



Update on Predation, Pinnipeds, and Killer Whales—Briefing

November 1, 2018

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Dan Rawding, Col River Salmon Resource Policy, WDFW

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Dr. Penny Becker, Killer Whale Policy Lead, WDFW

Outline

- Salmon survival
- Fish predation
- Avian predation
- Pinniped predation—Bonneville
- Pinniped predation—Willamette Falls
- Southern Resident Killer Whale Task Force

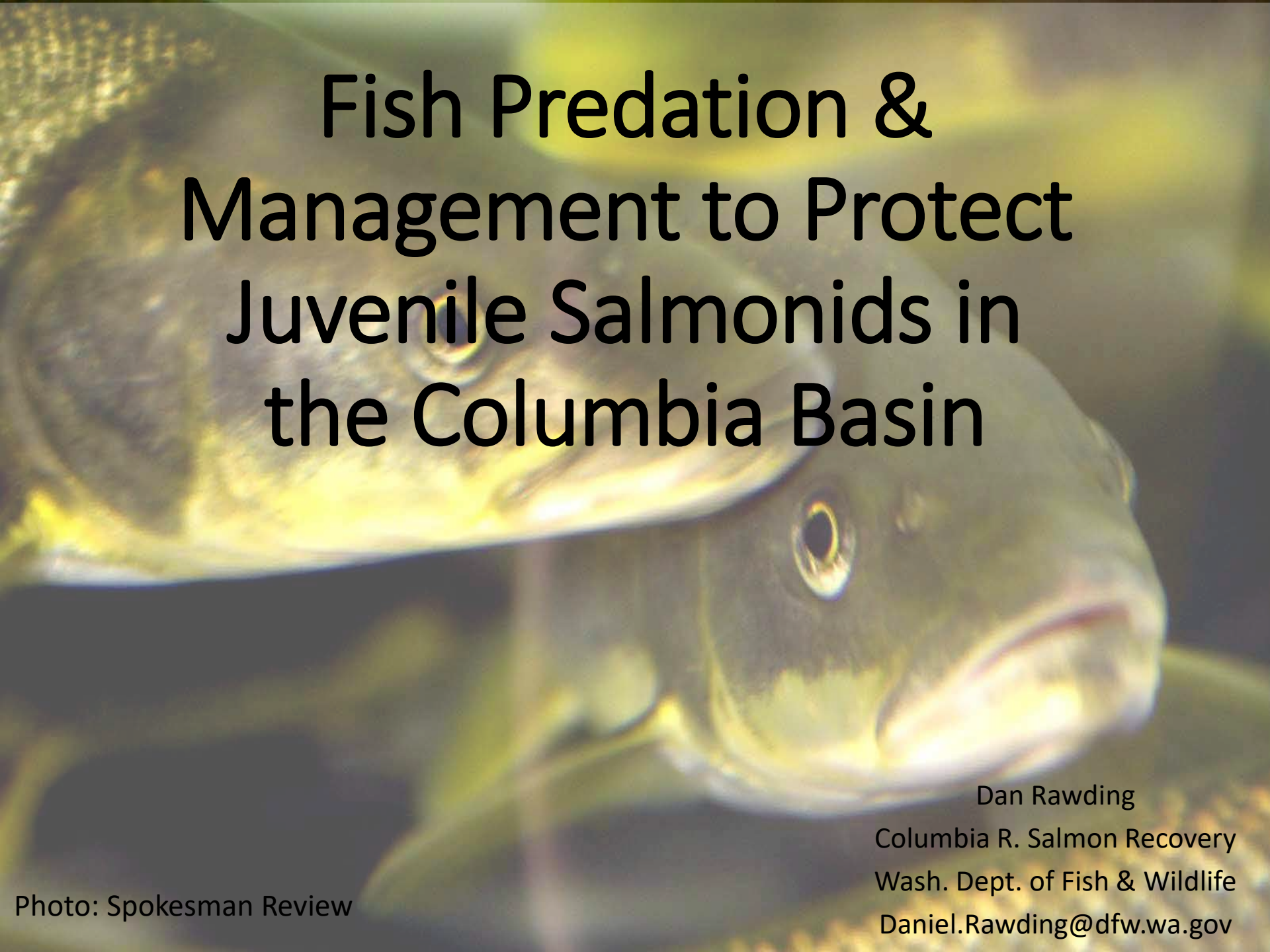
Salmon Recovery: All H's and Predation

- Habitat
- Hydropower
- Hatcheries
- Harvest



- Fish
- Avian
- Marine mammal





Fish Predation & Management to Protect Juvenile Salmonids in the Columbia Basin

Dan Rawding

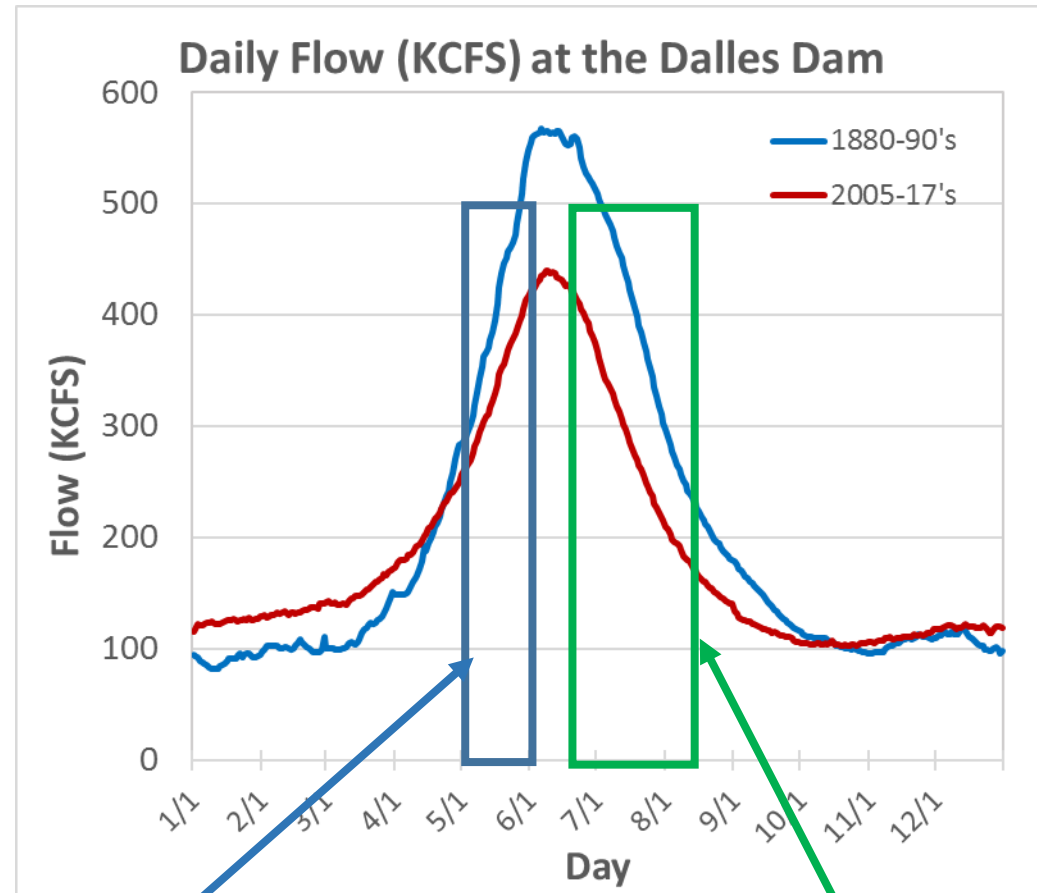
Columbia R. Salmon Recovery
Wash. Dept. of Fish & Wildlife
Daniel.Rawding@dfw.wa.gov

Photo: Spokesman Review

Outline

- Increased juvenile salmon predation in an altered Columbia River ecosystem
- Ongoing predation management
 - Northern Pikeminnow (25+ year project)
 - Northern Pike (emerging threat)
- Summary

