

# Evaluate Bull Trout Migration Between the Tucannon River and the Mainstem Snake River Using Streamwidth Passive Integrated Transponder Tag Interrogation Systems



Photo by Karl Geist

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# Introduction



Migratory component that may utilize Snake River for adult rearing.

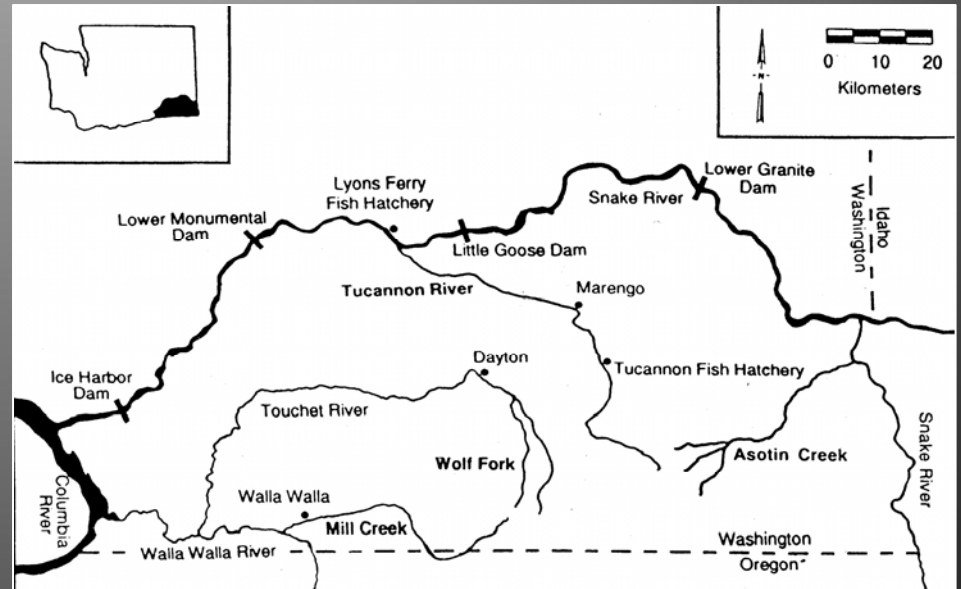
- Radio Telemetry and PIT tag research
- Underwood et al. 1995; Faler et al. 2008; Bretz 2008



Incidental observations at Lower Snake River dams

- BiOp requires investigation into use of Snake River by bull trout
- USFWS. 2000 Biological Opinion; Anglea et al. 2004

# Study Area



# Streamwidth Antenna Arrays



## Lower Tucannon River (A0)

- (3) 25x4 ft pass-through antennas
- FS1001M transceiver
- Thermoelectric generator
- 1 pass through offline since May, 2008



## Lower Tucannon River (C0)

- 1 log antenna
- FS1001M transceiver
- Thermoelectric generator
- Offline since May, 2008

# Objectives

Determine if bull trout migrate between the Tucannon River and the mainstem Snake River.

- Determine the relative proportion of the Tucannon River bull trout population that travels into the mainstem Snake River.
- Determine the migration timing of bull trout traveling between the Tucannon River and the mainstem Snake River.
- Determine the usage of Snake River dam adult and juvenile fish facilities by bull trout originating from the Tucannon River.

