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# Behavior, Distribution, and Passage Metrics of Subyearling Chinook Salmon Above and Below Lookout Point Dam, 2016

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WILLAMETTE FISHERIES SCIENCE REVIEW  
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STUDY CODE: JPL-15-04-LOP



# Presentation Outline

- ▶ Objectives
- ▶ Fall 2016 JSATS study
  - Study Area
  - Tagging and Release
  - Results
- ▶ Summary
- ▶ Acknowledgements





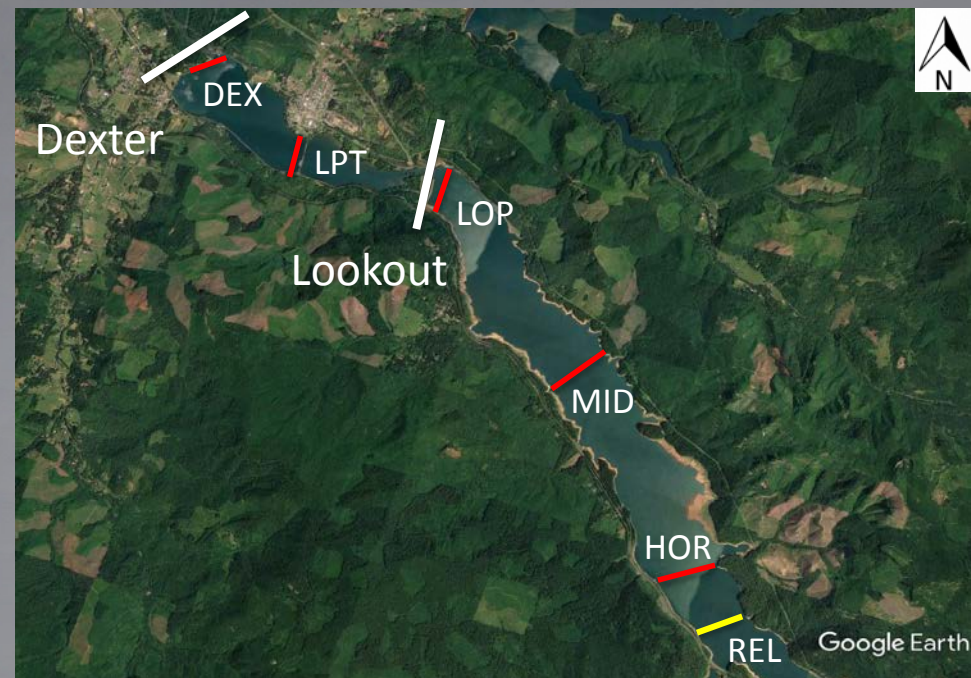
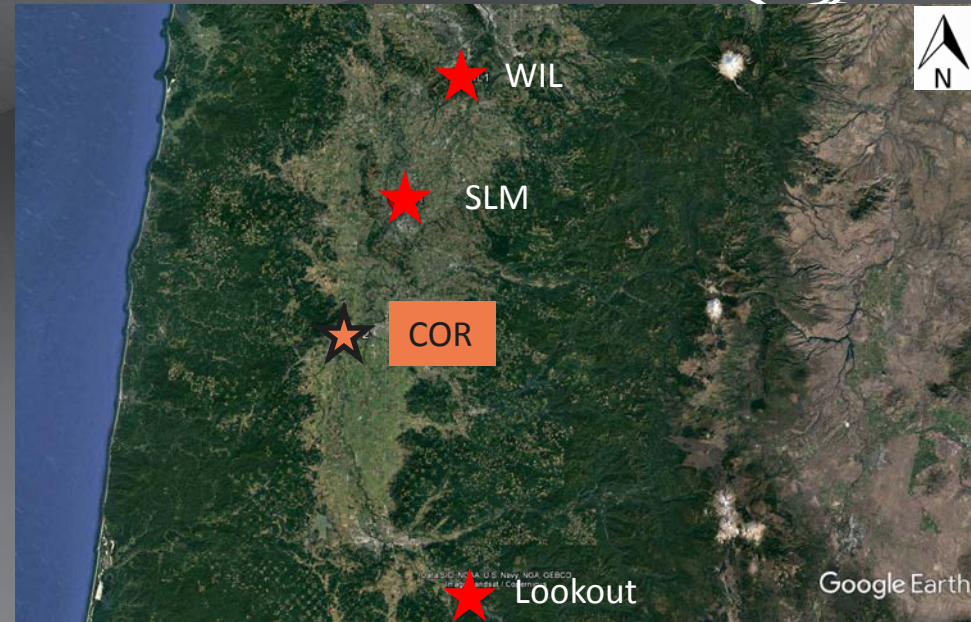
# Objectives

- ▶ Reservoir Movement and Behavior
  - Daily Movement
  - Cross Reservoir Distribution by Array
  - Forebay Approach
- ▶ Travel Times
- ▶ Downstream Migration and Survival



# Study Area

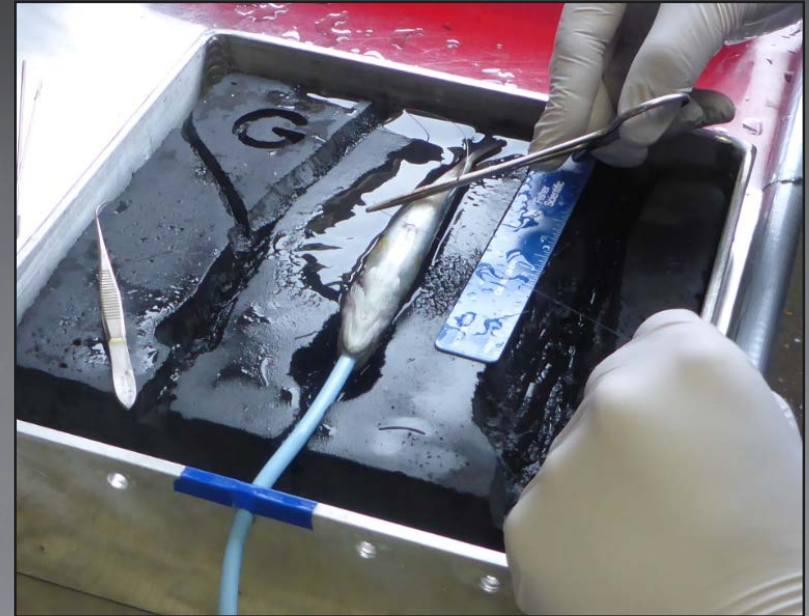
- ▶ One Release Location
- ▶ Receiver Arrays
  - 3 Lookout Reservoir Arrays
  - 1 Lookout Tailwater Array
  - 1 Dexter Forebay Array
    - Primary detection array for Lookout Point passed fish
  - 3 Downstream detection arrays





