

A scenic view of a rocky stream in a riparian habitat. The stream flows through a bed of smooth, grey and brown stones. The banks are lush with green grasses and shrubs. In the background, two workers in high-visibility vests stand near a large piece of equipment, possibly a conveyor or transport system, on a hillside. The sky is clear and blue, with distant mountains visible on the horizon.

# **BLM Challis Field Office Overview of Riparian and Fisheries Habitat Restoration 2015**

# Riparian and Fisheries Habitat Restoration

in the Upper Salmon River Basin Watershed

(Governor's Office of Species Conservation)

## **PARTNERS**

- Shoshone-Bannock Tribes
- Department of Agriculture
  - Natural Resources Conservation Service
  - Forest Service
- Department of the Interior
  - Bureau of Land Management
  - Bureau of Reclamation
  - US Fish and Wildlife
- NOAA
- Idaho Fish and Game
- Custer Soil and Water District

## **PARTNERS**

- Salmon Valley Stewardship
- Lemhi Regional Land Trust
- The Nature Conservancy
- Trout Unlimited
- Big Creek Ranch



SHOSHONE-BANNOCK TRIBES



USDA NRCS  
Natural Resources Conservation Service



Lemhi Regional  
LAND TRUST



Salmon Valley Stewardship

The Nature Conservancy

Upper Salmon Basin  
WATERSHED PROGRAM

# Habitat Programmatic for ESA Consultation

- 4 T&E Species & Critical Habitat
- Endangered
  - Snake River Sockeye Salmon (NMFS)
- Threatened
  - Snake River Chinook Salmon (NMFS)
  - Snake River Steelhead (NMFS)
  - Columbia River Bull Trout (FWS)

# BLM Challis Field Office Overview 2015

- PAHSIMEROI VALLEY
  - Mill Creek Reconnect Project
  - P-16 Furey Lane Water Conservation and Reconnect Project
  - Future Downstream Restoration
- EAST FORK of the SALMON RIVER
  - Little Boulder Campground Streambank Restoration Project



# Mill Creek Reconnect Project

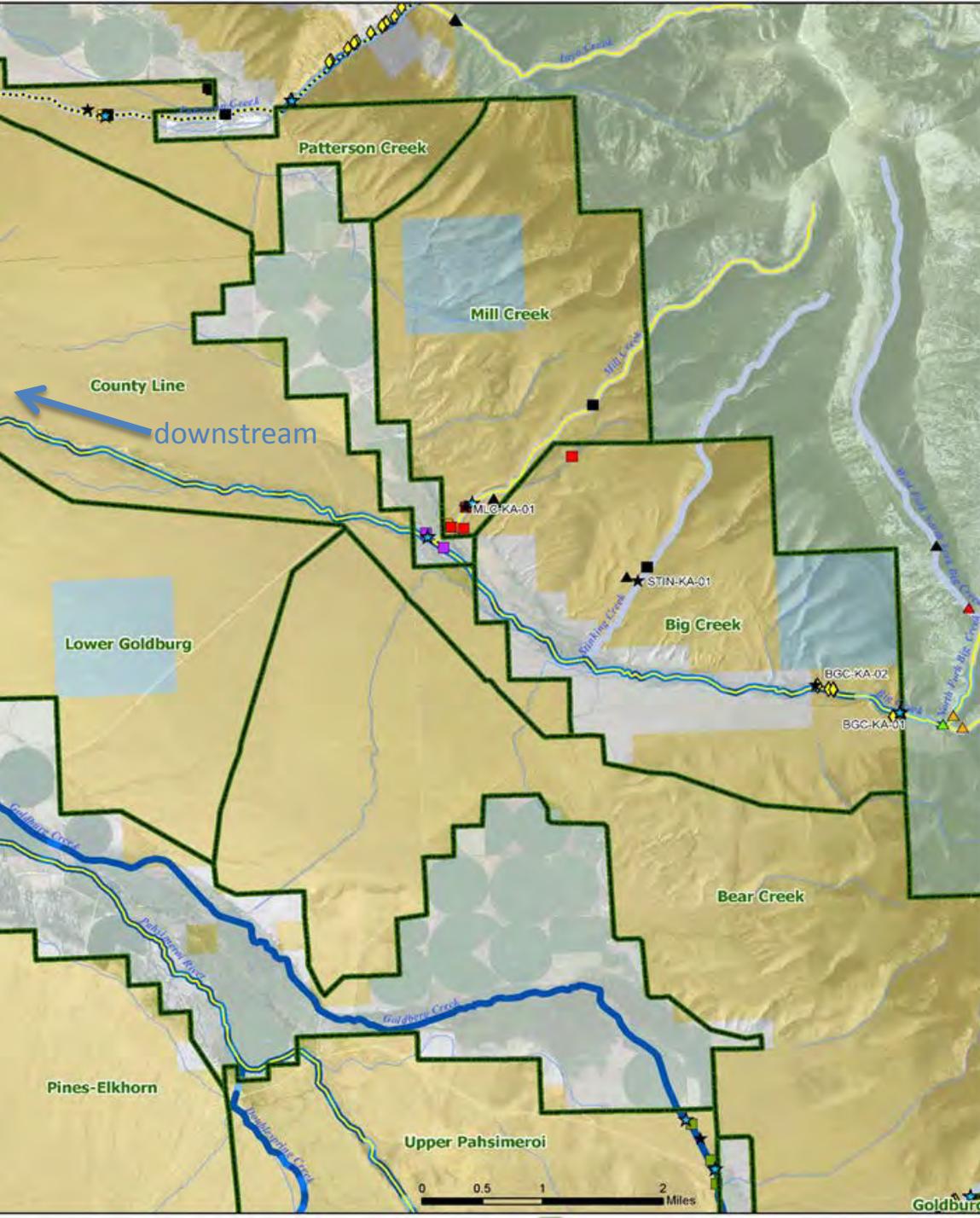


# Mill Creek Reconnect Project

- Pahsimeroi River Watershed
- Historically chinook salmon and steelhead fishery
- Disconnected for at least 80 to 100 years
- Largest tributary to Pahsimeroi River
- Most downstream tributary of the Pahsimeroi
- Inaccessible to Chinook salmon and steelhead
- Isolated westslope cutthroat trout, rainbow trout and blt fishery

# Mill Creek Reconnect Project

- Proposed by TU and Big Creek Ranch, LLC in 2012
- Design funding provided by USFWS, TU, and Formation Capital
- BLM performed scoping, baseline data collection and monitoring, cultural survey, and ESA Section 7 Consultation
- Implementation funding provided by Pacific Coast Salmon Recovery Fund, and matches from USFWS Partners for Fish and Wildlife Program, TU, and Big Creek Ranch, LLC.



