

# Coastal cutthroat trout in the Lower Columbia River: migration and residency in two tributaries

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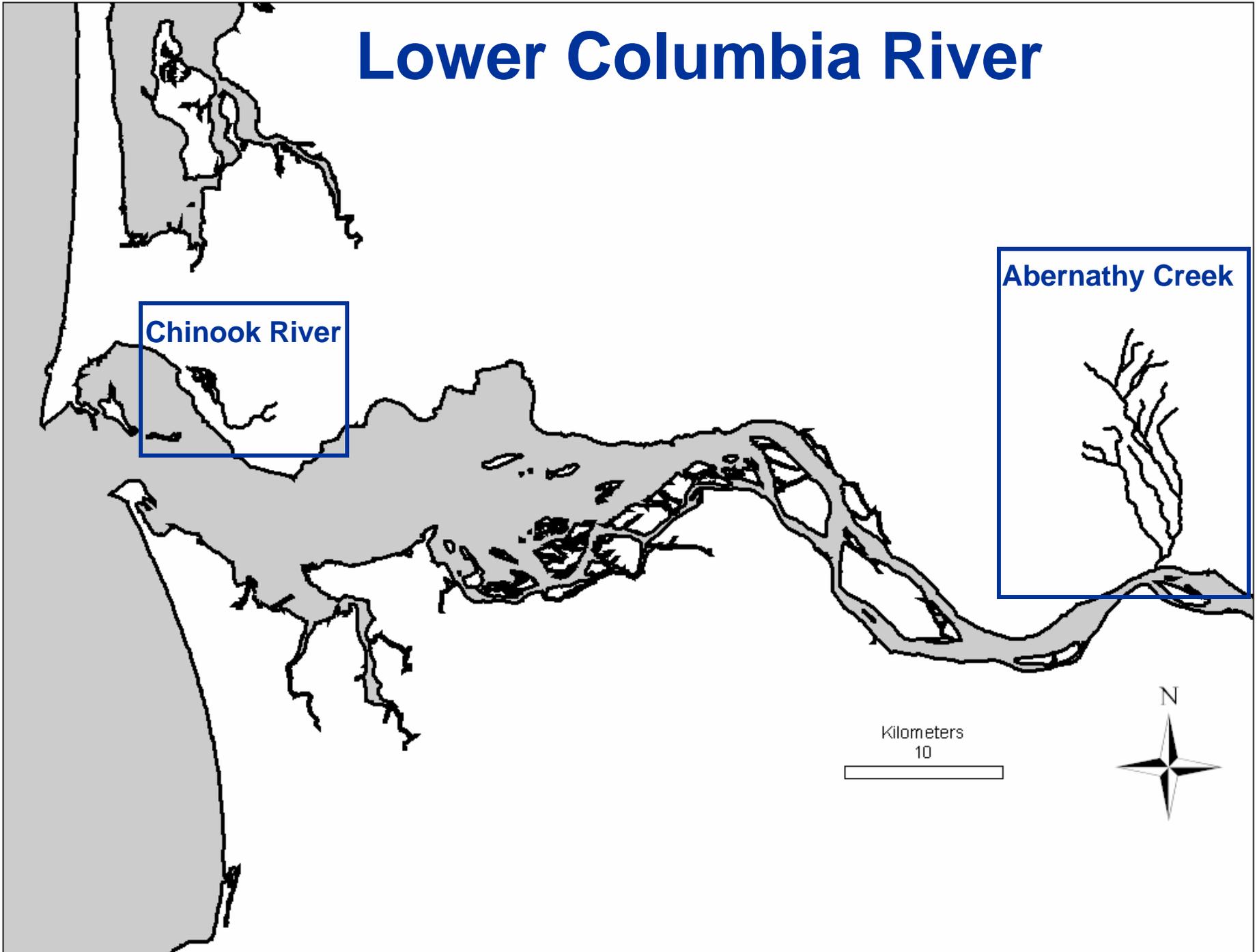
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# Objective



- Describe tributary use and migration timing using PIT tag technology
  - Describe of migrant and resident behaviors
  - Compare migrant and resident growth