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# Sample Methods



## Tucannon Fish Hatchery Weir

- Adults
- May through July
- ~ 210



## Electrofishing

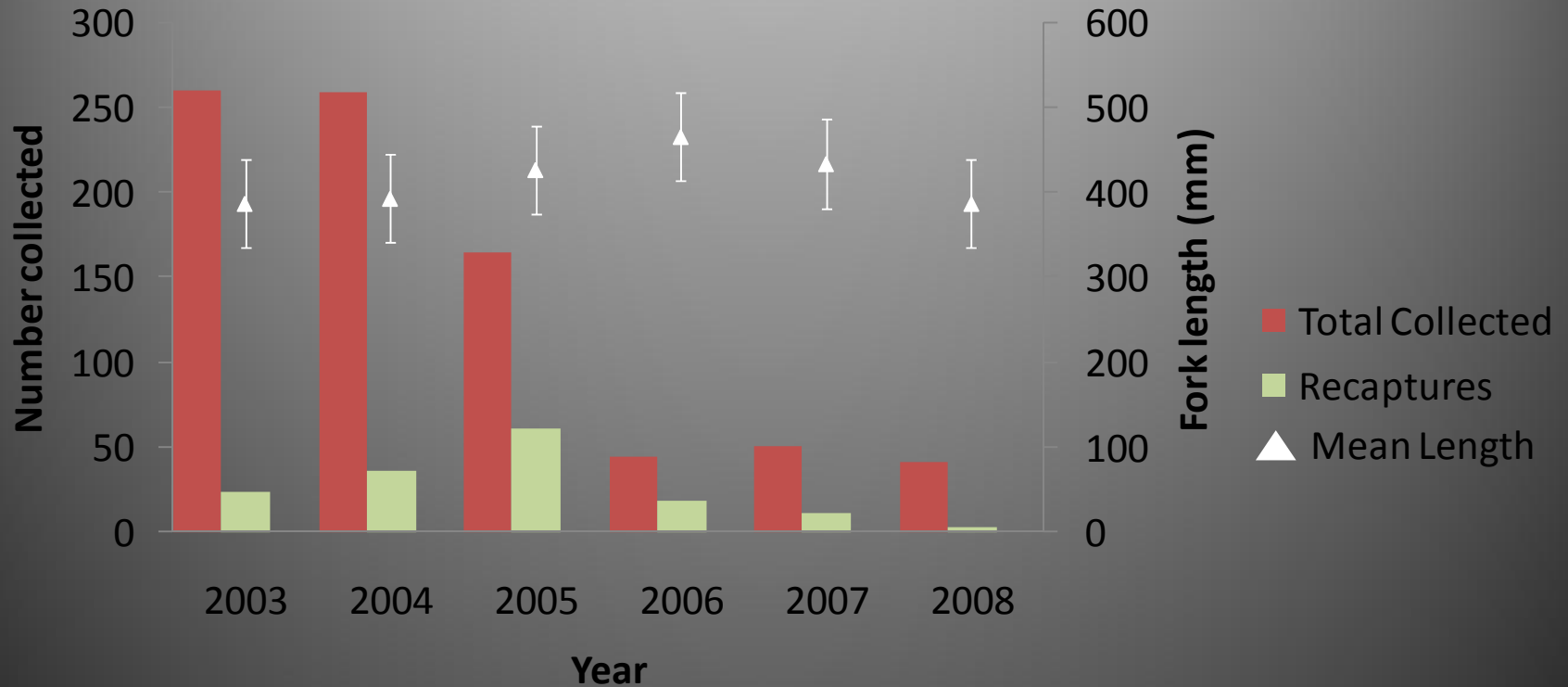
- Juveniles
- July
- ~ 700
- No sampling in 2008