# Tagging and Release

- ▶ OSU Wild Fish Surrogate Project
- ▶ Fish Tagging
  - Subyearling Chinook Salmon; n=520
    - 7 sec Tags; n=470
    - 10 sec Tags; n=50
  - 24-h Mortality = 0.38%
  - 20 Tag Life (~102 days; ongoing)
- ▶ Fish Release
  - October 4-8, 2016
  - Dead Fish Release; n=60

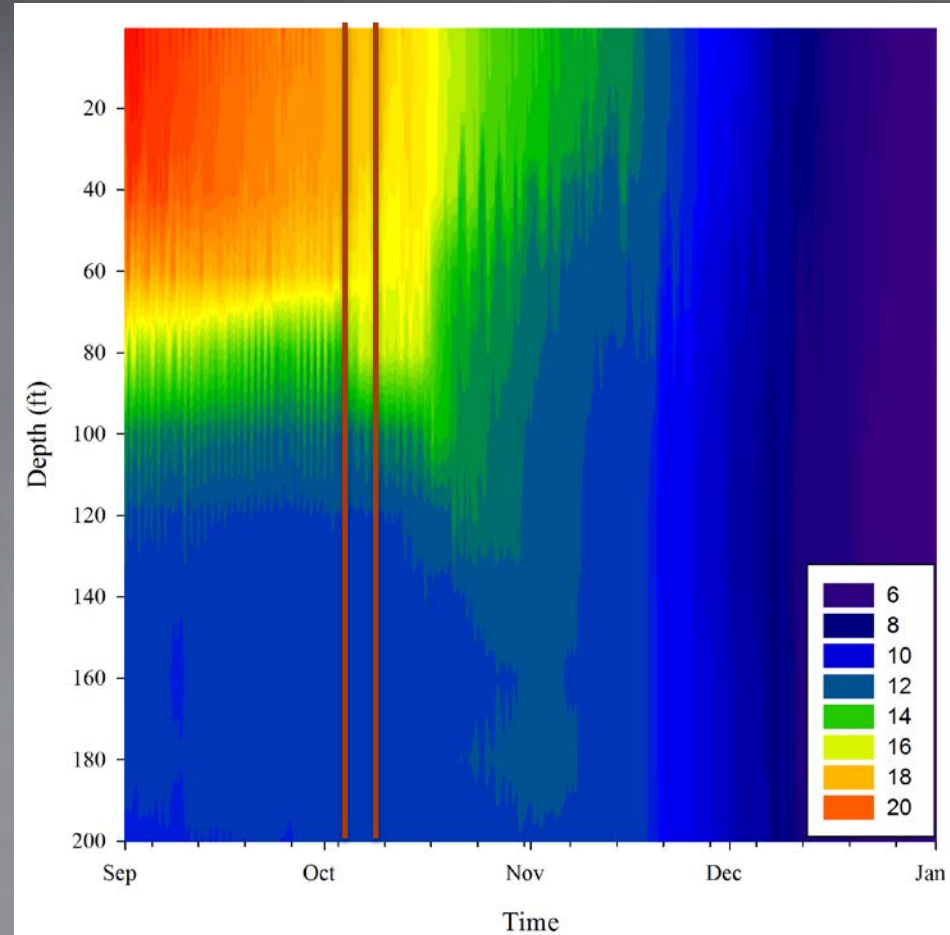


Species	n	Size (mm)	Weight (g)
Chinook salmon	520	148	39
Dead Fish Release	60	148	38