Altered Columbia River Ecosystem

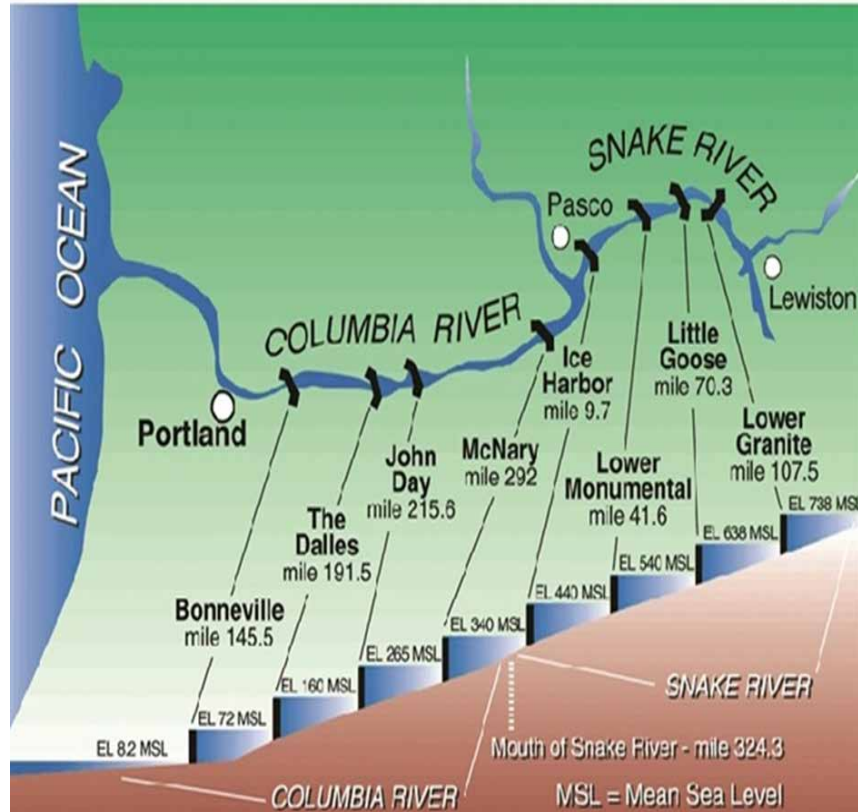


Yearlings
 Sp. Chinook
 Steelhead
 Sockeye & Coho

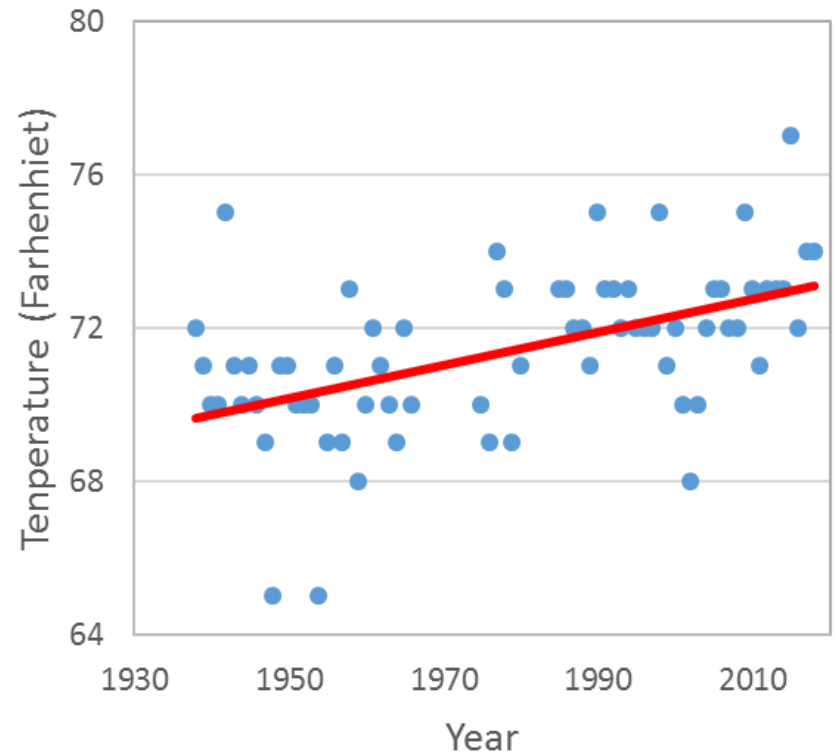
Subyearlings
 Summer
 & Fall
 Chinook

Altered Columbia River Ecosystem

Columbia-Snake River Inland Waterways



Max. Summer Temperature at BON



Northern Pikeminnow



- Native to Pacific NW but altered habitat in the Columbia River (Reservoirs) caused this population to explode.
- After 9" these fish become effective predators on juvenile salmon.
- Limit predation by dam angling and public participation in sport reward fishery by removing fish over 9".

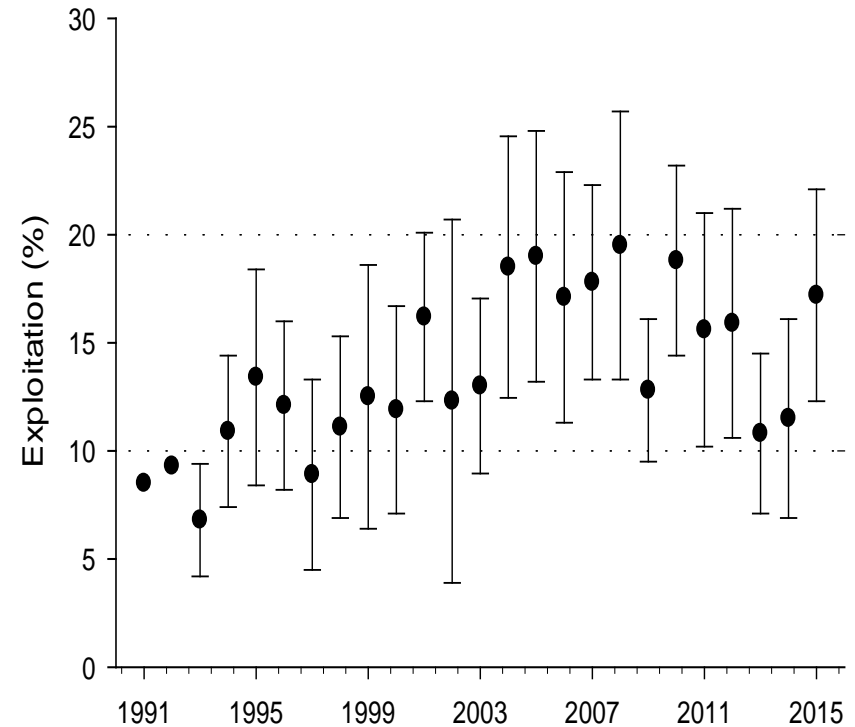
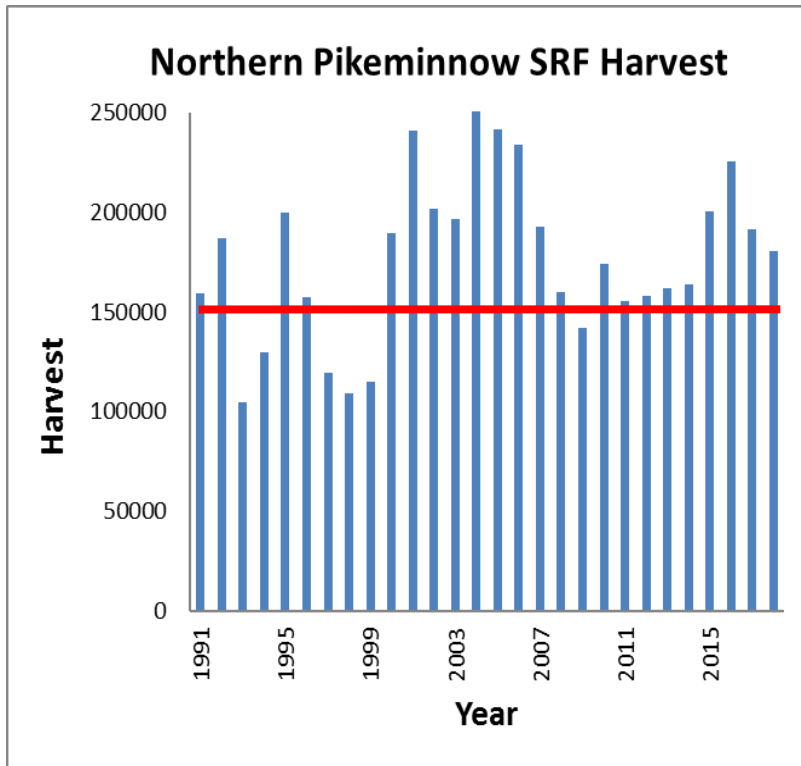


Northern Pikeminnow Sport Reward Fishery

- **Objective:** Increase the survival of outmigrating juvenile salmon and steelhead by reducing the number of larger, predatory pikeminnow in the mainstem Columbia and Snake rivers
- **Goals:** Harvest 10-20% of predatory-sized pikeminnow per year, and evaluate effect on salmonid predation



