

Little Truckee River Assessment

Sierraville Diversion to Stampede Reservoir

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March 19, 2014



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OUTLINE

- Purpose of Assessment
- Physical and Biological Setting
- Methods
- Selected Results
- Next Steps...



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Purpose of Assessment

Perform a transitional technical study to guide

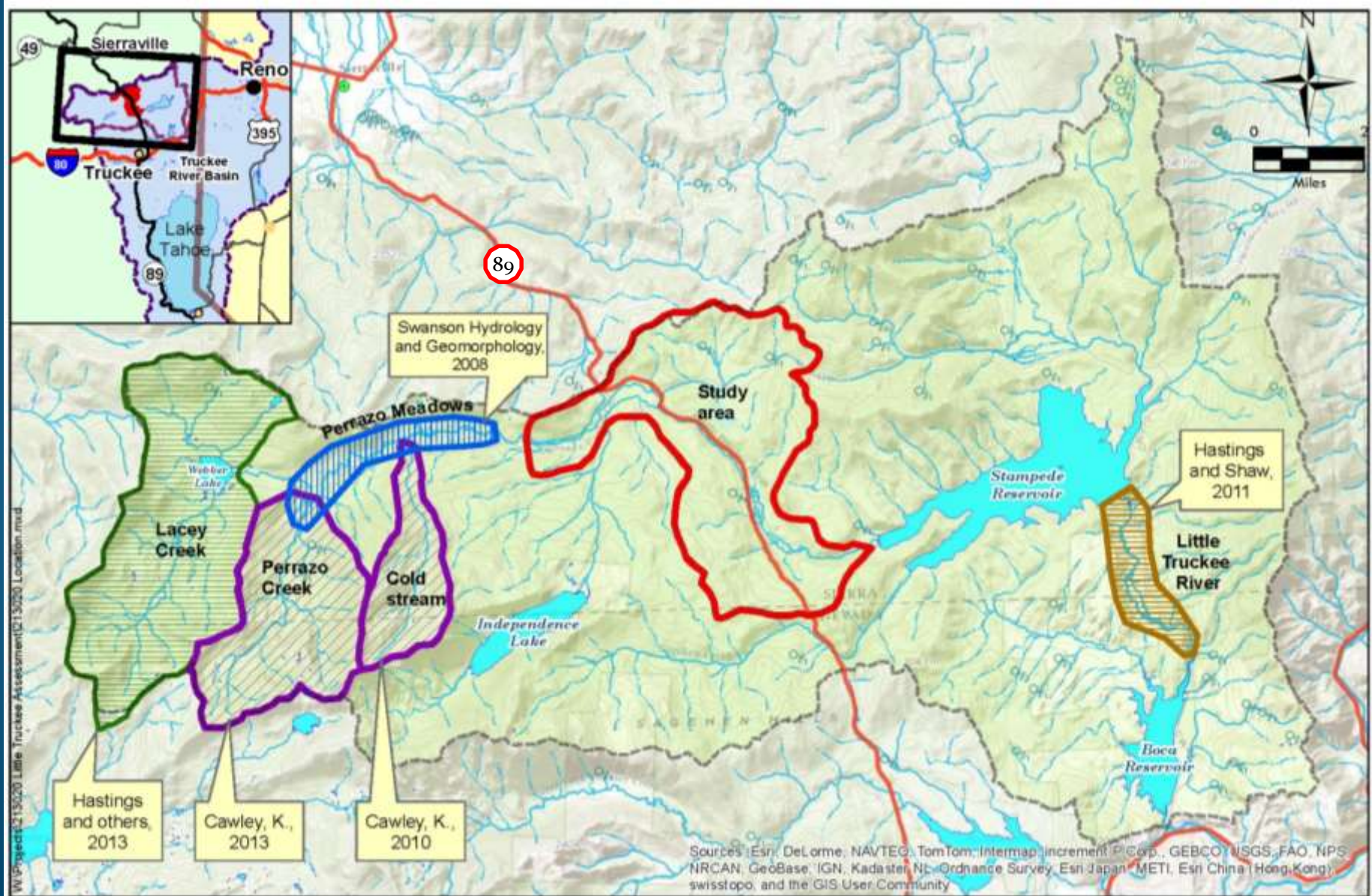
Trout Unlimited and their **partners** in:

- 1) Conserving functioning areas with high ecological value;
- 2) Identifying disturbed areas with impaired functions and values
- 3) Understanding the root cause(s) of disturbances
- 4) Identifying land- and watershed-management strategies
- 5) Completing study of the greater watershed

Study Area Location



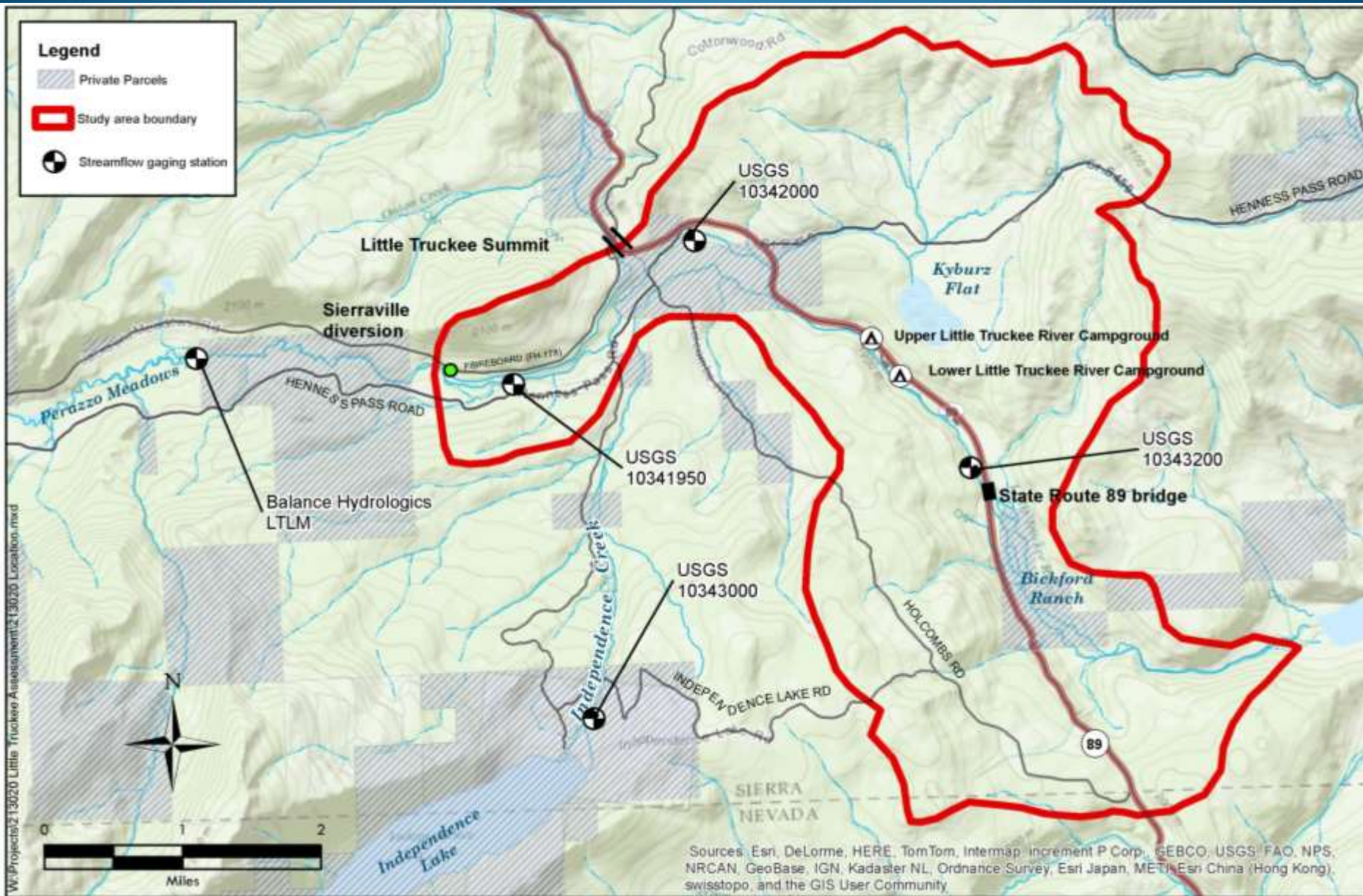
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Study Area Location



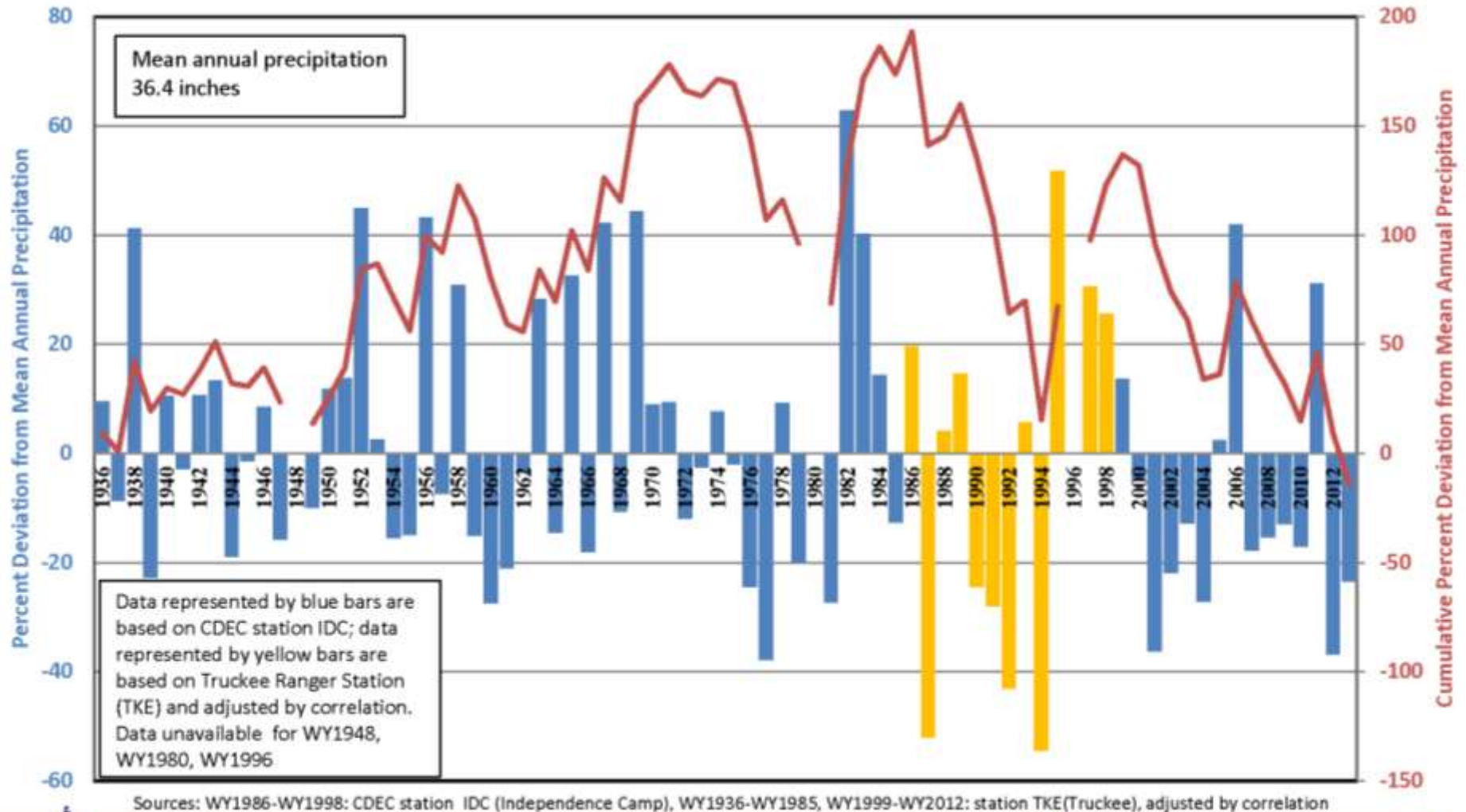
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Physical Setting: Climate

