

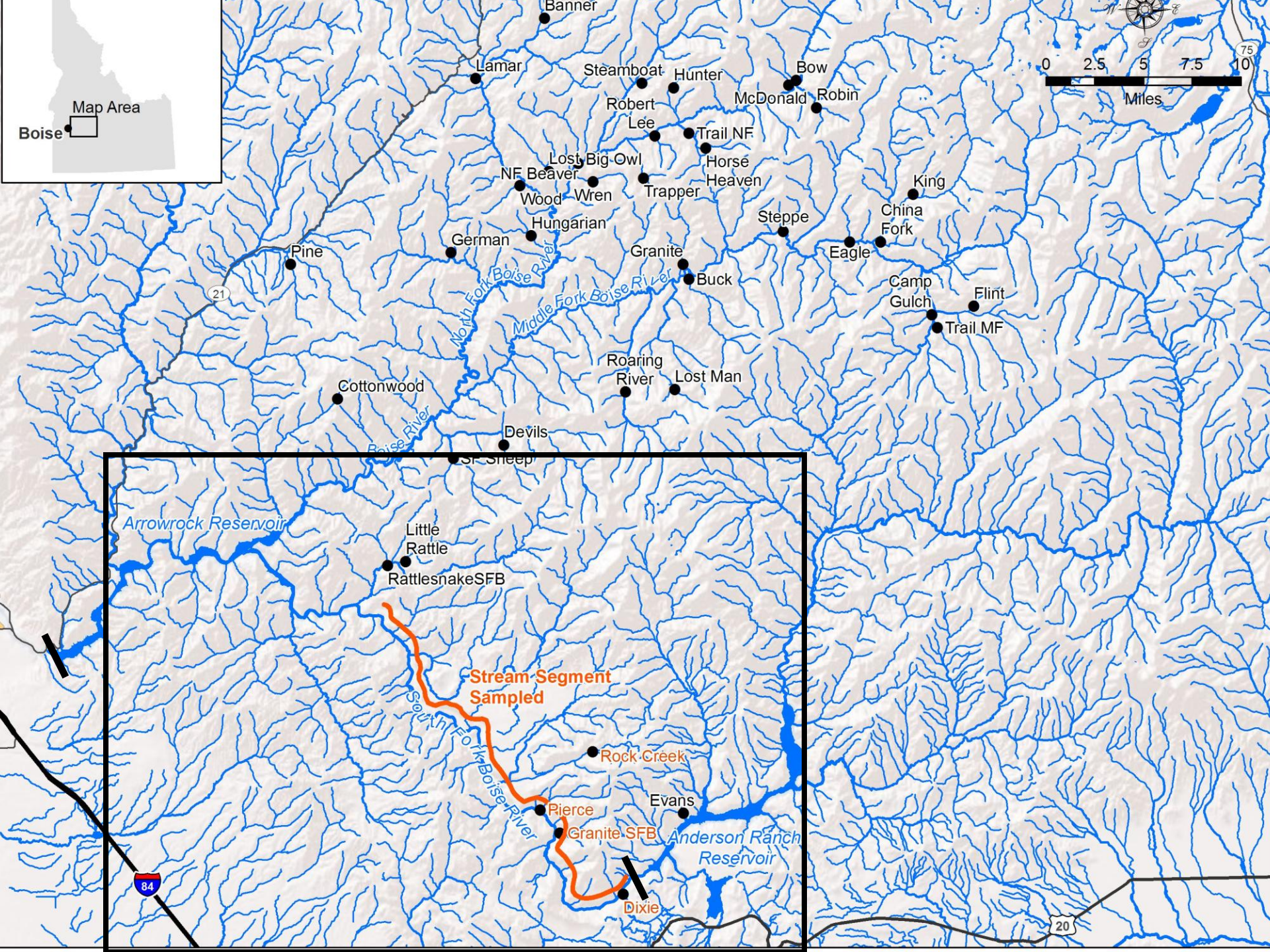
Genetic assessment of South Fork Boise River rainbow trout and potential interchange with headwater populations

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- Premier rainbow trout fishery in southwest Idaho (mostly native, some hatchery)
- 2006 IDFG survey of 10 km section showed:
 - Skewed age distribution
 - Increase in # large fish but decline in # small fish over last 10 years