## Angling

- Outmigrants
- October through January
- ~ 54

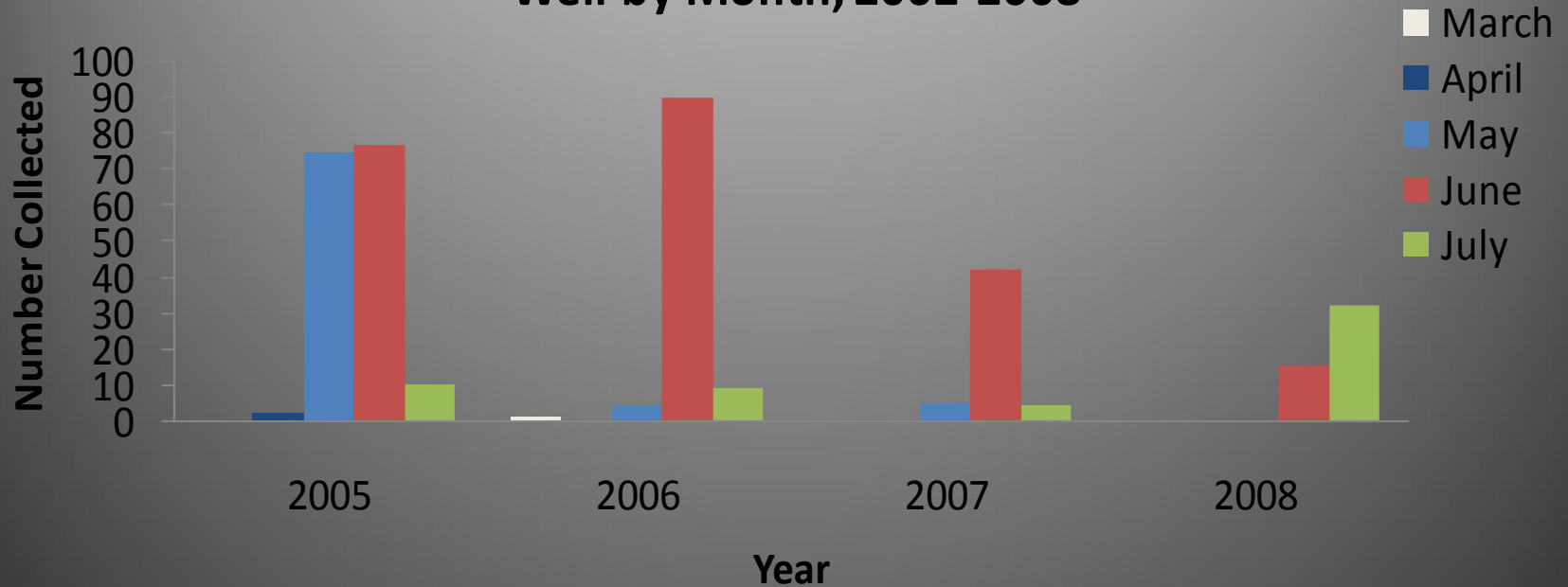
## Number and Mean Length of Bull Trout Captured at the Tucannon Fish Hatchery Weir



Number of adults returning to the Tucannon Fish Hatchery weir has crashed since 2004.

Population status listed as “healthy” by WDFW.