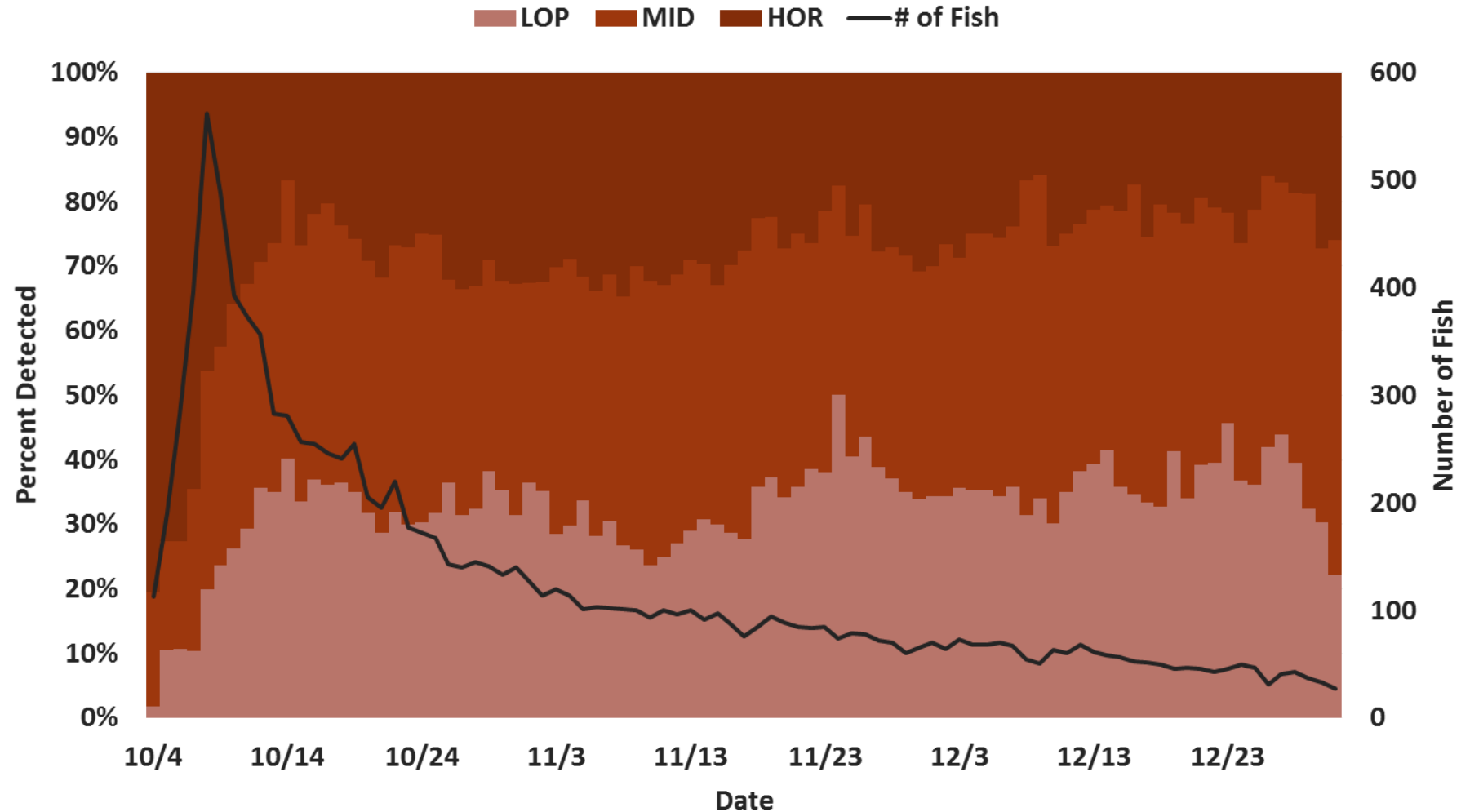
# Environmental Conditions

- ▶ Forebay Elevation
  - Minimum Conservation Pool
  - Elev. 825-845 ft.
- ▶ Release Temperatures
  - October 4-8, 2016
  - Average Surface Temp 17.5°C





# Daily Reservoir Movement

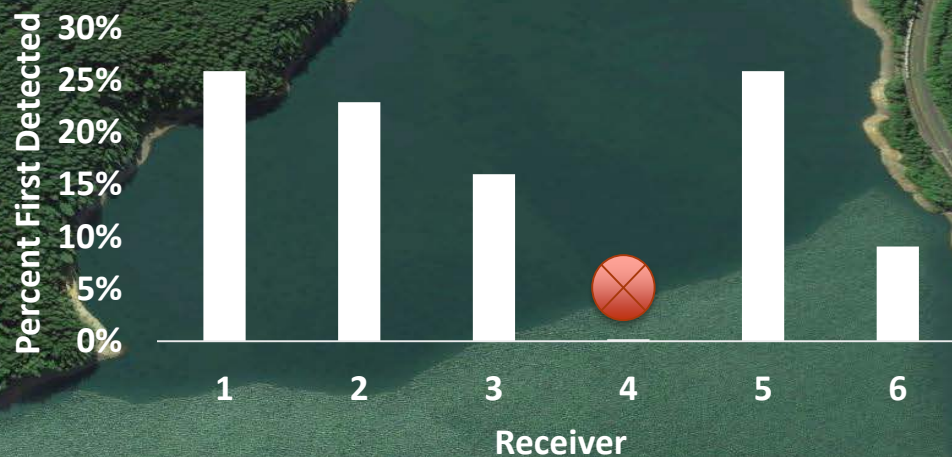


# Horizontal Distribution



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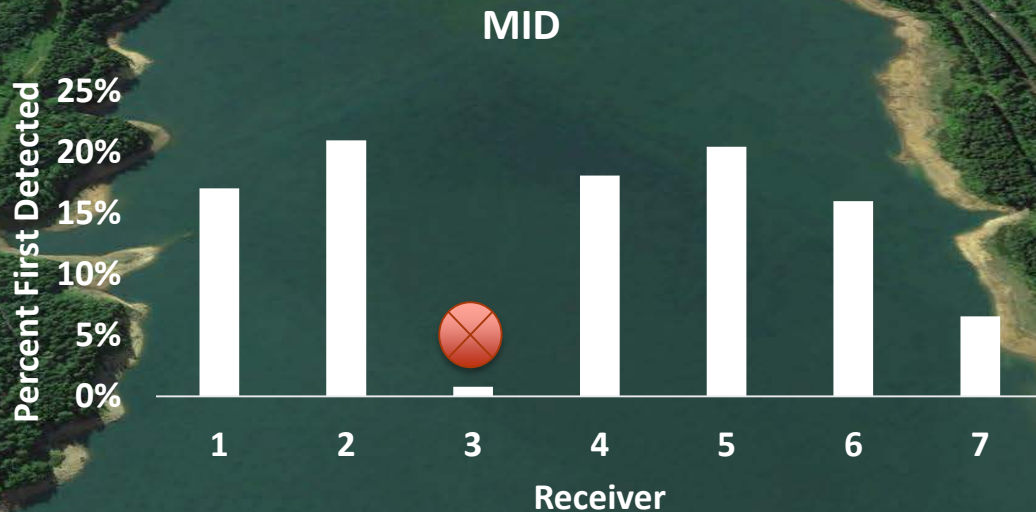