# Baseline Conditions

- 8 miles of intermittent Big Creek downstream of Mill Creek
- Limited function as critical habitat for Chinook, steelhead, bull trout
- Population sink habitat for existing resident salmonids

2011 photo showing  
extensive irrigation  
ditches and flow  
alterations

No vegetation  
downstream  
Pahsimeroi River



Big Creek Ranches  
Mill Creek Area  
2011 Aerial (NAIP)

NWelch 2012-08-15

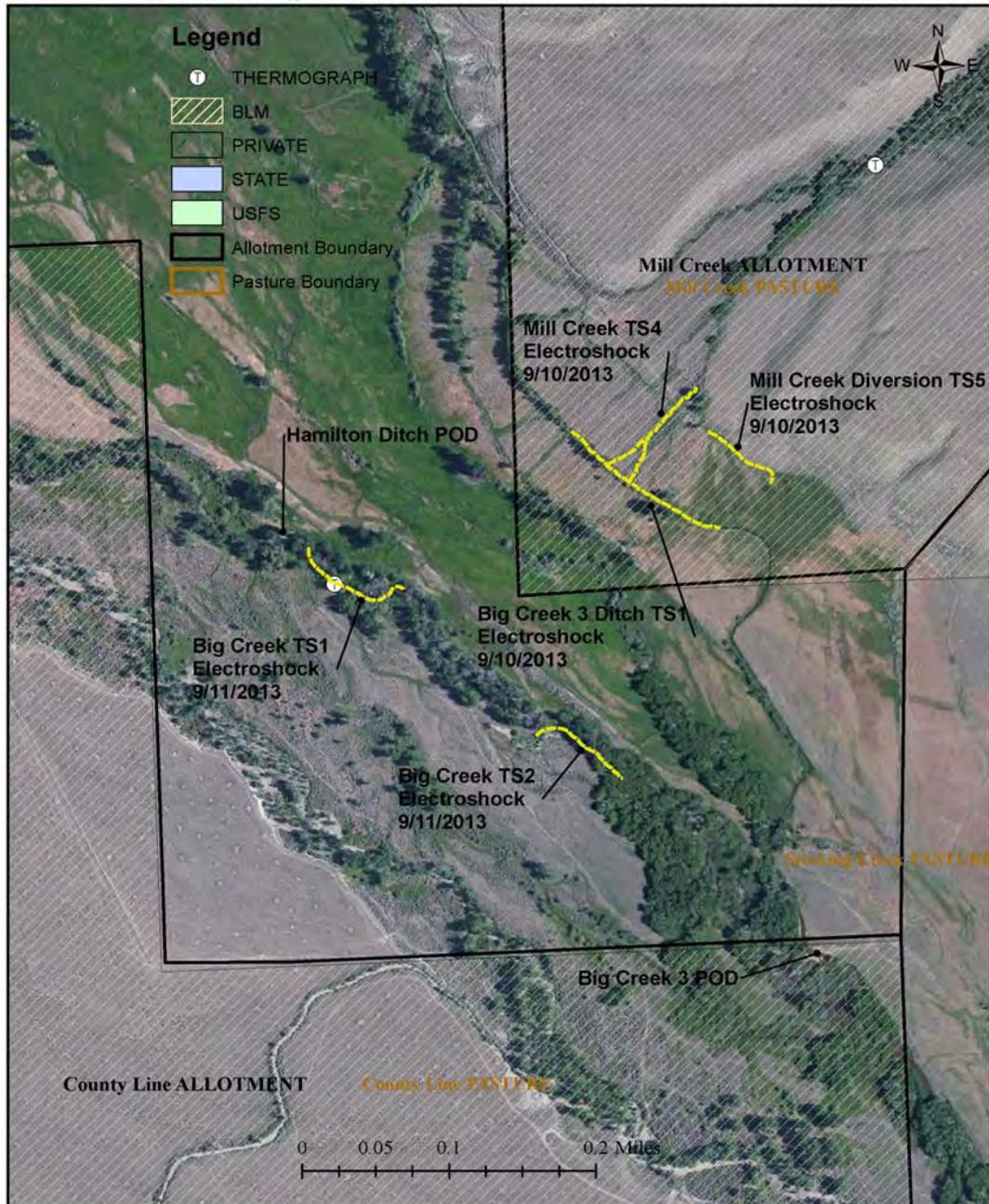
0 500 1,000 2,000 Feet

A horizontal scale bar with tick marks at 0, 500, 1,000, and 2,000 feet.



# Fish Species Composition and Habitat Fragmentation

- 2010 BLM fisheries survey in reference reaches
  - Only westslope cutthroat trout found in Mill Creek



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- 2013 survey included Big Creek, Big Creek 3 Ditch, and Mill Creek



# Fish Species Composition and Habitat Fragmentation

- 2013 survey included Big Creek, Big Creek 3 Ditch, and Mill Creek
  - BIG CREEK was near intermittent with fish in refuge pools
  - Rainbow trout, sculpin, and non-native brook trout in Big Creek



# Fish Species Composition and Habitat Fragmentation

- 2013 survey included Big Creek, Big Creek 3 Ditch, and Mill Creek
  - BIG CREEK 3 Ditch fragmented Mill Creek and was surveyed
  - Rainbow, bull, westslope cutthroat, and brook trout present



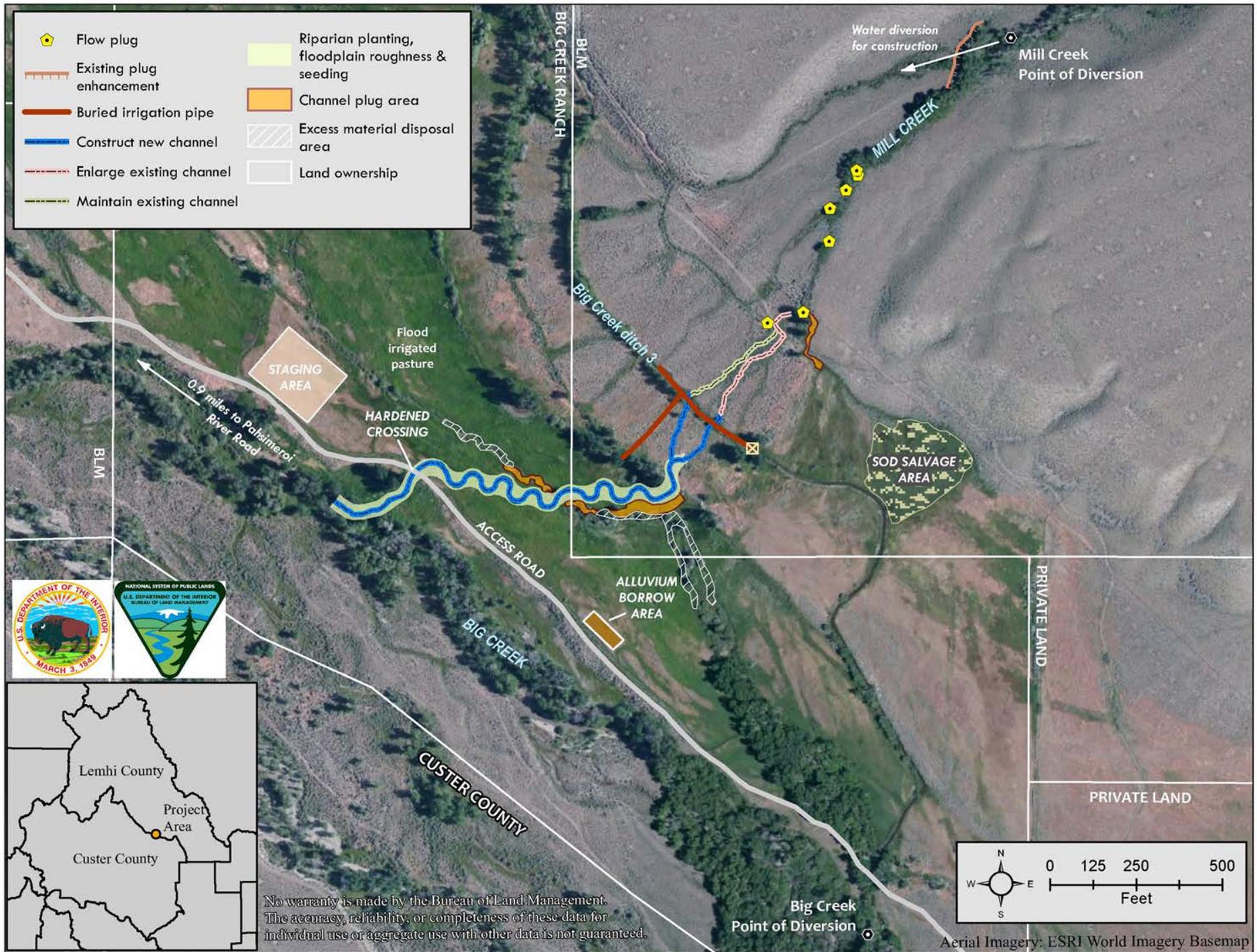
# Fish Species Composition and Habitat Fragmentation