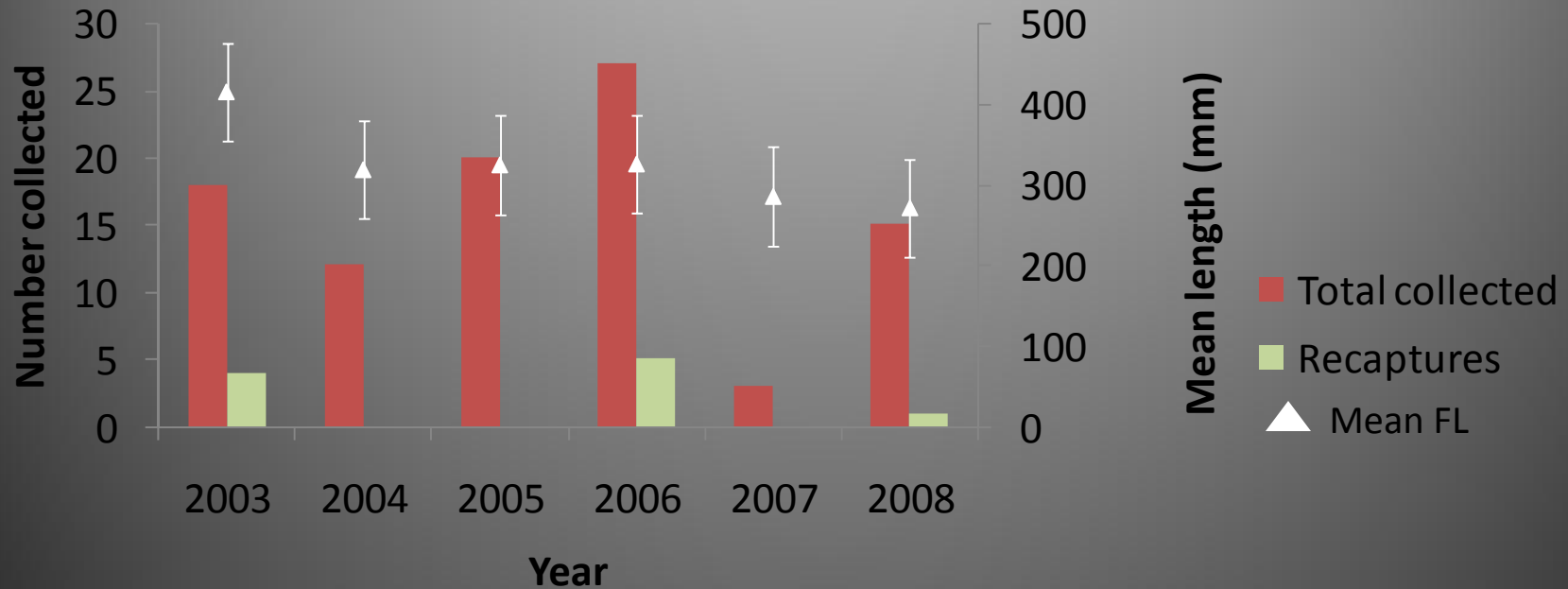
## Number of Bull Trout Collected at the Tucannon Fish Hatchery Weir by Month, 2002-2008



Between 2005-2007, 66% of adult returns to the Tucannon Fish Hatchery weir occurred in June.

In 2008, 68% of adult returns to the Tucannon Fish Hatchery weir occurred in July.

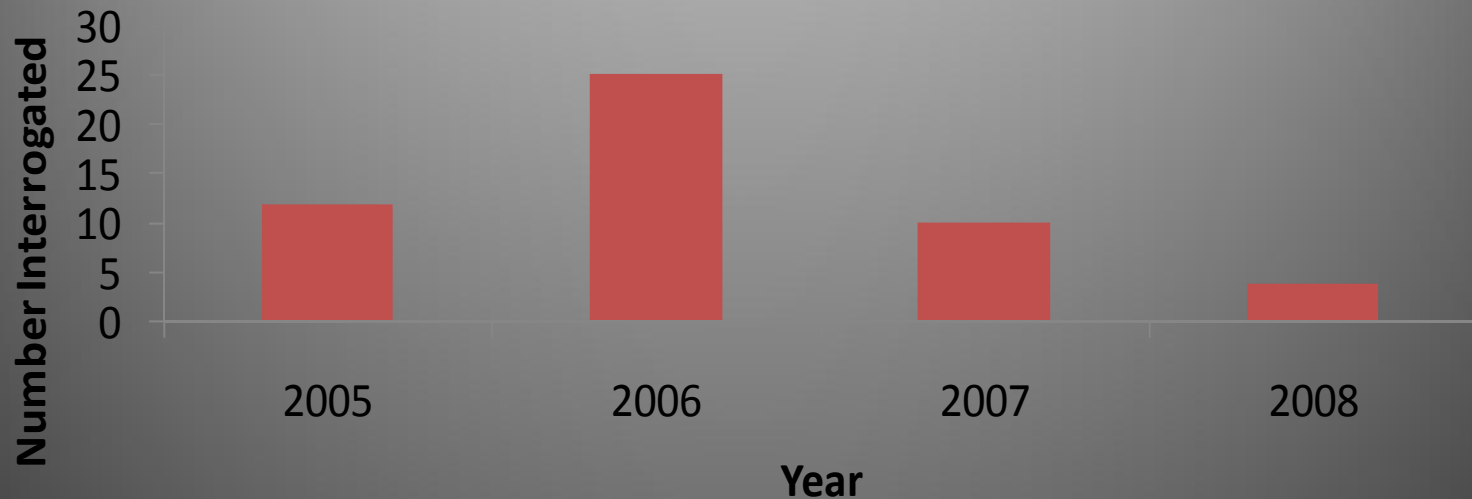
## Number and Mean Length of Bull Trout Collected by Angling



