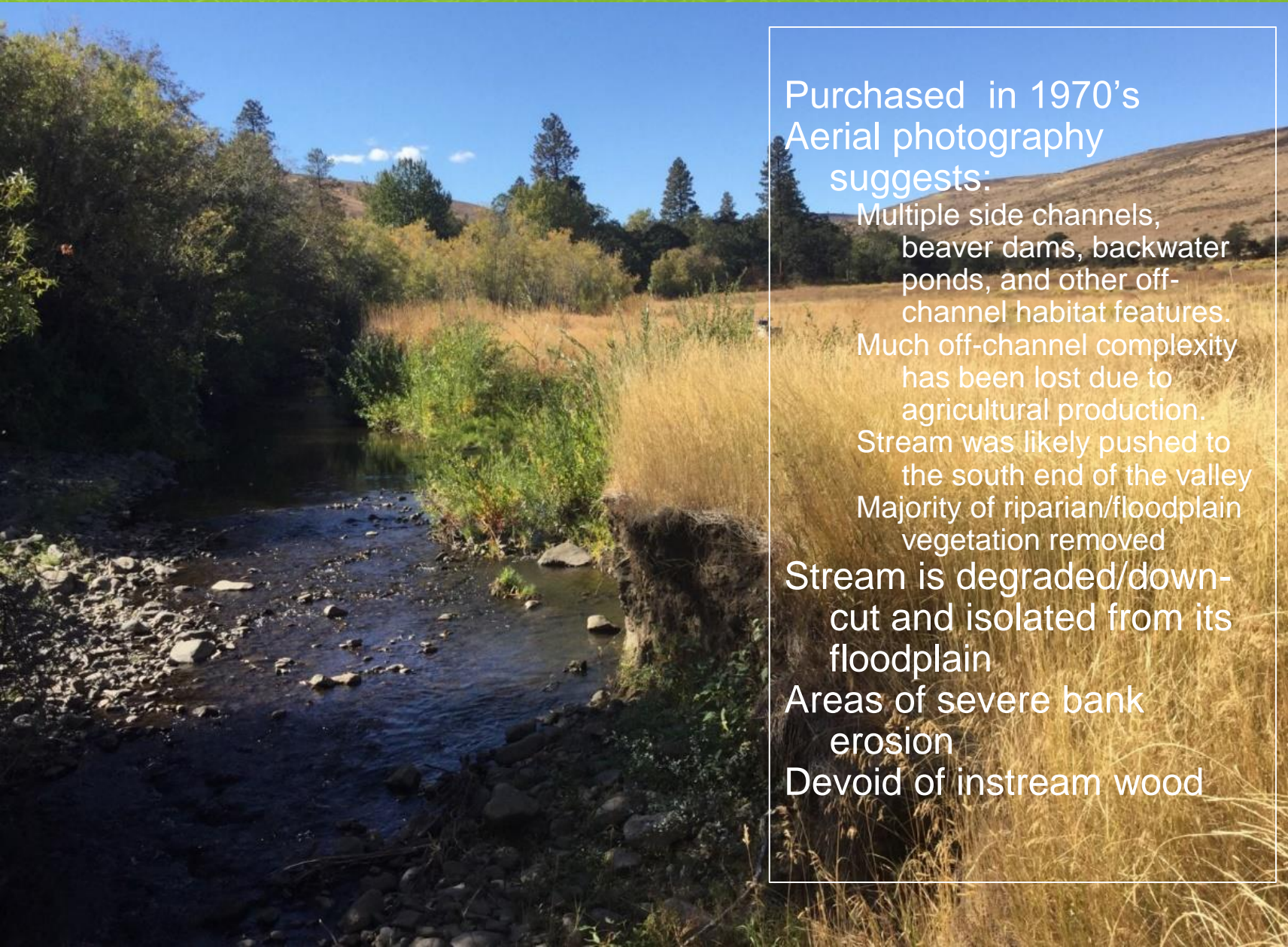


## South Fork Cowiche Creek

- WDFW's Oak Creek Wildlife Area – Cowiche unit
- 2 mile project reach
- ~12 RM from Naches River
- Supports ESA listed steelhead trout
- Potential/historic range of bull trout







Purchased in 1970's  
Aerial photography  
suggests:

Multiple side channels,  
beaver dams, backwater  
ponds, and other off-  
channel habitat features.