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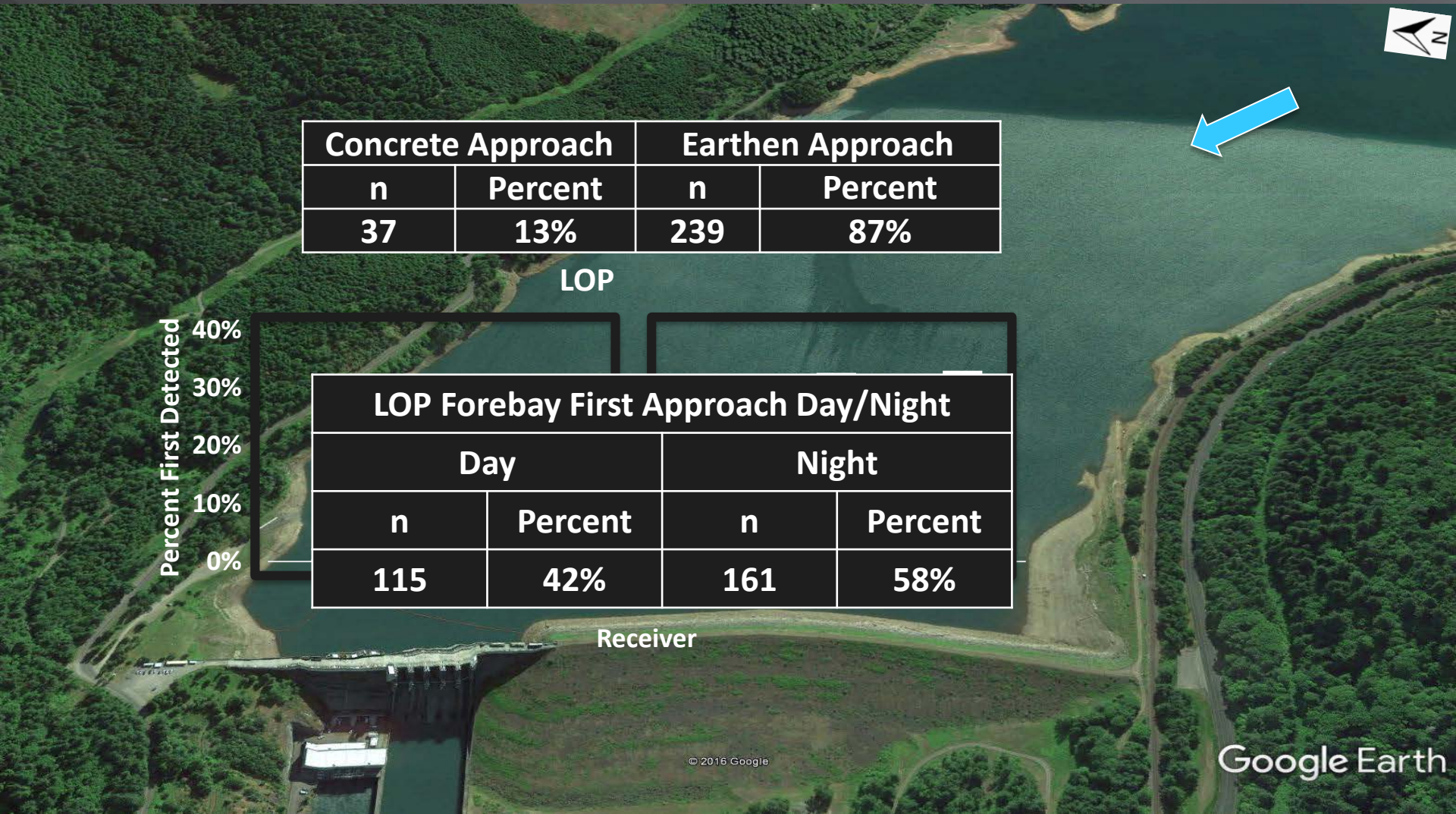
Google Earth



# Horizontal Distribution



# Horizontal Distribution



Concrete Approach		Earthen Approach	
n	Percent	n	Percent
37	13%	239	87%

LOP

Percent First Detected

40%  
30%  
20%  
10%  
0%

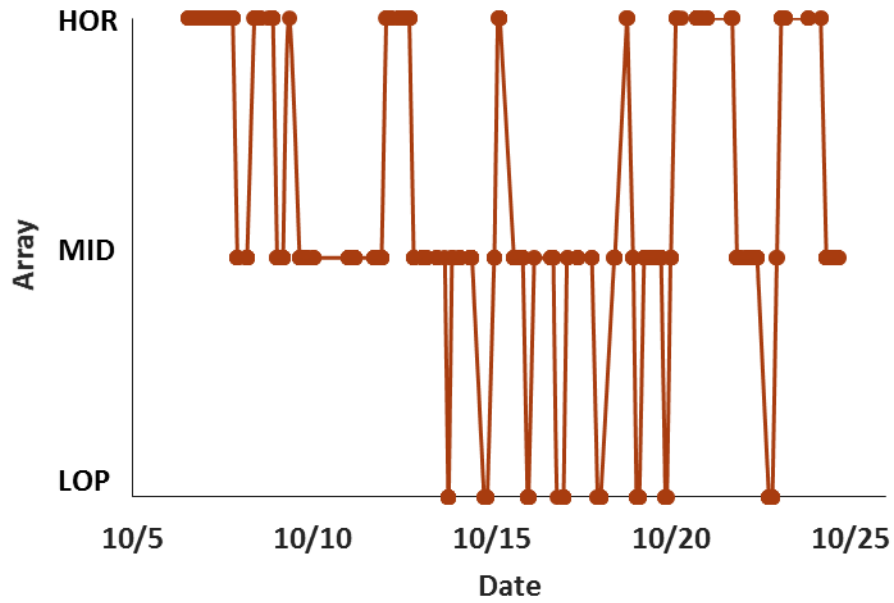
LOP Forebay First Approach Day/Night			
Day		Night	
n	Percent	n	Percent
115	42%	161	58%