Mean length of outmigrant bull trout is 100 to 150 mm less than returning adults.

Possibly a result of spawning mortality.

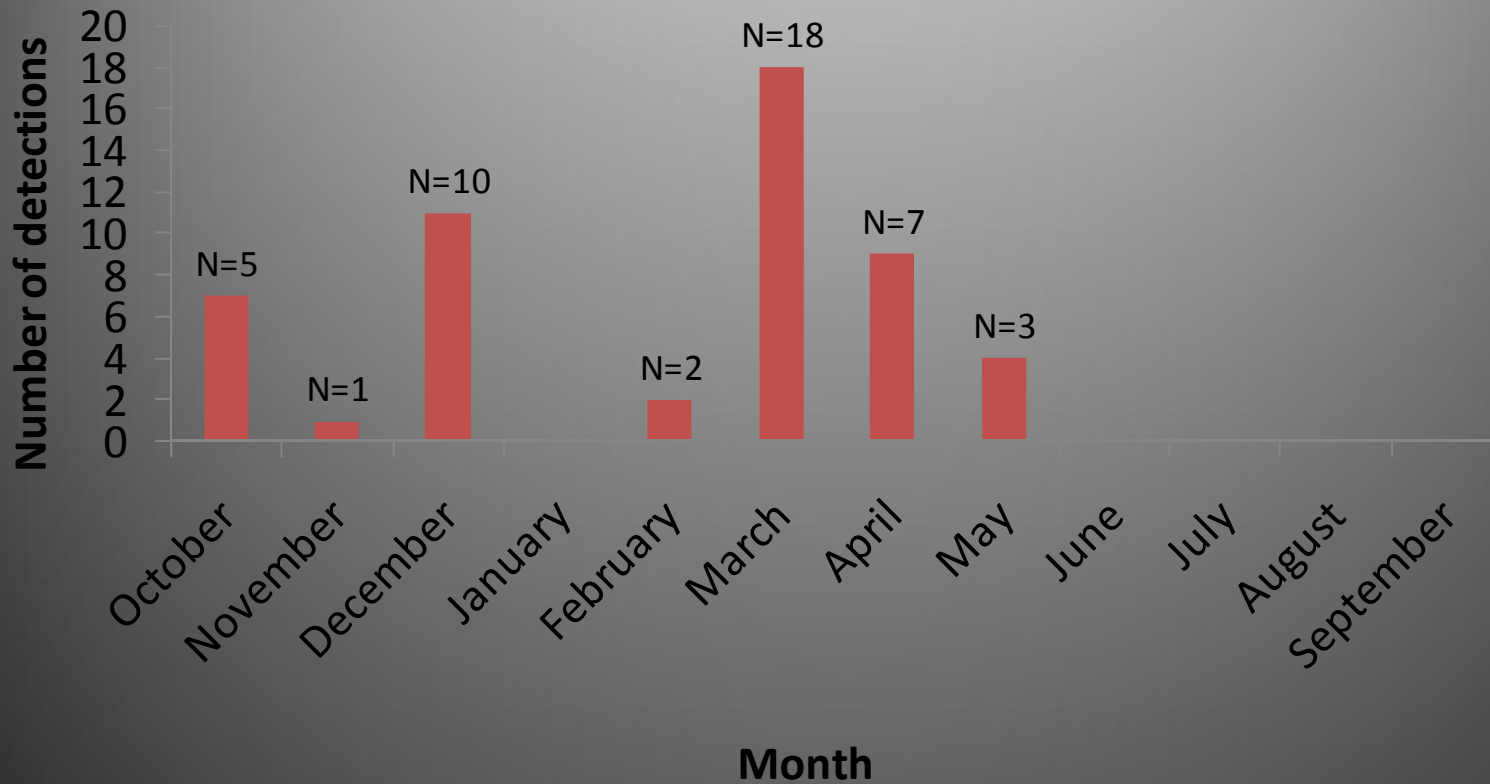
## Number of Unique Bull Trout Interrogations at Antenna Arrays By Year, 2005-2008