# Lower Columbia River



Chinook River

Abernathy Creek

Kilometers  
10



# Collection and Tagging



# Migration detection



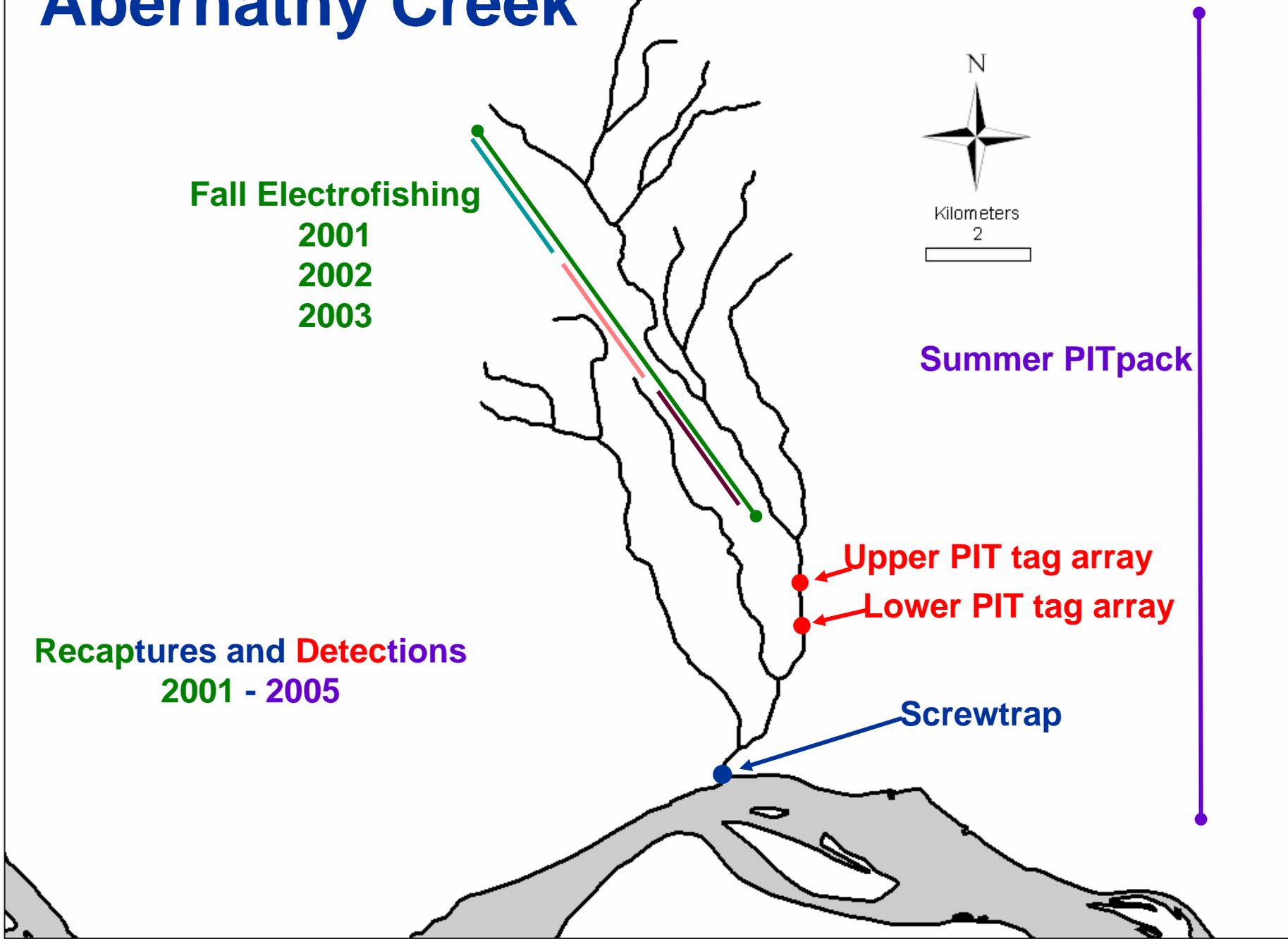
# Migration/Recapture



# Recapturing Electrofishing/PITpacking



# Abernathy Creek



Fall Electrofishing  
2001  
2002  
2003



Summer PITpack

Upper PIT tag array

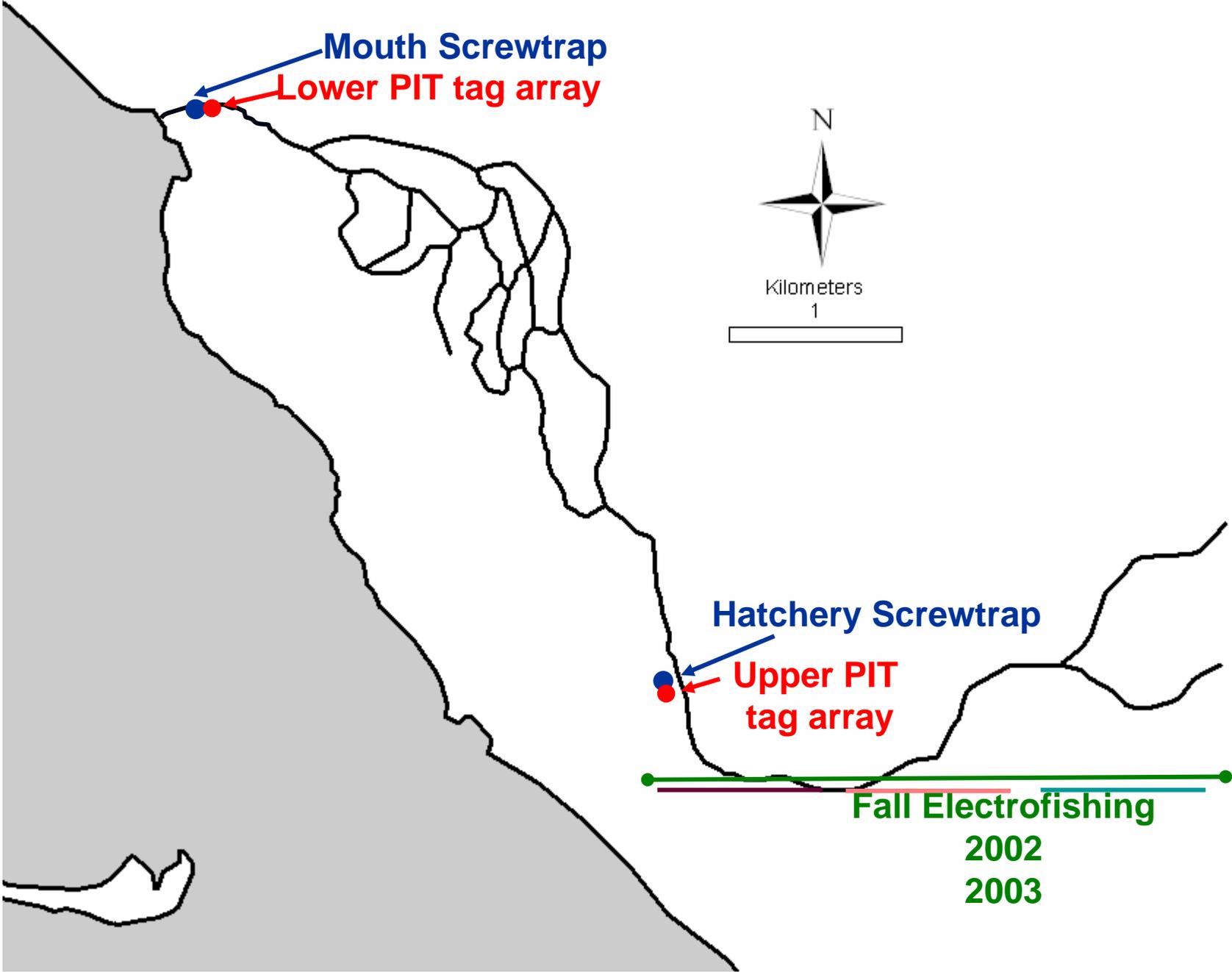
Lower PIT tag array

Screwtrap

Recaptures and Detections  
2001 - 2005

# Chinook River

Recaptures and Detections  
2003 - 2005



# Classifying migrants and residents

## ■ Migrants:

- detected at array
  - Note: those detected within 30 d of tagging and not observed again = unknown (particularly Chinook River)
- captured in screwtrap

