

Using the Juvenile Salmon Acoustic Telemetry (JSATS) system to evaluate adult Pacific lamprey movements and fate in Columbia River reservoirs.



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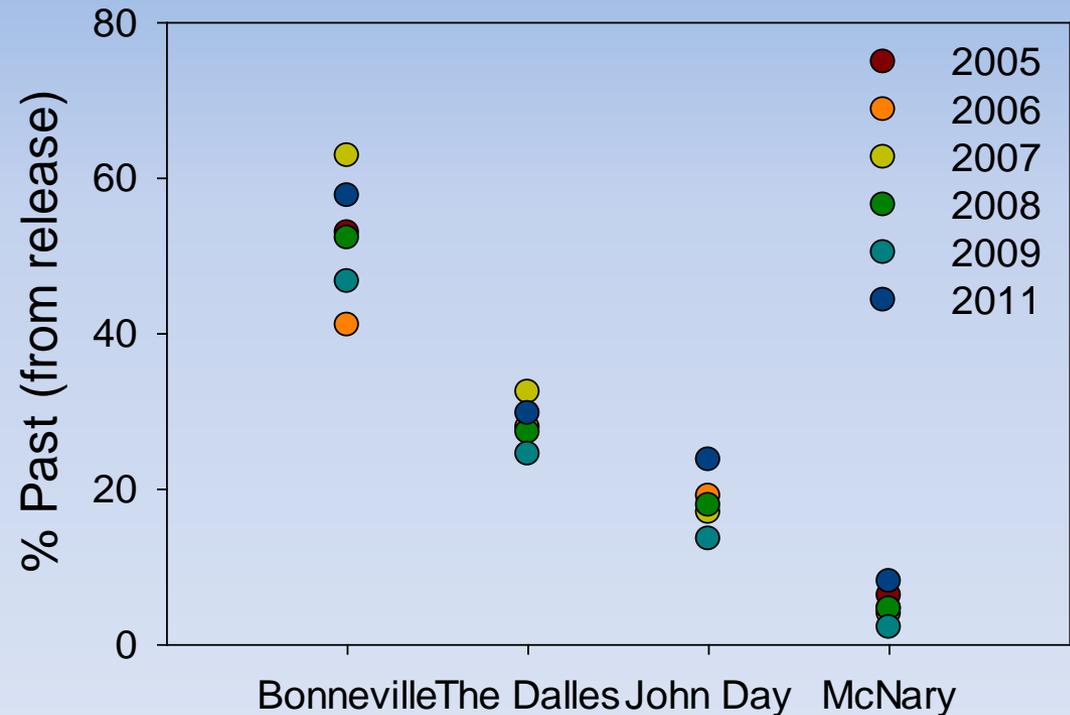
Idaho Cooperative Fish and Wildlife Department
Department of Fish and Wildlife Resources
University of Idaho



Adult lamprey reach escapement (HD-PIT)



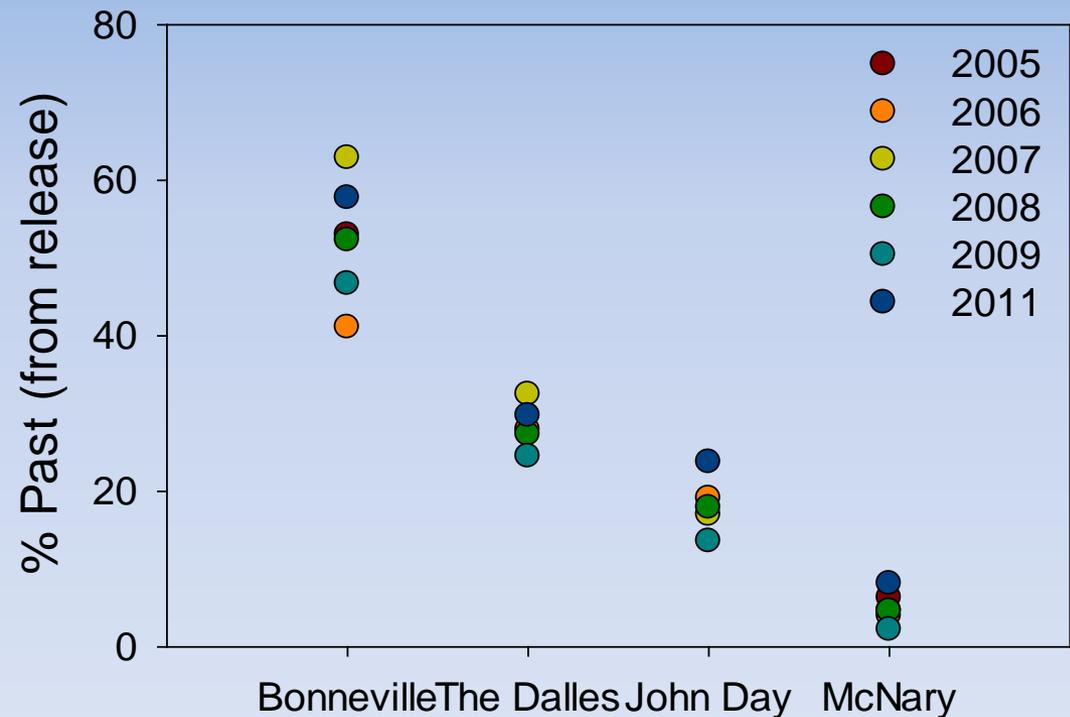
- 37-59% of HD-PIT tagged adults released below Bonneville Dam did not pass (2005-2011)
- Above Bonneville Dam, 58% of adults did not pass The Dalles (2008 RT, year with best telemetry monitoring)
- **Fate of unaccounted lampreys?**



Adult lamprey reach escapement (HD-PIT)



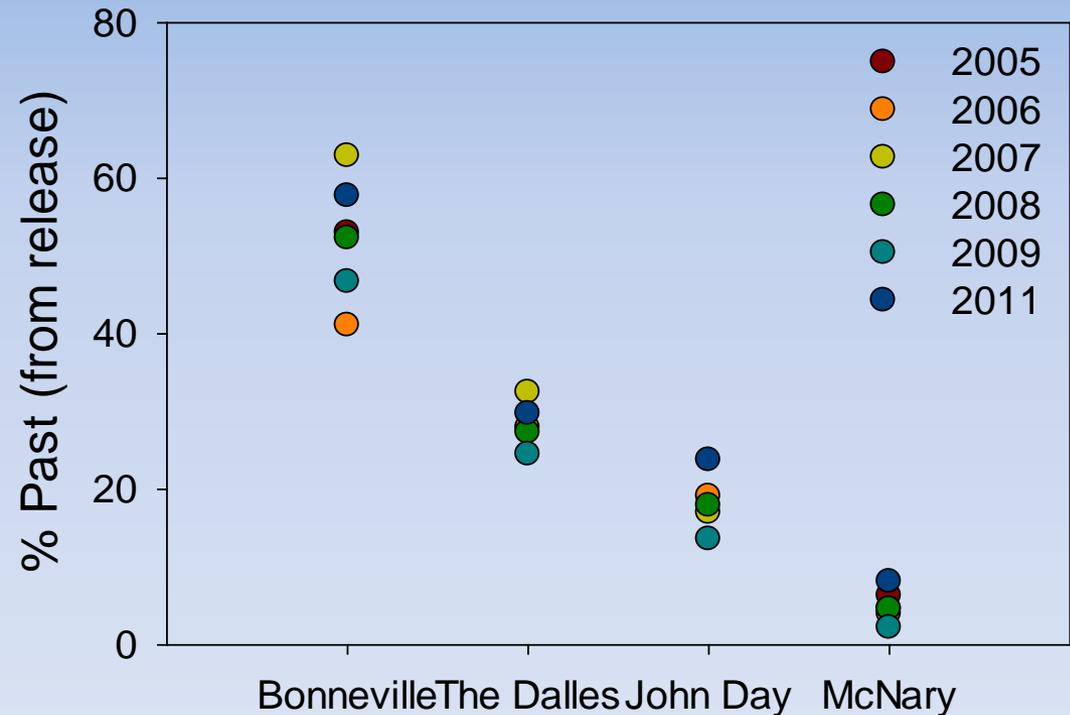
- Mortality?
- Tailrace spawning?
- Unmonitored tributaries?
- Overwintering in mainstem followed by tributary entry in spring?



Adult lamprey reach escapement (HD-PIT)



- Mortality?
- Tailrace spawning?
- Unmonitored tributaries?
- Overwintering in mainstem followed by tributary entry in spring?
- Monitor with JSATS technology:
 - suitable for deep water
 - longer tag life
 - no external antenna



2012 Objectives

- Monitor behavior and determine fate of adult Pacific lamprey below Bonneville Dam and in Bonneville Reservoir
- Continue monitoring for adult Pacific lamprey tagged in 2011
- Evaluate acoustic mobile tracking system

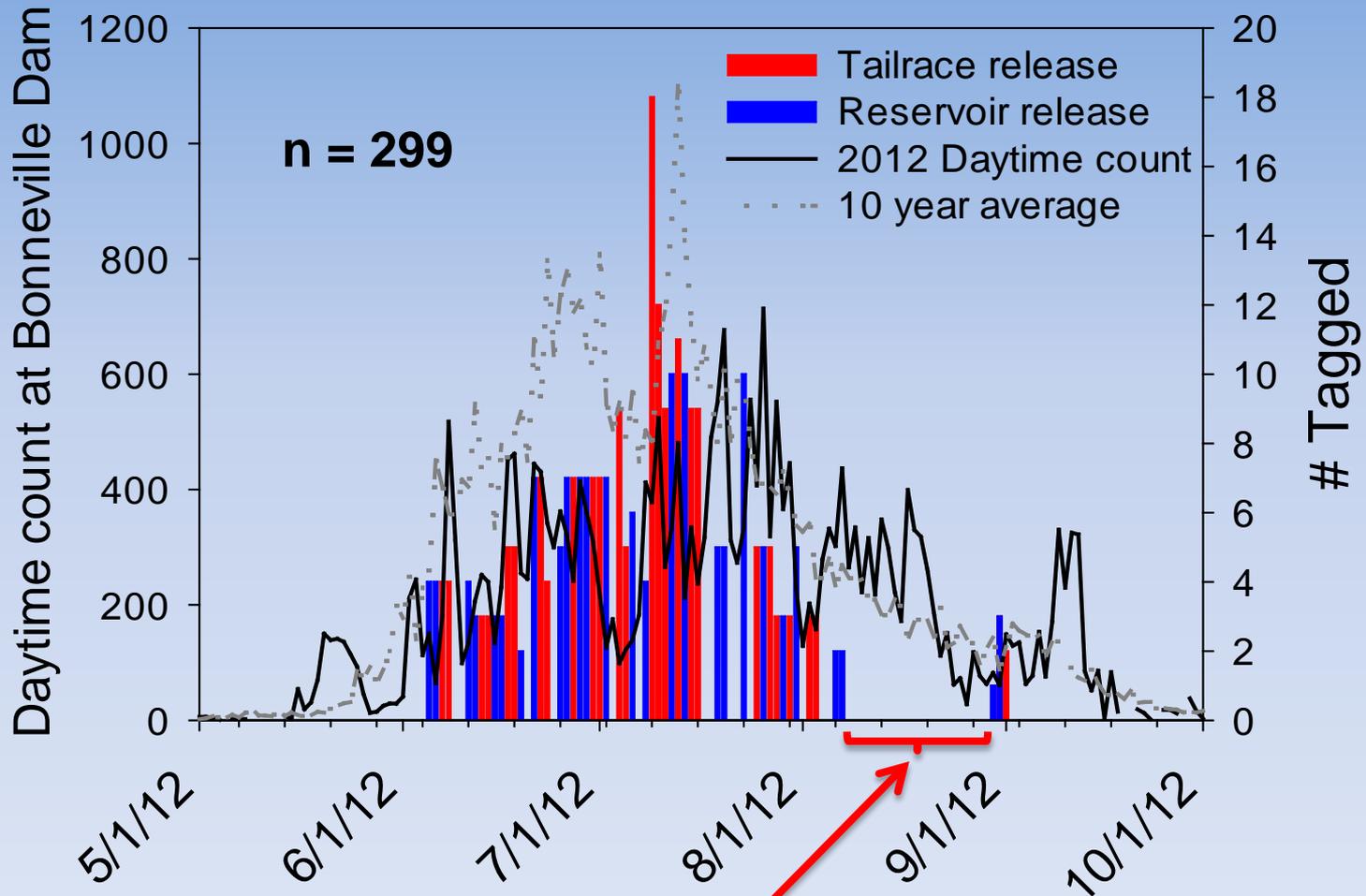
Lamprey Tagging

- Lamprey captured WA shore fish ladder
- Weight, length, and girth
- Surgically implanted JSATS tag and Half Duplex (HDX) PIT