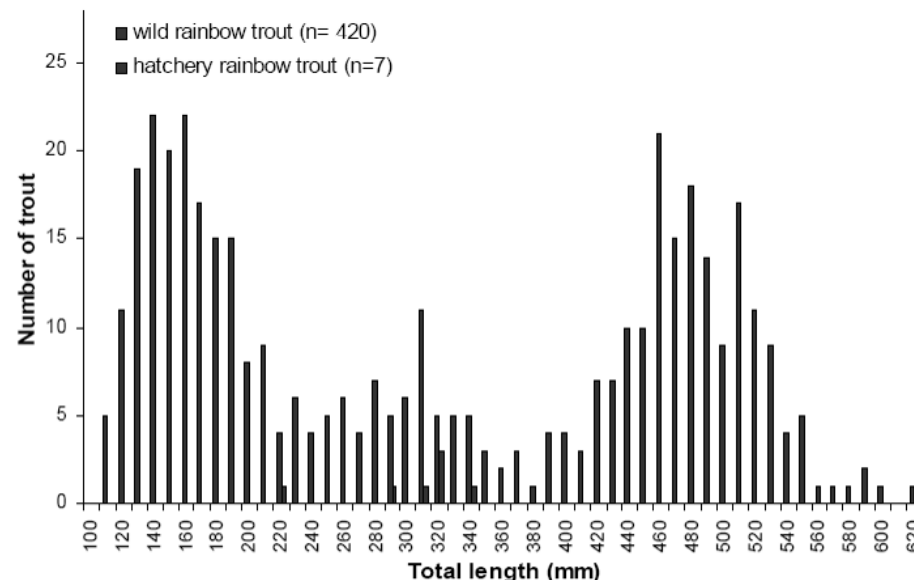
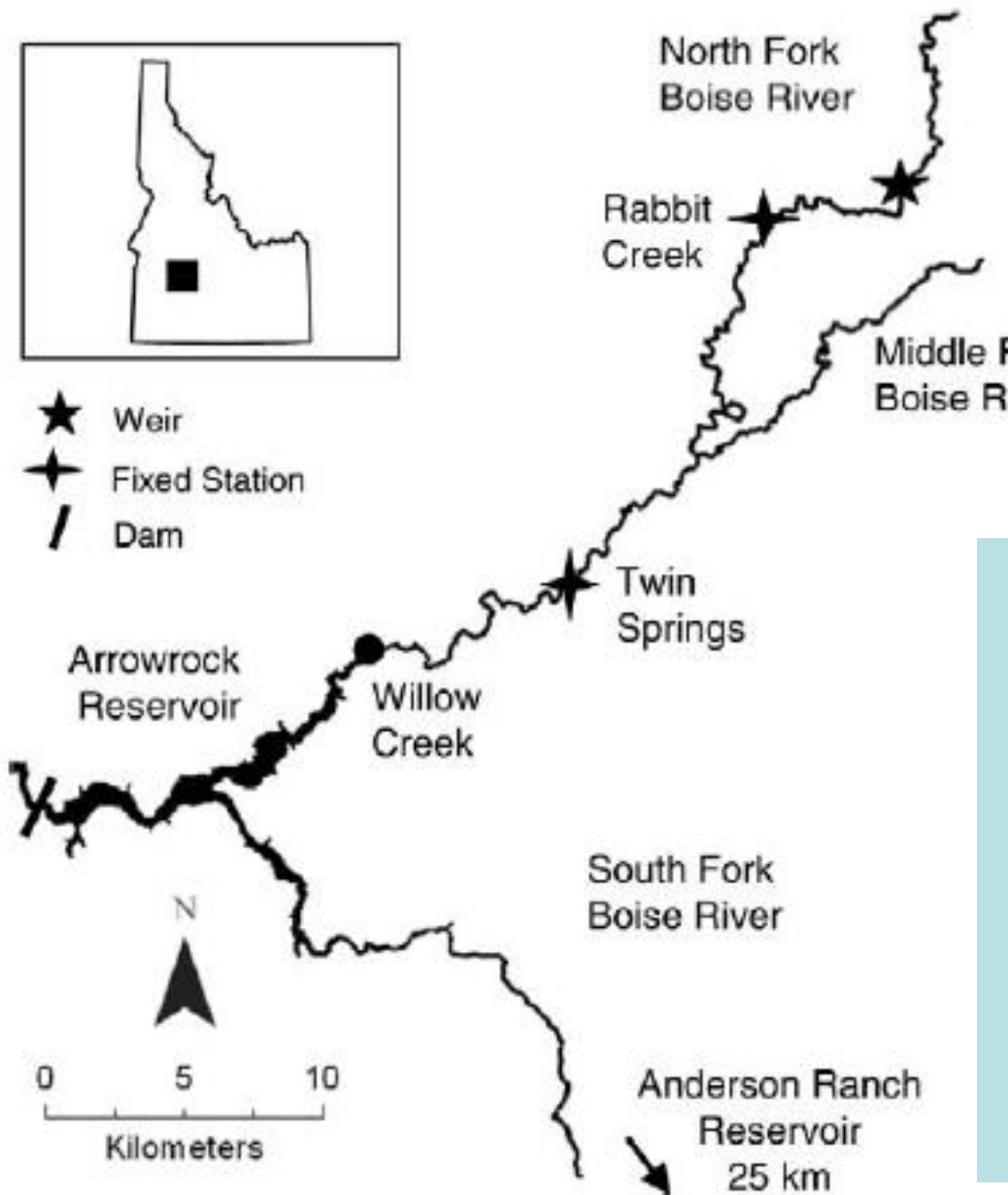


Figure 1. Length of rainbow trout captured by electrofishing on the South Fork Boise River downstream from Andersen Ranch Dam in 2006. Only trout greater than 100 mm total length are included.

