East River Fish Community

Rob Ryan
Regional Fishery Biologist

- Native and introduced fishes
- Unique characteristics
- Status of fish populations
- Population Trends
- Native fish conservation opportunities

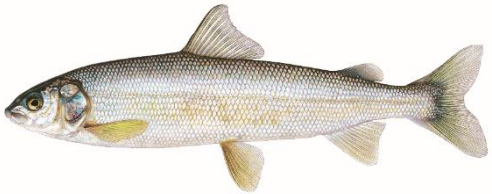
East River Fish Community

Rob Ryan
Regional Fishery Biologist

Native fishes

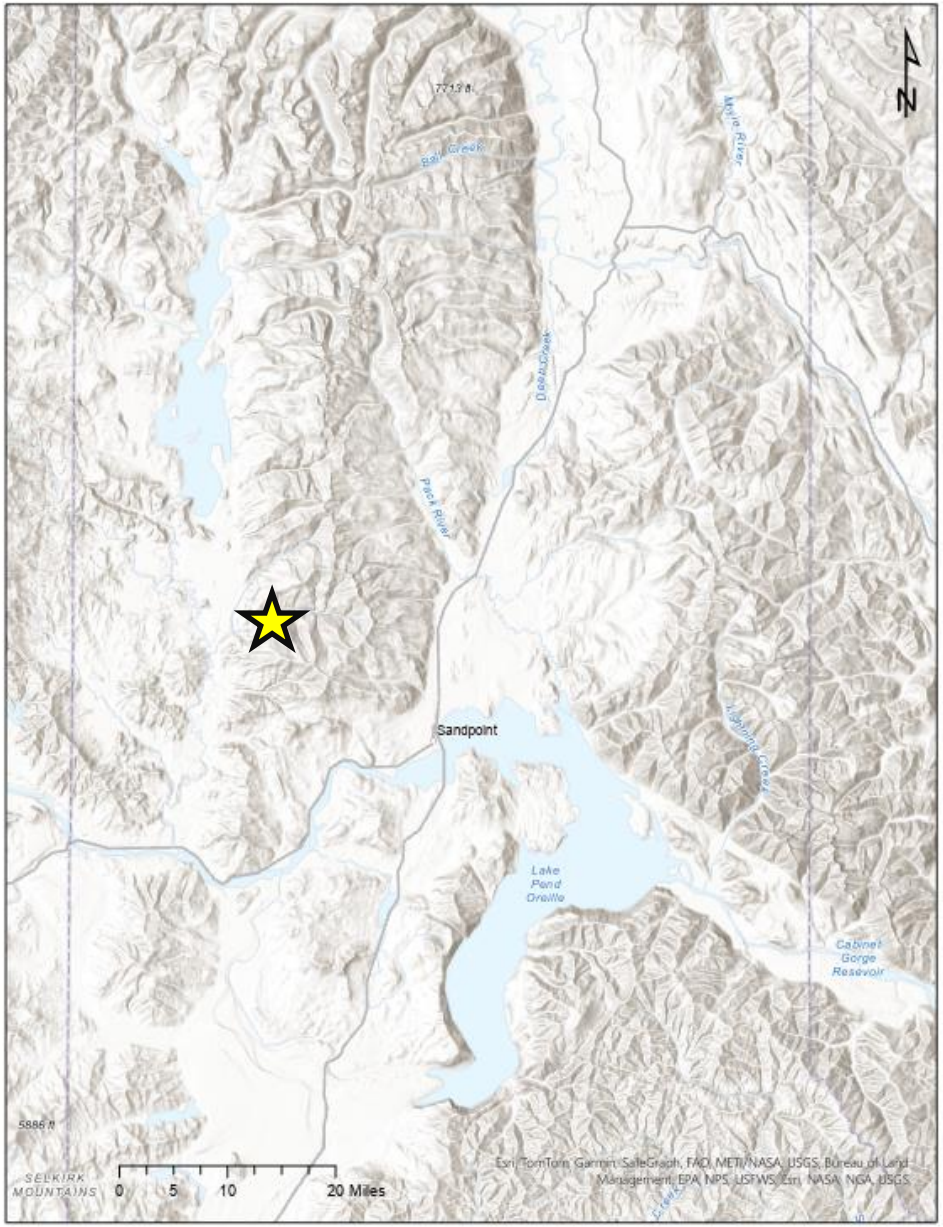
Bull Trout

Westslope Cutthroat Trout



Mountain Whitefish

Slimy Sculpin

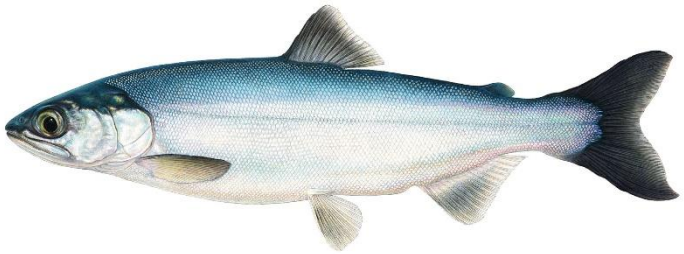


Illustrations by J. Tomelleri

Introduced fishes

Brook Trout: 1915 – 1947; 1980

Rainbow Trout: 1920 - 1973



kokanee: 1982 - 1983

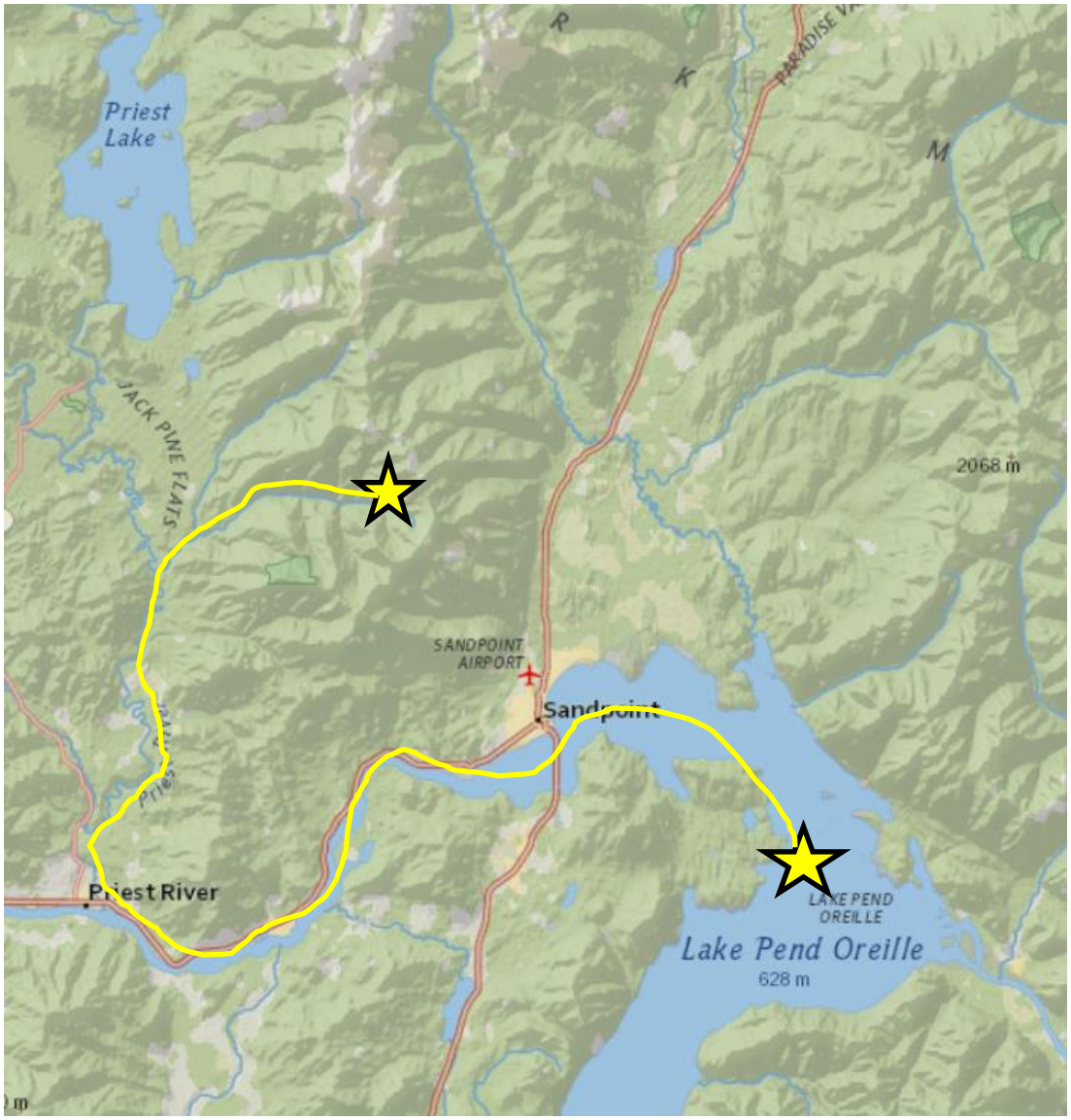
Brown Trout: 1976 - 1989

Illustrations by J. Tomelleri

Native fishes

Unique characteristics

Bull Trout



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[Management Brief]

Unique Allacustrine Migration Patterns of a Bull Trout Population in the Pend Oreille River Drainage, Idaho

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Abstract.—We captured and radio-tagged six adult bull trout *Salvelinus confluentus* in a spawning tributary of the East River basin, Idaho. These fish were tracked for a year to determine the type of migration they endured to reach their overwintering and spawning locations. Our tracking efforts revealed that the fish made complex postspawning migrations downstream and then upstream either towards or into Lake Pend Oreille. To reach the lake, bull trout migrated at least 12 km out of the East River basin into the Priest River, traveled 34 km down the Priest River into the Pend Oreille River, and then turned upstream and migrated 36 km to Lake Pend Oreille. Three of the six bull trout returned to the East River basin during the subsequent spring. These movement patterns are uniquely complex and extensive for outlet-spawning or allacustrine bull trout. This work illustrates the type of allacustrine migrations bull trout can have and suggests the need for new approaches for accomplishing bull trout population expansion into historically occupied habitats. Eliminating barriers downstream of lakes could potentially contribute to and increase bull trout populations considerably.

