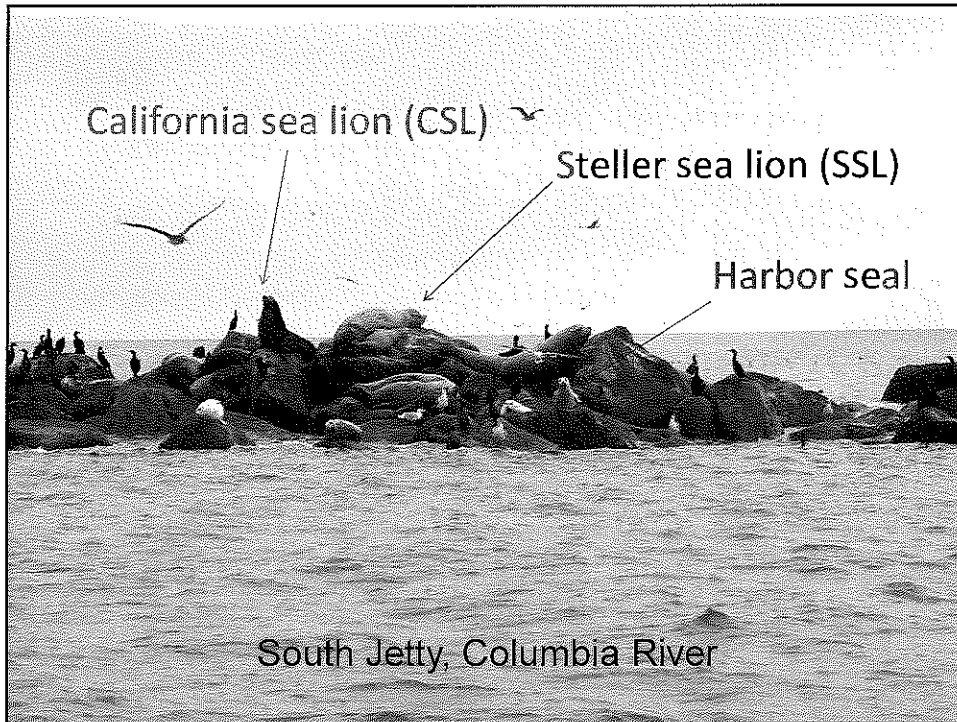


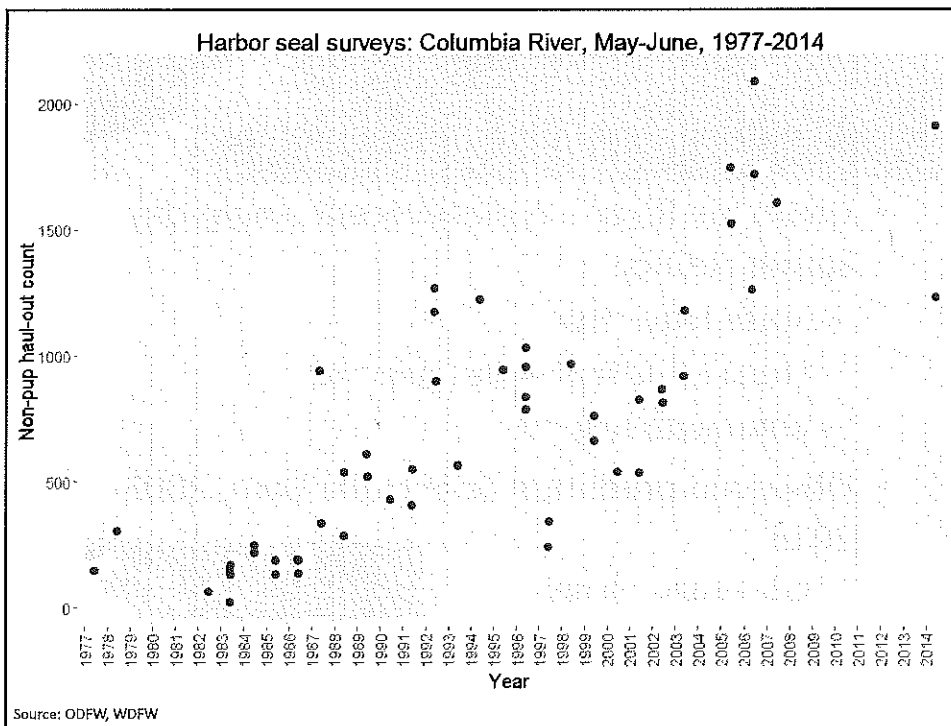
Acknowledgments

- NOAA Fisheries
- National Marine Mammal Laboratory
- Washington Department of Fish and Wildlife
- Pacific States Marine Fisheries Commission
- U.S. Army Corps of Engineers
- Columbia River Inter-Tribal Fish Commission
- Northwest Power and Conservation Council
- Bonneville Power Administration



