

***Migration Patterns of  
John Day River Adult  
Steelhead***

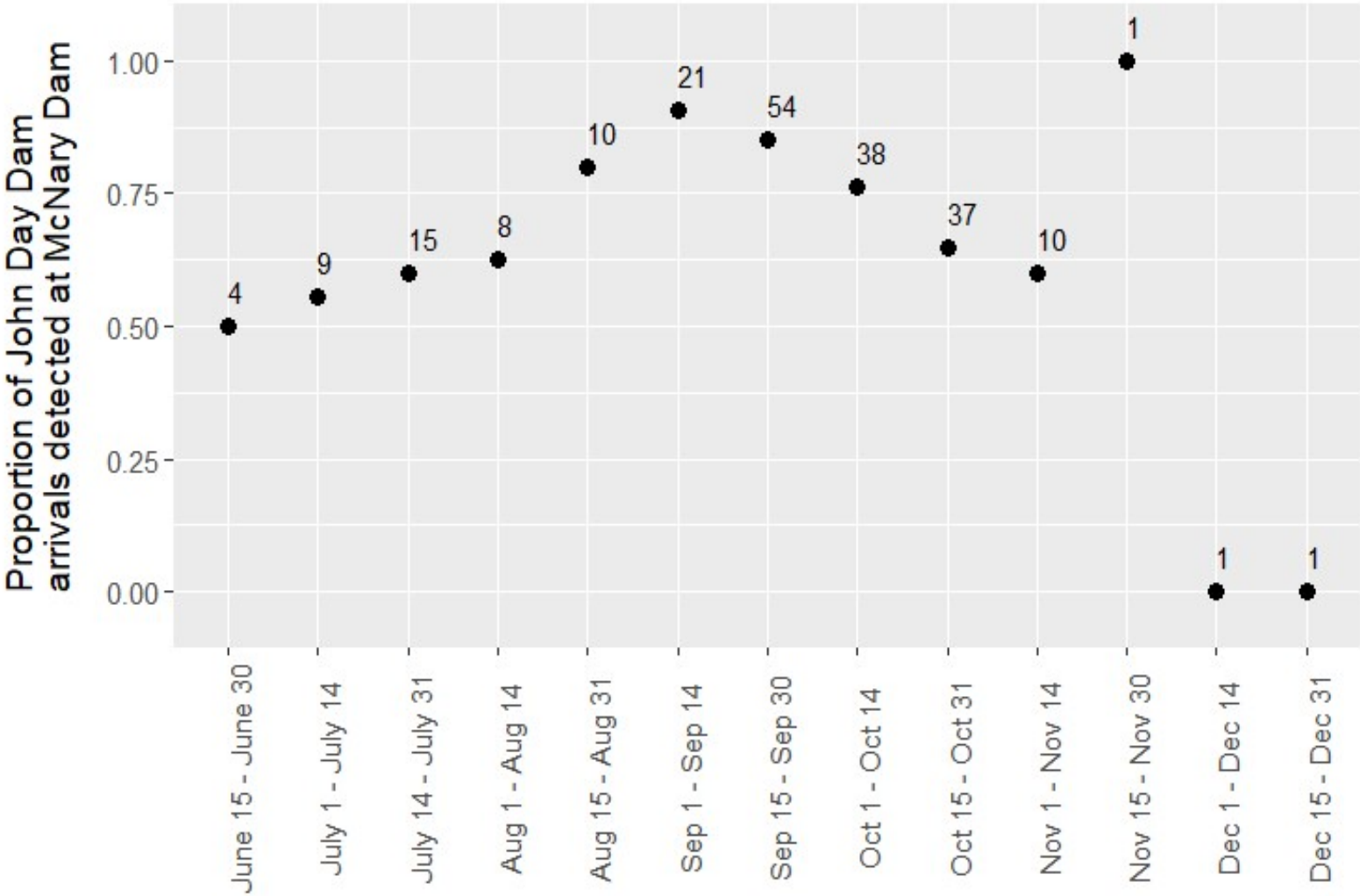




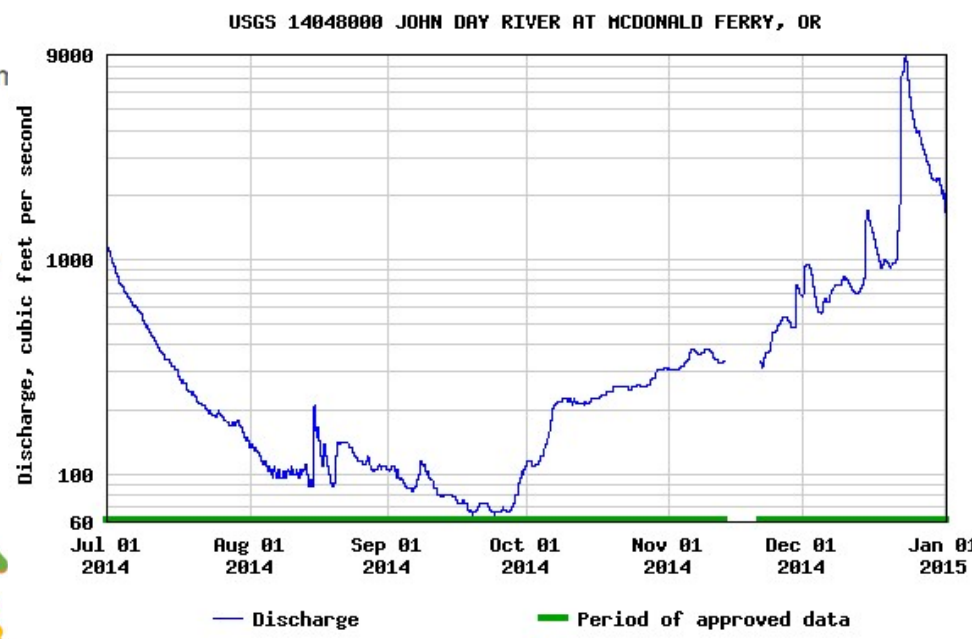
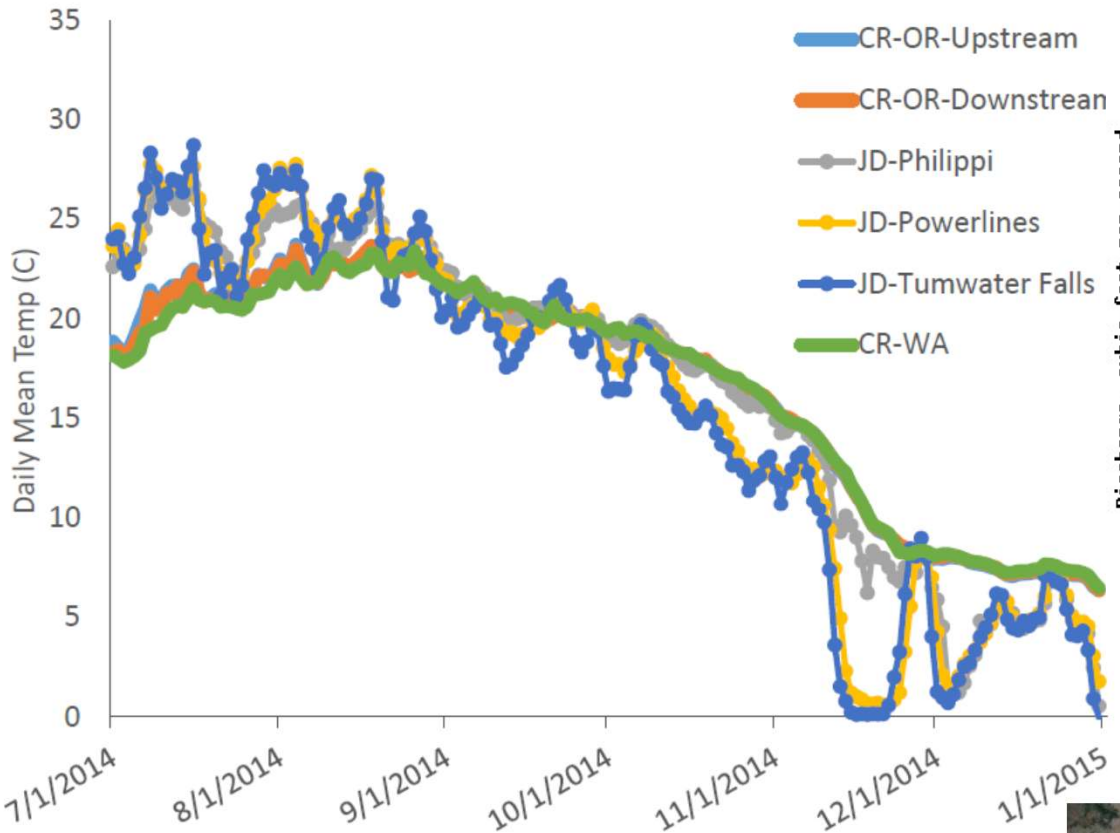
# Introduction and Background

- Tributary “overshoot” is a concern for several Mid-C and Lower Snake steelhead populations
- Most prevalent for John Day origin steelhead
- PIT tag detections identified the issue, but don’t inform us about what fish are doing at confluence

# Temporal Pattern of Steelhead Overshoot to McNary



	PRE – OCTOBER	POST - OCTOBER
<b>OVERSHOOT</b>	112	42
<b>NO OVERSHOOT</b>	31	24
<b>PROPORTION OVERSHOOTING</b>	0.78	0.64



# Objectives

- 1a) Identify Cold Water Refuge use in the “low smolt-transport” era
- 1b) Compare occupancy by John Day spawning steelhead versus run at large
- 2a) Identify entry and exit patterns at the John Day River mouth
  - Do adults enter the river and then exit? Or do they not enter?
- 2b) Track movements through John Day pool including fallback from McNary forebay
  - Where and how do they travel prior to / during entry / overshoot?

