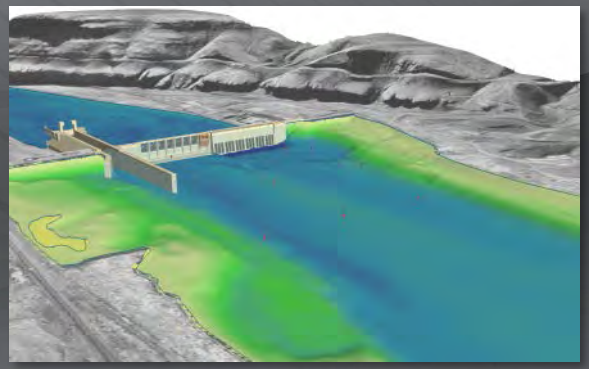

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Lower Snake River Performance Standards Assessments 2012: Experimental Design and Methods

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AFEP 2012

Presentation Outline

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- Experimental design overview
- Methods
  - Fish collection
  - Fish tagging
  - Fish releases
  - Receiver systems

Experimental Design

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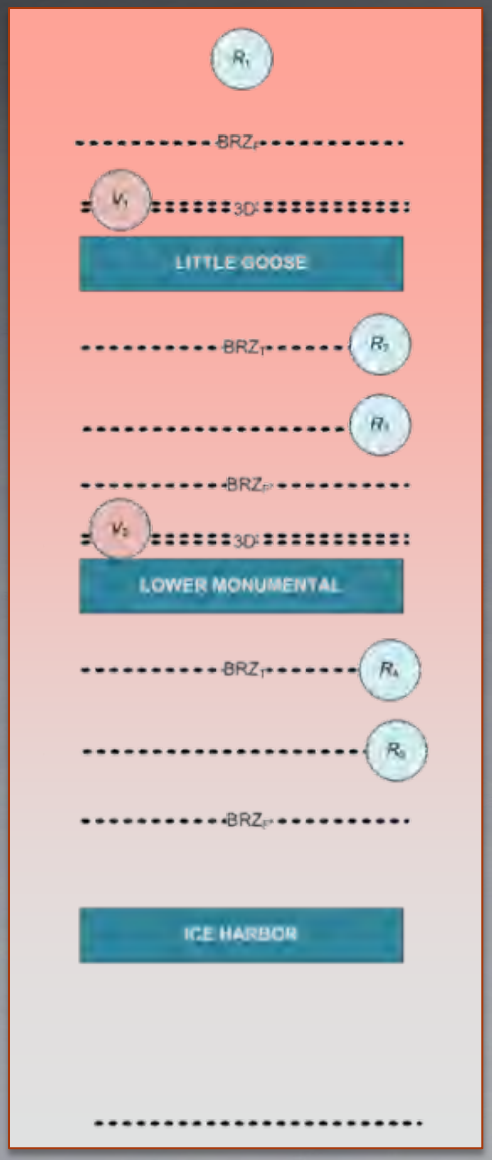
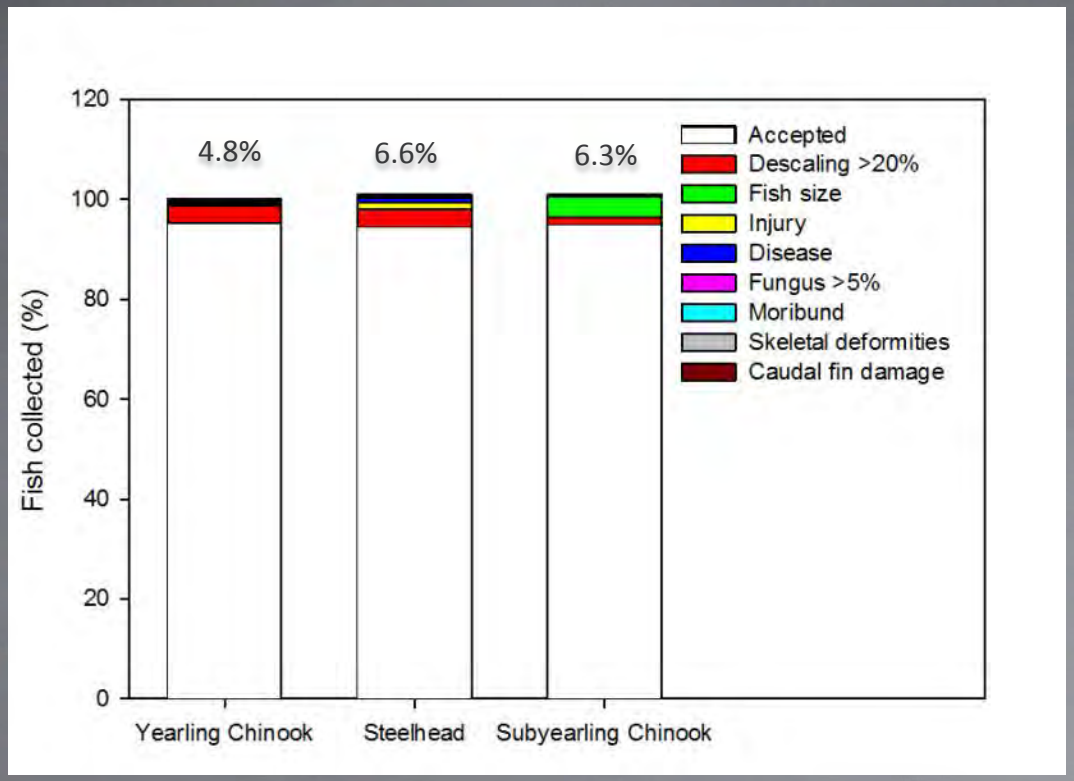
- Virtual paired release design
  - Uses fish released upstream to form virtual releases at Little Goose and Lower Monumental dams
  - A pair of releases in each tailrace