Several possible scenarios:

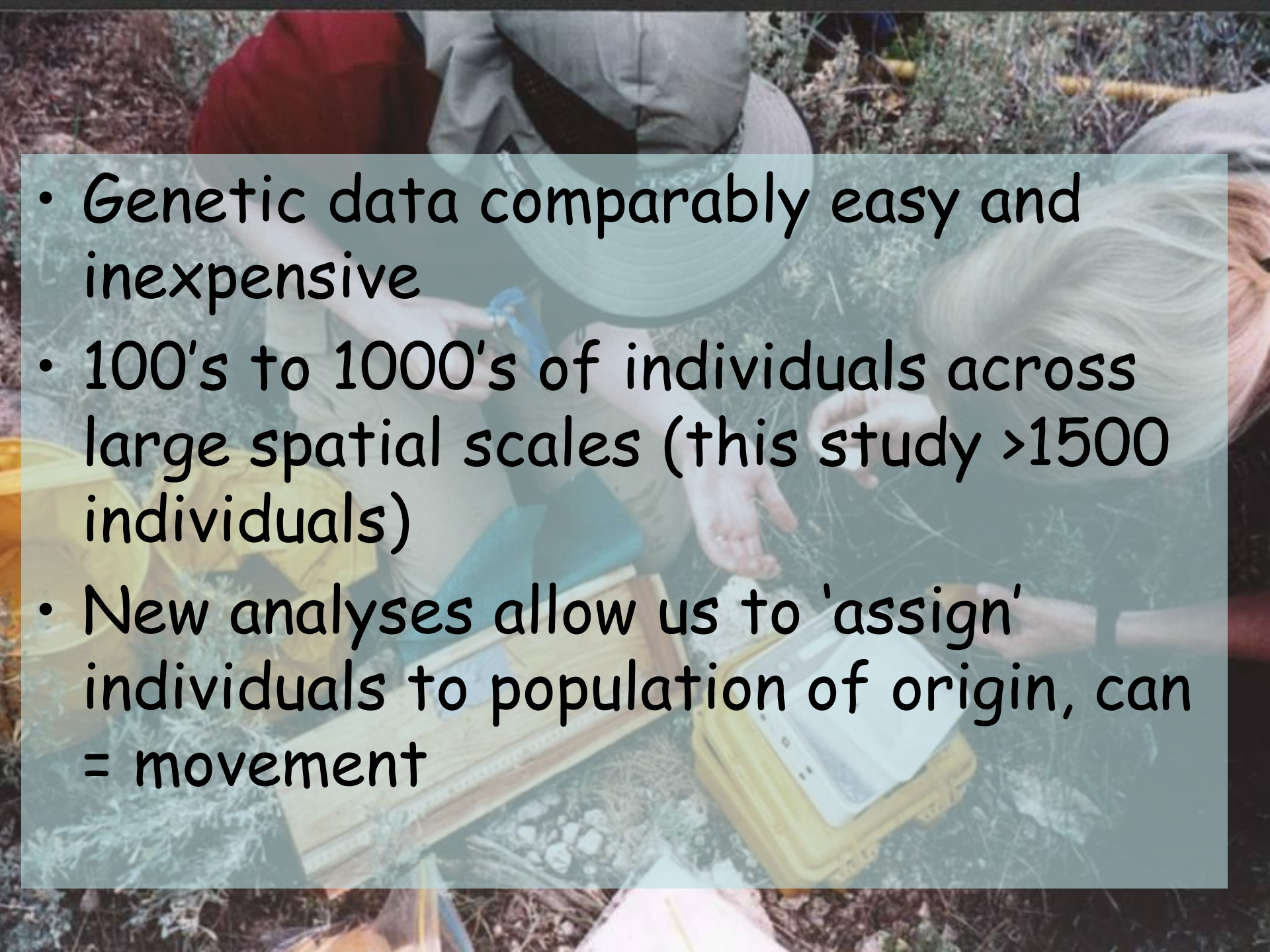
- Insufficient recruitment, population declining
- Smaller fish rearing in adjacent tributaries or other un-sampled areas
- *Larger fish moving in from elsewhere*



