

Pinniped Predation on Adult Salmonids and White Sturgeon in the Bonneville Dam Tailrace: An Update for 2011-2012

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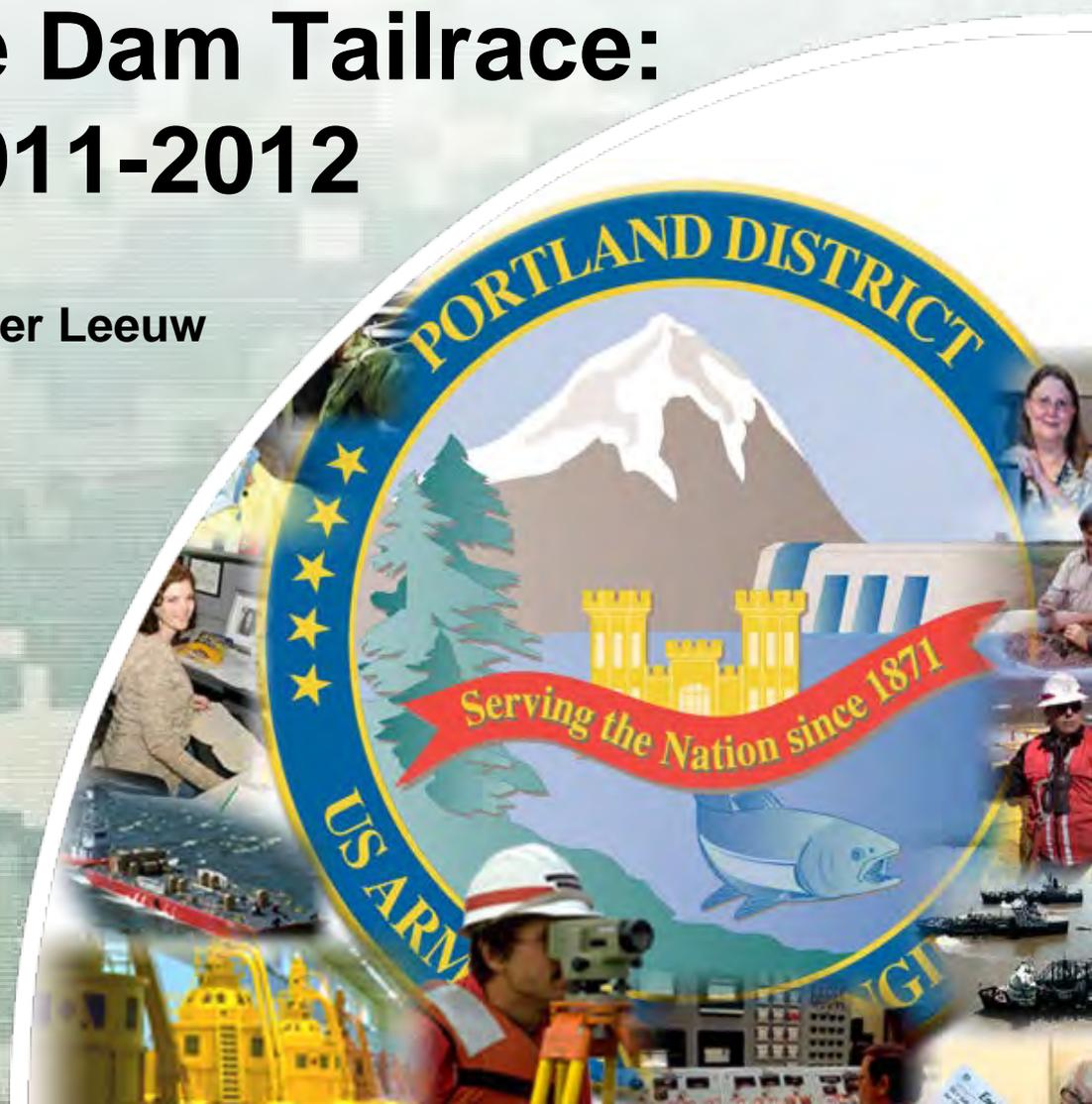
Fisheries Field Unit