Release site	Rkm	Yearling Chinook salmon and steelhead (spring)	Subyearling Chinook salmon (summer)
R_1	SR133	1,800	3,000
R_2	SR112	1,200	2,100
R_3	SR082	1,200	2,100
R_4	SR065	1,000	1,900
R_5	SR040	1,000	1,900
Total tags		6,200 each species	11,000



Fish Collection

- Run of river fish collected in Juvenile Fish Facility at Lower Monumental Dam
- Fish were held overnight prior to tagging
- Low % rejected

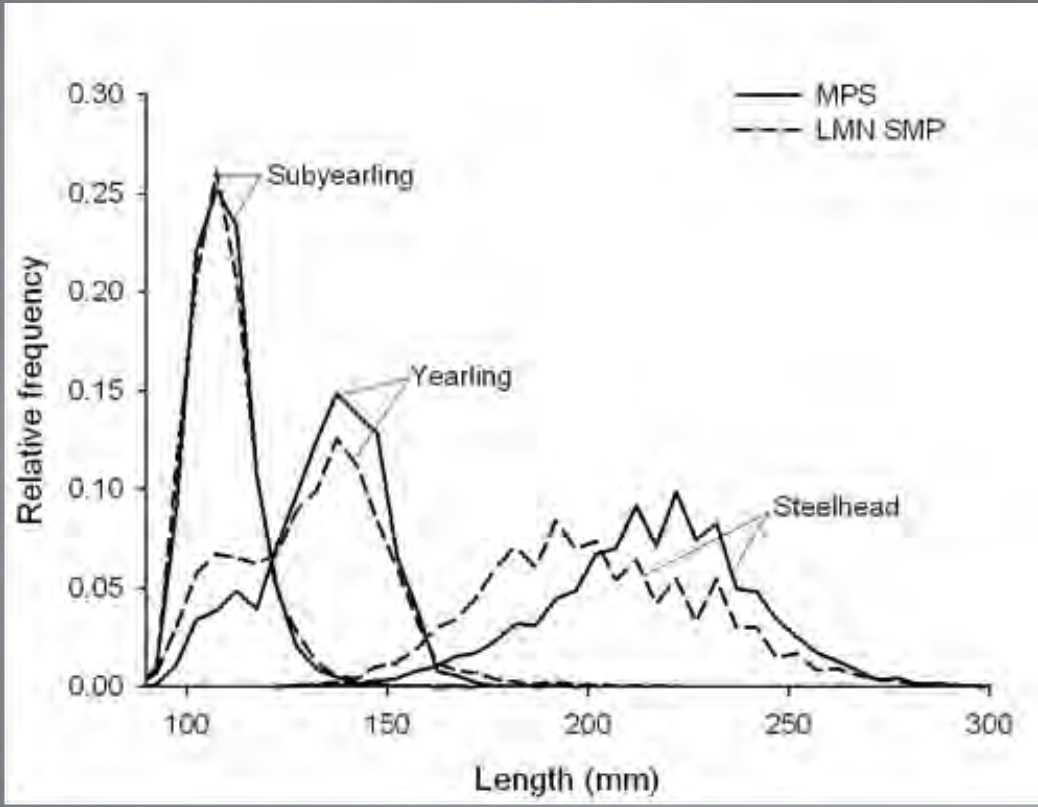


Fish Tagging

- Fish anesthetized with MS-222, measured, weighed, comments recorded, assigned to a surgeon
- JSATS and PIT tags inserted into each fish
  - JSATS acoustic tag with a single 348 battery; 10.79 mm long, 5.26 mm wide, 3.65 mm thick, 0.346 g in air, 3 second PRI in spring, 4.2 sec PRI in summer
    - Tag life (*N* = 75 each season)
      - Spring, minimum = 27.9 days, mean = 35.1 days
      - Summer, minimum = 29.5 days, mean = 47.3 days
  - PIT tag; TX1411SST, 12.5 x 2 mm, 0.1 g
- Typically 5 fish per uniquely-labeled 6-gallon bucket
- 12-36 hour post surgery holding prior to release

Fish lengths

- Length of tagged fish was representative of the lower Snake River
  - Yearling Chinook salmon (*N* = 6,199)
  - Steelhead (*N* = 6,202)
  - Subyearling Chinook salmon (*N* = 10,963)