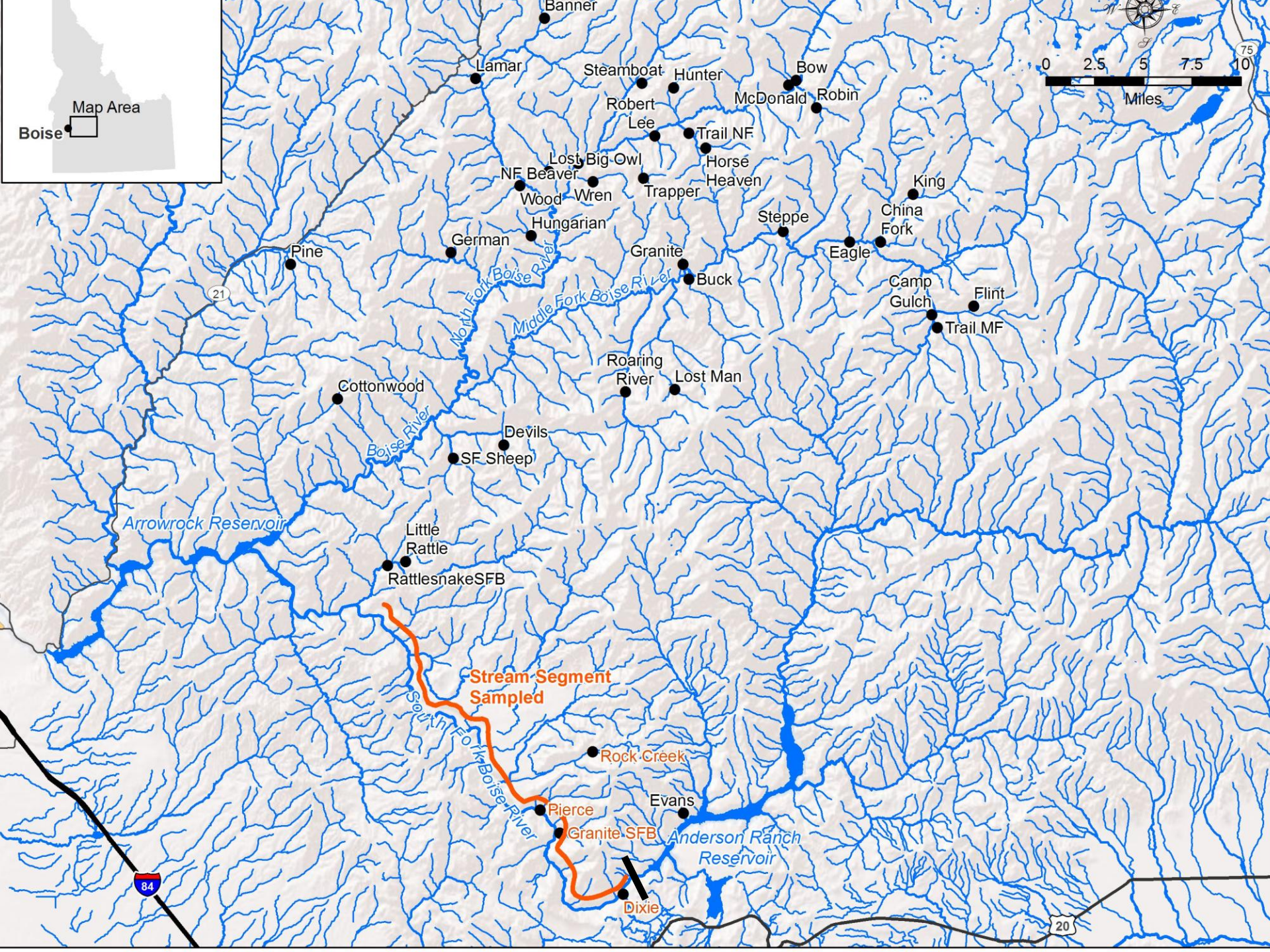
Recent telemetry work on bull trout showed many fish moved from NFBR into Arrowrock Reservoir and on to over-winter



Tracking fish to get movement data is difficult - here involved \$\$\$, weirs, fixed telemetry receiving stations, and flights and driving every week for months

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- A photograph of researchers in a field setting. One person is wearing a wide-brimmed hat and a red shirt, another is wearing a tan shirt. They are surrounded by field equipment including a yellow cooler, a wooden crate, and various papers and tools on the ground. The background shows dry, scrubby vegetation.
- Genetic data comparably easy and inexpensive
 - 100's to 1000's of individuals across large spatial scales (this study >1500 individuals)
 - New analyses allow us to 'assign' individuals to population of origin, can = movement

