

Columbia River Commercial Pound Net Briefing

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Outline

- Policy background
- Infrastructure
- Gear statistics
- Gear economics
- Next steps





Policy Background

Pound Net History

- 1930s peak had 453 pound nets in lower Columbia River (Wendler 1966)
 - Banned in Washington in 1935
 - Banned in Oregon in 1949
- Salmon Traps banned for one reason (Pacific Fisherman, 1959)

“enjoyed an exclusive right of fishery to a preferred location from which it barred the fishing equipment of others.”
- Bureau of Commercial Fisheries stated: (Pacific Fisherman, 1959)
 - No validity to argument against salmon traps on conservation grounds
 - Elimination is a matter of economic, social and political concern



Policy Background: Highlights and Timeline

pre-2012

- Various policies (C-3615, 3616, 3617, 3619) that begin to emphasize rec fishing allocation over commercial
- Identify fisheries as a tool for removal of hatchery fish
- Implement live capture and release of unmarked spring Chinook and steelhead

August
2012

- OR Governor Kitzhaber requested OR Commission to work with WA Commission to:
- Further prioritize recreational fisheries in the mainstem
- Enhance Select Areas (off-channel) for commercial fisheries
- Transition from gill nets to alternative gears in the mainstem

2013

- Final Workgroup Document
- “Management Strategies for Columbia River Recreational and Commercial Fisheries: 2013 and beyond”
- WA Policy C-3620 adopted

2017-2020

- Modified in 2017 to extend the transitional period
- Review (published report) in 2018
- Joint state commission process reviewed info in 2019 to achieve short-term concurrency (work on long-term)
- Joint state process paused; WA Columbia River Workgroup continued work on long-term policy items during 2019

September
2020

- New Policy C-3630 is adopted



Policy C-3620 (paraphrased)

Development and Implementation of Alternative Gear

- Investigate and promote funding, development, and implementation with full implementation by 2019
- Should provide area specific opportunity to:
 - Target harvest on abundant hatchery stocks
 - Reduce the number of hatchery fish in natural spawning areas
 - Limit mortalities of non-target species and stocks
 - Provide commercial fishing opportunities
- To facilitate development and transition, Washington should work with Oregon to develop incentives for commercial fishers using these gear
- Some offramps for gill net use if economic expectations and/or conservation goals are not met.



Policy C-3620 Review (2018)

- Alternative gear implementation a key component to Policy 3620 success; did not materialize
- Substantial resources invested (some from commercial licensees) to develop and test alternative gear
- Issues associated with successful implementation of alternative gears include:
 - High handle of non-target species (specifically steelhead)
 - High release mortality rates
 - Harvest constraints
 - High cost to purchase/operate gear



Current Policy C-3630 (paraphrased)

Goal: Sustainable harvest of healthy wild and hatchery stocks to the maximum extent practicable while minimizing non-target mortality (especially for ESA-listed species) **within harvest constraints**.



Current Policy C-3630 (paraphrased)

The Department shall work towards the goal that commercial fishing gear being used on the mainstem Columbia River optimize conservation and economic benefits.

- Work with commercial and recreational fishing industries to develop recommendations for commercial fishing gear that will
 - Increase the selectivity potential of commercial fisheries
 - Promote state conservation objectives (i.e., hatchery fish on spawning grounds)
 - Gain broad support from the commercial industry
 - Encourage innovation from the commercial industry
 - Compliment commercial fishery economic potential while minimizing impacts to recreational fisheries.
- Seek funding to develop and implement alternative gears
- The Commission will consider authorizing any successful alternative commercial gear that also considers allocations and concurrent regulations with Oregon

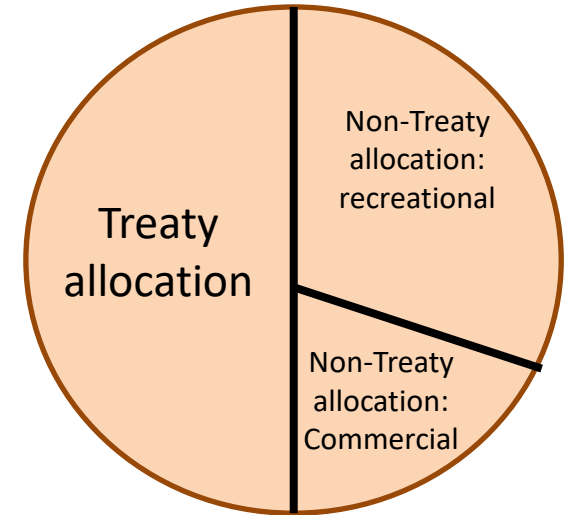
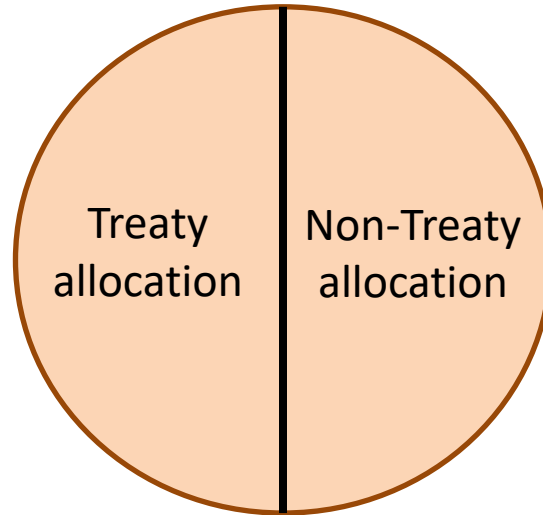
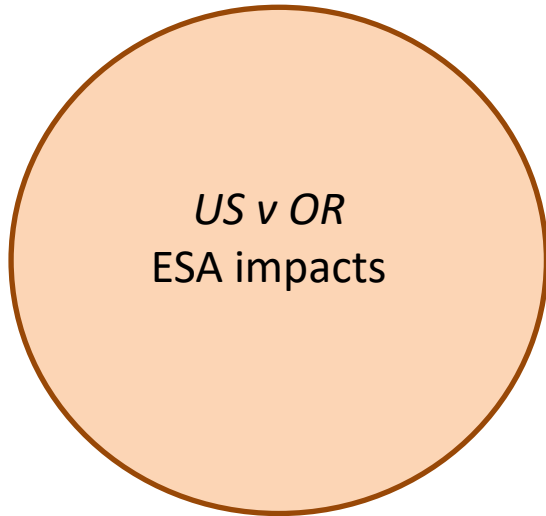