- Widely distributed North Atlantic and North Pacific.
- Five west coast U.S. stocks
- OR/WA coast stock:
 - Population stabilized 1990s but may have recently increased
 - 1999 estimate: ~25,000 seals (~10,000 in Oregon)
 - 2014 estimate pending

Source: U.S. Pacific Marine Mammal Stock Assessments, 2013 (NOAA-TM-NMFS-SWFSC-532); ODFW; WDFW



Steller sea lions

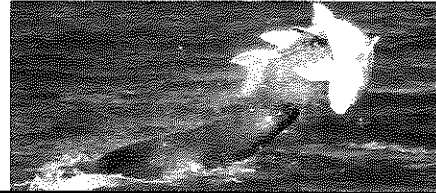
- U.S. stocks (2): Western, Eastern
- Eastern stock:
 - ~63,000-78,000 sea lions
 - Growth rate: 3%-5% per year
 - Delisted as "threatened" under ESA in 2013
- OR/WA population:
 - ~7,900 total (~1,500 pups)

Source: Alaska Marine Mammal Stock Assessments, 2013 (NOAA-TM-NMFS-AFSC-277); ODFW



Steller sea lions

- Columbia River – typical/recent single-day spring counts
 - South Jetty: ~100
 - Phoca Rock/Bonneville Dam: ~40
 - Willamette Falls: ~2
- Observed predation Bonneville Dam, 2005-2014
 - Salmonids: ~8,000
 - White sturgeon: >12,000



Source: ODFW; WDFW; USACE



California sea lions

- Five stocks (4 in Mexico)
- U.S. stock
 - ~300,000 sea lions
 - Growth rate: 5% per year (except El Nino years)
- Pacific Northwest
 - Seasonal migrants (fall, winter, spring)
 - Nearly all sub-adult and adult males

Source: U.S. Pacific Marine Mammal Stock Assessments, 2013 (NOAA-TM-NMFS-SWFSC-532)

California sea lions

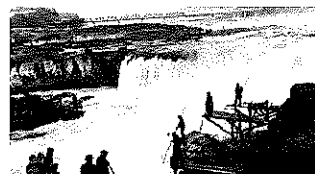
- Columbia River – “typical/recent” single-day spring counts
 - South Jetty: ~50
 - East Mooring Basin: ~250 (pre-2013)
 - Bonneville Dam: ~25
 - The Dalles: ~3
 - Willamette Falls: ~20



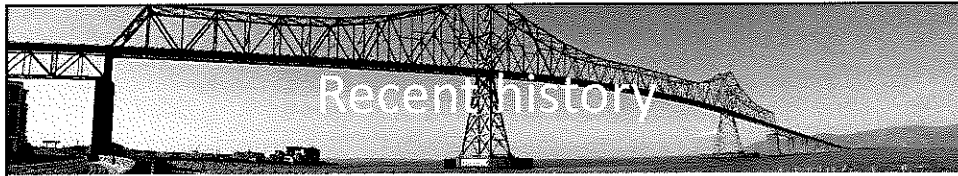
Source: ODFW, WDFW, USACE

Historic/prehistoric occurrence of pinnipeds in the lower Columbia River

- Archaeological evidence shows harbor seals present in lower Columbia River up to 10,000 years ago; no similar evidence for other pinnipeds.
- Harbor seals observed to Celilo Falls during 19th (e.g., Lewis & Clark) and early 20th centuries.
- Steller sea lion observations at river-km 70 in 1814 & river-km 150 in 1930s.
- *No history of CSLs in river.*



