MODIFICATION AND EVALUATION OF LAMPREY PASSAGE STRUCTURES (LPS) AT BONNEVILLE DAM AND THE JOHN DAY DAM SOUTH FISHWAY COLLECTION TRAP

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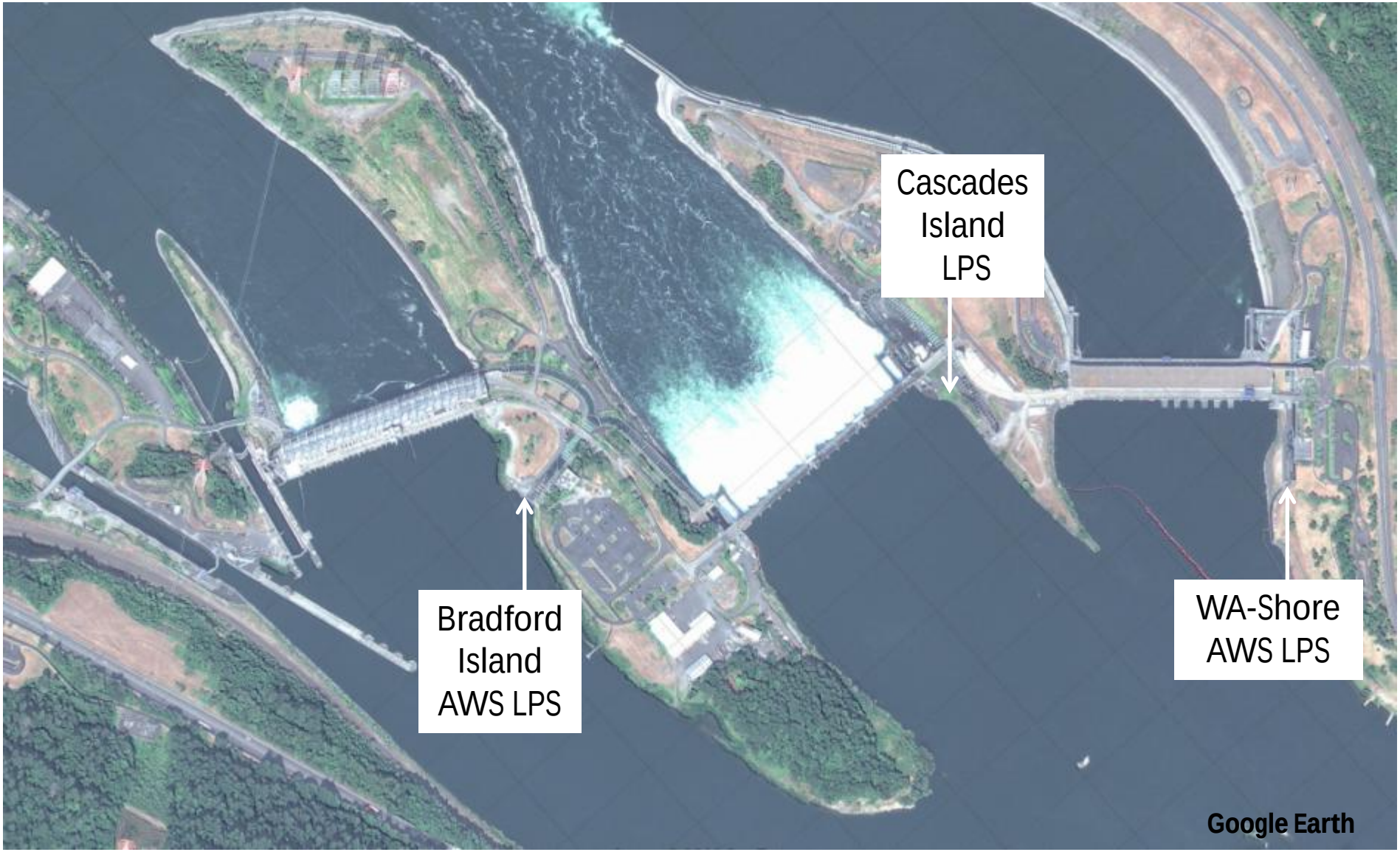
NWFSC
NMFS

USGS
science for a changing world

Lamprey Passage Structure (LPS)

Bonneville Dam

Bonneville Dam



Bonneville Dam

John Day Dam

Methods

PIT tag, half-duplex (3 x 32 mm)