Northern Pikeminnow SRF Results



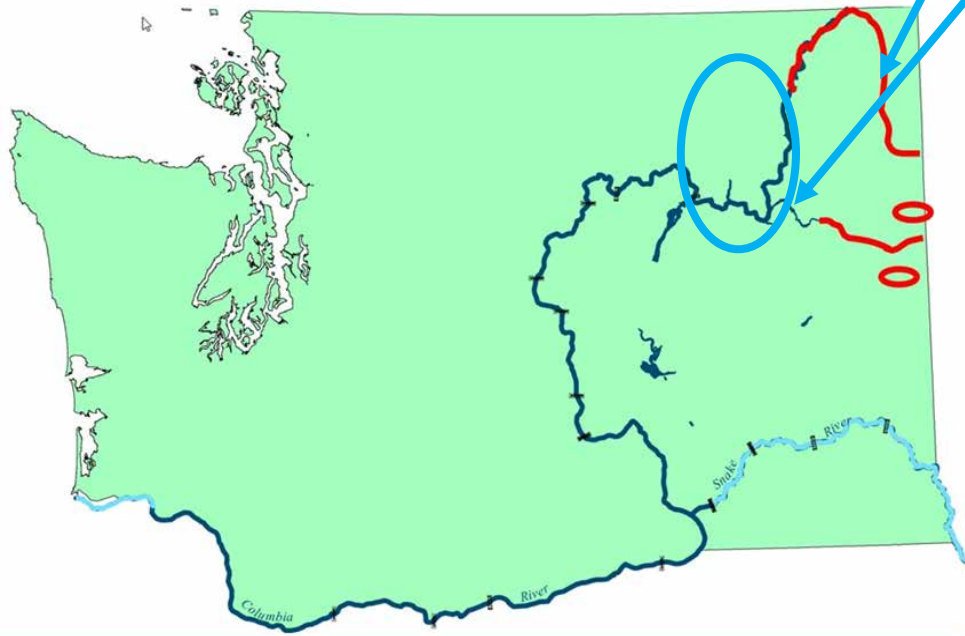
- Reduced predation on juvenile salmon by ~27% in 2017
- Program Cost \$4.5M with \$1.8M payed to anglers
- Northern Pikeminnow removal programs are also implemented by the WA PUDs in Columbia River above confluence of the Snake River

Northern Pike in NE Washington

Lake Roosevelt 6/17/17



Photo: Holly McLellan Confederated Colville Tribe



- Large predatory fish (avg. length ~18" with max 59" & fish are a high % of diet.
- Illegally introduced into Pend Oreille River system from MT and are now in Lake Roosevelt.
- Serious threat to both native fishes and to anadromous fish in they continue to move downstream.
- Suppression effort was initiated by Kalispel Tribe and WDFW in Pend Oreille in 2012 and recently expanded into Lake Roosevelt.

Northern Pike Suppression Efforts



Photo: Joe Maroney Kalispel Tribe

- **Pend Oreille (Box Canyon Res.)**

- 400 adult pike in 2006 but increased to 5,500 by 2010
- **Goal:** reduce pike by 87% using angler harvest, fishing derbies, and gill nets
- Removed over 17,000 pike from 2012-17; and have meet pike target reduction goal



Photo: Holly McLellan Confederated Colville Tribe

- **Lake Roosevelt**

- 76% of pike diet was kokanee, rainbow trout, & whitefish
- Tribal and state managers of Lake Roosevelt have been actively suppressing pike since 2015
- Many partners in the pike suppression effort – BPA, PUDs, NPCC, and NPS, along with tribal and state co-managers.

Public Involvement

STOP THE SPREAD OF INVASIVE NORTHERN PIKE



Northern Pike (*Esox lucius*) are a Prohibited Species in Washington State. Anglers are encouraged to kill **ALL** Northern Pike caught. Harvested Northern Pike must be dead before anglers leave the water where they are caught.

No minimum size or possession limit.

Northern Pike are now present in Lake Roosevelt. This fish species is known to have negative impacts on native fish populations and popular sport fisheries. In addition, further spread of Northern Pike into downstream portions of the Columbia River poses a severe threat to Salmon and Steelhead recovery efforts.

It is illegal to transport or release live fish without a WDFW permit.

Penalty includes up to \$5,000 in Fines and A Year in Prison (RCW 77.15.250) and a person found guilty can also be ordered to pay all costs of capturing, controlling or killing those fish or their progeny (in excess of \$100,000).

If you see someone transporting or releasing live fish, please call the Washington State Patrol. They will contact the nearest WDFW officer.

Spokane County WSP Dispatch: 509-456-4101
Stevens County WSP Dispatch: 509-684-7431



WANTED

Northern Pike Heads- \$10 Reward



Attention Anglers:

Help protect the Columbia River from Invasive Northern Pike!

Northern Pike pose significant threats to the Columbia River fisheries including predation on native and important game fish species, introductions of parasites and disease, and competition with other species for food resources.

Drop off locations located at the Noisy Water Gas Station and near the Park Service Kettle Falls fish cleaning station, or any CCT Fish and Wildlife Office
Fill out the label with: drivers license, birthday, name, address, phone number, email, date of capture, and general location of capture
(Pike from Lake Roosevelt and the Kettle River only)

Place the head and the label in the bag and deposit into the freezer
¹A \$10 Reward will be mailed to you



Questions:
Holly McLellan
Colville Confederated Tribes
(509) 209-2415

¹Allow 4-5 weeks for processing
\$590 limit per person/year

Funding provided by the Colville Confederated Tribes

Predatory Fish Management Summary



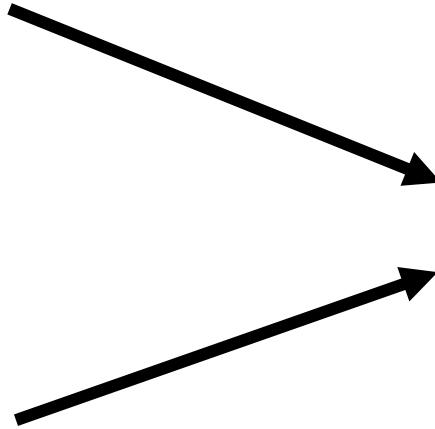
- An altered Columbia River ecosystem, climate change, and illegal introduction of predatory fishes will require continued actions to limit predation on juvenile salmon and other native fishes.
- Northern pikeminnow program has successfully demonstrated that we can strike a balance for salmon recovery and preserving a native population.
- Establishment of invasive species (northern pike) is problematic. Eradication is not likely but the Box Canyon is an example of successful suppression project.
- All managers are very concerned with the expansion of northern pike into Lake Roosevelt and possible expansion into the anadromous zone of the Columbia River.
- The keys to prevent spread of invasive predatory species are: 1) early detection and rapid response; 2) public education on the deleterious impacts; 3) prevent, control and stop the expansion of the invasive species; and 4) adequate funding.

Predatory Fish Additional Information



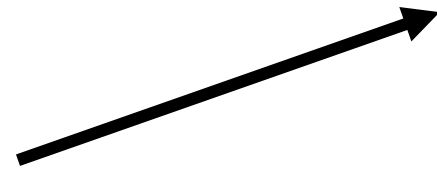
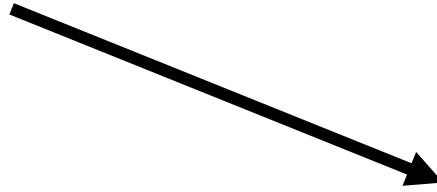
- More information:
- Predation Overview
 - <https://www.nwcouncil.org/fish-and-wildlife/fw-independent-advisory-committees/independent-scientific-advisory-board/predation-metrics-report>
- Northern Pikeminnow
 - <http://www.pikeminnow.org/>
 - <https://nwcouncil.app.box.com/s/fslki3deq2xphzdnwczxbauma9bj5h9n>
- Northern Pike
 - https://wdfw.wa.gov/ais/esox_lucius/
 - https://www.nwcouncil.org/sites/default/files/2018_10_09_f6.pdf