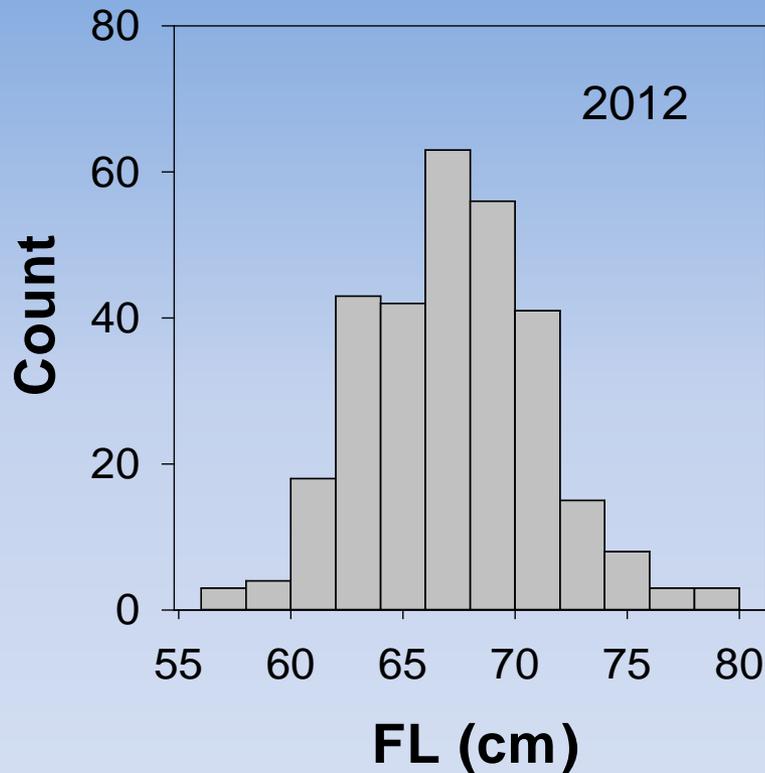
2012 JSATS tag 23 x 8 x 4 mm
Tag life = 400 days @ 10 sec
1.7 g Tag burden ~ 0.4%

Tagging Results

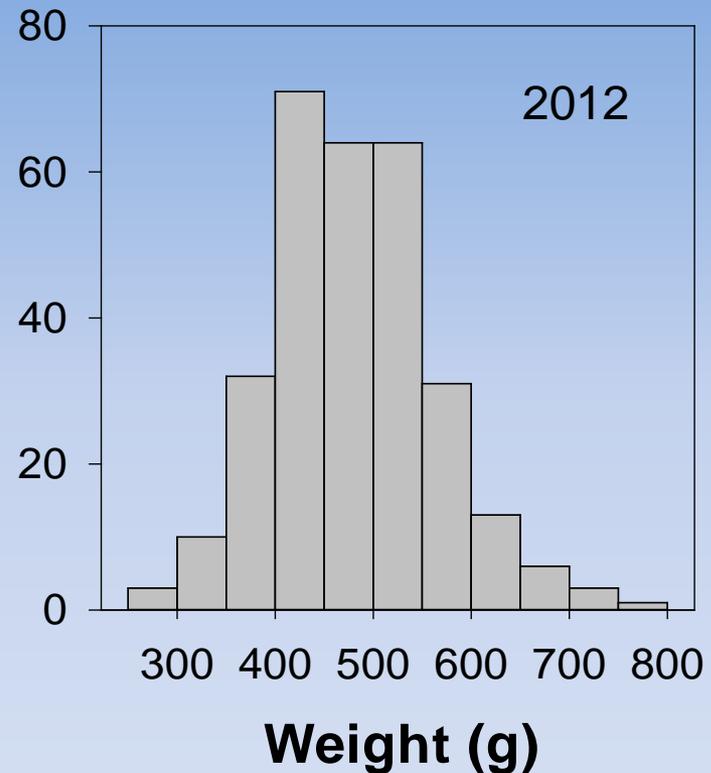


Tagging suspended due to high water temperature

Tagging Results



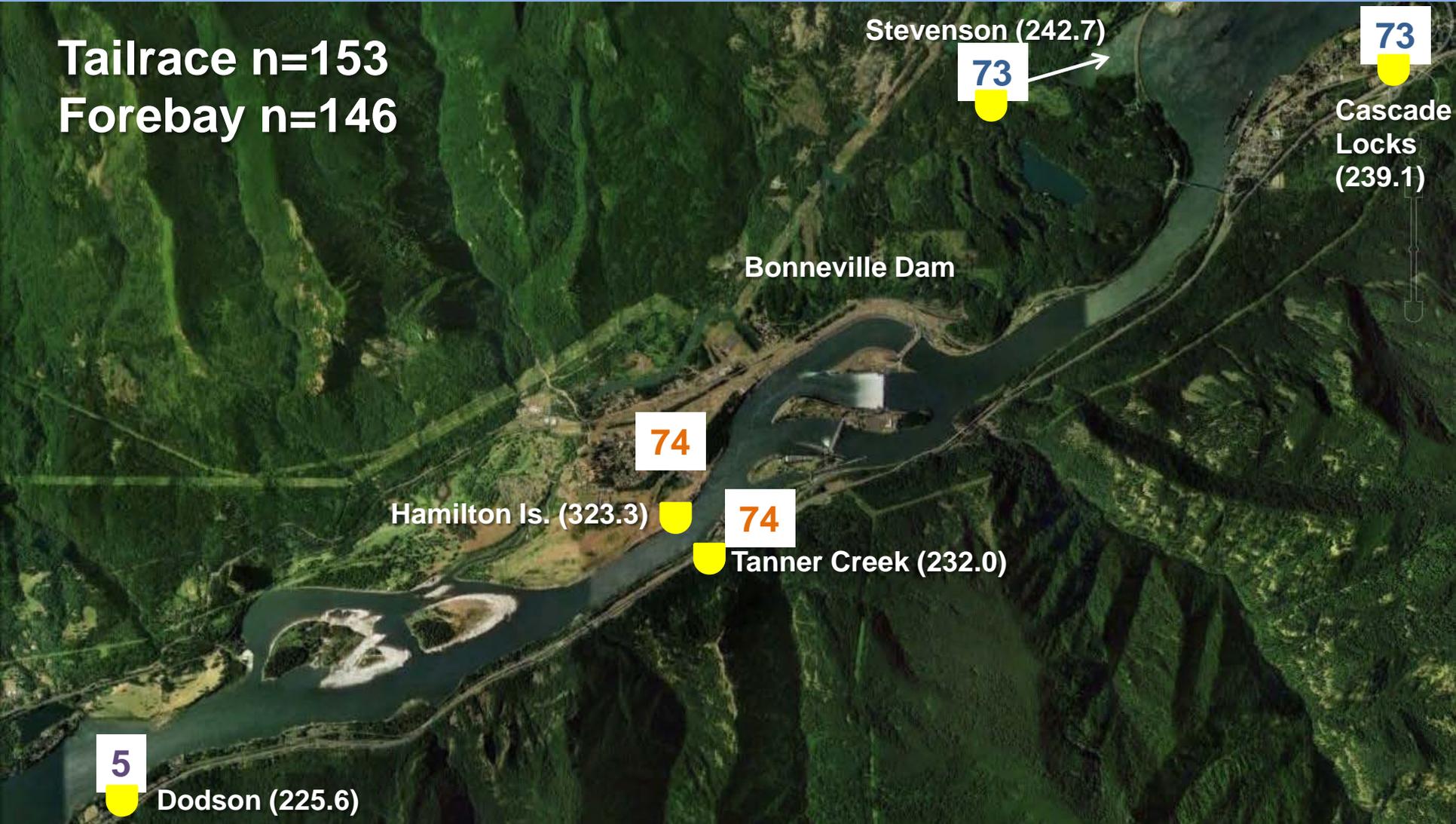
2012 mean length = 67.0 cm
2011 mean length = 65.0 cm



2012 mean weight = 479 g
2011 mean weight = 439 g

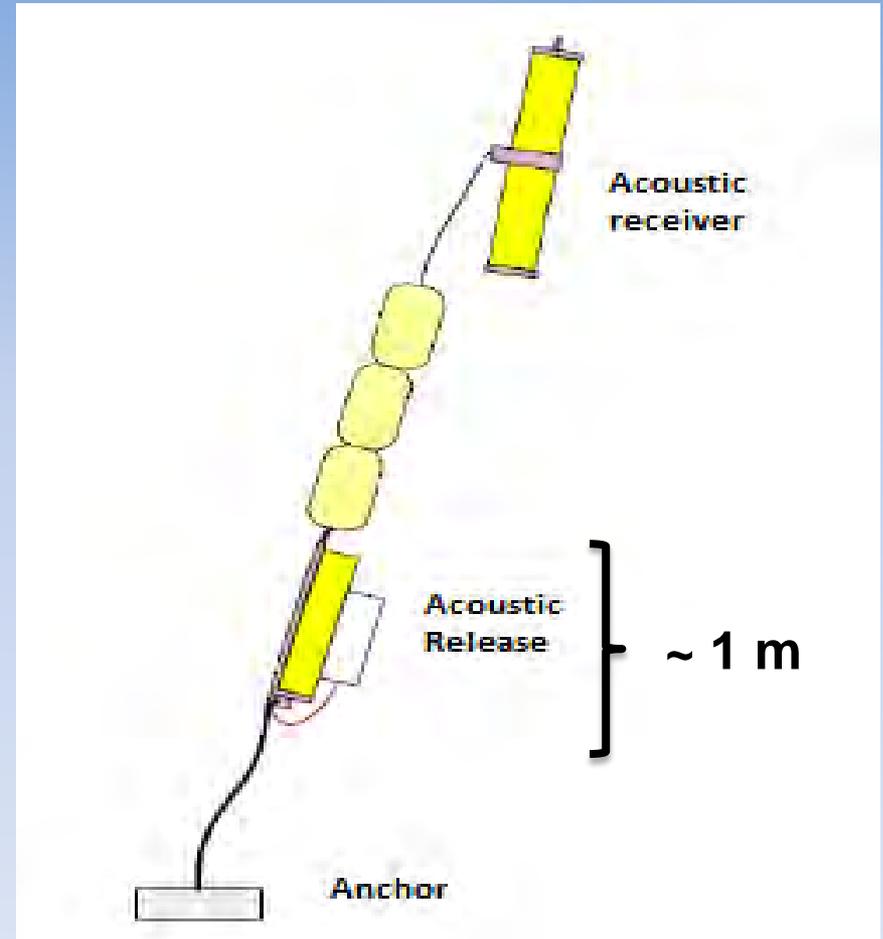
Release Sites

Tailrace n=153
Forebay n=146

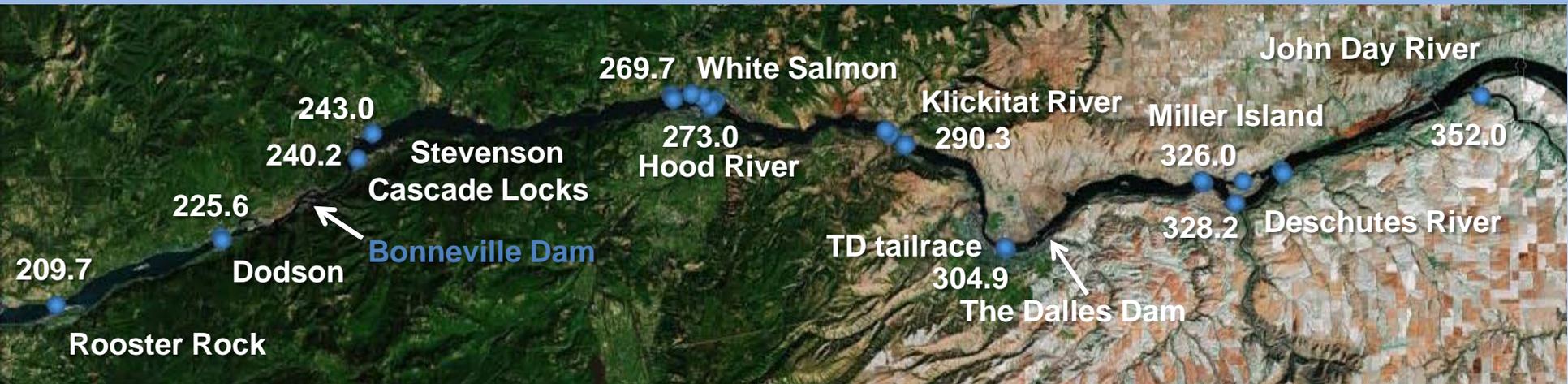


JSATS Monitoring

- Acoustic Receiver (aka “Node”) and hydrophone
- Acoustic Release
- ~ 35 day deployment duration