US vs OR: Parties and Structure

- Parties include OR, WA, ID, Treaty tribes, NOAA, USFWS
- WDFW represents WA recreational, commercial, and non-treaty tribal interests (Colville and Wanapum)
- Committees (WA has a seat on all)
 - Policy Committee – Policy decision body
 - Technical Advisory Committee (TAC) – Forecast, in-season updates, run reconstruction, gear mortality rates, ESA accounting
 - Production Advisory Committee (PAC) – Hatchery production
 - Regulatory Coordination Committee (RCC) – Regulation coordination
 - Sturgeon Management Taskforce – Sturgeon fishery quotas, discussion of stock issues

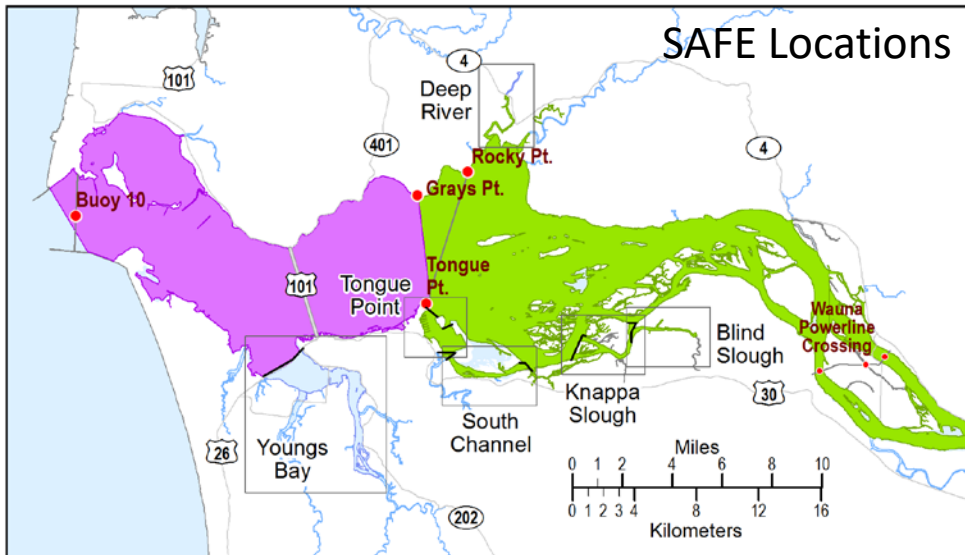
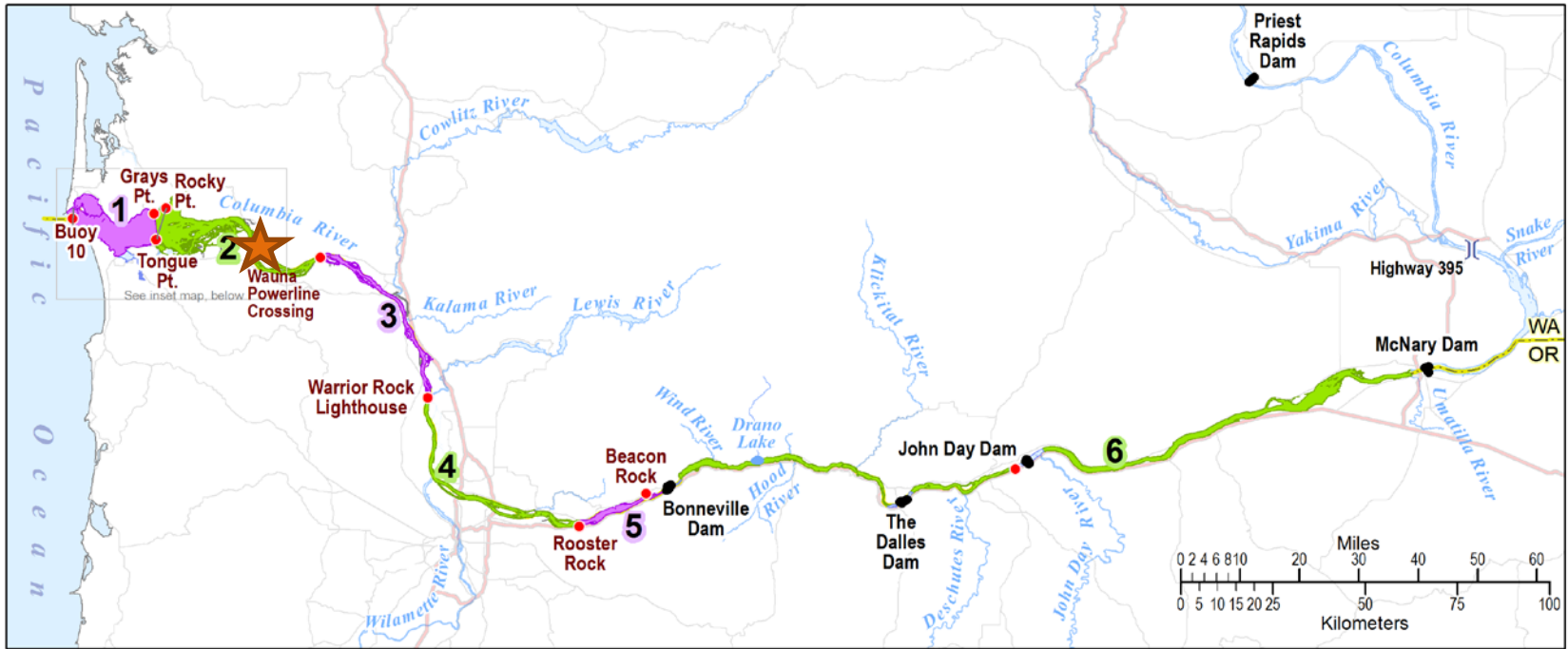