- 2013 survey included Big Creek, Big Creek 3 Ditch, and Mill Creek
  - MILL CREEK in the project area surveyed
  - Only westslope cutthroat trout present

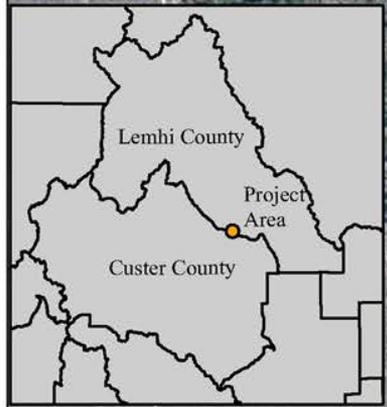
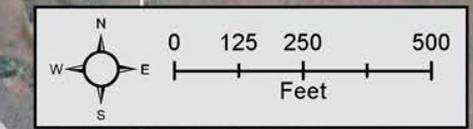
# Mill Creek Reconnect Project Primary Objectives

- Conserve existing stream flow in Mill Creek through channel consolidation and ditch closures
- Convey conserved flow and restore habitat connection between Mill and Big creeks through channel construction and irrigation improvements
- Accelerate riparian area recovery through planting, supplemental watering and fencing

|  |                           |  |   |
|--|---------------------------|--|---|
|  | Flow plug                 |  | Riparian planting, floodplain roughness & seeding |
|  | Existing plug enhancement |  | Channel plug area                                 |
|  | Buried irrigation pipe    |  | Excess material disposal area                     |
|  | Construct new channel     |  | Land ownership                                    |
|  | Enlarge existing channel  |  |   |
|  | Maintain existing channel |  |   |



No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.



Aerial Imagery: ESRI World Imagery Basemap



**Project Construction – October 2014**

# Project Construction – October 2014





**Project Completion  
Spring/Summer 2015**



**Project Completion  
Spring/Summer 2015**



**Project Completion  
Spring/Summer 2015**

A photograph of a stream in a natural setting. In the center of the stream, there is a large, tangled pile of dead, light-colored branches and twigs. The water flows around this pile. The stream is bordered by green grass and some rocks. In the background, there are several trees, including a large, bare tree on the left and some green trees on the right. A fence is visible in the distance. The sky is blue with some light clouds. The text "Project Completion Spring/Summer 2015" is overlaid in white at the bottom of the image.

**Project Completion  
Spring/Summer 2015**



**Project Completion  
Spring/Summer 2015**

# Mill Creek Conclusion and Future Project Potential

- Constructed channel was not flowing to Big Creek until spring 2015.
- Flow connection to Big Creek has persisted since spring (1-2 cfs currently).
- Further monitoring of fish distribution needed.
- Next project related priority – BC3 Fish Screen

# BLM Challis Field Office Overview 2015

## • PAHSIMEROI VALLEY

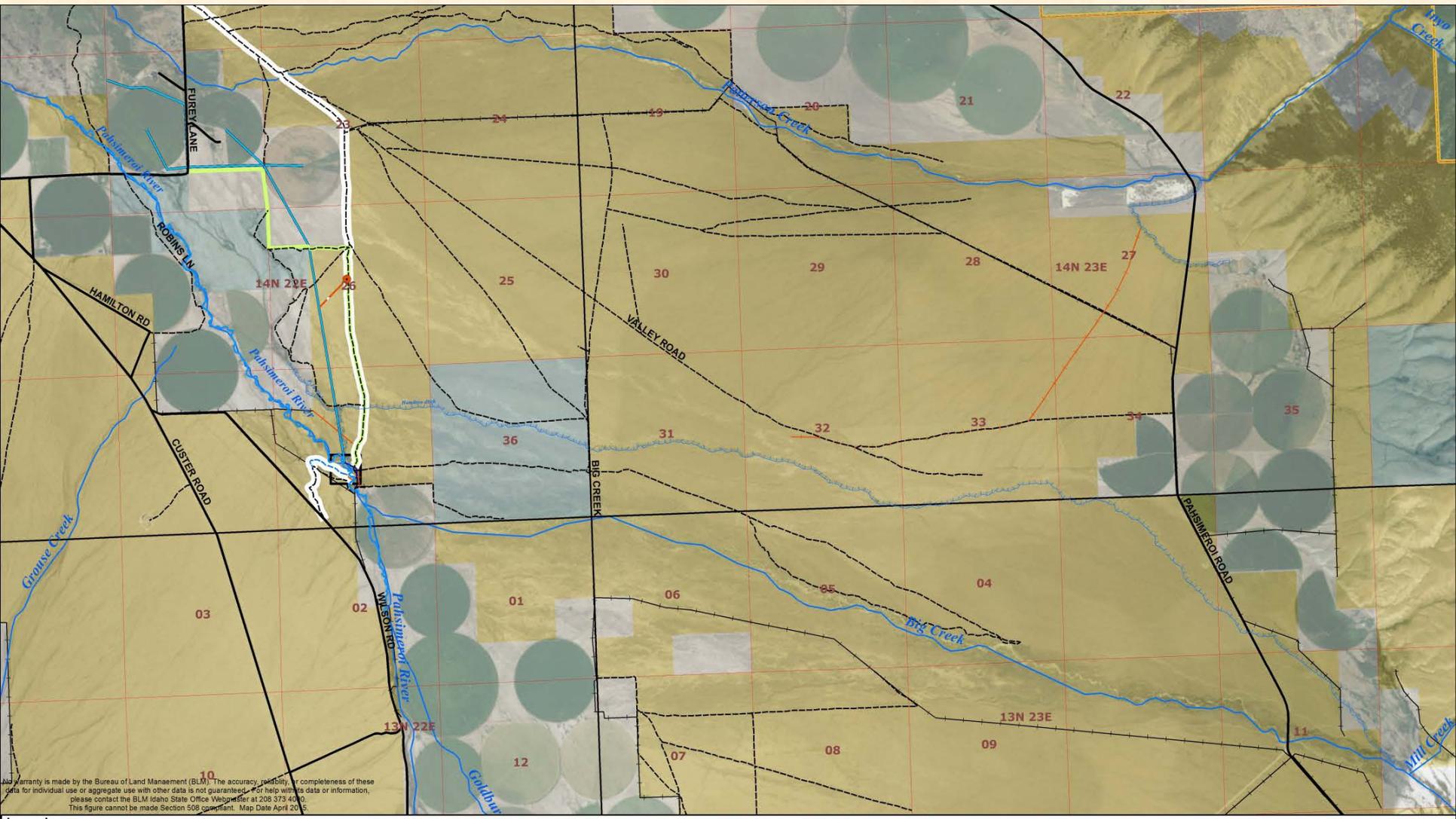
- Mill Creek Reconnect Project
- - P-16 Furey Lane Water Conservation and Reconnect Project
- Future Downstream Restoration