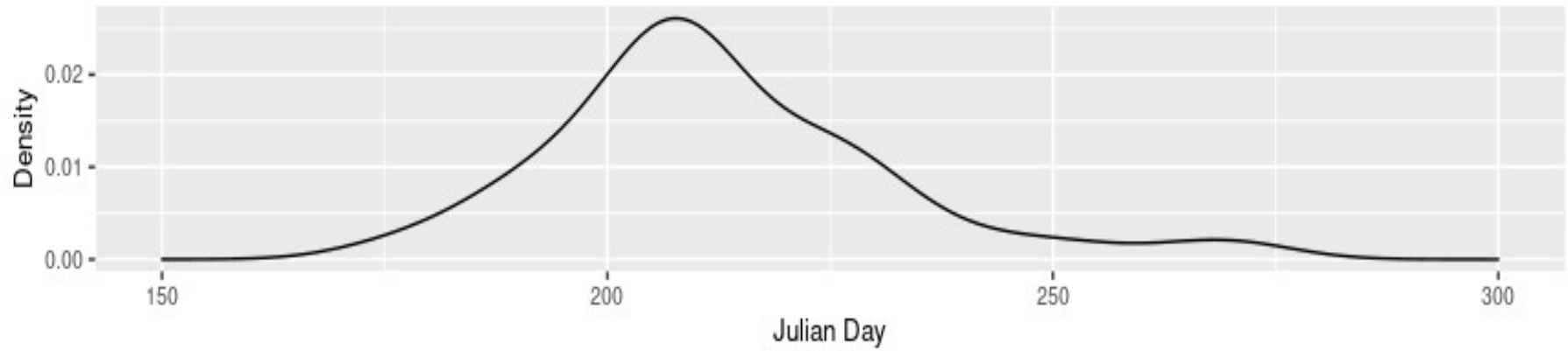
# Methods

- Bonneville Adult Fish Facility sampling in 2020
- Capture and tag 200 Wild A-index steelhead
- “Broadcast” approach to tag steelhead that ultimately spawn in the John Day River basin
- Vemco 69 khz acoustic tags - existing infrastructure
- PIT tag to leverage additional detection points

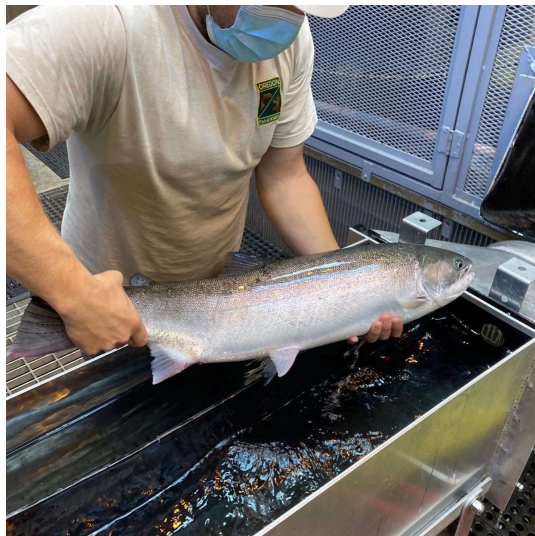
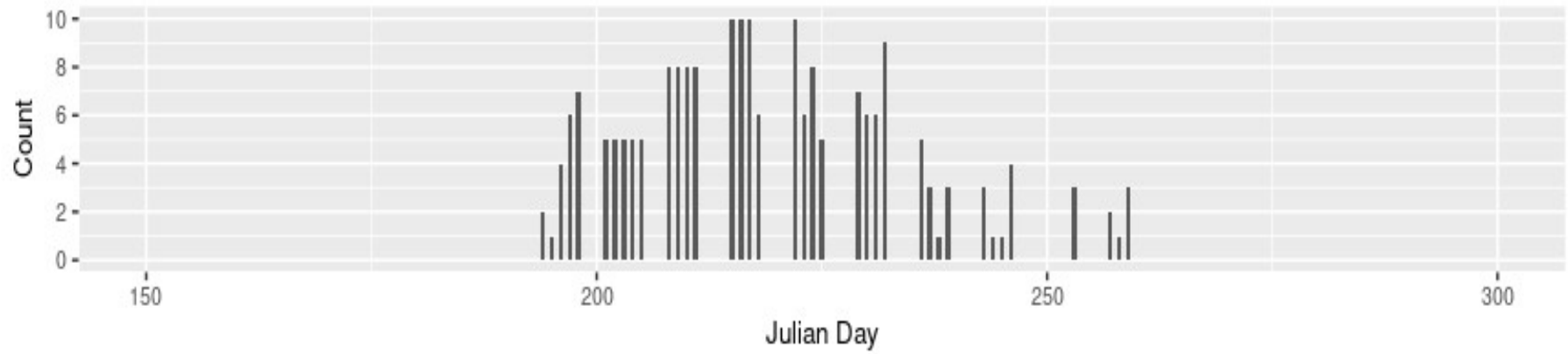