Bull trout *Salvelinus confluentus* exhibit both resident and migratory life history strategies (Rieman and McIntyre 1993). Fluvial bull trout occupy smaller streams for their entire lives (Goetz 1989; Northcote 1997; Jakober et al. 1998). Migratory bull trout travel to spawn in streams that flow into lakes (lacustrine–adfluvial; Varley and Gresswell 1988; Northcote 1997) or that flow out of lakes (allacustrine), or they move from rivers into tributaries to spawn (fluvial–adfluvial). Juvenile fish rear in their natal streams for 1–4 years before returning to lakes or rivers to mature (Fraley and Shepard 1989; Goetz 1989; Northcote 1997; Swanberg 1997; Downs et al. 2006). Migratory forms of bull trout probably evolved because migration took them to places that increased their reproductive potential through a combination of increased survival, growth, and gamete production (Gross 1991). Fluvial forms of bull trout reside in predominantly cold and unproductive headwater tributaries that would not provide these same opportunities.

Spawning migrations of fluvial–adfluvial, lacustrine–adfluvial, and allacustrine forms of bull trout occur from lakes and rivers to tributaries where survival of eggs and young is optimized. In most cases, migratory bull trout, like most salmonids, move upstream into tributaries to spawn (USFWS 2002). Environmental cues from home streams guide fish migration back to spawning areas, and olfactory imprinting is probably the most significant guiding factor (Groves et al. 1968; Hara 1970; Hasler and Scholz 1983). Chemical cues originating in home waters are carried downstream past upstream-migrating fish and presumably guide them back to the spawning areas. However, optimal spawning and rearing habitat sometimes occurs in tributaries downstream of the lakes and rivers used by adults, thus necessitating downstream spawning migrations. Downstream migrations have been documented for spawning adults of rainbow trout *Oncorhynchus mykiss* from Loon Lake, British Columbia (Lindsey et al. 1959), and cutthroat trout *O. clarki* from Yellowstone Lake, Wyoming (Cope 1957). Brown and Mackay (1995) noted that fluvial and fluvial–adfluvial cutthroat trout within the Ram River drainage of Alberta also moved downstream to spawning areas, and Schmetterling (2001) noted this behavior in cutthroat trout in the Blackfoot River drainage, Montana. Bahr and Shrimpton (2004) observed downstream spawning movement by fluvial–adfluvial bull trout in a British Columbia river drainage. Bull trout also exhibit downstream migrations out of lakes to spawning areas in outlet streams (i.e., allacustrine migrations; Thomas 1992; Herman 1997; Northcote 1997; Kelly-Ringel and DeLaVergne 2000; Hogen and Scarnecchia 2006). However, none of these populations migrate more than 10 km downstream from the lake's outlet, and all spawn directly in the outlet stream or less than 8 km up a side tributary.