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Outline

- Background
- Objectives
- Methods
- Results
 - ▶ Pinniped Deterrents
 - ▶ CSL Removal Program
 - ▶ Pinniped Abundance
 - ▶ Predation Estimates
 - ▶ Fall 2011 Data
- Conclusions



Background

- 2000 FCRPS Biological Opinion called for investigation into marine mammal predation in the tailrace of Bonneville Dam
- Corps observation program began in 2002
- NOAA authorized CSL removal program in 2008



The Pinnipeds



California sea lion (CSL)
Zalophus californianus



Steller sea lion (SSL)
Eumetopias jubatus

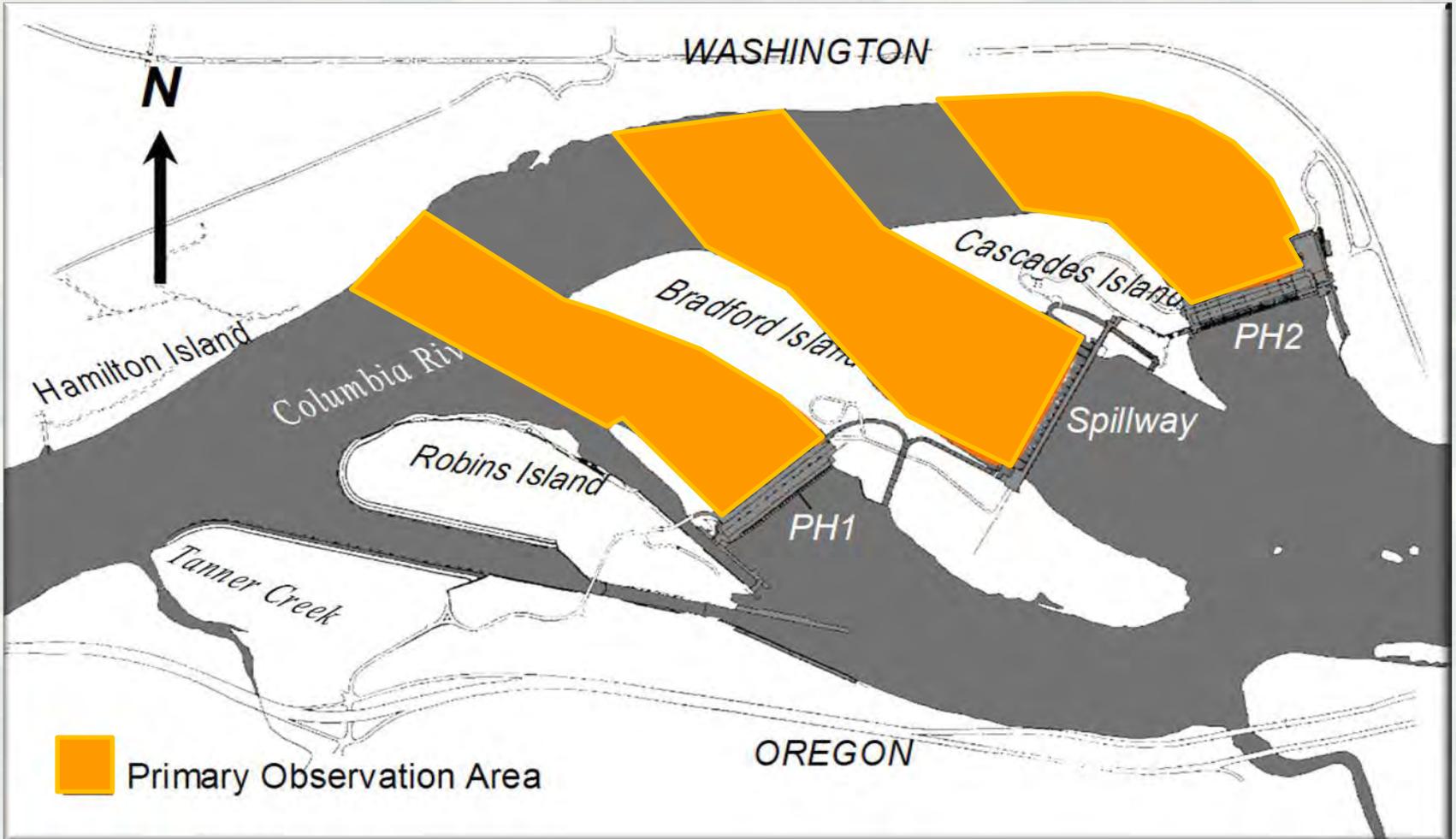


Objectives

- Evaluate the effectiveness of deterrent actions
 - ▶ Non-lethal harassment
 - ▶ Permanent removal of CSL