# John Day River adult summer steelhead arrival at Bonneville Dam 2020

## PIT tag returns



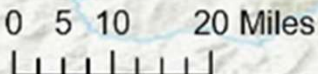
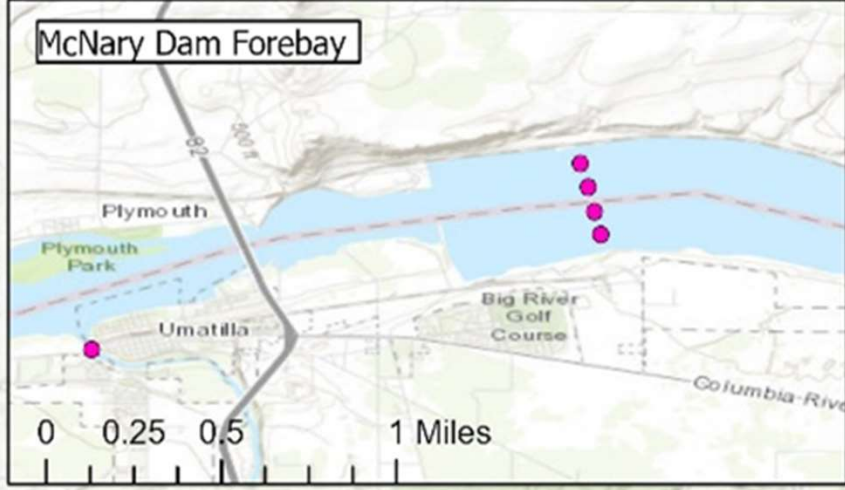
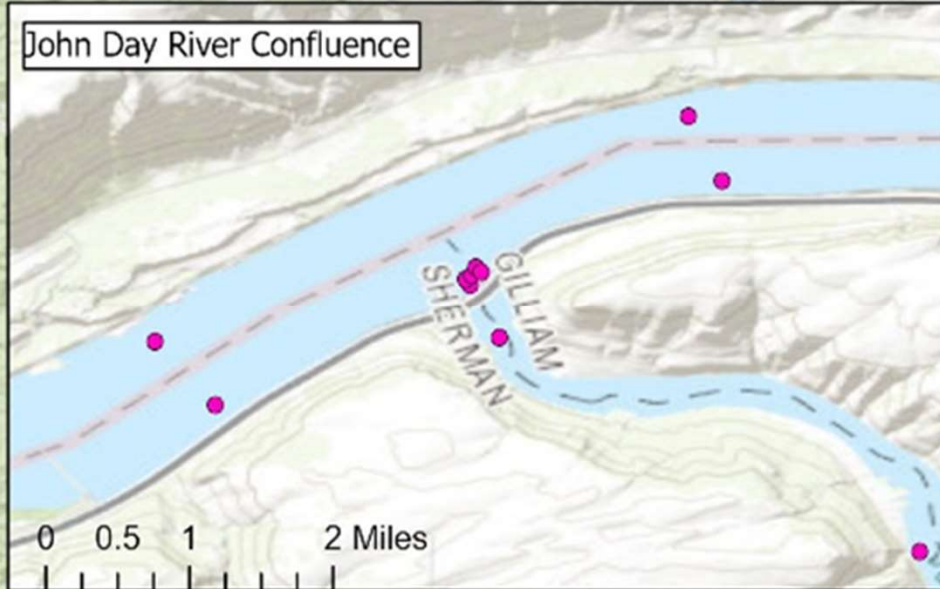
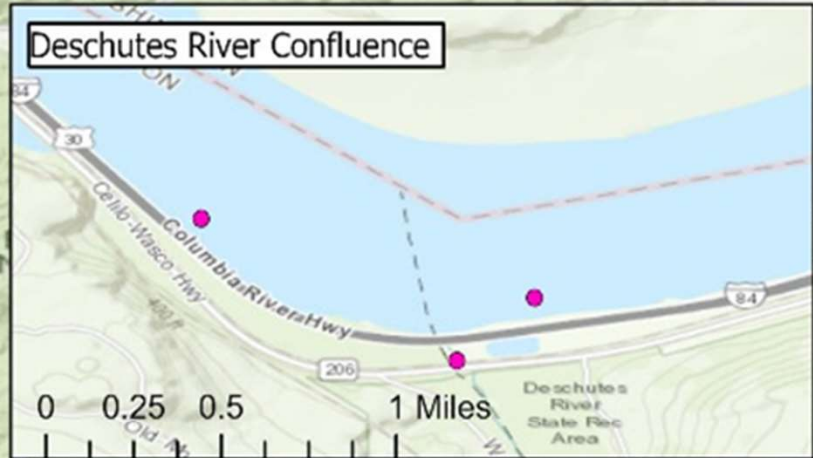
## Acoustic tags



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# Acoustic Receiver Locations