Avian Predation



Salmon
Mortality

Avian Predation

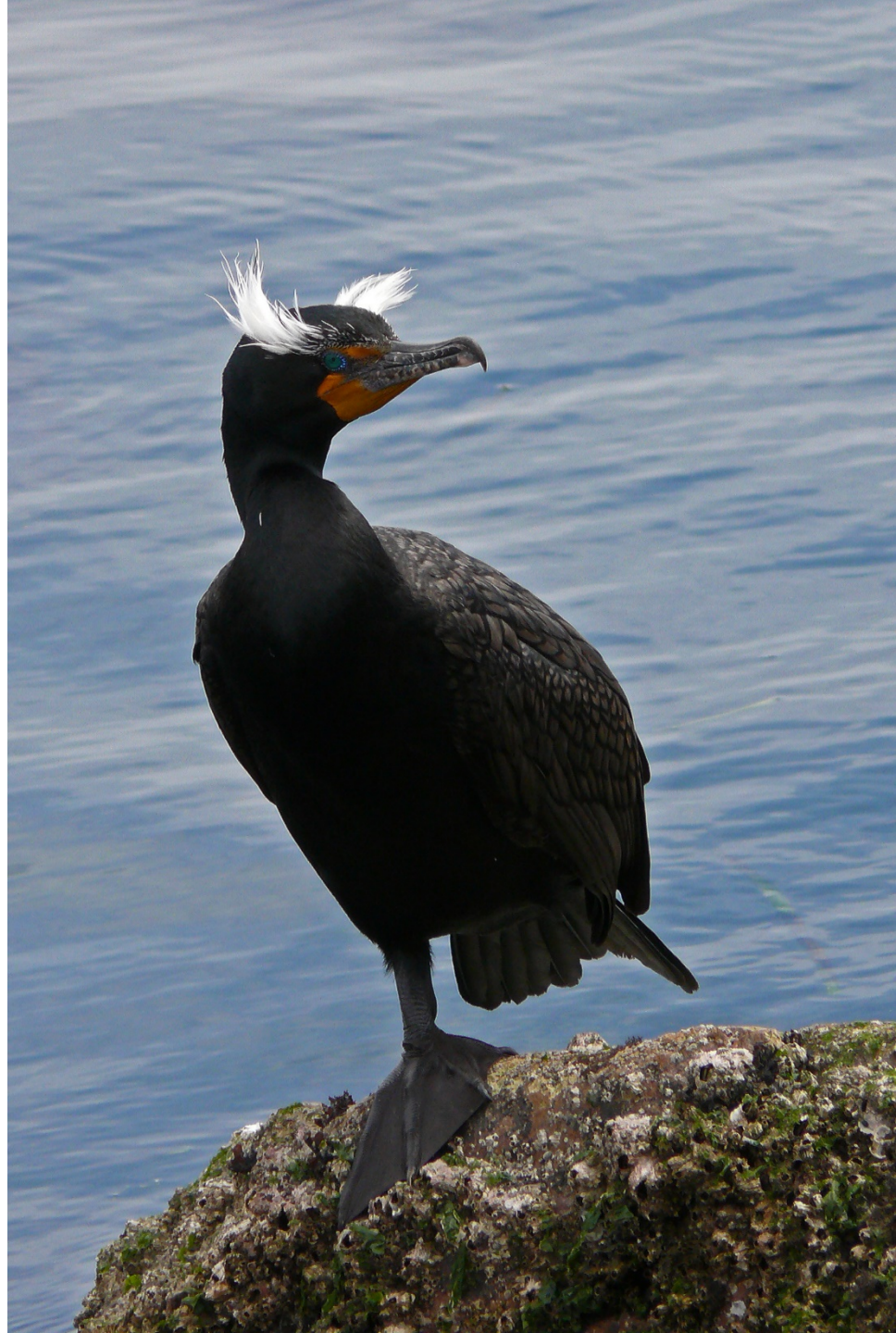


Salmon
Mortality

States have **advisory** role
under **Army Corps** avian
management plans.



2–7% predation rate





1–16% predation rate

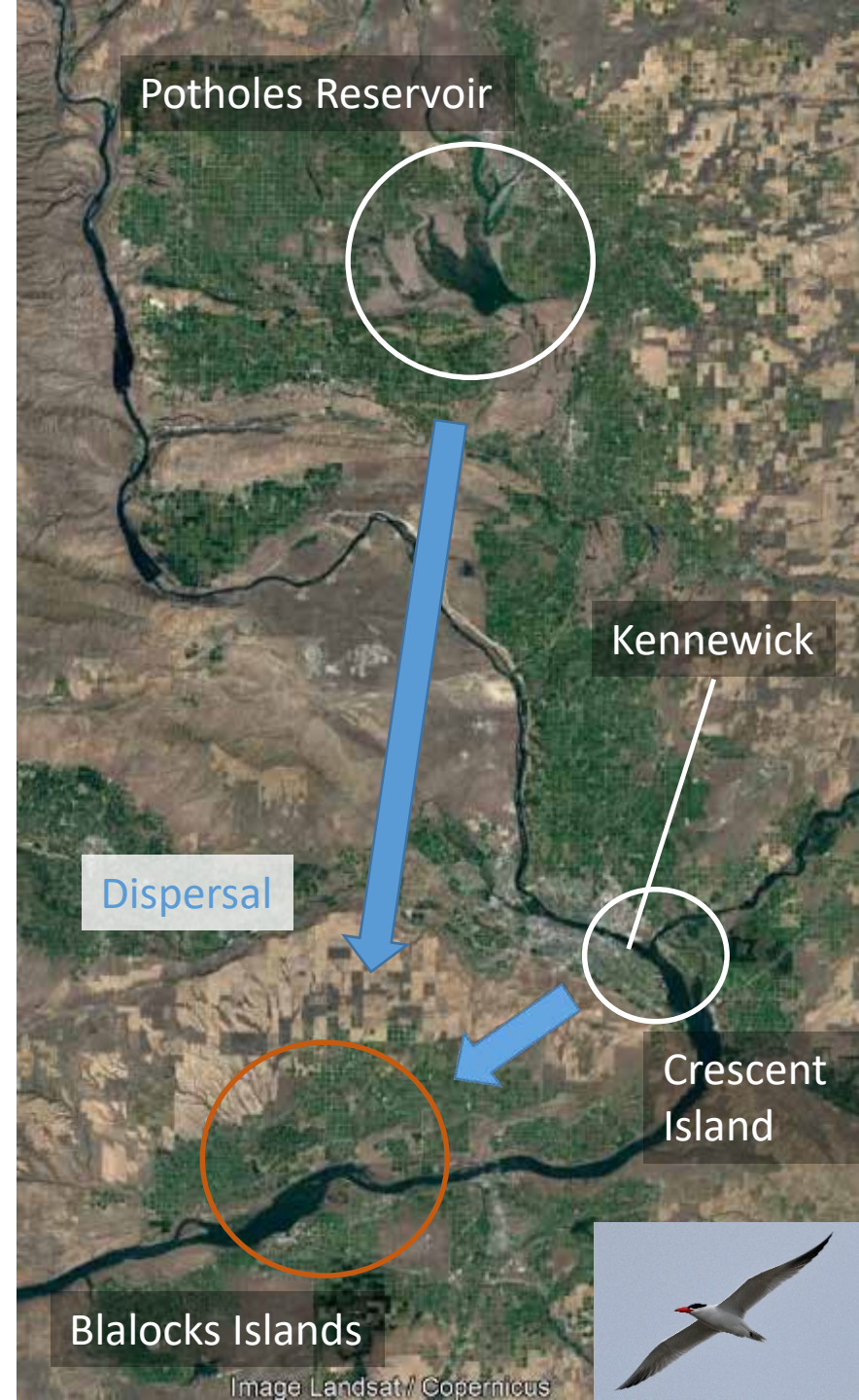
Inland Avian Predation Management Plan

Goal

~100 breeding pairs
<2% tern predation

Outcome

~900 → 640 breeding pairs
Columbia Steelhead: 18% → 5%
Snake Steelhead: 4% → 5%
Snake Sockeye: 1% → 4%