Receiver

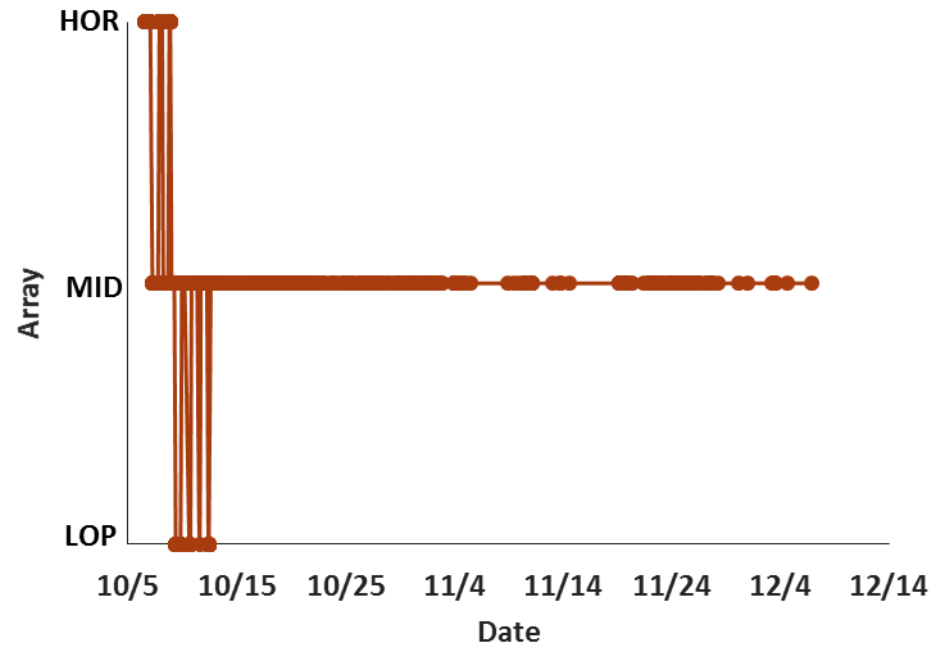


# Lookout Reservoir Movement

### G728A326A



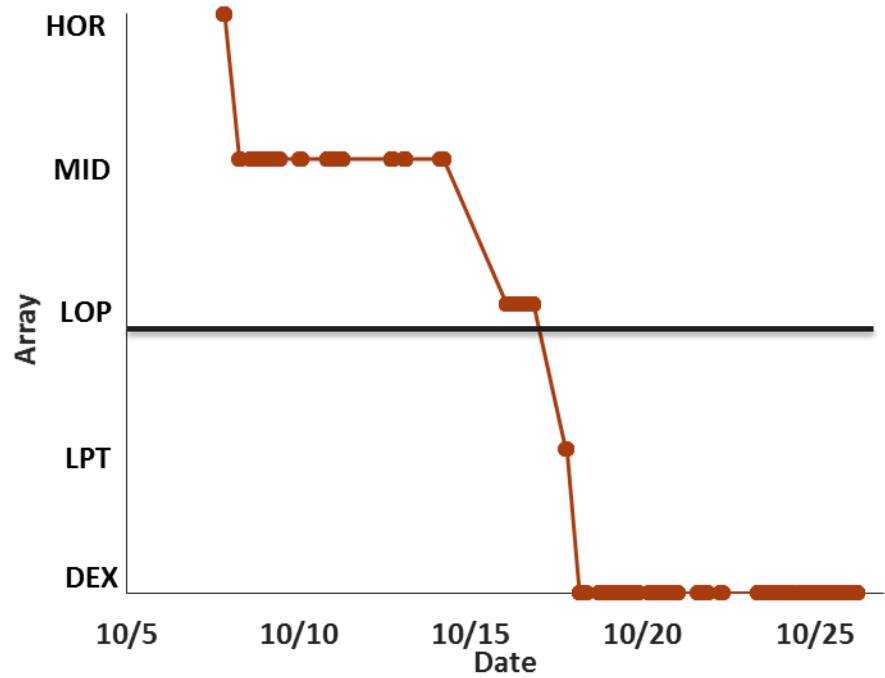
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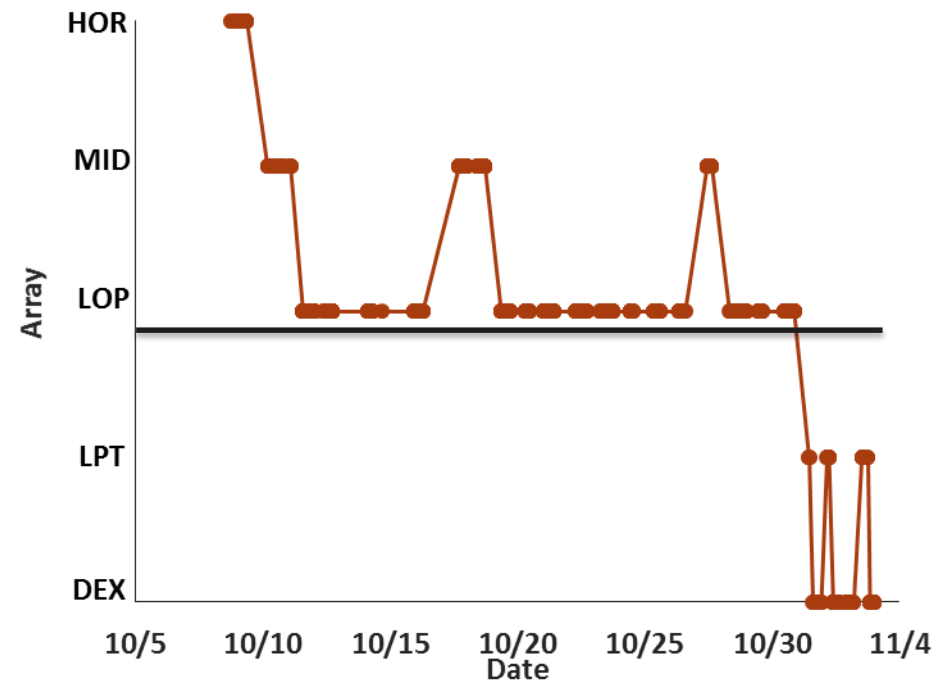