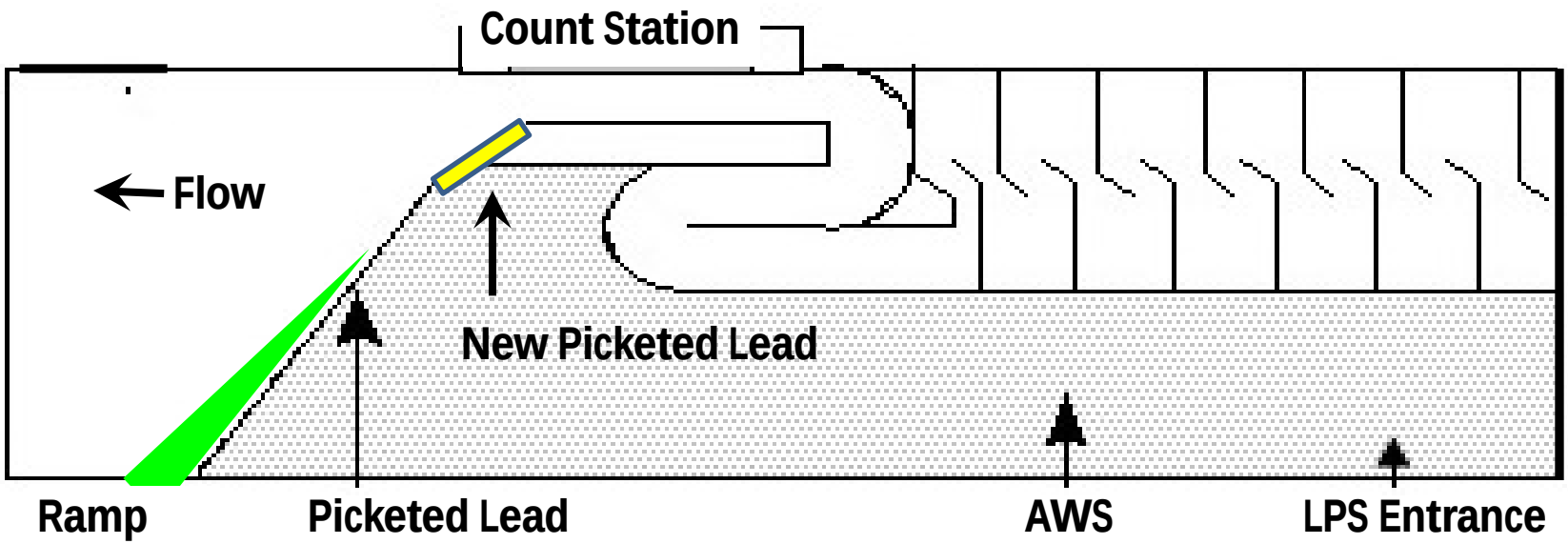
1199
Released downstream BON

599
PIT tag only

600
PIT tag
+
radio transmitter

Monitor passage using existing HD-PIT detection array

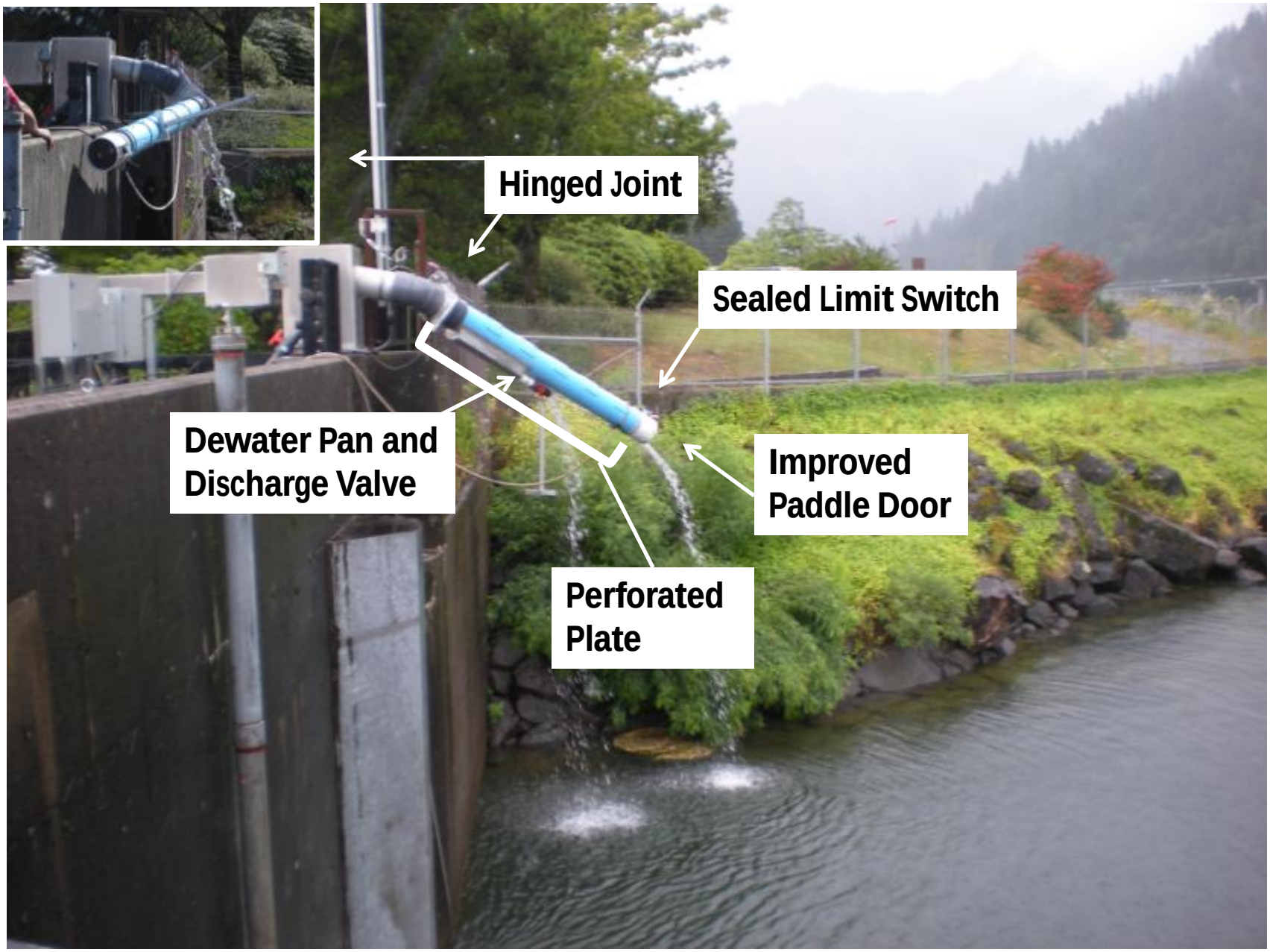
Modifications at Bradford Island Fishway



