Washington Department of FISH and WILDLIFE

Update on Pinniped Predation of Salmon in Washington

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OUTLINE

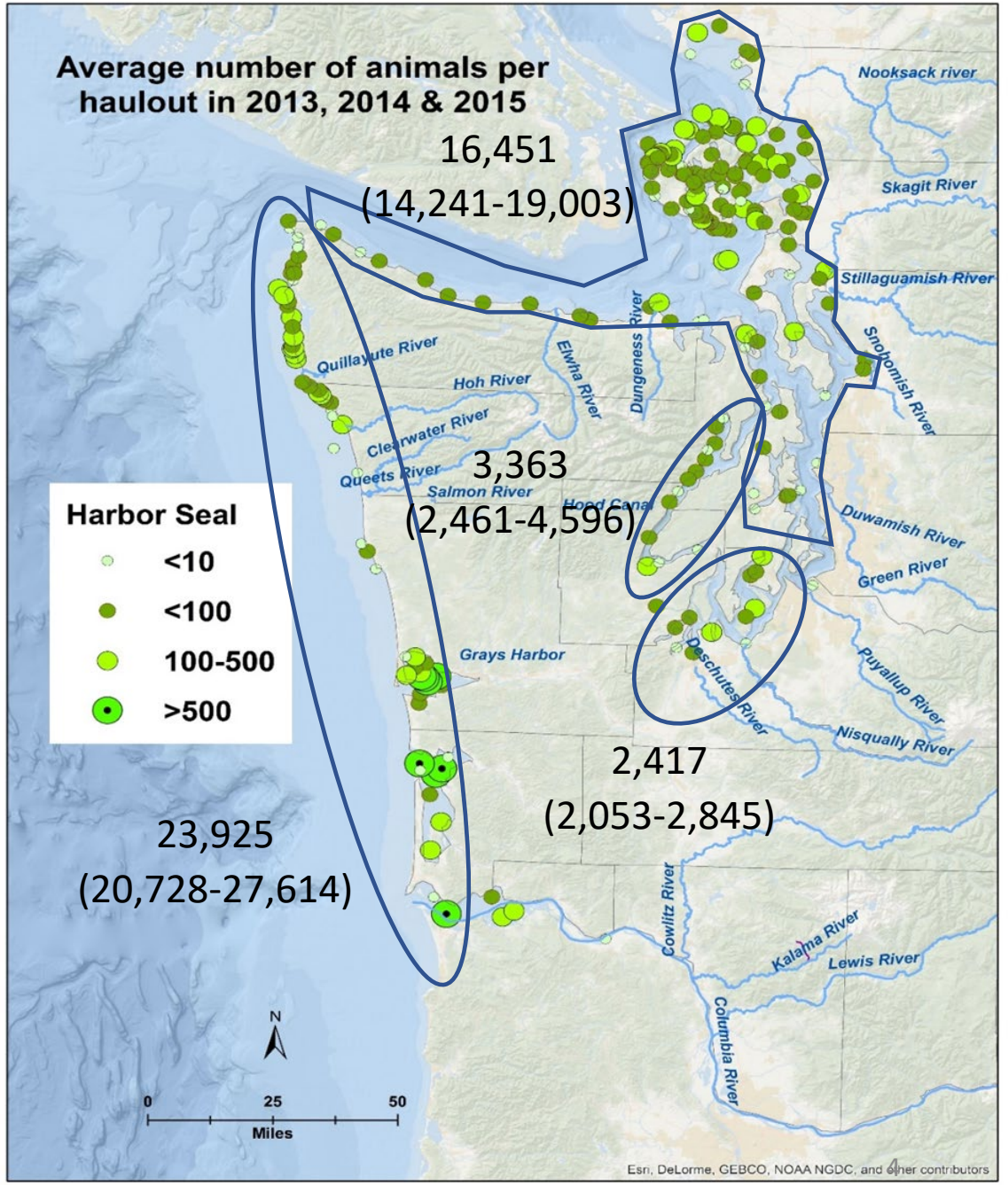
- Pinnipeds in Washington
- Coastal estuary pinnipeds
- Columbia River Update
- Puget Sound/Coast Update
- WA State Academy of Sciences Report
- Next Steps