Interrogations in 2008 may change due to increased active migration in December.

Low numbers of interrogations may be a result of reduced adult returns.

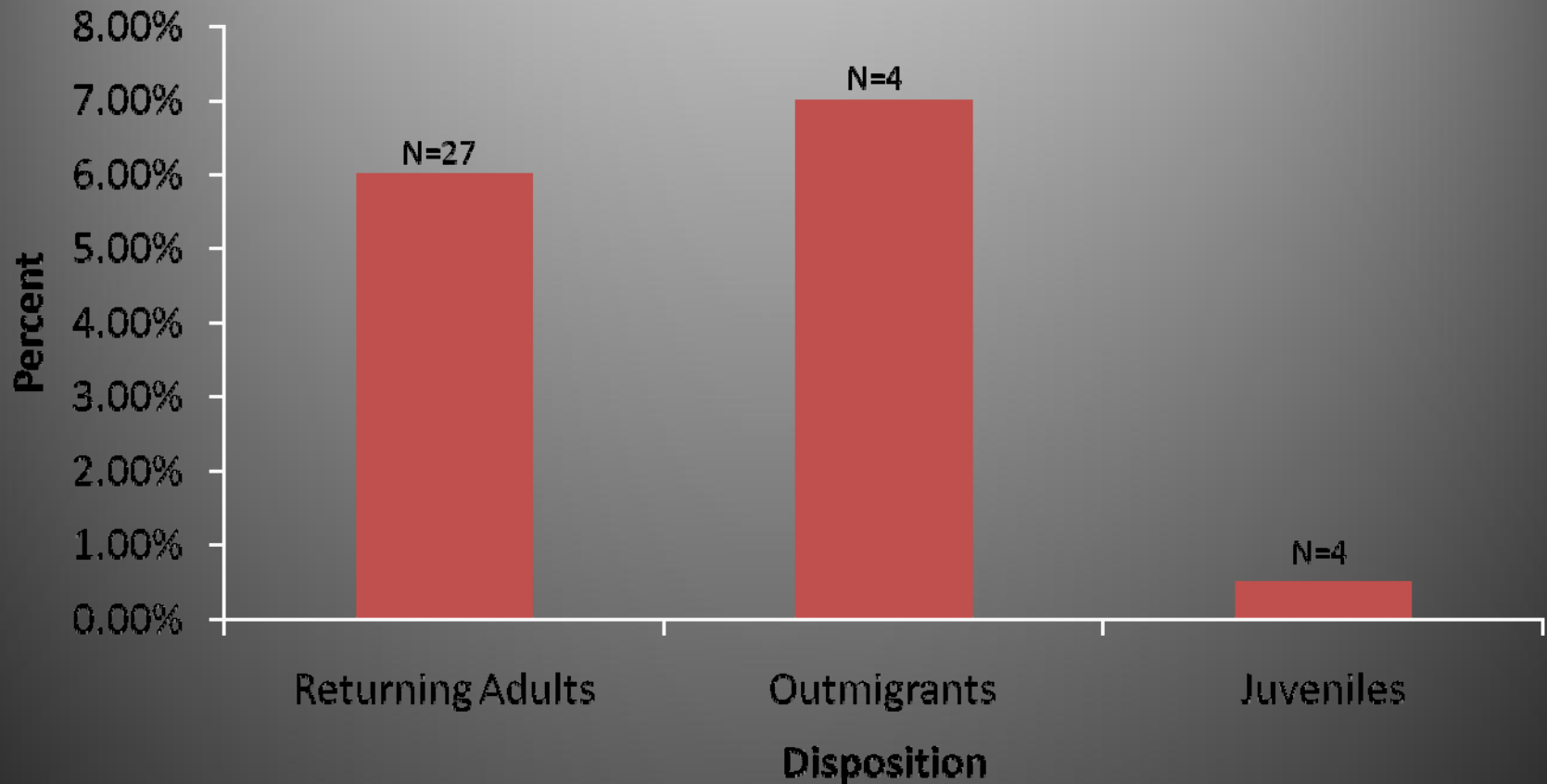
## Number of Bull Trout Detections by Month, 2005-2008