Many recovery or restoration plans describe passage barriers as a significant risk to the long-term persistence of bull trout (USFWS 2002). These plans

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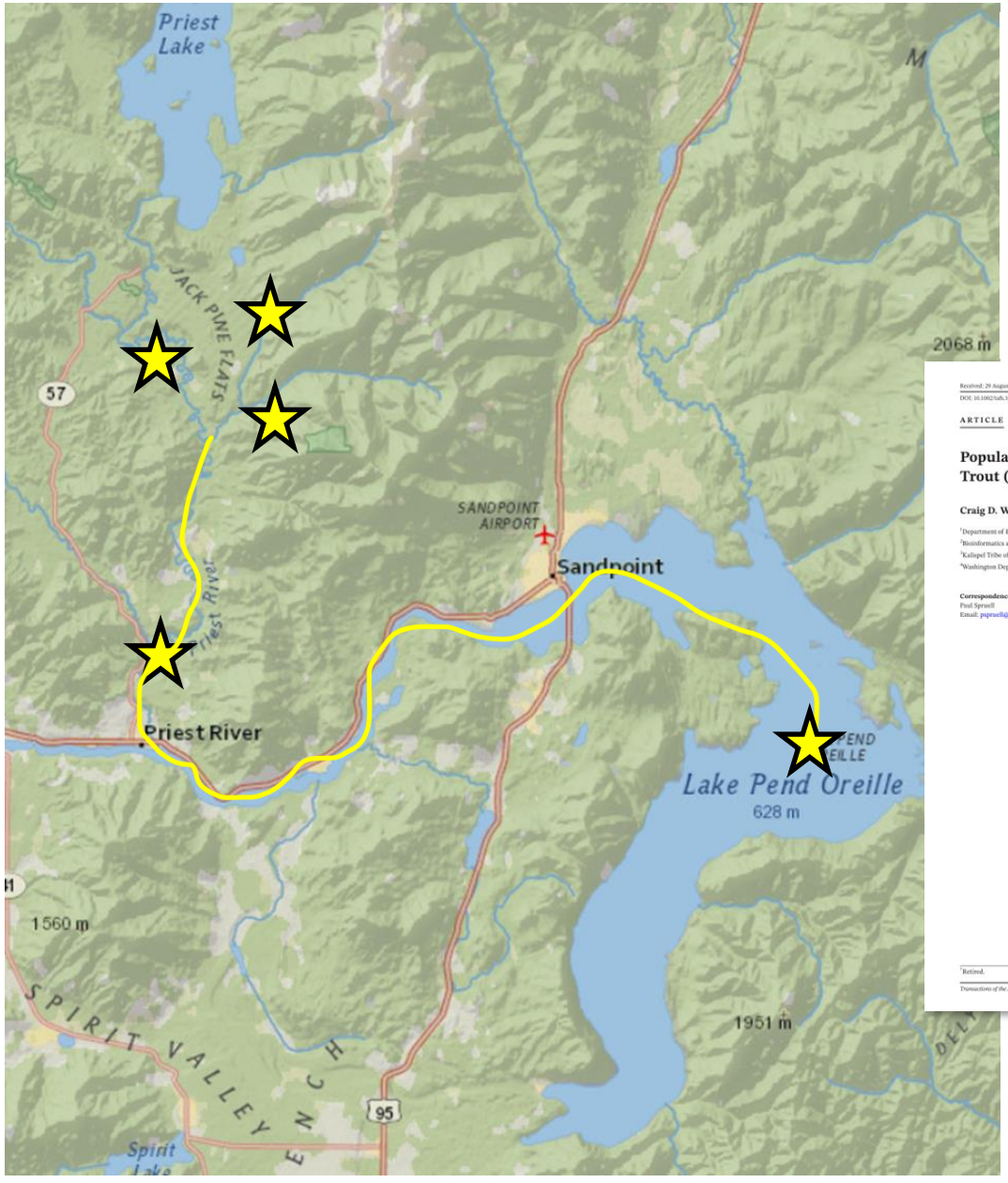
Unique characteristics



Westslope Cutthroat Trout

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ARTICLE

Population assignment of migratory Westslope Cutthroat Trout (WCT) in the Clark Fork–Pend Oreille River basin

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Abstract

Objective: The Clark Fork–Pend Oreille River b
and the Idaho Panhandle historically supported
Westslope Cutthroat Trout (WCT) *Oncorhynchus*
of high cultural and economic value. The constru
dams and smaller instream barriers has prevented
spawning tributaries, leading to the fragmentatio
past 100 years. One such impassible barrier is Alber
Washington, which was completed without fish
sought to examine large-scale genetic patterns in
most likely spawning tributary of origin for migrat
Methods: We created a genetic baseline representati
Fork-Pend Oreille River basin from upstream and
biallelic single-nucleotide polymorphism genetic m
collections, which allowed for an examination of p
influence across the study area and provided a robu
Population assignment tests were conducted using t
Result: Population assignment tests were successf
origin despite potential influence from hatchery lin
migratory WCT captured below AFD, approximat
ies upstream of AFD with a posterior assignment
one fish was assigned to a tributary downstream of
Conclusion: Our results indicate that AFD disr
dynamics of WCT populations in the basin. Passa
reestablish metapopulation connectivity within th
dividuals to make genetic contributions to populat

KEYWORDS
fisheries, genetics, population dynamics, restoration and en

†Retired.

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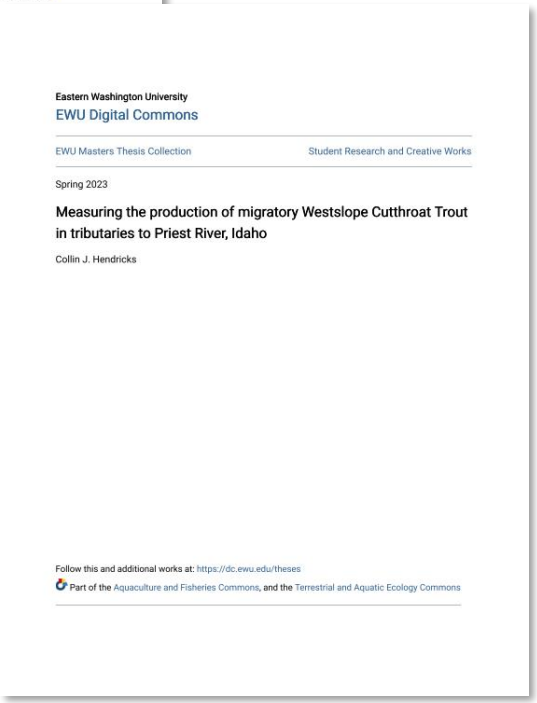
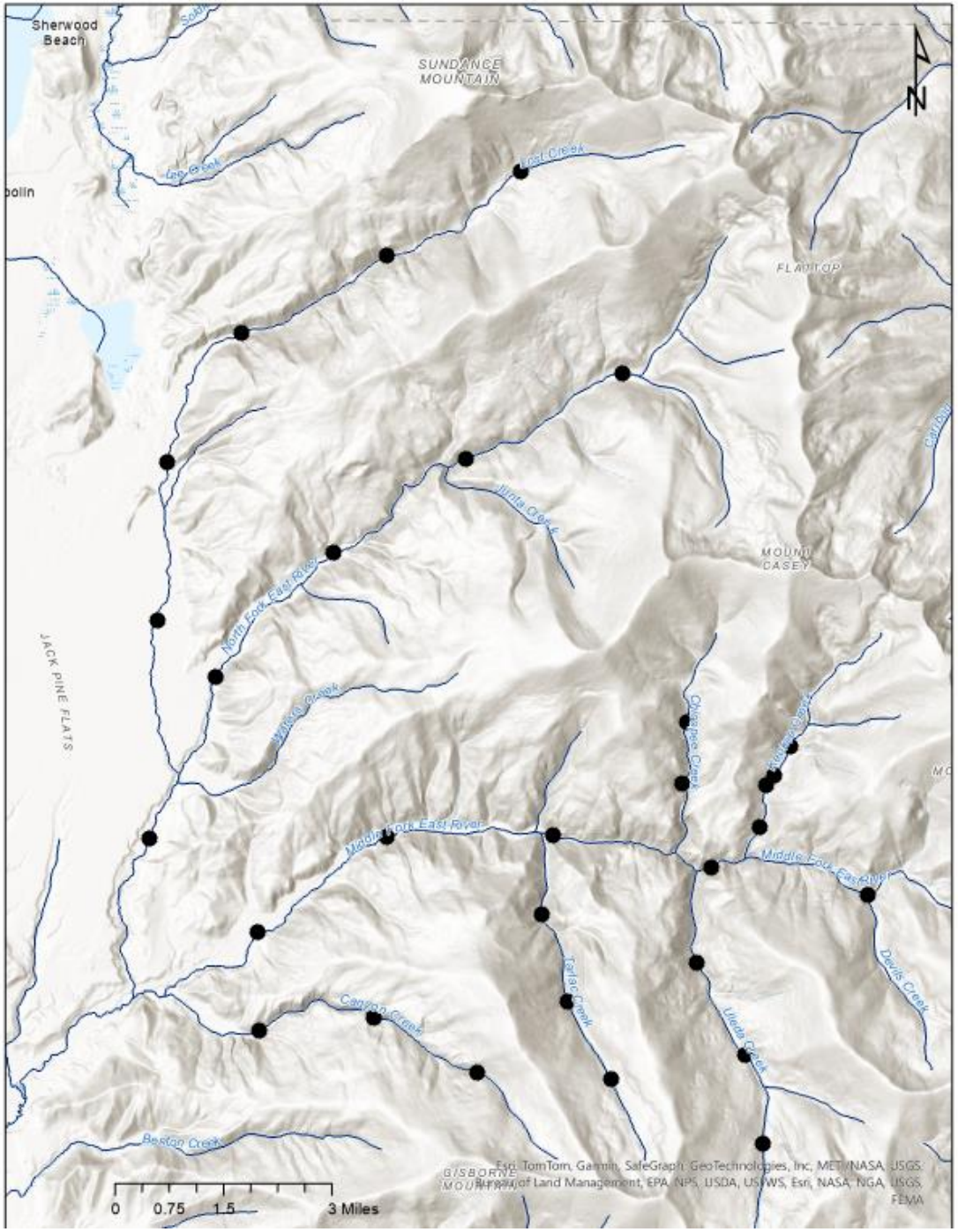