Focus on Three Species of Pinnipeds

- Harbor Seal
- California Sea Lion
- Steller Sea Lion

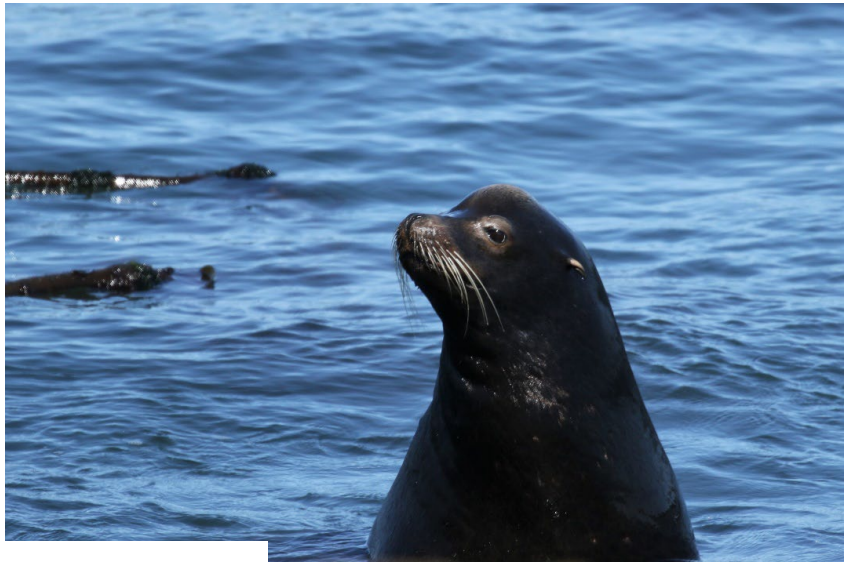
Harbor seals in WA

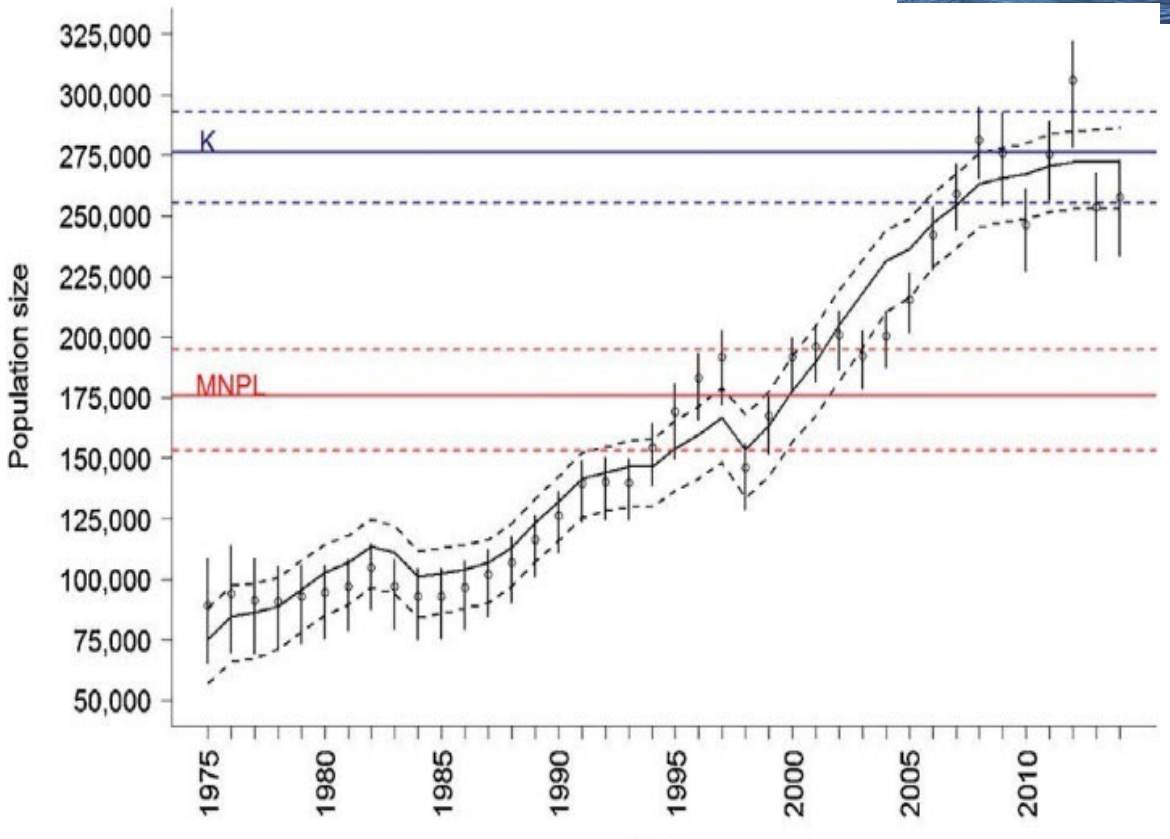
- Year-round resident
- 1 coastal stock and three stocks in inland marine waters
  - Washington/Oregon coast
  - Northern inland waters
  - Hood Canal
  - South Puget Sound