Much off-channel complexity  
has been lost due to  
agricultural production.

Stream was likely pushed to  
the south end of the valley  
Majority of riparian/floodplain  
vegetation removed

Stream is degraded/down-  
cut and isolated from its  
floodplain

Areas of severe bank  
erosion

Devoid of instream wood





## Technique: Wood Replenishment

This approach involves adding unanchored wood directly to the channel or to adjacent floodplains, side channels, or banks where it can be readily recruited and/or redistributed by the stream. (Risk to infrastructure and public safety need to be well understood.)

South Fork Cowiche: Placed ~1400 pieces of large wood over 2 miles in the stream channel and adjacent floodplain in appropriate locations using a 1993 Link Belt 4300 log loader with grapple hook



Before



During



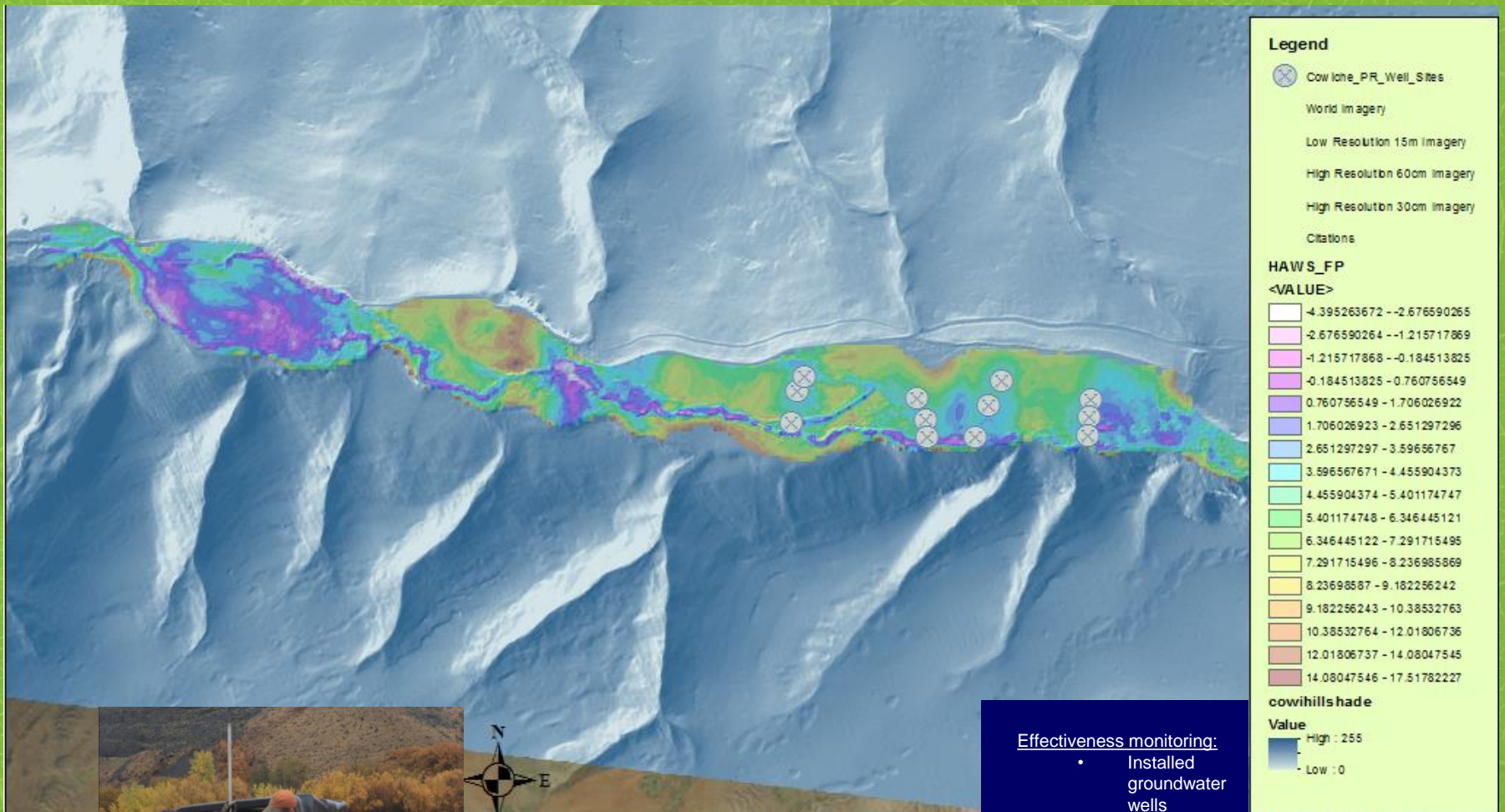
After











Sources: Esri, DigitalGlobe, GeoEye, AeroGRID, IGN, ISF,...

4,500

0

4,500 Feet

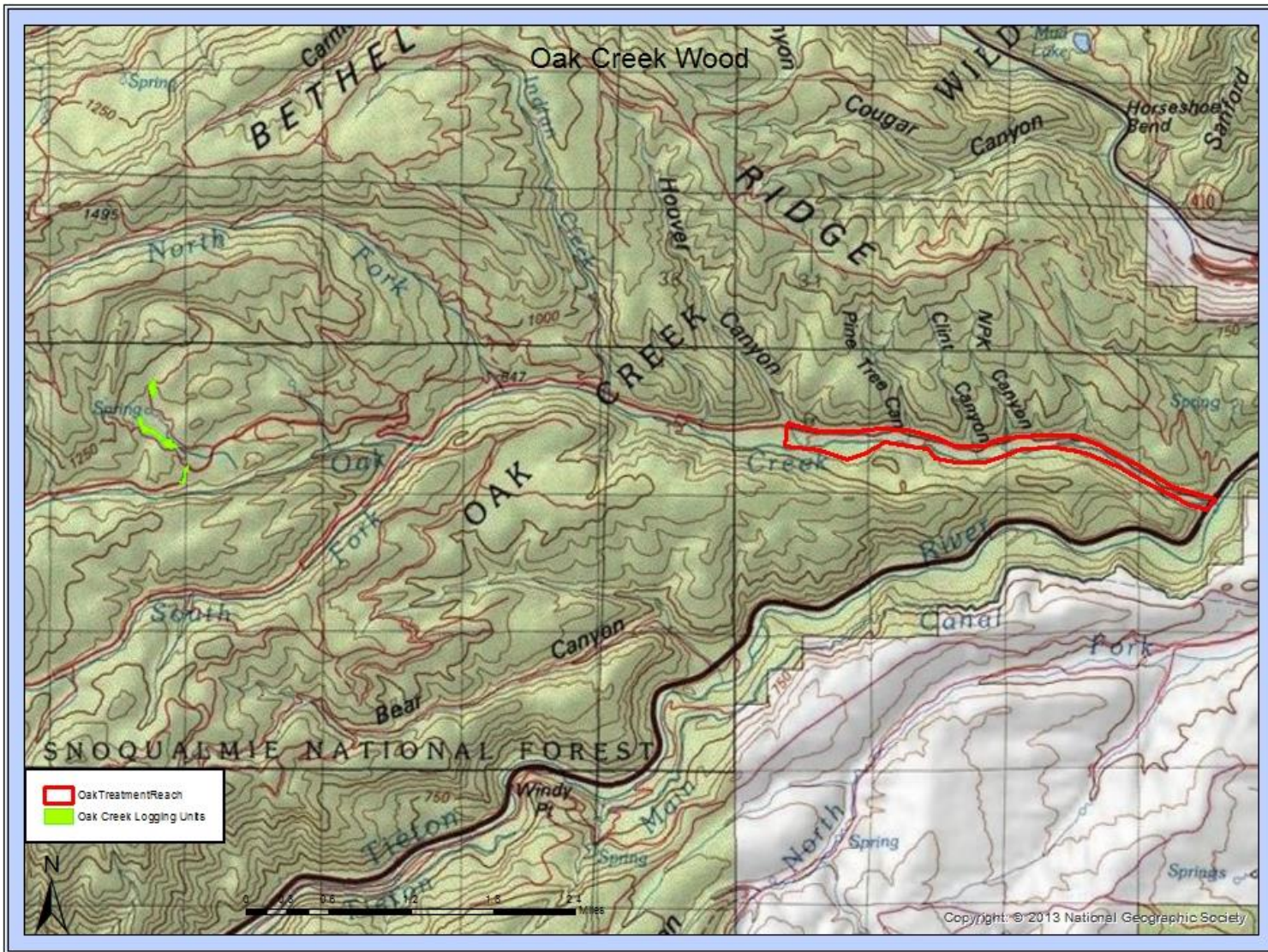
- Effectiveness monitoring:
- Installed groundwater wells
  - Aerial photography (drone flights)
  - Photo points
  - Time lapse cameras
  - Habitat and vegetation survey
  - Stream temperature