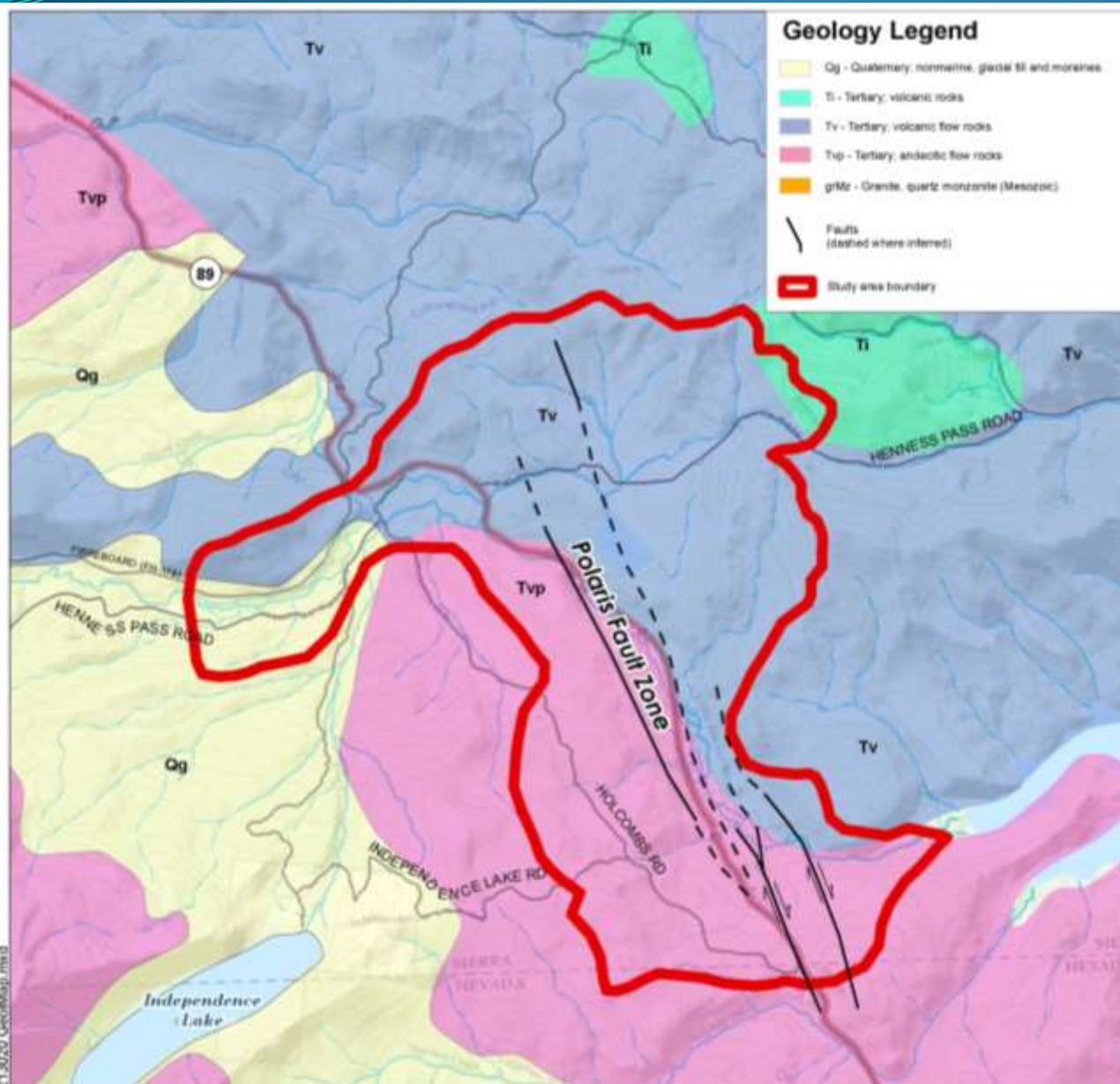


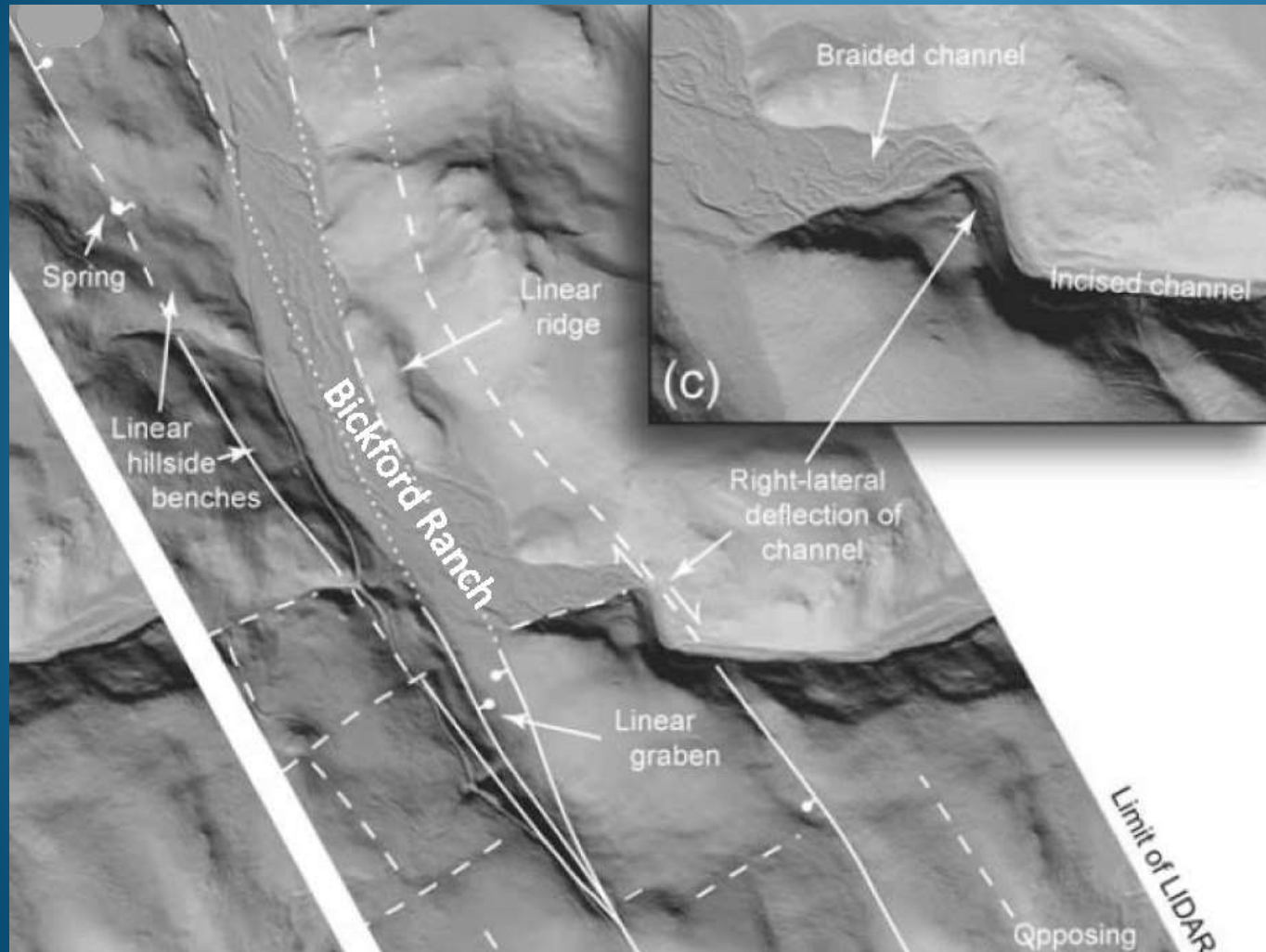


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Physical Setting

Geology:
Volcanics
Faulting





Physical Setting

Tectonic
geomorphology



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Legend

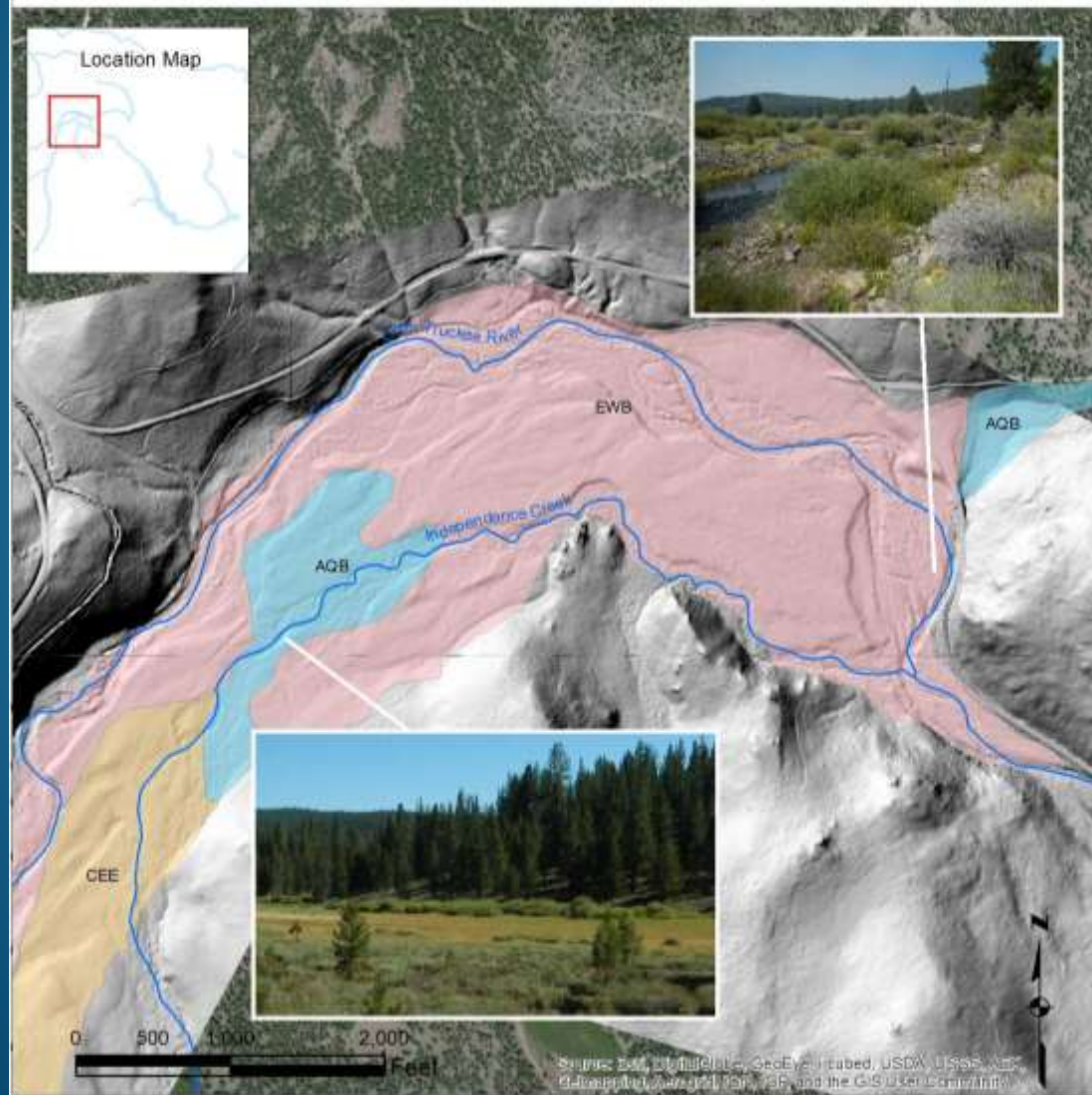
River

Soil type

AQB - AQUOLLS AND BOROLLS, 0 TO 5 PERCENT SLOPES - Wetland Soils

CEE - CELIO-GEFO-AQUOLLS COMPLEX, 2 TO 30 PERCENT SLOPES - Soils Formed on Glacial Deposits

EWB - INVILLE-RIVERWASH-AQUOLLS COMPLEX, 2 TO 5 PERCENT SLOPES - Soils Formed on Glacial Deposits



Physical Setting

Glaciation and Geomorphology



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Historical Land Uses, Practices and Culture