Caspian Tern Management Plan: Estuary

Goal

2,800 pairs

5% steelhead predation

Outcome

10,000 → 5,000 pairs

20% → 9% steelhead predation



Double-crested Cormorant Management Plan: Estuary

Goal

5,660 breeding pairs

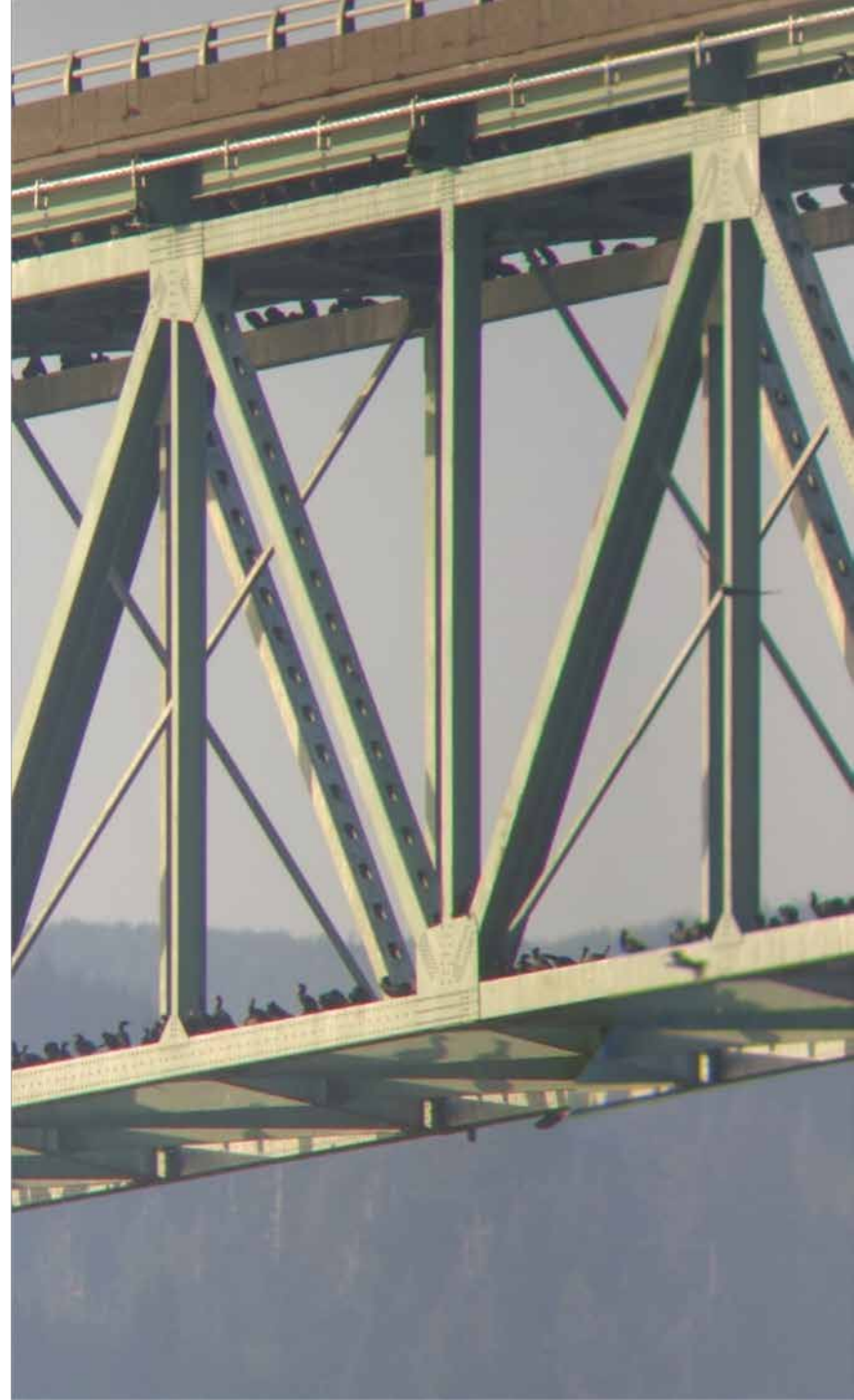
↓ 57% predation

Outcome

↑ Astoria-Megler Bridge

13,000 → ??? pairs

Little to no change



Mission Accomplished?

Implementation nearly complete for three plans.

Progress, but biological goals not met. Hydrosystem implications.

No clear path forward under current federal plans.



Bonneville Pinniped Predation



Bonneville Dam









Oregon

RM 145

Washington

Non-lethal Effectiveness

Deterrent Type	Effective	Ineffective	The Bottom Line
Physical Barriers for Fishways (SLEDs, FOGs)			No animals in <u>fishways</u> in 2008, but C404 was absent this year.
Acoustic Deterrents at Fishways			No visible effects on sea lion behavior near fishways.
Hazing Calif. Sea Lions			Effects seem temporary; Usual avoidance noted.
Hazing Steller Sea Lions			Not as effective as in 2006 and 2007.
Relocation (Trap & Release)			Most animals return to BON after release. <i>Does help individual ID efforts!</i>

Section 120 Permit Removal Criteria

- Each CA sea lion must be individually identifiable – this requires trapping, marking, and releasing the animal.
- Individual sea lions must be observed at Bonneville Dam for 5 days.
- Individual sea lions must be observed eating a salmon at Bonneville Dam.
- Individual sea lions must be subjected to hazing while at Bonneville Dam.

Section 120 Implementation— 2017 Data

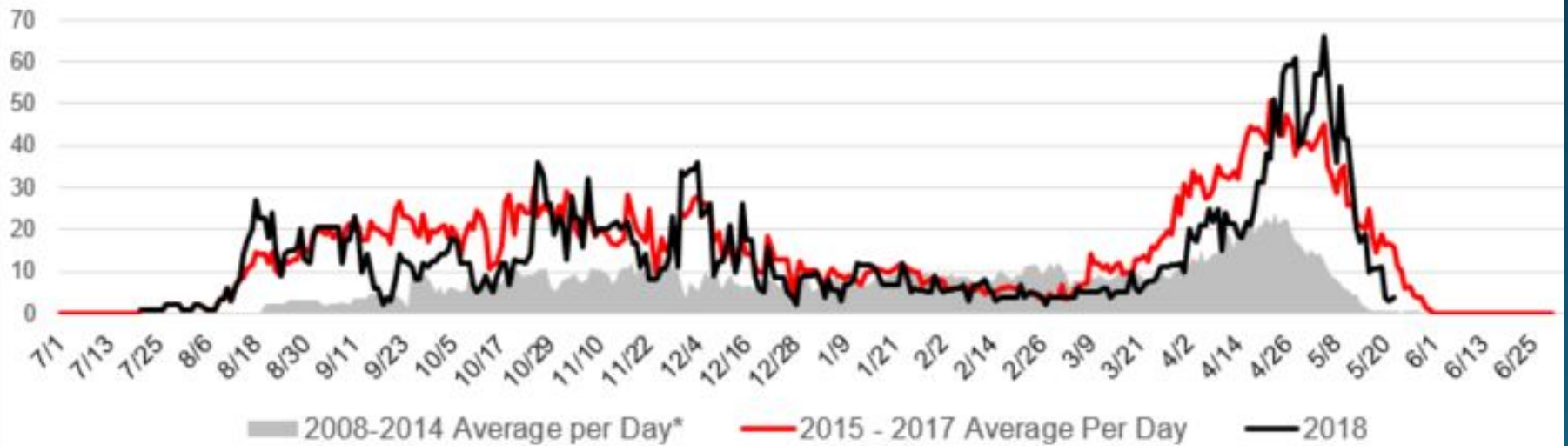
	Individuals	Estimated Predation	Hazing Events	Lethal Removals
CA Sea Lions	92	2,142 (1.9% of run)	683	24
Steller Sea Lions	63	3,242 (2.8% of run)	1,852	N/A

Bonneville Pinniped Abundance

California Sea Lion Daily Abundance



Steller Sea Lion Daily Abundance



Section 120 Implementation

Year	CA Sea Lion Euthanized
2008	0
2009	11
2010	14
2011	0
2012	12
2013	2
2014	15
2015	30
2016	59
2017	24
2018	29
TOTAL	196

Section 120 Permit Improvements Requested

WDFW, IDFG, ODFW, CRITFC requested NMFS in March 2018 to:

- Provide resources to expediently review ODFW's Section 120 Application for Upper Willamette steelhead.
- Adopt Task Force Recommendations to improve efficiency of current permit.
 - Modify requirement of seeing an individually identifiable sea lion eating a salmon ~~and~~ OR has been observed in the area for X days...
 - Reduce observation days from 5 days to 3 days.
- Provide pass-through funding for implementation.

Pinniped Assessment Next Steps

(WA F&W Commission Briefing in Dec 2018)

- Use recent population estimates for all pinnipeds
- Organize data around meaningful geographic management units
- Use regionally-specific pinniped diet data
- Use updated Chinook smolt and adult consumption estimates
 - Include availability of hatchery / wild Chinook
 - Include uncertainty in pinniped diet
 - Include uncertainty in pinniped population estimates
- Assess relative impact of consumption by pinnipeds to other factors.
- Estimate number of removals needed to increase marine survival and recruitment in certain geographic areas.

MMPA Management Options

- 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
 - Intentional lethal taking of individually identifiable pinnipeds which are having a significant negative impact on the decline/recovery of salmonids