The Pie Analogy





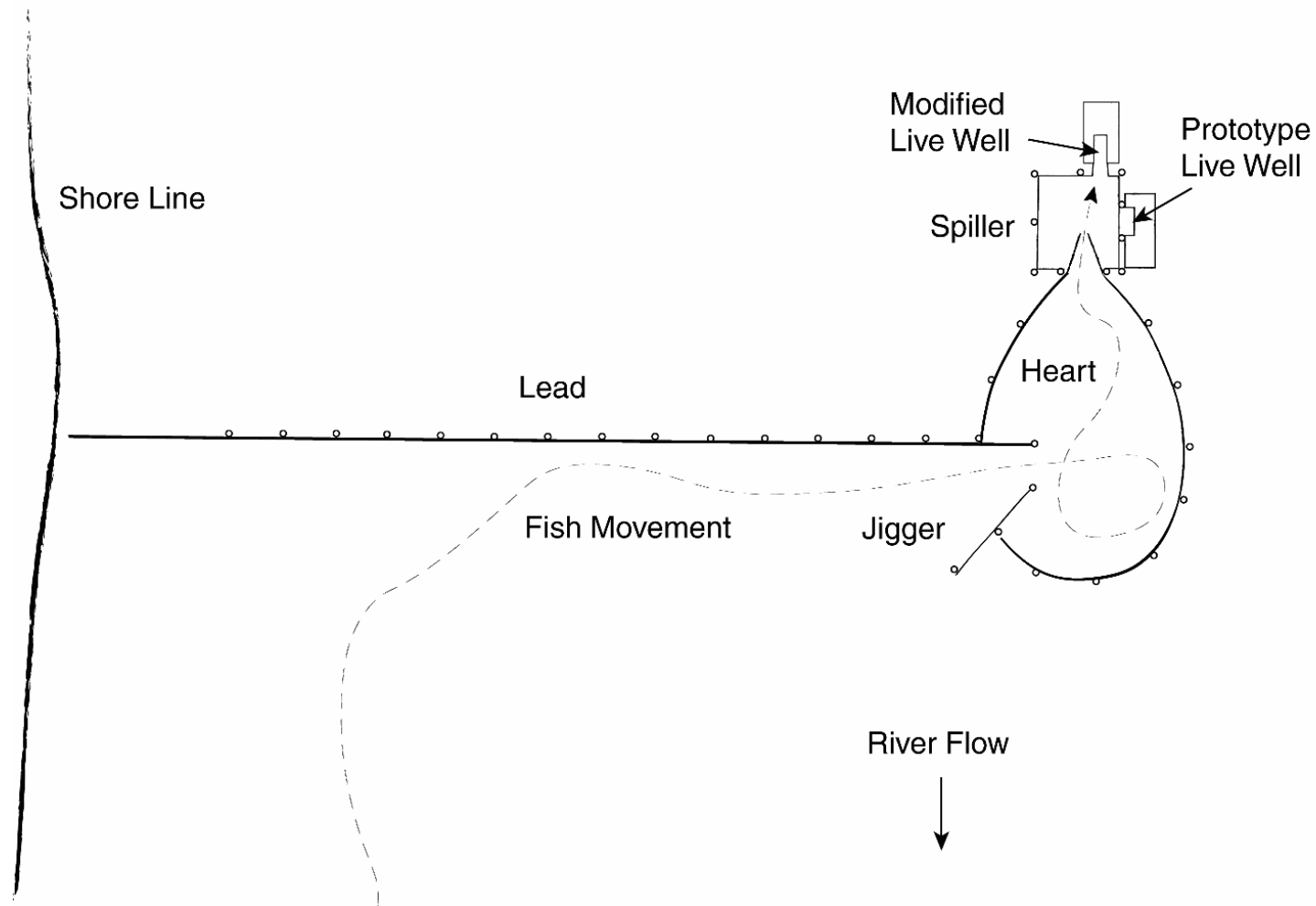
Infrastructure



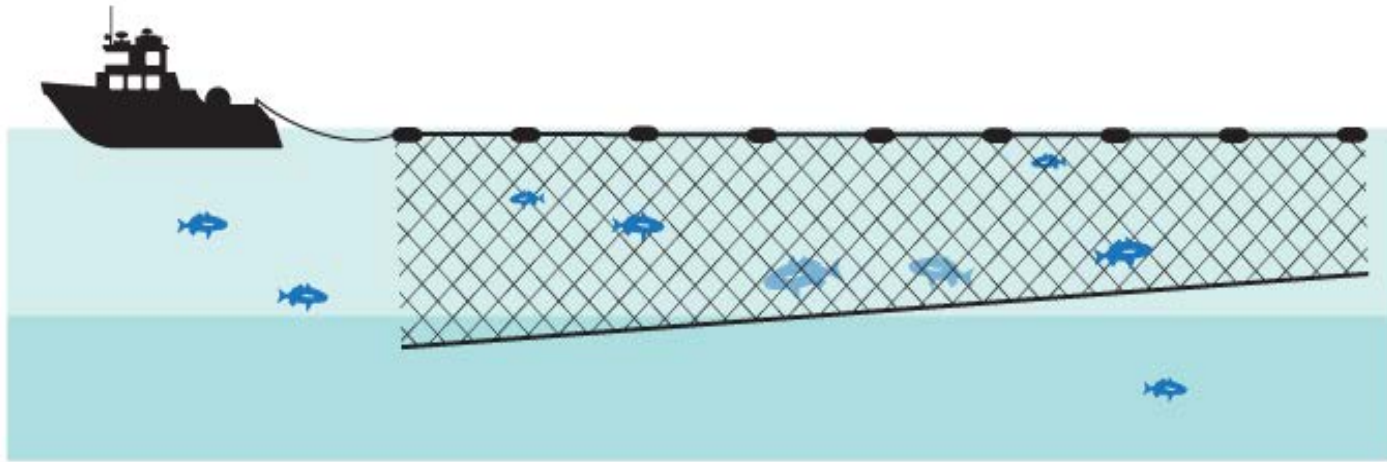
WDFW Fish Science, 11/23/2021



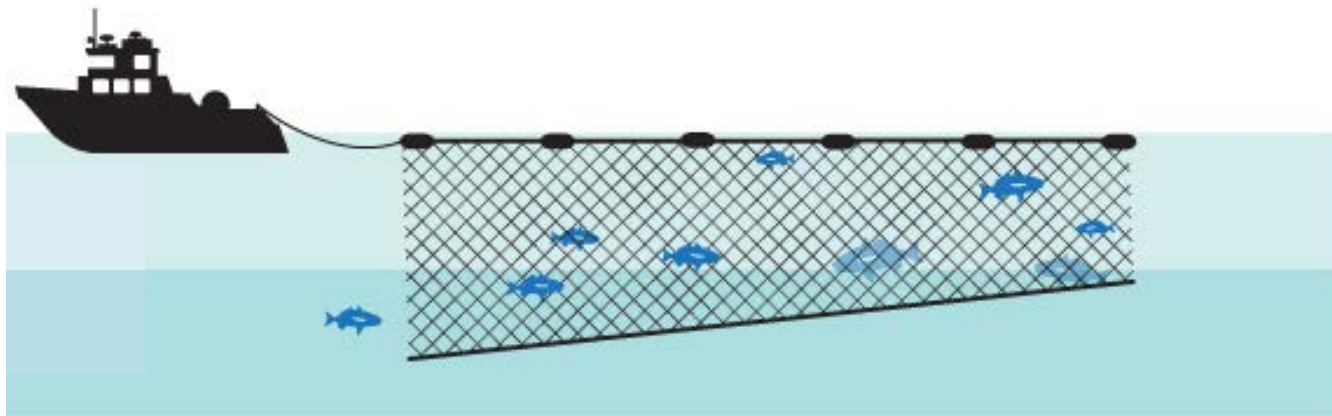
How Does a Pound Net Work?