Run Timing

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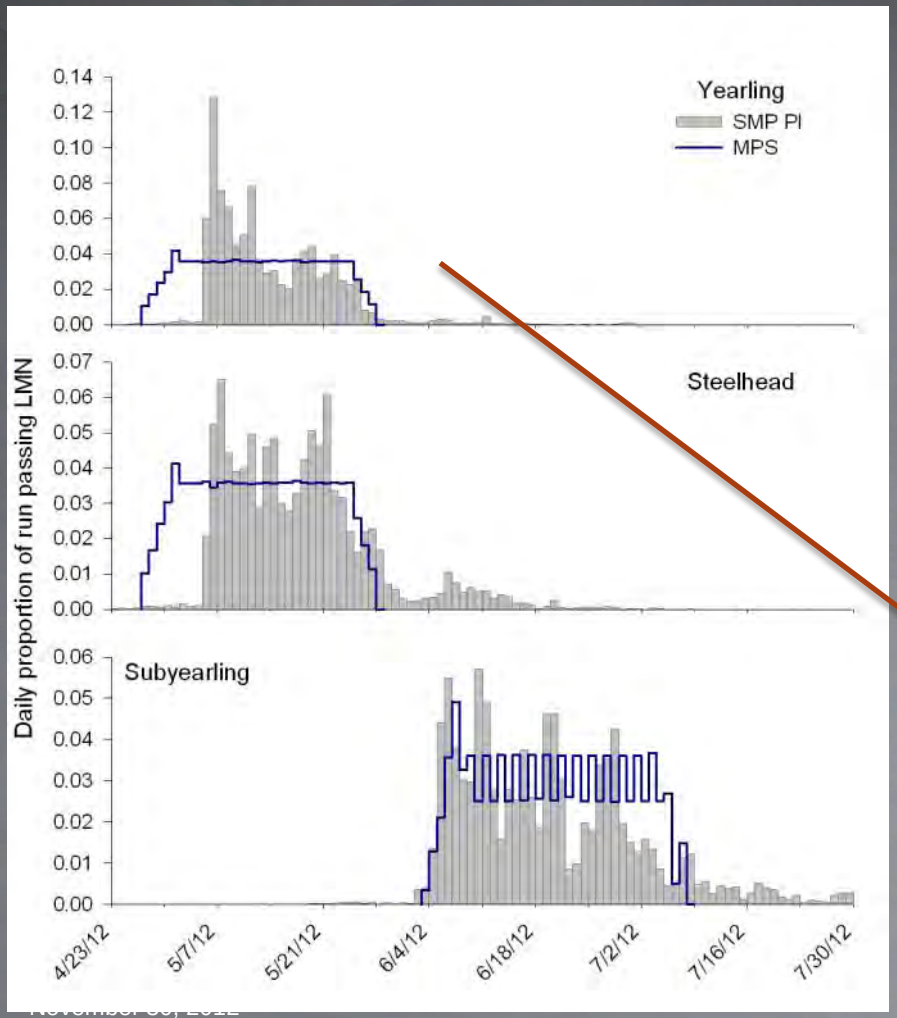
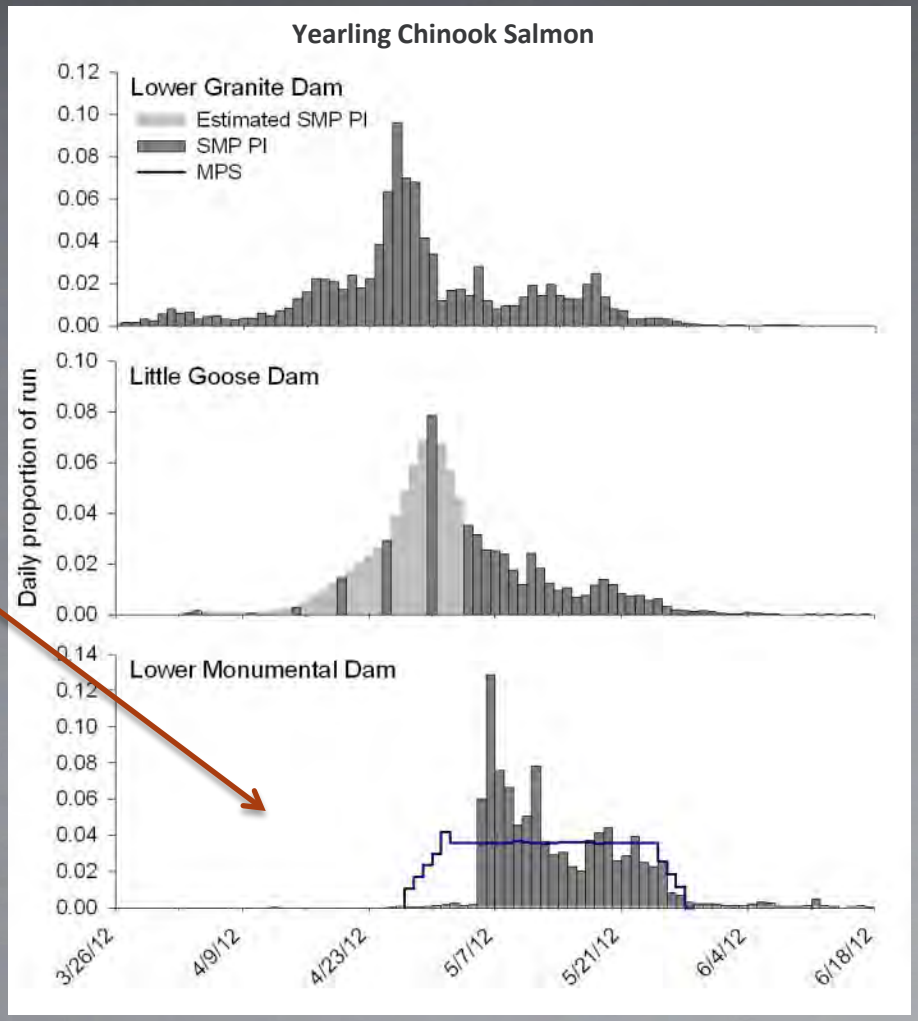
- Run timing was representative of the lower Snake River