- Determine pinniped abundance
- Estimate pinniped predation at Bonneville Dam



Study Site



Methods: Pinniped Observation

- Surface Observation
 - ▶ How many pinnipeds
 - Identify individual sea lions
 - ▶ How many fish consumed
 - Which species
- Sunrise-sunset, 5 days/wk
- January – May



Results



- Presenting “adjusted consumption estimate”
 - ▶ Expands for hours and days not observed
 - ▶ Adjusts for nocturnal predation
 - ▶ Partitions “unknown” fish catches



Results: Deterrents



Results: CSL Removal Program (OR, WA, ID)



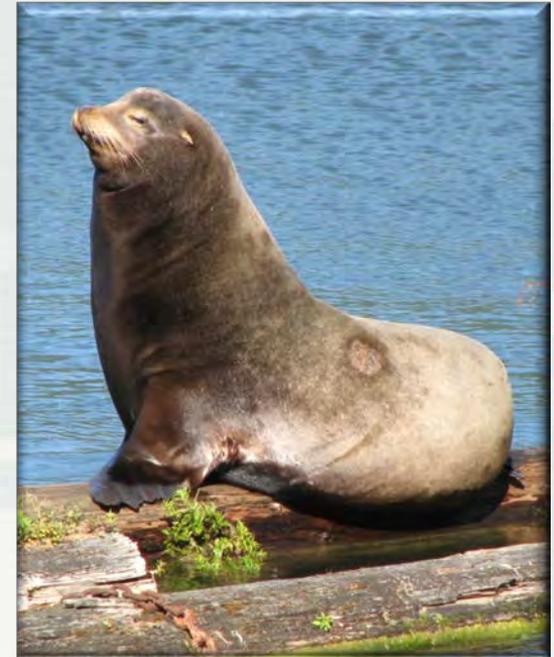
CSL Removal Program 2008-2012

- 54 California sea lions removed
 - ▶ 11 sent to zoos/aquariums
 - ▶ 39 euthanized
 - ▶ 4 accidentally died on trap



Is the Removal Program Working?