## • EAST FORK of the SALMON RIVER

- Little Boulder Campground Streambank Restoration Project



# P-16 Furey Lane Water Conservation and Reconnect Project



# P-16 Furey Lane Water Conservation and Reconnect Project

- Pahsimeroi River Watershed
- Fish Presence
- Fish Absence
- Proximity to Hooper Lane and Why It Matters
- Project Implications:
  - Water Downstream in Historically Dewatered Reach
  - Accessibility and Stockwater Implications

# P-16 Furey Lane Water Conservation and Reconnect Project

## Partners

- Custer Soil & Water Conservation District
- Bureau of Reclamation
- NRCS
- IDFG
- Big Creek Ranch
- Ted O'Neal

## BLM's Role

- Complete Environmental Assessment
- Consultation
- Realty Actions

# Current Diversion Practices



JUN 2 2010

# Current Diversion Practices



# Current Diversion Practices (Pahsimeroi River on left)



08/07/15

# Water Rights

- Big Creek Water Rights
- Pahsimeroi River Water Rights
- Water Savings
  - Paper Water Savings
    - Big Creek 9.5 cfs
    - Pahsimeroi 11.5-15 cfs)
  - Actual Realized Water Savings
    - Big Creek >9.5cfs
    - Pahsimeroi 11.5->?? cfs

# Existing Conditions

## Pahsimeroi River below P-16 diversion

- Annual dewatering
- Limited riparian extent
- Limited recruitment
- Sediment issues/bank stability
- Limited fish habitat (pools, wood, undercut banks)



# Existing Conditions Pahsimeroi River below P-16 diversion



June 2011

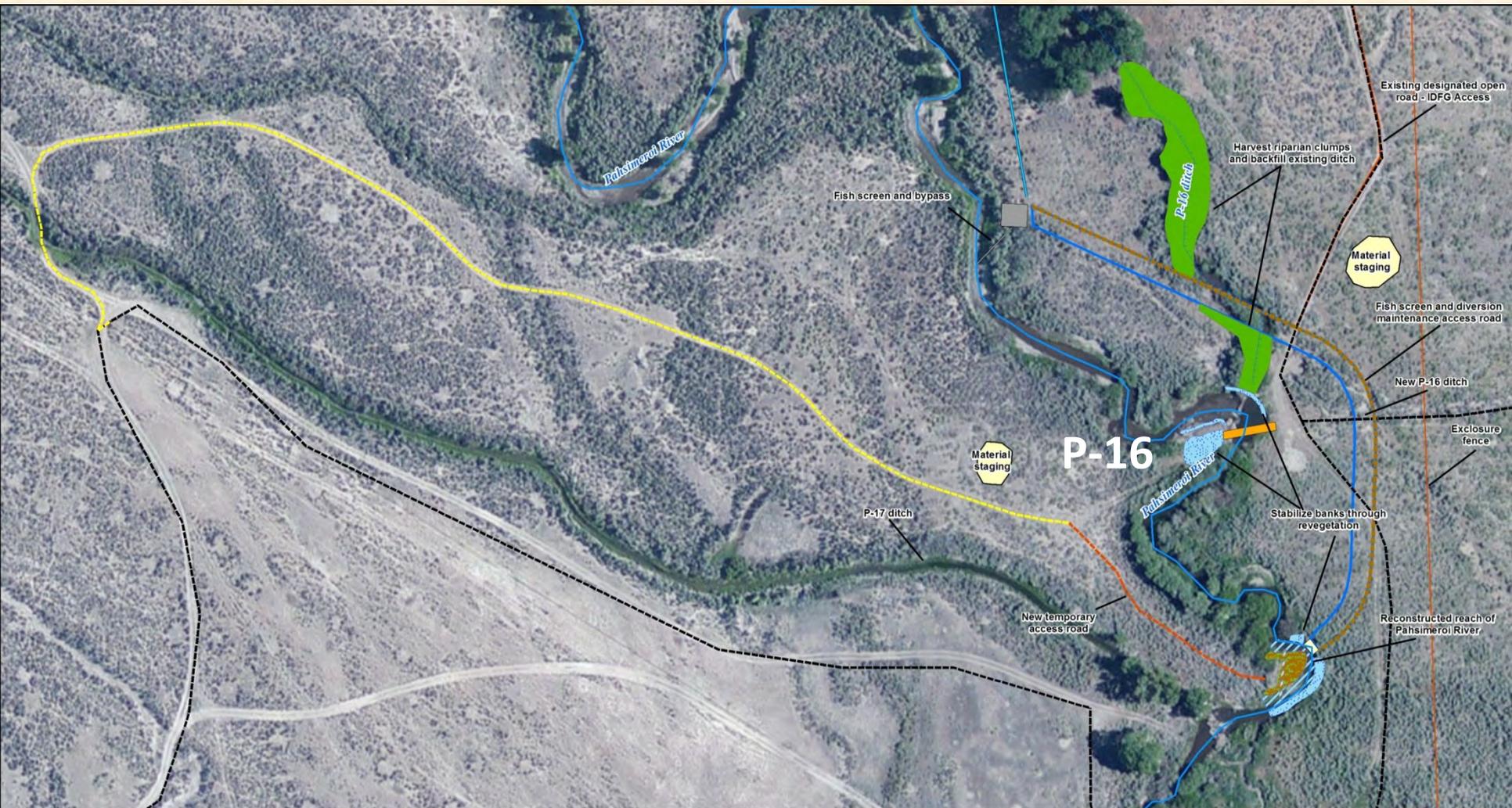


September 2012



June 2013

# P-16 Implementation, August 2015

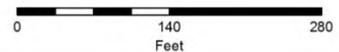


## Legend

|                               |   |                                      |
|-------------------------------|---|--------------------------------------|
| PAHSIMEROI RIVER              | IDFG ACCESS ROUTE (BLM AND PRIVATE)                       | DIVERSION HEADWORKS                  |
| DITCHES                       | IRRIGATION PIPELINE (PROPOSED)                            | FLOW BYPASS CMP                      |
| <b>Roads</b>                  | EXCLOSURE FENCE (PROPOSED)                                | NEW P-16 DITCH                       |
| UNDESIGNATED ROAD             | <b>PROPOSED DIVERSION AND CHANNEL RECONSTRUCTION WORK</b> | TEMPORARY CROSSING LOCATION          |
| NEW TEMPORARY ROAD (PROPOSED) | BACKFILL DITCH - HARVEST RIPARIAN CLUMPS AND WILLOWS      | RECONSTRUCT AND STABILIZE VEGETATION |
| DESIGNATED OPEN ROAD          | FISH SCREEN   | RECONSTRUCT AND STABILIZE POINT BAR  |
| MAINTENANCE ACCESS ROAD       | FISH SCREEN BYPASS PIPE                                   | STAGING AREA - MATERIALS ONLY        |
| ROAD                          | CHANNEL RECONSTRUCTION ZONE                               |                                      |



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New P-16 diversion  
ditch construction  
08/07/15