Fish Releases

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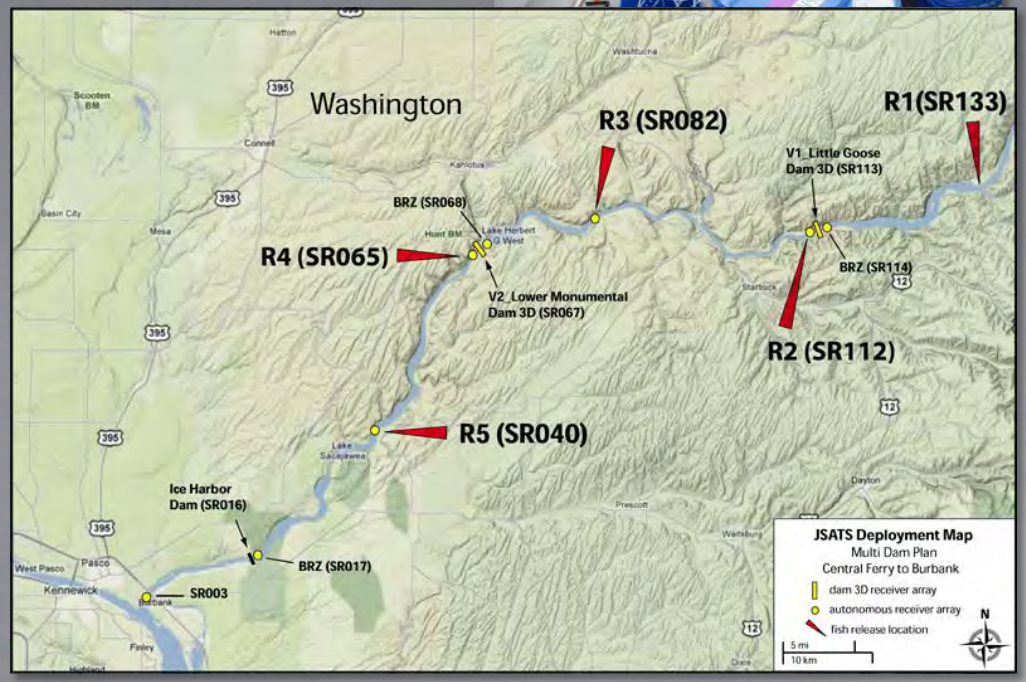
- All tags confirmed to be transmitting
- Transported by truck to ramp near release
- Air bubbled in during boat ride
- Spring: 28 blocks at 5 different sites = 140 releases
- Summer: 32 blocks at 5 sites = 160 releases
  - Day and night releases at all locations