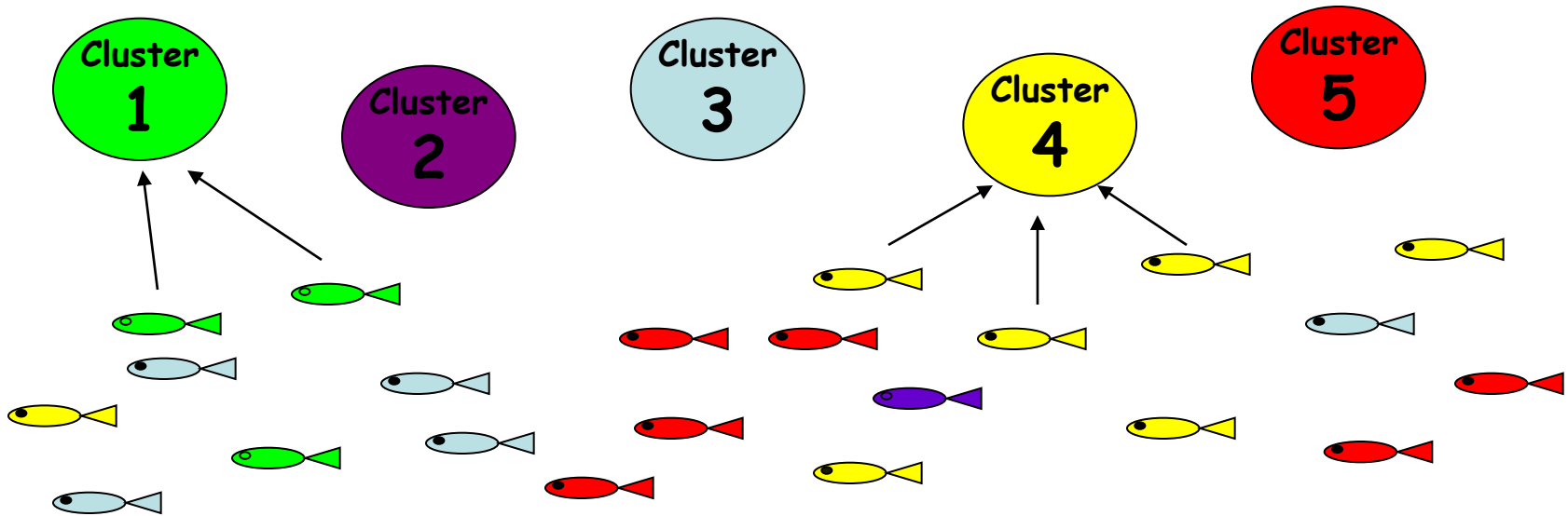




Genetic diversity (or "health")

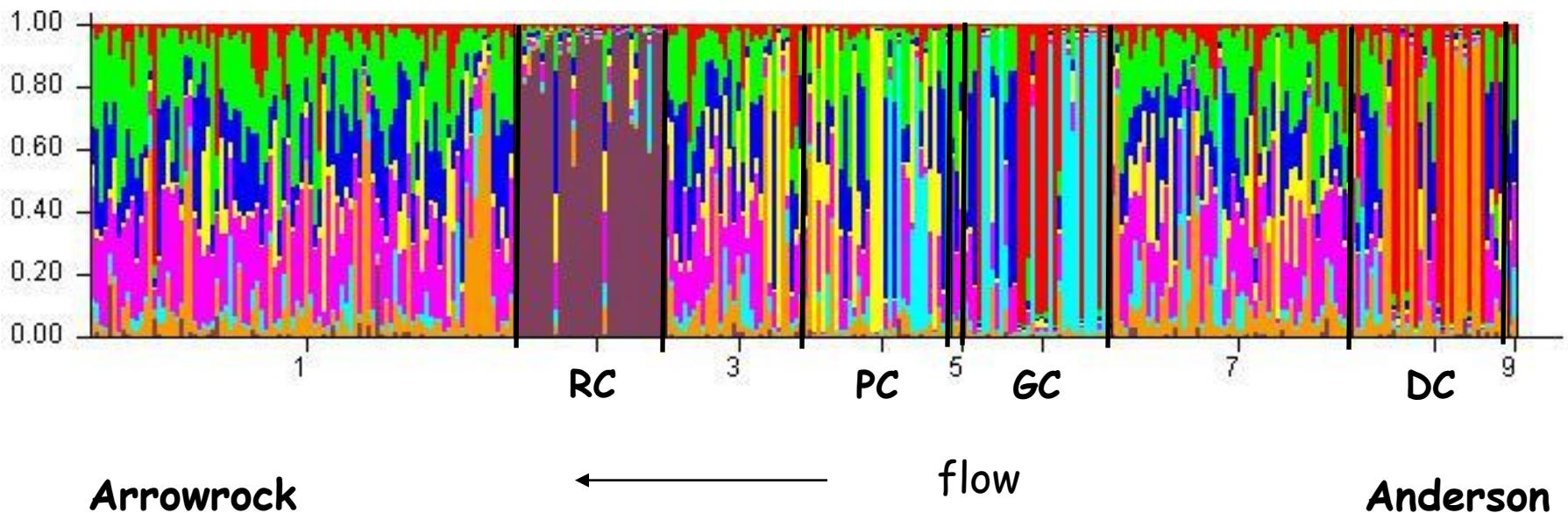
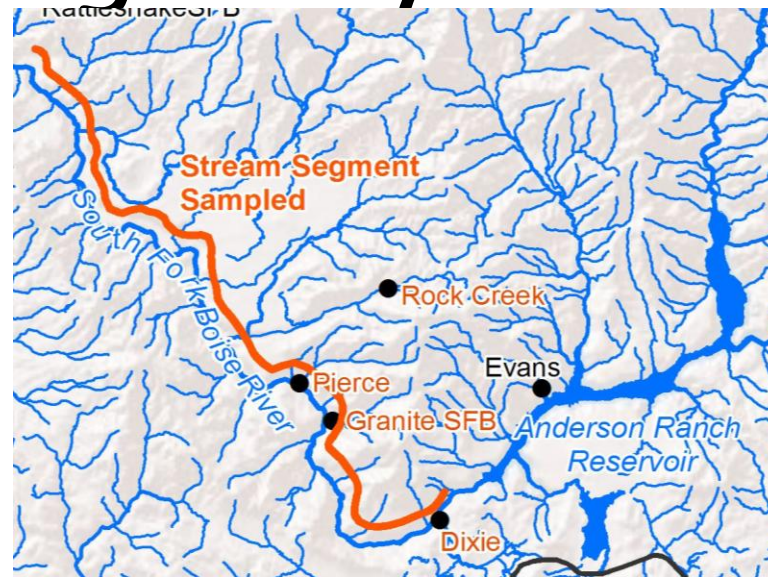
- Overall levels of diversity (heterozygosity; H_E) normal, 'healthy':
 - SFBR was 0.76
 - Three tributaries ranging from 0.72-0.75
- H_E for 55 headwater populations in Boise and Payette Rivers 0.45-0.84