# Lookout and Dexter Movement

### G72D5C74E

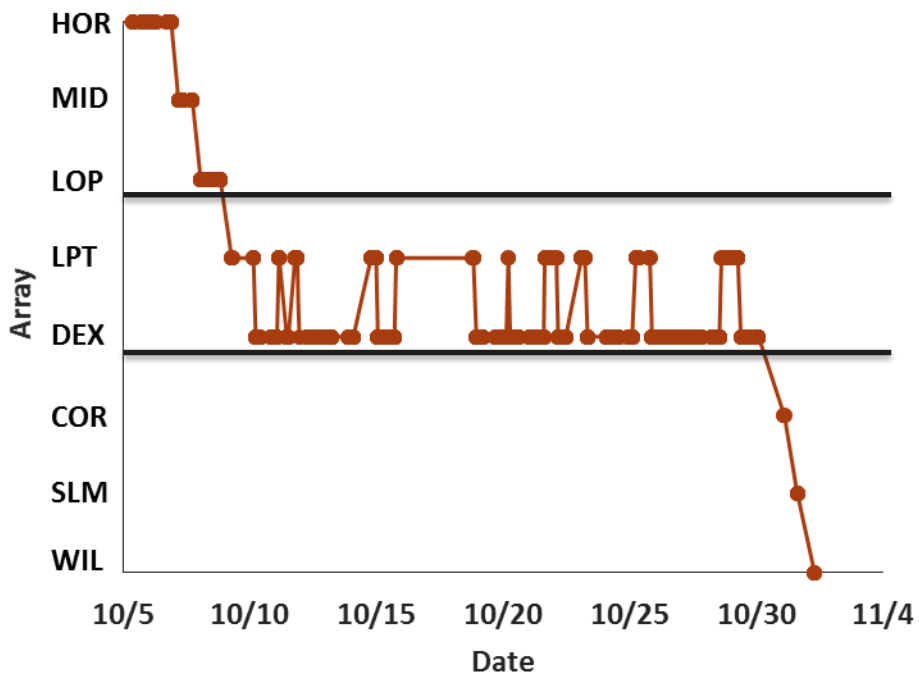


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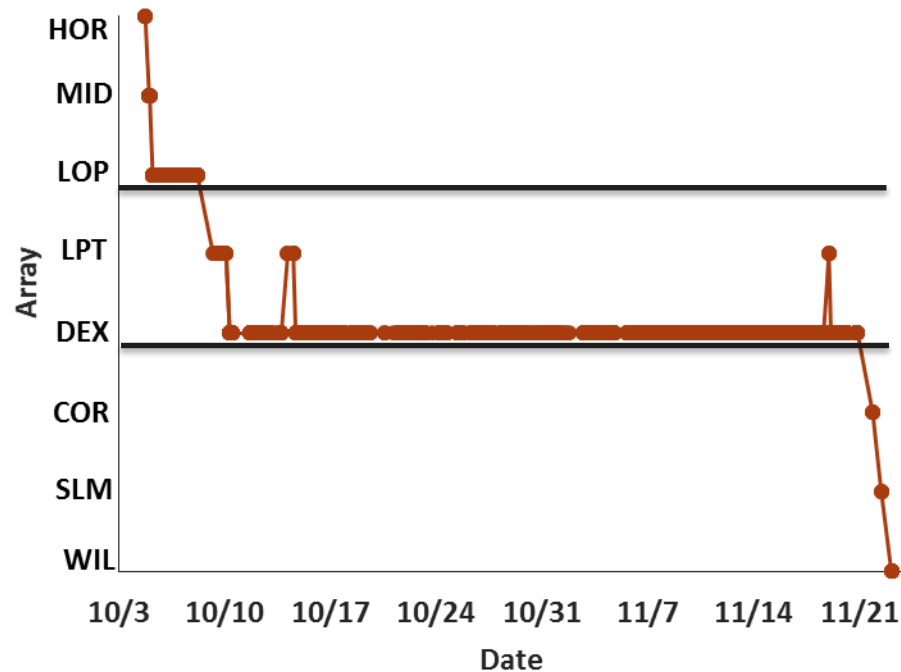