  - Five release positions at all release locations
- Dead/moribund fish removed
- Dead fish releases into SWs
  - LGS
    - spring = 26 (14 CH1, 12 STH)
    - summer = 32 CH0
  - LMN
    - spring = 29 (15 CH1, 14 STH)
    - summer = 28 CH0



Receiving Systems Locations

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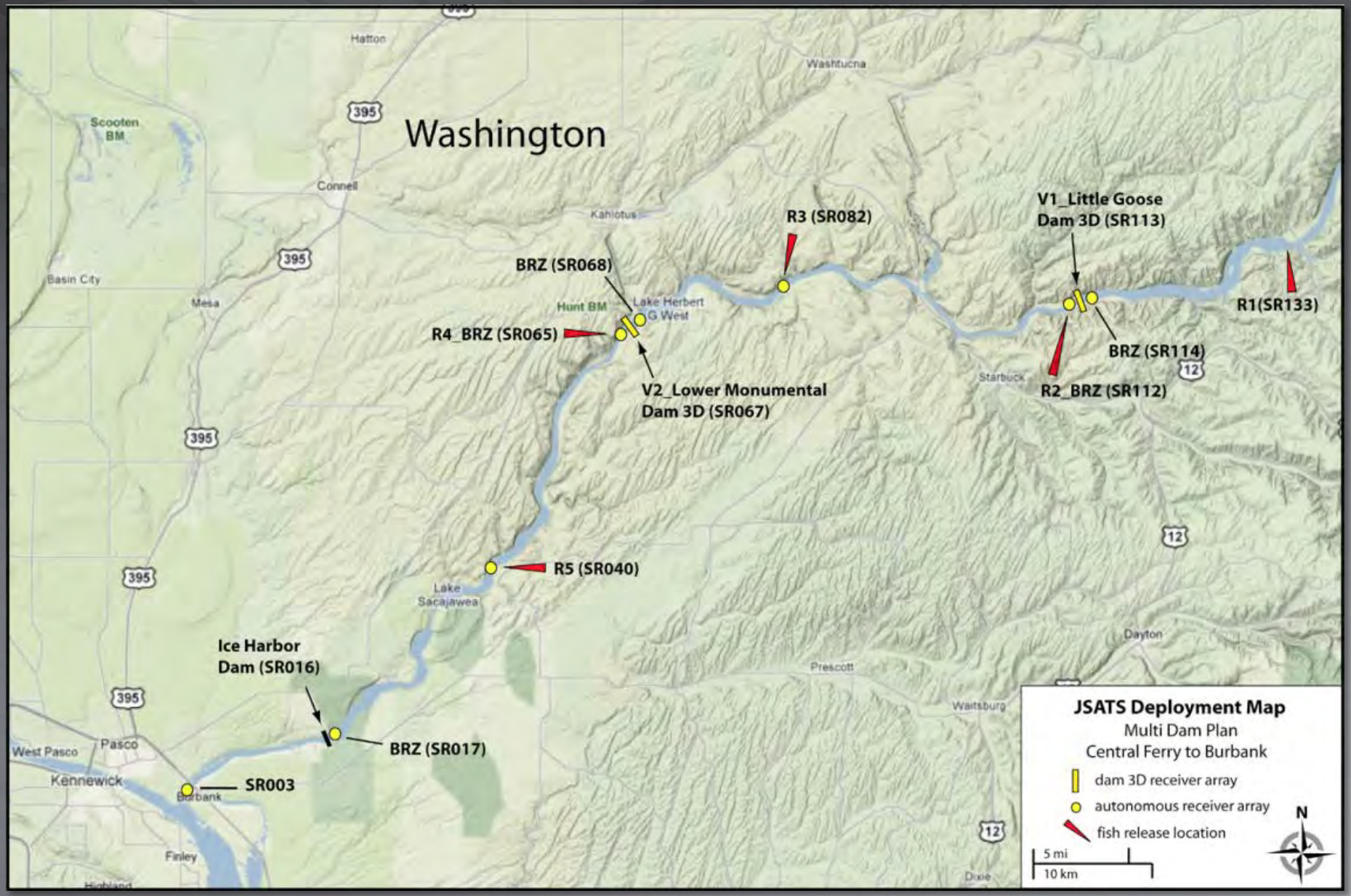
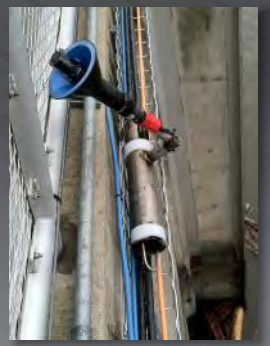