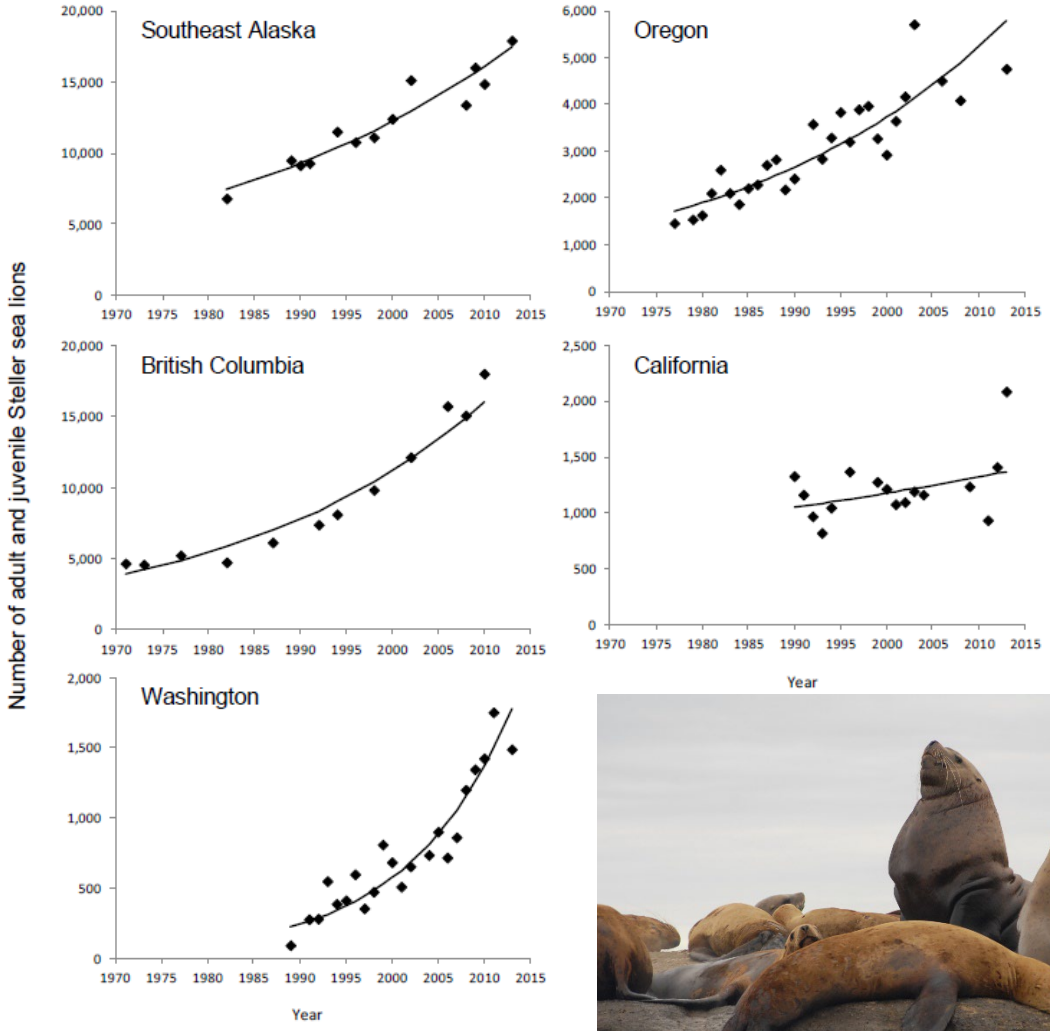
California Sea Lion

- Primarily present in Washington waters in Sept - April
- A single US stock

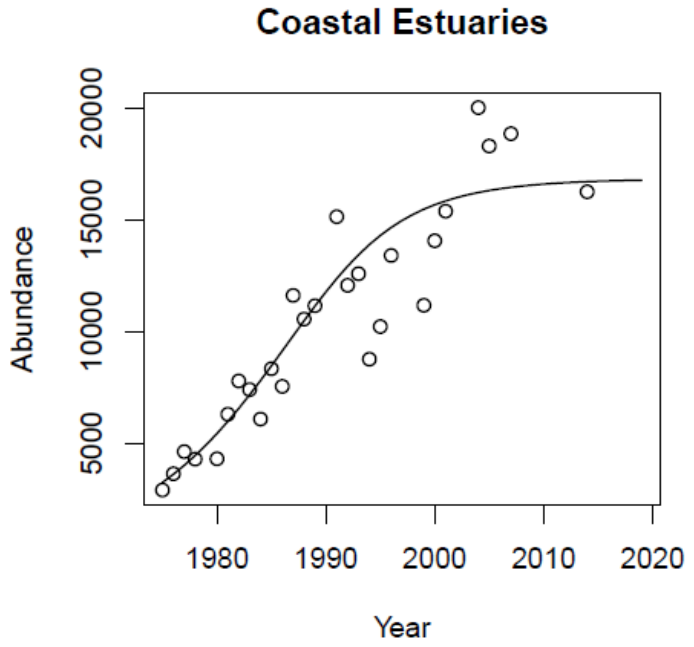


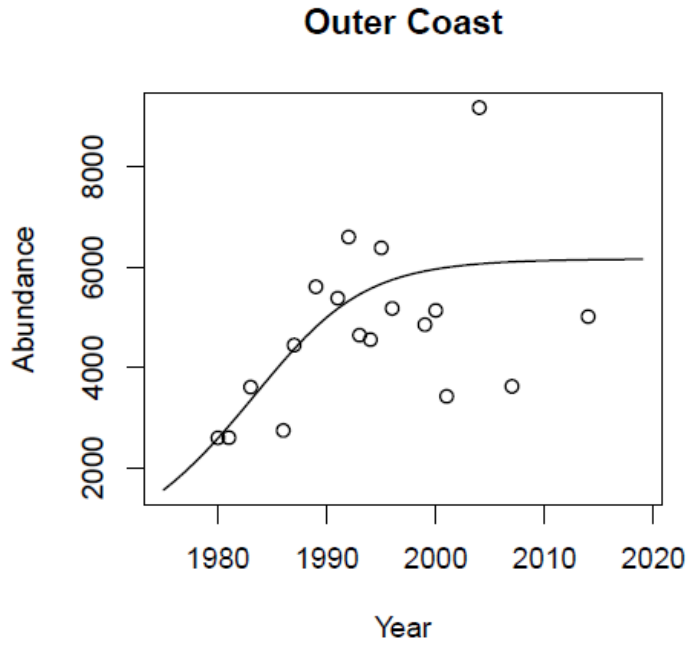


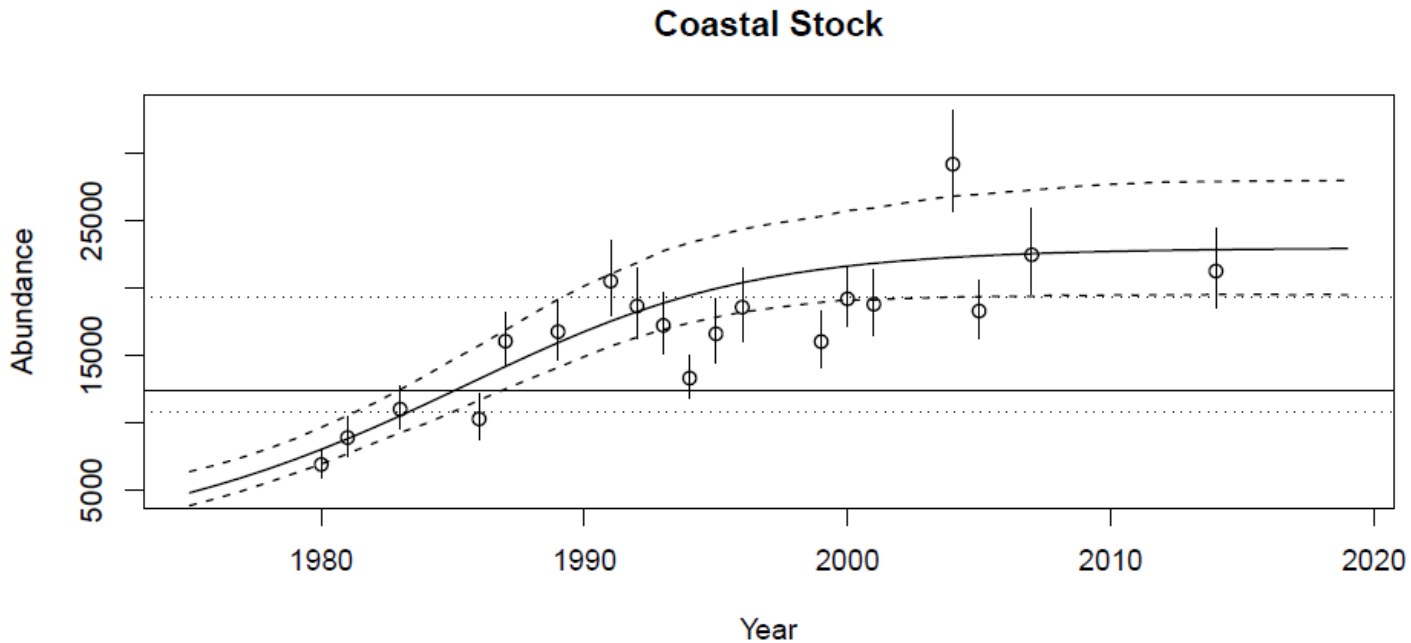
Steller Sea Lion



Coastal Estuary Harbor Seals








Bonneville Dam
RM 145
Oregon
Washington

Predation loss at Bonneville and the lower river