WA Fish and Wildlife Commission Policy Position on Pinnipeds

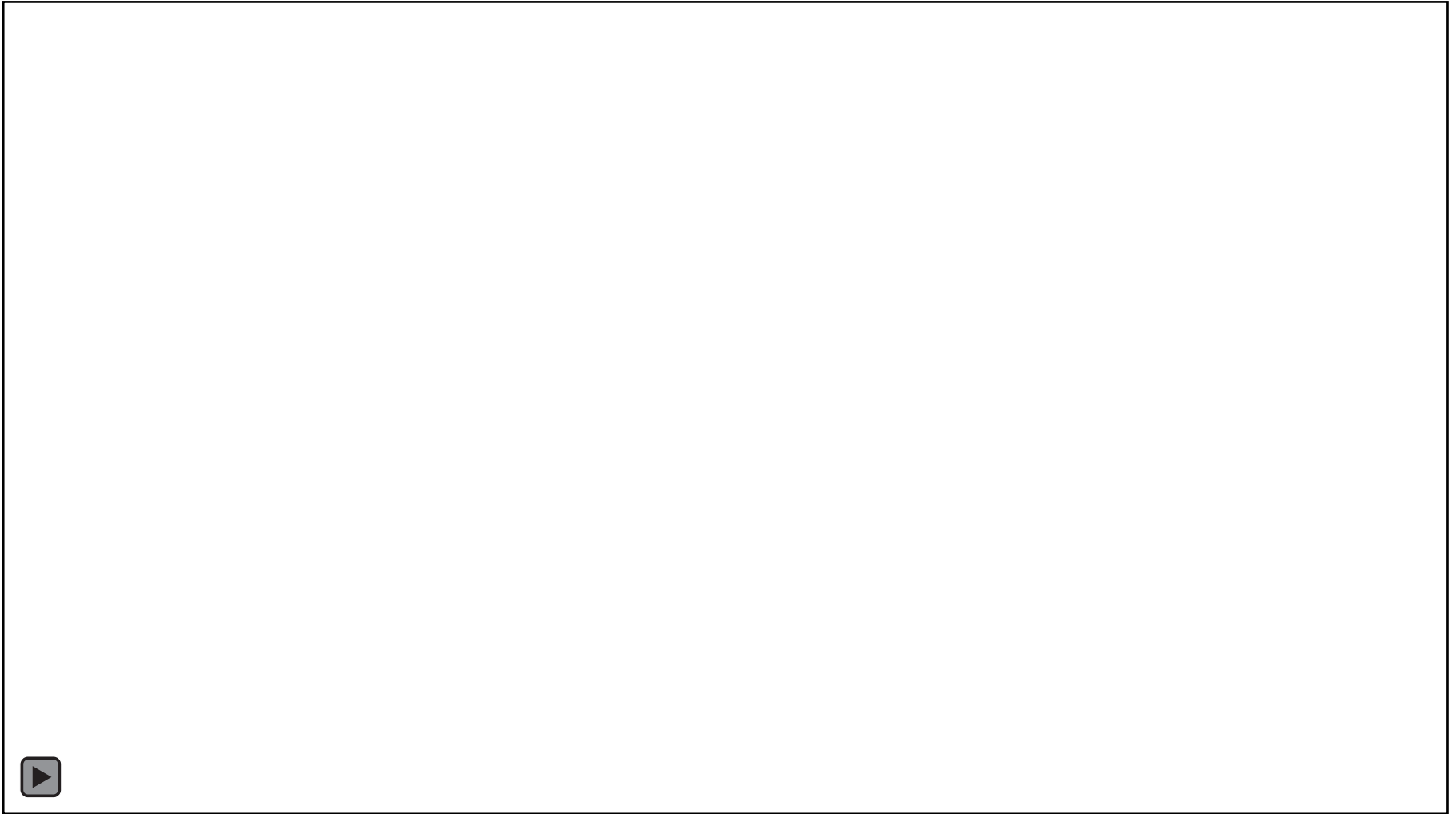
Policy Position on Reducing Pinniped Predation on Salmon

August 11, 2018

Based on the information on record at this time, and until such time as there is a more equitable balance between the population abundance status of pinniped species and ESA-listed wild salmon populations in the State of Washington, the Washington Fish and Wildlife Commission advocates for authorization of greater flexibility in the management of pinniped populations in Federal and State legislation, towards a goal of significantly reducing pinniped predation on salmon. Further, the Commission tasks the Director with expeditious and efficient implementation of any flexibility forthcoming from successful passage of such legislation.

This policy position applies to the Columbia River, coastal river basins, and Puget Sound including the Strait of Juan de Fuca. Flexibility in management activity should include a priority to actively discourage pinniped residence in areas of salmon predation, including effective harassment and lethal removal, both done in a humane manner that discourages residence and predation behavior.