Logging

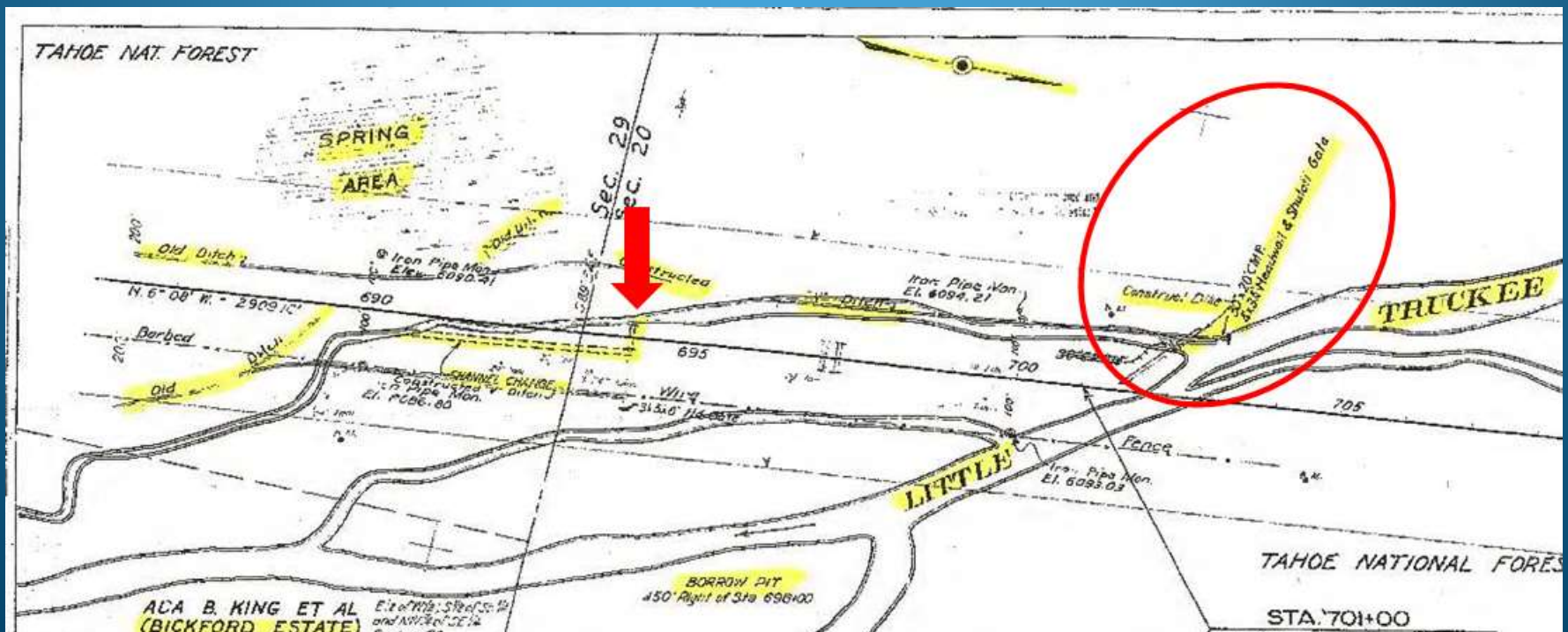




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Historical Land Uses, Practices and Culture

Grazing
Road Building





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Historical Land Uses, Practices and Culture

Water management and
diversions

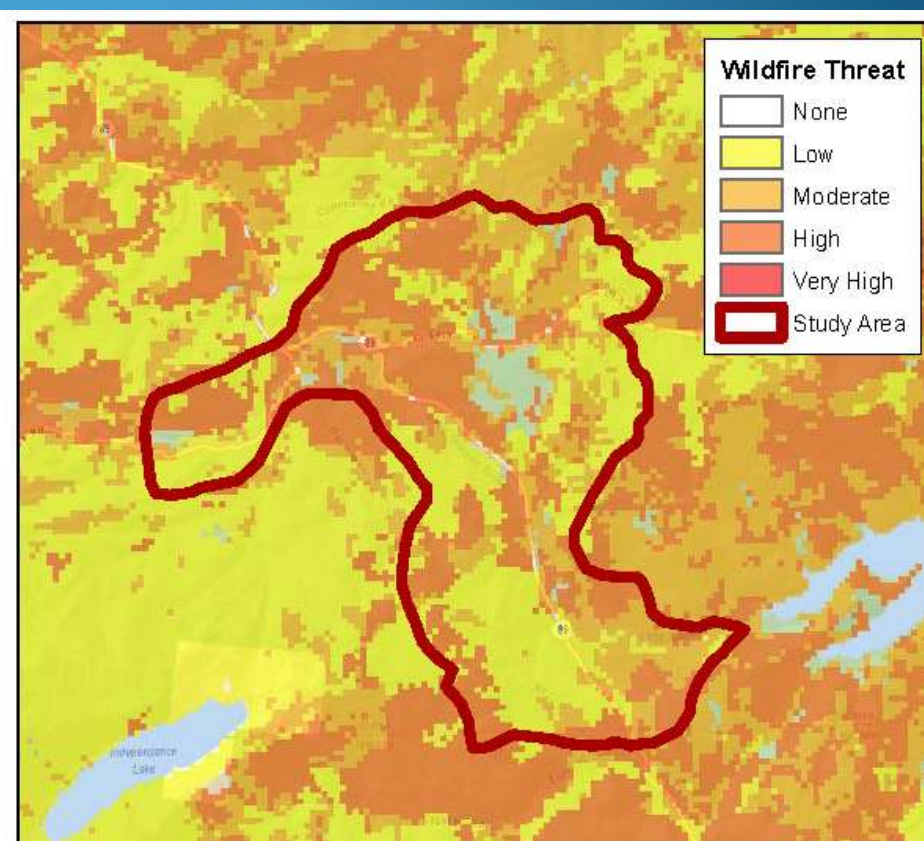
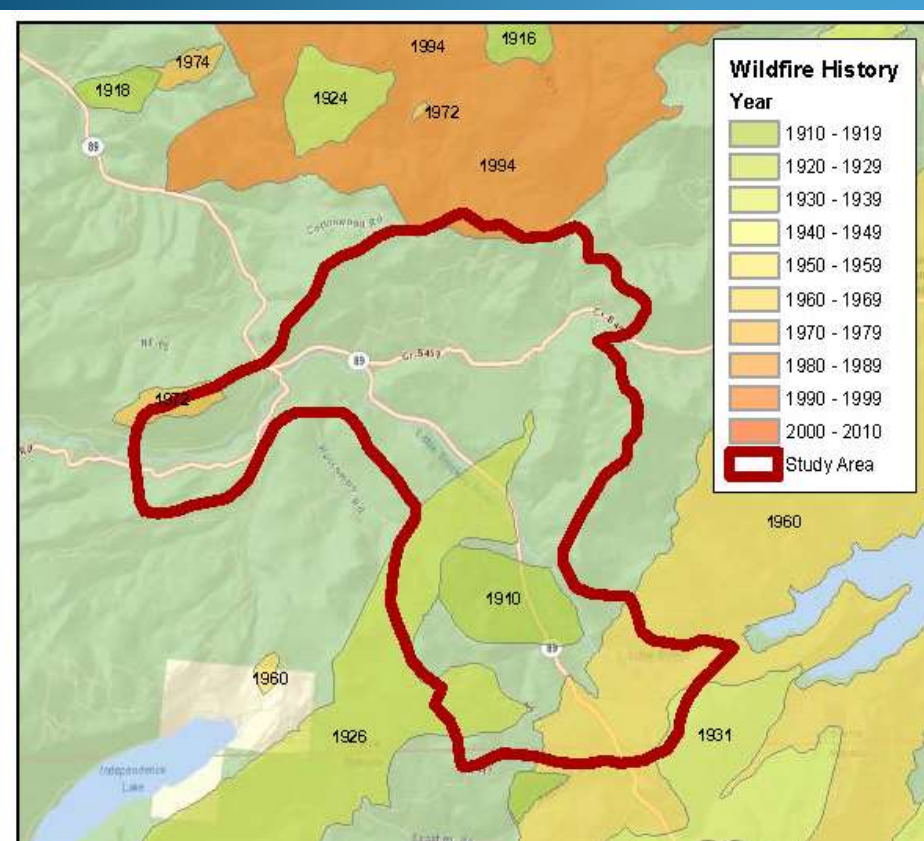




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Historical Land Uses, Practices and Culture

Wildfire and Wildfire Suppression



Biological Setting – Vegetation



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Biological Setting – Fishes

- 1) Historic Assemblage of Native Fishes
- 2) Pronounced Impact of Non-Native Fishes





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Biological Setting – Fishes Continued...

- 1) Stocking historic and current impact on River
- 2) Connection to Stampede Reservoir presents significant challenges



Biological Setting – Amphibians and Reptiles

*The Northern Sierra supports diverse
aquatic herpetofauna*

- 1) Sierra Nevada yellow-legged frogs (*Rana sierrae*)
- 2) Pacific chorus frog (*Pseudacris regilla*)





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Biological Setting – Beaver

- 1) North American beaver (*Castor canadensis*)
- 2) Beaver affects stream condition
 - Most pronounced - alteration of channel patterns, especially in high energy systems
 - Geo-relevant studies linking Beaver presence to increased trout densities





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Assessment Methods – Vegetation Survey

Vegetation surveys for the inner
riparian zone





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Assessment Methods – Fish and Macroinvertebrate Survey



- 1) Timed visual encounter surveys (VESs)
- 2) Invertebrate samples using multi-habitat sampling methods
- 3) Sent to the Aquatics Ecosystems Analysis Laboratory at UNR for sorting and identification



Assessment Methods— USFS Stream Inventory Survey



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Surveys conducted September
26-29, 2013

- 1) Conducted one to two
surveys in each channel
reach
- 2) Survey at each “Channel
Unit”

*Other Measurements: *Substrate, Wolman Pebble Counts,
and Channel Alterations, Shade, Water Quality, Streamflow,
Aquatic Biota, Data Analysis*





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Assessment Methods

Physical methods (hydrology and geomorphology):

- 1) Road network survey
- 2) Stream reconnaissance
- 3) Stream gage analysis
- 4) Historical aerial imagery/maps
- 5) Existing studies



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Selected Results

Hydrologic and Geomorphic Assessment

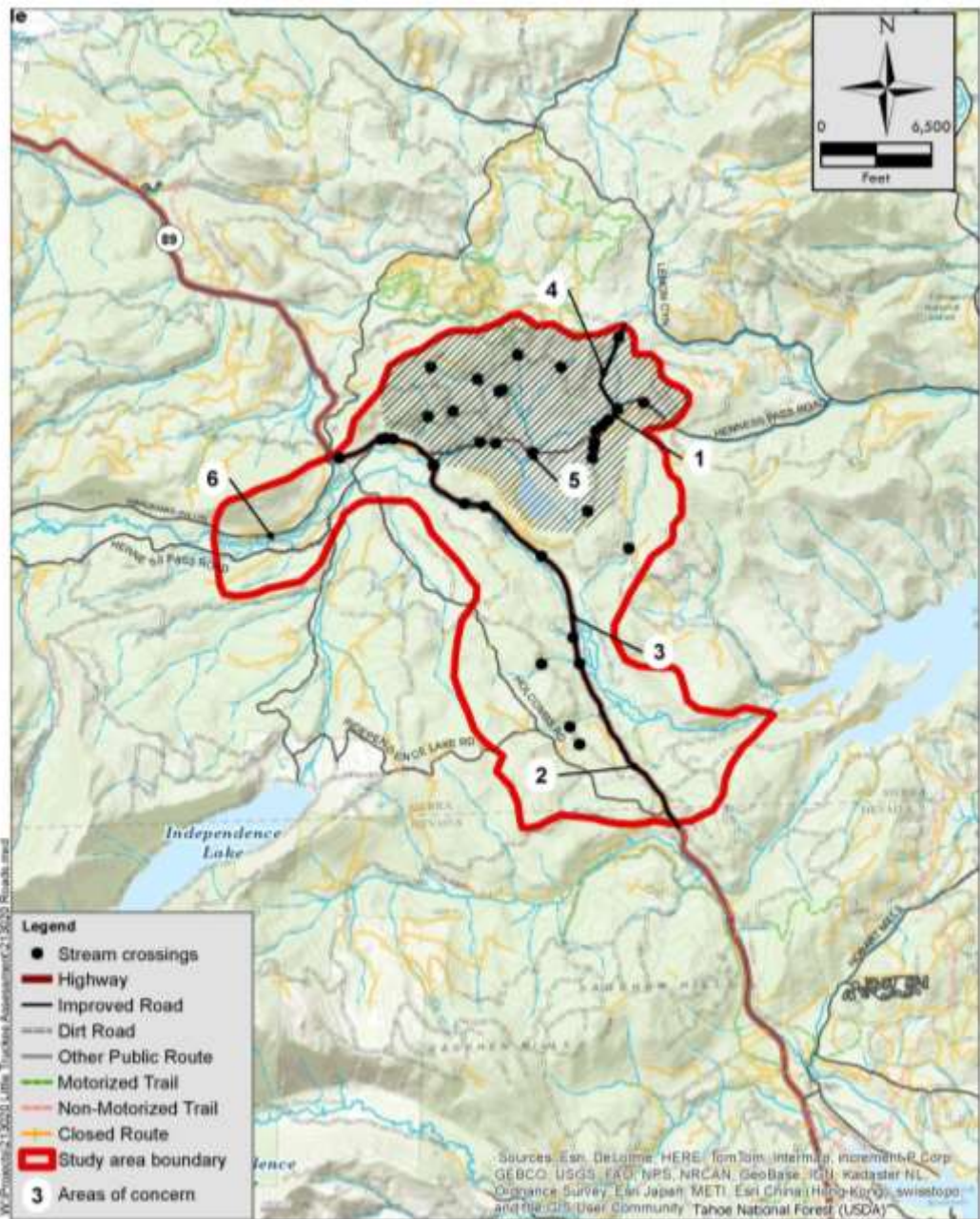


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Hydrologic and Geomorphic Assessment