Source: Lyman et al. 2002, Northwestern Naturalist



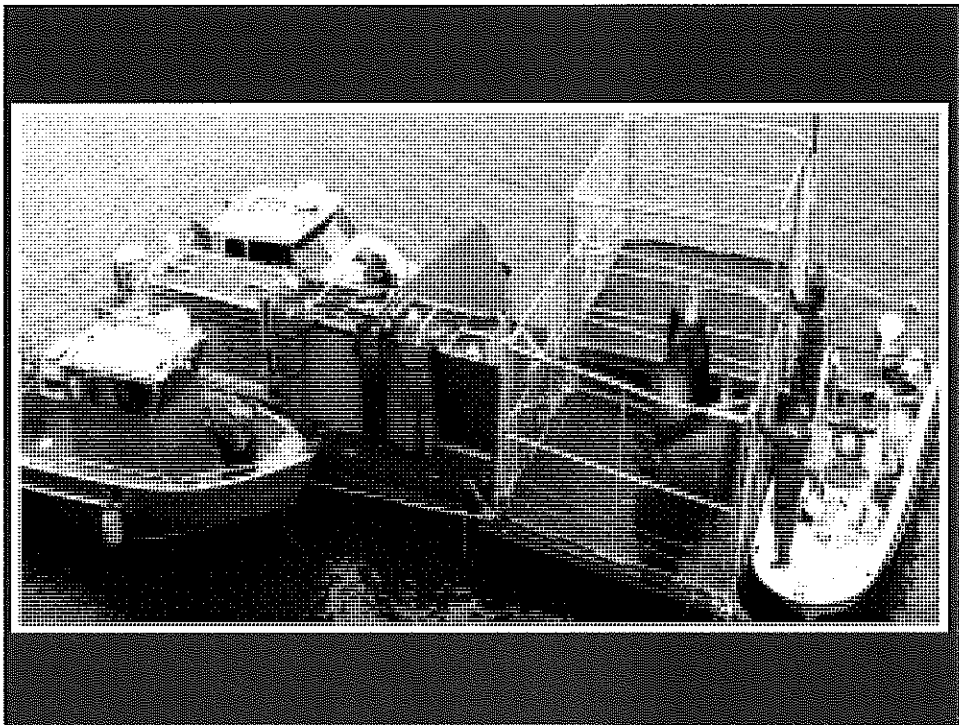
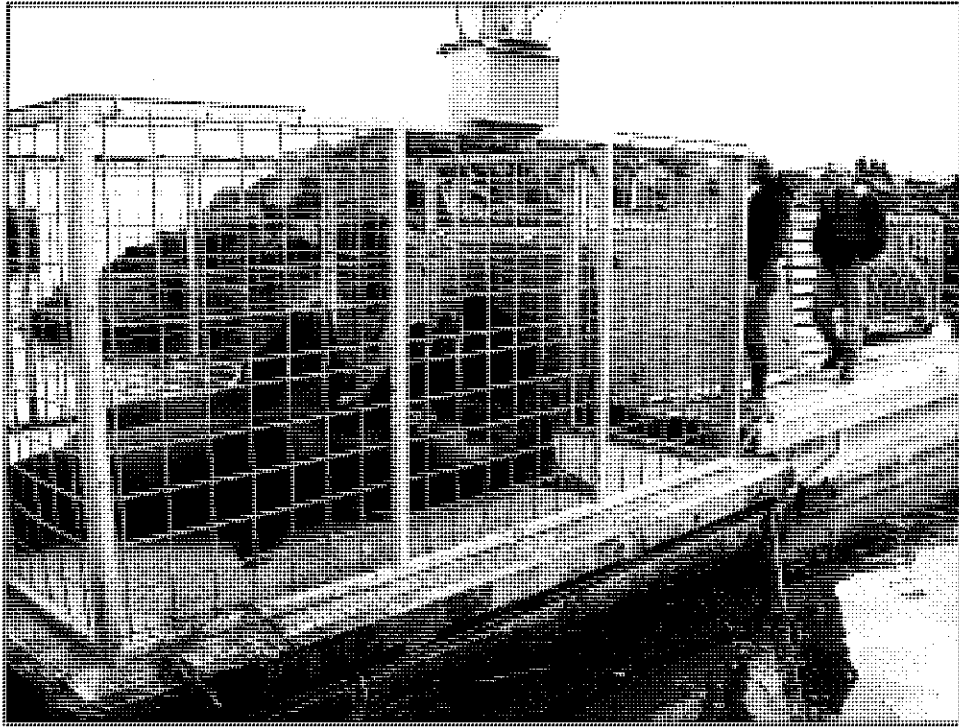
- 1970s
 - Marine Mammal Protection Act (MMPA) of 1972
- 1980s
 - CSLs begin occurring regularly in the lower Columbia River
- 1990s
 - CSLs start occurring regularly at Willamette Falls
 - CSL branding program starts in Astoria 1997
 - ESA listings of Columbia River salmonids