How Do Other Gears Work?



Drift
Gillnet



Tangle net
(tooth net)



Infrastructure

Question: How many pilings have been used for the Cathlamet Channel and Clifton Channel pound nets and what is the cost of applying for piling permits and installing/maintaining them?

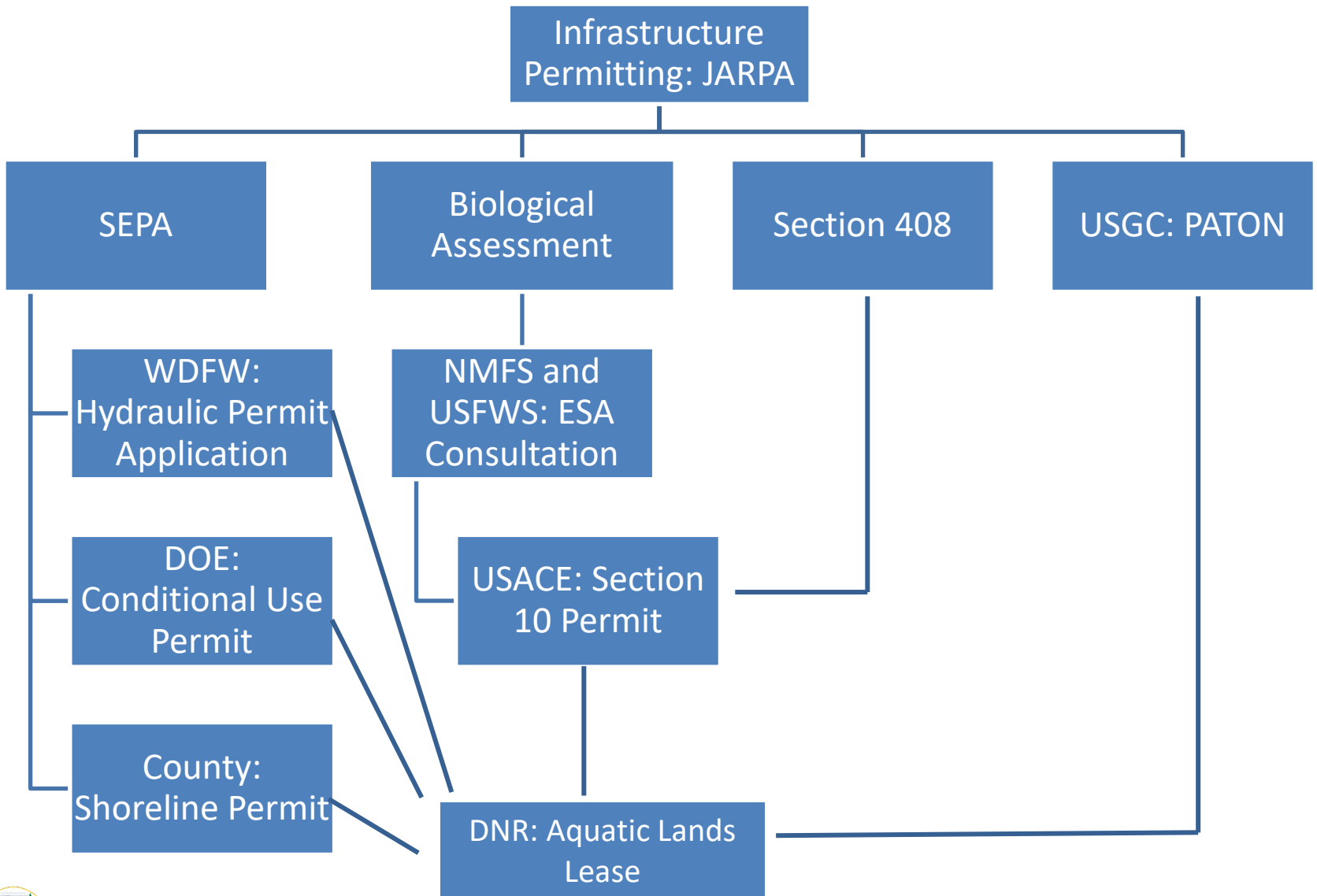
- Cathlamet Channel: 40 pilings
- Clifton Channel: 46 pilings

Upfront costs	Single pot – 35 piles ¹	Double pot – 46 piles ¹
Permitting	~\$7,000	~\$7,000
Pile Driving	~\$58,300	~\$81,800
Net Construction	~\$16,300	~\$20,200
Docks/ livewell	~\$14,800	~\$29,500
Misc equipment	~\$6,000	~10,800
Skiff	~\$25,000	~\$25,000
Total	~\$127,400	~\$174,300

¹ Based on passive handle trap design

Information provided by the Wild Fish Conservancy





Modified from a WFC Figure



Environmental Footprint

Question: What is the environmental footprint associated with a permanent pound net compared to the number of gillnet boats it would be expected to replace?

- The two pound nets currently installed are different in design and are ~178 ft. x 120 ft.
- The average gillnet boat is about 25 ft. x 10 ft.
 - A drift gillnet is ~1,500 ft. x 45 ft.
 - A fall coho tangle net is ~900 ft. x 40 ft.