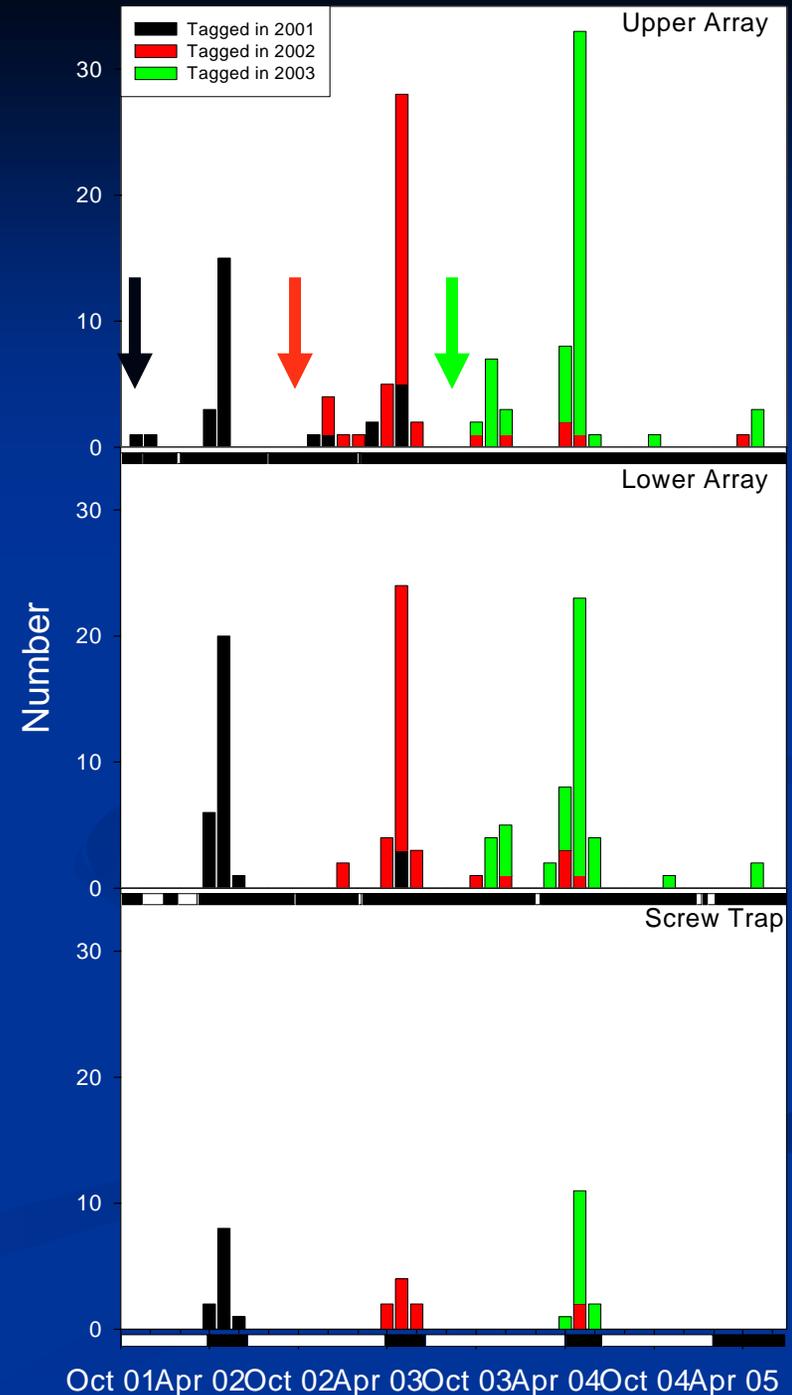
## ■ Residents:

- recaptured electrofishing
- detected with PITpack

# Abernathy Creek

## Migrants

123 detections at Upper array  
110 detections at Lower array  
33 recaptures at Screw Trap