Lower Snake River JSATS Receivers



- Cabled receivers
  - 71 hydrophones
  - 4.8 miles of cable
  - 19 quad-channel amps and servers
- Autonomous receivers
  - 30 receivers in 8 arrays, 8 servicing trips, 311 individual deployments

Detection Probabilities

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Array	System	CH0	CH1	STH
SR113.0	Autonomous	1.000	0.999	1.000
SR112.0	Cabled	0.993	0.999	0.992
SR082.0	Autonomous	0.995	0.999	0.995
SR068.0	Autonomous	0.997	1.000	0.997
SR067.0	Cabled	0.997	0.999	0.998
SR065.0	Autonomous	0.997	0.998	0.985
SR040.0	Autonomous	0.998	0.998	0.988
SR017.0	Autonomous	0.998	0.999	0.989
SR003.0	Autonomous	0.998	0.999	0.989

- Detection factoids
  - 23,369 live JSATS-tagged fish released in 2012
  - 368,285,253 individual valid detections in lower Snake River in 2012
    - PTAGIS, 32 million fish in 24 years, ~ 13 million detections (www.ptagis.org)

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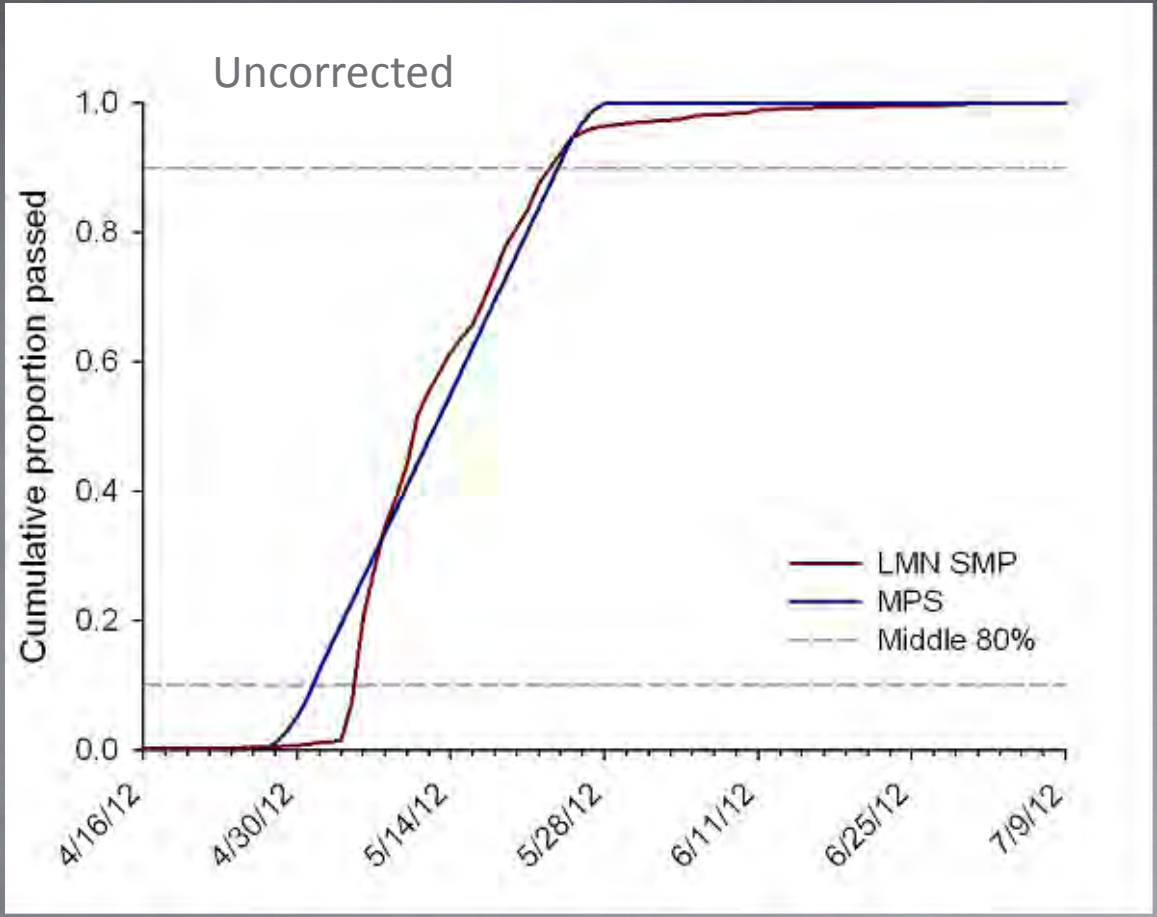
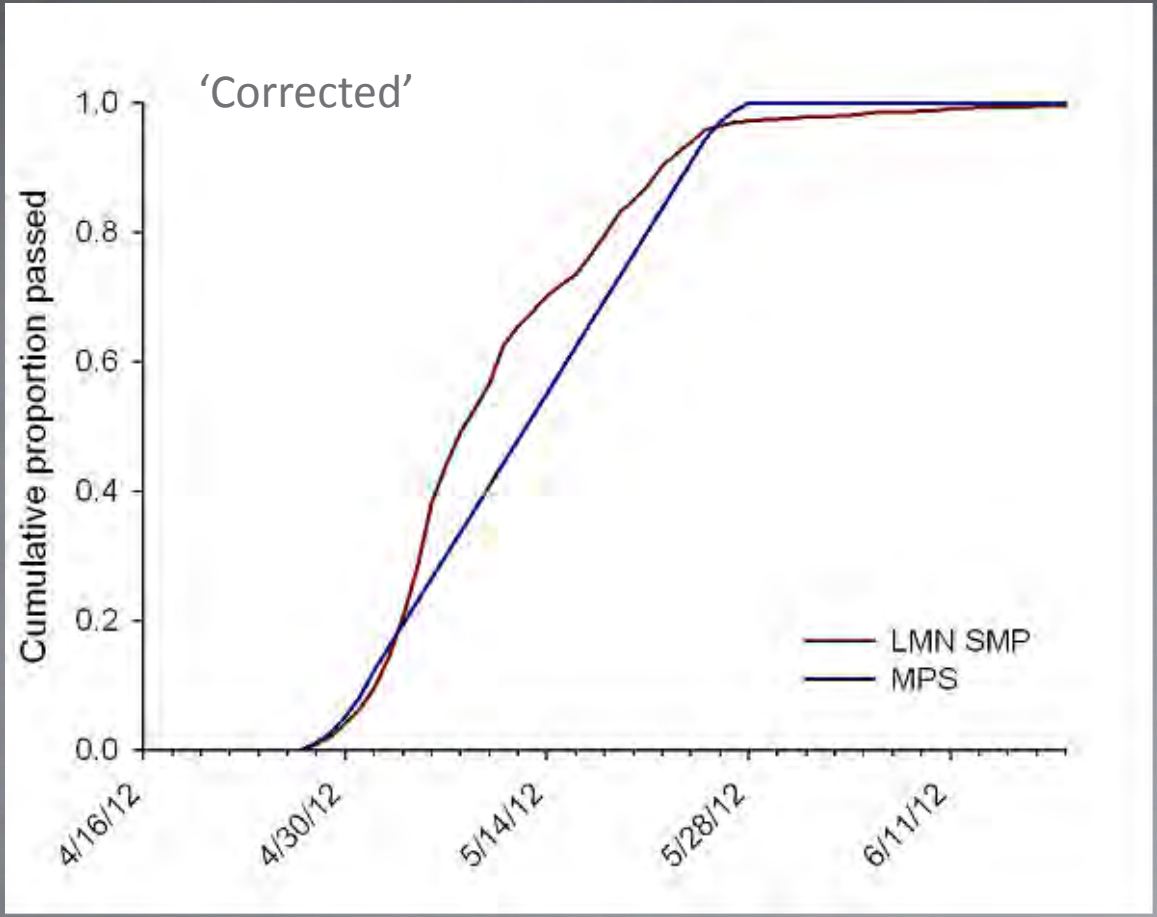
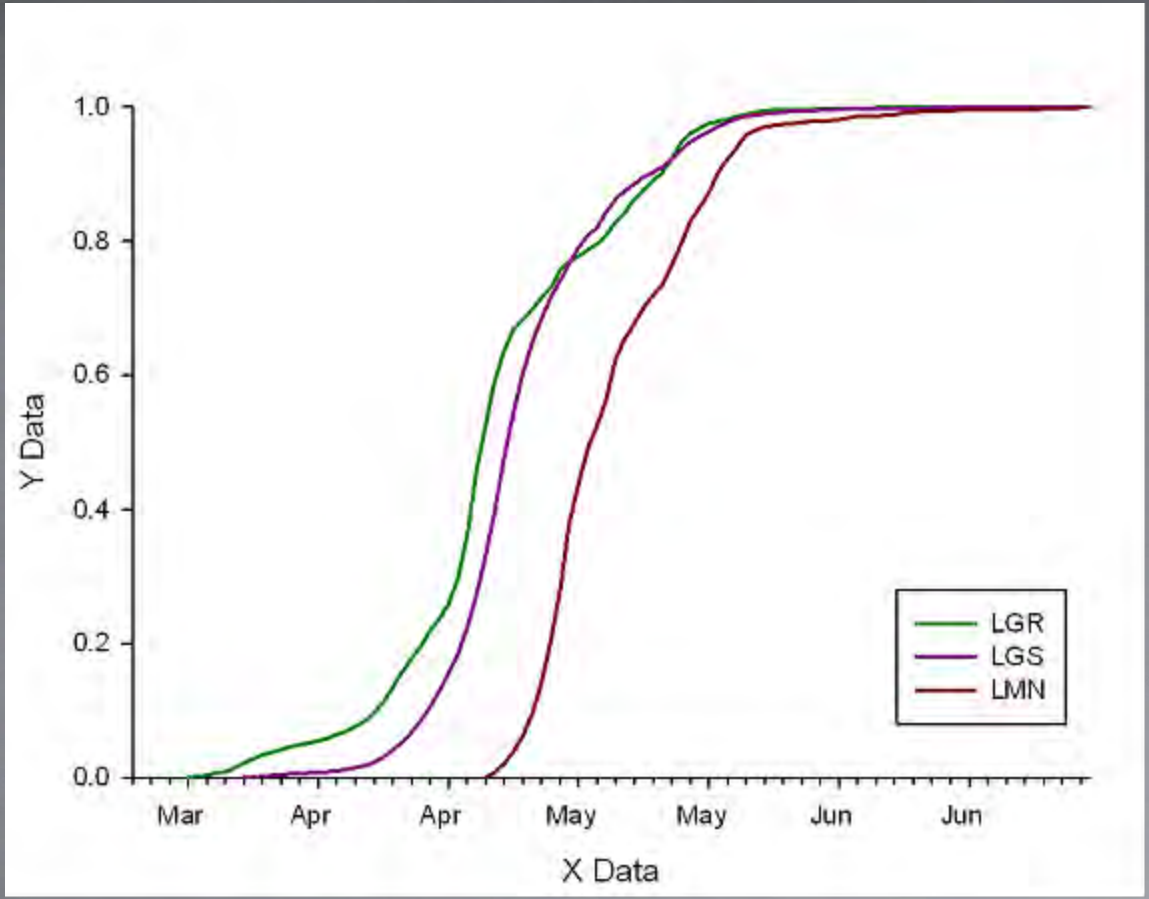
- **WDFW:** S. Lind

Cumulative Timing Distribution: CH1



Cumulative Timing Distribution: CH1



Cumulative Timing Distribution: CH1