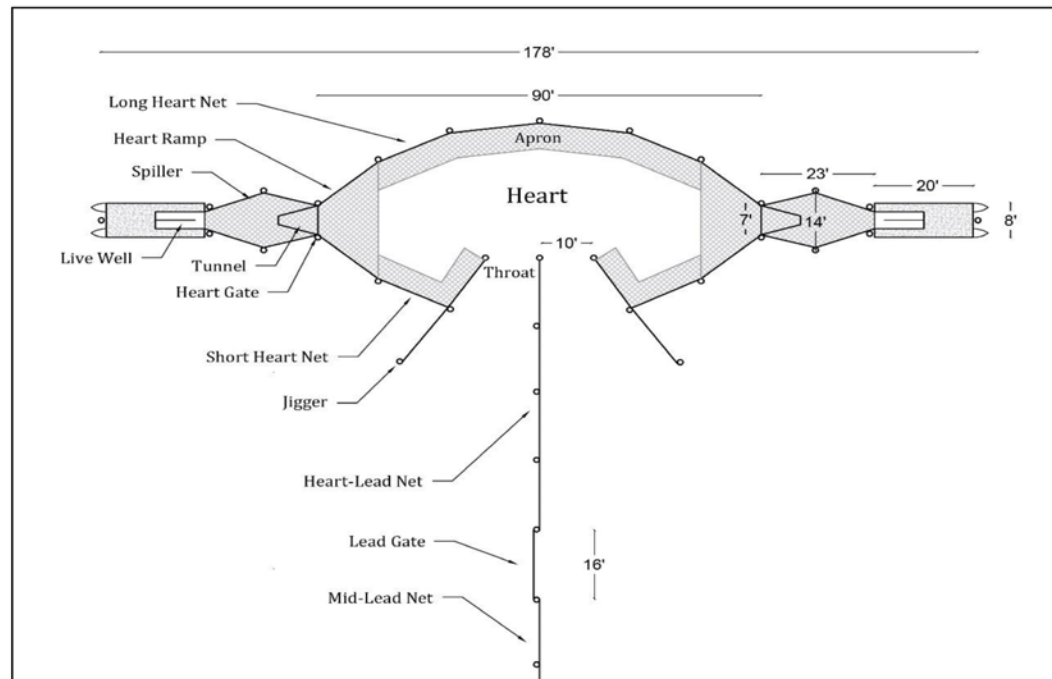


Figure credit: WFC



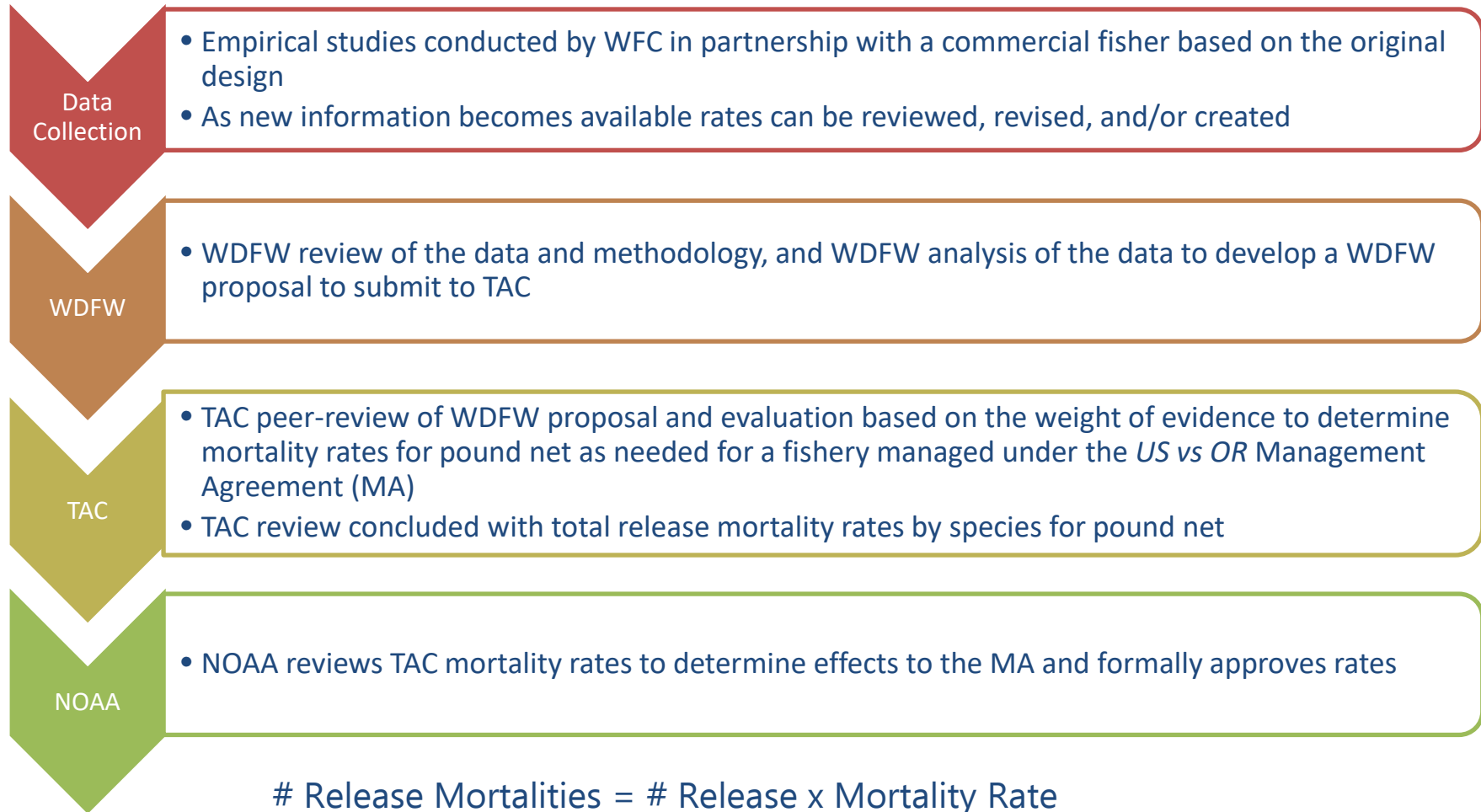


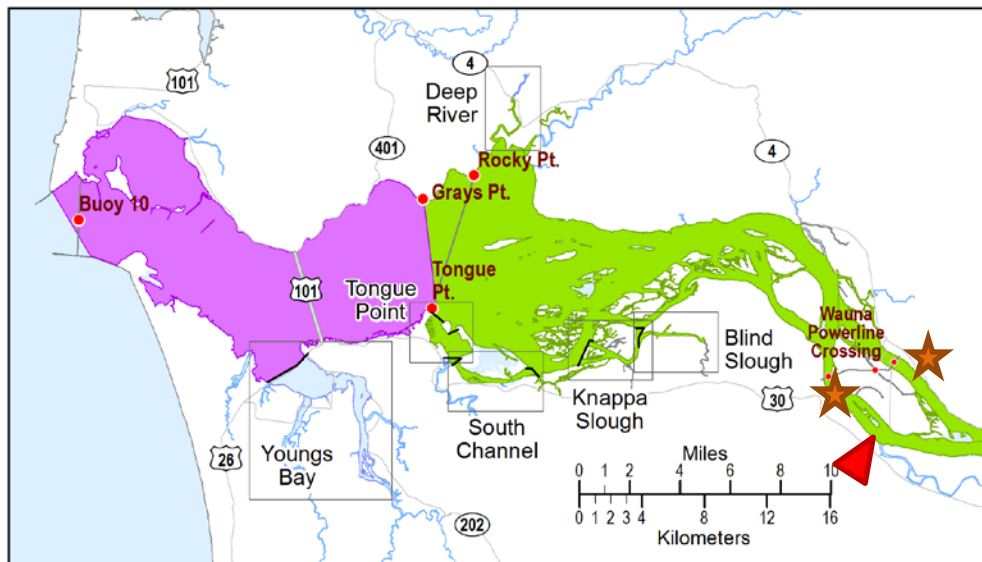
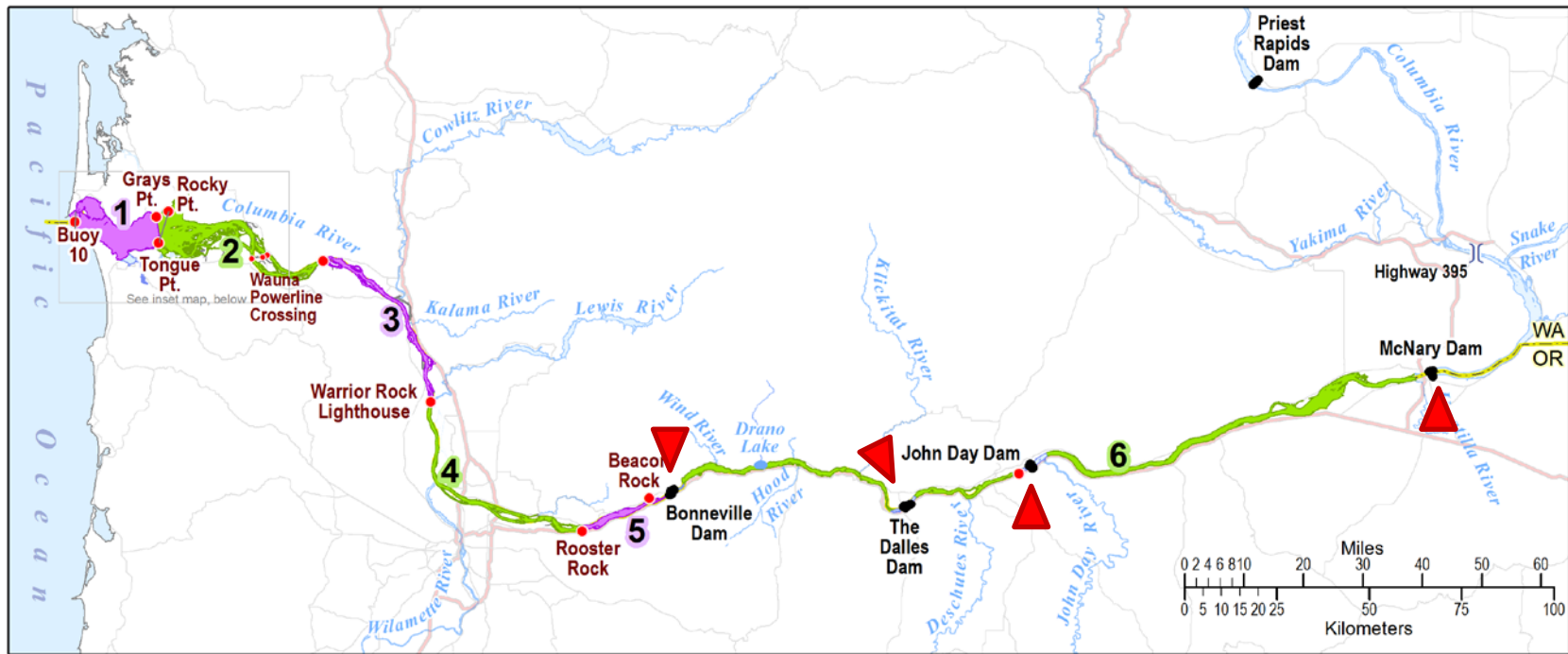
Gear Statistics

Release Mortality Rates

Season	Species	Per fish release mortality rate
Fall	Chinook	7%
	Coho	9%
	Steelhead	6%

Question: How will mortality be measured and estimated?





Question: Will it look at short- and long-term release mortality?

Pound net rates include immediate and post-release mortality

- Steelhead and Chinook are PIT tagged
- Fish that die within the trap = immediate
- PIT tag detection sites upstream allow researchers to detect fish post-release (i.e., mark-recapture)
- Fish tagged, but not detected upstream assumed to have died
- Coho held in net-pens for long-term mortality assessment
 - Original study too short for long-term mortality data; limited to mid-late September
 - Chinook:Coho release mortality rate ratio from seine study was used for Pound Net Chinook rate

Mortality Rate = (Immediate + Post-release deaths)/Sample Size

WDFW Fish Science, 11/23/2021



Mortalities

Question: It seems like a stationery structure might contribute to more pre-engagement mortality than drift gear. Is this considered in mortality measurements?

- Unknown, and may be a topic for future research.



Gear Statistics

Question: How has pound net data compared with Columbia River drift gillnet and tangle net operated in the mainstem Columbia River below Bonneville Dam for average catch of target fish, handle of non-target fish, and mortality of released fish?