Road Network Survey:

- 61 miles of road
- 3.7 miles/square mile
- 37 stream crossings
- 6 areas of concern

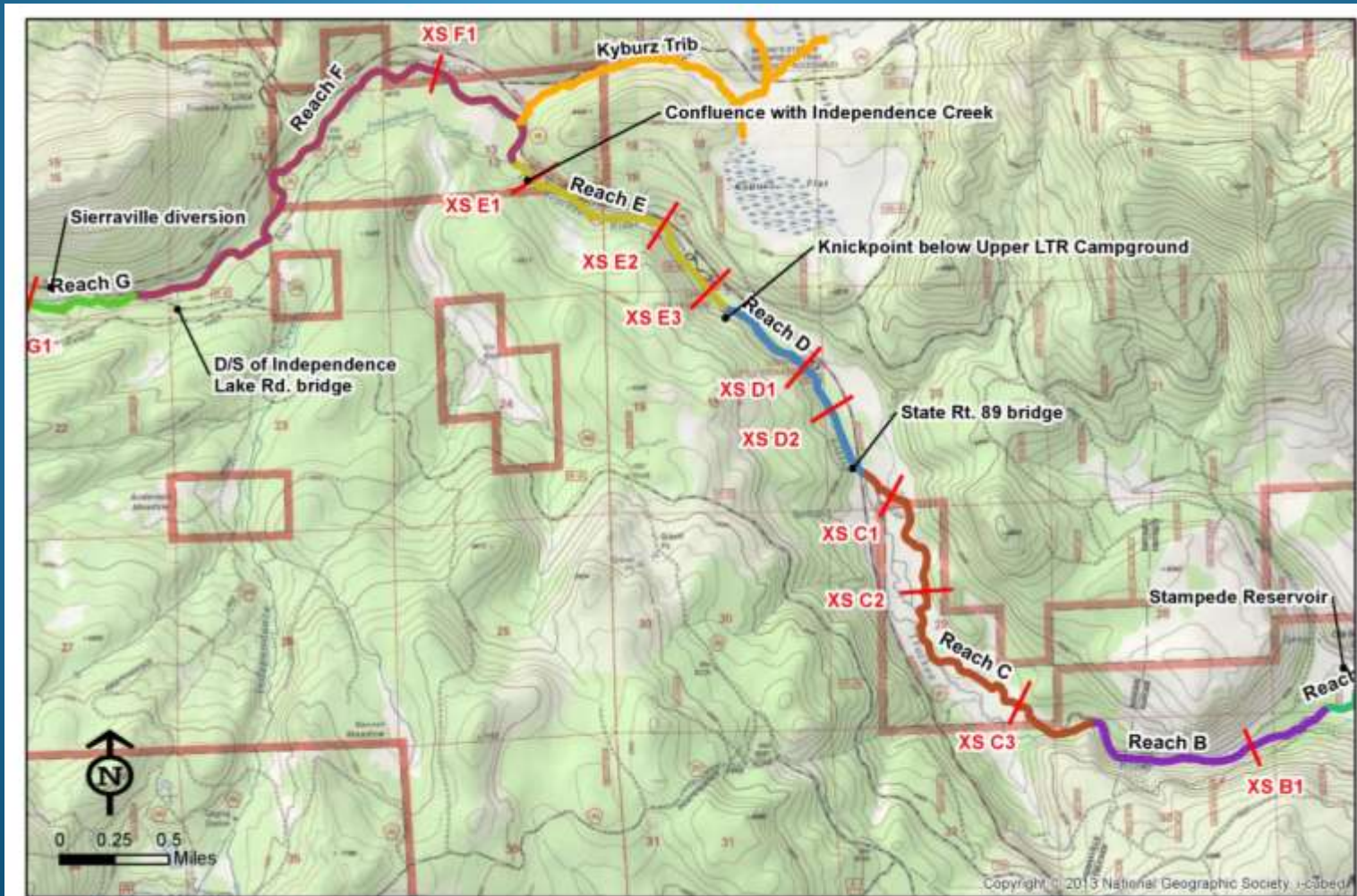




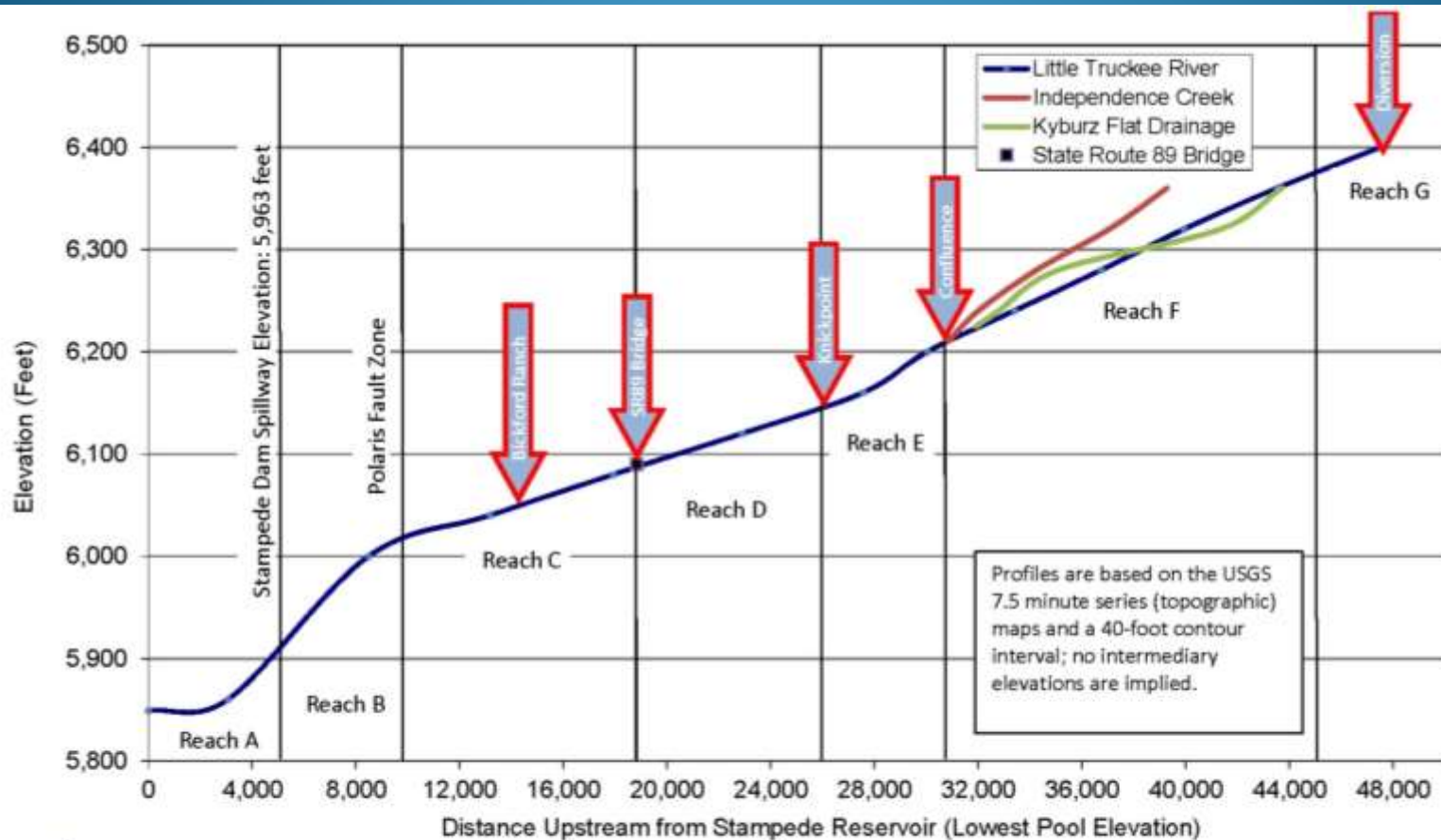
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Hydrologic and Geomorphic Assessment

Channel Reach Classification



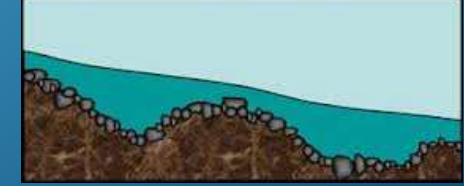
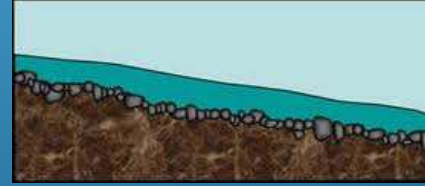
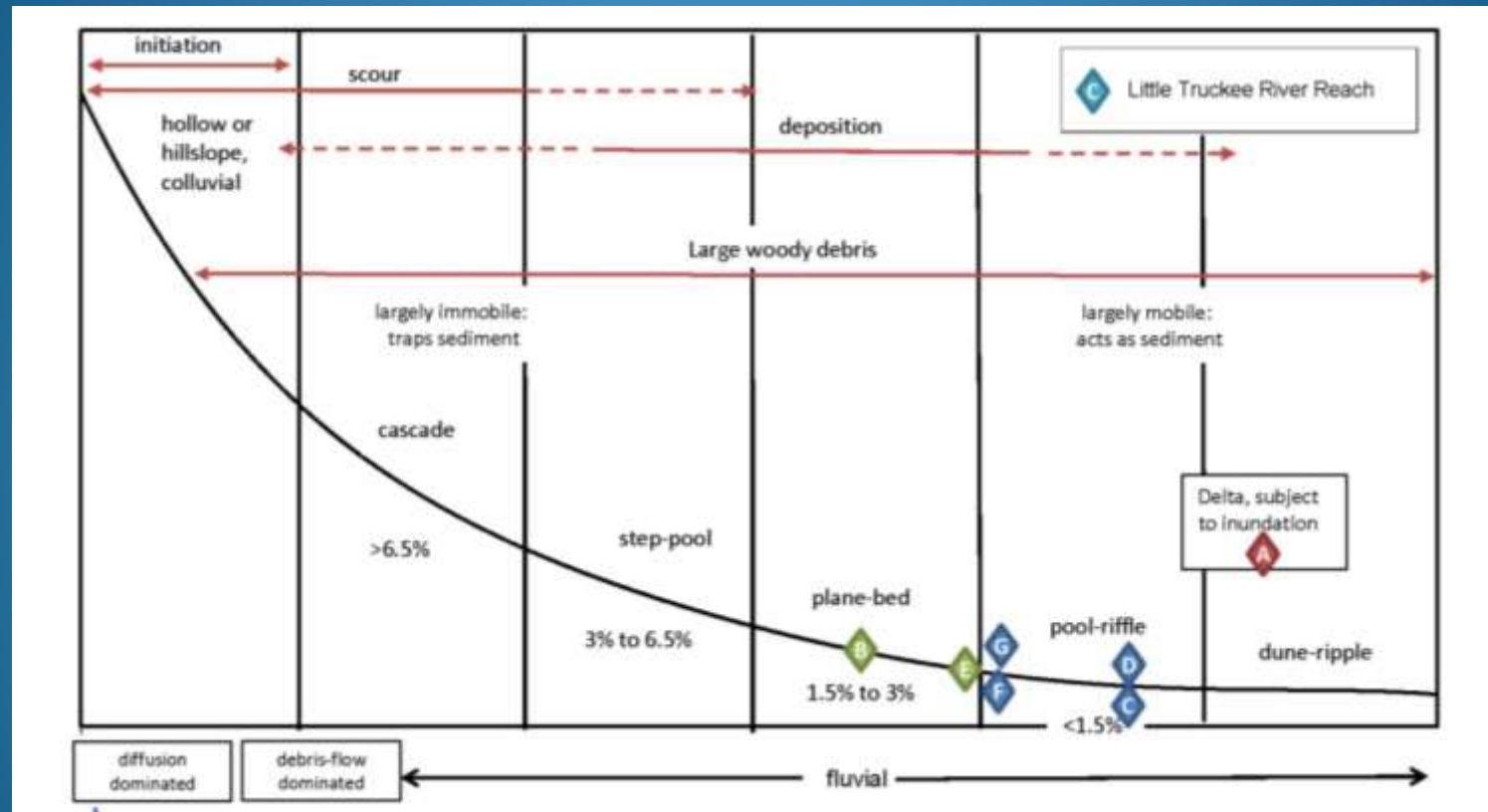
Selected Results