Detections include bull trout that have been interrogated multiple times.

Active migration occurs October through December and February through May.

## Percent Interrogation by Disposition, 2005-2008



Returning adults and outmigrants have similar rates of interrogation.

## Tucannon River

October, 2005  
Radio-tagged

April, 2006  
Starbuck Bridge

July, 2006  
Upstream of  
TFH weir

June, 2007  
TFH weir

December, 2005  
Interrogated  
@ LTR

March, 2006  
Little Goose  
tailrace

October, 2006  
Interrogated @  
LTR

April, 2007  
Interrogated @  
LTR

## Snake River

This individual made multiple migrations into the mainstem Snake River.

Remained in the mainstem Snake River for approximately 6 months.

## Tucannon River

June, 2005  
TFH Weir

June, 2006  
TFH Weir

June, 2007  
TFH weir

December, 2005  
Interrogated  
@ LTR

March, 2006  
Interrogated  
@ LTR

May, 2006  
Interrogated  
@ LTR

October,  
2006  
Interrogated  
@ LTR

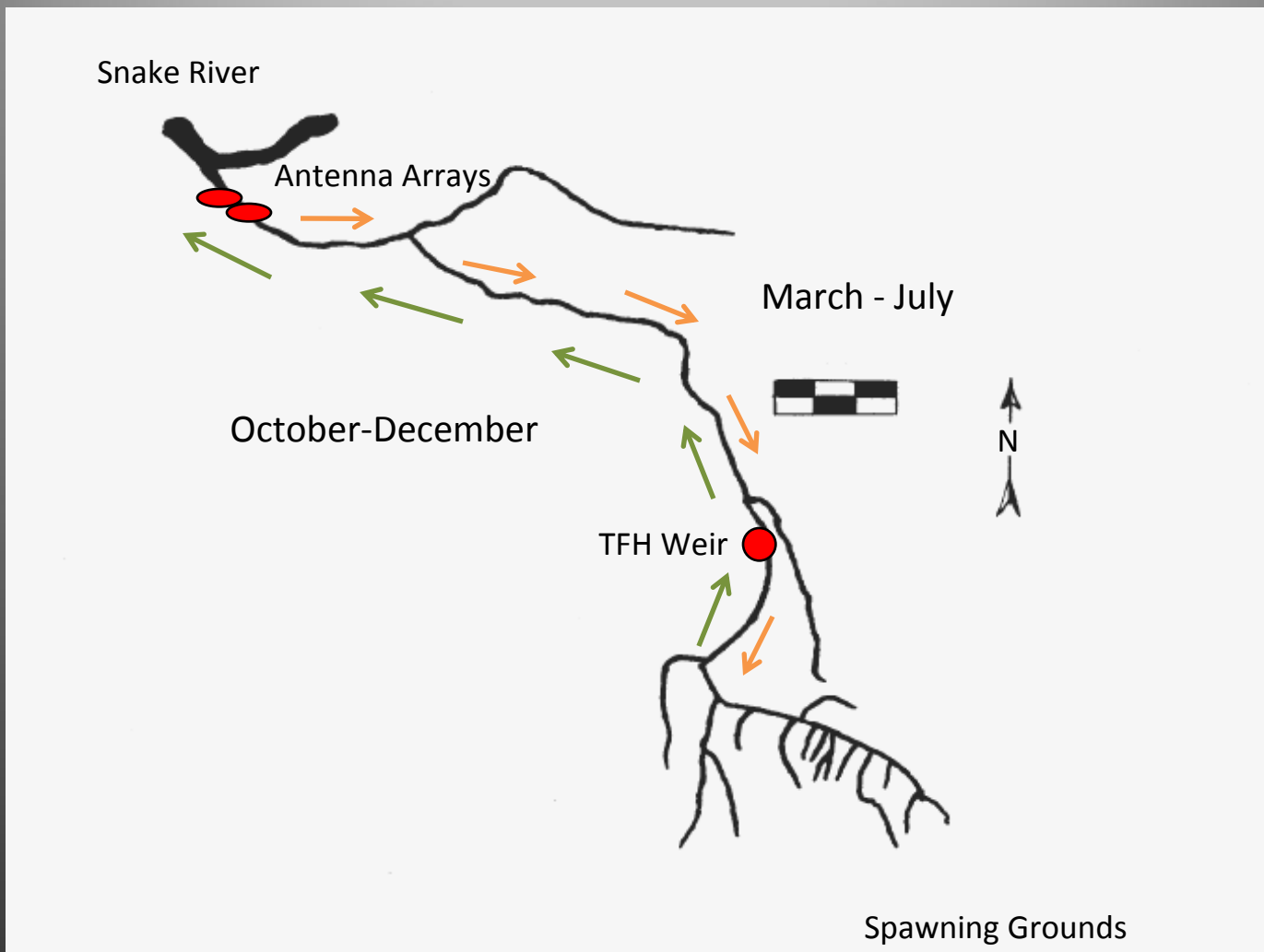
March, 2007  
Interrogated @  
LTR

April, 2008  
Interrogated @  
LTR

Snake River

This individual made multiple migrations into the mainstem Snake River.

Remained in the mainstem Snake River for approximately 5 months.



Migratory route of bull trout originating from the Tucannon River.

# Objectives

Determine if bull trout migrate between the Tucannon River and the mainstem Snake River.

- Unique bull trout detections within lower Tucannon River/Lake Herbert G. West interface (n=35).
- Successive migrations between the Tucannon River and the mainstem Snake River (n=5).