Year	Bonneville Dam salmonids passage (Jan 1 – May 31)	Adjusted salmonids consumption estimate in Bonneville tailrace	% of run (Jan 1 – May 31)	Predation of spring Chinook between estuary and Bonneville	% of run (Jan 1 – May 31)
2010	267,194	6,542	2.39%	77,560	22%
2011	223,380	4,007	1.76%	59,480	21%
2012	171,665	2,382	1.37%	51,750	23%
2013	120,619	2,954	2.39%	35,210	23%
2014	219,929	4,746	2.11%	98,470	31%
2015	239,326	10,859	4.34%	224,450	48%

Bonneville Tailrace + lower River

From Tidwell et al. 2018 and Wargo Rub et al. 2019

History of Section 120 and 120(f) Pinniped Removals in the Columbia Basin (Bonneville and Willamette Falls)

Year	CA Sea Lions Removed	Steller Sea Lions Removed	Total
2008	11	2*	13
2009	15	N/A	15
2010	14	N/A	14
2011	1	N/A	1
2012	13	N/A	13
2013	4	N/A	4
2014	15	N/A	15
2015	35	1*	36
2016	59	N/A	59
2017	24	N/A	24
2018	33	N/A	33
2019	50	N/A	50
2020	0	6	6
2021	29	38	67
2022	17	9	26
TOTAL	**320**	**56**	**376**