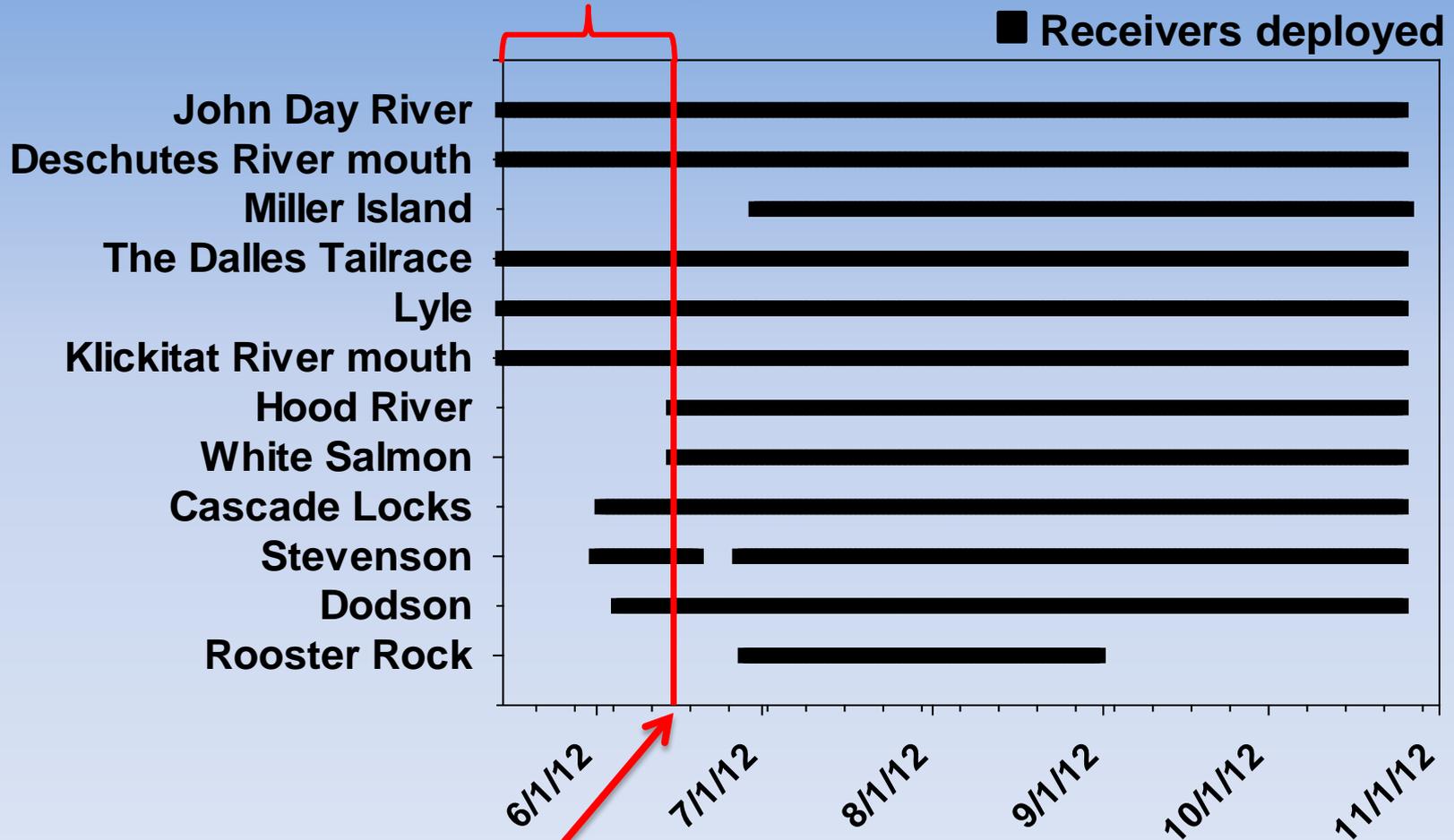


JSATS Monitoring



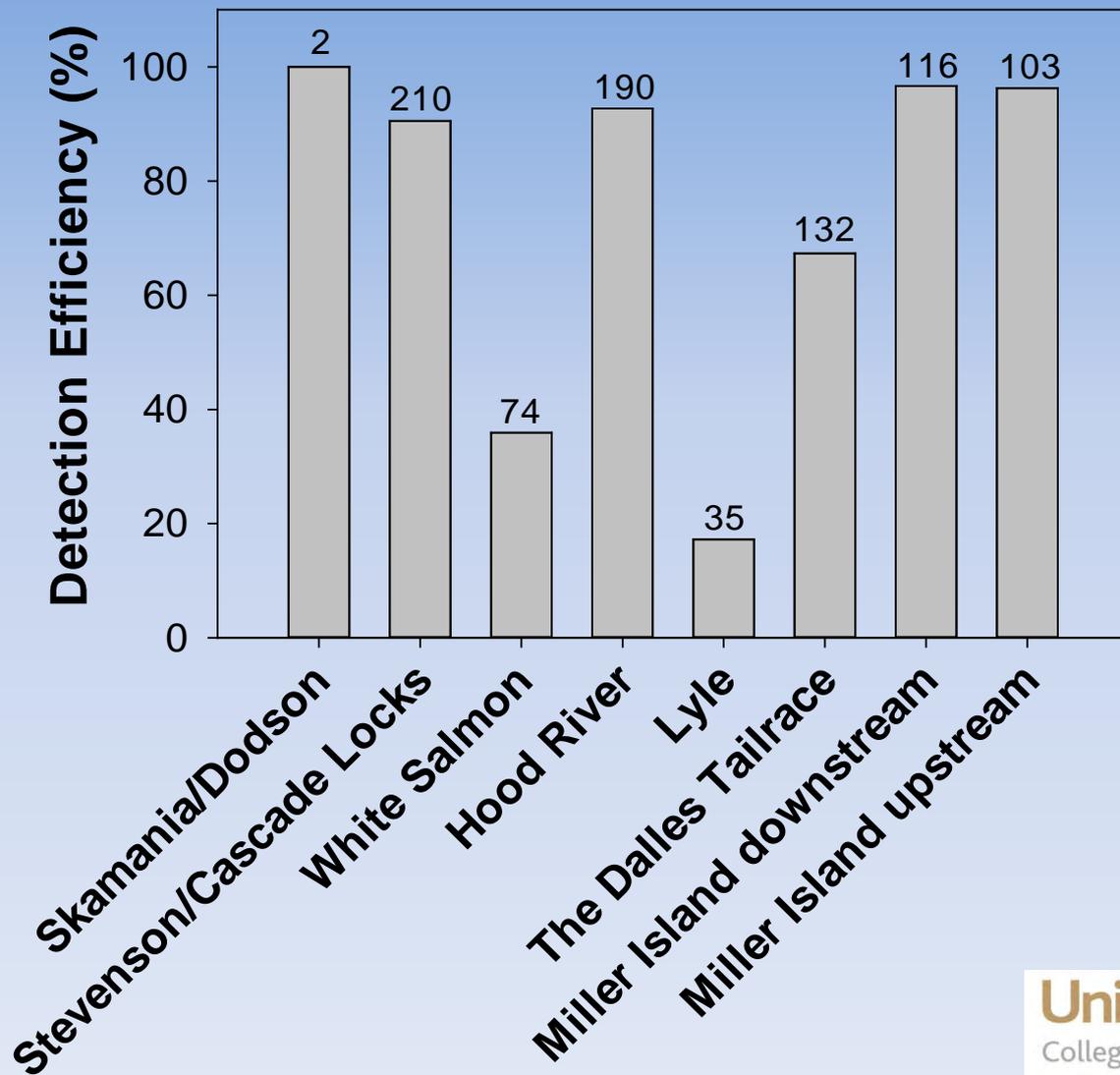
Deployment Schedule

Monitoring for overwintering 2011 lamprey



2012 tagging effort begins

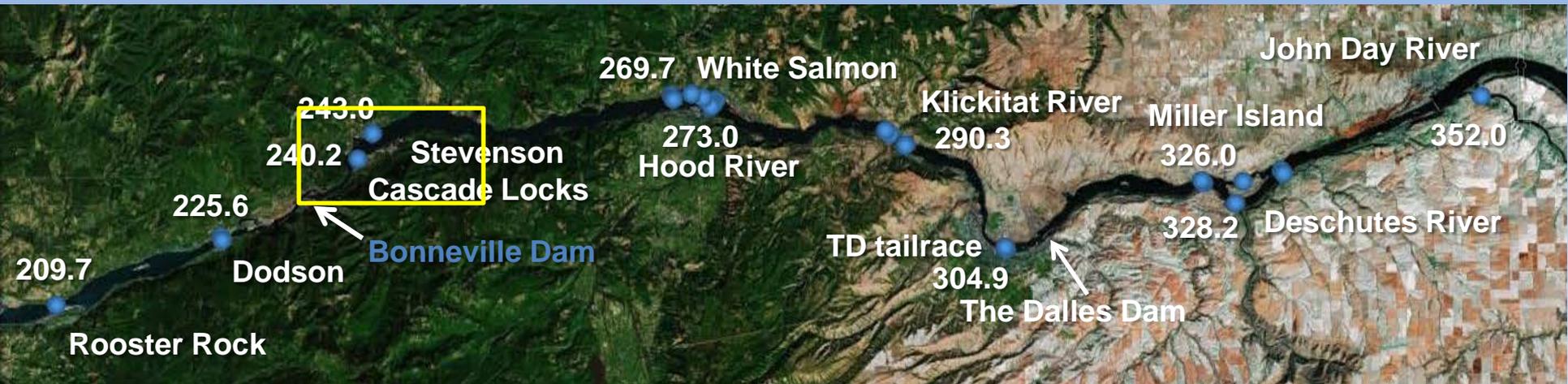
Detection Efficiencies



2012 Objectives

- Monitor behavior and determine fate of adult Pacific lamprey above Bonneville Dam
 - Reservoir behavior
 - Distribution and fate
 - Tributary use