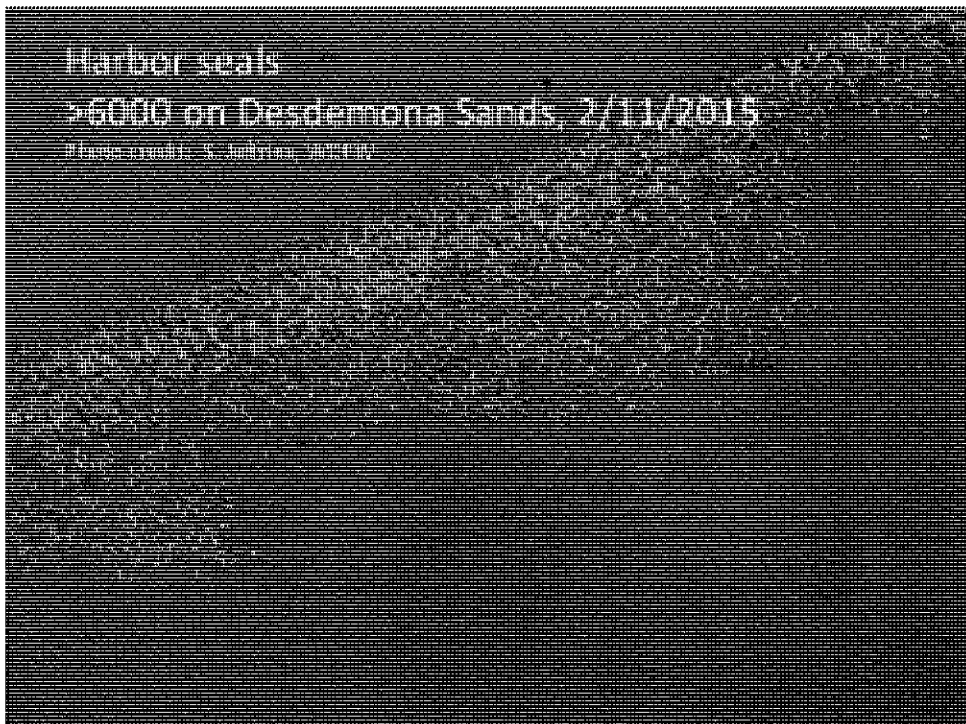
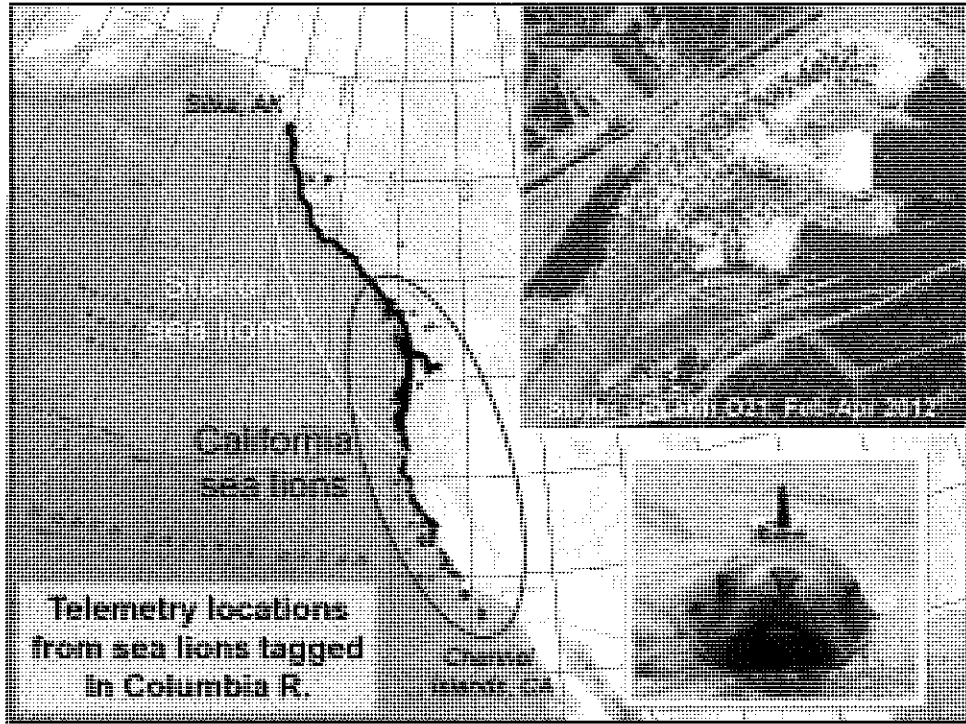
Source: ODFW, WDFW