PINNIPED PREDATION:
THE WILLAMETTE, LEGISLATION, & REGIONAL MANAGEMENT

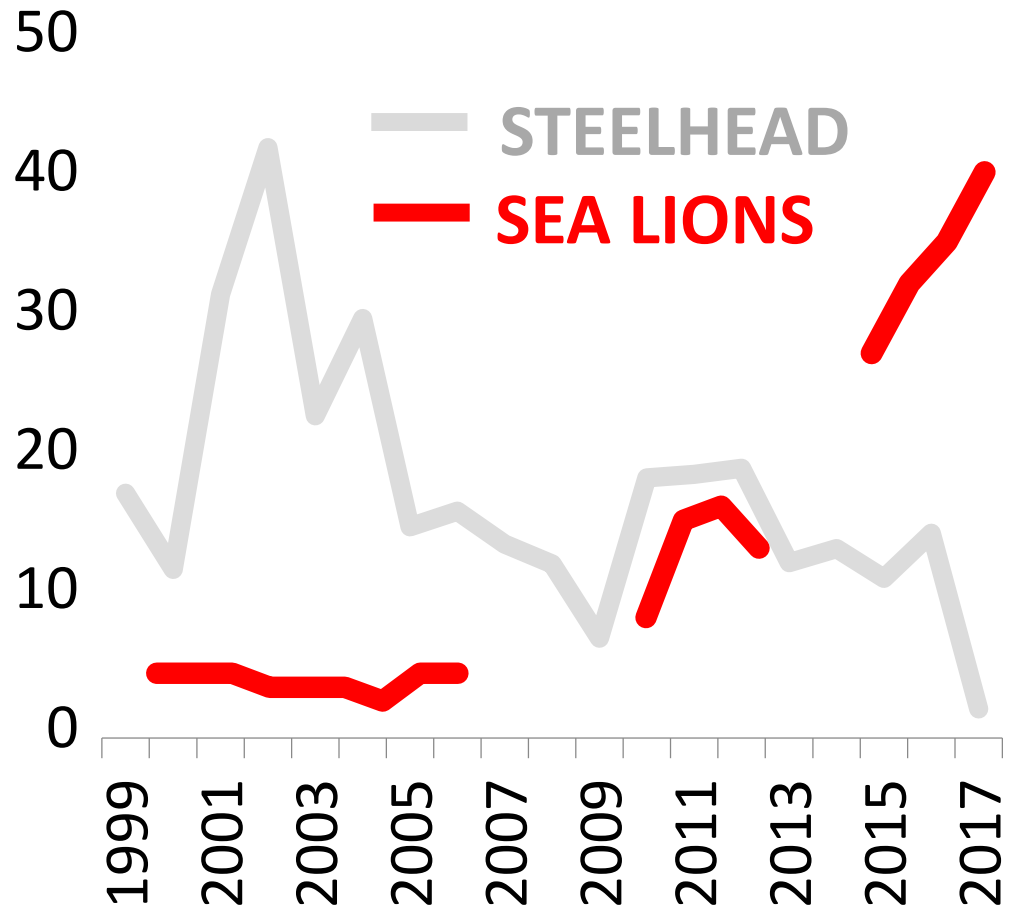


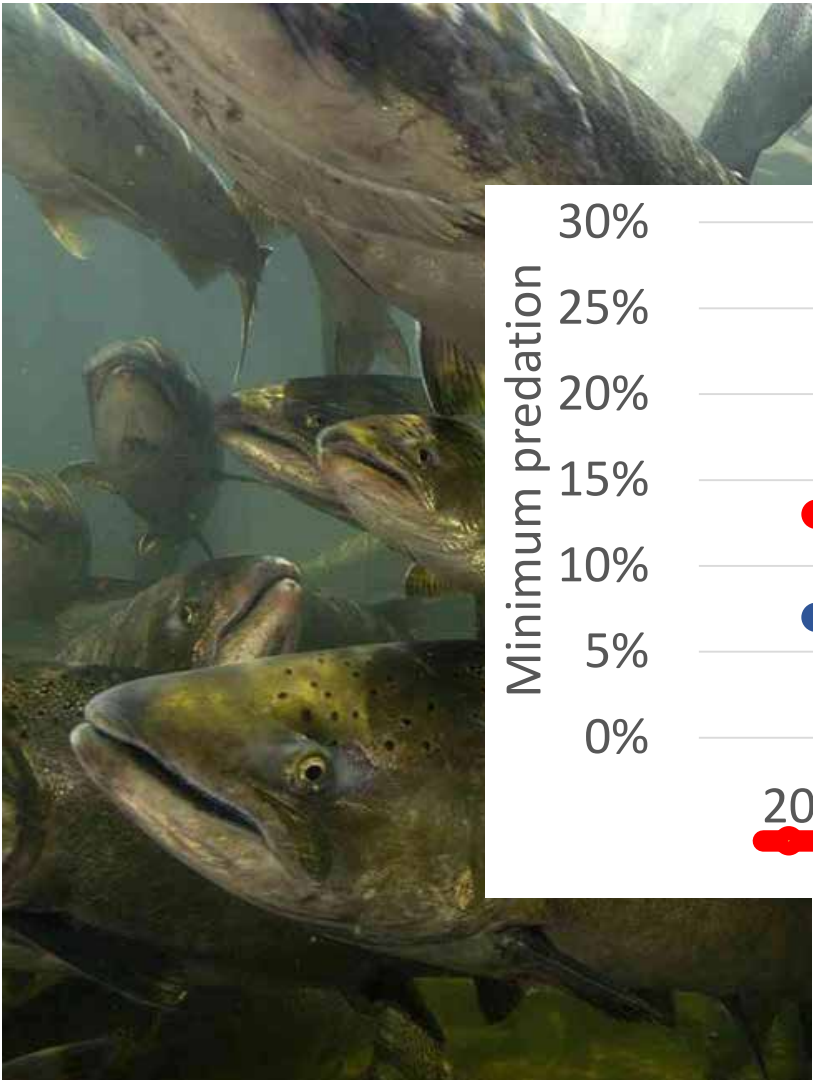
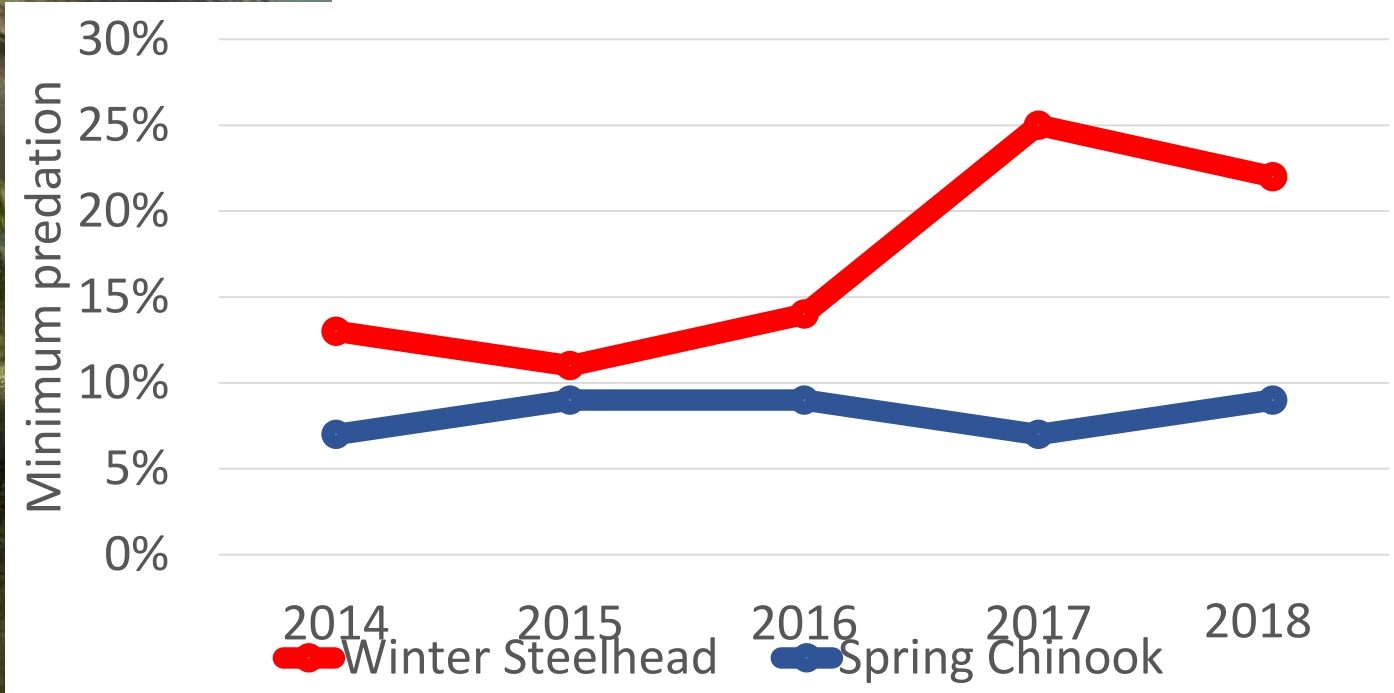
Video: Steller Cam

WILLAMETTE FALLS | 128 MILES UPRIVER



WILLAMETTE FALLS | SEA LION NUMBERS INCREASING





WILLAMETTE WINTER STEELHEAD | A RUN IN PERIL



Probability
89%
of Extinction



Probability
6%
of Extinction



Probability
30-45%
of Extinction



Probability
20-30%
of Extinction



PINNIPEDS | EMERGING ISSUES

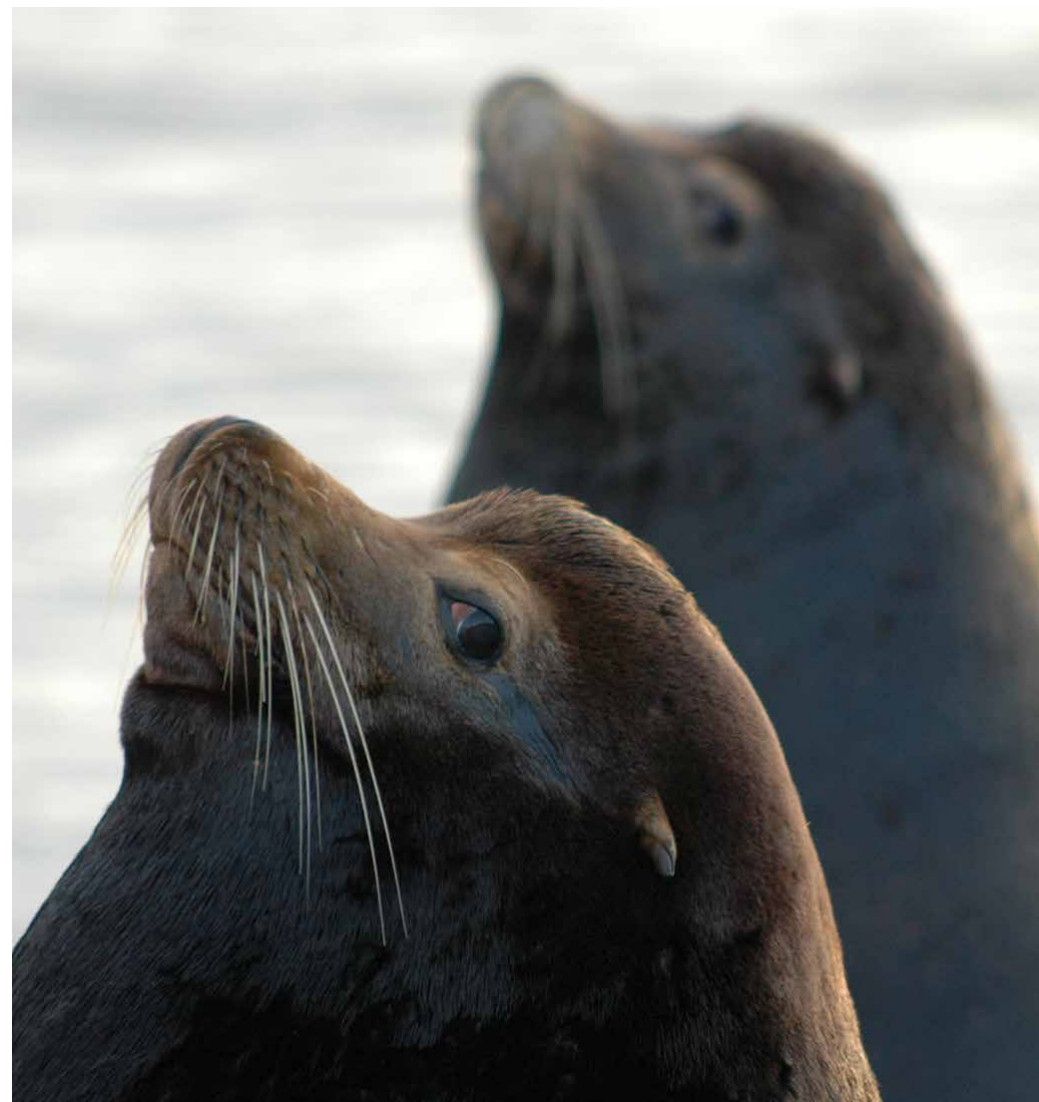




Apply lessons learned over 30 years reconciling the MMPA and ESA

- Proactive
- Place based
- Protects sturgeon and lamprey

PINNIPED MANAGEMENT | THINKING REGIONALLY



Columbia Basin + OR/WA Coast

- Increase pool of qualified staff
- Expand state/federal/tribal cooperation

ODFW POP to increase capacity

Southern Resident Killer Whale Task Force Update



Dave Ellifrit, Center for Whale Research

Penny Becker, WDFW Director's Office



Governor's Executive Order

March 2018

- Supplemental Funding
- Immediate actions for state agencies
- Established Task Force
 - ✓ Charged with developing action plan
 - ✓ Year 1 report due November 16, 2018
 - ✓ Year 2 report due October 1, 2019