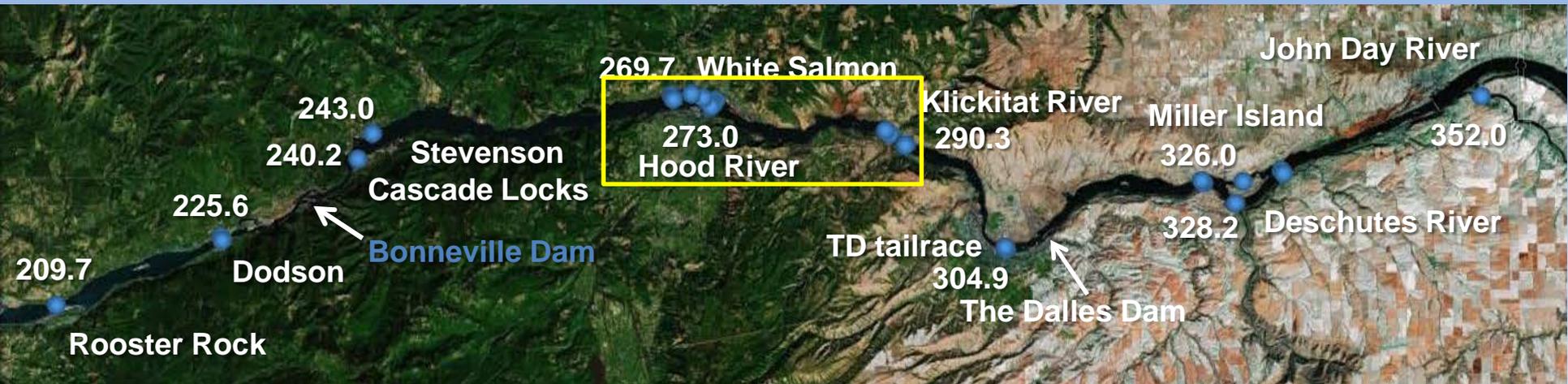
JSATS Monitoring



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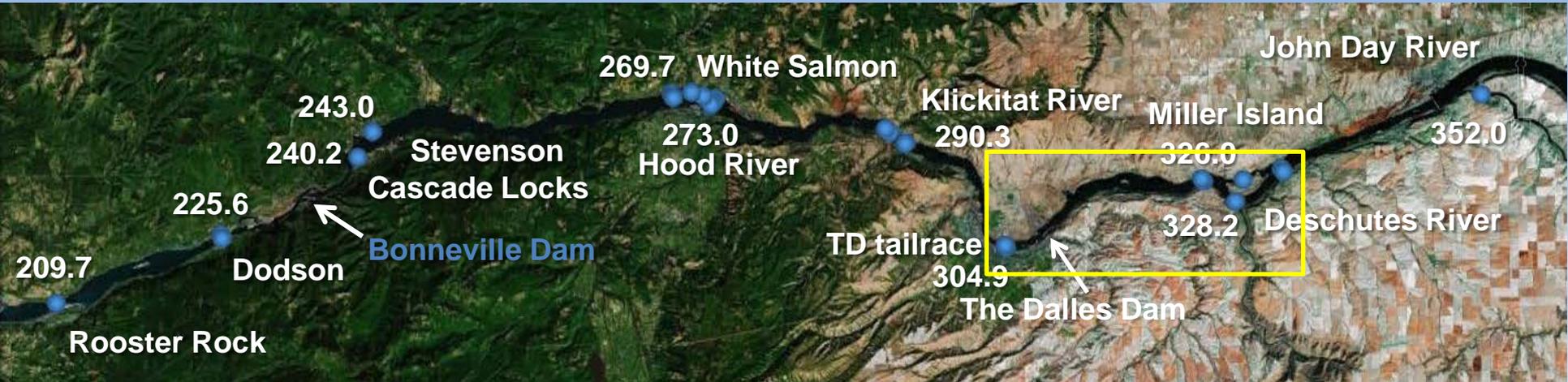
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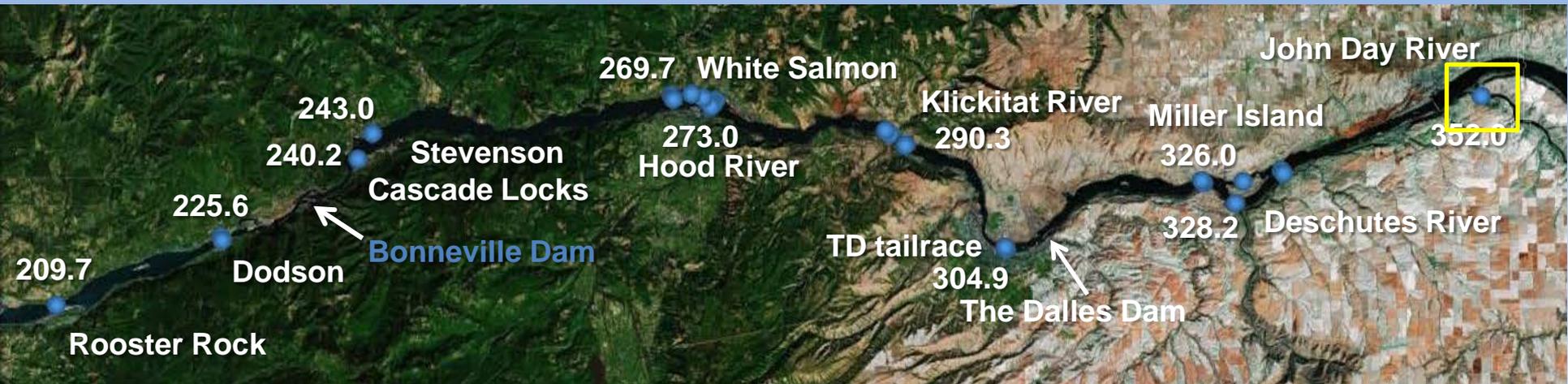
JSATS Monitoring



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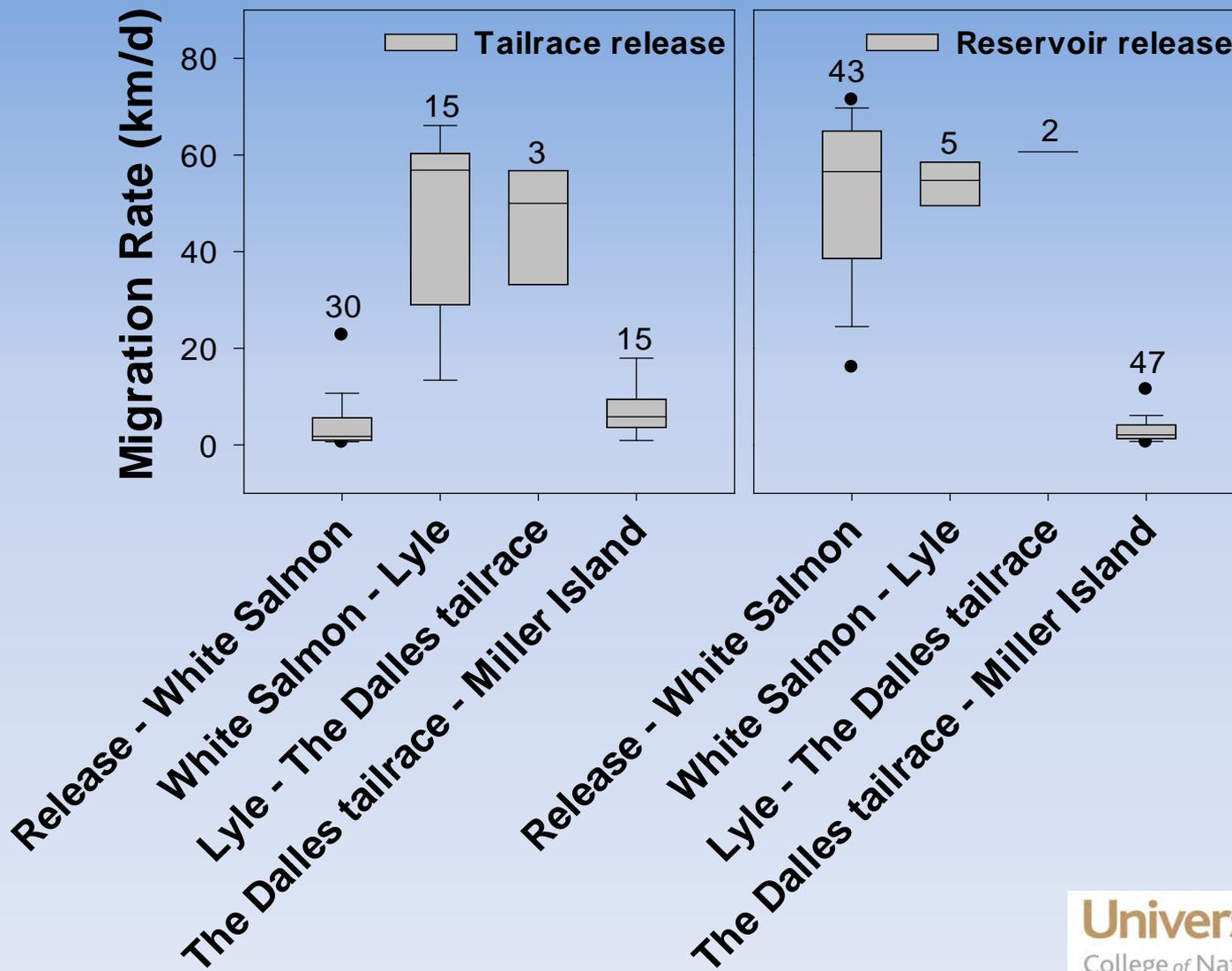
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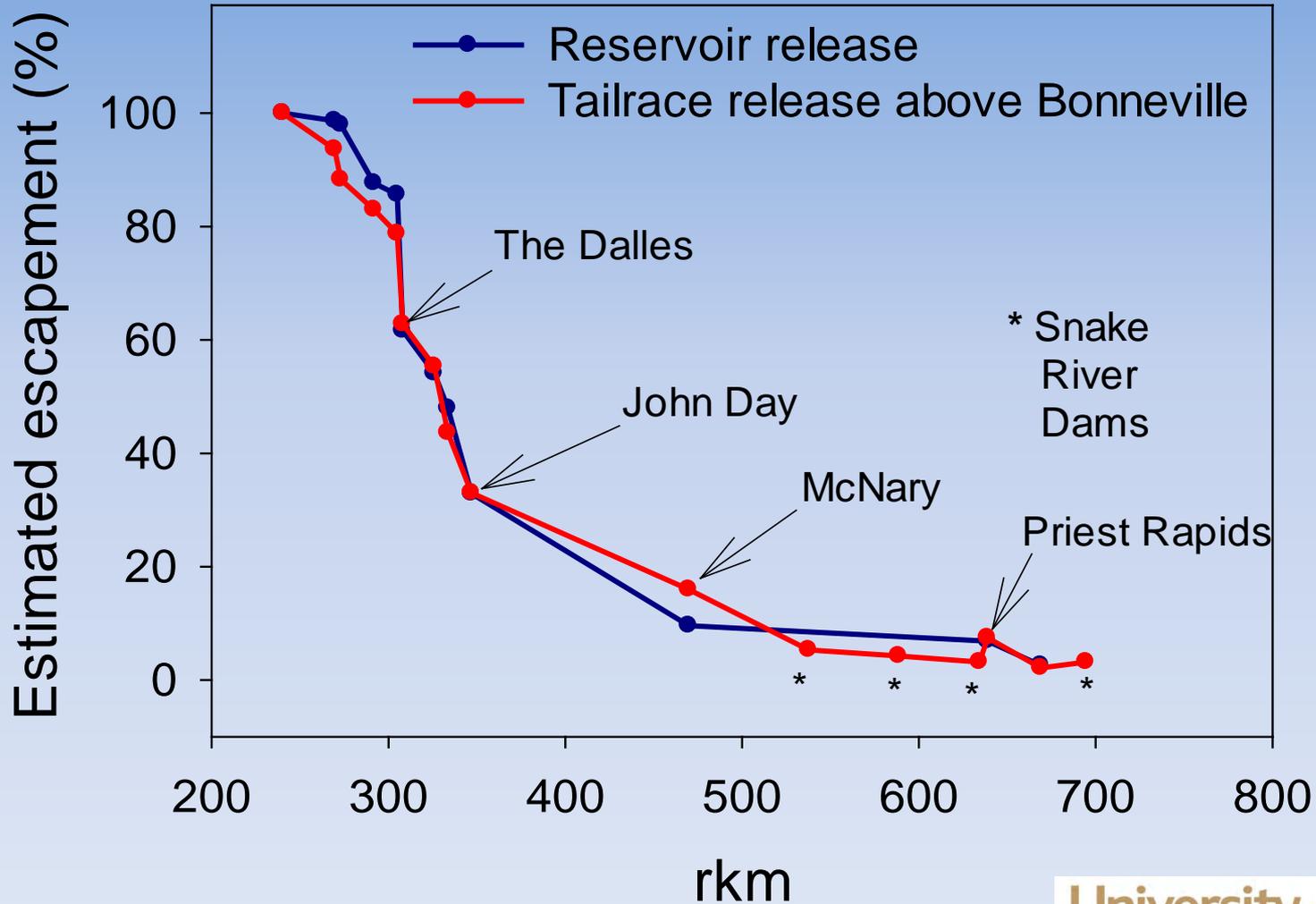
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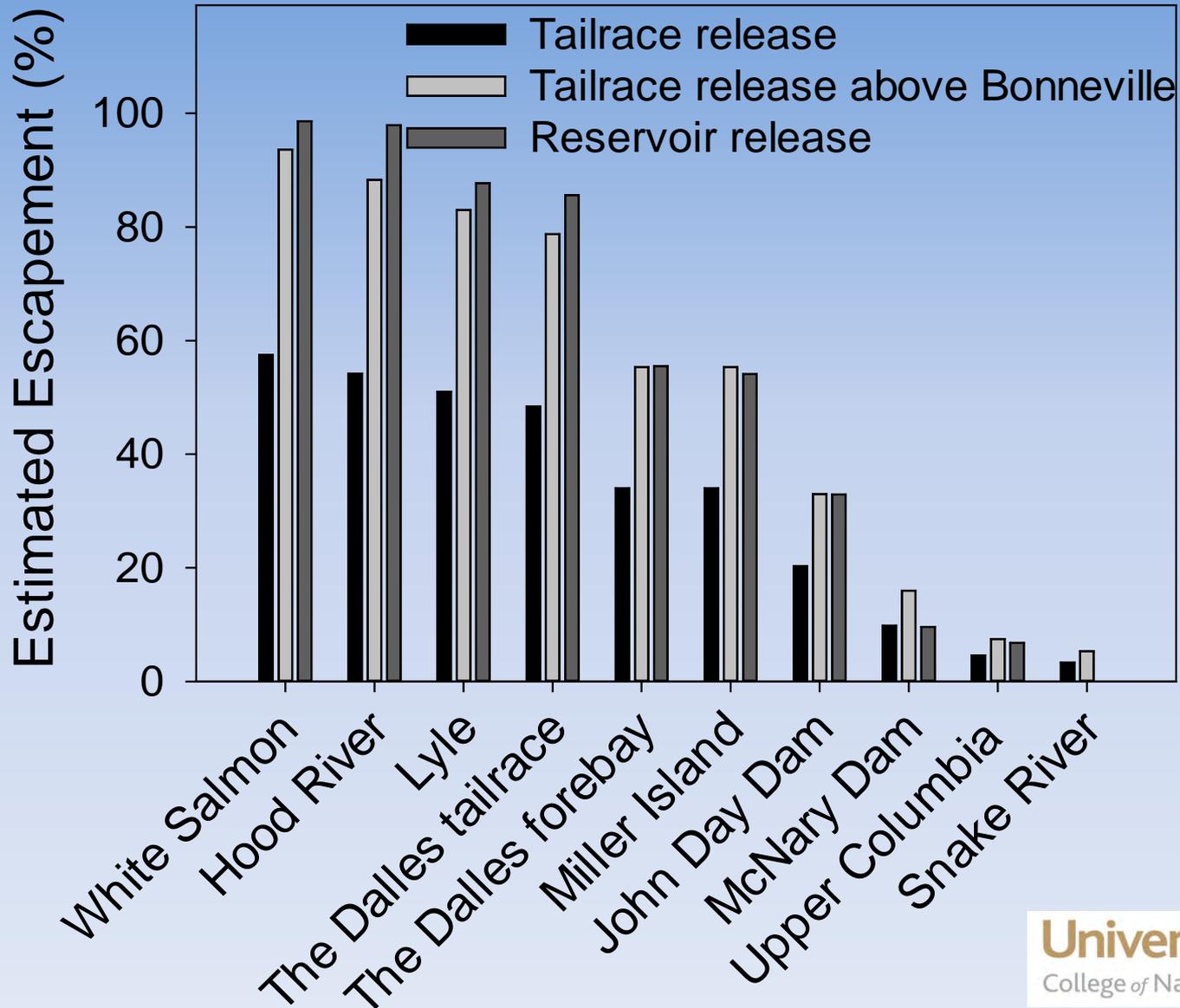
Migration Rates