Increased access to AWS channel via metal ramp

Reduced access to area behind count station crowder

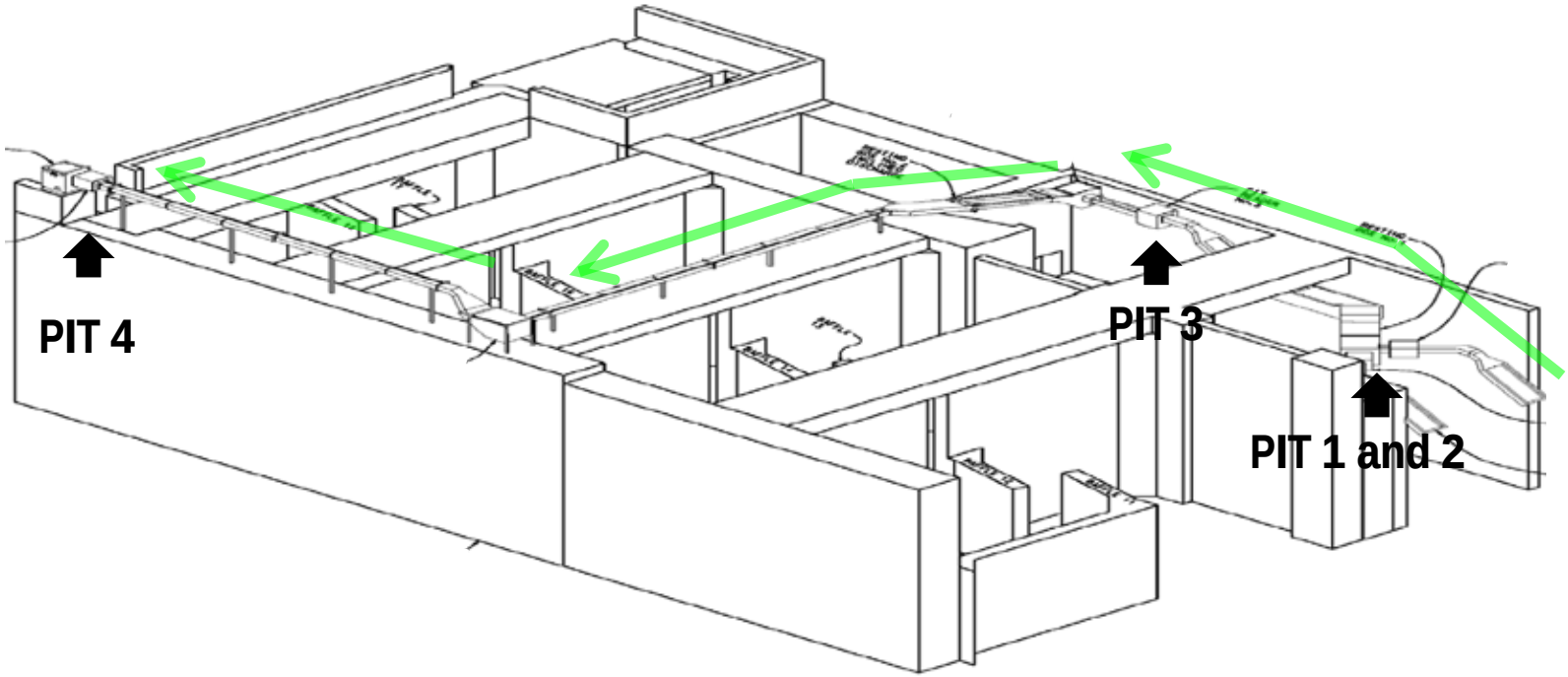
Bradford Island LPS Exit



PIT Detections – Bradford Island LPS

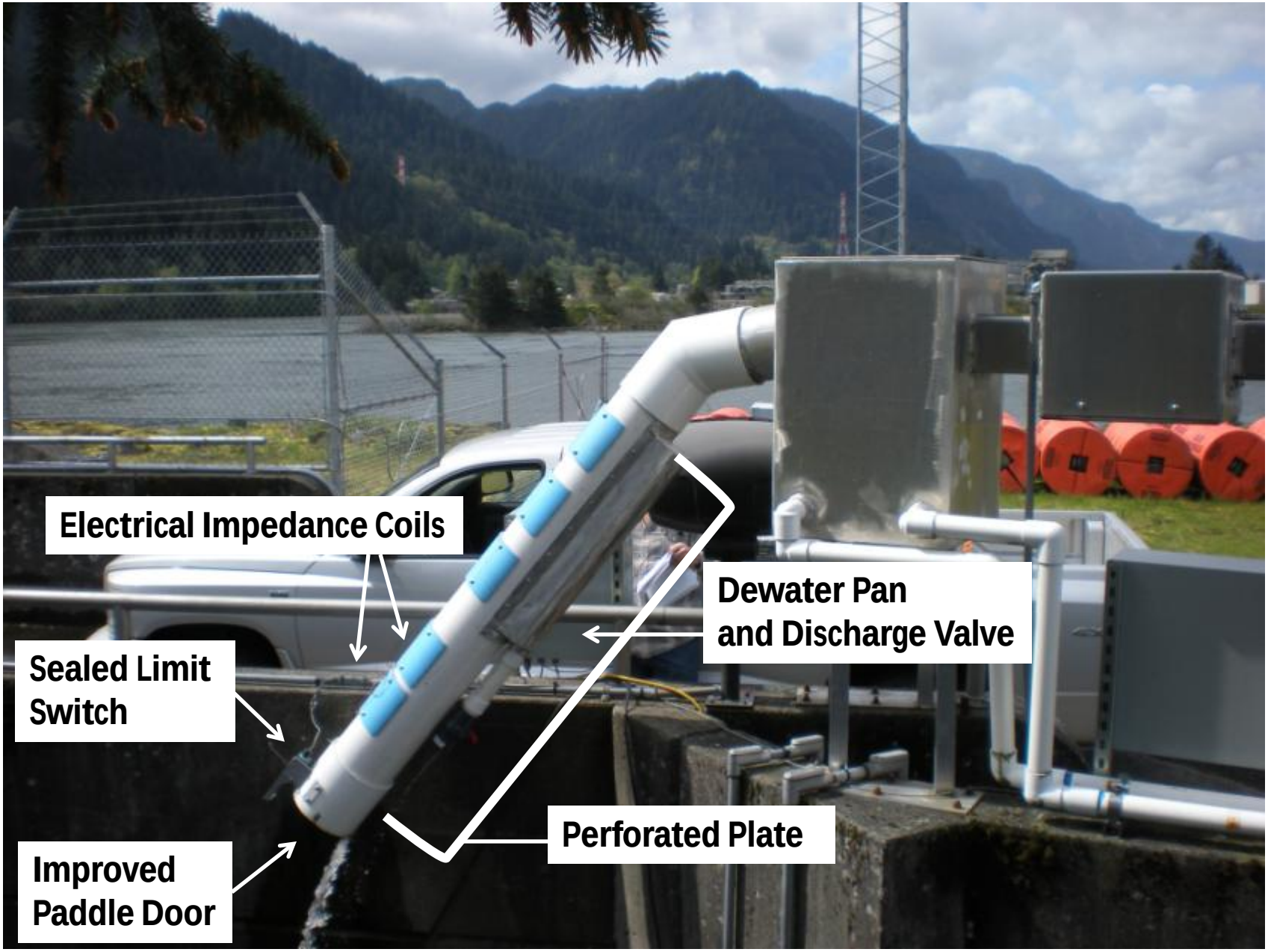
LPS watered April 23-October 20

	Detected at LPS (%) rel DS	Passage efficiency (%)	Median time to pass (h)	Passage time range (h)
2011	60/823 (7)	60/60 (100)	0.6	0.3-2.0
2012	45/976 (5)	44/45 (98)	0.6	0.4-6.0
2013	43/1073 (4)	42/43 (98)	0.7	0.3-1.9
2014	**39/1199 (3)**	**39/39 (100)**	**0.7**	**0.4-1.5**

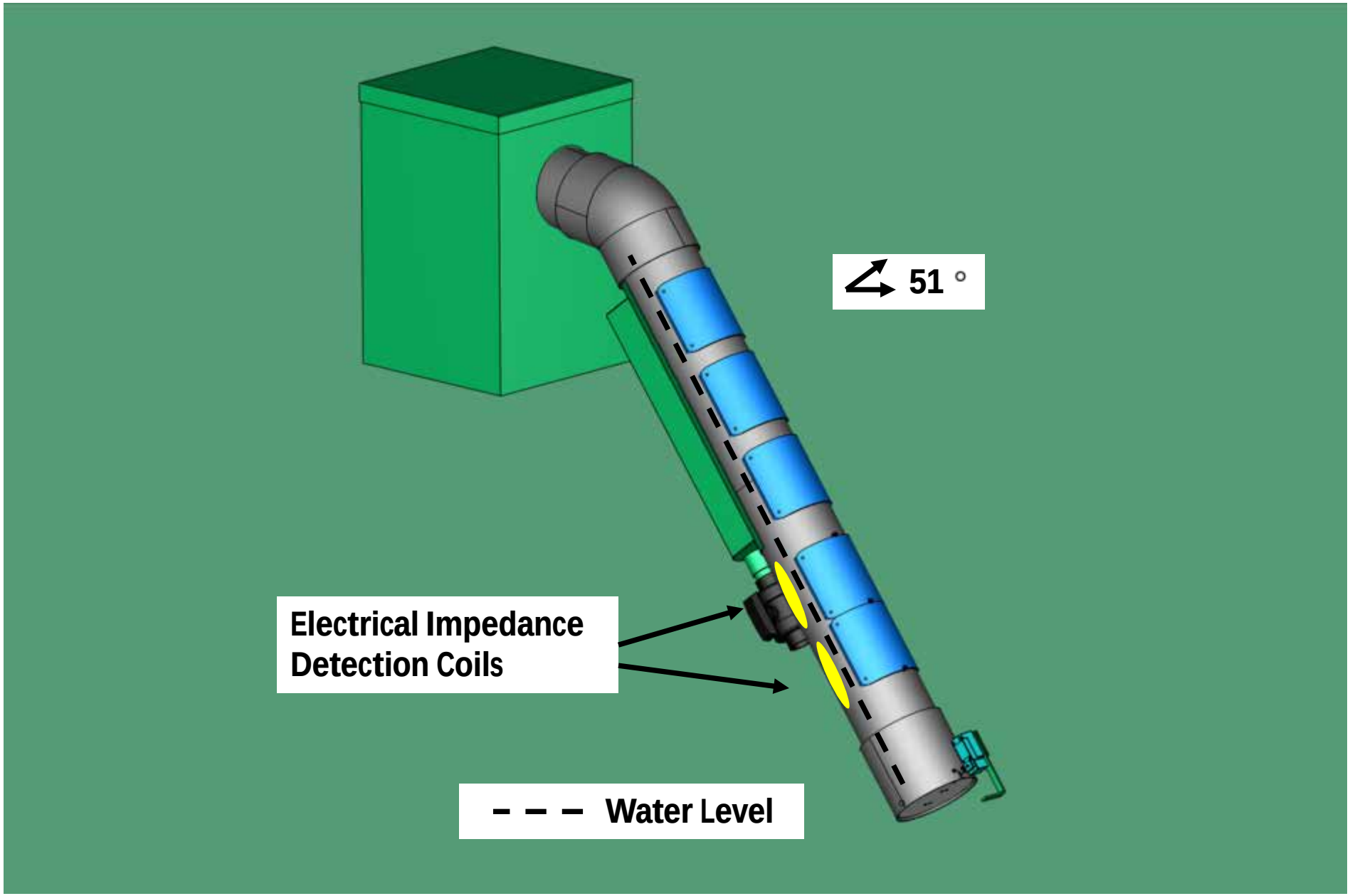


Bonneville Dam

Washington Shore LPS Exit



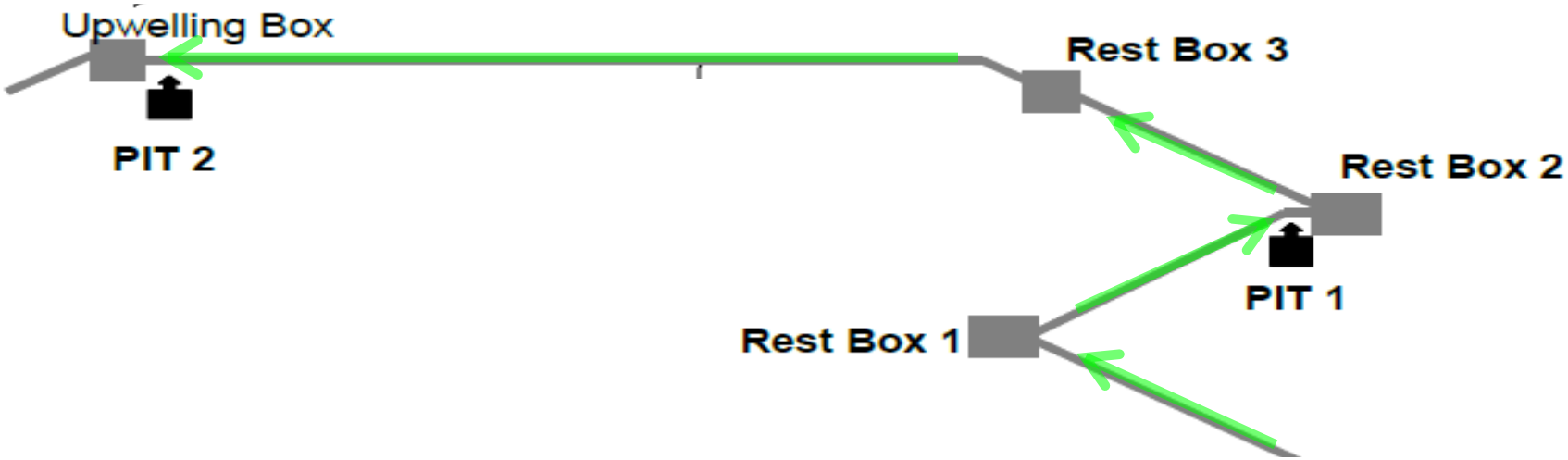
Washington Shore LPS Exit Electrical Impedance