New P-16 diversion  
ditch construction  
08/15



New P-16 diversion  
ditch construction  
08/15



New P-16 diversion  
ditch construction  
08/15



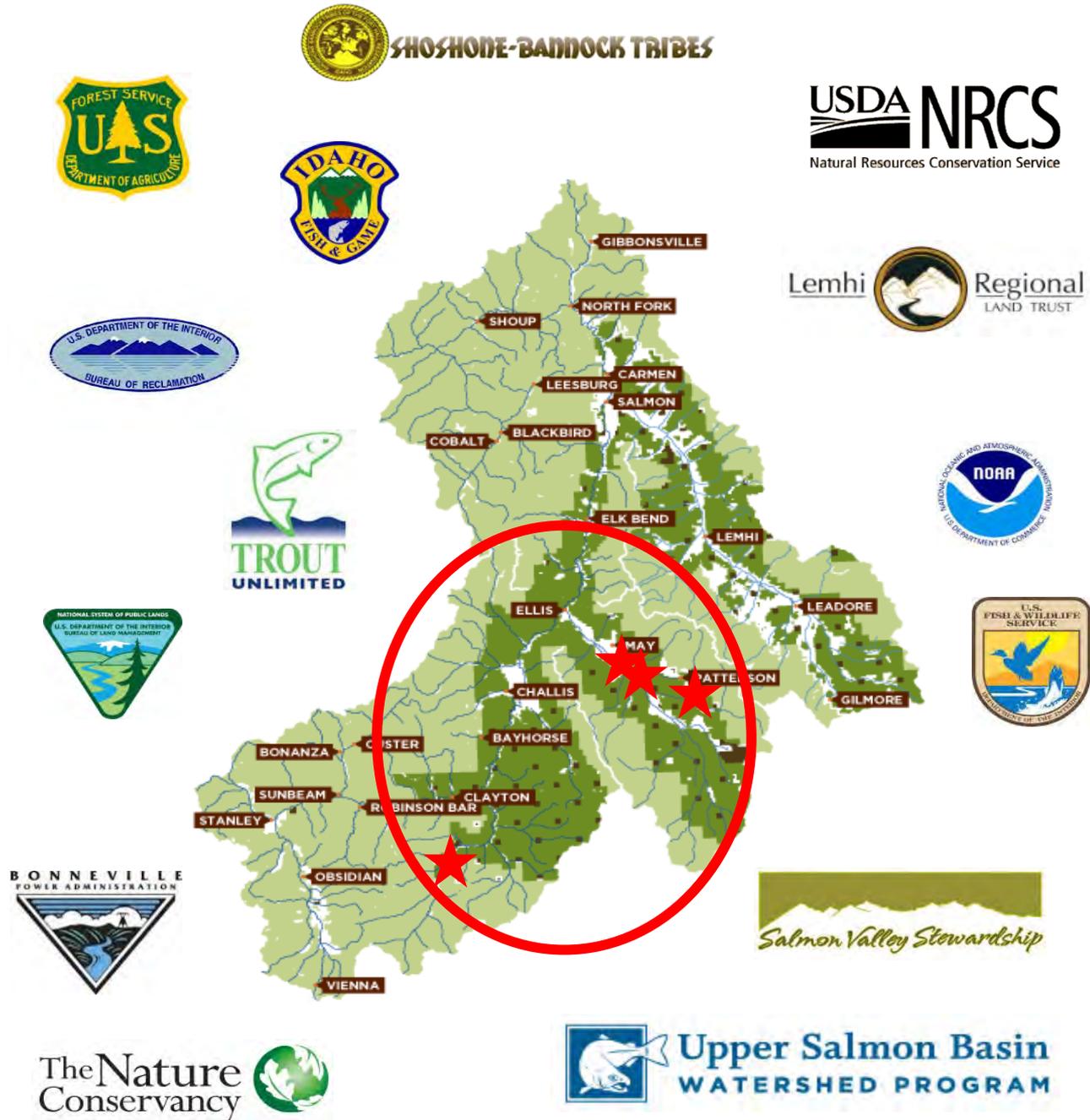
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- Mill Creek Reconnect Project
- P-16 Furey Lane Water Conservation and Reconnect Project
- – Future Downstream Restoration