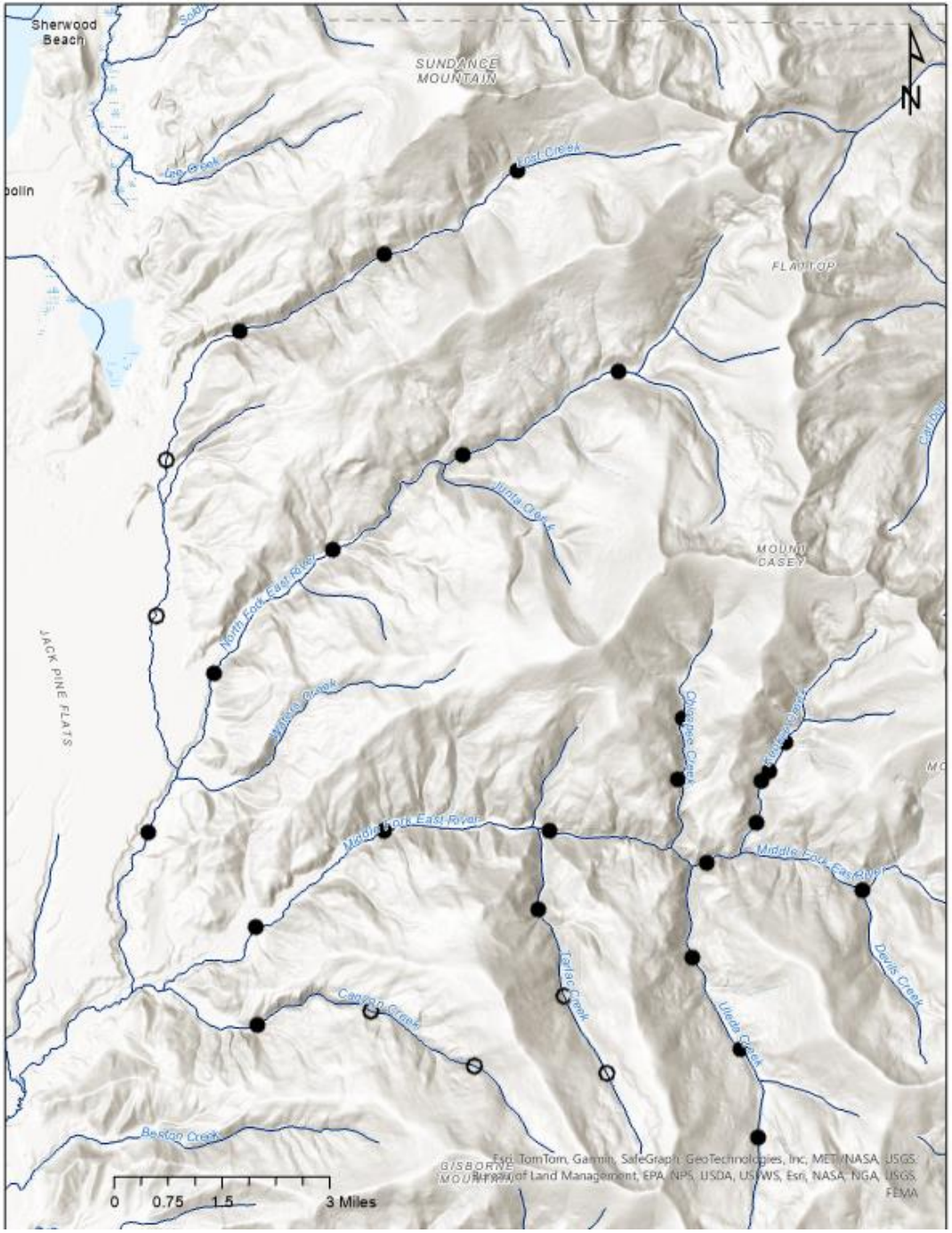
Measuring the production of migratory Westslope Cutthroat Trout in tributaries to Priest River, Idaho