- Confirmation of bull trout in the mainstem Snake River using radio telemetry (n=3).

# Objectives

Determine the migration timing of bull trout traveling between the Tucannon River and the mainstem Snake River.

- Active migration occurs from October through December (n=18) and March through May (n=16). February is a “blackbox” (n=3).

# Objectives

Determine the relative proportion of the Tucannon River bull trout population that travels into the mainstem Snake River.

- Within a single migratory year (2005/2006), 25% to 29% of PIT-tagged bull trout migrated into the mainstem Snake River.
- In migratory year (2006/2007), 18% of PIT-tagged bull trout migrated into the mainstem Snake River.
- Estimates are subject to variability due to unknown estimates of juvenile and post-spawn mortality and variability in detection efficiencies.

# Objectives

Determine the usage of Snake River dam fishways by bull trout originating from the Tucannon River.

- No bull trout originating from the Tucannon River has been detected within Snake River dam fishways.
- Tucannon River bull trout was detected in the Little Goose Dam tailrace.
- Bull trout (origin unknown) collected and PIT-tagged at the Little Goose Dam juvenile facility was detected within the Lower Granite Dam adult ladder.

# Acknowledgements

US Army Corp of Engineers: Walla Walla District

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Tucannon River Fish Hatchery

US Fish and Wildlife Service: Idaho Fishery Resource  
Office