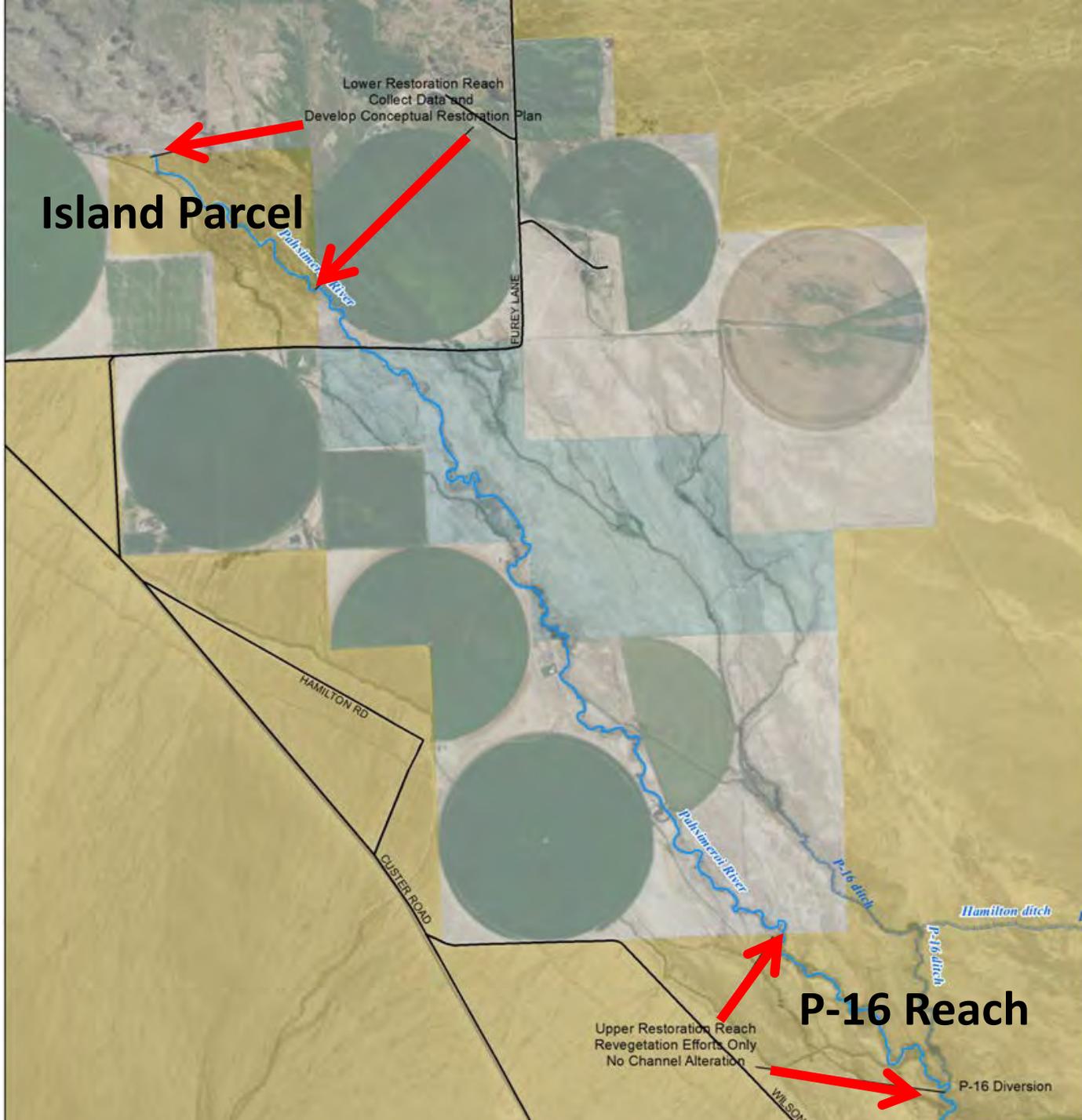
## • EAST FORK of the SALMON RIVER

- Little Boulder Campground Streambank Restoration Project



# Next BLM Projects Pahsimeroi River

- P-16 Reach
- Island Parcel





# P-16 Reach FY16-18

- BLM \$88K
- Trout Unlimited Agreement
- IDFG
- BOR
- Others



# P-16 Reach FY16-18

- 0.85 Stream Miles
- Proper Channel
- Quality Pools
- Sediment in Balance

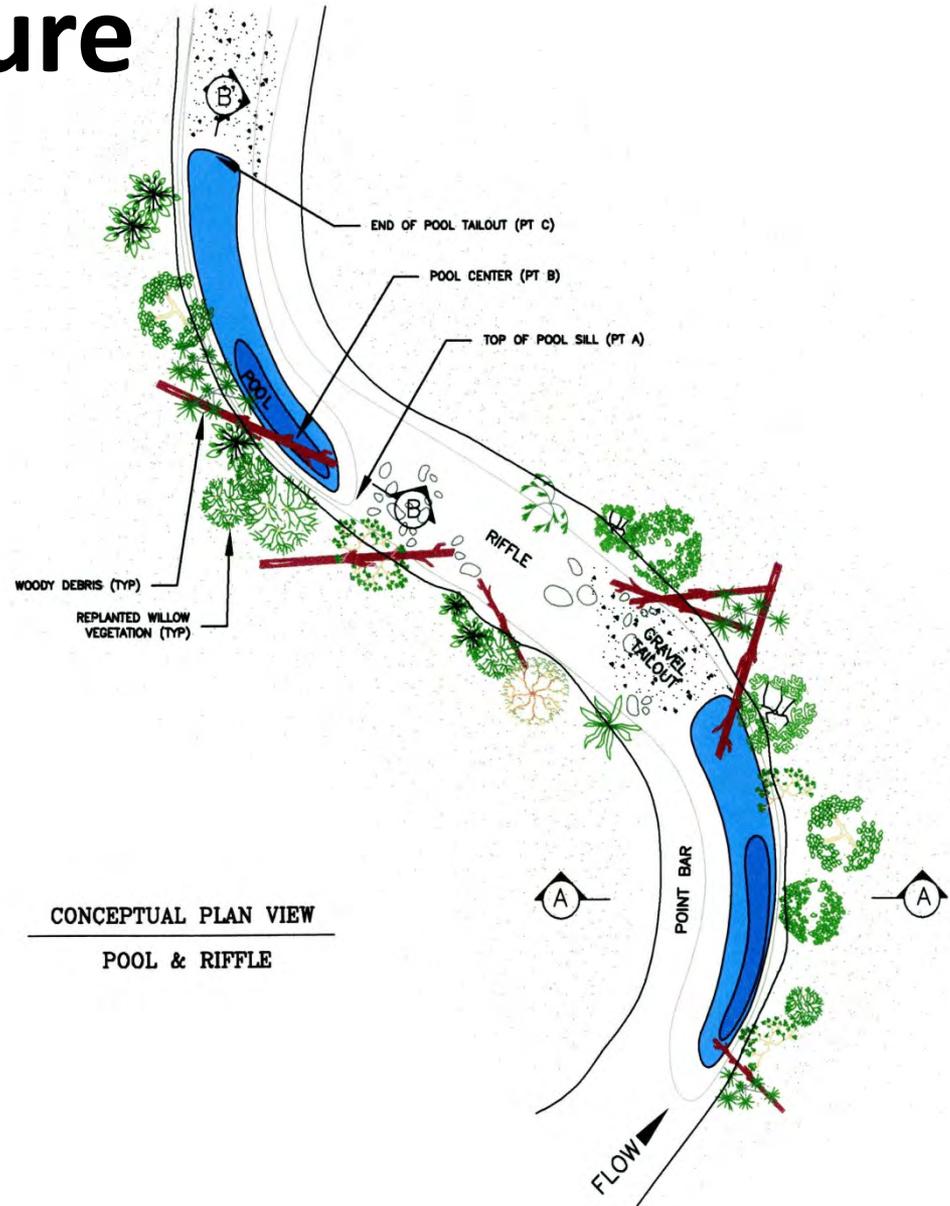
# P-16 Reach Now

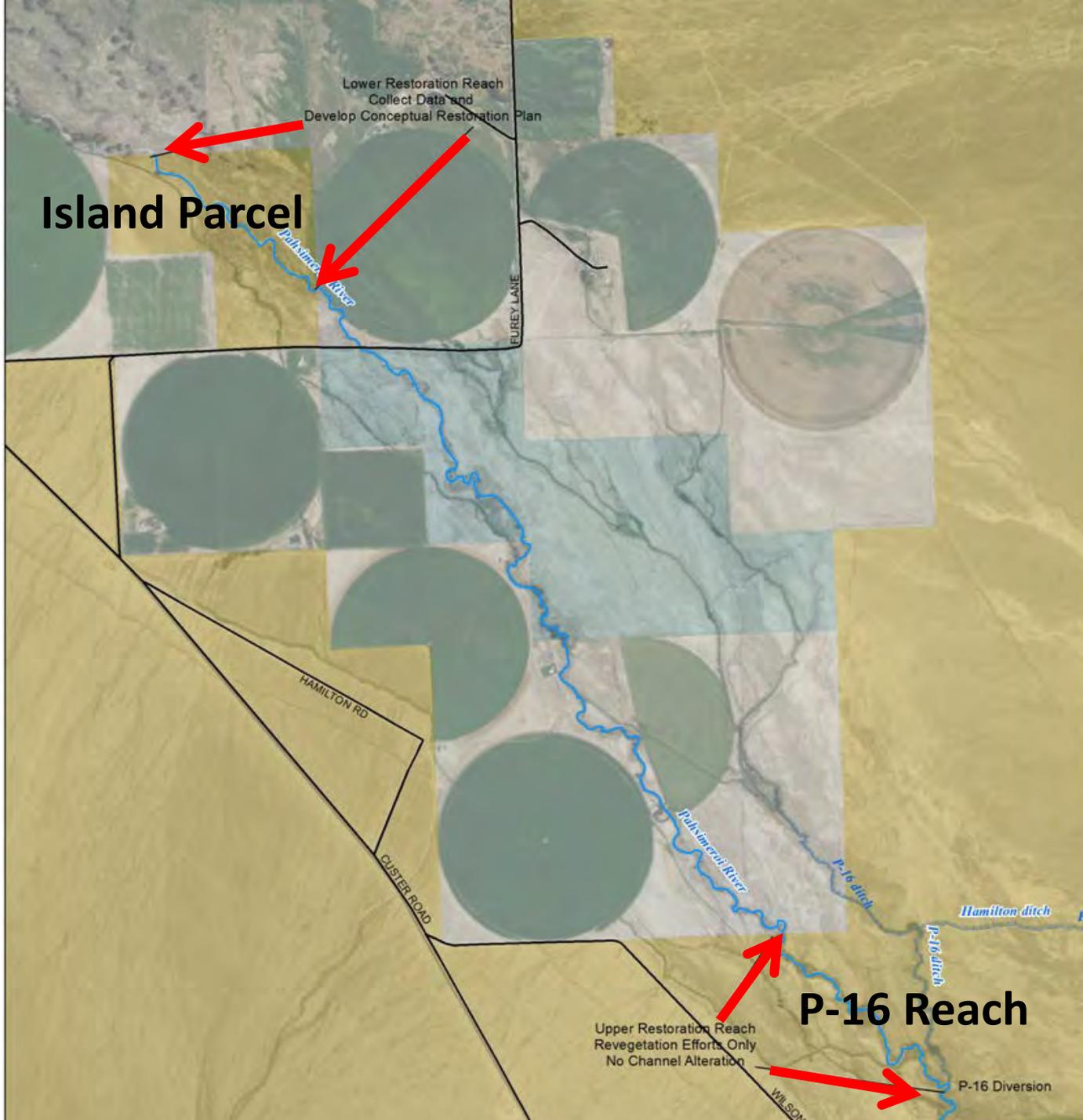
- Seasonally Dewatered
- Embedded Substrate
- Lacks LWD Habitat and Complexity
- Poor Riparian Vegetation