# 2020 Acoustic Receiver Array

Arlington OR - Richland WA

**Legend**

-  Overshoot Receivers
-  Sturgeon Project Receivers

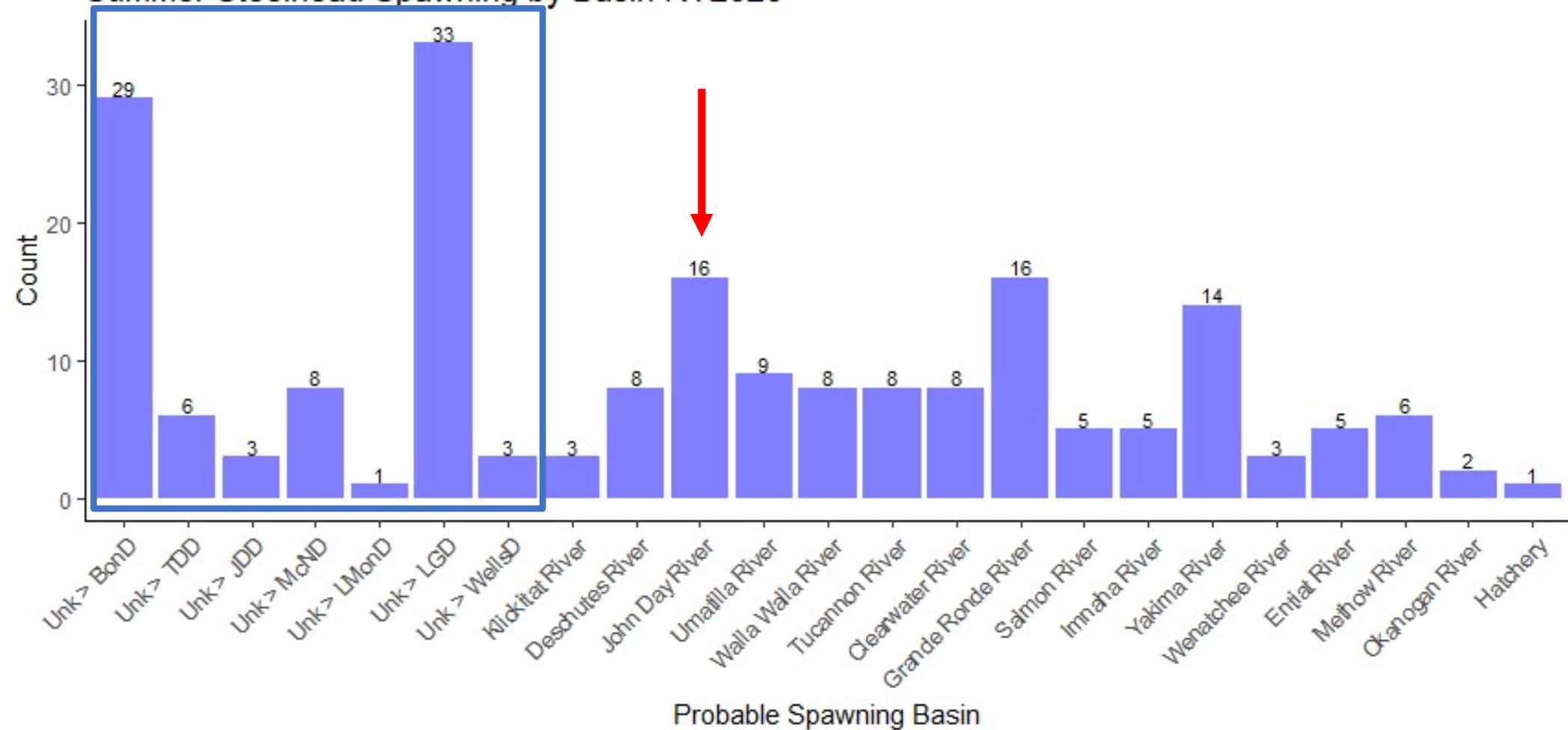


10 mi



# Final Destinations

Summer Steelhead Spawning by Basin RY2020



87% conversion out of Bonneville Pool for acoustic tagged adults

9 year mean conversion = 85% for John Day PIT's, 88% for Snake River PIT's

# Cold Water Refuge Occupancy

Receiver Location	% of All <i>*Available</i> Steelhead	% of John Day Spawning Steelhead
Eagle Creek ( <i>*Plume</i> )	13%	-
Herman Creek	4%	-
Wind River	3%	-
“Drano Lake”	41%	38%
White Salmon River	10%	6%
Klickitat River	6%	-
Deschutes River ( <i>*Railroad Bridge</i> )	43%	50%

**\*Available:** denominator reduced at Deschutes for steelhead with no acoustic signals detected anywhere upstream from The Dalles Dam