# Chinook River

## Residents:

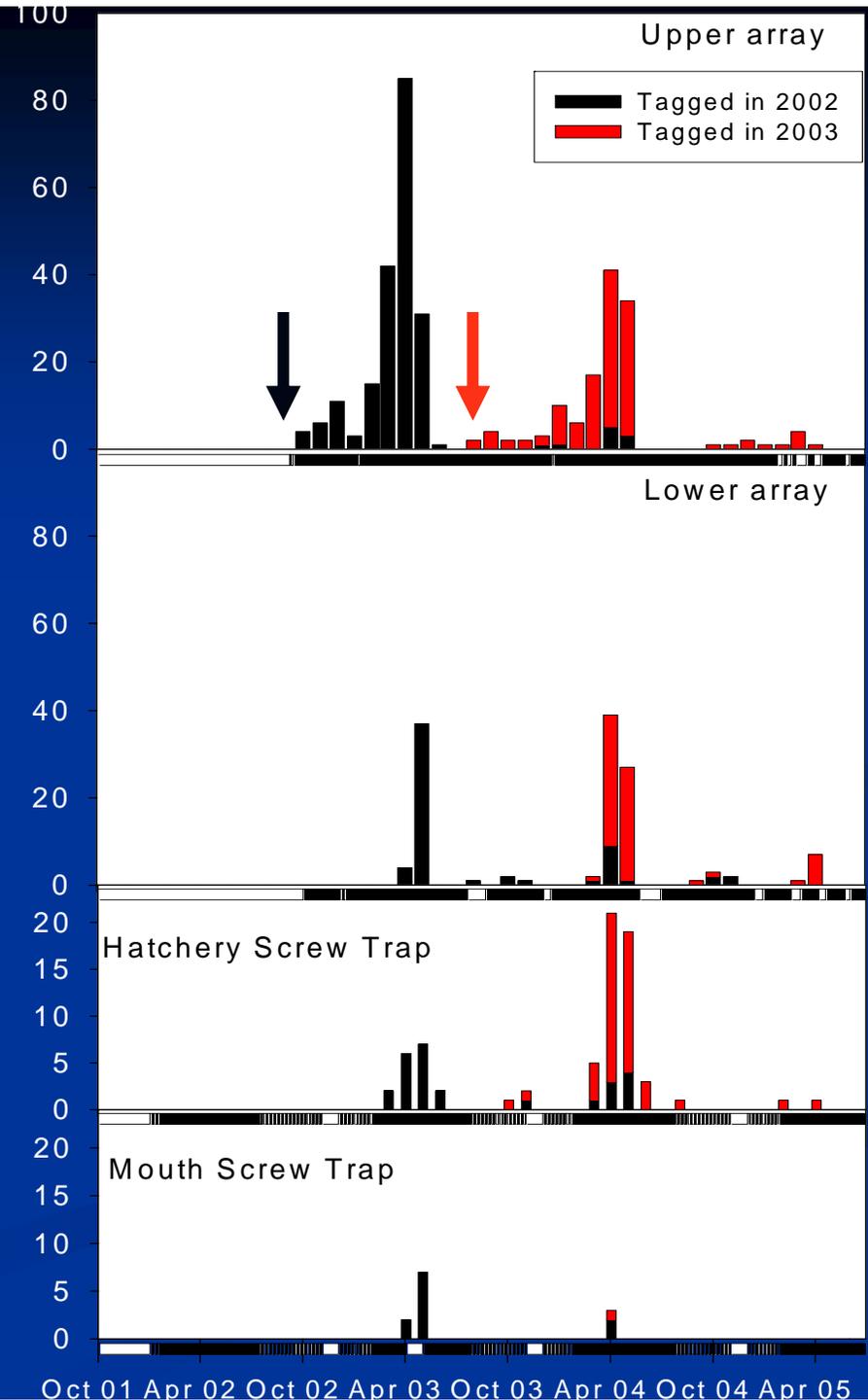
39 Electrofishing recaps

## Migrants

343 detections at Upper array

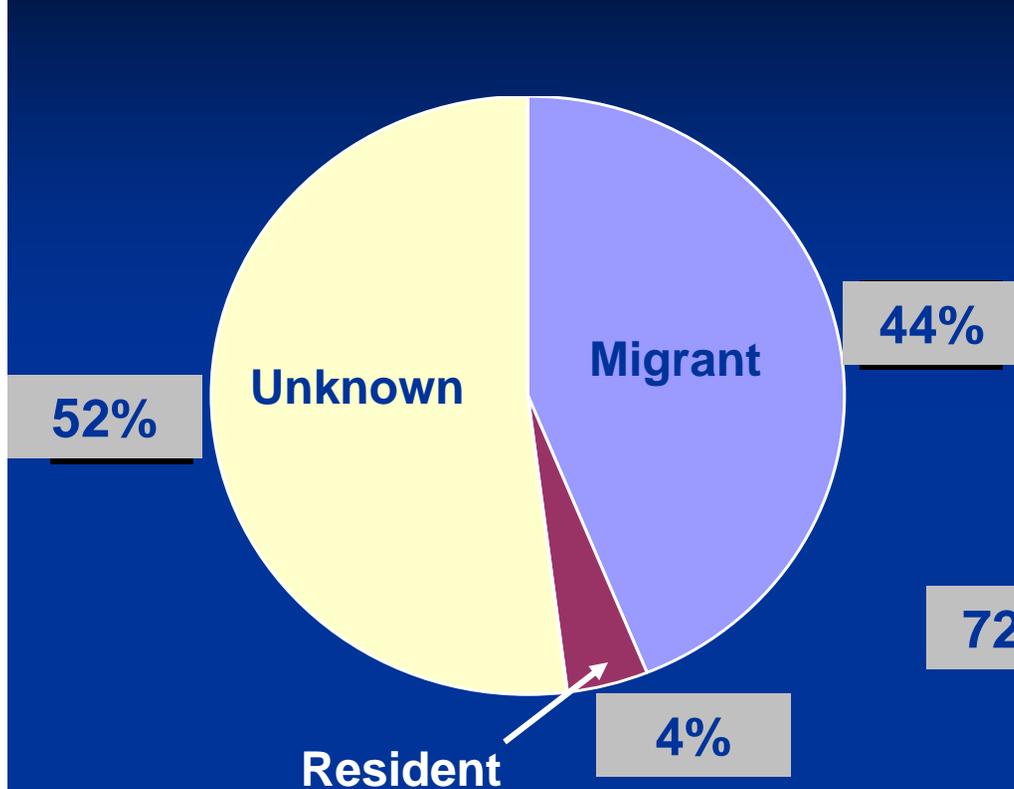
132 detections at Lower array