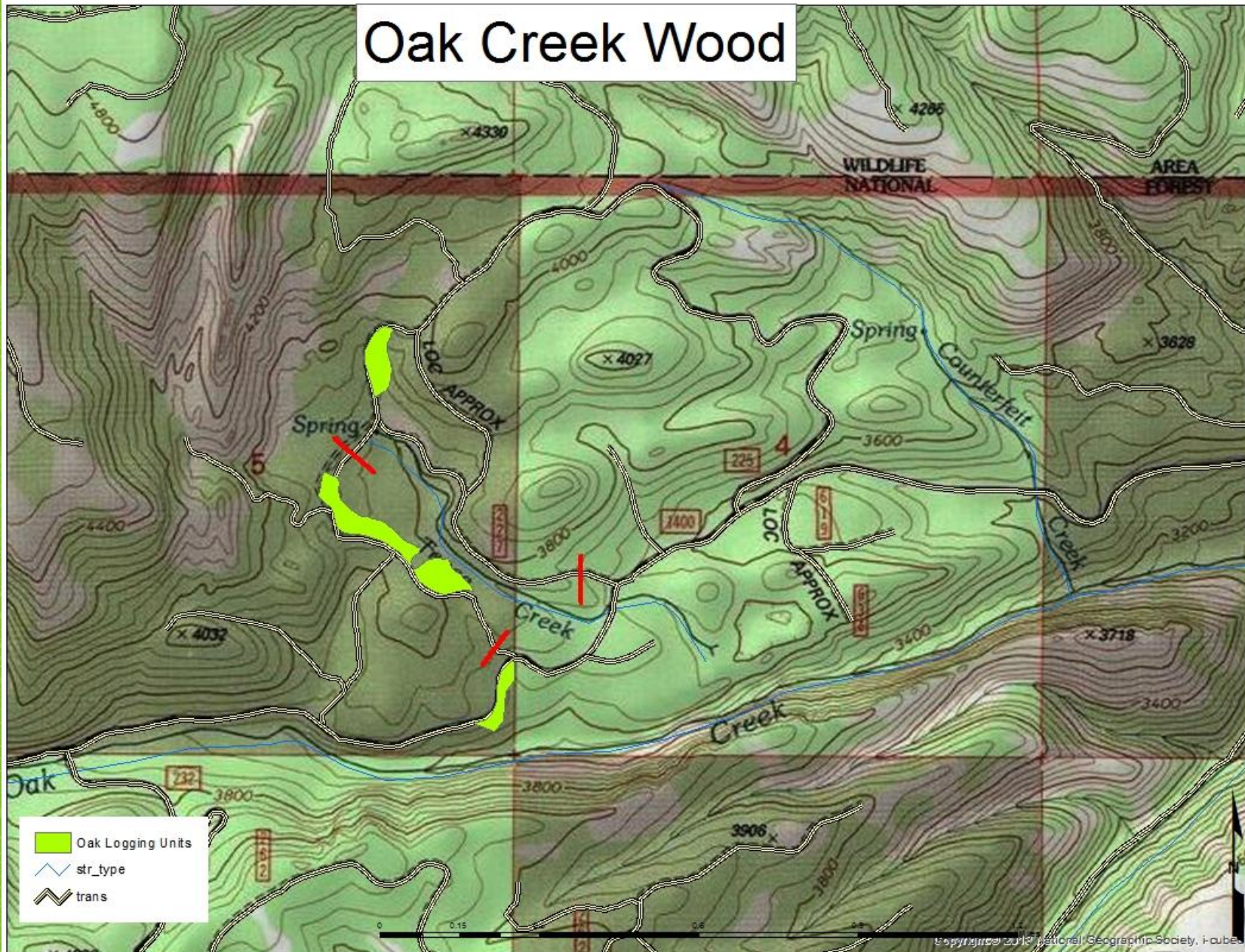
Video courtesy of Jason McCormick





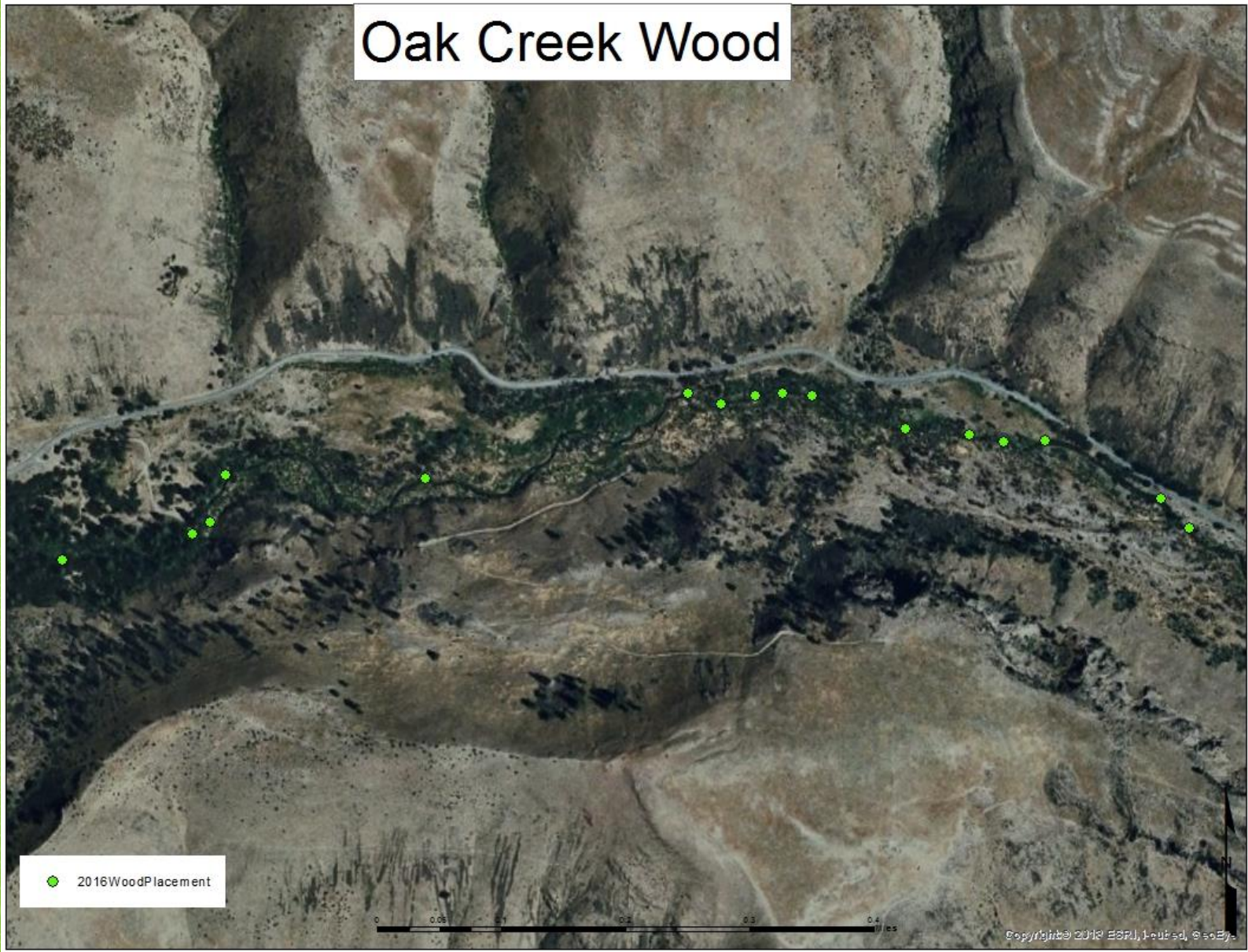


# Oak Creek Wood





# Oak Creek Wood





2015





2016