**\*Plume:** this receiver differs from the others, in that it was in the Columbia

**\*Railroad Bridge:** farthest upstream receiver in 2020, potential change for 2022

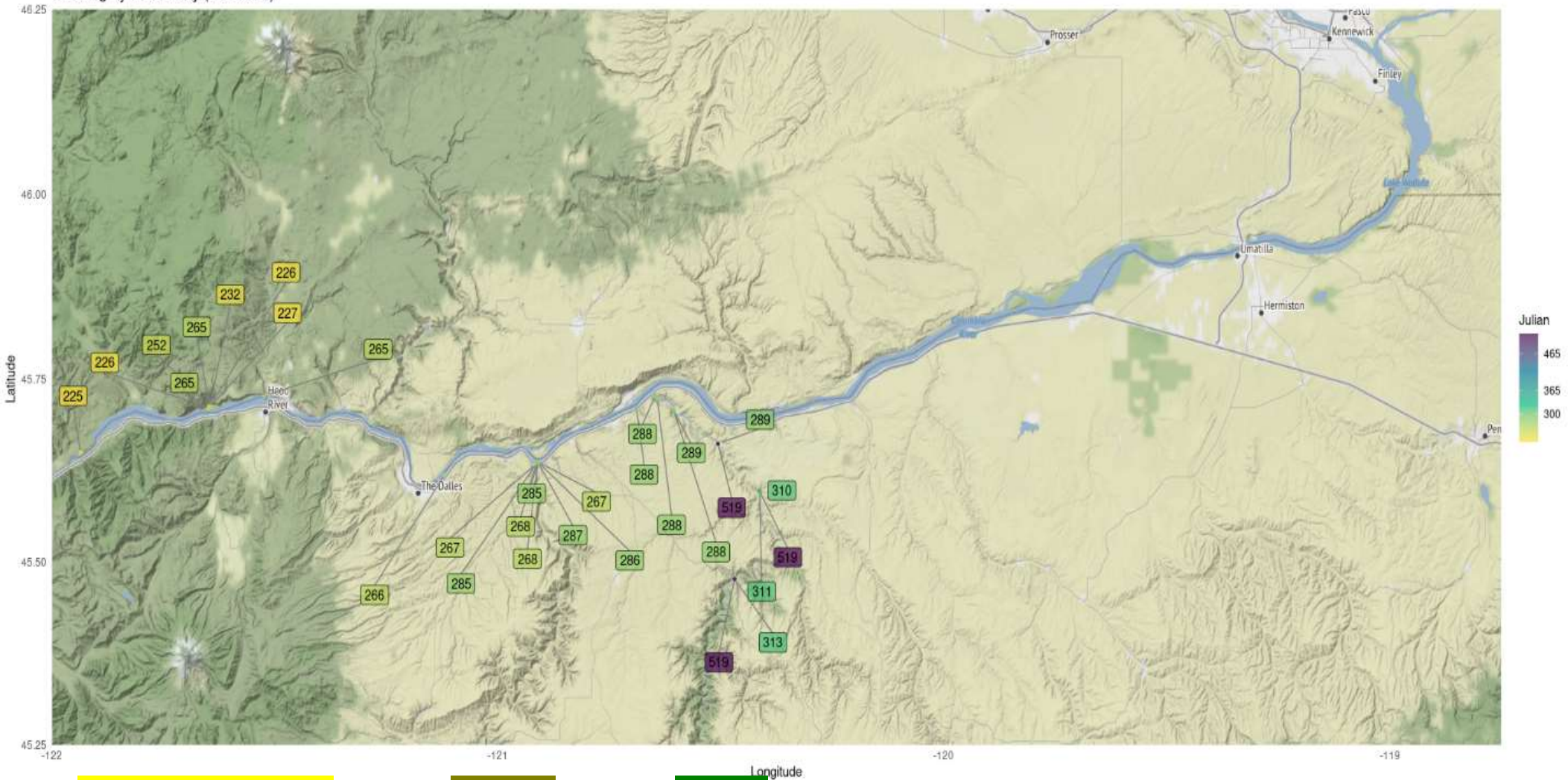


# John Day Pool Migration Patterns of John Day Spawning Steelhead

- Categorized as:
  - Enter, Stay -- 23%
  - Enter, Exit -- 23%
  - No River Entry, Overshoot -- 54%

# Enter, Stay - 53937

Tracking by Julian Day (ID-53937)