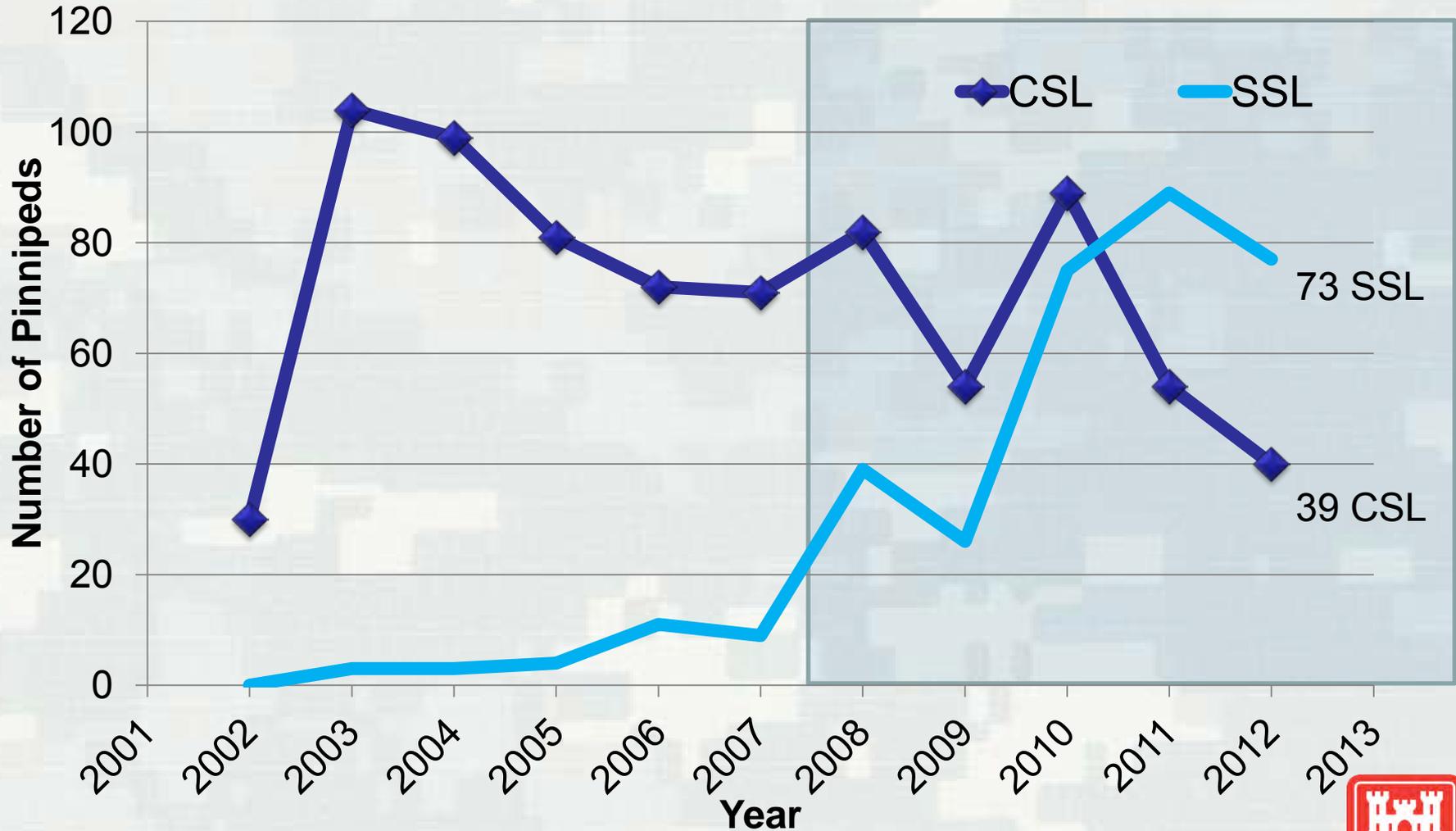
- More questions than answers
- Most removed CSL were multi-year individuals with high levels of salmonid consumption
- Reduction of CSL abundance
- Reduction of CSL predation
- Other potential contributing factors
 - ▶ SSL displacing CSL
 - Cleptoparasitism
 - ▶ Natural variability
 - ▶ Combination of factors