Success at Willamette Falls

Winter steelhead predation at Willamette Falls **before removals**

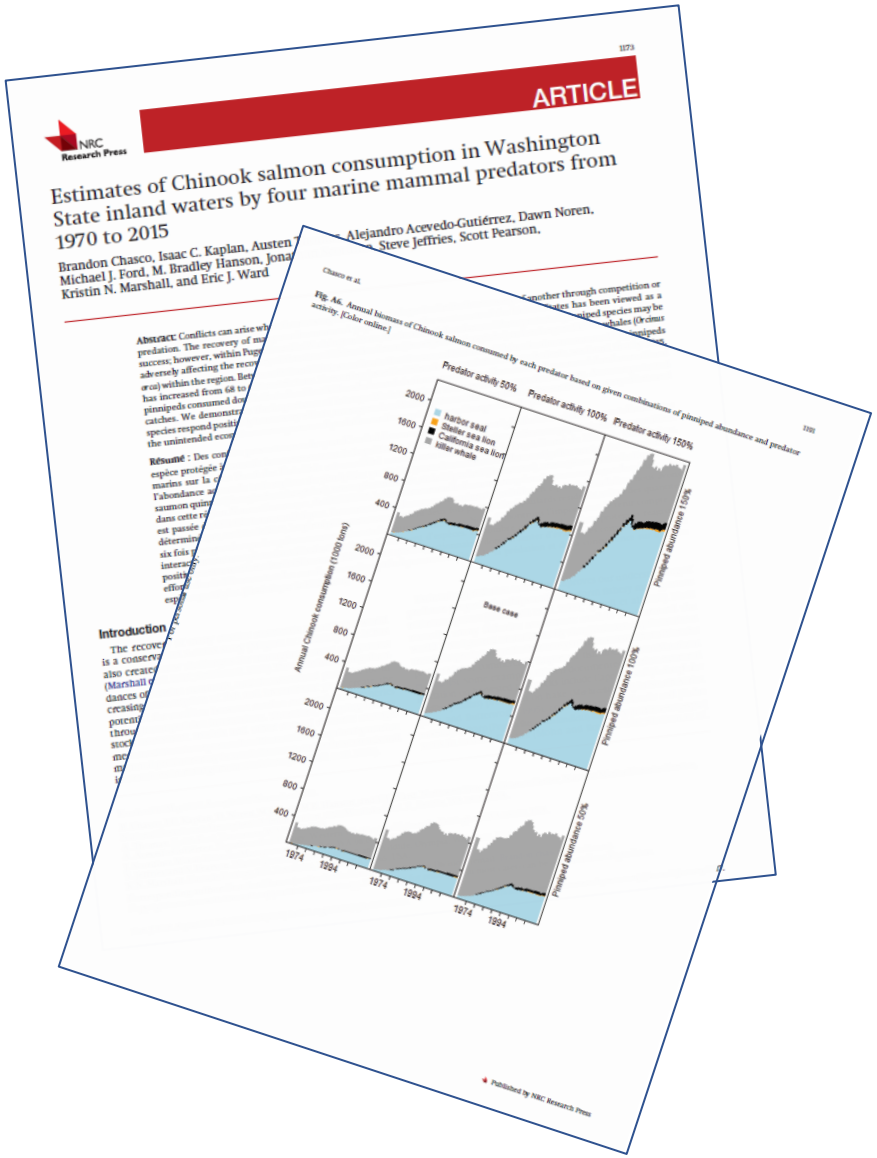
Year	2014	2015	2016	2017	2018
% of potential escapement	13%	11%	14%	25%	22%