# P-16 Reach Future

- 50 LWD trees
- 5,000 Willow Sprigs
- 3,500 Bare-root Plants
- 500 Potted Plants
- 2,000 Sod Plugs
- FY16-18





**Island Parcel**

Lower Restoration Reach  
Collect Data and  
Develop Conceptual Restoration Plan

**P-16 Reach**

Upper Restoration Reach  
Revegetation Efforts Only  
No Channel Alteration

P-16 Diversion

**NEXT:  
BLM's  
Island  
Parcel**

Down-stream  
of the P-16  
Reach on the  
Pahsimeroi  
River



# BLM's Island Parcel

- 0.75 Stream Miles
- Annually Dewatered
- Channelized with Berms/Levees
- Poor Channel



# BLM's Island Parcel

- Eroding Streambanks
- Poor Sediment Balance
- Lacks Habitat & Riparian Vegetation
- **Needs Major Channel Adjustments**



# Next Steps - BLM's Island Parcel

- Project Design
  - BLM + BOR + IDFG
- NEPA & ESA Consultation
  - BLM + NMFS + FWS
- NEPA Project Funding
  - \$235,000 to \$250,000
  - Depends on Revegetation
- Project Implementation
  - Oversight

# BLM Challis Field Office Overview 2015

- PAHSIMEROI VALLEY
  - Mill Creek Reconnect Project
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  - Future Downstream Restoration
- EAST FORK of the SALMON RIVER
  - – Little Boulder Campground Streambank Restoration Project

The map displays the Upper Salmon Basin Watershed Program area, showing various towns and project locations. A red circle highlights the East Fork of the Salmon River area, and a red star marks the Little Boulder Campground. The map is surrounded by logos of various agencies and organizations, including the Shoshone-Bannock Tribes, USDA NRCS, Lemhi Regional Land Trust, NOAA, U.S. Fish & Wildlife Service, Bonneville Power Administration, The Nature Conservancy, and Trout Unlimited.

**SHOSHONE-BANNOCK TRIBES**

**USDA NRCS**  
Natural Resources Conservation Service

**Lemhi Regional LAND TRUST**

**NOAA**  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
U.S. DEPARTMENT OF COMMERCE

**U.S. FISH & WILDLIFE SERVICE**  
DEPARTMENT OF THE INTERIOR

**BONNEVILLE POWER ADMINISTRATION**

**The Nature Conservancy**

**Trout UNLIMITED**

**Salmon Valley Stewardship**

**Upper Salmon Basin WATERSHED PROGRAM**

**Towns and Project Locations:** GIBBONSVILLE, NORTH FORK, SHOUP, COBALT, BLACKBIRD, LEESBURG, CARMEN, SALMON, ELK BEND, LEMHI, LEADORE, GILMORE, PATTENSON, MAY, CHALLIS, ELLIS, BAYHORSE, CLAYTON, ROBINSON BAR, SUNBEAM, BONANZA, CUSTER, STANLEY, OBSIDIAN, VIENNA.

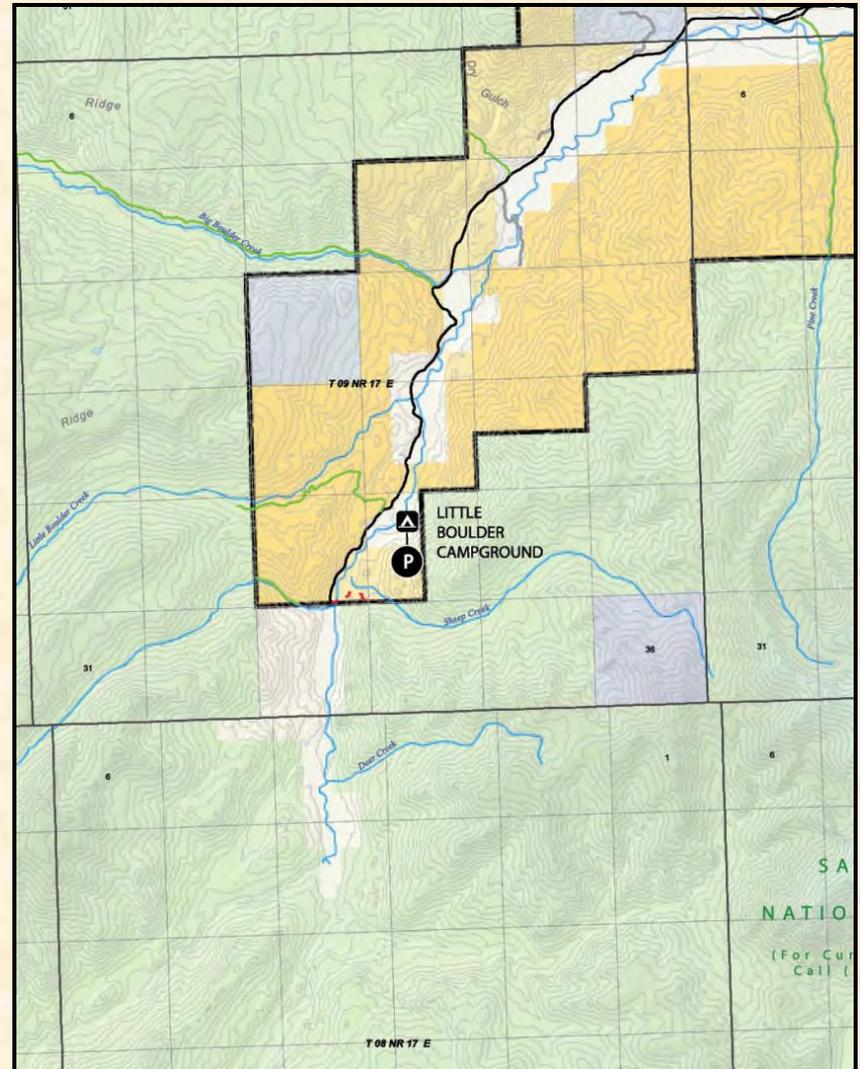
# East Fork of the Salmon River Streambank Restoration



# BLM's Little Boulder Campground

## Streambank Restoration

- Location
  - East Fork of the Salmon River
- Less Developed Site
  - 3 campsites
  - Parking area
  - Vault toilet
  - Drinking water
- Anticipate Increased Use – White Clouds Wilderness Trailhead



# BLM's Little Boulder Campground

A photograph of a river flowing through a grassy area. The river is turbulent, with white water rapids. The surrounding area is green and grassy, with trees in the background. A wooden bench is visible on the left side of the river. The date 06/05/2012 is printed in yellow in the bottom right corner.