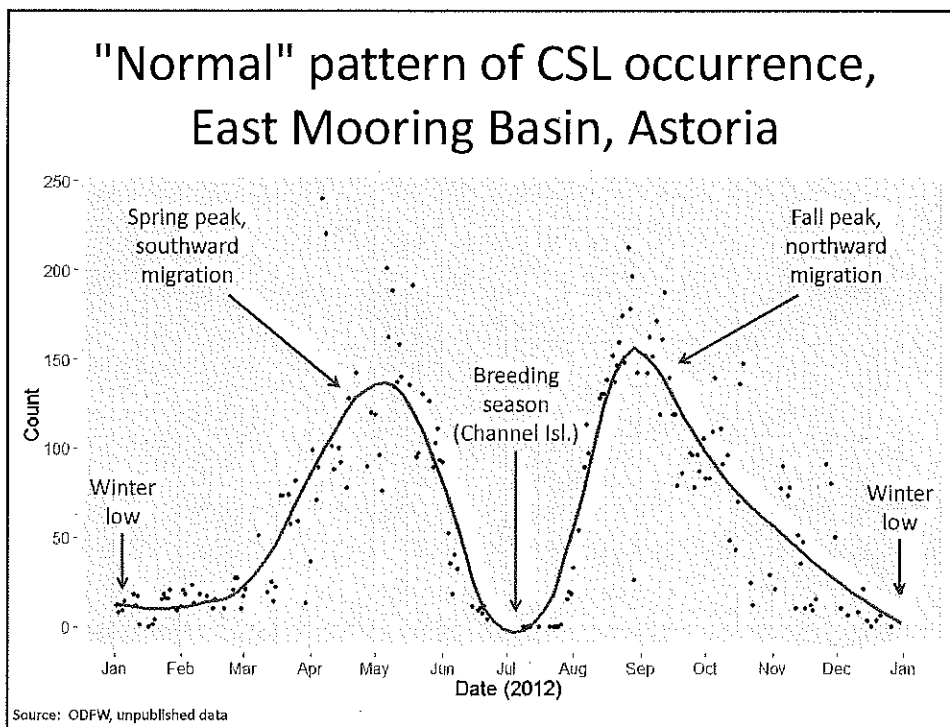
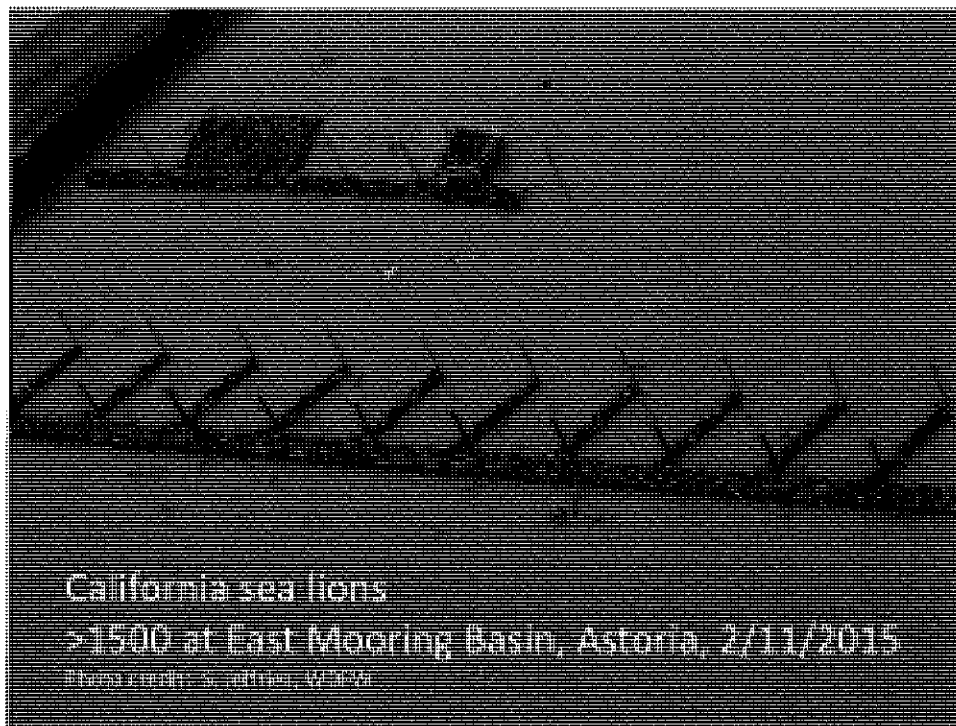