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Selected Results





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Selected Results

Hydrologic and Geomorphic
Assessment:

Channel conditions

-Abundant sediment supply



-Absence of instream wood





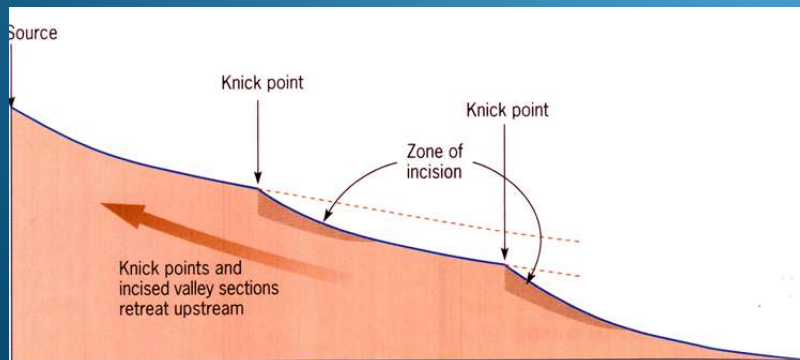
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Selected Results

Hydrologic and Geomorphic
Assessment:

Channel conditions

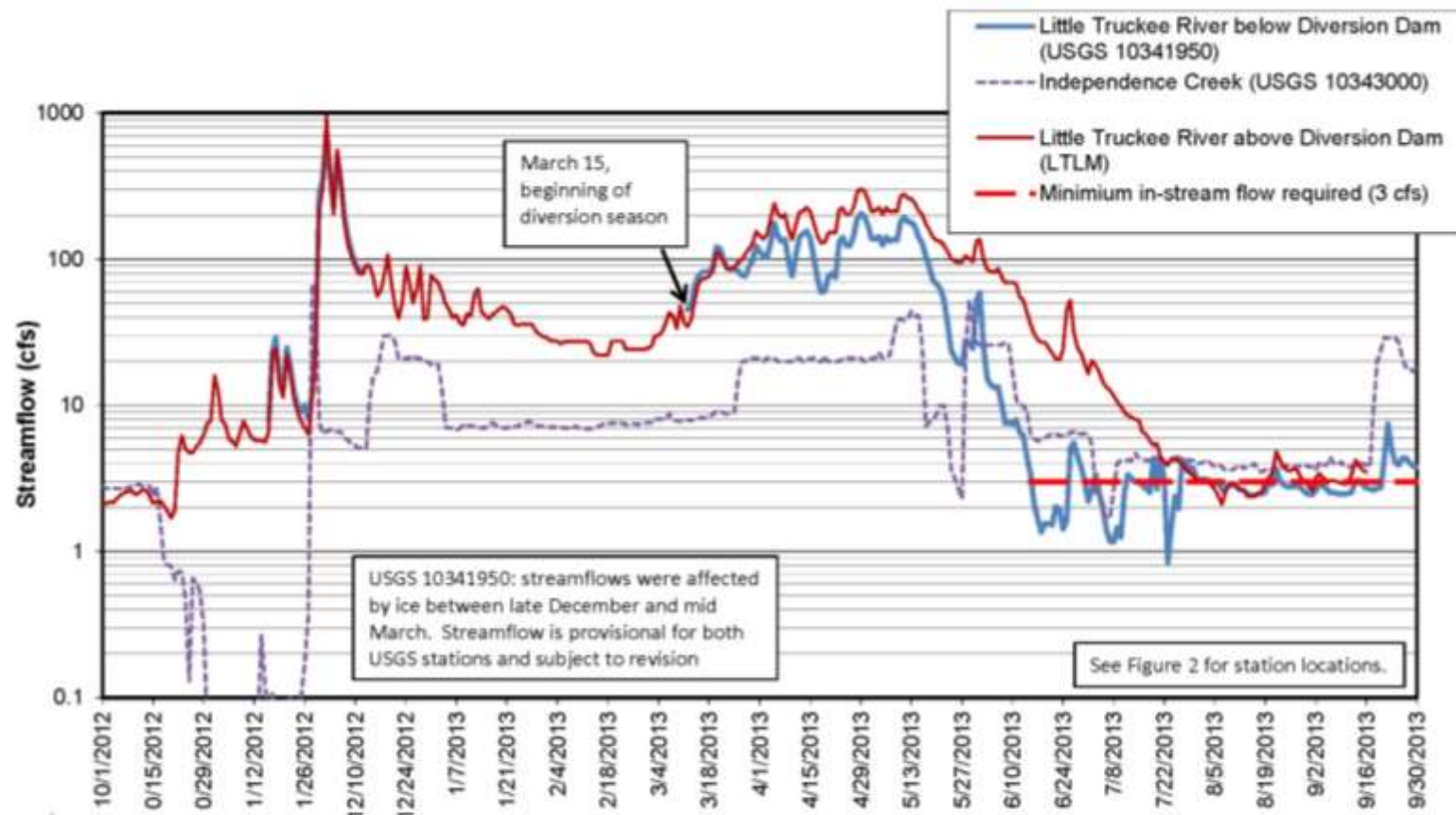
-Incising + widening channel





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Selected Results



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Figure 16. Daily Streamflow, Little Truckee River (above and below Diversion) and Independence Creek, Sierra County, California, WY2013 Recent gaging records below the Sierraville diversion suggest periods of time between June 15 and August 1, 2013 when instream flows requirements were not met. Streamflows receded rapidly through the summer and daily values were below 3 cfs at times upstream of the diversion (LTLM). Independence Creek provided additional baseflows during the summer and into the fall.

Selected Results

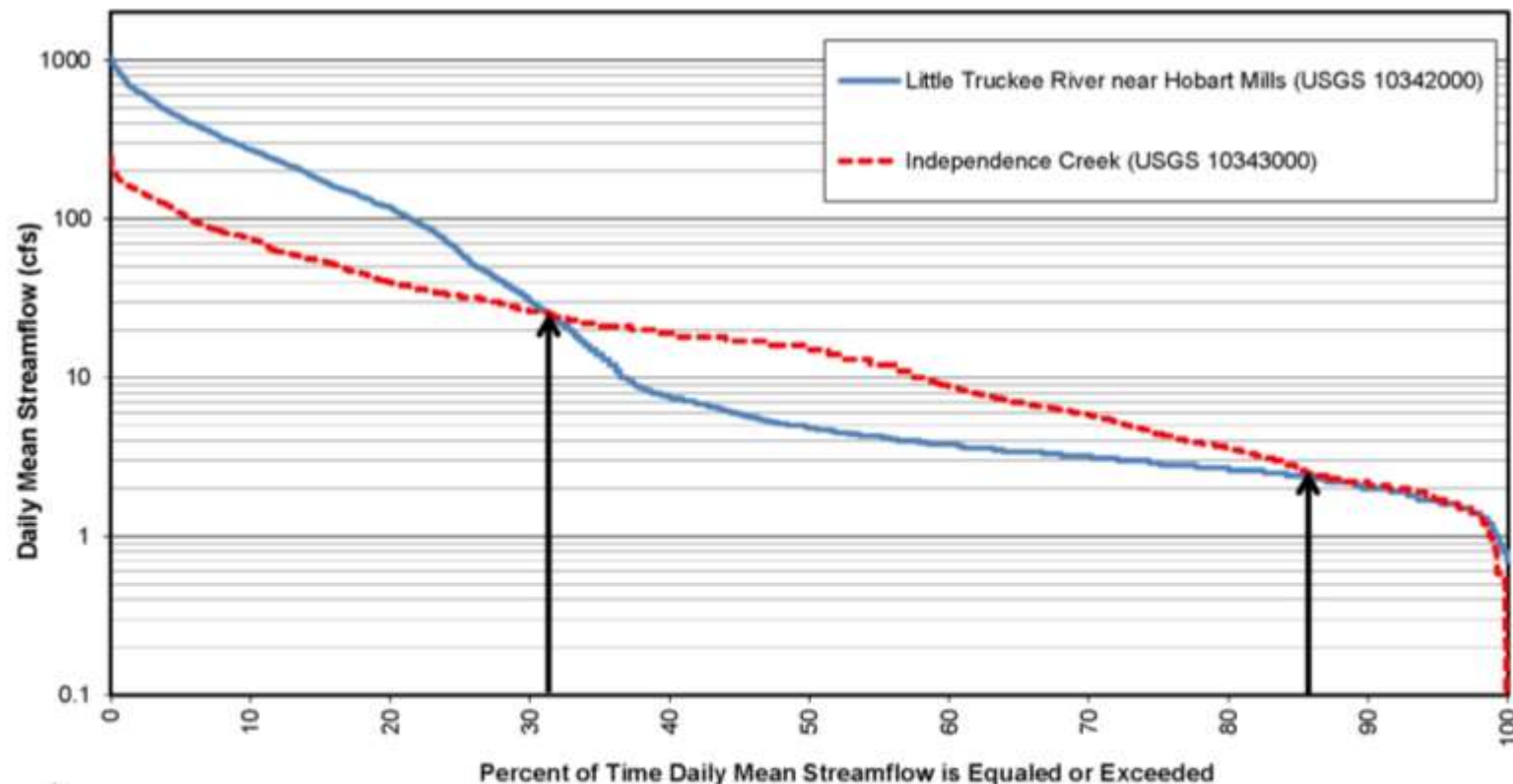


Figure 7. Baseflow Duration Curves, Little Truckee River above Independence Creek, and Independence Creek, Sierra County, California. Daily mean streamflows between June 1 and September 30 (baseflows) for each year were used for this analysis for each station's period of record. These data show that Independence Creek accounts for more than half (as high as 75 percent) of the total flow in the Little Truckee River during active diversion at Sierraville Dam. Furthermore, this occurs roughly 55 percent of the time between June and September of each year.