Summary of average annual Chinook catch and steelhead mortalities in Fall Chinook-directed Columbia River commercial fisheries. Data preliminary.

Fishery	Data Years	Chinook					Steelhead			Chinook:Steelhead ²	
		MSF ¹	Handled	Kept	Released	Total mortalities	Handled	Total mortalities	ESA wild mortalities	Handle/Rel mort	Handle/ESA wild mort
Zone 4-5 Gillnet (8-9.75"; fall) ³	2018-2020	No	16,394	16,394	-	16,394	312	117	24.1	140	681
Zone 2 Pound Net (fall) ⁴	2018-2020	Yes	1,108	437	671	484	401	24	5.2	46	213

¹ MSF are mark selective fisheries, where only marked salmon can be retained while unmarked salmon are released, including unclipped and wild salmon. Non mark-selective fisheries allow the retention of clipped and unclipped salmon, including wild salmon.

² Average kept Chinook per steelhead mortality and average kept Chinook per ESA-listed steelhead mortality. ESA-listed steelhead include wild A- and wild B-index.

³ Zone 4-5 Gillnet allows marked and unmarked Chinook and coho to be retained (adults and jacks included), while all steelhead and chum must be released. Release mortality rate for steelhead were 33.8% (9.75") and 44.8% (8").

⁴ Pound Net was operated as a test fishery with only marked Chinook being retained (adults and jacks included), while all steelhead and unmarked Chinook were released; a limited number of marked Chinook were released but are included in kept category. Release mortality rate for Chinook is 7% and steelhead is 6%.



Gear Statistics

Summary of average annual coho catch and steelhead mortalities in Coho-directed Columbia River commercial fisheries over the duration of fishing for each gear type. Data preliminary.