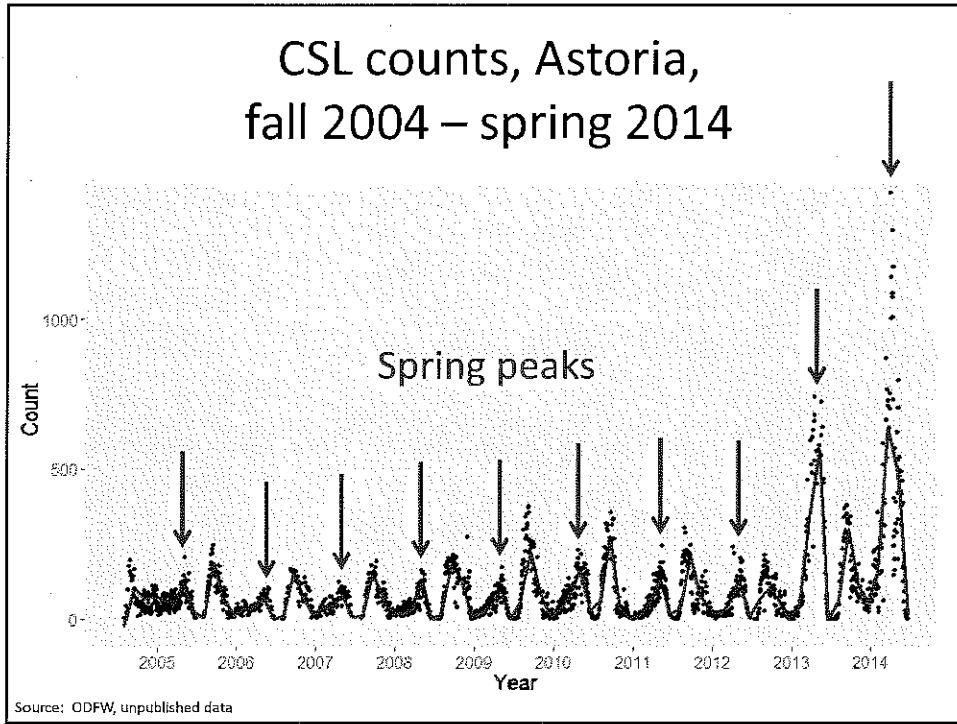
- 2000s
 - CSLs occurring regularly at Bonneville Dam 2001
 - Monitoring at dam starts 2002
 - SSLs occurring regularly at Bonneville Dam 2006
 - Commission directs agency to apply for MMPA Section 120 removal authority 2006 (with WDFW and IDFG)
 - Section 120 authority granted 2008
 - CSL & SSL begin increasing at Willamette Falls

Source: USACE, ODFW, WDFW









California and Steller sea lions
Several 'pods' of 100-200 each, RM 24 to RM 68,
2/20/2015
How great is that, huh?