83 recaptures at Screw Traps

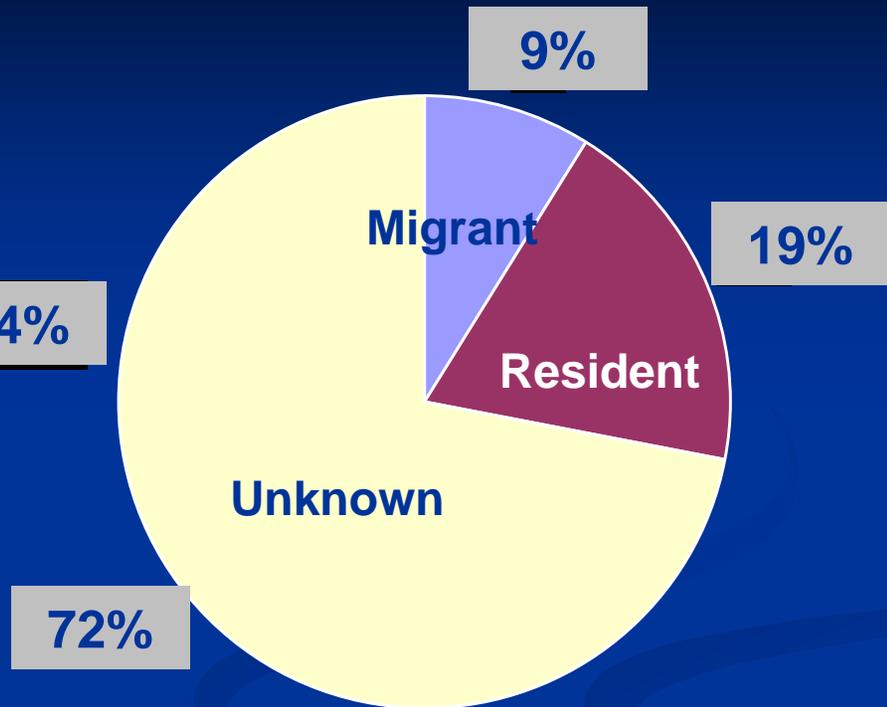


# Chinook

# Abernathy



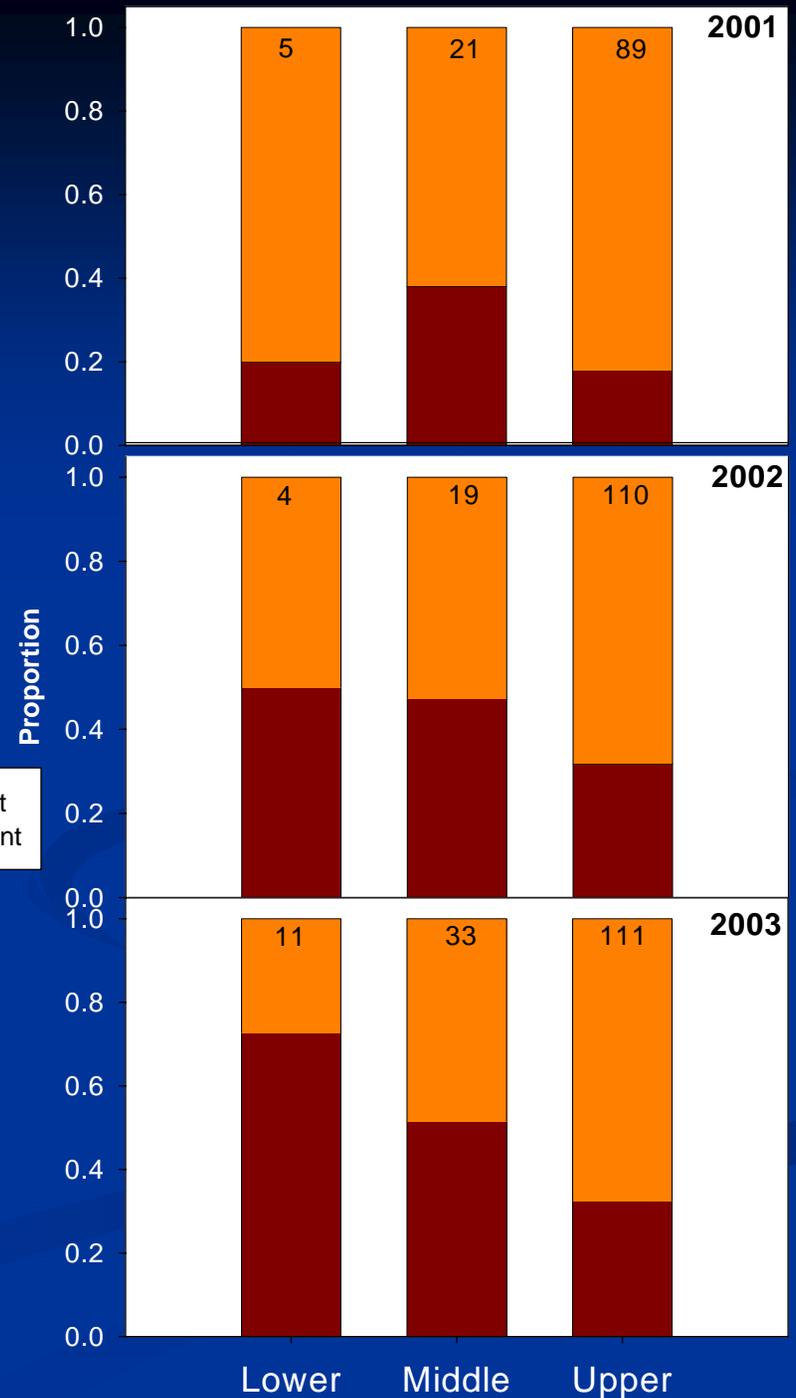
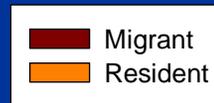
Number tagged  
754  
Fall 2002: 444  
2003: 310