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Selected Results



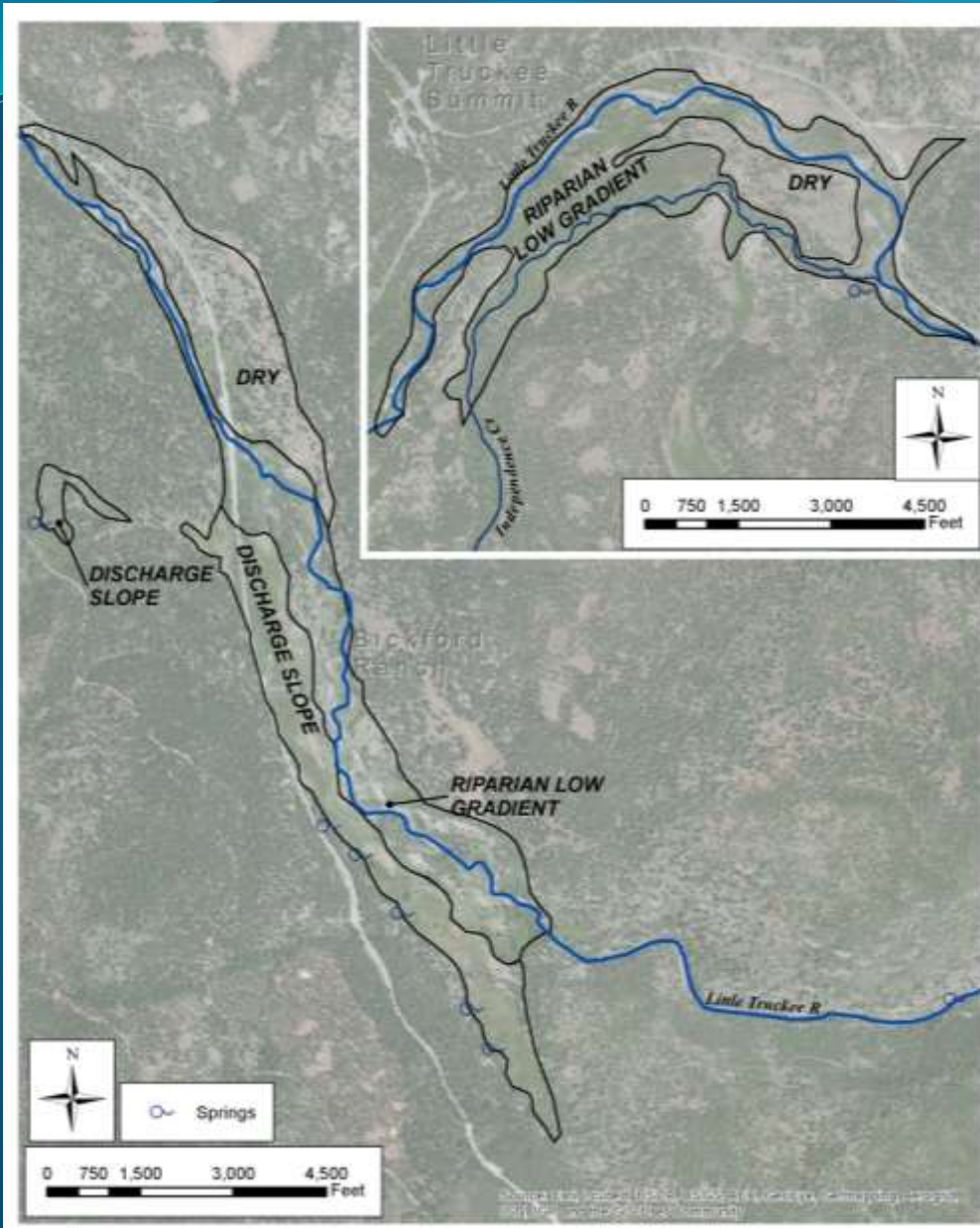


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Selected Results

Functional meadow types

-HGM mapping





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Selected Results

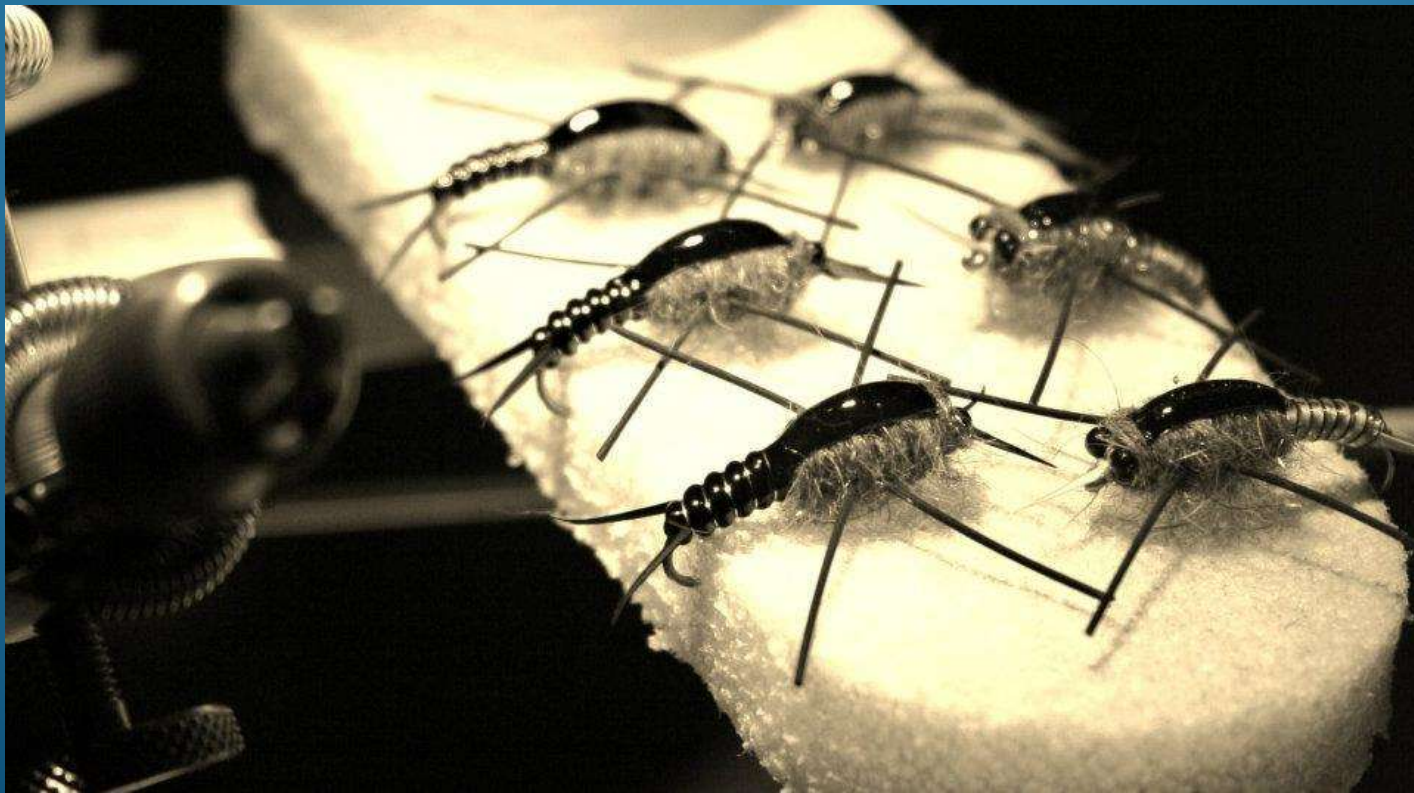
Biological Assessment



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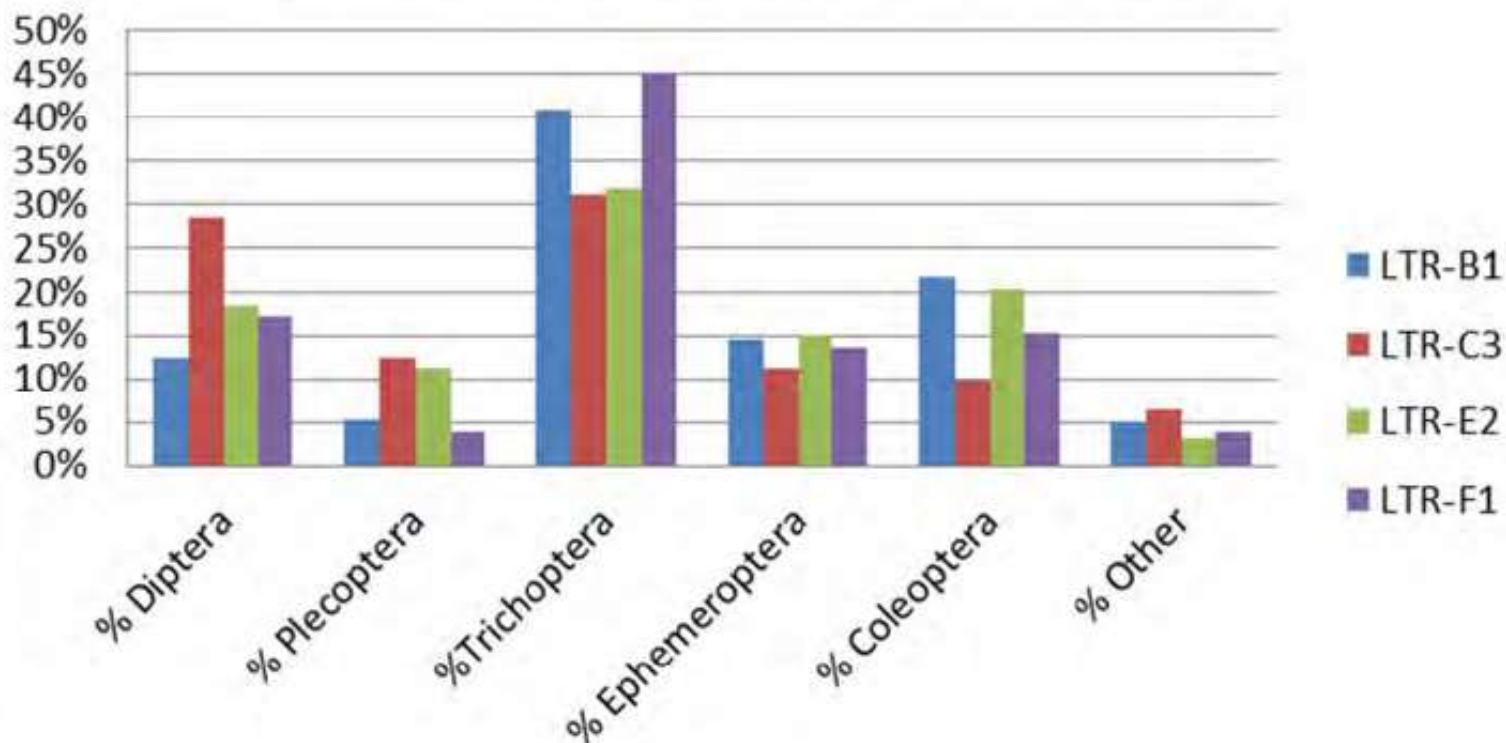
Selected Results – Macroinvertebrates

Overall, the taxonomic diversity (38 families, 48 species) and the abundance of macro-invertebrates sampled suggests that invertebrate production is robust and diverse, an overall indicator of good water quality



Selected Results – Macroinvertebrates

Percentage Invertebrates by Order



Selected Results – Macroinvertebrates

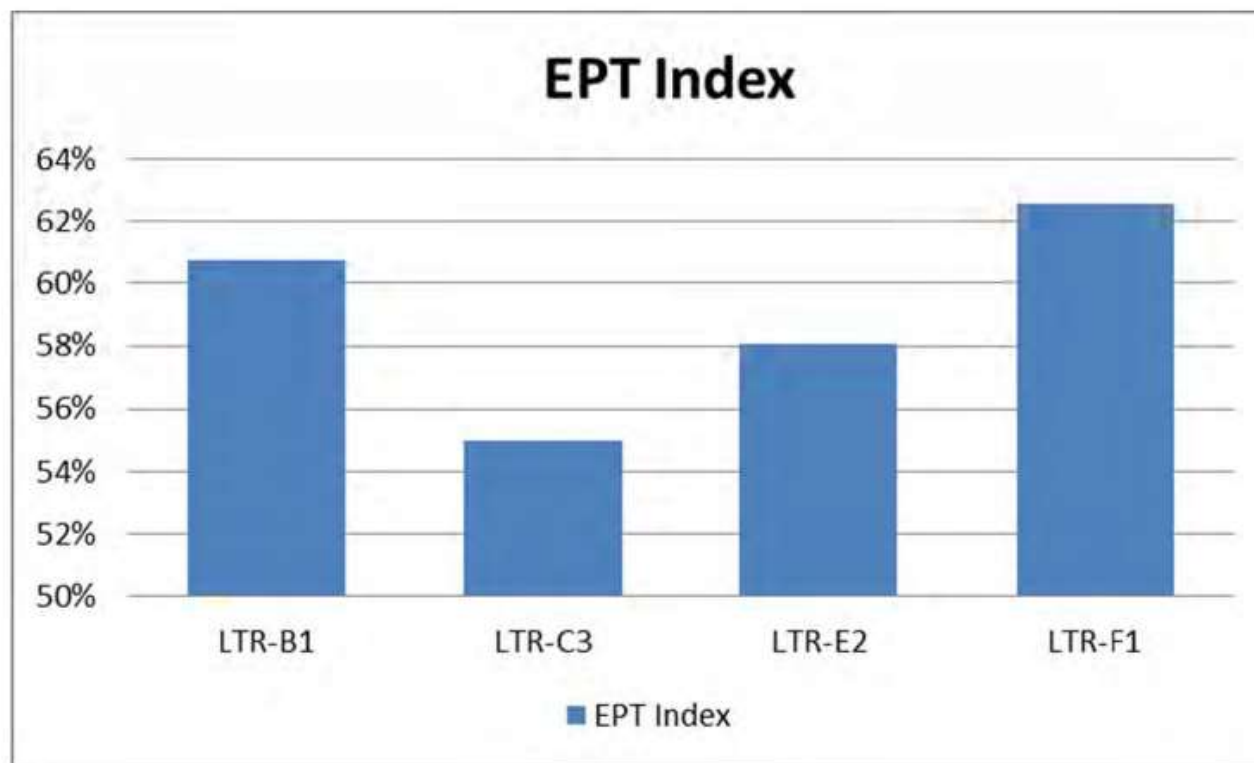


Figure 27. Macroinvertebrate Results, Little Truckee River Study Area, Sierra County, California
Data suggest abundant and diverse taxon with high EPT index—an indicator of good water quality.