# Downstream Movement

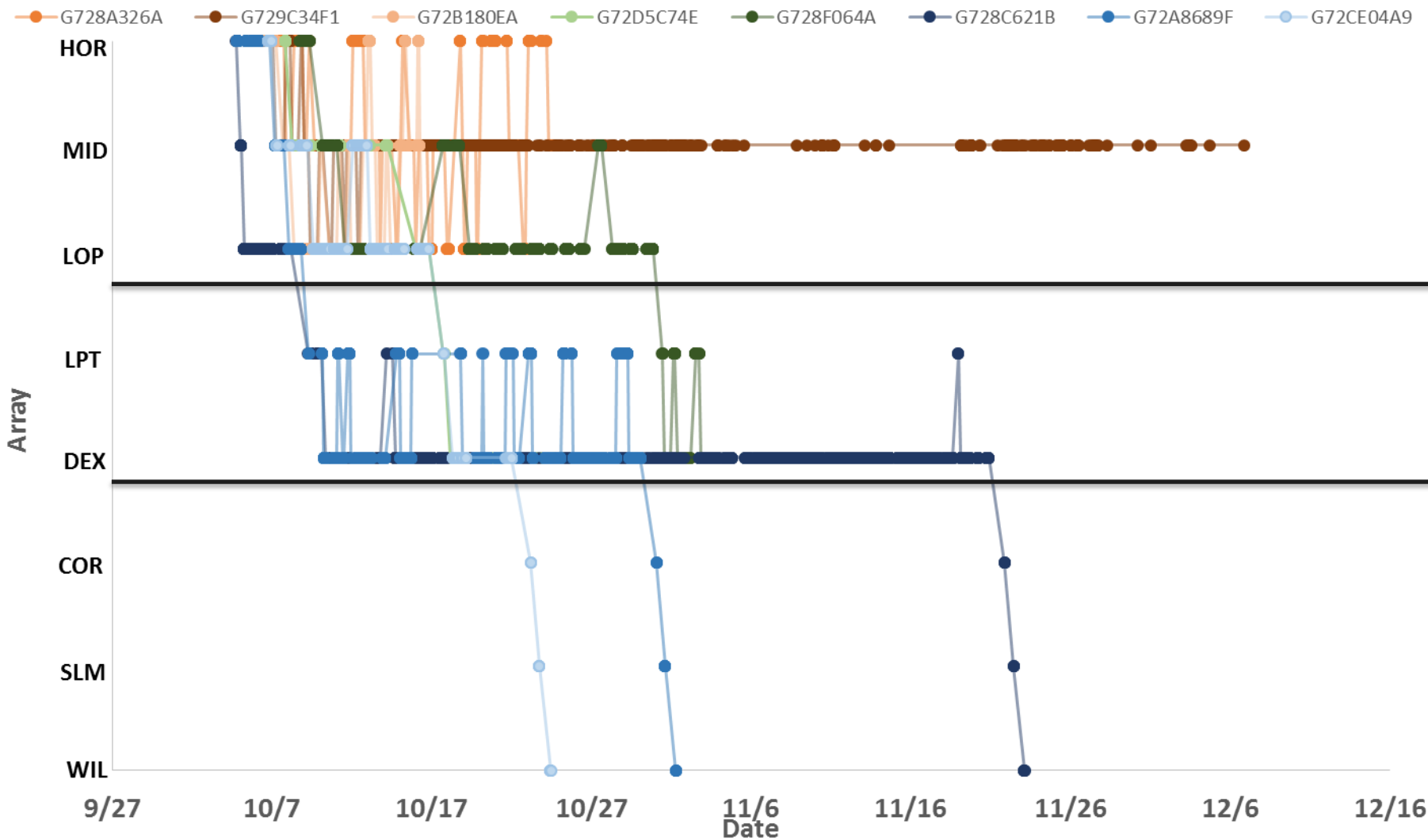
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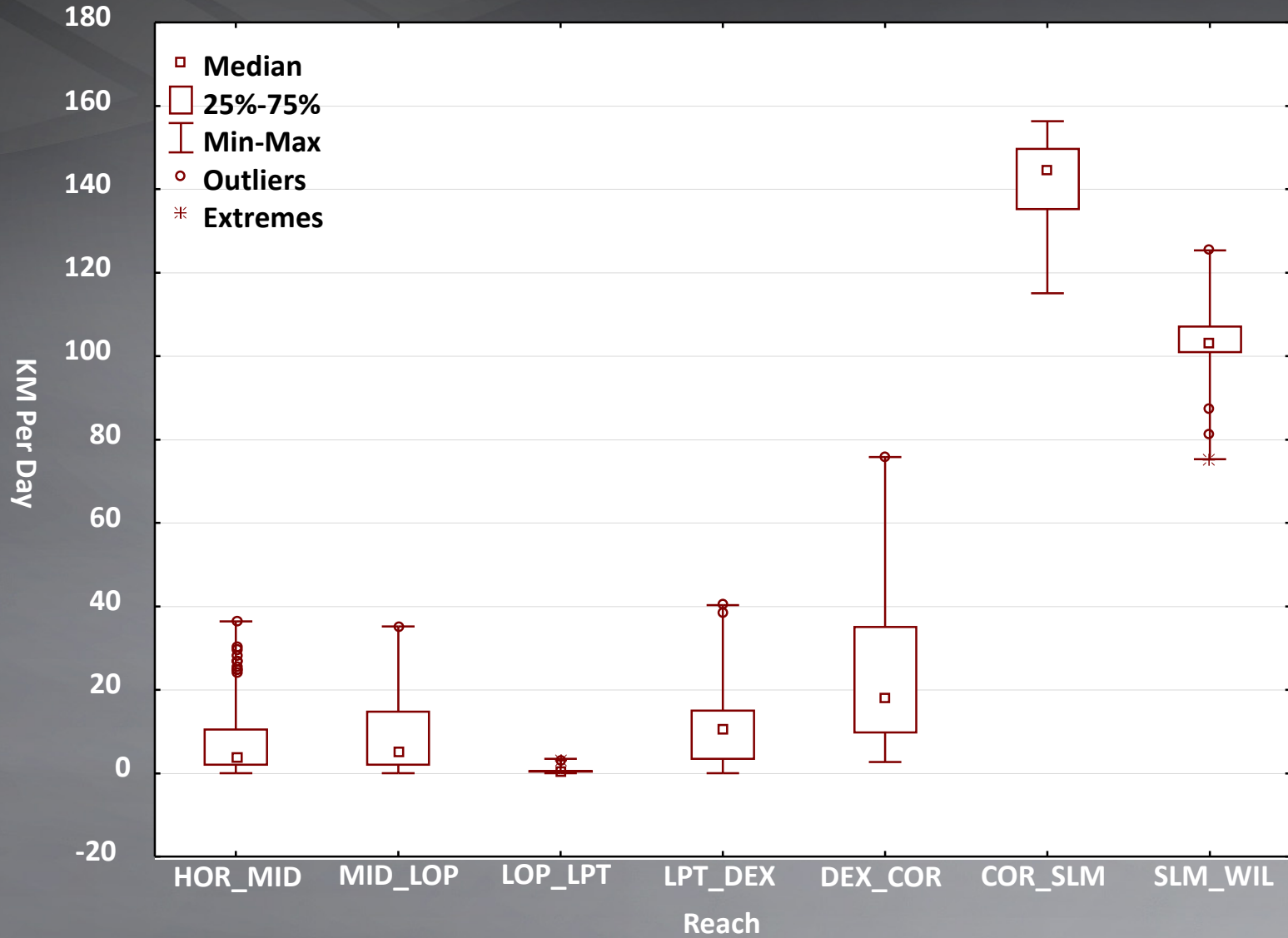