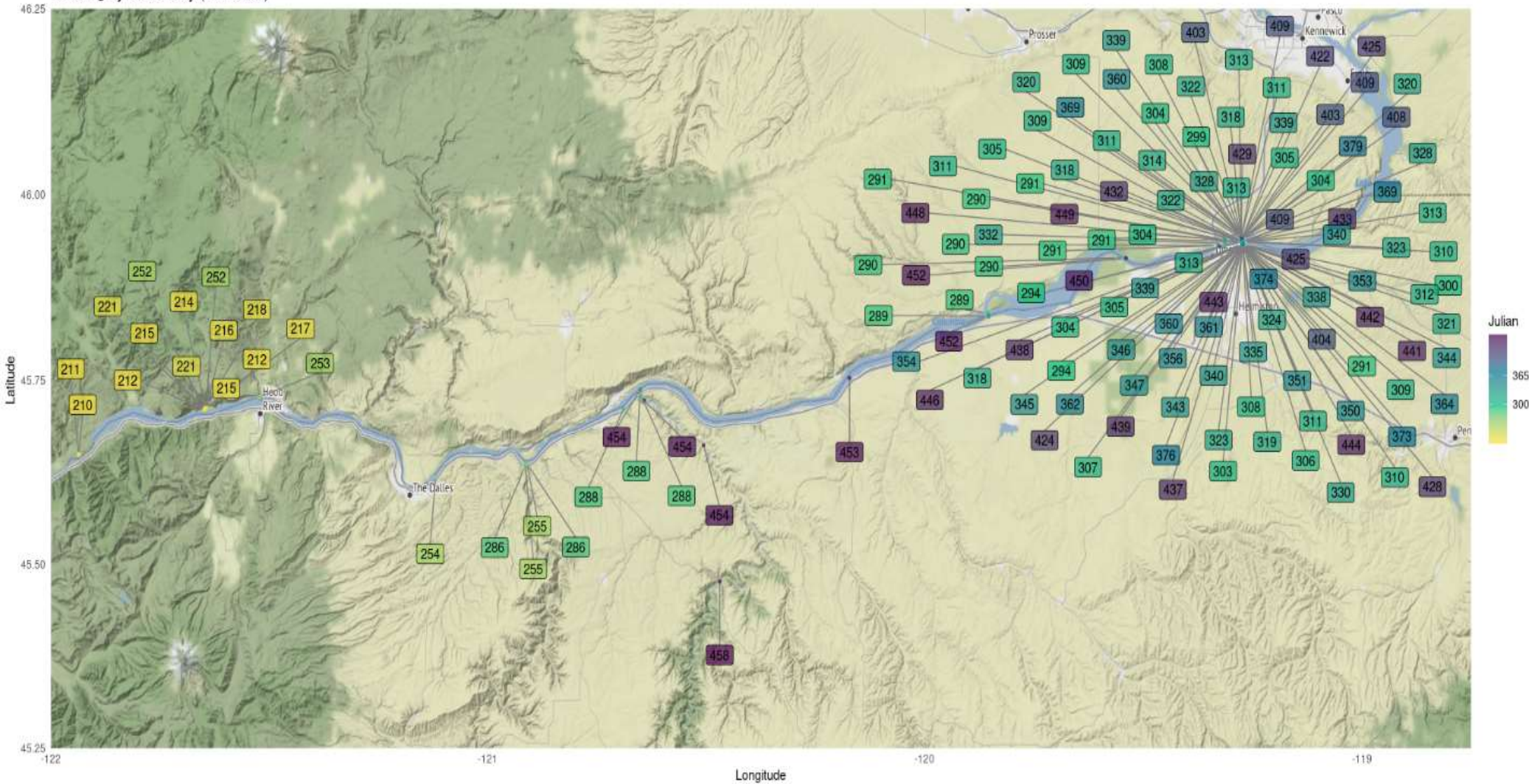
Aug 12 – Sep 21

Oct 11

Nov 5

# Enter, Exit - 16003

Tracking by Julian Day (ID-16003)



Aug 2 – Sep 9

Sep 9 – Oct 12

Oct 14

Mar 26







# Velocity Tracks

Velocity measurements taken during August and September 2020 at the John Day River and Columbia River confluence.

**Legend**

- 📍 Acoustic Receiver
- ▲ Track

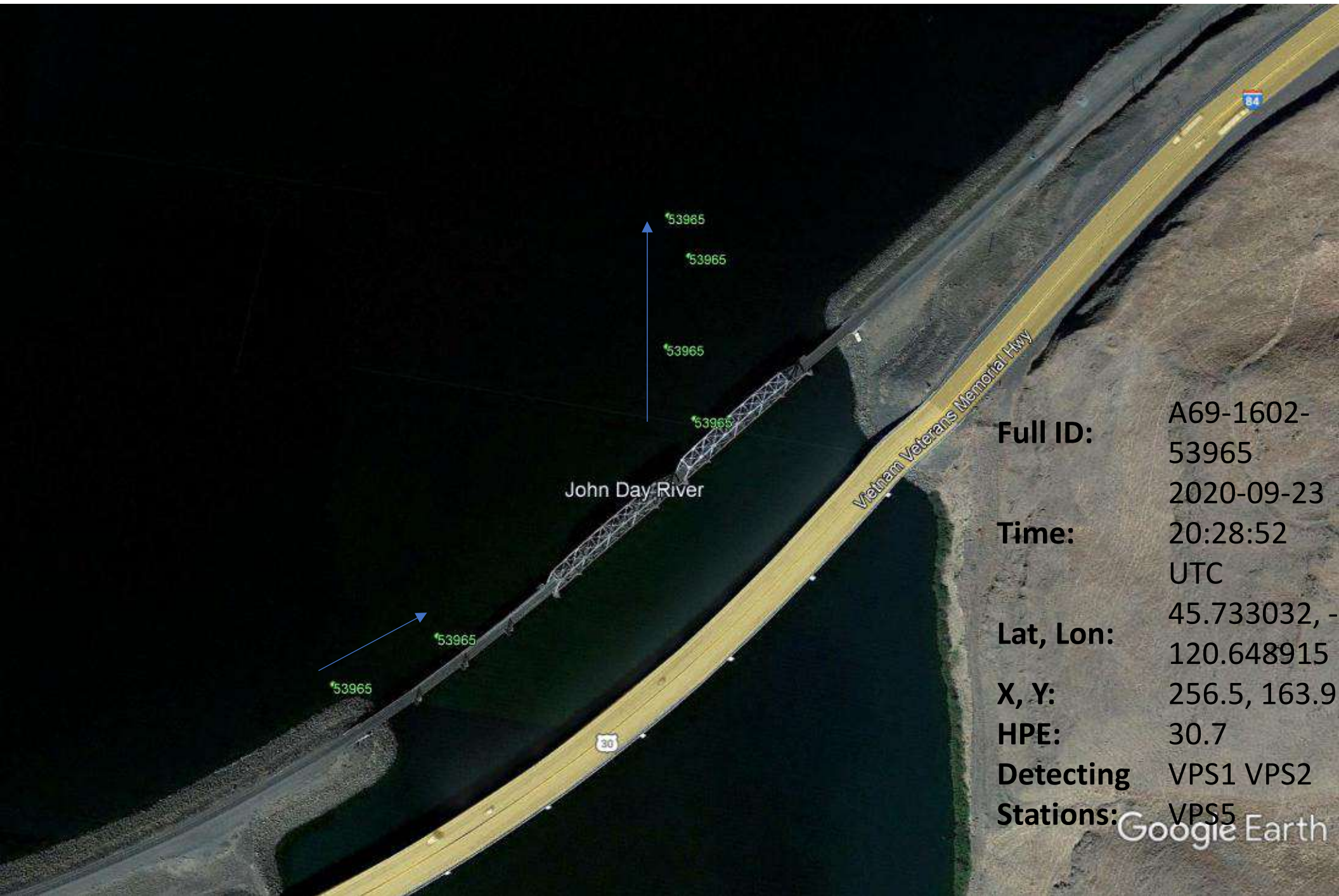


Google Earth

700 ft



# No River Entry, Overshoot -53965, 9/23 Prior to McNary



**Full ID:** A69-1602-53965  
**Time:** 2020-09-23 20:28:52 UTC  
**Lat, Lon:** 45.733032, -120.648915  
**X, Y:** 256.5, 163.9  
**HPE:** 30.7  
**Detecting Stations:** VPS1 VPS2 VPS5