Individual clustering and assignment



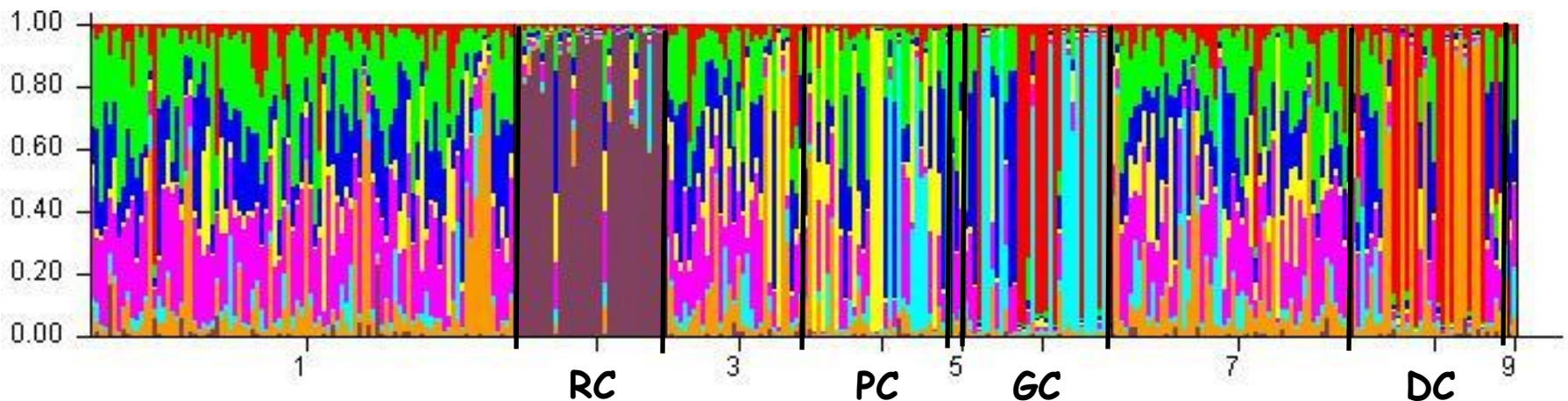
- Defines 'clusters' based on theoretical expectations
- Probability of origin for each individual in each cluster
- Assigns individual to cluster with highest probability
- Under certain scenarios, indicates movement

