Sea Lions and Salmon in the Columbia River

Pinniped-Fisheries Interactions in the Pacific Northwest

Columbia River Basin
- More than 400 dams—11 run-of-the-river dams
- Most hydroelectrically developed river system in the world
- > 21 million kilowatts of generating capacity

Salmon in the Columbia River: Then
- Columbia River drains 259,000 square miles
- Before 1850, an estimated 11-15 million salmon and steelhead returned to Columbia River annually
- Harvest of Columbia River Chinook salmon peaked in the late 1800s at almost 43 million pounds!
Salmon in the Columbia River: Now

- Runs are at a fraction of historic levels
- Around 660,000 salmon and steelhead return annually
- Billions of dollars spent on salmon recovery
- Many stocks listed as threatened or endangered

Salmon in the Columbia River: Now

- Threatened by:
  - irrigation & runoff
  - timber harvesting
  - commercial and recreational fishing
  - mining
  - pollution
  - construction of river structures
  - flood control measures
  - predation—sea lions, birds, humans, other fishes

Salmon in the Columbia River: Now
Salmon in the Columbia River: Now

Pinnipeds in the Columbia River: A Brief History

Pinnipeds in the Columbia River: Early Accounts

- 1806: "...The Seal or Phoca are found here in great numbers, and as far up the Columbia as the great Falls, above which there are none..." –William Clark, Celilo Falls
- Records of Columbia River tribes taking pinnipeds for food & materials
- 1888: "Hundreds of seals can be seen in the month of July at the mouths of the Columbia river" –State of Oregon report

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The Pinniped Hunt

- **1888**: Pinnipeds characterized by Oregon report as "perhaps the greatest" mortal enemies of salmon
- **1901**: "...some action should be taken at the coming session of the legislature for the destruction of the thousands of seal and sea lions found along the coast and near the mouth of the rivers, preying on salmon during the entire season." - Oregon Dept. of Fisheries
- **1909**: Oregon paid hunters $945.47 to kill at least 670 sea lions and 288 seals at the mouth of the Columbia River. This is praised as "remarkably good work."
- Bounty on pinnipeds continued through 1960's

Pinnipeds in the Columbia River

- **1938**: Bonneville Dam in service, effectively eliminating now-minimal pinniped presence upstream
- **1972**: Marine Mammal Protection Act passed, protecting all pinnipeds
- **1970's**: 1,000-2,000 California sea lions on Oregon coast
- **1930's-1990's**: Pinnipeds are only occasional visitors at Bonneville Dam

Pinnipeds in the Columbia River: The Sea Lion Boom

- **1990's**: 5,000-7,000 California sea lions in Oregon
- In the late '90s, sea lions began congregating at Bonneville Dam
- **2002**: About 1,010 salmonids (0.4%) were taken by 31+ sea lions at Bonneville
- **2005**: About 2,920 salmonids (3.4%) taken by sea lions at Bonneville
- Hazing and other deterrents have proven to be relatively ineffective
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The Conflict

ODFW Photos

What should be done?

Case Study: Ballard Locks

- **1980**: Sea lions first noticed feeding on steelhead
- **1985**: Serious declines in steelhead runs noticed, and agencies begin unsuccessful efforts to deter sea lions
- **1992**: 30-60 sea lions (1 to 3 individuals in particular) consumed as much as 60% of the winter wild steelhead run
- **1994**: Only 70 steelhead returned to spawning grounds
- **1995-6**: Problem sea lions were FedExed to Sea World Orlando and predation problem stopped, but fish runs did not recover
Should we just kill them?

- Sea lions are protected under Marine Mammal Protection Act
- Steller sea lions are also listed under the Endangered Species Act
- Public outcry

Now what?

- Non-lethal deterrents & harassment on the Columbia River
  - Begun in 2005
  - Full testing in 2006
  - Complete hazing program 2007-current

- OR and WA have permits under MMPA Section 120 to kill some of the sea lions that are taking endangered salmon
  1. Animals must be identifiable in order to be removed from the population
  2. Animals must have been previously non-lethally hazed
  3. Animals must have been seen repeatedly eating salmon below the Dam
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Hot Branding

Release

Will we find a balance?