Winter steelhead predation at Willamette Falls **after removals**

Year	2019	2020	2021
% of potential escapement	8%	0.4%	1.2%

Data from Wright et al. 2021

Chasco et al. 2016 – comparing impacts to Chinook

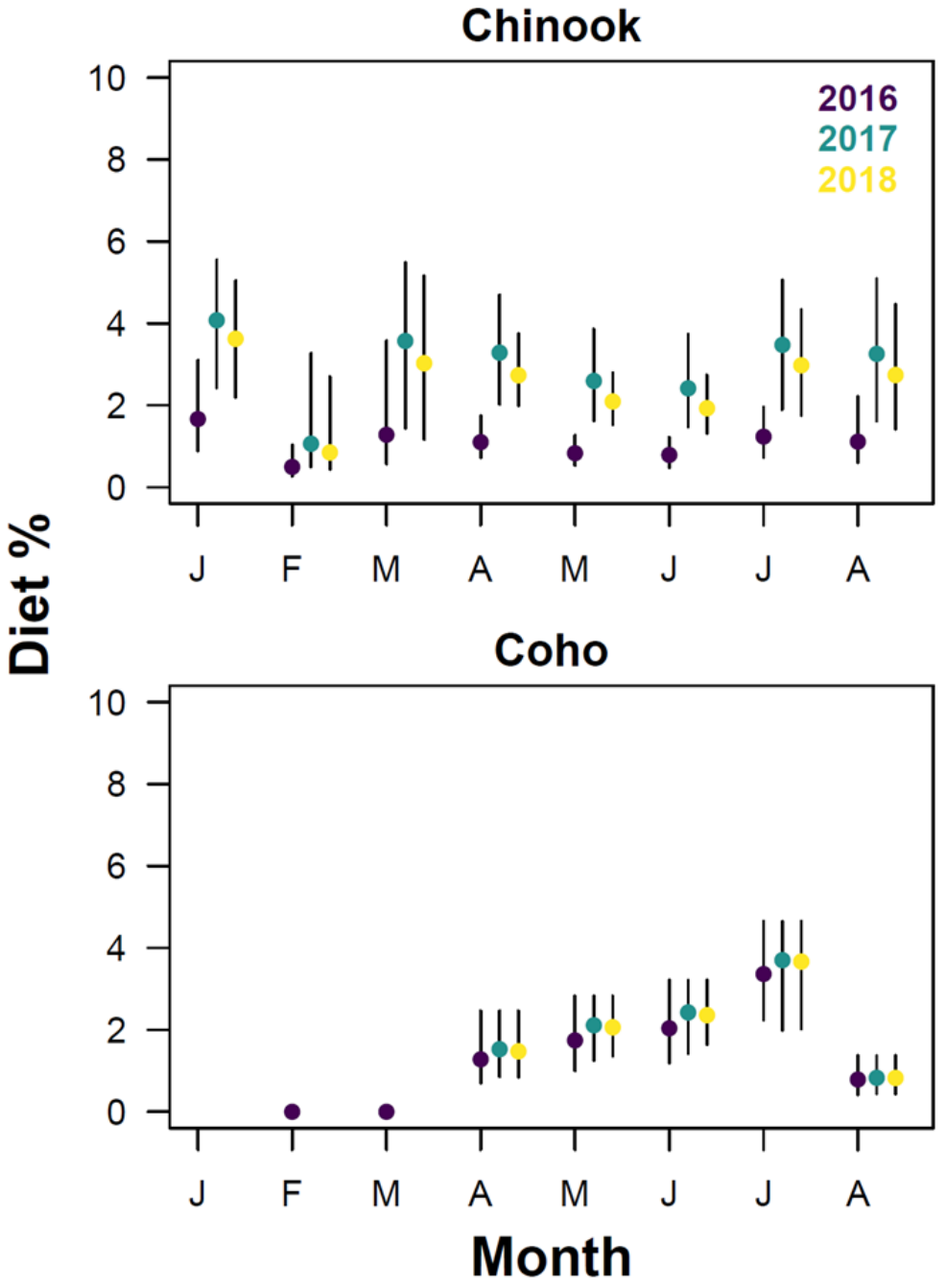


- Puget Sound bioenergetics model
- Estimated consumption of Chinook salmon from 1970-2015
- Modeled population size, diet, and energetic demands for killer whales, California sea lions, Steller sea lions, and harbor seals
- Chinook consumed by pinnipeds increased from 68 to 625 metric tons
- Pinnipeds consumed more than killer whales and all fisheries

Updated estimates of salmon consumption by Puget Sound harbor seals

- Mean monthly seal diet percentages (± credible intervals)

- Interannual differences for Chinook but not for coho.