# No River Entry, Overshoot – 53965, 10/14, Post McNary

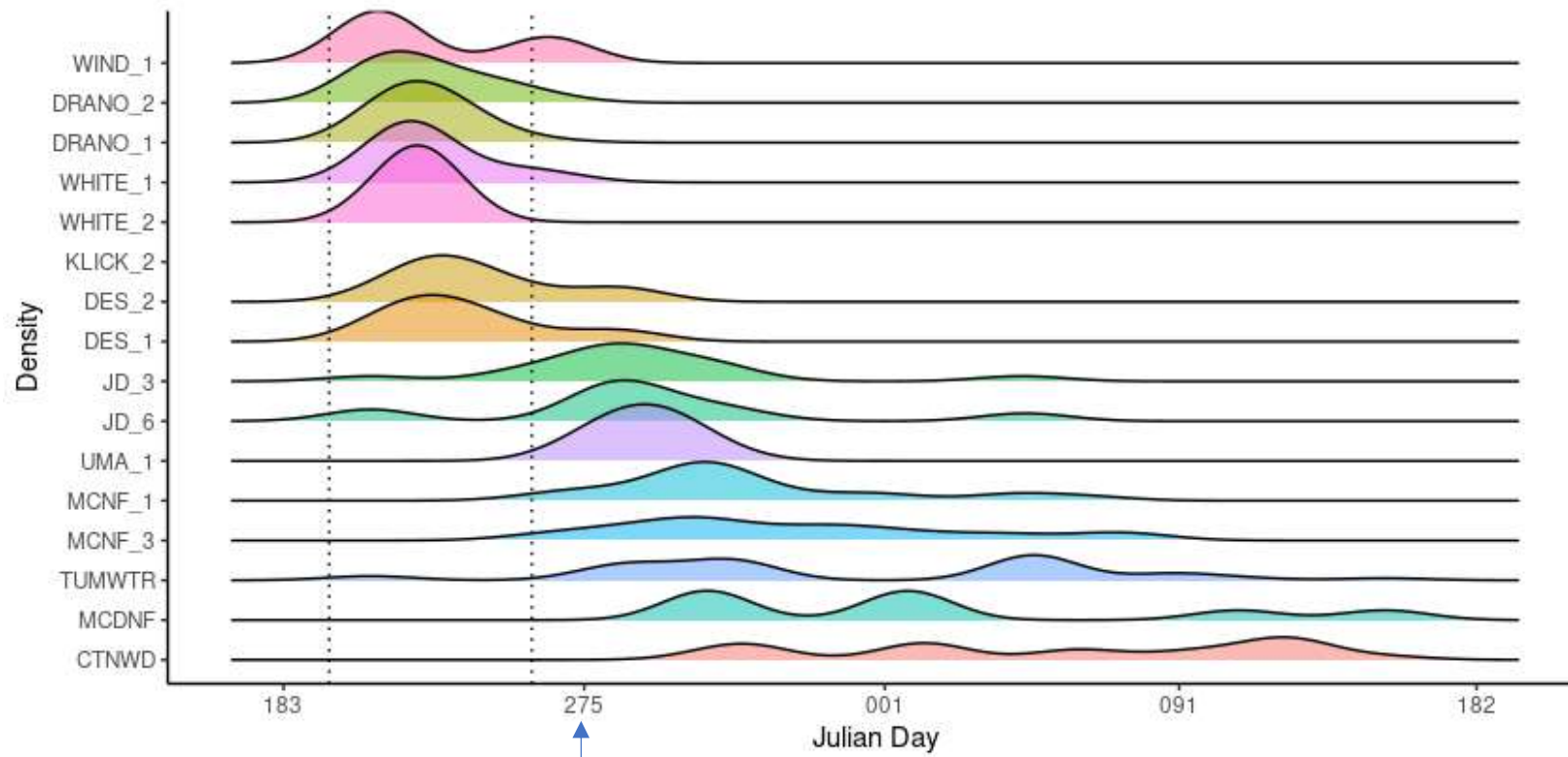


**Full ID:** A69-1602-53965  
2020-10-14  
**Time:** 01:35:08 UTC  
**Lat, Lon:** 45.732711, -120.650438  
**X, Y:** 138.0, 128.2  
**HPE:** 14.3  
**Detecting Stations:** VPS1 VPS2 VPS5

Google Earth

# McNary Forebay Timing of Occupancy

Acoustic detections of John Day steelhead (2020-'21)



Oct 1





# Future Directions

- Active tagging round 2 in 2022
  - Similar approach, ~250 tags
  - Select John Day origin if possible
- John Day and Upstream:
  - Expand VPS array at John Day mouth
  - Calibrate floating PIT arrays with active tags