Clustering analysis for SFBR



Clustering analysis for SFBR

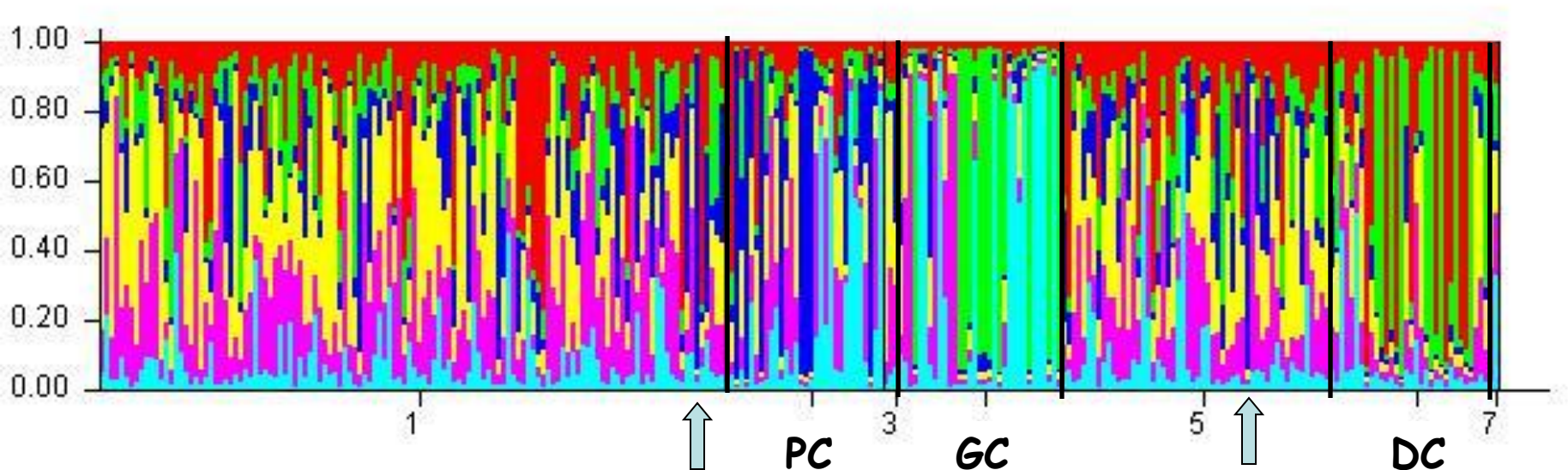
Rock Creek structure due to RBT/CT
hybrids! (32/34 individuals)
Also 1 hybrid in Pierce, 3 in Dixie



Arrowrock

Anderson

SFB - no hybrids



- Suggests some genetic autonomy of creeks, particularly Granite and Dixie - likely spawning/rearing areas
- Limited interchange between Pierce and Granite, and a little more between Granite and Dixie
- Also *some* evidence of mainstem individuals assigning to tribes