Collin J. Hendricks

Population status

- Species Composition
- Distribution
- Abundance



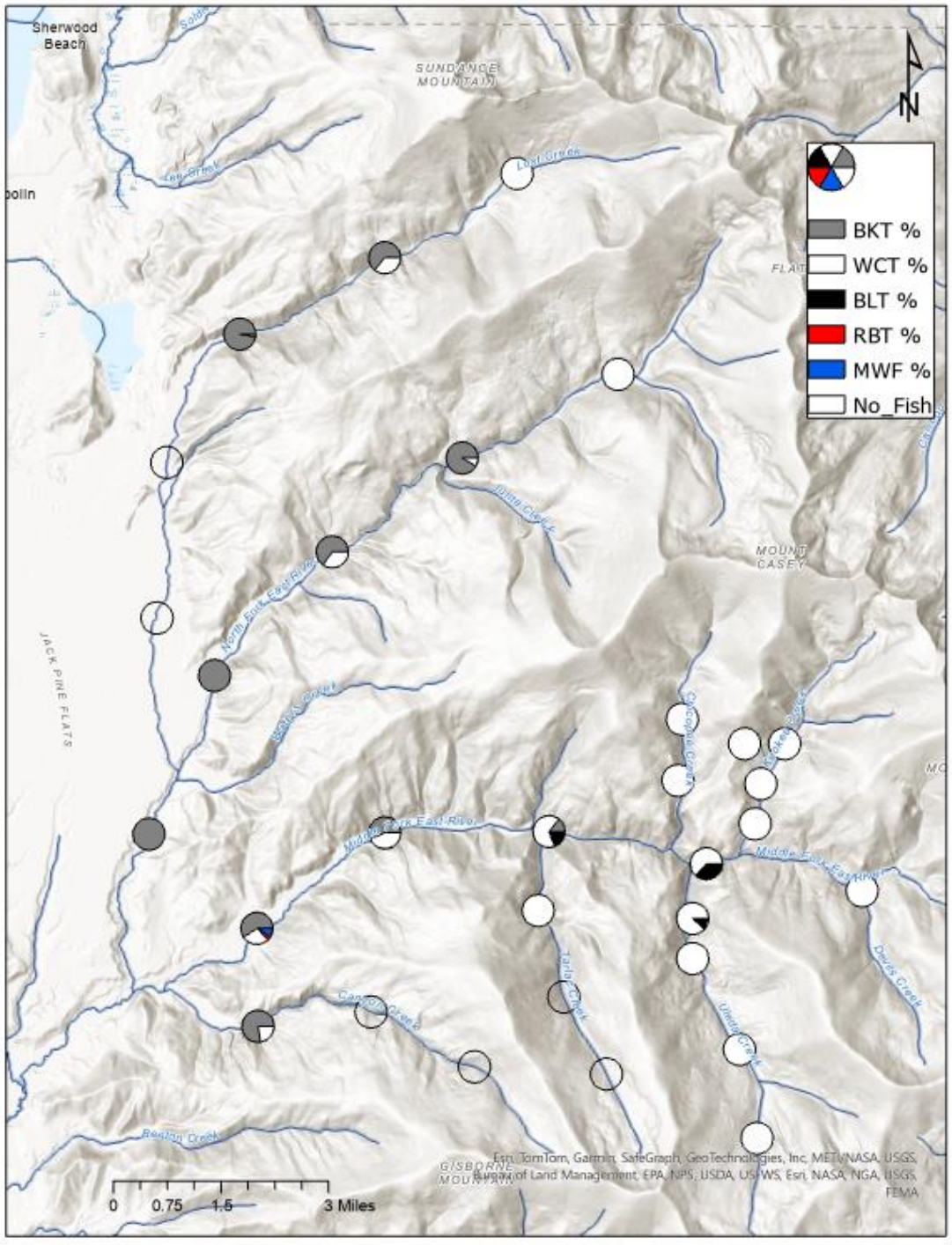


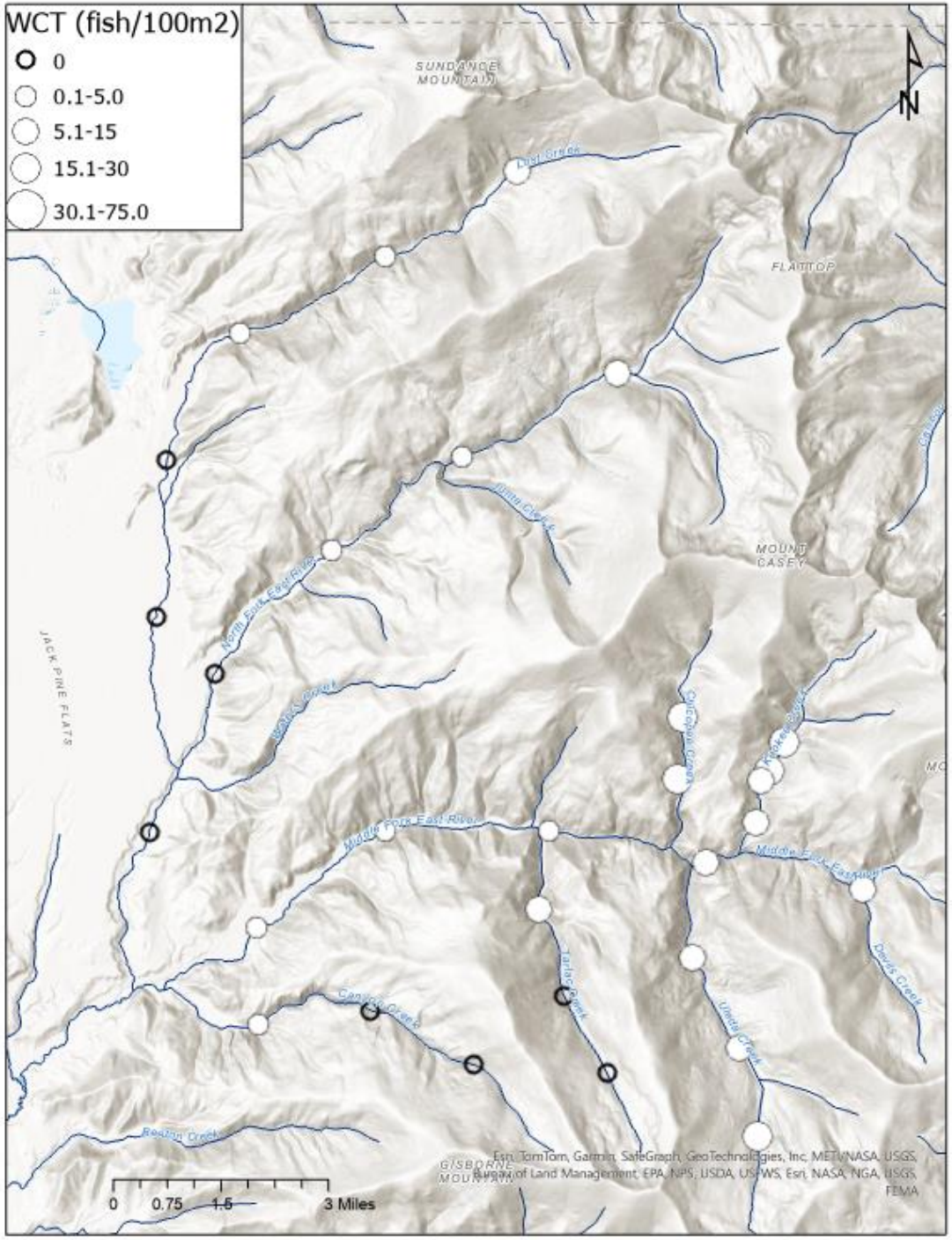
Population status

- Sample locations = 30
- Fish present = 24
- Fish absent = 6

Population status

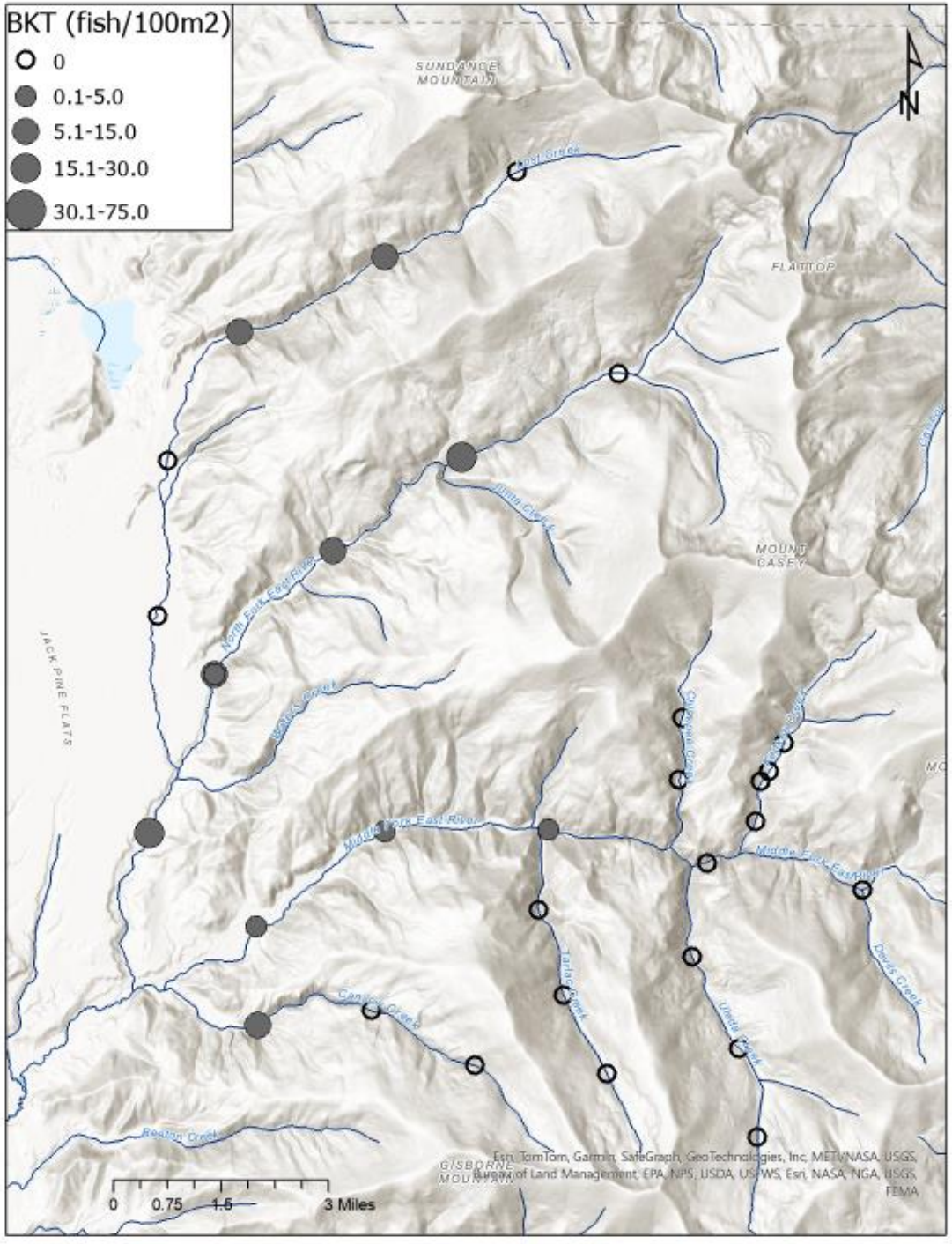