Fishery	Data Years	Coho					Steelhead			Marked Coho:Steelhead ²	
		MSF ¹	Handled	Kept	Released	Total mortalities	Handled	Total mortalities	ESA wild mortalities	Kept/Rel mort	Kept/ESA wild mort
Zone 1-3 Tangle Net (fall) ³	2019-2020	Yes	4,498	3,733	765	181	77	18	3.3	205	1,149
Zone 2 Pound Net (fall) ⁴	2018-2020	Yes	3,177	1,333	1,844	166	401	24	5.2	55	256

¹ MSF are mark selective fisheries, where only marked salmon can be retained while unmarked salmon are released, including unclipped and wild salmon. Non-mark selective fisheries allow the retention of clipped and unclipped salmon, including wild salmon.

² Zone 1-3 Tangle Net allows both marked and unmarked Chinook and only marked coho to be retained (adults and jacks included), while all steelhead and chum were released. Release mortality rate for coho and steelhead is 23.6%.

³ Pound Net was operated as a test fishery with only marked coho being retained (adults and jacks included), while all steelhead and unmarked coho were released; a limited number of marked coho were released but are included in kept category. Release mortality for coho is 9% and steelhead is 6%.

⁴ Average kept marked coho per steelhead mortality and average kept marked coho per ESA-listed steelhead mortality. ESA-listed steelhead include wild A- and wild B-index.



Gear Statistics

Summary of average annual coho catch and steelhead mortalities in Coho-directed Columbia River commercial fisheries from September 30-October 31. Data preliminary.

Fishery	Data Years	Coho					Steelhead			Marked Coho:Steelhead ²	
		MSF ¹	Handled	Kept	Released	Total mortalities	Handled	Total mortalities	ESA wild mortalities	Kept/Rel mort	Kept/ESA wild mort
Zone 1-3 Tangle Net (fall) ³	2019-2020	Yes	4,498	3,733	765	3,914	77	18	3.3	205	1,149
Zone 2 Pound Net (fall) ⁴	2018-2020	Yes	157	119	37	123	20	1	0.3	98	456

¹ MSF are mark selective fisheries, where only marked salmon can be retained while unmarked salmon are released, including unclipped and wild salmon. Non-mark selective fisheries allow the retention of clipped and unclipped salmon, including wild salmon.

² Zone 1-3 Tangle Net allows both marked and unmarked Chinook and only marked coho to be retained (adults and jacks included), while all steelhead and chum were released. Release mortality rate for coho and steelhead is 23.6%.

³ Pound Net was operated as a test fishery with only marked coho being retained (adults and jacks included), while all steelhead and unmarked coho were released; a limited number of marked coho were released but are included in kept category. **Data only includes Sept. 30-Oct. 31 to align with Zone 1-3 Tangle Net fishery date range.** Release mortality for coho is 9% and steelhead is 6%.

⁴ Average kept marked coho per steelhead mortality and average kept marked coho per ESA-listed steelhead mortality. ESA-listed steelhead include wild A- and wild B-index.



Gear Statistics - Clifton Channel

Summary of catch (adults and jacks) for Clifton Channel Pound Net from August 21 – October 18, 2021. Data preliminary.

Species	Handled		
	Marked	Unmarked	Total
Chinook	291	115	406
Steelhead	22	10	32
Coho	1,772	308	2,080



Scenarios

Ask: Using the currently available catch data for the Cathlamet Channel (WA) and Clifton Channel (OR) pound nets, what is the proportion of an average run that would need to be handled by pound nets to remove enough hatchery fish to make a 50% reduction in pHOS for:

- Lower River Tule Fall Chinook Salmon
- Lower River Coho Salmon
- Summer steelhead run proportion incidentally intercepted as bycatch

What we did: Calculated harvest rates needed to reduce the **proportion of hatchery-origin fish** (not pHOS) escaping Lower Columbia fisheries to 50%

- Used runs based on 2021 Lower River Tule Chinook and Coho
- Assumed fish intercepted in proportion to their abundance
- Assumed that pound nets were the only fishery (because we used pound net mortality rates)



What is pHOS, and how is it calculated?

pHOS = The proportion of hatchery-origin spawners, typically at the population level

$$\text{pHOS} = \text{HOS} / (\text{HOS} + \text{NOS})$$

A return of 10,000 HOS, and 100 NOS requires removal of 9,900 to get to 50%



HOS/NOS affected by suite of management actions

Some examples are:

- Hatchery production
- Hatchery fish removals at weirs/hatchery racks
- Mainstem harvest
- Tributary harvest
- Passage through hydro projects



Lower River Tule Fall Chinook 2021 Example

Natural-
origin: 15%



Hatchery-origin
(unclipped): 10%



Hatchery-origin
(clipped): 75%



94% * 7% release mortality
of natural and unclipped

Remove 94% of clipped
hatchery fish



Results in a proportion of hatchery fish of 50%

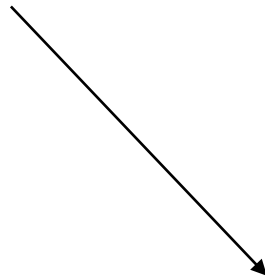


Lower River Coho 2021 Example

Natural-
origin: 40%



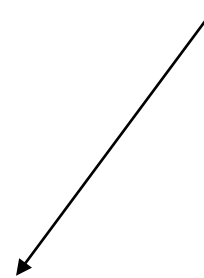
35% * 9% release mortality
of natural and unclipped



Hatchery-origin
(clipped): 60%



Remove 35% of clipped
hatchery fish



Results in a proportion of hatchery fish of 50 % in the run





Gear Economics

Gear Economics

Question: How do pound nets compare with Columbia River drift gillnet and tangle net operated in the mainstem Columbia River below Bonneville Dam, in terms of economic viability (gross profit)?

Year	Fishery	Days Fished	Harvest ¹		Total
			Chinook	Coho	Ex-Vessel Value
2018	Zone 4-5 Gillnet	4	8,320	380	\$378,454
	Zone 1-3 Tangle Net	---	---	---	---
	Cathlamet Pound Net	32	648	509	\$24,901
2019	Zone 4-5 Gillnet	5	8,148	220	\$322,144
	Zone 1-3 Tangle Net	4	676	2,492	\$41,118
	Cathlamet Pound Net	36	186	1,830	\$21,990
2020	Zone 4-5 Gillnet	15	32,714	2,813	\$1,272,433
	Zone 1-3 Tangle Net	11	911	4,974	\$67,987
	Cathlamet Pound Net	25	379	1,269	\$26,435

1 Includes adults and jacks.



Question: How many pound nets needed to replace the ~580 permits in the current WA/OR commercial fleet?