Number tagged  
1,496  
Fall 2001: 469  
2002: 494  
2003: 533

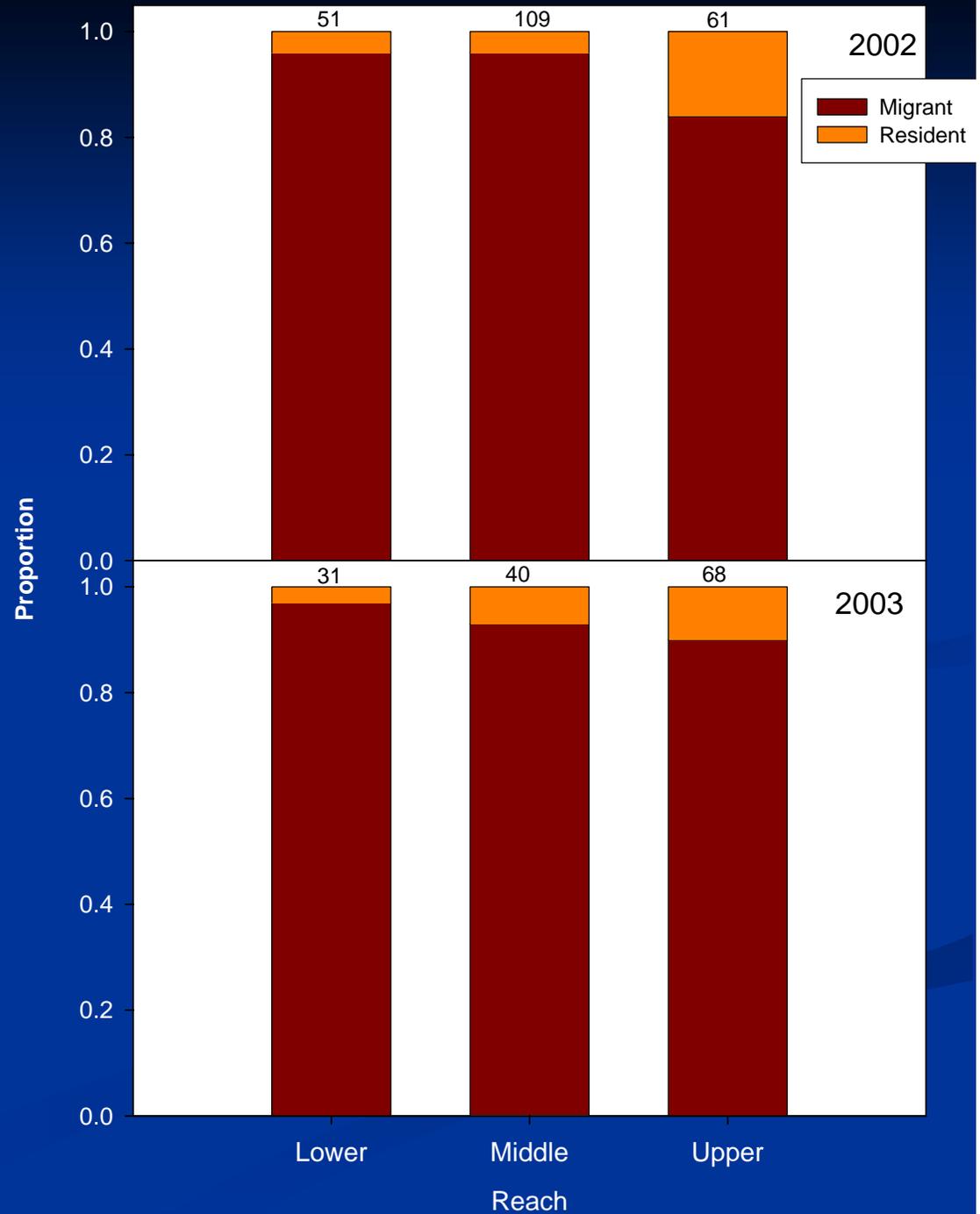
# Abernathy Creek:

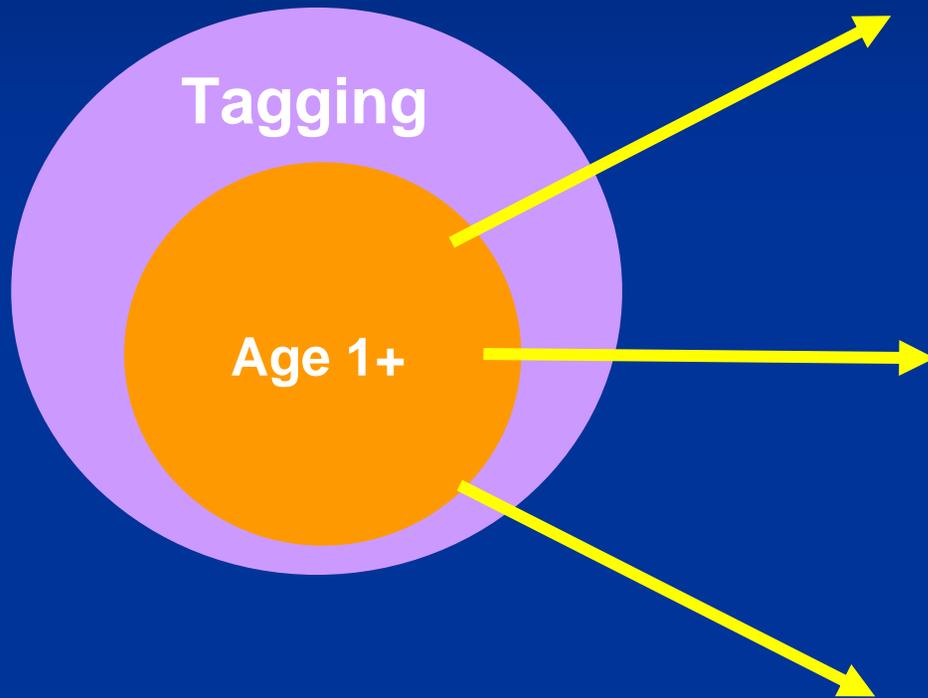
Higher proportion of residents observed upstream



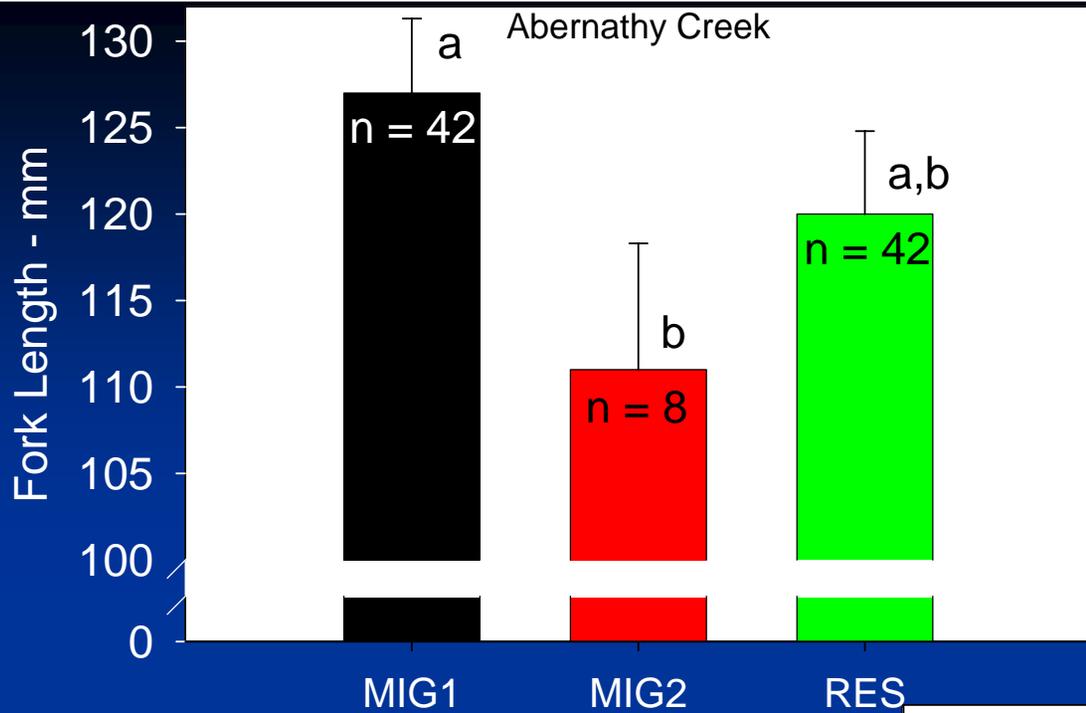
# Chinook River:

Higher proportion of residents observed upstream

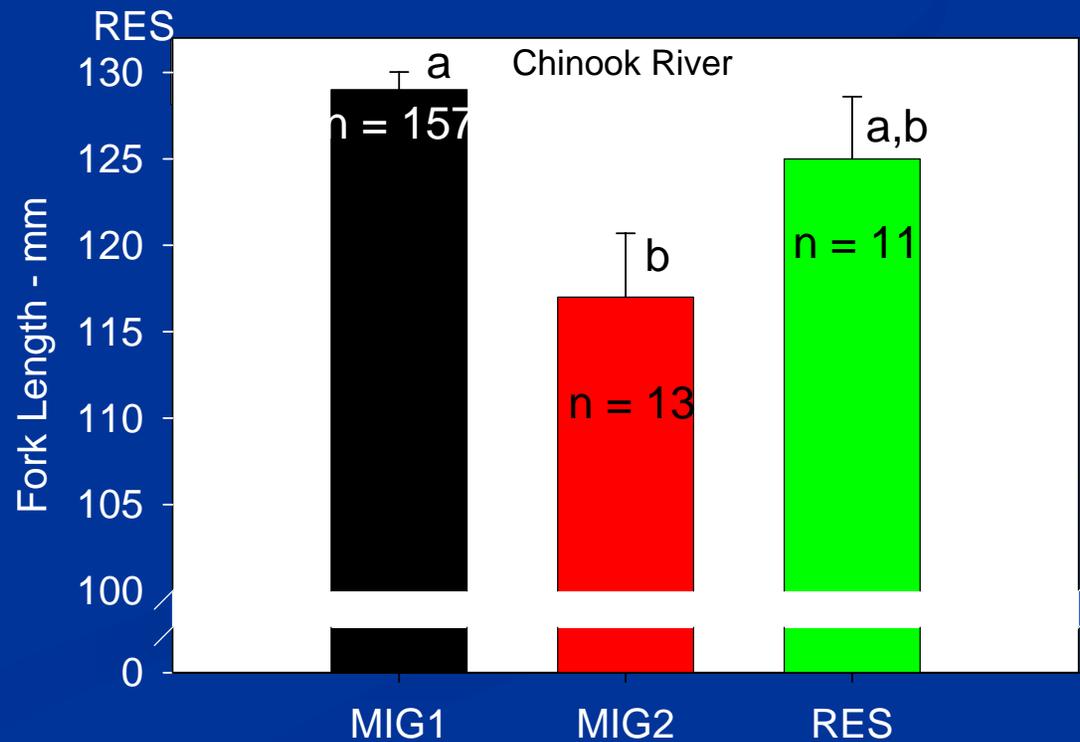




- Resident
  - E-fishing
  - PIT pack
  
- Migrant (1 or 2 years later)
  - PIT antenna
  - Screw trap
  
- No observations



# Retro-Analysis: Length at age-1



# Abernathy - Migrant and Resident Growth Rates - Weight

- Classifying age 1 Migrants by year of movement
  - **MIG1:  $0.335 \pm 0.034$  (n = 7)\***
  - MIG2:  $0.262 \pm 0.065$  (n = 2)
  - RES:  $0.222 \pm 0.014$  (n = 45)

# CHINOOK - Migrant and Resident Growth Rates - Weight

- Classifying Migrants by year of movement
  - **MIG1:  $0.447 \pm 0.020$  (n = 35)\***
  - MIG2:  $0.276 \pm 0.049$  (n = 14)
  - RES:  $0.339 \pm 0.041$  (n = 11)

# Summary



- Evidence of both residence and migratory life history strategies
- Proportion of residents increases in upper reaches
- Fish that will migrate at age 1+ are larger at tagging and have faster growth rates than those that will remain another year or remain as residents

# Acknowledgements

- US Army Corps of Engineers, Bonneville Power Administration
- USFWS CRFPO; John Brunzell, Jeff Hogle
- Washington Department of Fish and Wildlife; Pat Hanratty, Steve Wolthausen, Bryan Blazer
- Sea Resources; Robert Warren, Garth Gale
- USFWS Abernathy Behavioral Physiology Crew; Dee McClanahan, Christiane Winter, Megan Hill, Bill Gale, Ben Kennedy, Casey Jackson, Jim Gasvoda
- Landowner: Robert Davis