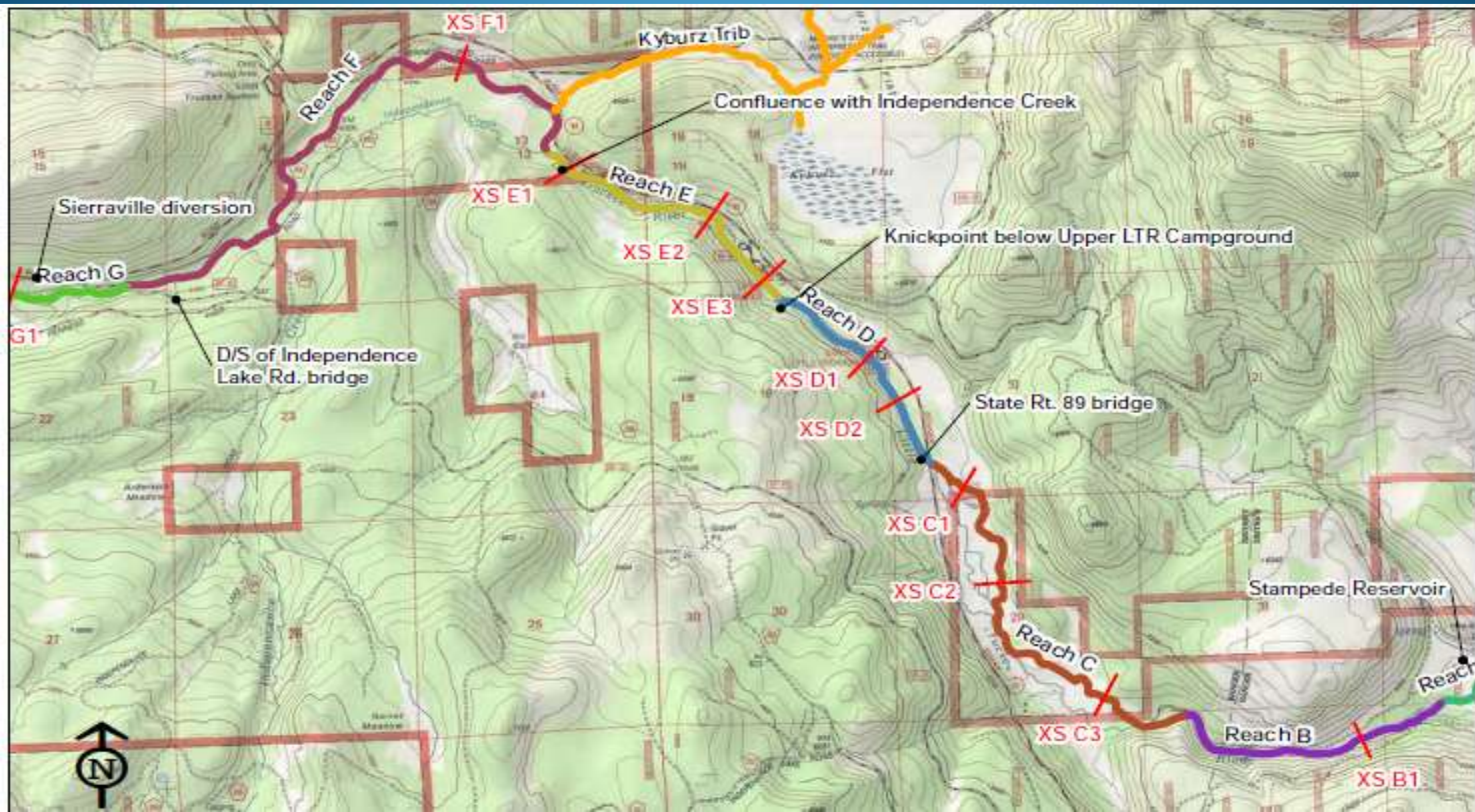
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Selected Results –

Fish Survey Results



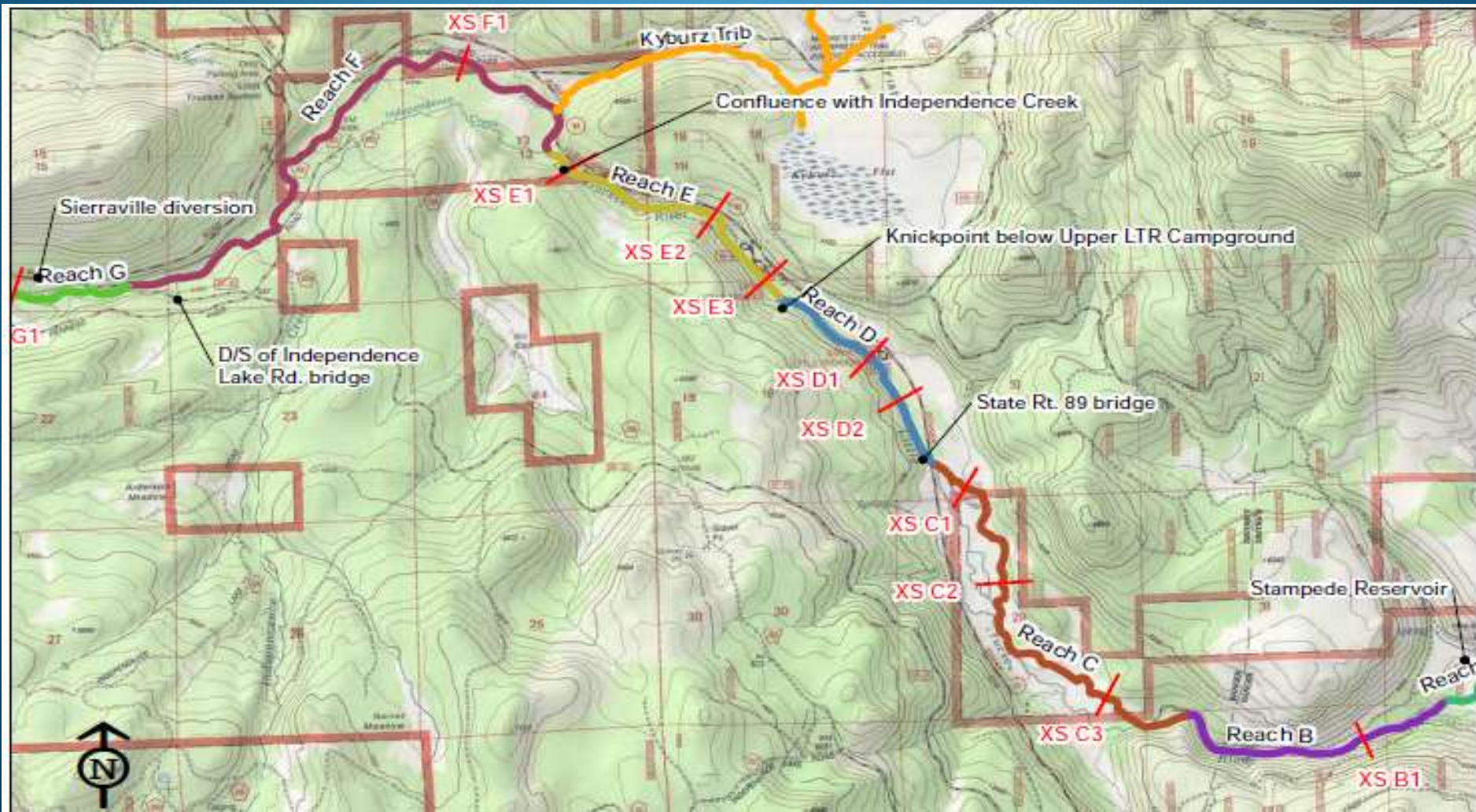
Overall, presence, density and diversity of native and non-native game fishes are low throughout the study area, as compared to similar Sierra systems.





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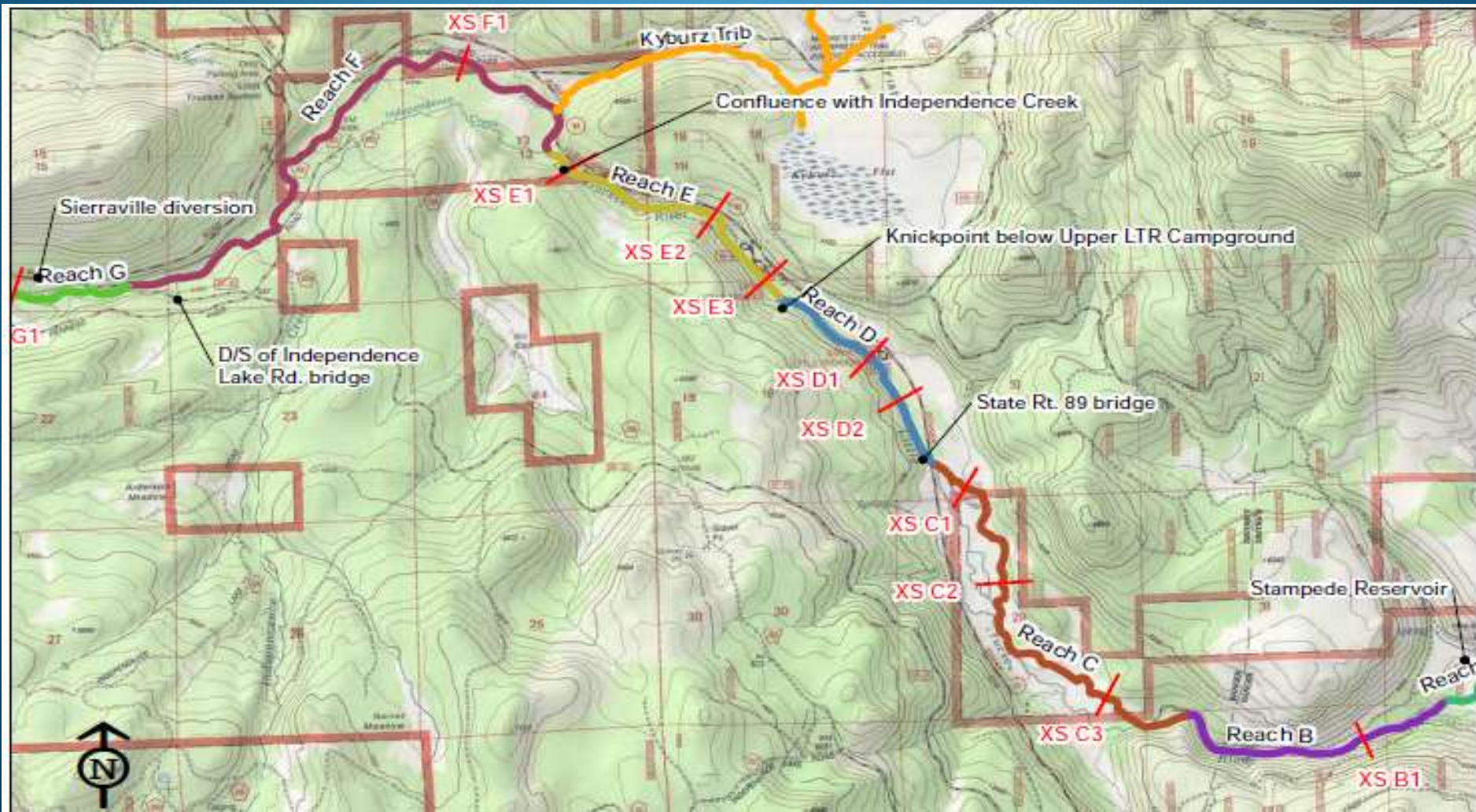
Selected Results – Reach C1 Survey Results