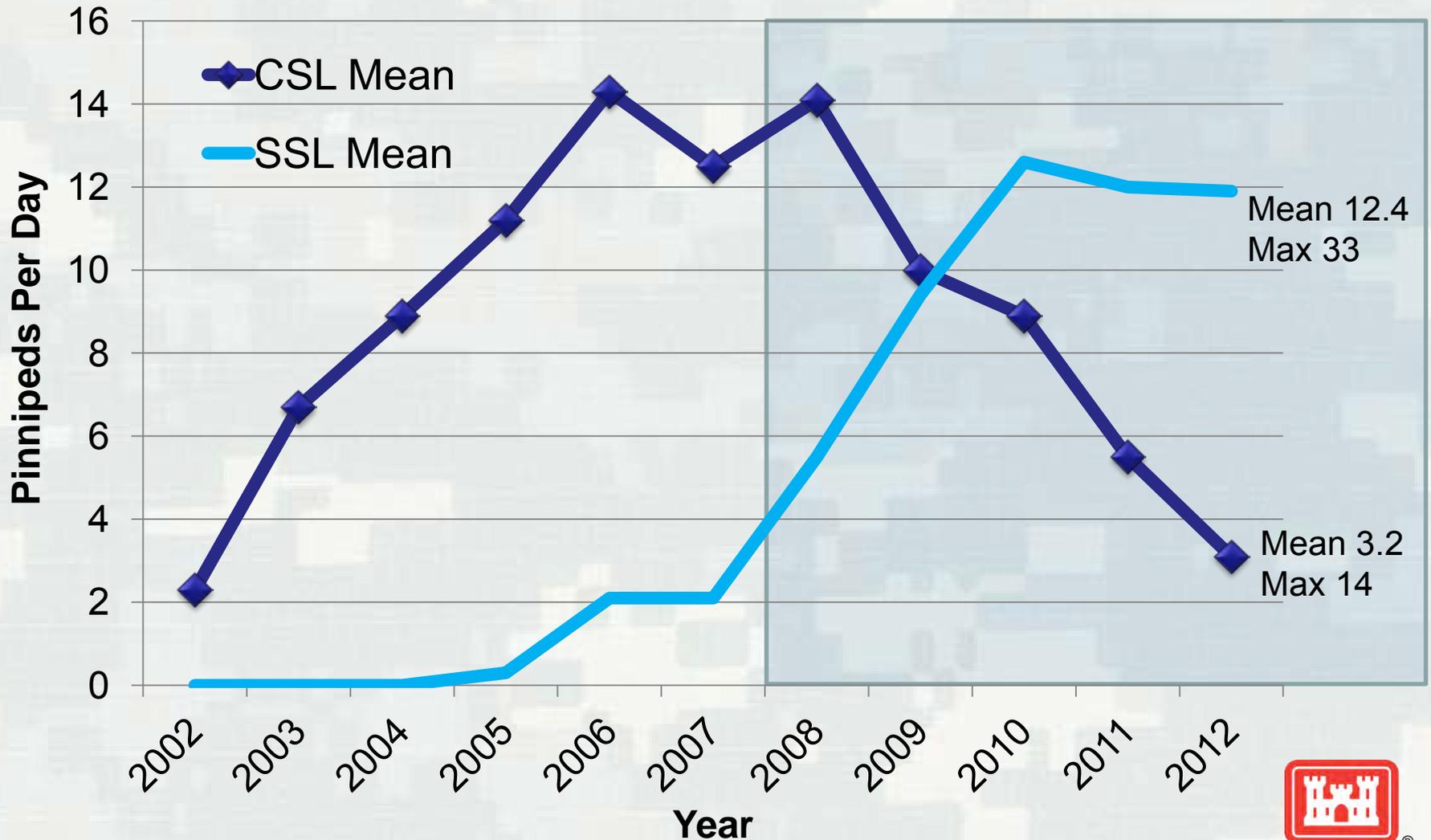
Results: Pinniped Abundance



Annual Pinniped Abundance Estimates



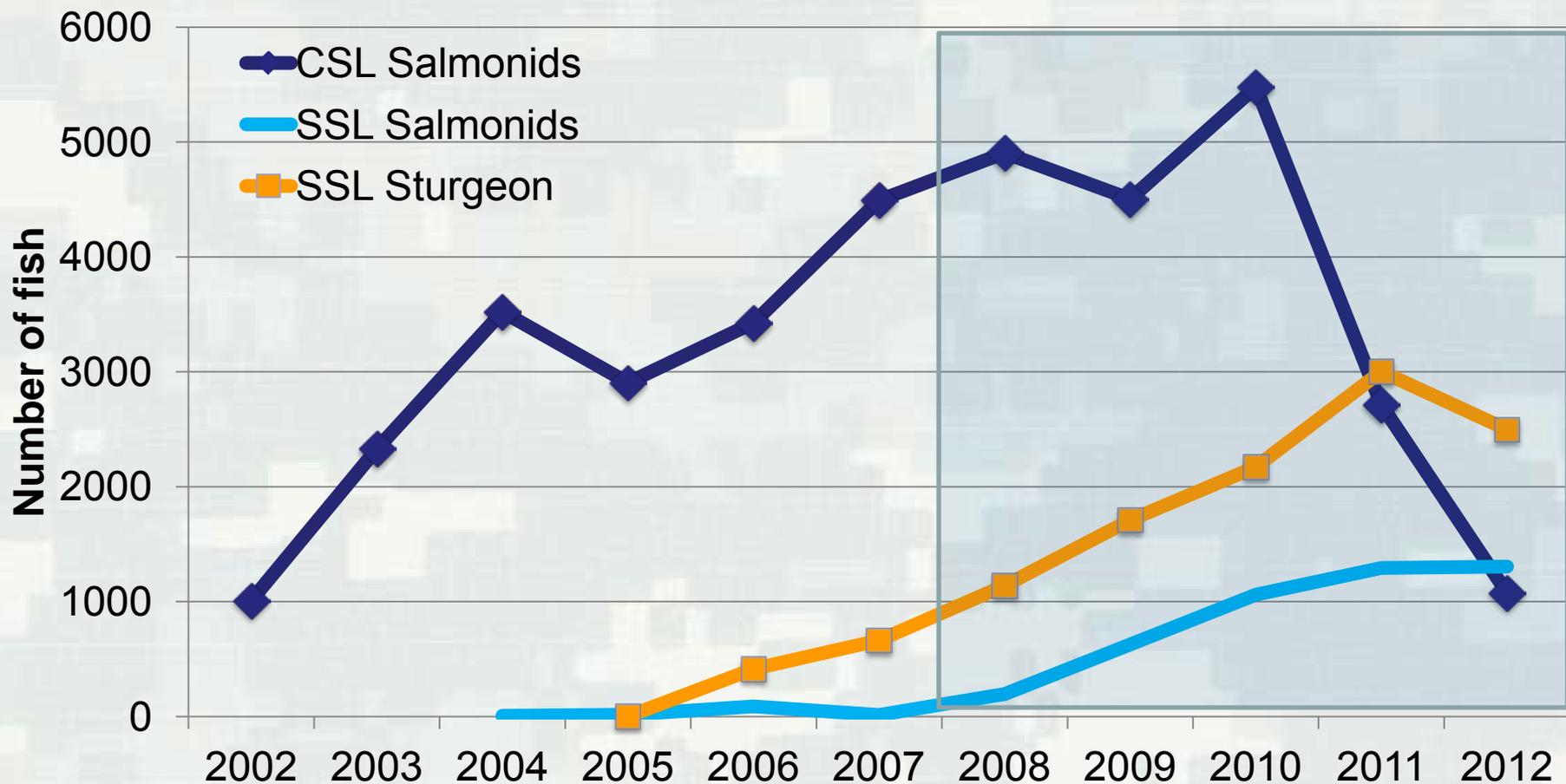
Daily Mean Pinniped Abundance



Results: Pinniped Predation



Estimate of Salmonid and Sturgeon Consumption (2002- 2012)