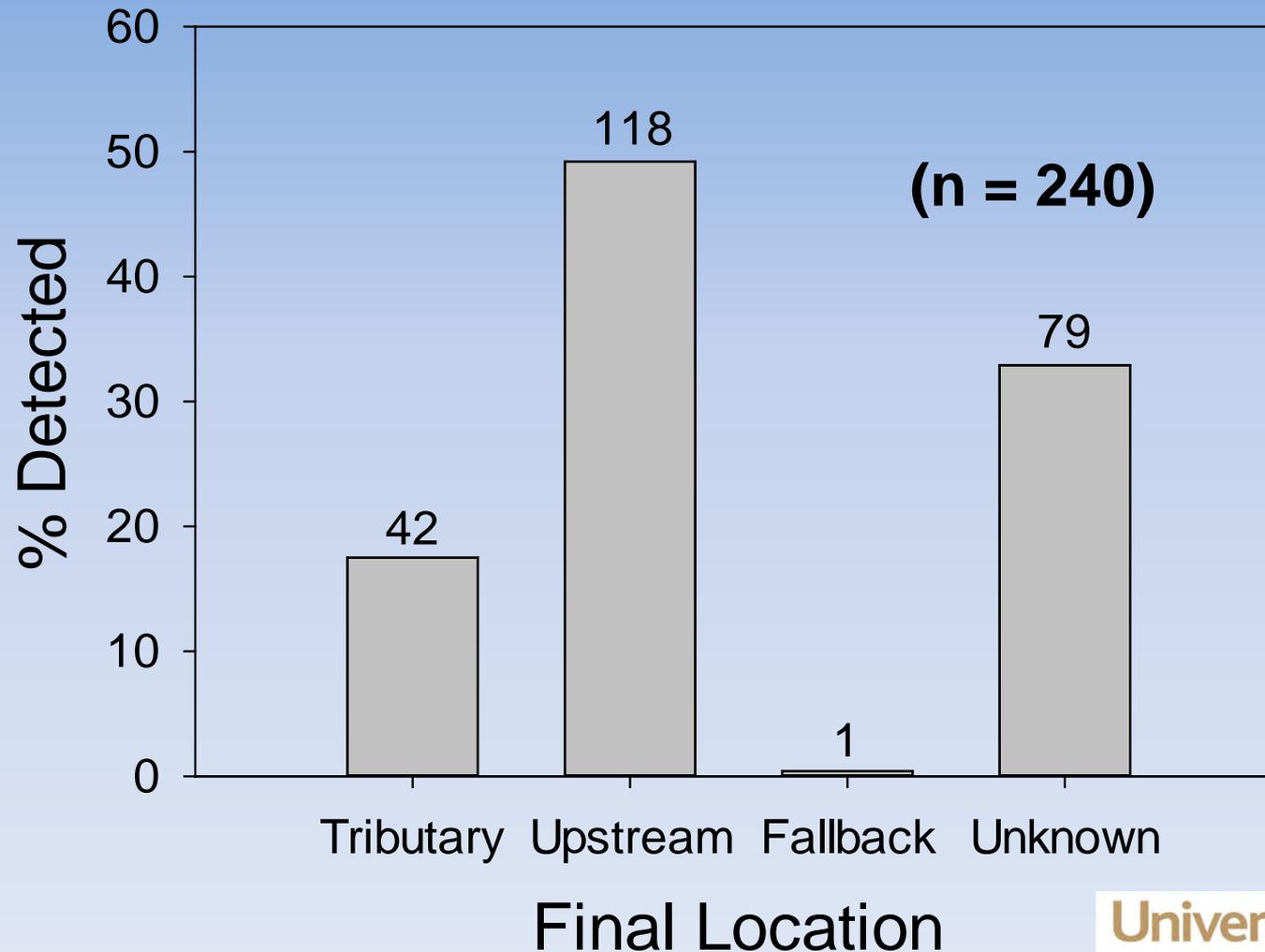
Escapement Estimates



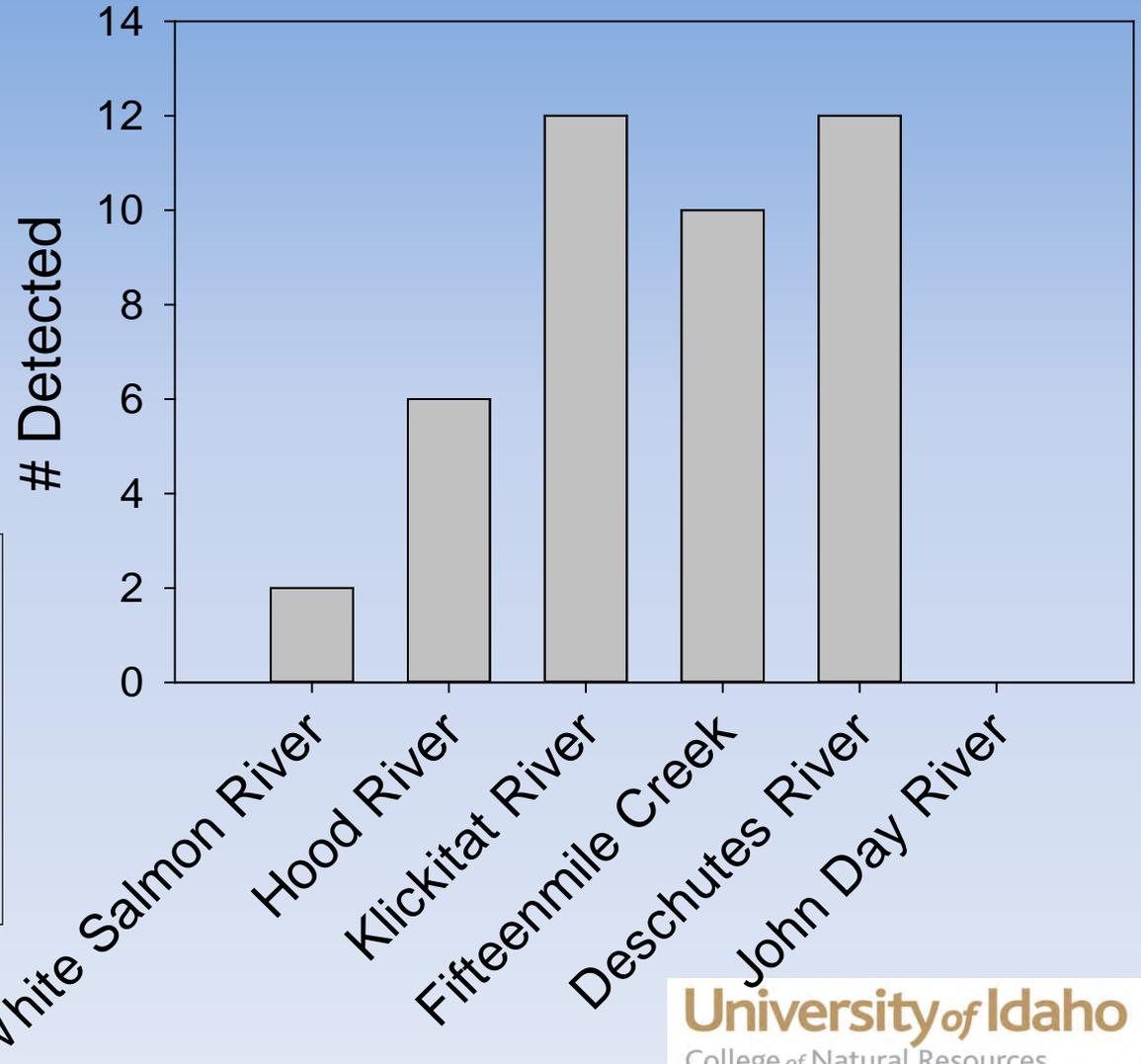
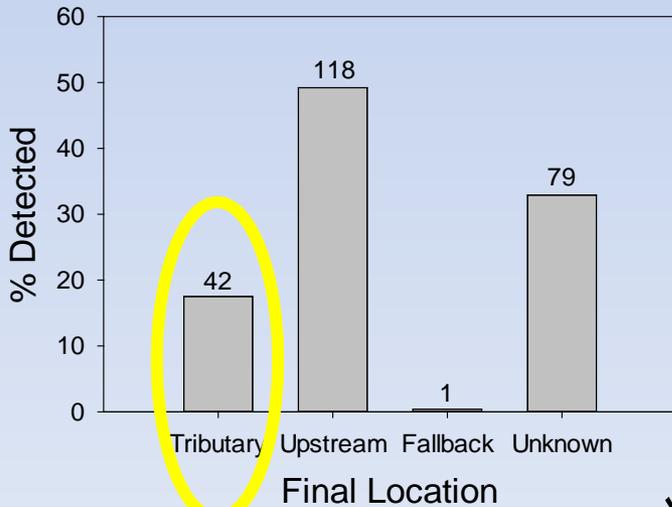
Escapement Estimates



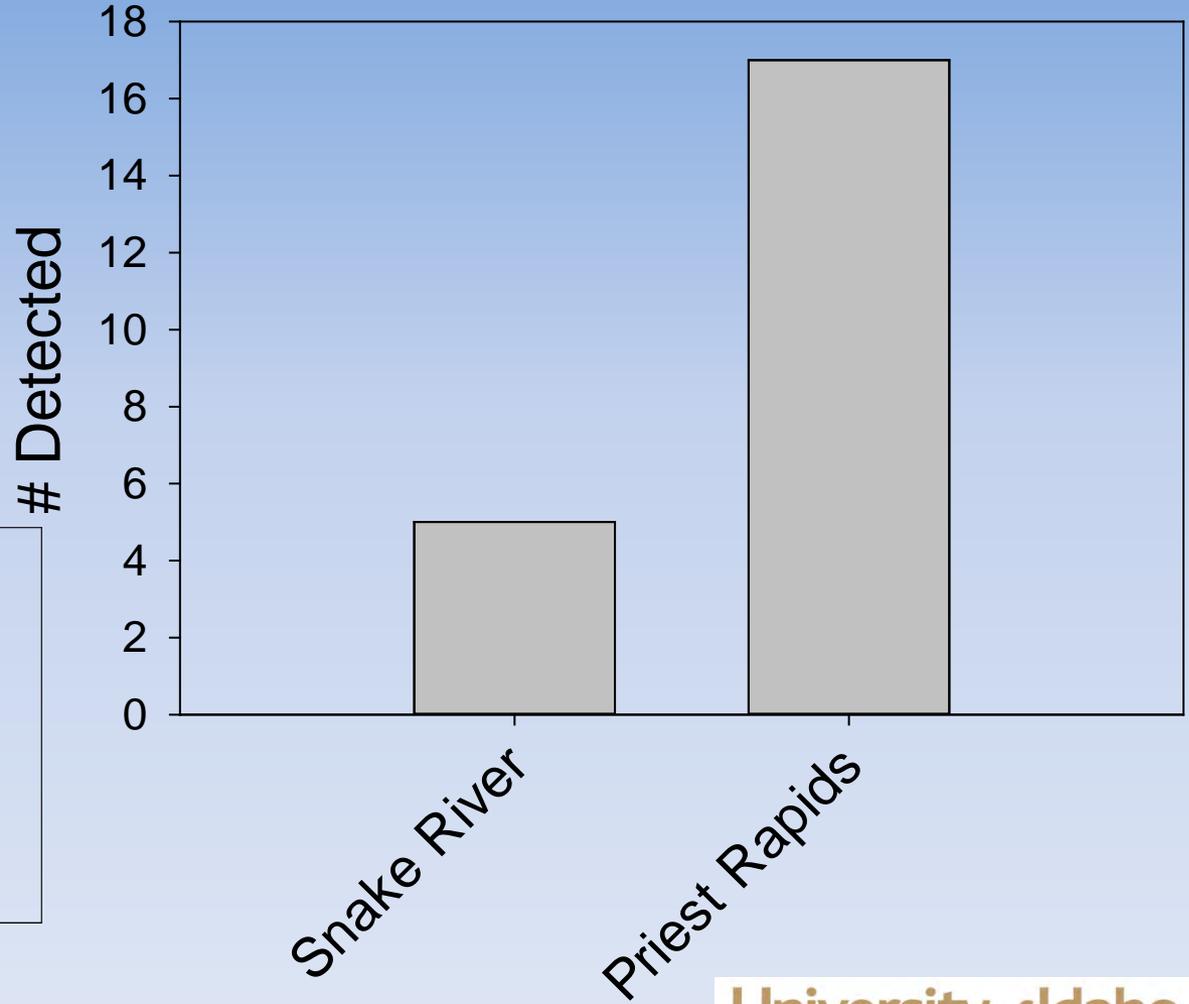
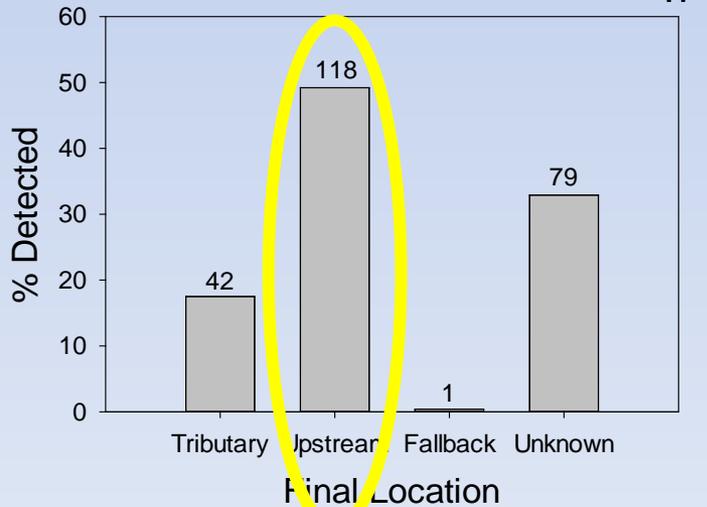
Final Fates 2012