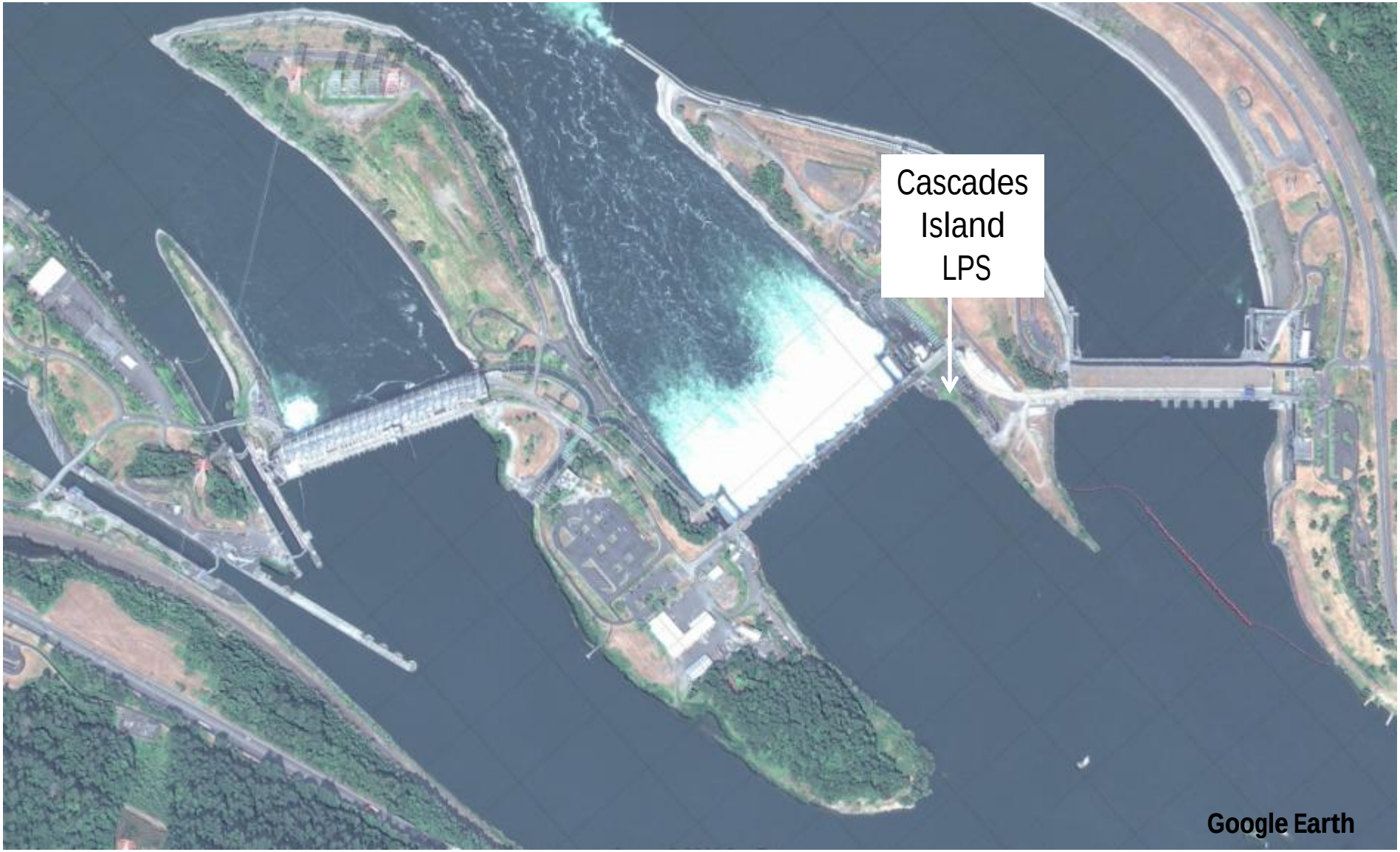
PIT Detections - Washington Shore LPS

LPS watered April 1-October 29

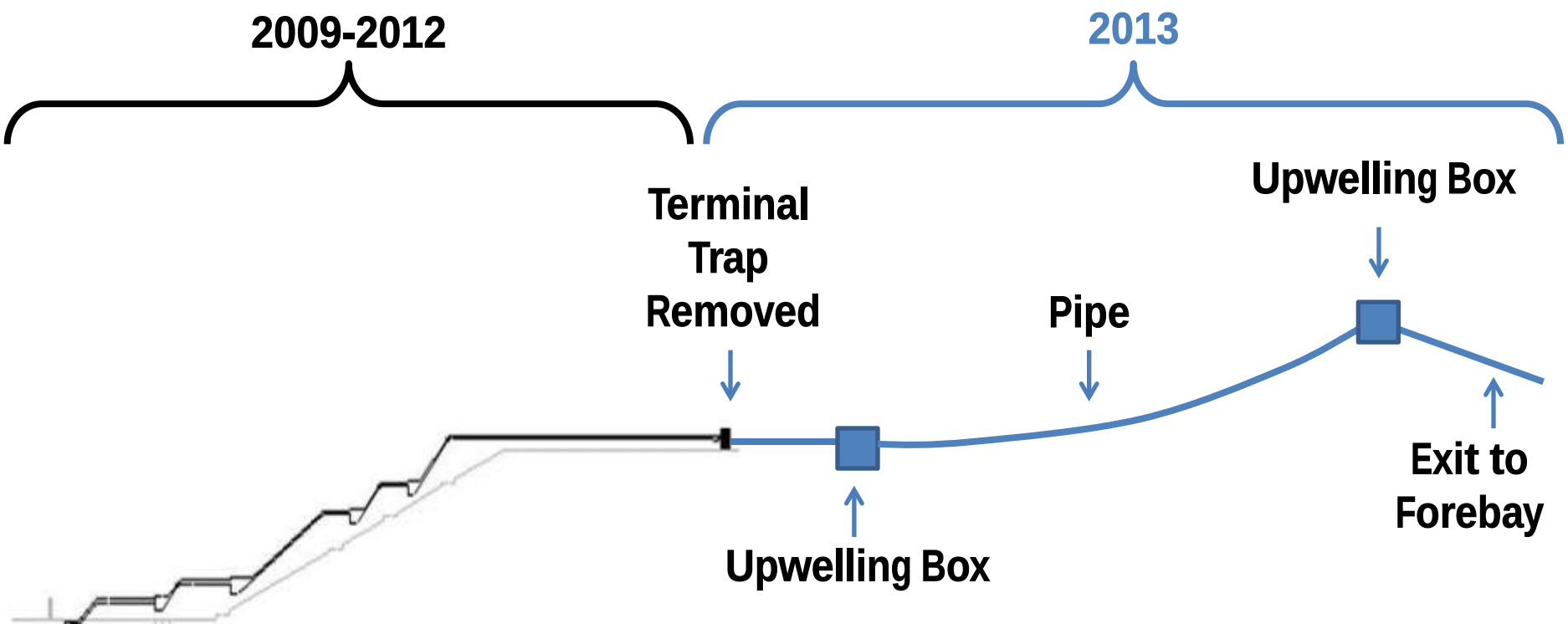
	Released DS and Detected at LPS (%)	Passage efficiency (%)	Median time to pass (h)	Passage time range (h)
2011	62/823 (8)	53/62 (85)	0.4	0.2-1.7
2012	62/976 (6)	56/62 (90)	0.5	0.3-1.6
2013	227/1073 (21)	195/227 (86)	0.6	0.2-3.72
2014	**197/1199 (16)**	**179/197 (91)**	**0.5**	**0.2-3.1**