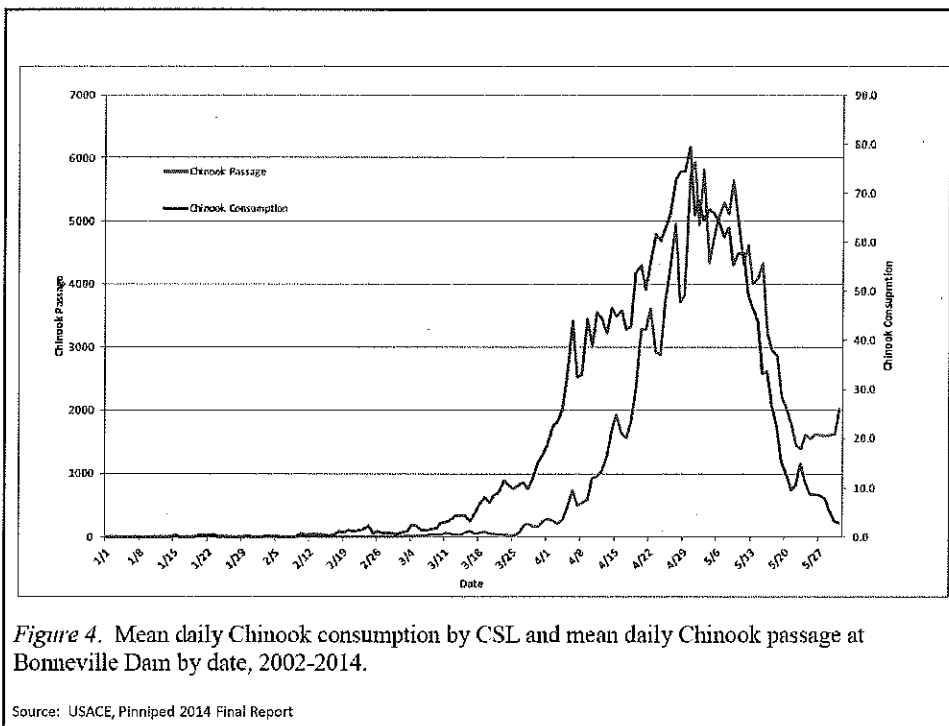


Figure 4. Mean daily Chinook consumption by CSL and mean daily Chinook passage at Bonneville Dam by date, 2002-2014.

Source: USACE, Pinniped 2014 Final Report



- Maximum USACE-observed consumption:
 - 12 salmon/day
 - 198 salmon/season
- Prey requirements at dam based on energetics model: 3 salmon/day
- Observed predation at Bonneville Dam, 2002-2014: 40,000+ salmonids