- Westslope Cutthroat Trout and Brook Trout dominate
- Limited distribution of Bull Trout
- Limited occurrence of other species





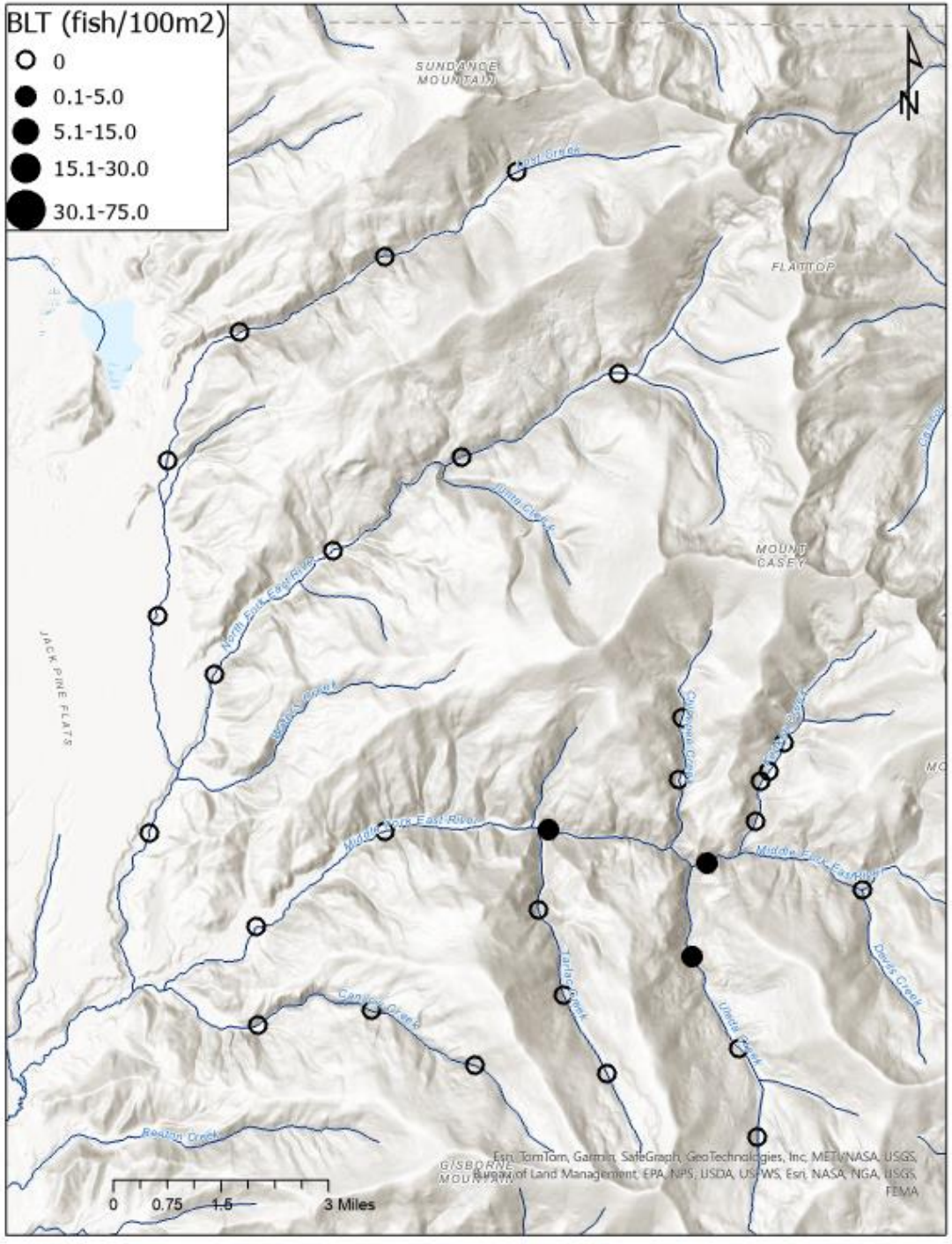
Population status

- Westslope Cutthroat Trout
- Widely distributed
- Densities vary from low to high
- Distribution influenced by Brook Trout