Bonneville Dam

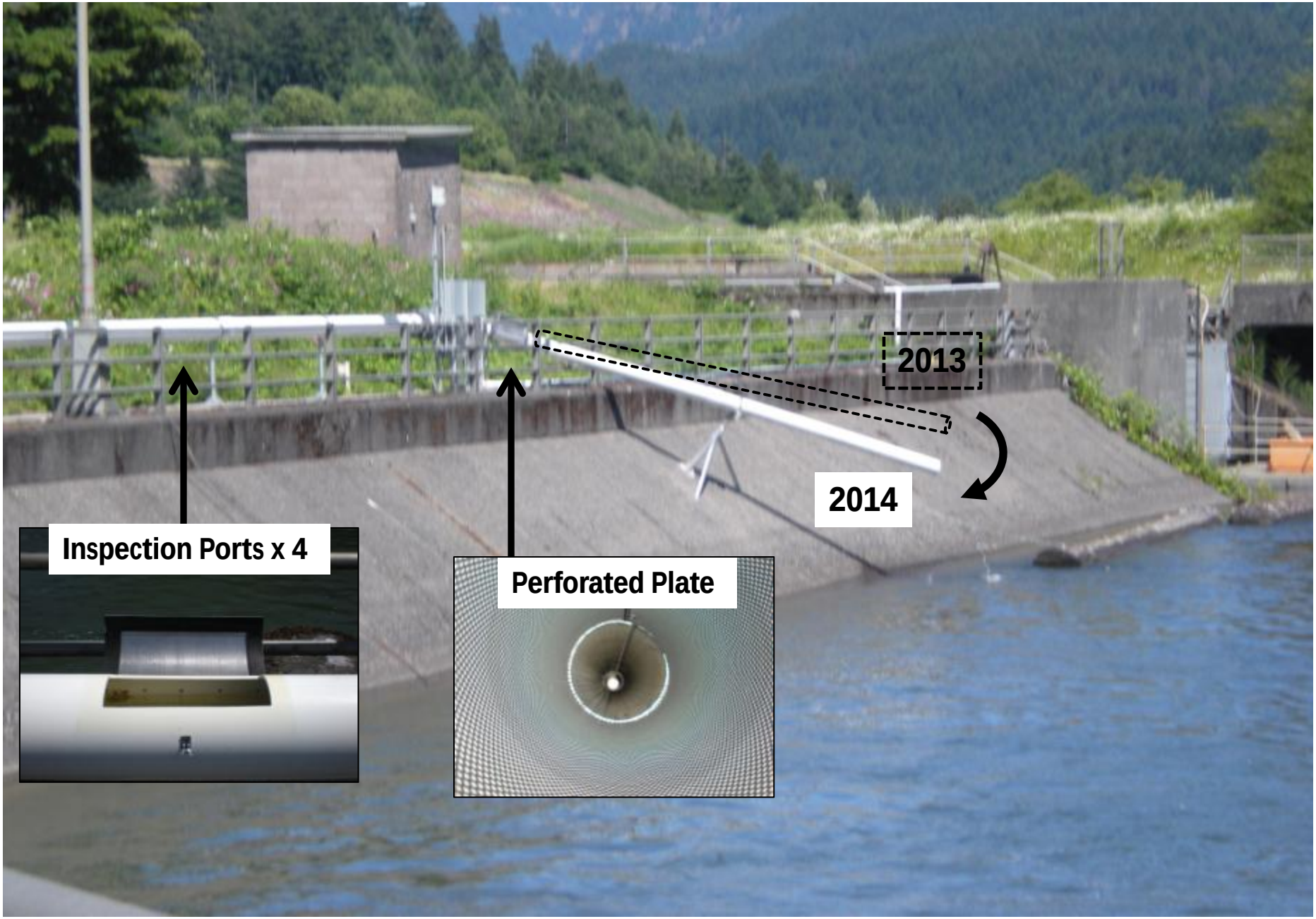


Cascades Island LPS Extension



Tailrace

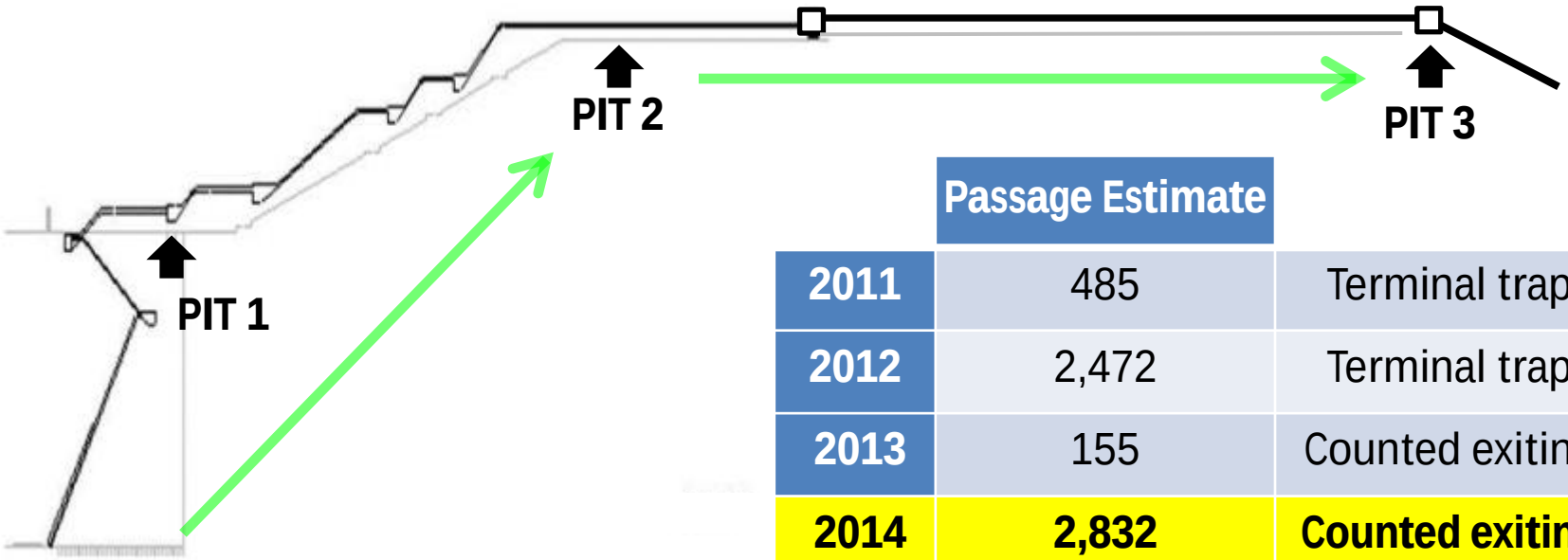
Cascades Island LPS Exit



PIT Detections - Cascades Island LPS

LPS watered May 14-October 30

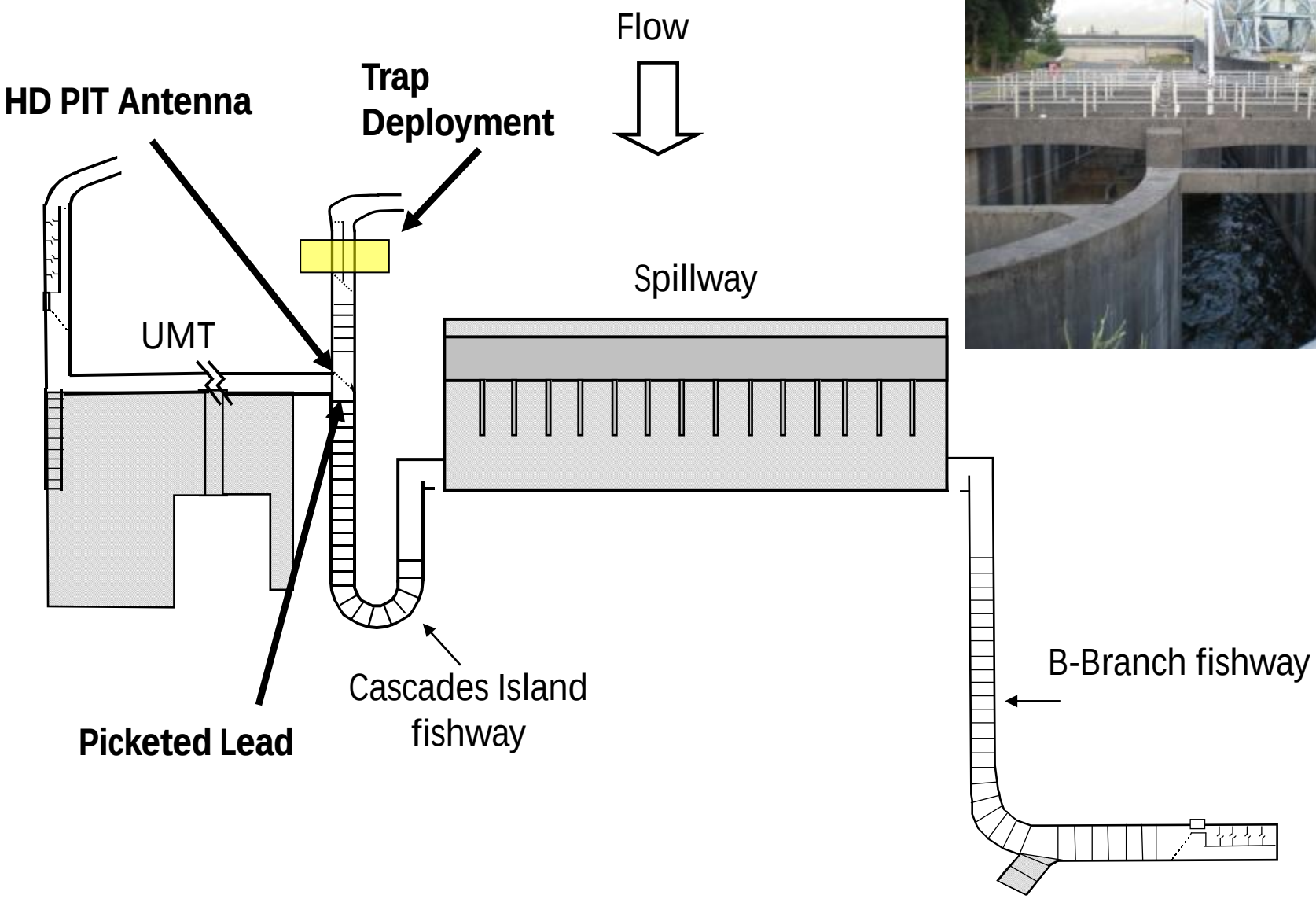
	Detected at LPS (%) rel DS	Passage efficiency (%)	Median time to pass (h)	Passage time range (h)
2013	3/1073 (0.3)	2/3 (66)	1.6	1.6-1.6
2014	**7/1199 (1)**	**7/7 (100)**	**2.9**	**1.7-20.9**