Kirk and Chili





















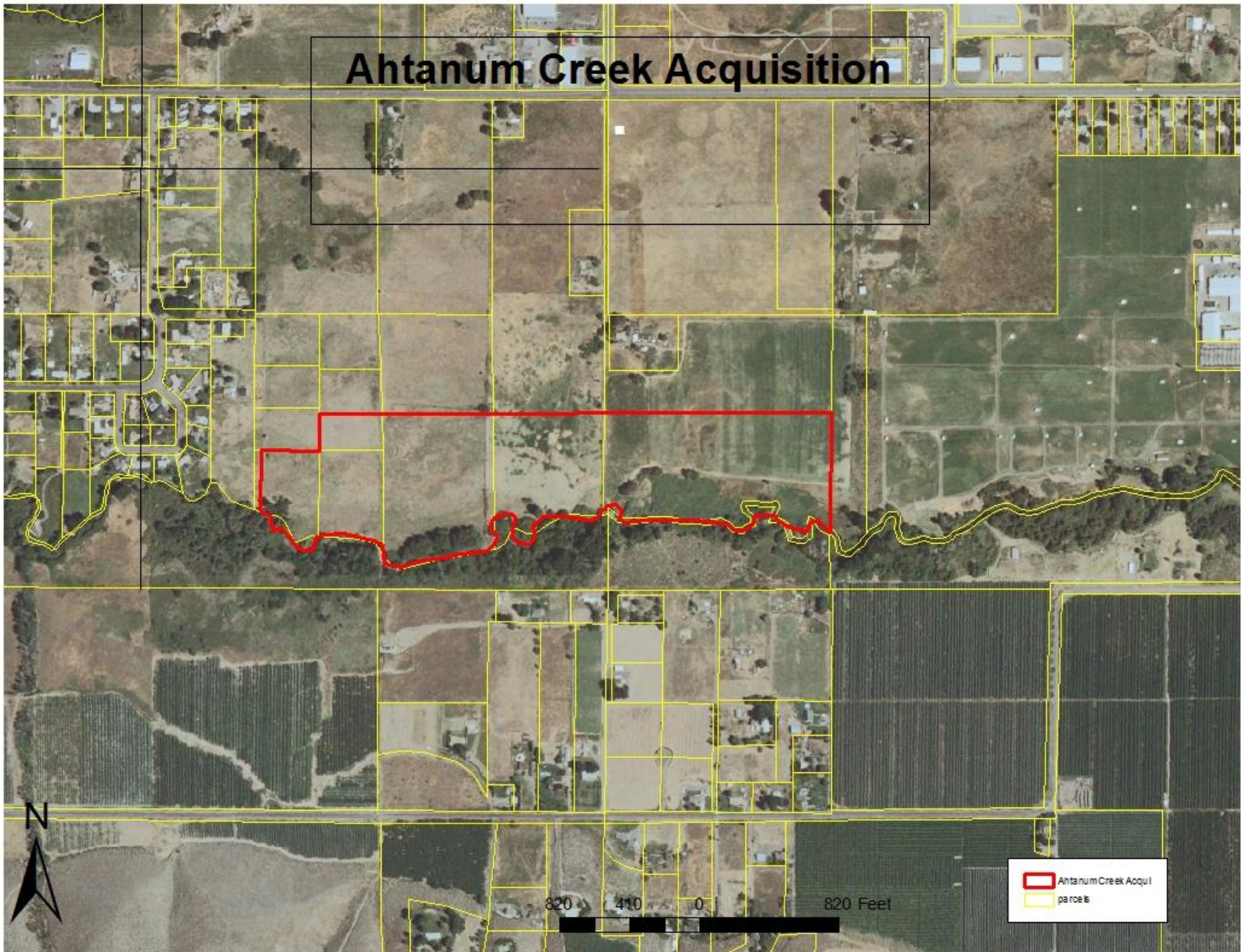








# Ahtanum Creek Acquisition



0 410 820 Feet

Ahtanum Creek Acqui  
parcels







The Not So Good Stuff





Special thanks to all the people who made these awesome projects happen:

- Dukes Construction - Cowiche Creek
- Rivers Edge Construction – Oak Creek
- Wickstrom Logging – Oak Creek
- Wasington Conservation Corps
- And the Money Folks