Supplemental Funding and Immediate Actions

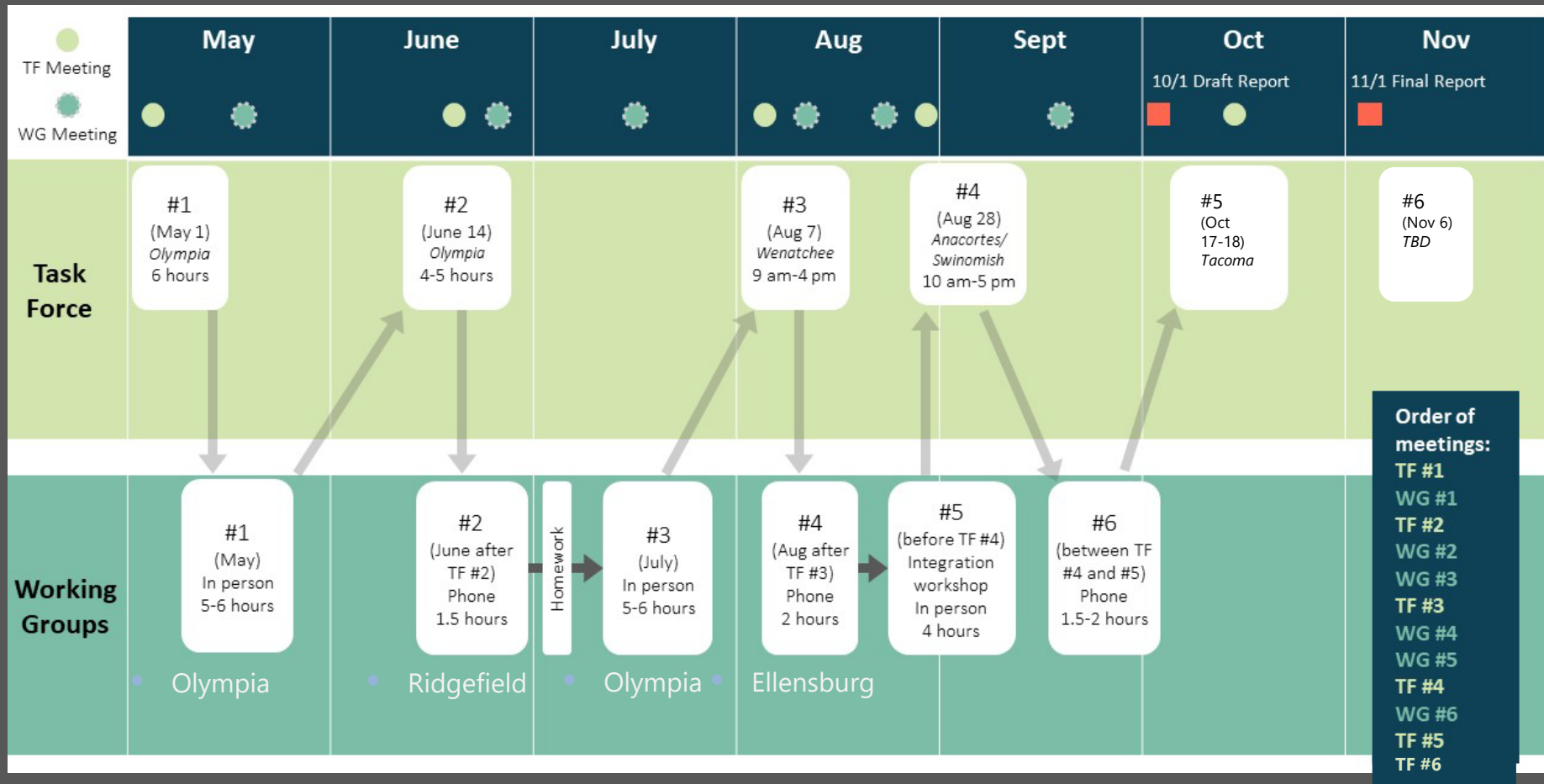
- Chinook Stock Prioritization
- SRKW considerations in fisheries
- Increase hatchery production, research PCBs
- Report how chinook habitat funding benefits orcas
- Pinniped predation research & data compiling
- Increased Enforcement patrols for vessel regulations

Task Force



- Identify, prioritize, and support the implementation of an action plan needed for the recovery of Southern Residents.
- Diverse membership
- Three Working Groups
 - ✓ Vessels (Todd Hass, PSP)
 - ✓ Contaminants (Derek Day & Tom Laurie, ECY)
 - ✓ **Prey** [Penny Becker (WDFW) & Steve Martin (GSRO)]
 - ✓ **ODFW participation in WG: Chris Kern and Shaun Clements**

Hectic Schedule



TF received:

- Potential actions from WG
- Presentations, Webinars on issues
- Public input

Reports

2018

Draft out September 24, 2018 |
Final due Nov. 16, 2018

Content includes:

- Task Force recommendations for addressing major threats and recovering Southern Residents (legislation, actions, and budget needs)
- Include summary of minority views and those actions considered but not ultimately recommended
- Issues and actions to discuss in 2019

2019

Due Oct. 1, 2019

Content will include:

- Progress made
- Lessons learned
- Outstanding needs and additional recommendations

Prey

- Habitat
- Predation
- Hydropower
- Harvest
- Hatcheries
- Forage fish/food web



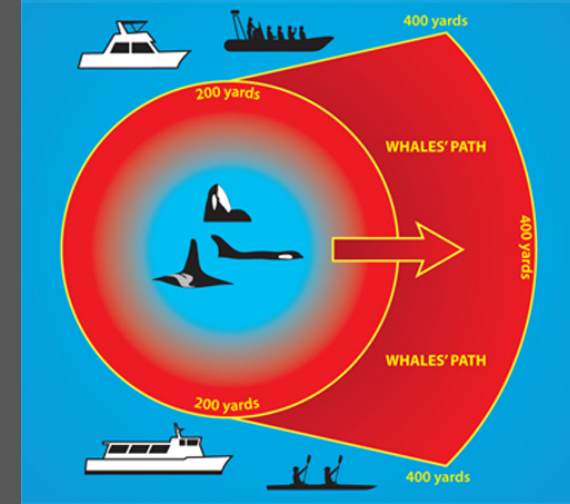
Priority Chinook Stocks for SRKW

1. N. Puget Sound (Fall); S. Puget Sound (Fall)
2. Lower Columbia (Fall Tules and Fall Brights); Strait of Georgia (Fall)
3. Upper Columbia & Snake (Fall); Fraser (Spring); Lower Columbia (Spring)
4. Middle Columbia (Fall Brights)
5. Snake River (Spring/Summer); N. Puget Sound (Spring)
6. WA coast (Fall; Spring)
7. Central Valley (Spring)
8. Mid and Upper Columbia (Spring; Summer)
9. Fraser (Summer)
10. Central Valley (Fall); Klamath River (Fall; Spring)
11. Klamath (Fall; Spring)
12. Upper Willamette (Spring)

Potential Prey Recommendations

- Hatchery- increase production, pilot studies
- Habitat- protection, restoration, incentives
- Hydro- re-establish runs above dams, remove dams, increase spill
- Predation- predatory fish removal, artificial haul-out removal pilot, support Columbia R. MMPA amendments & salmon survival studies, PS/Outer Coast science and management panels
- Harvest- bycatch reductions, implement and fund Pacific Salmon Treaty

Potential Vessel Recommendations



- Go slow regulation around whales
- Turn off echo-sounders near orcas
- Limited entry commercial whale watching
- Ferry and/or Shipping slow-downs, quieter designs
- No-Go Zone in high priority foraging area



Potential Contaminants Recommendations

- Reform Federal Toxic Substances Control Act
- Accelerate ban on PCBs in state purchased products
- Improve effectiveness, implementation, and enforcement of NPDES permits
- Reduce stormwater threats in existing hotspots

Task Force: Next Steps

- Final Year 1 Meeting:
 - November 6, Puyallup
- Year 1 Report to Governor November 16.
Follow up on Recommendations:
 - State and Federal Funding
 - State Policy Changes
 - Implementation
- Year 2- through Oct 1, 2019
 - Progress made
 - Lessons learned
 - Outstanding needs and additional recommendations

FWC motion re: Chinook hatchery production; Sept 2018

1. At a high policy level, the Commission proposes a significant enhancement in chinook salmon abundance, via increases in releases from hatchery programs, approximating 50 million smolts beyond 2018 status quo releases. This is to include approximately 30 million from Puget Sound locations and approximately 20 million from Columbia River locations.
 2. The Director is tasked with prioritizing what can be done in the most immediate time frame as the highest priority, with the remainder to be done as soon as possible.
-

Questions?

