Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle *Since 1965*

Behavior, Distribution, and Passage Metrics of Juvenile Chinook Salmon Above and Below Lookout Point Dam, Fall 2017 and Spring 2018

STUDY CODE: JPL–15-04-LOP

JS HUGHES AND GE JOHNSON

2016-2017 LOP Study

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

Objectives

- Estimate seasonal and diel passage metrics (residence times and survival rates) for tagged fish in reaches between telemetry receiver arrays, including:
  - LOP reservoir
  - LOP project (forebay+tailrace)
  - DEX project (forebay+tailrace)
- Characterize entrance and exit timing, residence time, and horizontal distribution for tagged-fish detected at each receiver array .

- Tagged and released 600 Chinook – October 2016
- Tag and release 600 Chinook – March 2017

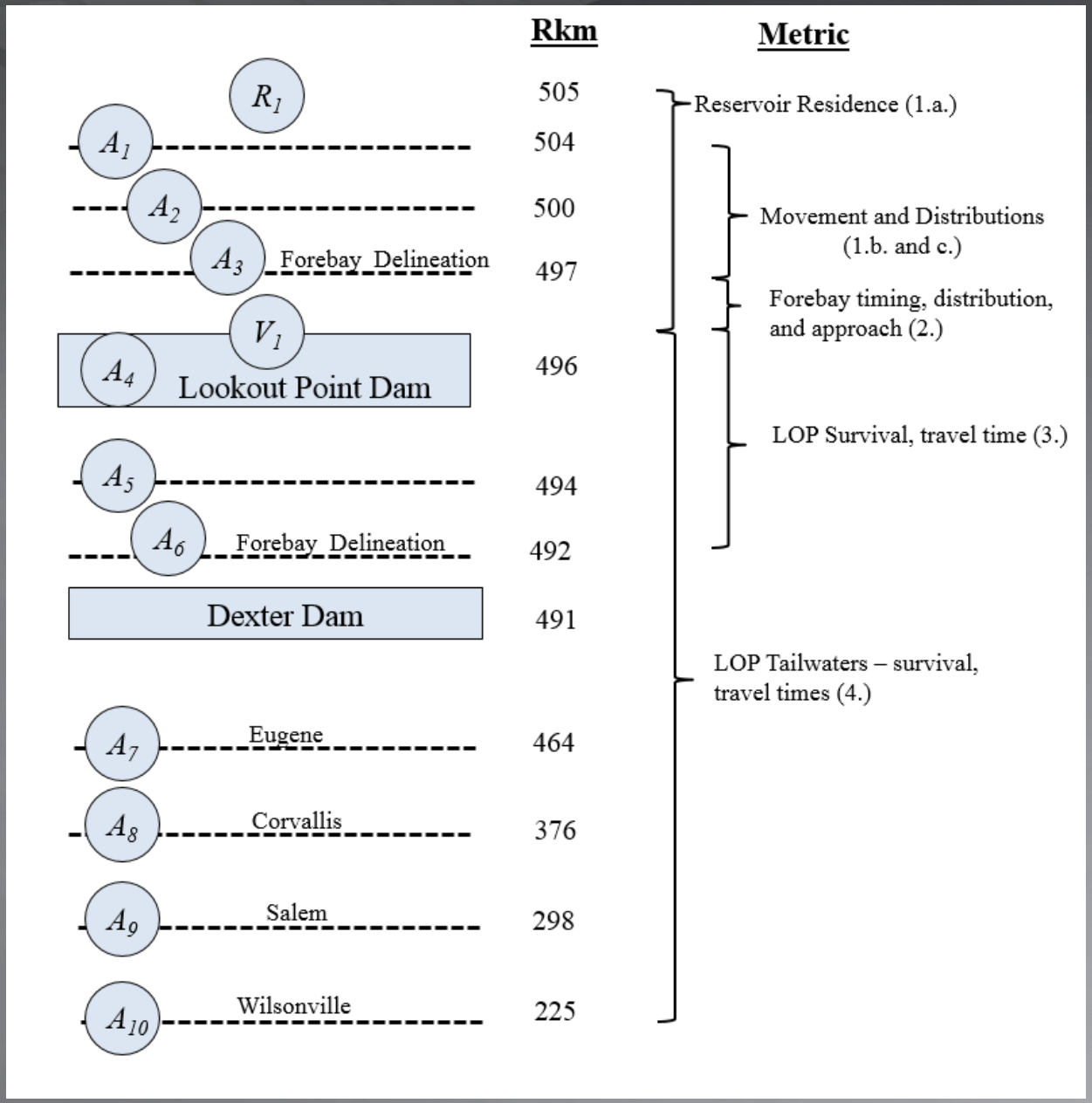
Objectives; 2017-2018 Full Project

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

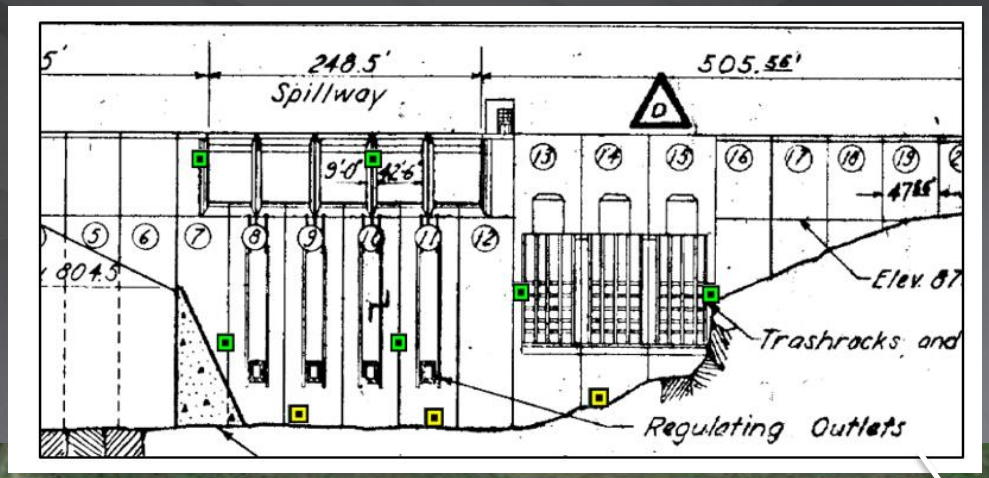
For Yearling and Subyearling Chinook *(O. tshawytscha)*:

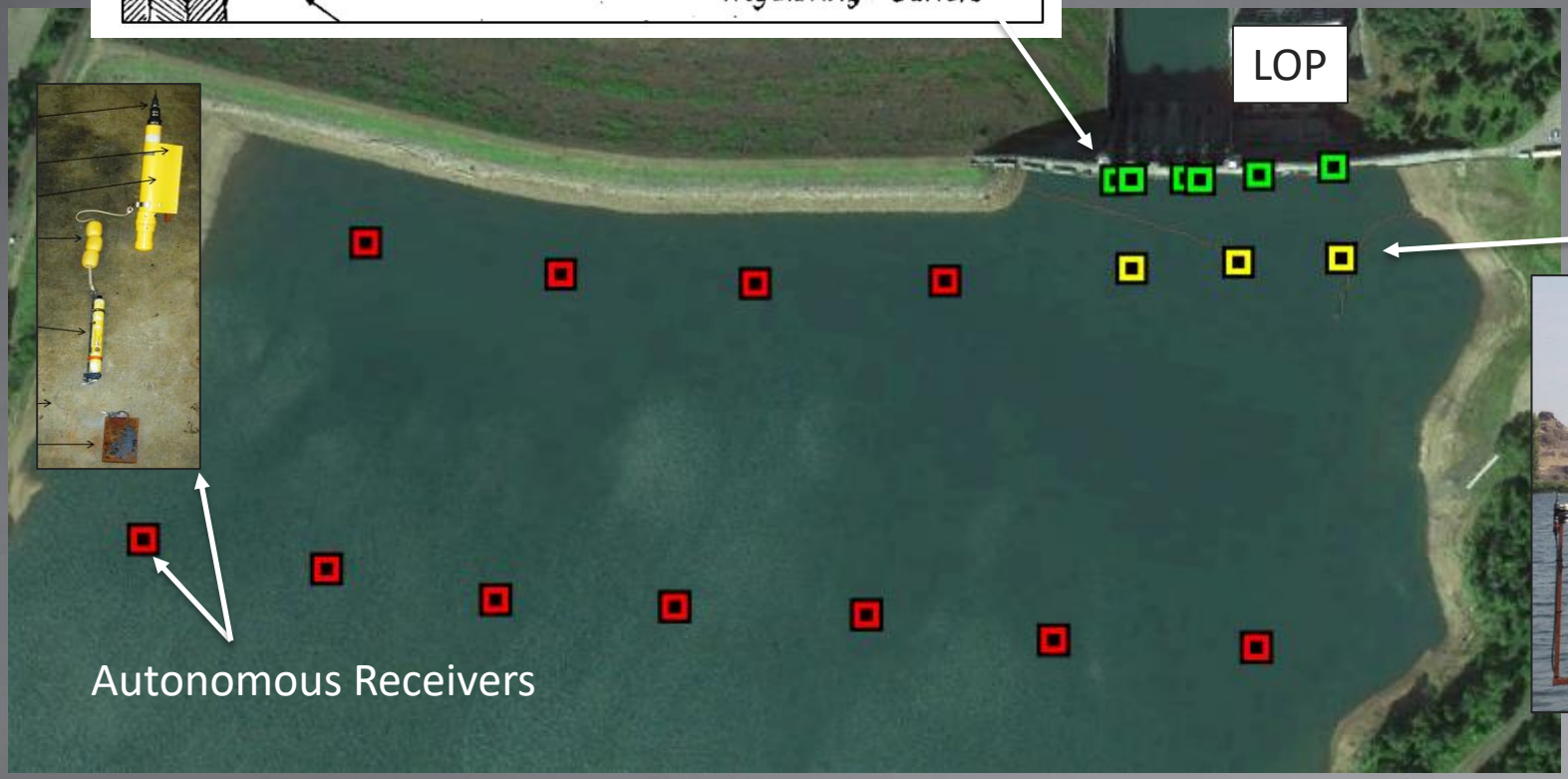
- For the reservoir, estimate distribution, behavior, and movements of study fish, including:
  - Reservoir residence time
  - Movement patterns within the reservoir (day/night)
  - Horizontal distribution at reservoir receiver arrays (day/night)
- For the forebay, estimate detailed distribution, behavior, and movements into and within the forebay, including:
  - Timing of entrance to the forebay and horizontal approach distributions (day/night)
  - Forebay residence time
  - Movement patterns and behavior (day/night)
- For Lookout Point Dam, estimate passage metrics and survival rates, including:
  - Route distribution (turbines, regulating outlets) (day/night)
  - Dam passage efficiency (DPE) and fish passage efficiency (FPE) (day/night)
  - Dam and route-specific single-release survival
- For the Lookout tailwaters, estimate survival rates and travel times to include:
  - LOP and DEX Dam project survival
  - Travel times between LOP and DEX, and LOP and Willamette Falls.

2017-2018 Full Study Design



2017-2018 LOP 3-D Array





2017-2018 Tagging and Release

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

Table 1. Numbers of test fish.

Year	Season	Week	Time Frame	# Live Fish	# Dead Fish	Total # Fish
2017	Fall	1	Early Oct	375	32	407
		2	Mid-Oct	375	31	406
		3	Late Oct	375	31	406
		4	Early Nov	375	31	406
2018	Spring	1	Mid-March	375	32	407
		2	Late March	375	31	406
		3	Early April	375	31	406
		4	Mid-April	375	31	406
				3000	250	3250

Anticipated Results

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

- 2016-2017 Study
  - Will inform full study in fall 2017 and spring 2018:
    - Receiver array locations/detection efficiency
    - Number of study fish we can expect to pass LOP in 2017-2018
    - 3-D tracking efficiency in the LOP forebay (testing fall 2016)
    - Preliminary results presented at WSR- February 2017
- Full study, 2017-2018
  - Reservoir and forebay behavior
  - LOP route-specific survival, passage distributions, etc.
  - Residence and travel times