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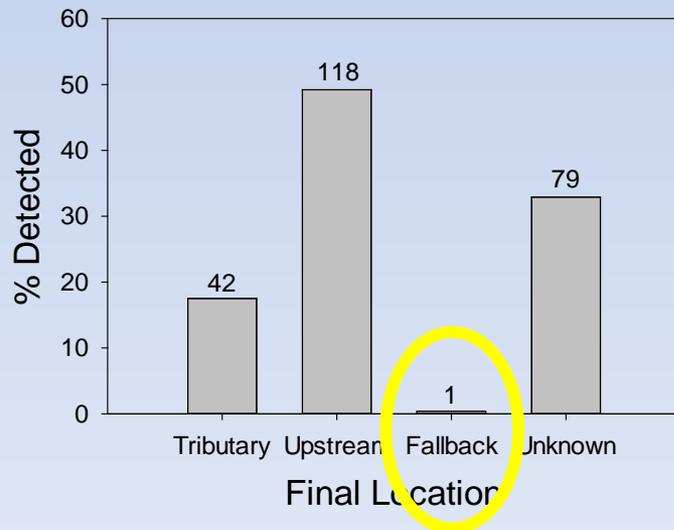


Final Fates 2012

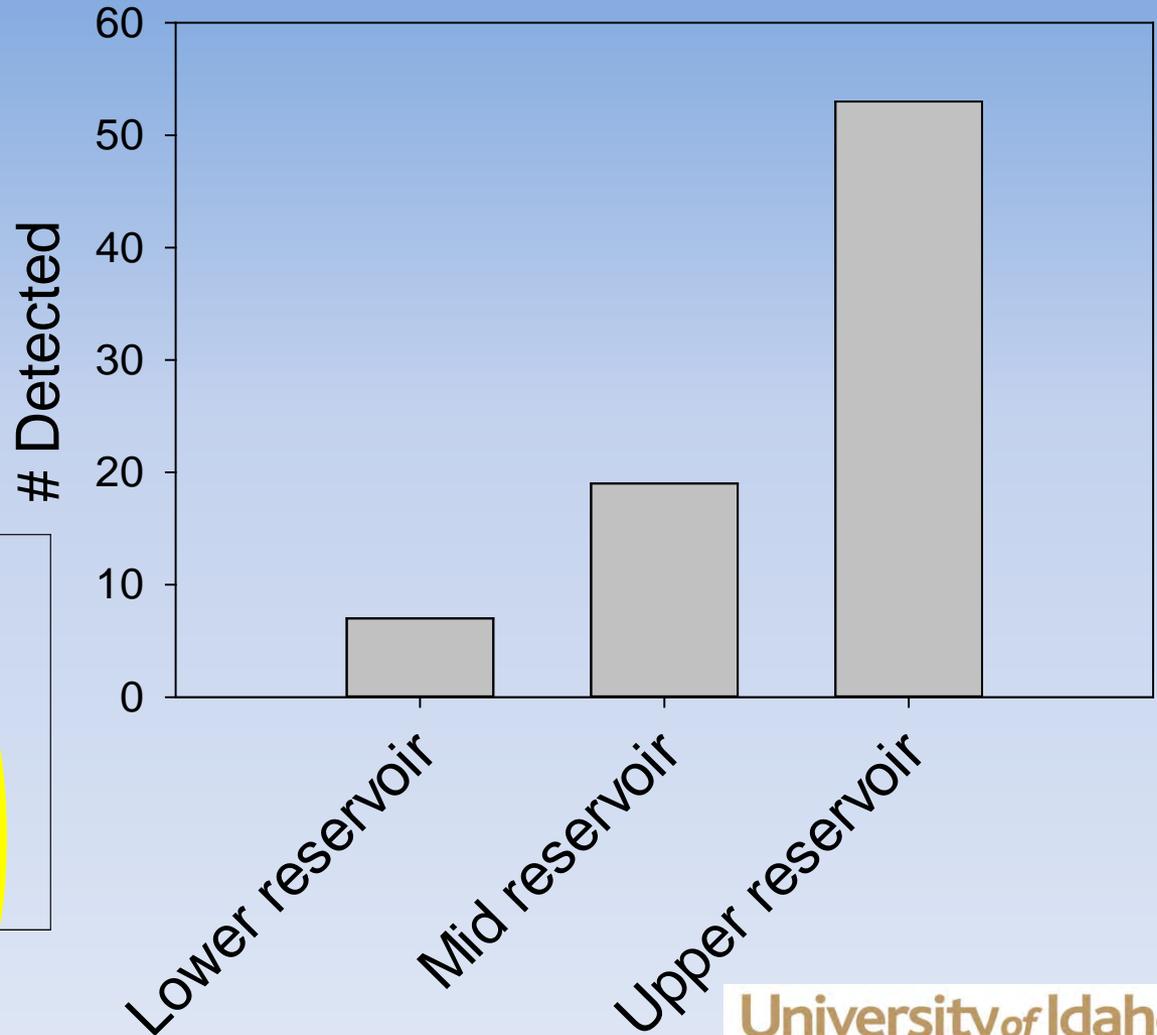
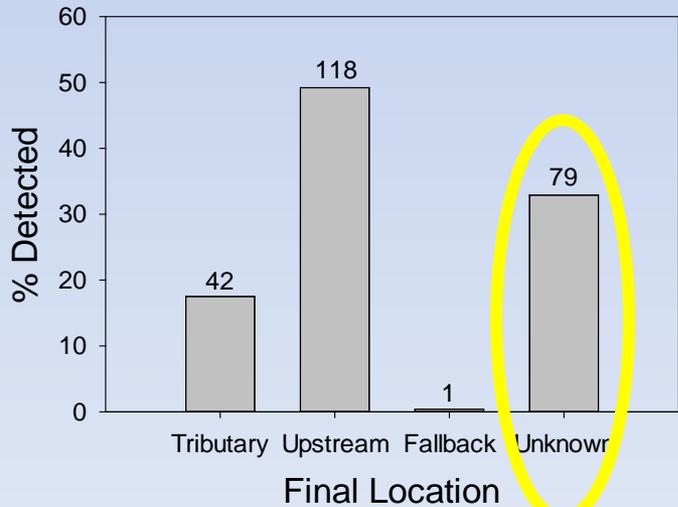


Final Fates 2012

- One lamprey detected at the top of Bradford Island LPS
- Final detection recorded at Dodson, OR site
- No reservoir released fish fell back over Bonneville Dam