	Passage Estimate	
2011	485	Terminal trap
2012	2,472	Terminal trap
2013	155	Counted exiting
2014	**2,832**	**Counted exiting**

Bonneville Dam

Cascades Island Auxiliary Water Supply Channel



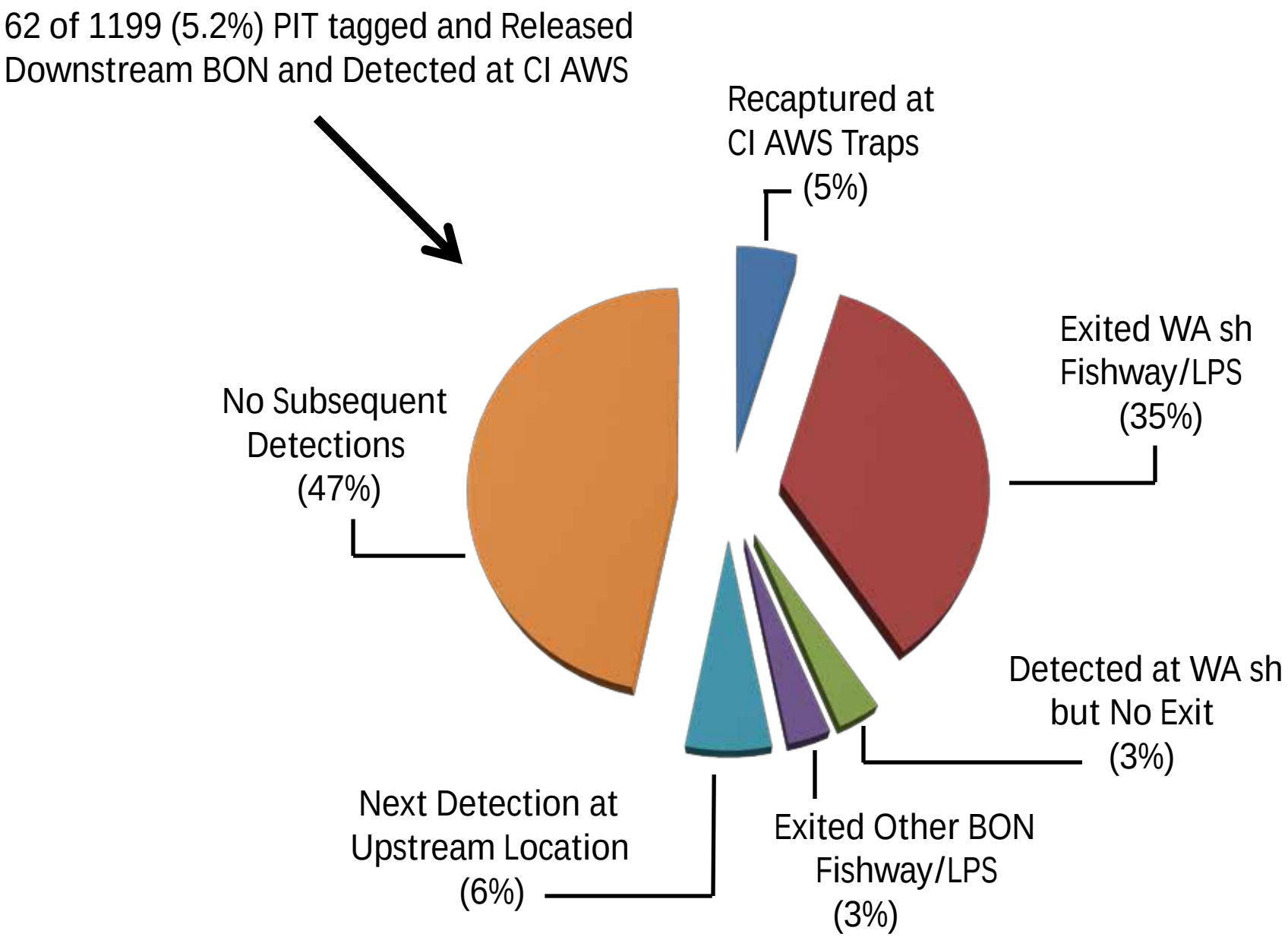
Cascades Island AWS Trapping

	Date Range	Lamprey Captured and Released Upstream of BON
2012	8/16-9/20	268
2013	7/9-10/23	625
2014	**5/19-10/30**	**1,512**

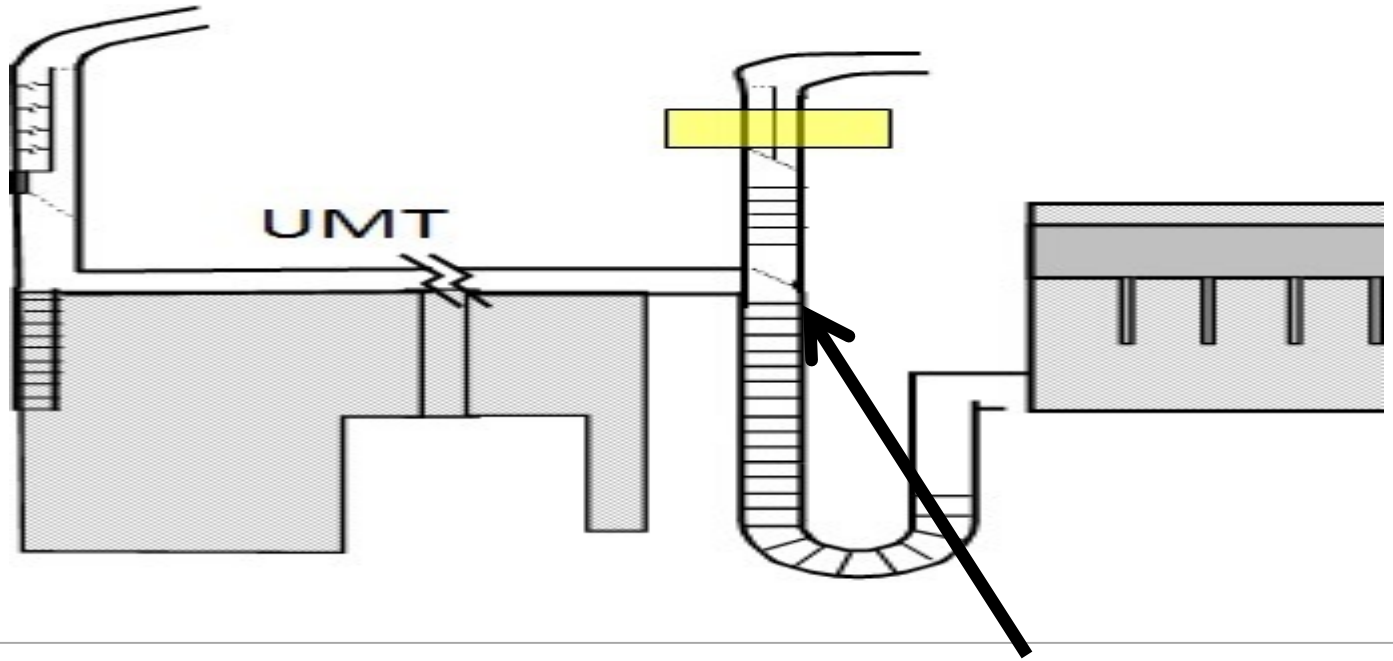
62 of 1199 (5.2%) PIT tagged released DS from BON detected