Puget Sound Harbor Seal Diet Data Summary

- Diffuse impact adds up – lots of seals and many are eating proportionally small amounts of salmon relative to other prey items
- WDFW diet analysis suggests harbor seals in Puget Sound could consume anywhere between 0.33 to 13 million juvenile salmon
- These estimates are very sensitive to the size of the salmon consumed by the seals: smaller fish = higher consumption estimates
- Thus, we need more information about the size of the fish being eaten

Ongoing seal projects in Puget Sound

- Comprehensive Southern Puget Sound diet study
- Assessing predation impacts on Stillaguamish Chinook
- Pinniped hotspot mapping
- Non-lethal deterrent testing: Targeted Acoustic Startle Technology
- Hood Canal Bridge passage improvement and predation mitigation
- Non-lethal deterrent RFQQ for Hood Canal Bridge

Gov Inslee SRKW Task Force

- Established by Executive Order in Mar. 2018
- Address primary threats:
  - Prey availability
  - Vessel disturbance and noise
  - Contaminants
- 2018 Report: 36 recommendations
- 2019 Report: 13 additional recommendations

Gov Inslee SRKW Task Force (2018): Pinniped-related Recommendations

- Recommendation #12: Direct the appropriate agencies to work with tribes and NOAA to determine if pinniped predation is a limiting factor for Chinook in Puget Sound and outer coast and evaluate management actions.
- Recommendation #13: Support authorization and other actions to more effectively manage pinniped predation of salmon in the Columbia River.

Rec. #12 (Puget Sound/Outer Coast) Details

- Remove artificial haul outs
- **Independent science panel by Academy of Sciences to evaluate extent of pinniped predation on Chinook.**
  - Co-manager engagement
- Engage NOAA to determine OSP for harbor seals
- If pinniped removal identified as a management option, secure authorization through the MMPA
- Provide funding for science, research, and if deemed necessary, removal

WSAS Pinniped Predation Report (Nov 2022)

- Compilation of information of pinniped abundance and distribution
- Trophic relationships
- Pinniped predation on salmonids (diet, rate, behaviors, compensatory/additive)
- Impacts of predation on salmon recovery
- Adaptive management and science

WSAS Findings (continued)

- "The **preponderance of evidence** supports the hypothesis that current populations of **pinnipeds are likely impeding the recovery of salmon populations** in Washington waters. As such, **strategic lethal removal of pinnipeds is an approach that may be required** for understanding the magnitude of impacts of pinnipeds on salmonids, either at local scales or at the ecosystem scale."

- "…the status quo [without intervention]…could further depress salmon populations.."

WSAS Findings (continued)

- Complex trophic relationships and ecological interactions among pinnipeds, salmonids, and other predators and prey introduce uncertainty; **"However, potential unintended effects should not be a barrier to strategic removals."**

- "…a management experiment of this scale and complexity would involve **substantial investment in scientific capacity and political will over long time periods.**"

- Authors note the complexity of the MMPA and the limited administrative options available to intervene and the **"…constraints it creates effectively block[s] most pinniped removal…"**

- Authors offer guidance on adaptive management and research programs.

Management Options in the MMPA

- Apply for Waiver and Request Direct Take
  - Request waiver of the Take Moratorium [Section 101(a)(3)]
  - Rule-Making [Section 103]
  - Take Permit [Section 104]

- Request Return of Management Authority to State: [Section 109]

- Pinniped Removal Authority: [Section 120 and 2018 Section 120(f)]
  - Intentional lethal taking of individually identifiable pinnipeds which are having a significant negative impact on the decline/recovery of salmonids

- Non-Lethal Management of Nuisance Animals: [Section 109(h)]

Next Steps

- 2023-25 Operating Budget Requests to Legislature
  - $1.4M Columbia River pinniped management; funded as one-time
  - $954K Puget Sound/Coast pinniped abundance, distribution, diet; funded as one-time

- Puget Sound/Coast—WSAS report recommendations:
  - Coordinate with Gov Office, F&W Commission, NMFS, treaty tribes, state and federal legislature on next steps
    - Socialize the findings of the Academy report
    - Confirm the direction in previous approaches
    - Explore opportunities to secure resources to be successful—this is going to be a lot of work from an administrative side, but even greater from the social acceptance of intervening in areas where it is deemed necessary.
  - Continue distribution/abundance/diet research; expand into new areas
  - Evaluate effectiveness of non-lethal deterrents

Questions