SFB

Pierce

SFB

Granite

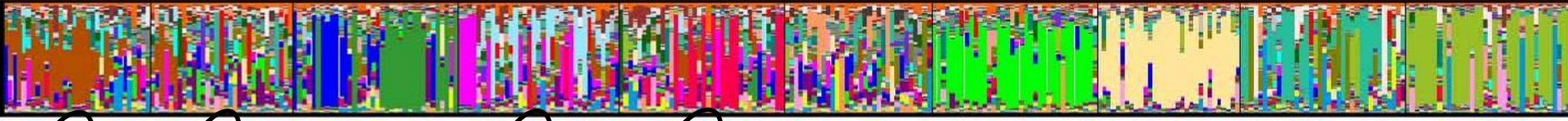
SFB

Dixie

SFB

Lost *

Lost Man *



Little Rattle

Big Owl

Wren

Cottonwood

SF Sheep

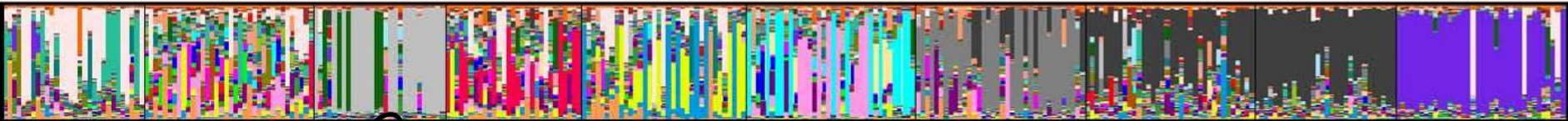
Trail

NF Beaver

Trapper *

Trail

Steppe *



Flint

Buck

Evans

Devils

King

Bow

Robin

German

Eagle *

Hunter *



Pine

Wood

China Fork

Steamboat

Banner

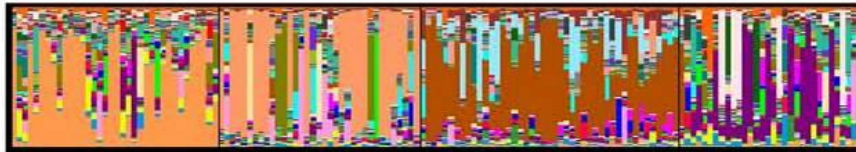
Granite *

Lamar

Robert Lee

Camp Gulch

Horse Heaven

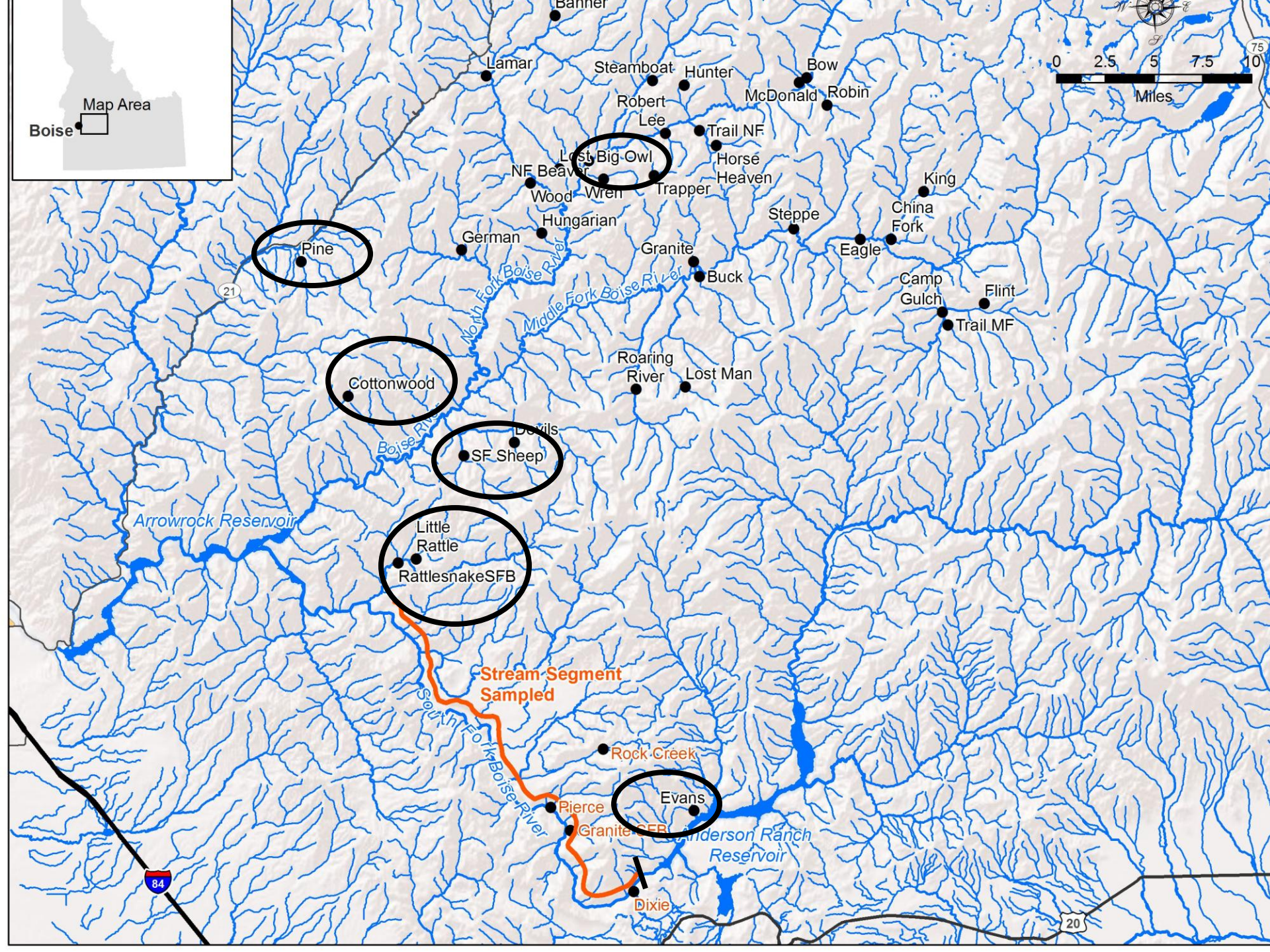


Roaring River *

McDonald

Rattlesnake

Hungarian *



Limitations

- This type of analysis gives snapshot picture:
 - Sampled in summer, may find different patterns at other times
 - Many areas/tributaries not sampled, and reservoir not sampled
 - Some historical legacy (e.g., Evans Creek)

What we can conclude for SFBR:

- Rock creek full of RBT/CT hybrids - important for barrier removal project
- SFBR tribs do seem to be spawning tribs
- Not strong assignments but definitely evidence of interchange between mainstem river and several other tribs - particularly Cottonwood, Rattlesnake and Little Rattlesnake - and even more distant tribs
- *SFBR needs to be viewed as part of a larger system*