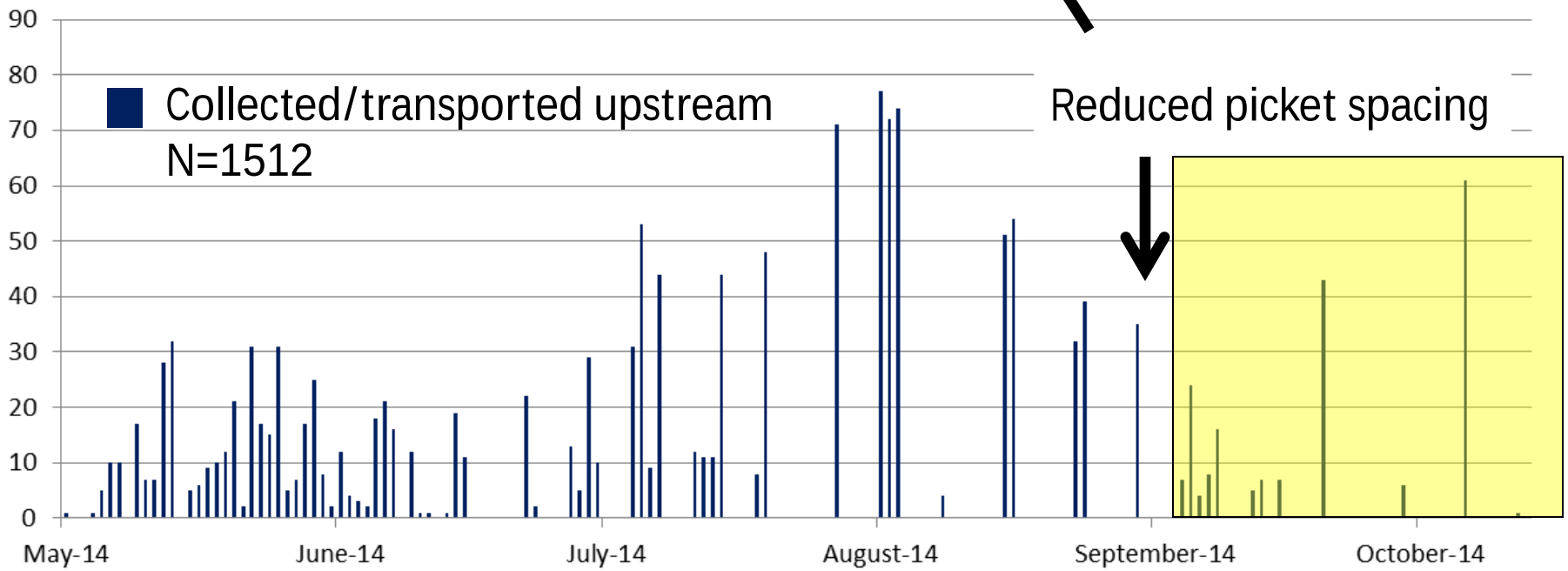
7-10% 2007-2013

Fate of PIT Tagged Lamprey Detected at Cascades Island AWS



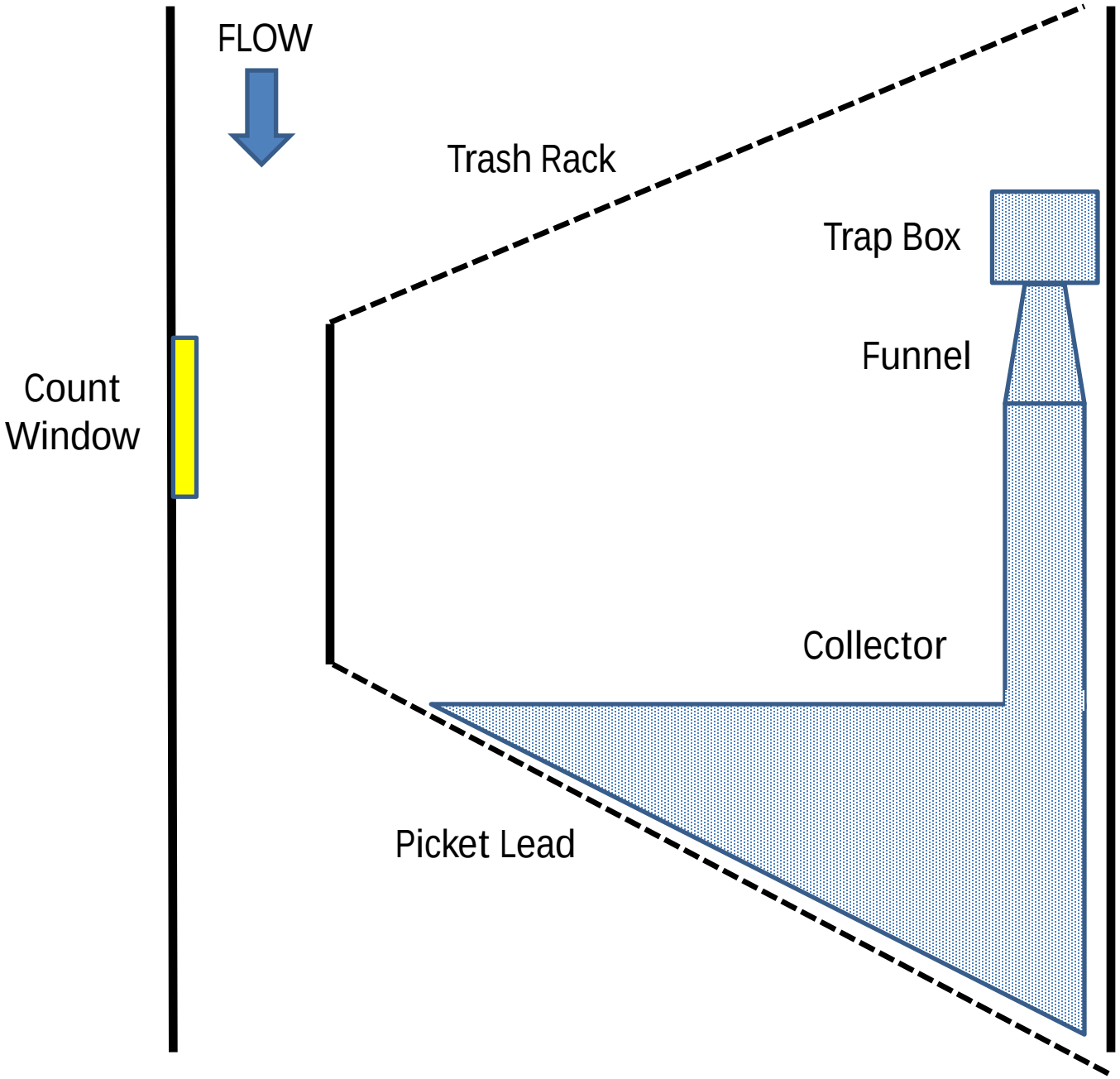
Reduced Picket Spacing at Cascades Island AWS