Final Fates 2012



Tributary Use

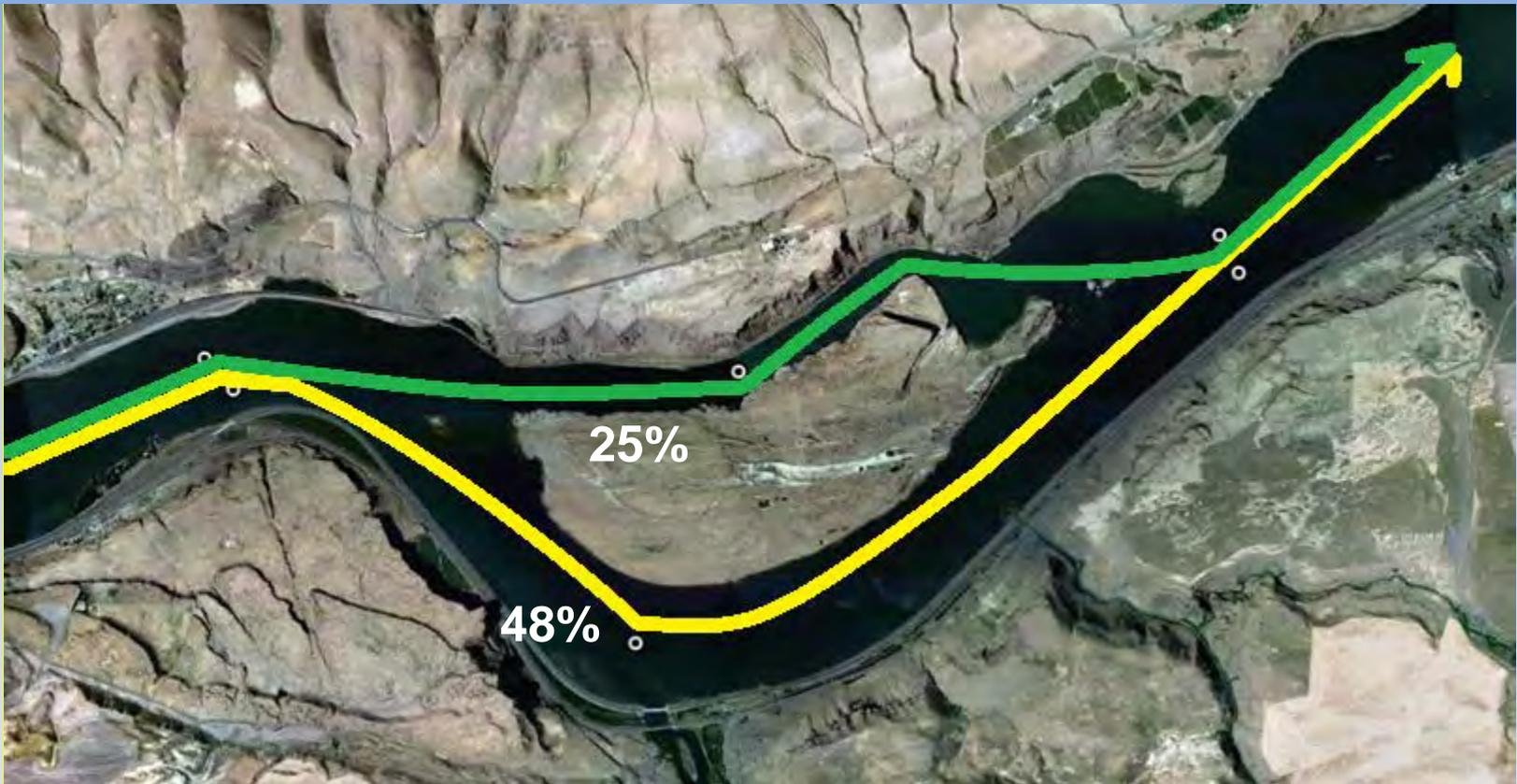


Tributary Use



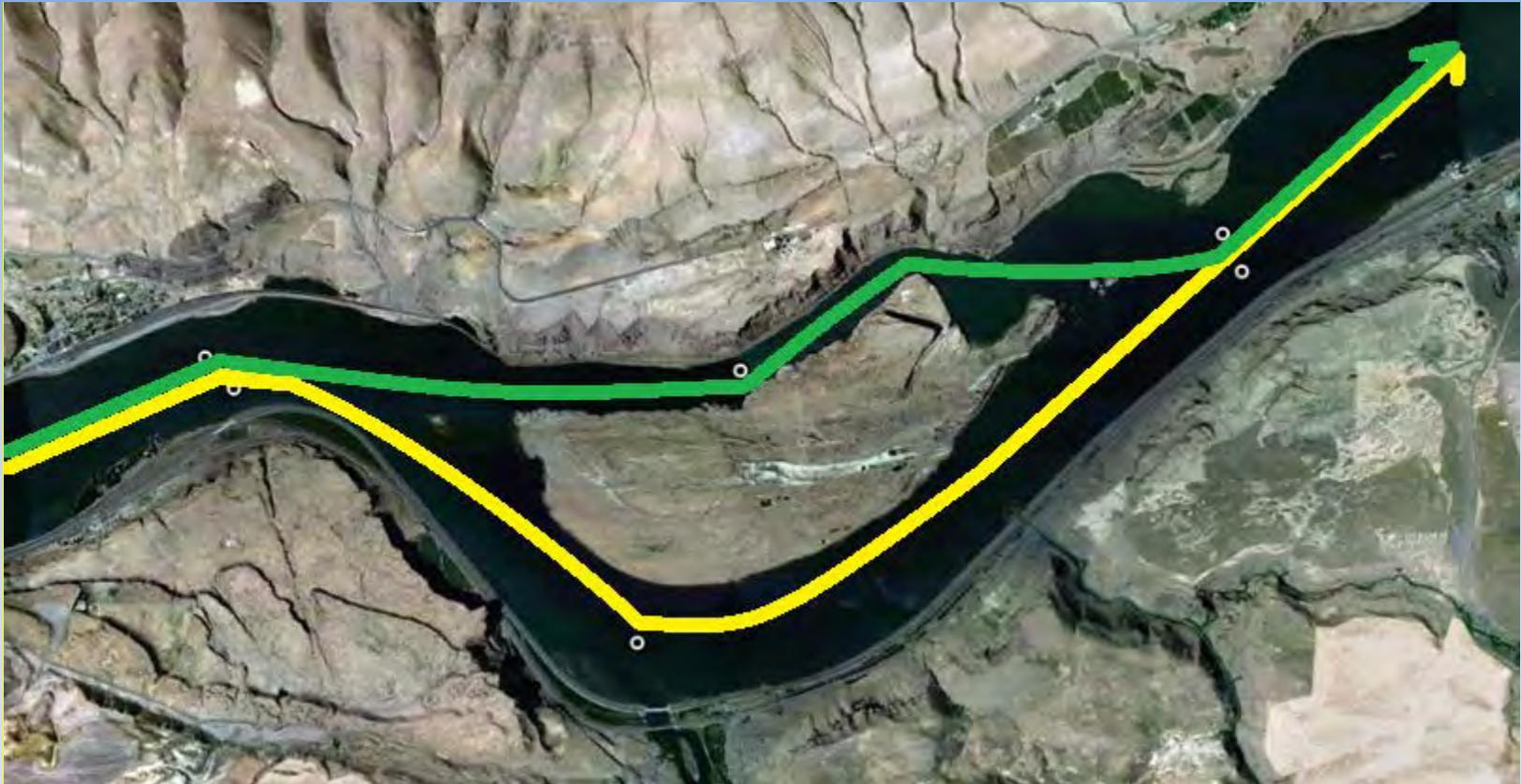
43.8% (n = 131) of all tagged lamprey were detected approaching Miller Island

Tributary Use



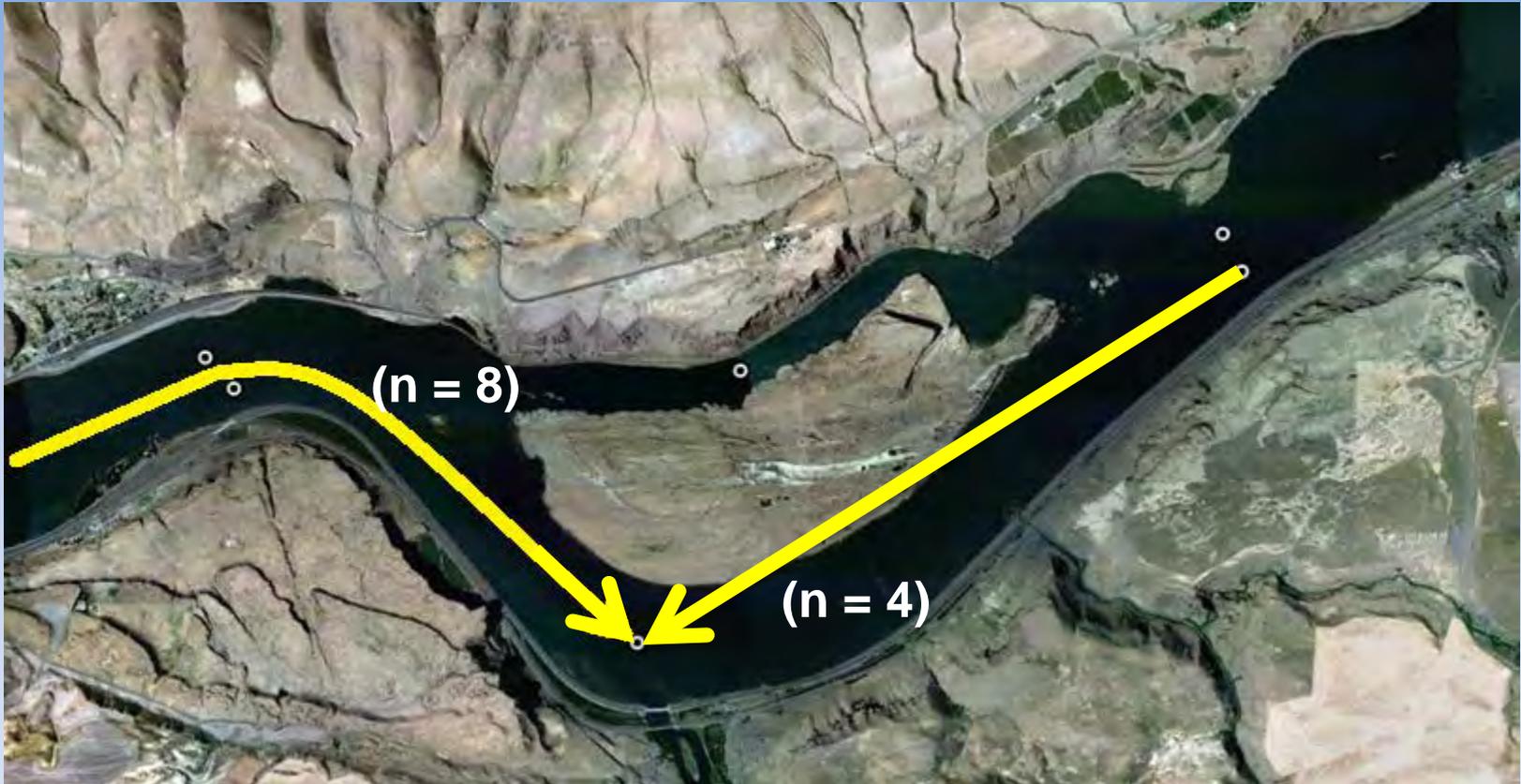
76.3% (n = 100) of all lamprey that approached Miller Island were last detected at upstream sites

Tributary Use



**Of the 100 lamprey last detected upstream
98% went straight through with no milling behavior
2% lingered in area of Miller Is.**

Tributary Use



9.2% (n = 12) that approached Miller Island were last detected at the Deschutes River mouth (4% of total tagged sample)

Tributary Use



5.3% (n = 7) of fish that approached Miller Island were last detected moving downstream

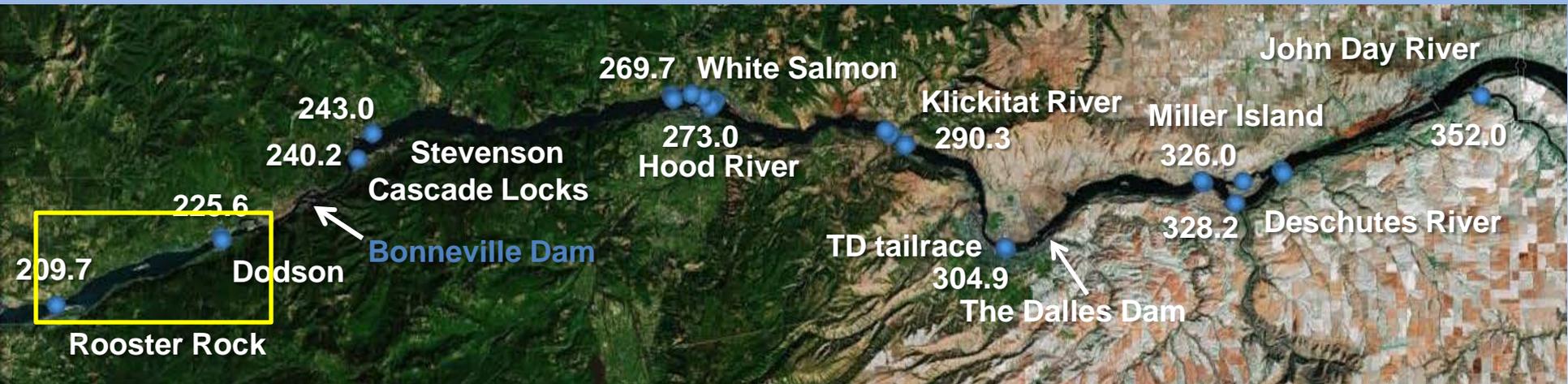
Reservoir & Tributary Summary

- 299 tagged lamprey released – similar in size to previous years
- Within-reservoir migration rates very high
- Dam-to-dam escapement similar to past years
- ~80% of lamprey reach The Dalles Dam tailrace
- 32.9% have unknown final fate
- Little milling around Deschutes River mouth

2012 Objectives

- Monitor behavior and determine fate of adult Pacific lamprey below Bonneville Dam
 - Fate after release
 - Downstream movements?