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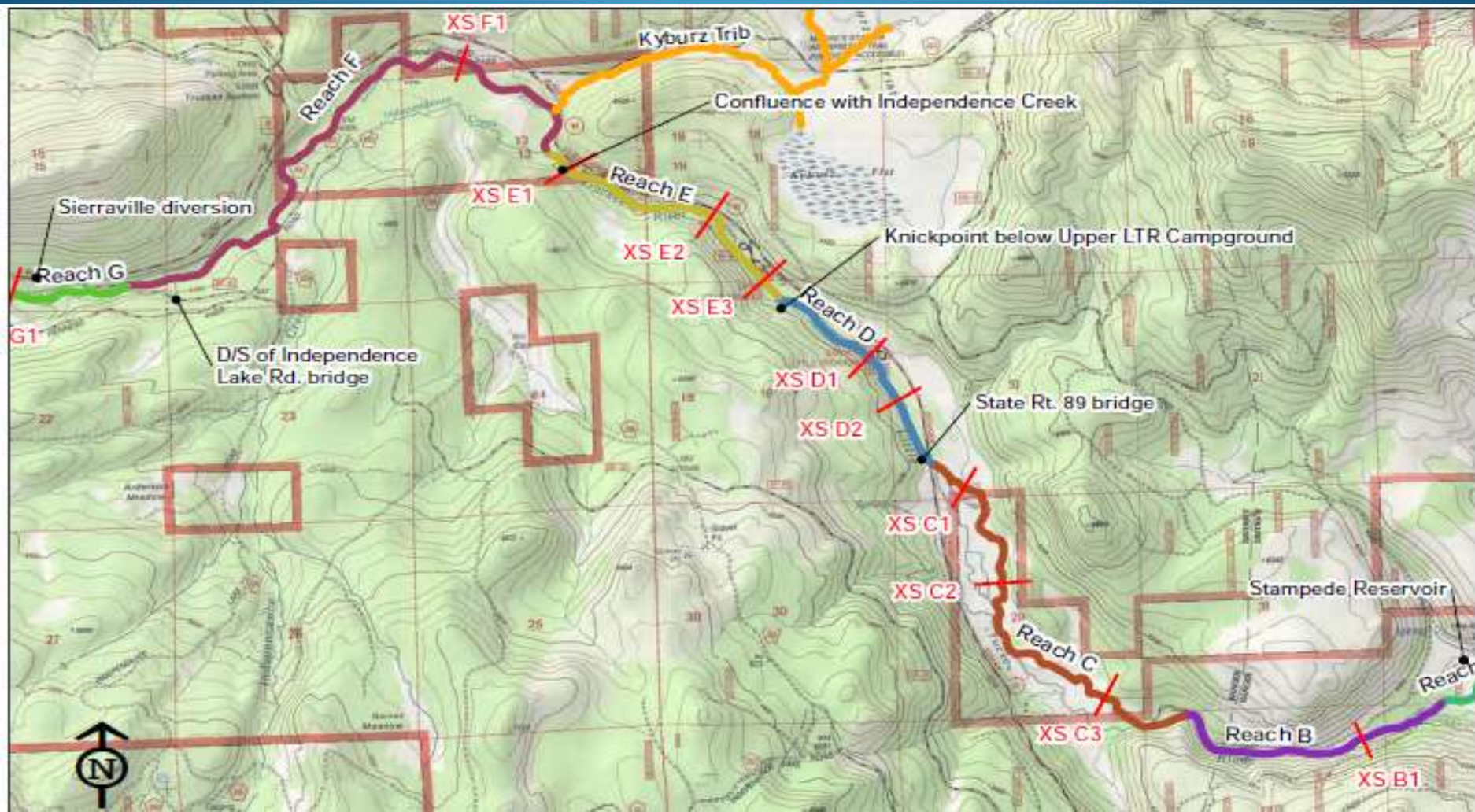
Selected Results – Reach E2 Survey Results





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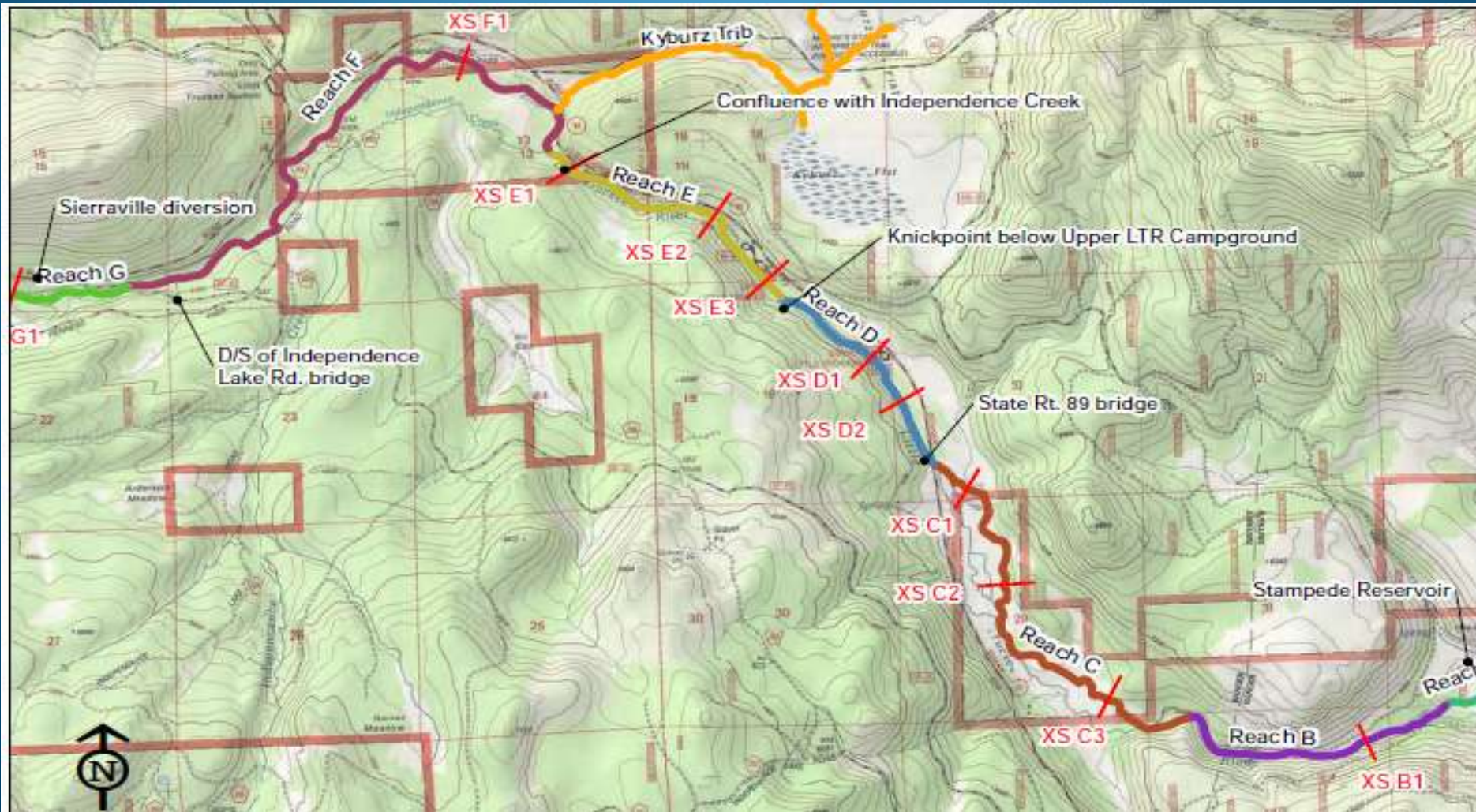
Selected Results – Reach F1 Survey Results





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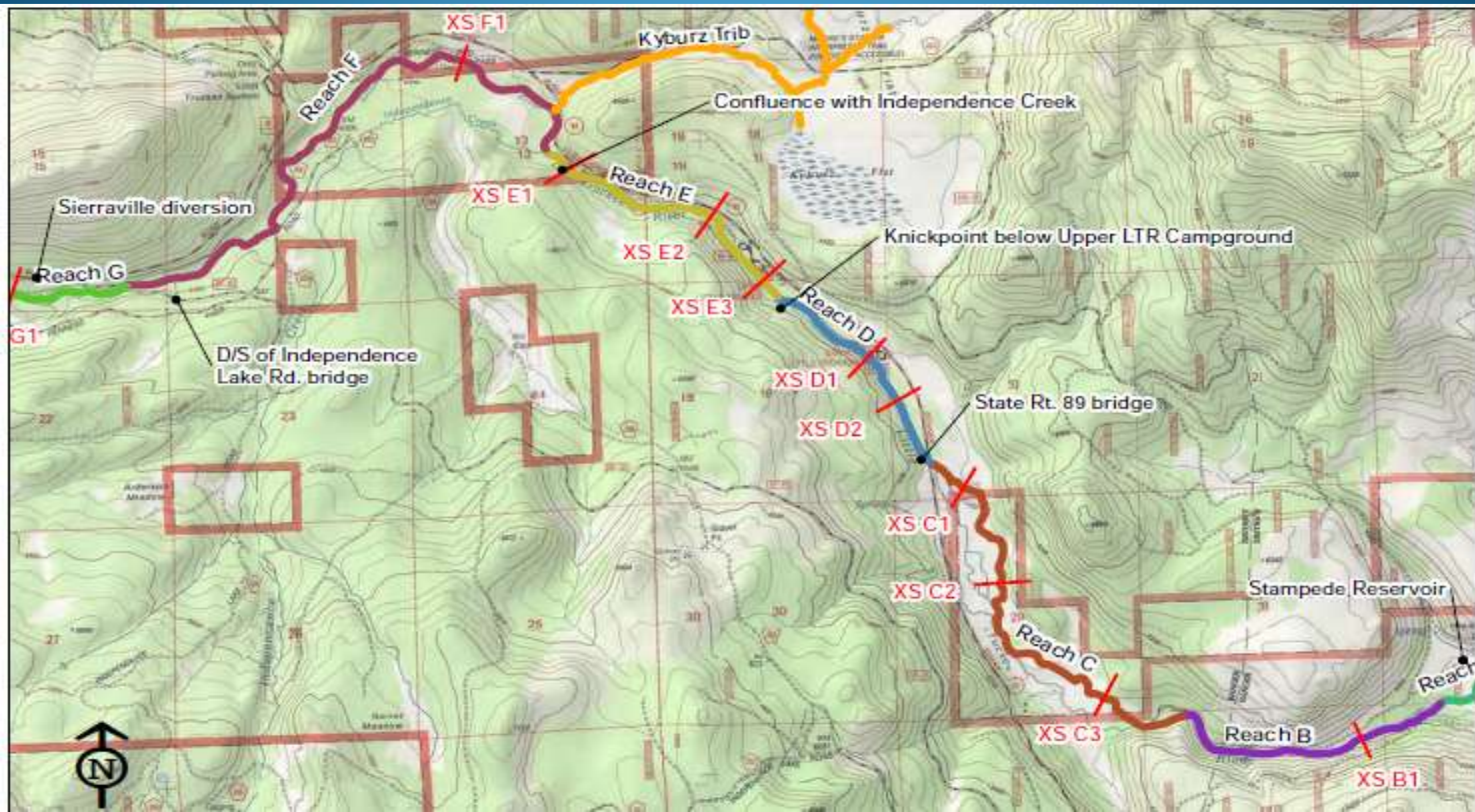
Selected Results – Reach F2 Survey Results





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Selected Results – Reach G1 Survey Results





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Next Steps

Management Strategies and Restoration Recommendations

- **Roads:**

- Improve Kyburz Flat road drainage
- Restore meadow functions at SR89 Bridge

Hydrology:

- Enhance or manage baseflows during spawning periods
- Protect and/or enhance groundwater recharge and discharge zones

Channel Geomorphology:

- Restore channel-floodplain connectivity in reaches where its impaired

- **Aquatic Habitat:**

- Introduce instream wood in strategic reaches
- Install temporary livestock-exclusion fences
- Encourage beaver activity



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Acknowledgments

Michael Baldrica, Archeologist (Tahoe National Forest),
Robert Reugebrink, Roads Manager (Tahoe National Forest)
Randy Westmoreland, Soil Scientist (Tahoe National Forest)

We also thank **Gary and Lauren Ranz** and **Robert Graham**
for site access to private lands within the study area.

Funding

The Secure Rural Schools Act,
provided by the Sierra County Resources Advisory Council.



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A photograph of a rural landscape. In the foreground, there is a field of tall, dry, yellowish-brown grass. In the middle ground, there is a wooden fence and a large, old, weathered barn with a corrugated metal roof. The barn appears to be in poor condition, with some of its structure missing. In the background, there is a dense forest of evergreen trees under a blue sky with some clouds.

Questions?