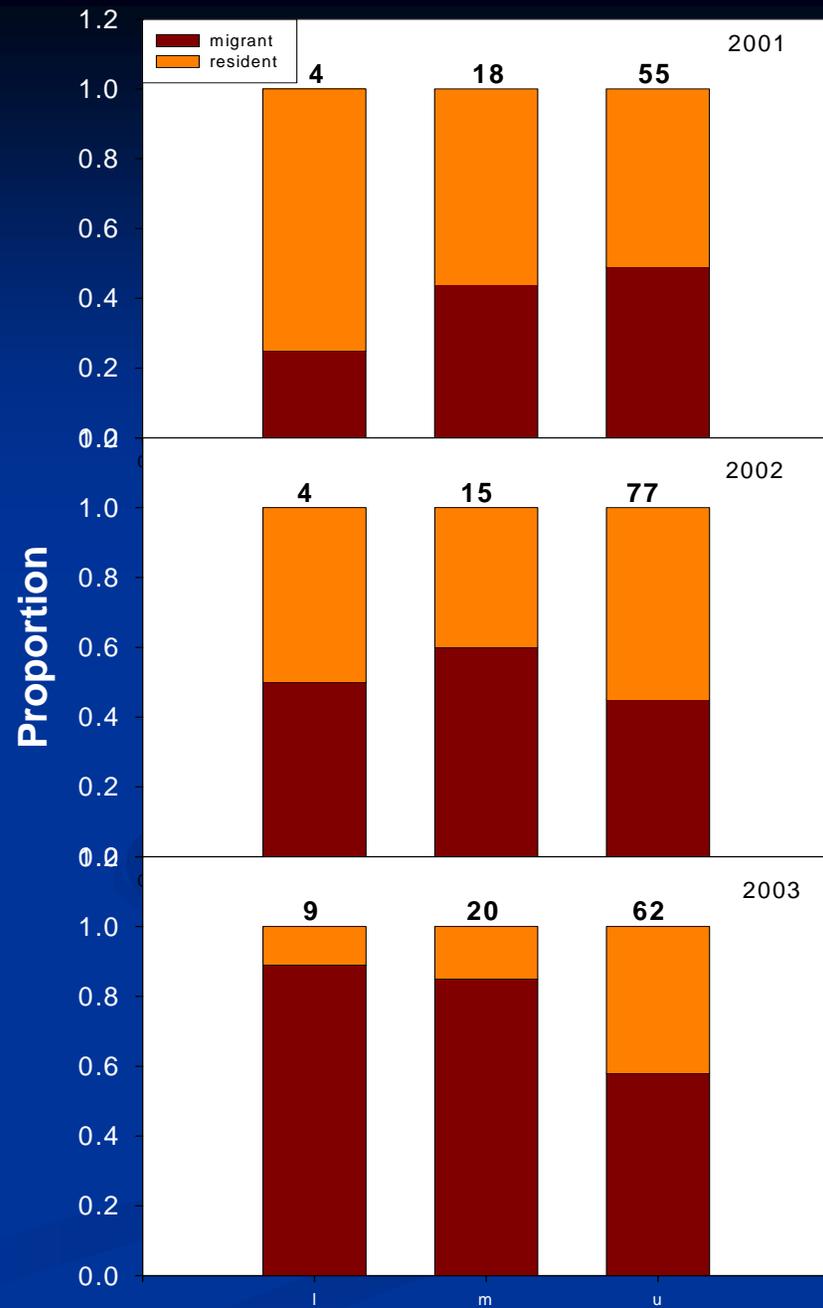
# The End



# Abernathy Creek *may want to use for discussion purposes*

Mover data  
Without PITpack:

10% migrants  
8% residents  
82% unknown

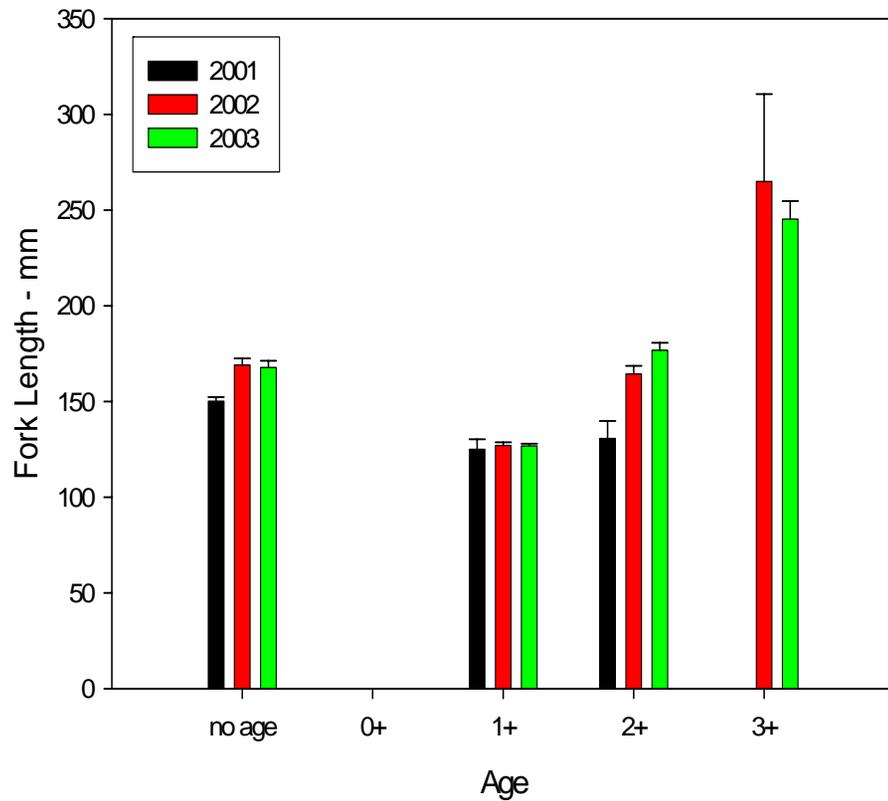


# Retro-Analysis: Length at age-1

| Tributary          | Fork Length<br>Median (25%, 75%)     | Fork Length<br>Median (25%, 75%)   | p                  |
|--------------------|--------------------------------------|------------------------------------|--------------------|
| Abernathy<br>Creek | <b>127 – MIG1</b><br>(±4.3) n = 42   | <b>111 – MIG2</b><br>(±7.3) n = 8  | <i>p &lt; 0.05</i> |
|                    | 127 – MIG1<br>(±4.3) n = 42          | 120 – RES<br>(±4.8) n = 42         | p > 0.05           |
|                    | 120 – RES<br>(±4.8) n = 42           | 111 – MIG2<br>(±7.3) n = 8         | p > 0.05           |
| Chinook<br>River   | <b>129 - MIG 1</b><br>(±1.0) n = 157 | <b>117 – MIG2</b><br>(±3.7) n = 13 | <i>p &lt; 0.05</i> |
|                    | 129 - MIG 1<br>(±1.0) n = 157        | 125 – RES<br>(±3.6) n = 11         | p > 0.05           |
|                    | 125 – RES<br>(±3.6) n = 11           | 117 – MIG2<br>(±3.7) n = 13        | p > 0.05           |

# Length at Age

## Abernathy Creek



## Chinook River