# Combined Fish



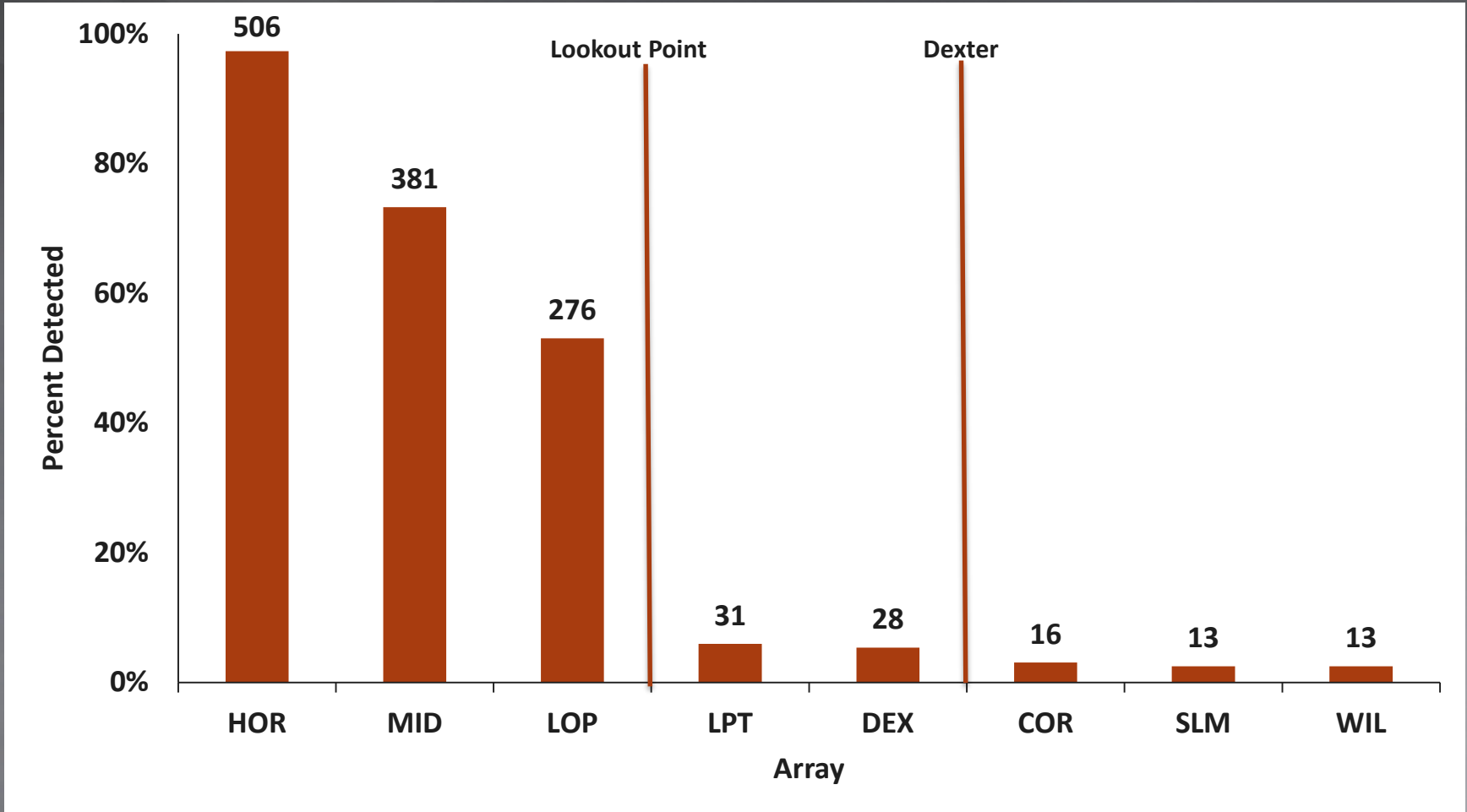


# Travel Time





# Downstream Movement







# Survival

## ▶ Survival

- Lack of adequate numbers to estimate survival
  - 31 fish detected below Lookout Point Dam
  - 16 fish detected below Dexter Dam

## ▶ Detection Probability

- 3 Lookout Arrays (100%)
- Lookout Tailrace Array (96%)
- Dexter Forebay Array (93%)
- Corvallis Array (92%)
- Salem and Wilsonville Arrays (100%)



# Summary

- ▶ Tagged and released 520 subyearling Chinook salmon into Lookout Reservoir
- ▶ Fish dispersed throughout the reservoir
- ▶ Large percentage of fish only detected in Lookout reservoir
- ▶ Majority of fish first approached LOP from the earthen side
- ▶ 31 fish detected below Lookout Point
- ▶ 16 fish detected below Dexter
- ▶ Numbers of fish passing LOP/DEX too small to estimate survival
- ▶ Detection Probabilities greater than 90% at all Arrays
- ▶ Spring Study to commence in March 2017 (yearling Chinook salmon)



# Acknowledgements

## ▶ Army Corps of Engineers

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- Chris Vernon

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# Questions



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