Population status

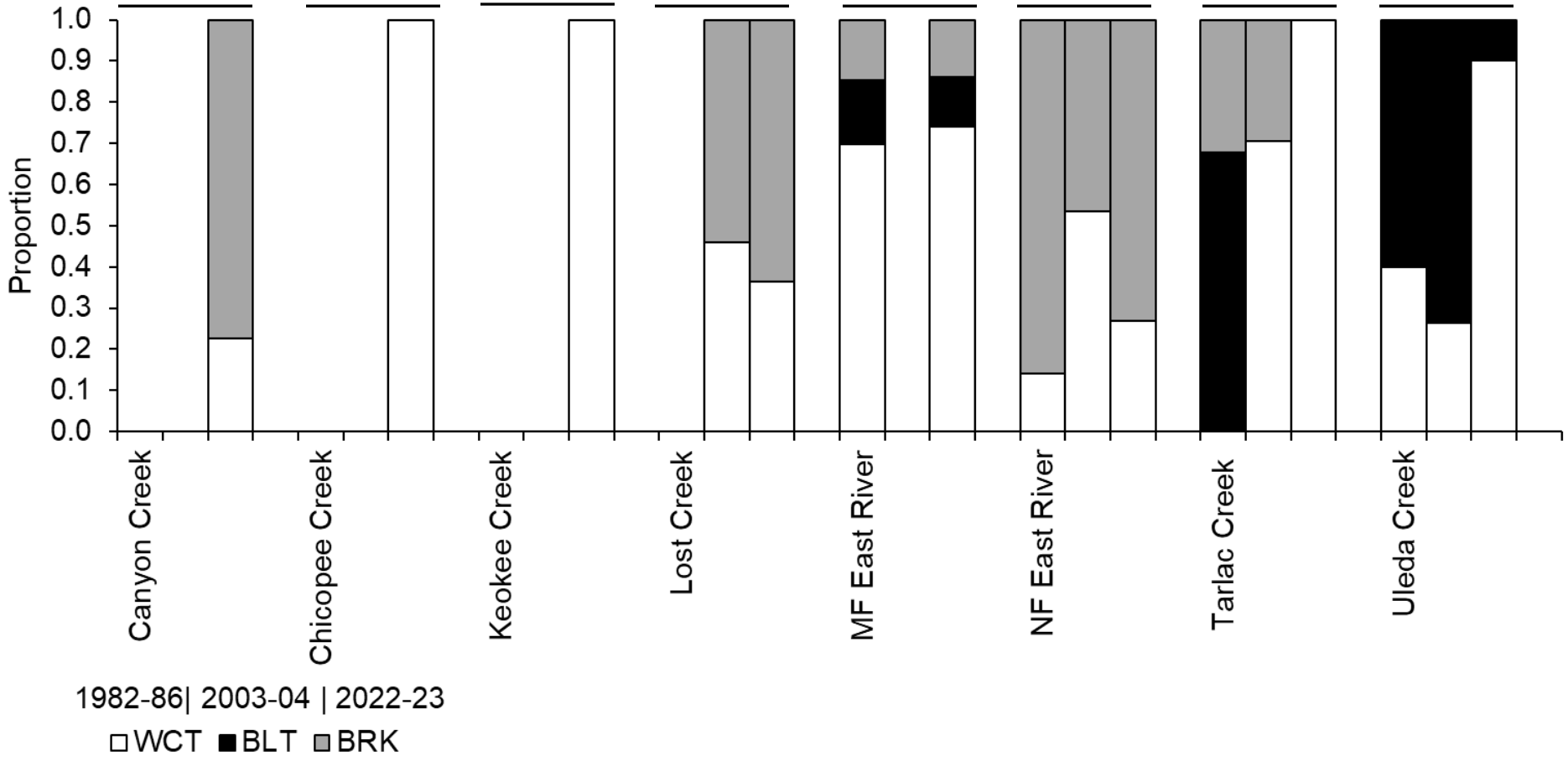
- Brook Trout
- Widely distributed
- Densities vary from low to high
- Consistently high densities in portions of the drainage



Population status

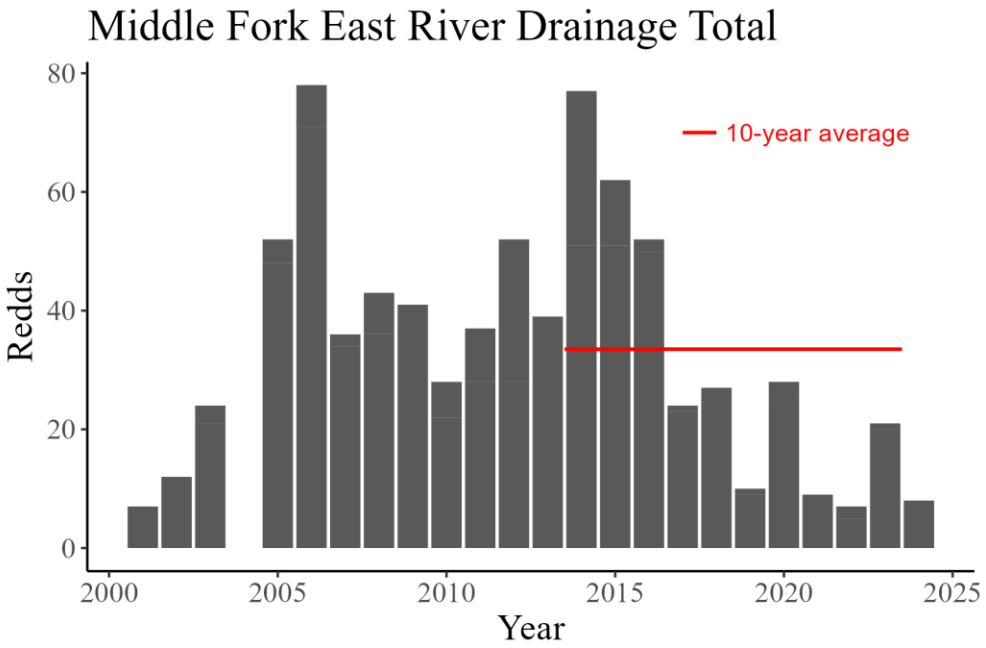
- Bull Trout
- Limited distribution
- Low to moderate densities
- Distribution consistent with observed spawning zones