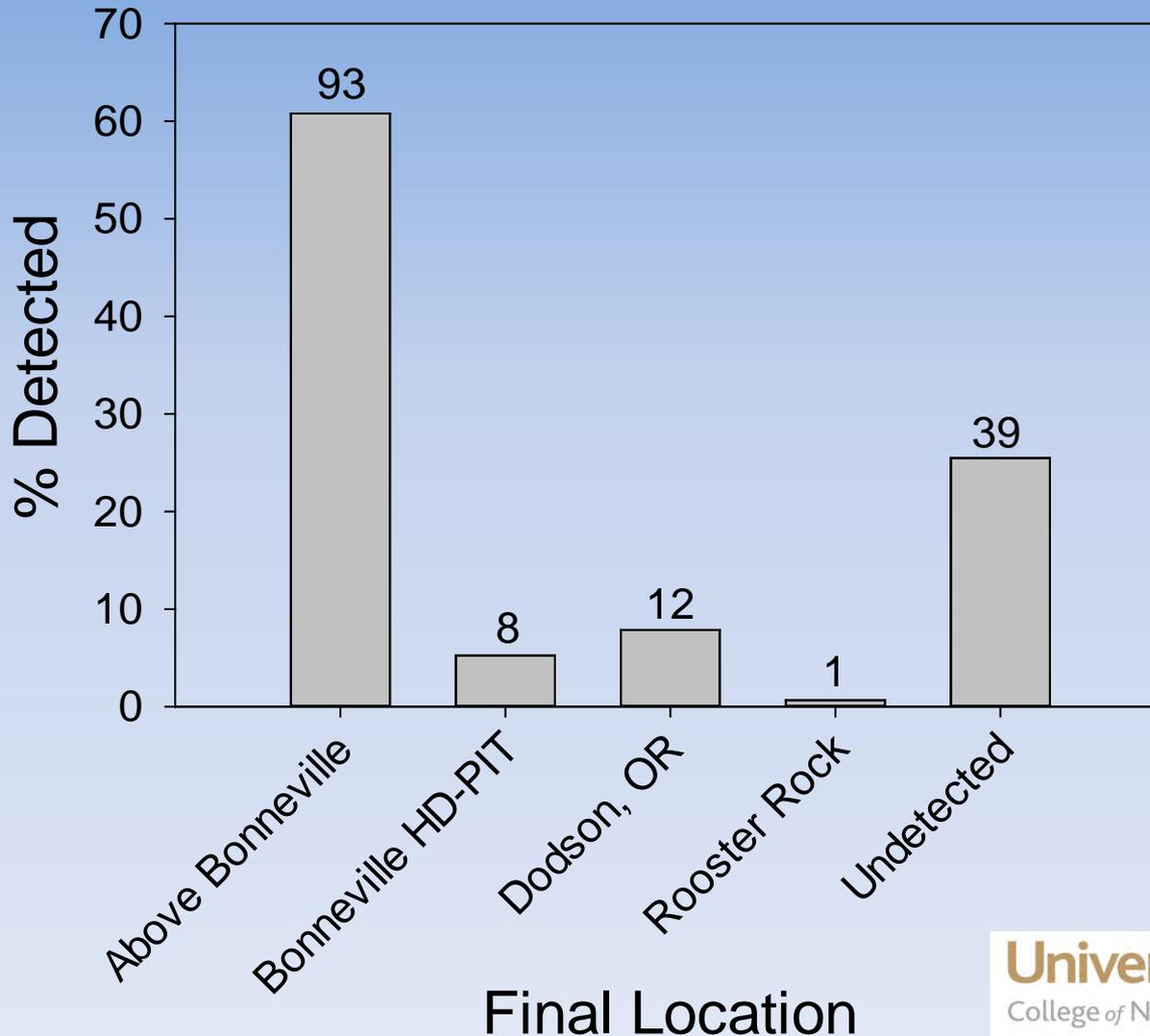
JSATS Monitoring



JSATS Monitoring



Final Fates 2012



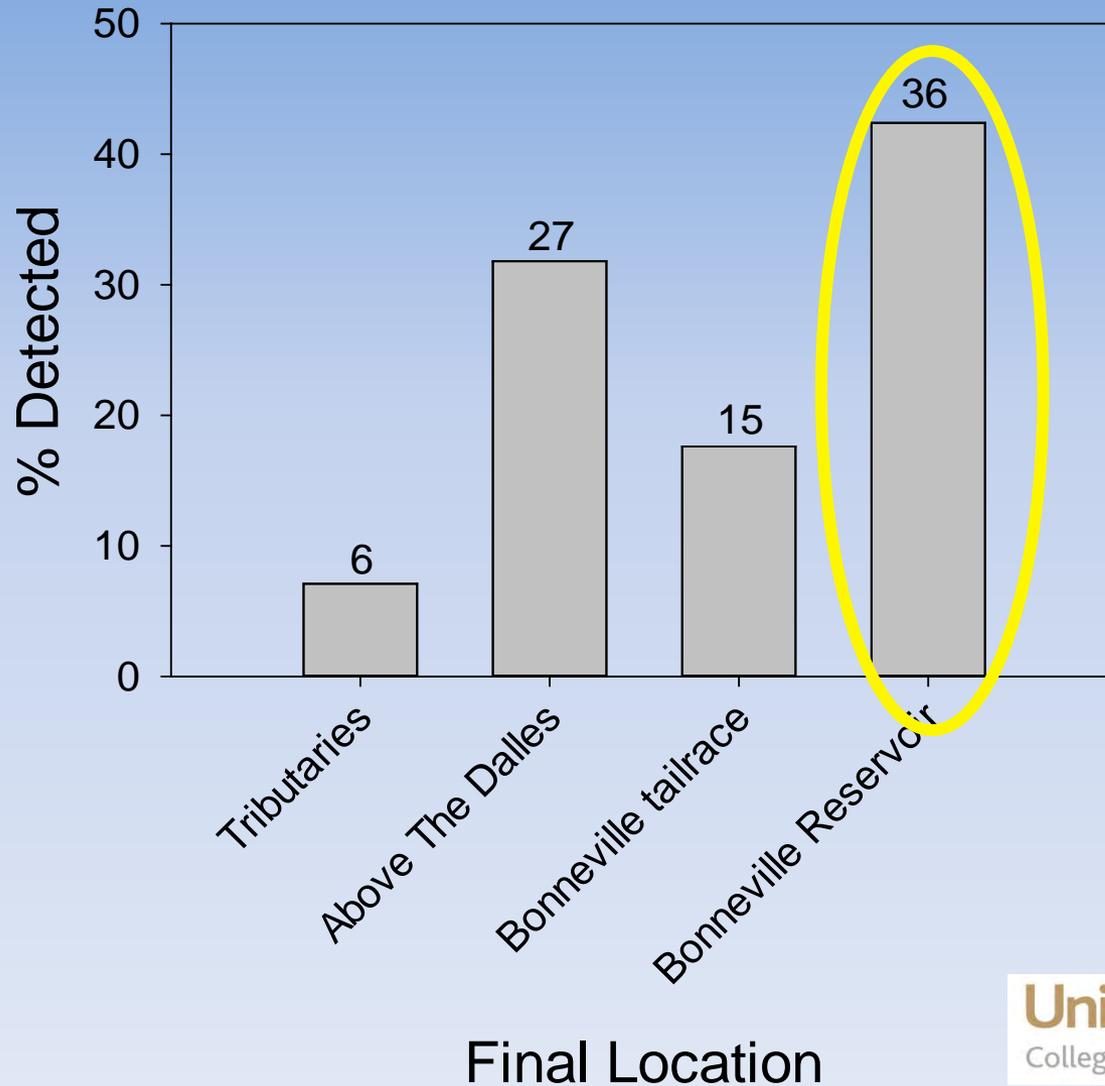
Tailrace Summary

- 153 lamprey released into tailrace
- 60.8% passed Bonneville Dam
- 39.2% last detected in Bonneville Dam tailrace
 - 8.5% were last detected moving downstream
 - 1 fish may have left the study area
- 25.5% were never detected

2012 Objectives

- Continue monitoring for adult Pacific lamprey tagged in 2011

Final Fates End of 2011



Final Fates 2011 in 2012

- Monitoring continued through Spring 2012
- 8.2% (n = 7) were detected in 2012
 - 2 were likely post spawn carcasses
 - 1 was detected in Bonneville tailrace
 - 4 were last detected at tributary mouths
 - 3 at the Klickitat River mouth
 - 1 at the Hood River mouth

2011 Final Fates Summary

- Four lamprey detected at tributary mouths represent 11.1% of lamprey last detected in Bonneville Reservoir in 2011

Acknowledgments

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ATS

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PSMFC

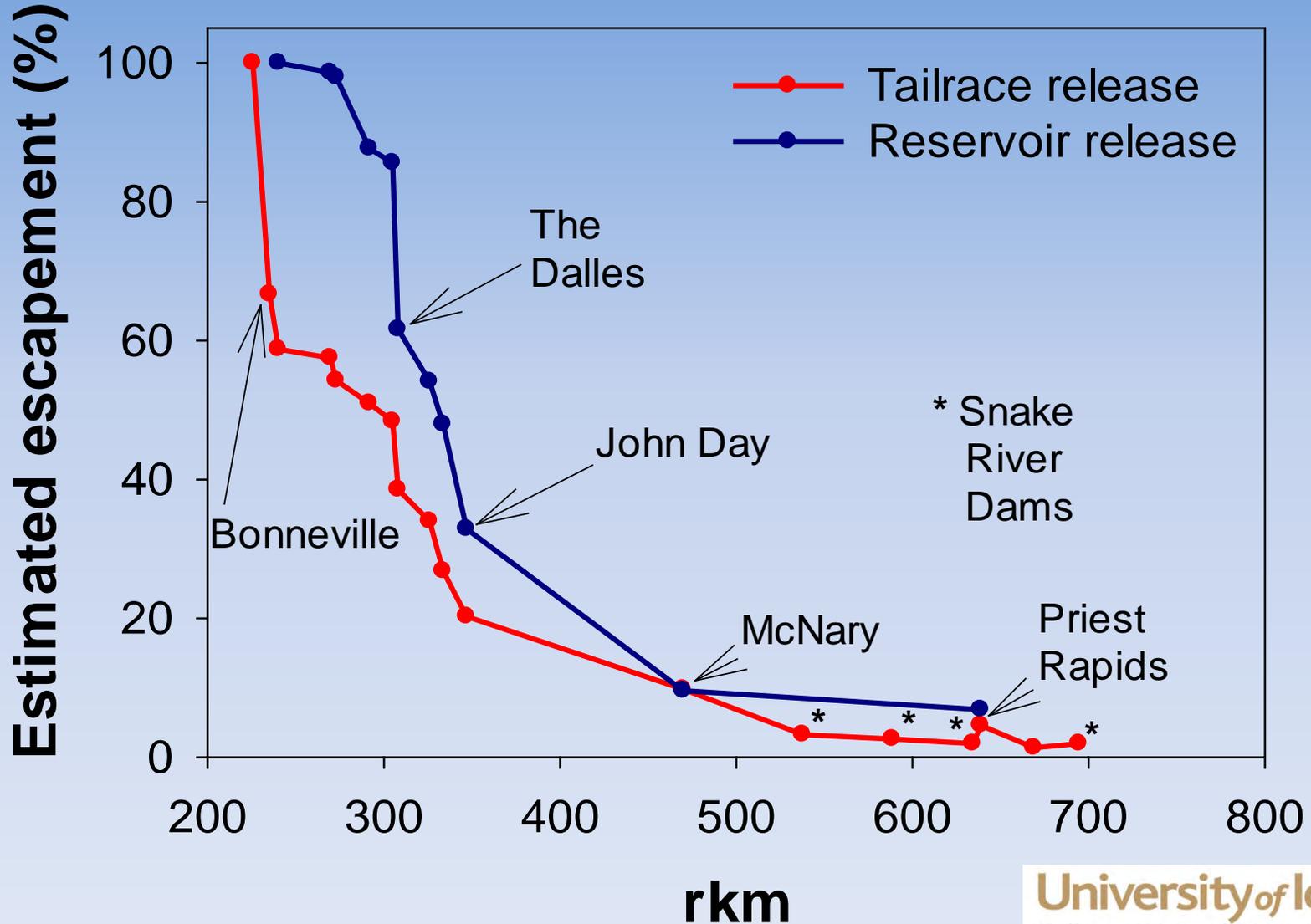
D. Etherington

Cover photo:

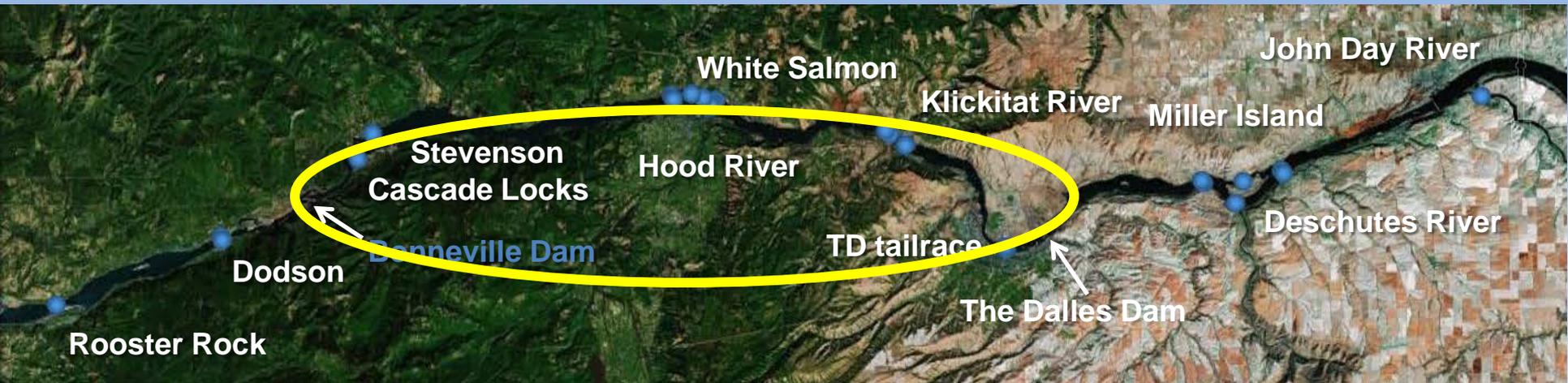
B. McIlraith



Escapement Estimates

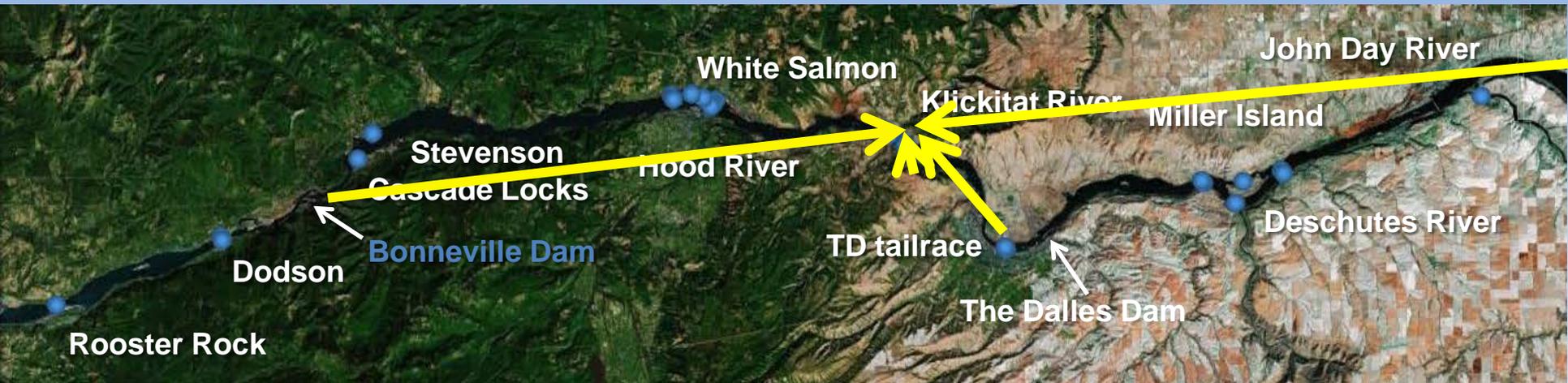


Final Fates End of 2011



- 7.1% (n = 6) last detected in or near mouths of tributaries
- 31.8% (n = 27) last detected above The Dalles Dam
- 17.6% (n = 15) last detected in Bonneville Dam Tailrace
- 42.4% (n = 36) last detected in Bonneville Reservoir**

Final Fates 2011



Monitoring continued through Spring of 2012

8.2% (n = 7) of all 2011 tagged lamprey detected again in 2012

1.2% (n = 1) in Bonneville Dam tailrace

1.2% (n = 1) at Stevenson, WA

1.2% (n = 1) at Hood River mouth

4.7% (n = 4) at Klickitat River mouth

Final Fates 2011



Monitoring continued through Spring of 2012

8.2% (n = 7) of all 2011 tagged lamprey detected again in 2012

11.1% (n = 4) of “missing” fish last detected at mouths of Klickitat and Hood River