Source: USACE, ODFW

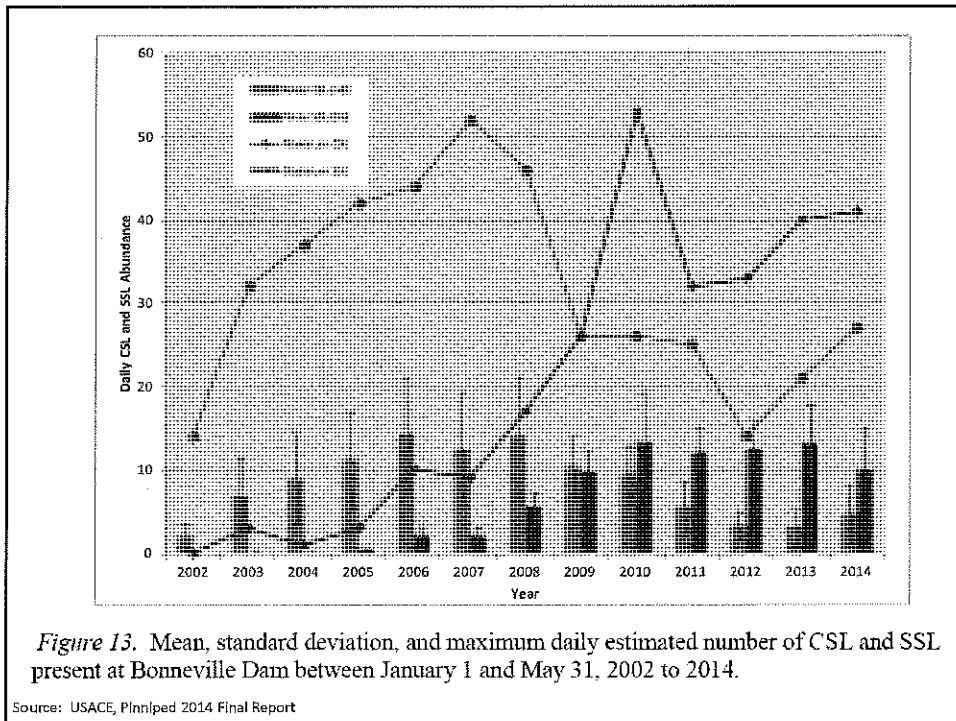


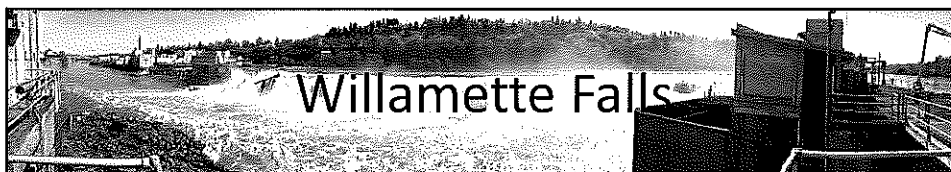
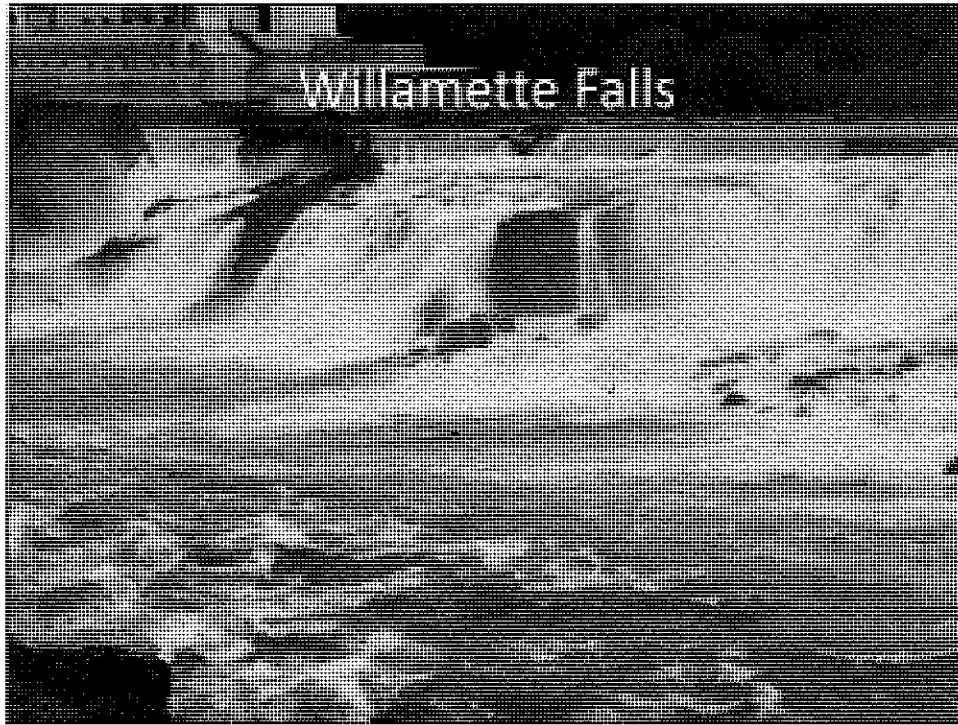
Figure 13. Mean, standard deviation, and maximum daily estimated number of CSL and SSL present at Bonneville Dam between January 1 and May 31, 2002 to 2014.

California sea lion removals

Year	Captivity	Accidental mortality	Euthanized	Total
2008	6	5		11
2009	4		11	15
2010			14	14
2011*			1	1
2012	1		12	13
2013	2		2	4
2014			15	15
Total	13	5	55	73

*On-going litigation suspends removal program

Source: ODFW, WDFW



- Monitoring: 1995-2003, 2009-2013, 2014-
- Hazing by ODFW: 2010, 2012-2013
- 2014 results (March-May)
 - At least 27 CSLs, 2 SSLs, 1 HS
 - 14 CSLs seen previous years at WF or Bonneville
 - 5 CSLs on removal list
 - 3,700 (+/- 400) salmonids killed
 - 13% (+/- 3%) of listed winter steelhead
 - 8% (+/- 2%) of listed spring Chinook
- 2015: increased monitoring; trap preparations

Source: Willamette Falls 2014 Field Report

2015 and beyond

- Astoria
 - Continue sea lion marking project
 - Key to understanding affects of growing sea lion numbers on salmonids, other fish resources
- Columbia River
 - Monitor pinniped abundance, distribution, and foraging habits

2015 and beyond

- Bonneville Dam
 - Continue predator removals 2015 and 2016
 - Request 5-year extension of NMFS LOA – 2021
 - Evaluate need for Steller sea lion management
- Willamette Falls
 - Continue monitoring of predation 2015, 2016...
 - Evaluate predation affects on T&E salmonids