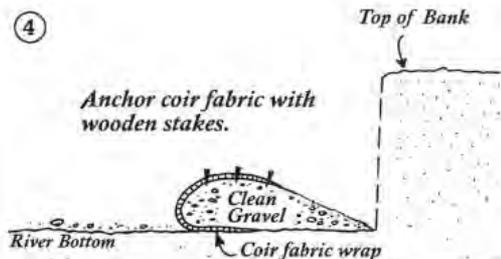
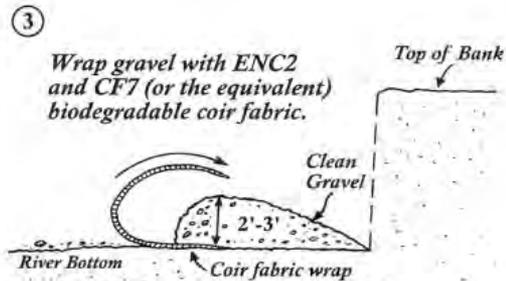
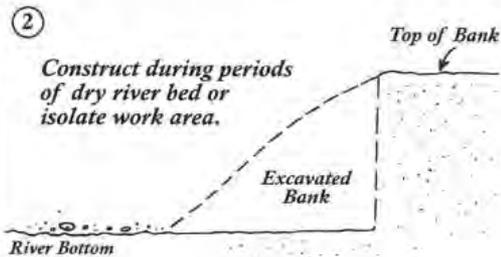
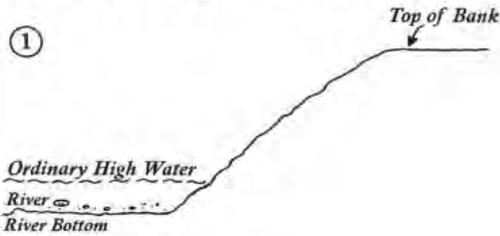
06/05/2012

# **Bioengineering for Streambank Stabilization**

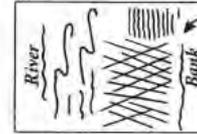
- Alternative to riprap
- Employs natural materials
- Multiple benefits
- Proven successful in many environments and stream projects

# Bioengineering Technique

## Brush / Hedge Brush Layering Step-by-Step



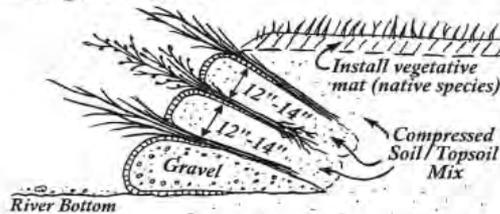
- ⑤ Crisscross layers of 15 dormant cuttings per foot or 10 rooted cuttings per foot. Deposit topsoil over cuttings and water liberally. Compress soil to 2 - 4 inches.



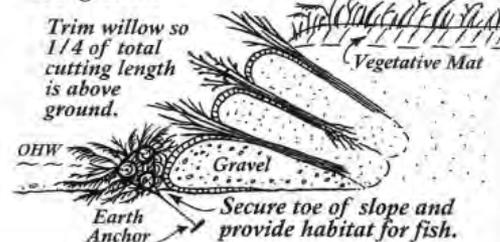
- ⑥ Wrap second layer of soil / topsoil mix with ENC2 and CF7 coir fabrics (or equivalent) 2' - 3' over topsoil and stake fabric into place. Water each layer liberally and compress soil / topsoil mix to 12" - 14" before willow placement.



- ⑦ Repeat steps 4, 5, 6 until desired bank height is reached.



- ⑧ Trim vegetative mat shoots by 1/3 to compensate for root loss and promote root growth.



# Bioengineering – Step by Step



04.09.2014

# Bioengineering – Step by Step



04.09.2014



# Bioengineering – Step by Step

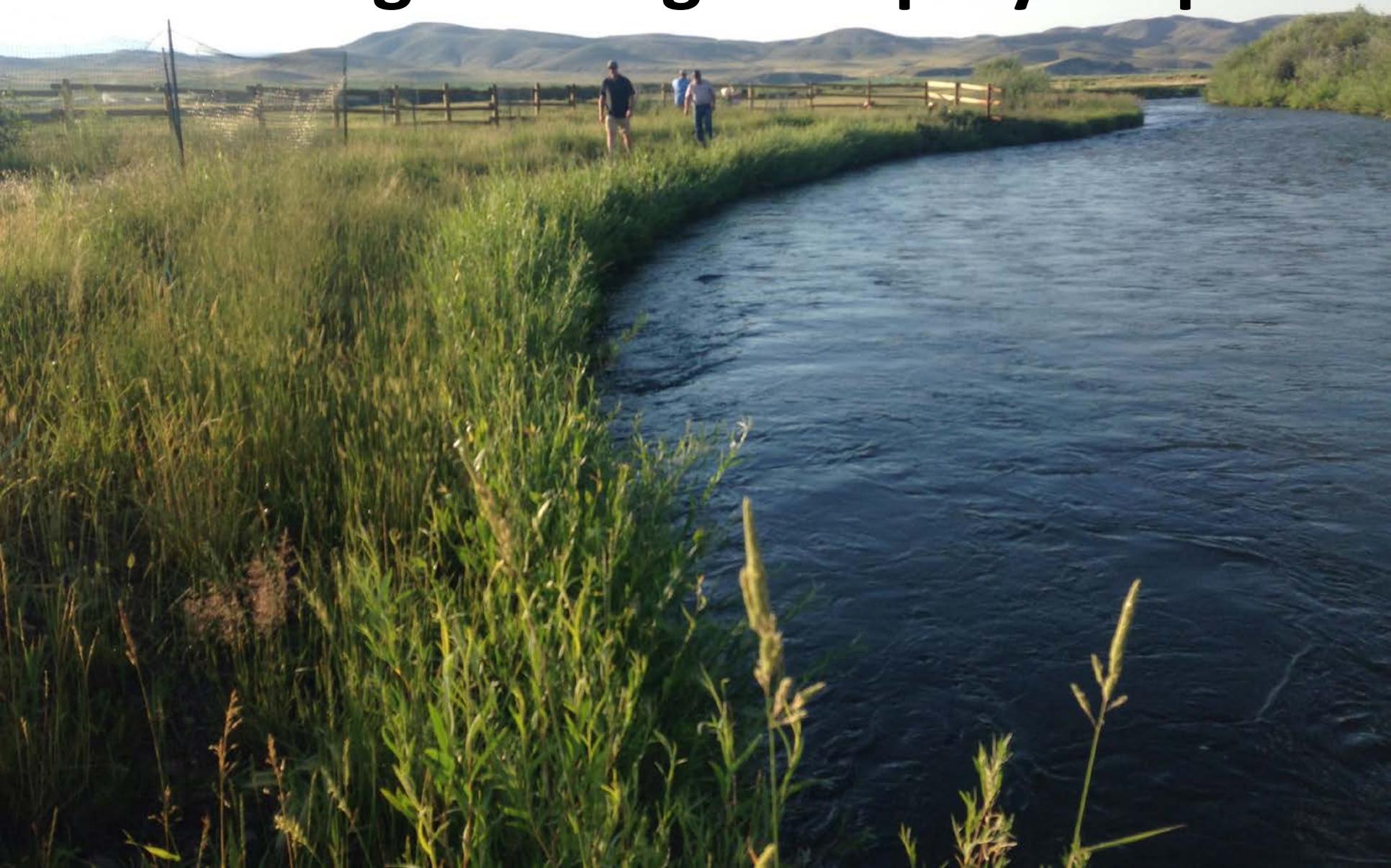
04.10.2014

# Bioengineering – Step by Step



04.10.2014

# Bioengineering – Step by Step



# Next Potential BLM Riparian Projects

- Additional Pahsimeroi River Projects
- Lyon Creek on the Broken Wing Ranch
- Little Morgan Creek
- Thompson Creek
- Squaw Creek

# Habitat Programmatic for ESA Consultation

- 4 T&E Species & Critical Habitat
- Endangered
  - Snake River Sockeye Salmon (NMFS)
- Threatened
  - Snake River Chinook Salmon (NMFS) \*\*
  - Snake River Steelhead (NMFS)
  - Columbia River Bull Trout (FWS)