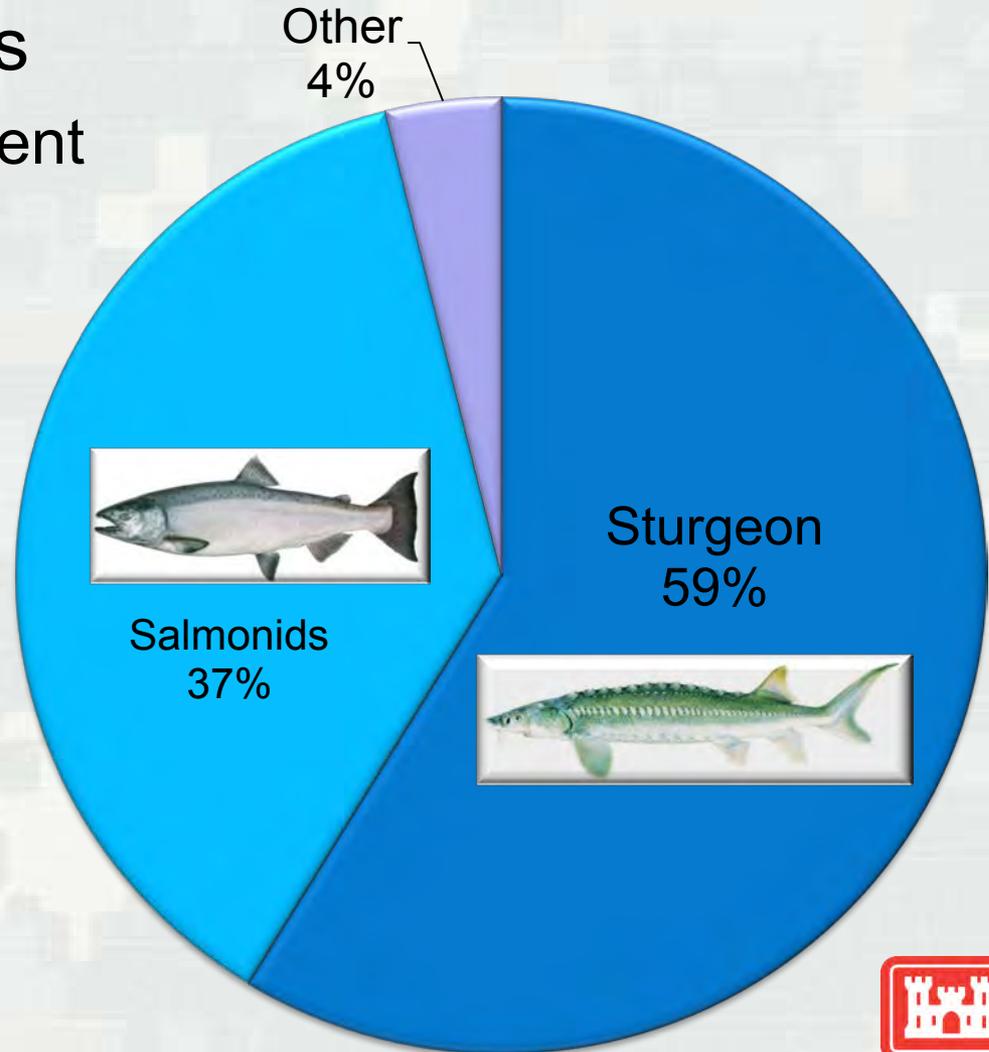
Bonneville Salmonid Passage and Estimated Consumption by Pinnipeds

Year	Salmonid Passage (Jan - May)	Adjusted Consumption Estimate	% of Run (Jan - May)
2002-2010 (Range)	173,890 (81,252 – 284,732)	3,844 (1,010 – 6,542)	2.6% (0.4 – 4.9%)
2011	223,380	4,007	1.8%
2012	171,665	2,382	1.4%



Results: Fall 2011 Observations

- Oct-Dec: 315 hours
 - ▶ Primarily SSL present
 - ▶ 828 Sturgeon
 - ▶ 528 Salmonids
 - Chinook
 - Coho
 - Steelhead
 - Chum
 - ▶ 54 Other
 - Shad
 - Lamprey
 - Carp



Conclusions

- CSL abundance and predation decreased in 2011 & 2012
- Need to find and test new non-lethal deterrents
- SSL are now the predominant pinniped species at Bonneville
- Recommend an increase in fall observations



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Collaborators



Questions?