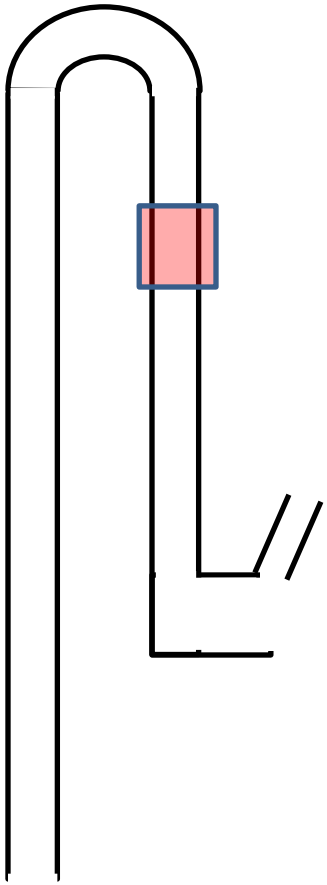


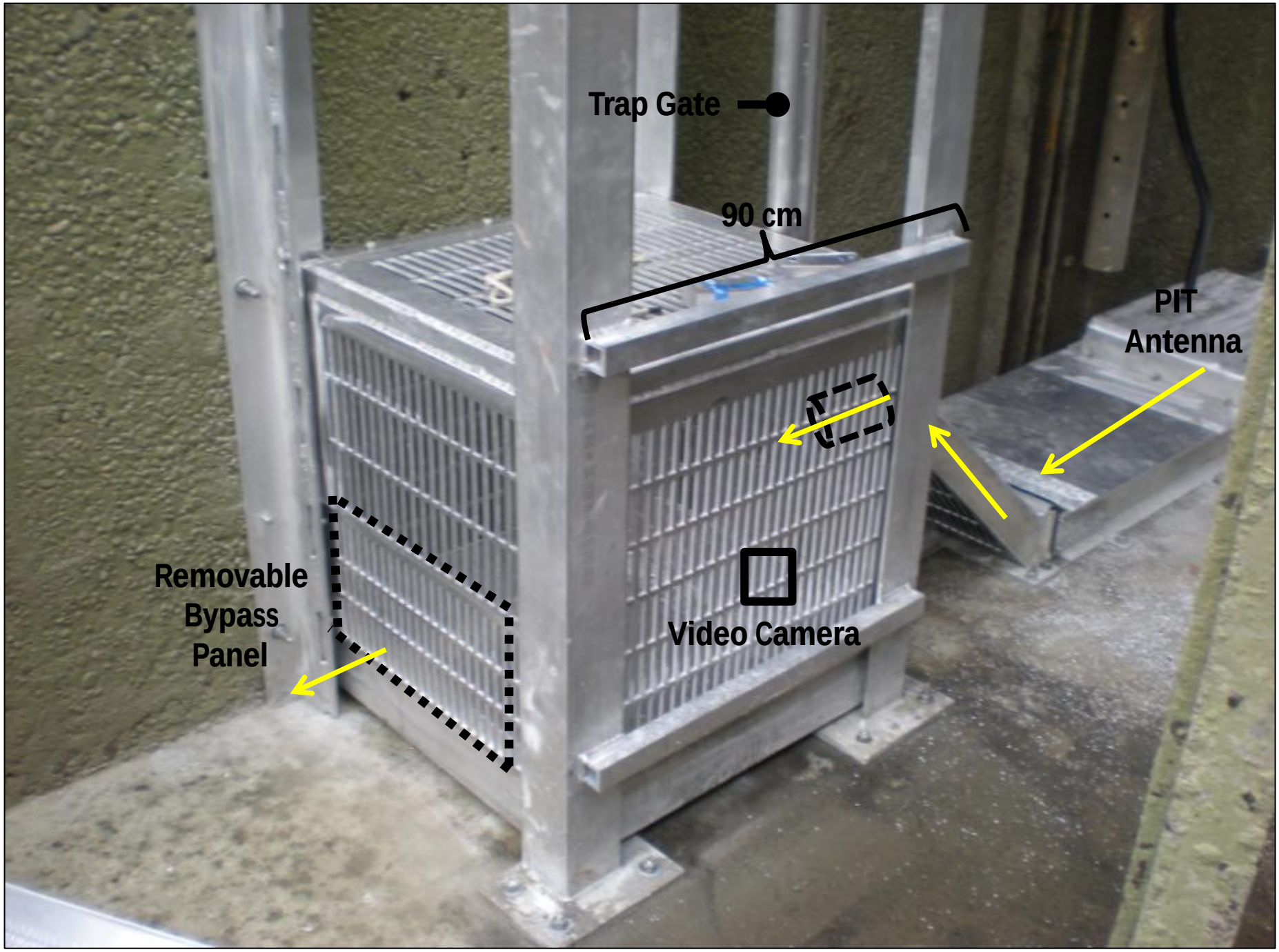


John Day Dam

John Day Dam South Fishway Lamprey Trap






Trap Gate
90 cm
PIT
Antenna
Removable
Bypass
Panel
Video Camera

PIT Detections at John Day South Lamprey Trap

16 PIT-Only

5 PIT+Radio

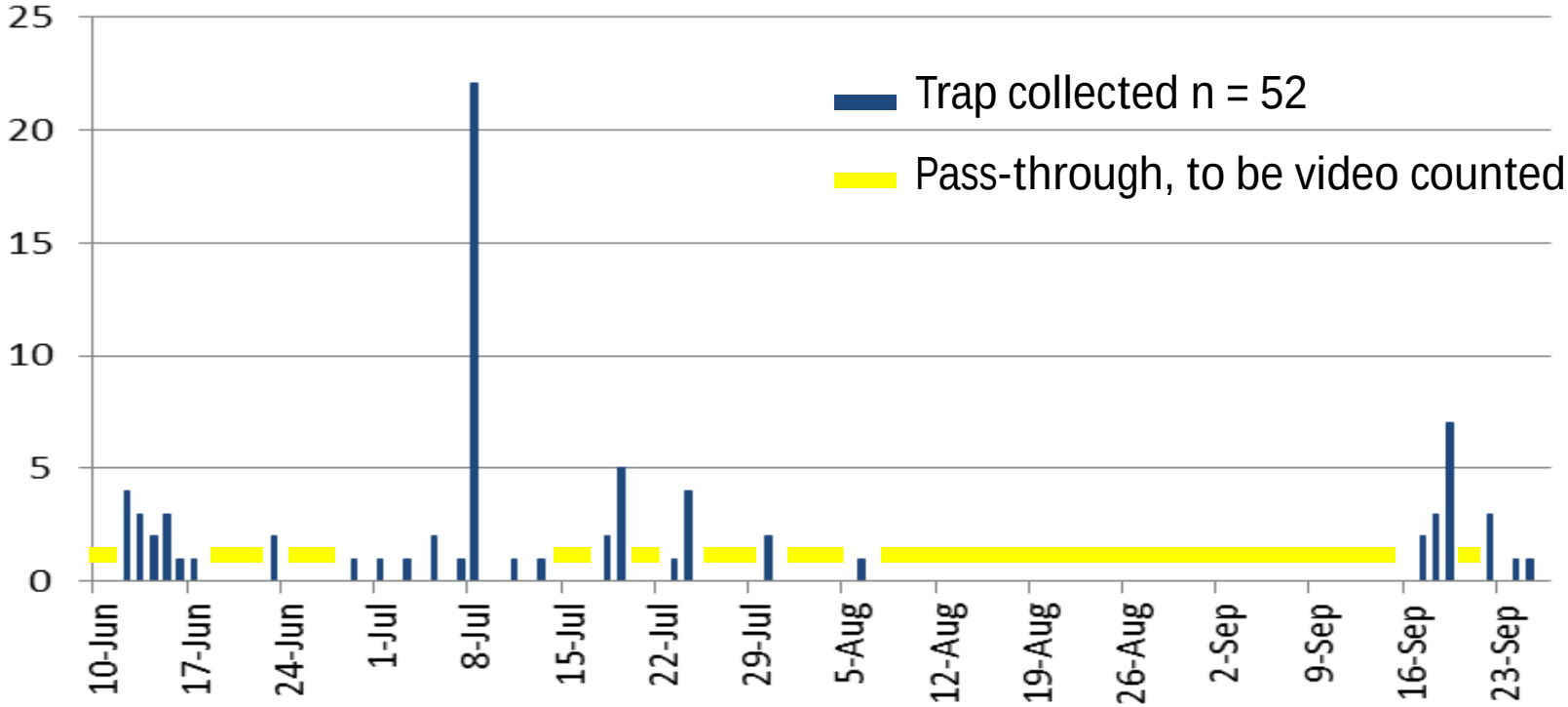
11 tagged 2013

32 HD PIT-tagged lamprey detected

2013= 39

6 PIT tagged lamprey recaptured

Collection and Passage at John Day South Lamprey Trap



Conclusions

- Problems exist with LPS passage estimation despite modifications to exit slides
- Improved access to Bradford Island AWS LPS
- High use of WA shore LPS following operational change in 2013
- Trapping and recaptures at the CI AWS indicate that lamprey continue to access despite reduced picket spacing
- Passage estimation at John Day South trap in progress

Thanks to:

- Mike Hanks (Ocean Associates) Bill Wassard, Jeff Moser, Galen Wolf, Ron Marr, Louis Tullos (NOAA Fisheries, Pasco Research Station)

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