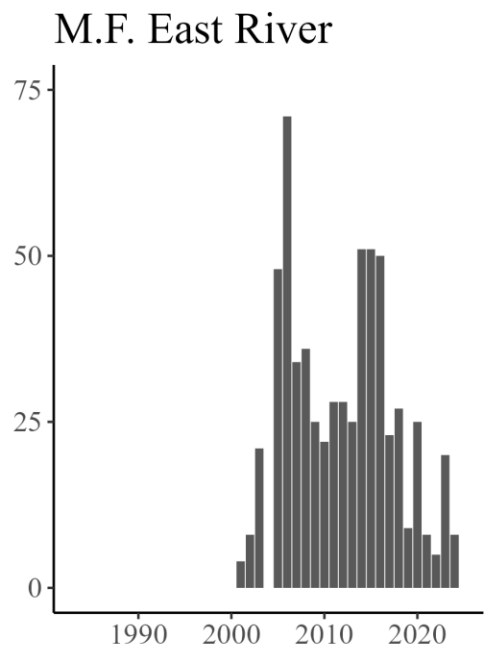
Population trends

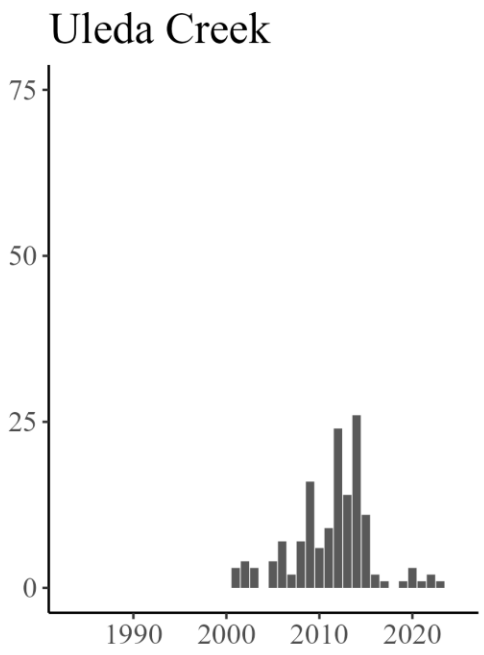


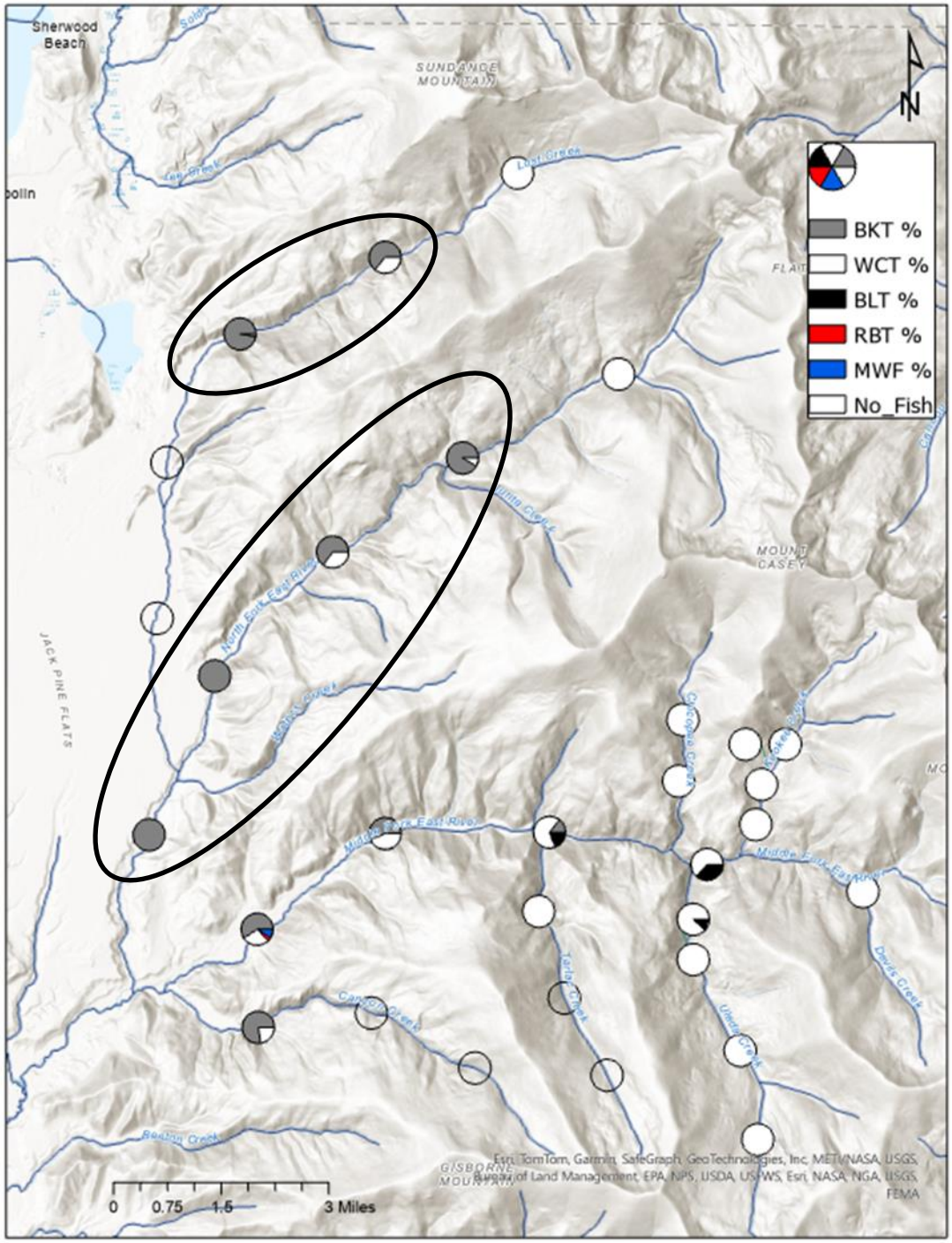
Population trends

- Bull Trout redd counts
- MF East River and Uleda Creek
- Below average
- Redd count vs trend









Conservation opportunities

- Identify management actions that benefit native fishes
- Brook Trout negatively influence native fishes
- Opportunity manage Brook Trout abundance
- Treatment options include chemical (rotenone) and or mechanical (electrofishing) removal

Summary

- East River fish community is blend of native and introduced fish species.
- Bull Trout and Westslope Cutthroat Trout exhibit unique migratory behaviors
- Strong native fish populations exist.
- Brook Trout are abundant and influence the distribution and abundance of native fishes.
- In general, proportional abundance of native and introduced fishes has remained relatively stable.
- There appear to be opportunities to manage non-native fishes
- Recreational fishing, does it play a role?