- Significant changes in land use and regulation since banned include:
 - Massive increases in recreational fisheries
 - Water-based recreation has increased (e.g., kayaks, motorsports, river cruises)
 - The creation of several wildlife refuges
 - Transportation needs
 - The privatization of shoreline
 - Installation of many dams and water diversions
- A fisher's business model is needed to inform answer: Co-ops versus individuals
- In any given year, a subset of fishers may also choose to go on waiver or fish a different geographic area





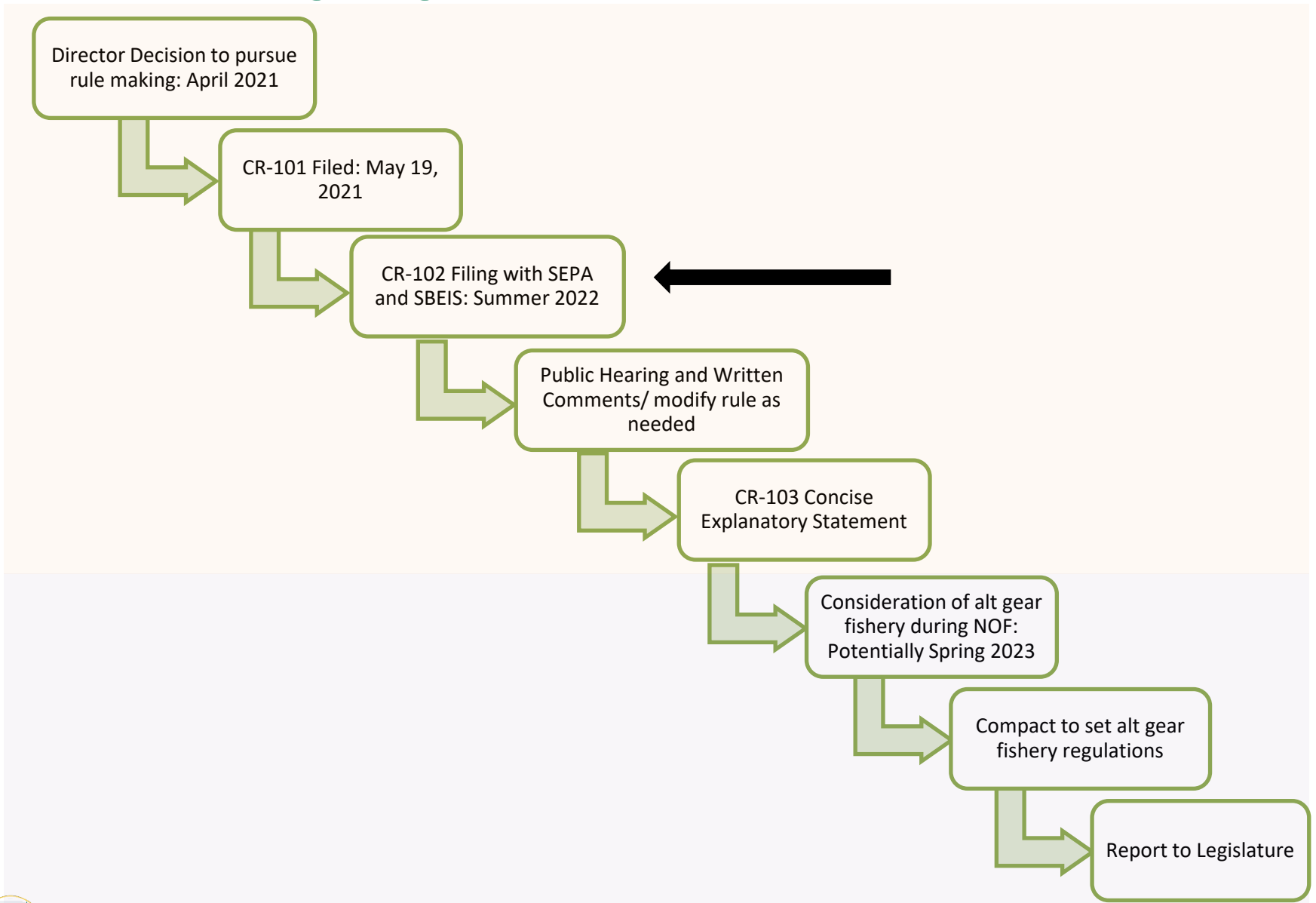
Next Steps

Next steps

- Emerging Commercial Fishery Designation
- Emerging Commercial Fishery Implementation
- Staff are considering research needs using a fishery implementation lens
 - Understanding if gear can be further modified to reduce encounters of non-target fish (e.g., steelhead)
 - Questions specific to other species depending on when gear could/would be deployed (e.g., sockeye)
 - Pinniped interaction/habituation potential
- Implementation modeling framework
- Research Impacts Request



Emerging Commercial Fishery



Management Considerations

Goal: Sustainable harvest of healthy wild stocks, and harvest of hatchery stocks to the maximum extent practicable while minimizing non-target mortality (especially for ESA-listed stocks) **within harvest constraints**.

Ability to optimize the goal (how quickly/fully we eat our pie piece) depends on:

- Sector/gear allocation
- ESA limits (e.g., bright Chinook, LRH tule Chinook, summer steelhead)
- Mortality rates
- Encounter rates
- OR rules/WA policy
- Working with time, place and manner
- Hatchery fish mark rates
- Understanding fish migration at various scales (e.g., steelhead swim close to shore)

The implementation model will allow us to evaluate scenarios



Pound Net Potential Commercial Use

Fishing Season	Target Species	Biological and Economic Considerations	Pound Net fit?
Spring	Chinook	<ul style="list-style-type: none"> Commercial allocation $\leq 20\%$ is used in SAFE areas We have an established alternative mobile gear (i.e., tanglenets) Pinniped habituation to fixed gear? No research/testing has been conducted to-date 	Poor potential
Summer	Chinook	<ul style="list-style-type: none"> No alternative gear available yet; non-concurrence on gillnets Commercial allocation of 20-30% on a small run size limits profit potential Pinniped habituation to fixed gear? Sockeye impacts limiting? Very limited research to determine potential catch rates 	Fair potential
Fall	Chinook	<ul style="list-style-type: none"> Low mark rates for bright Chinook (26%), but high value ($\sim \\$3/\text{lb}$) High mark rates for tules (77%), but low value ($\sim \\$0.5/\text{lb}$) Existing commercial fisheries can catch share ESA impacts are limiting Pinniped habituation to fixed gear? 	Fair potential
Fall	Coho	<ul style="list-style-type: none"> High mark rates (76%) Decent value ($\sim \\$1.5/\text{lb}$) ESA impacts limiting, but fewer steelhead due to run timing Pinniped habituation to fixed gear? 	Good potential

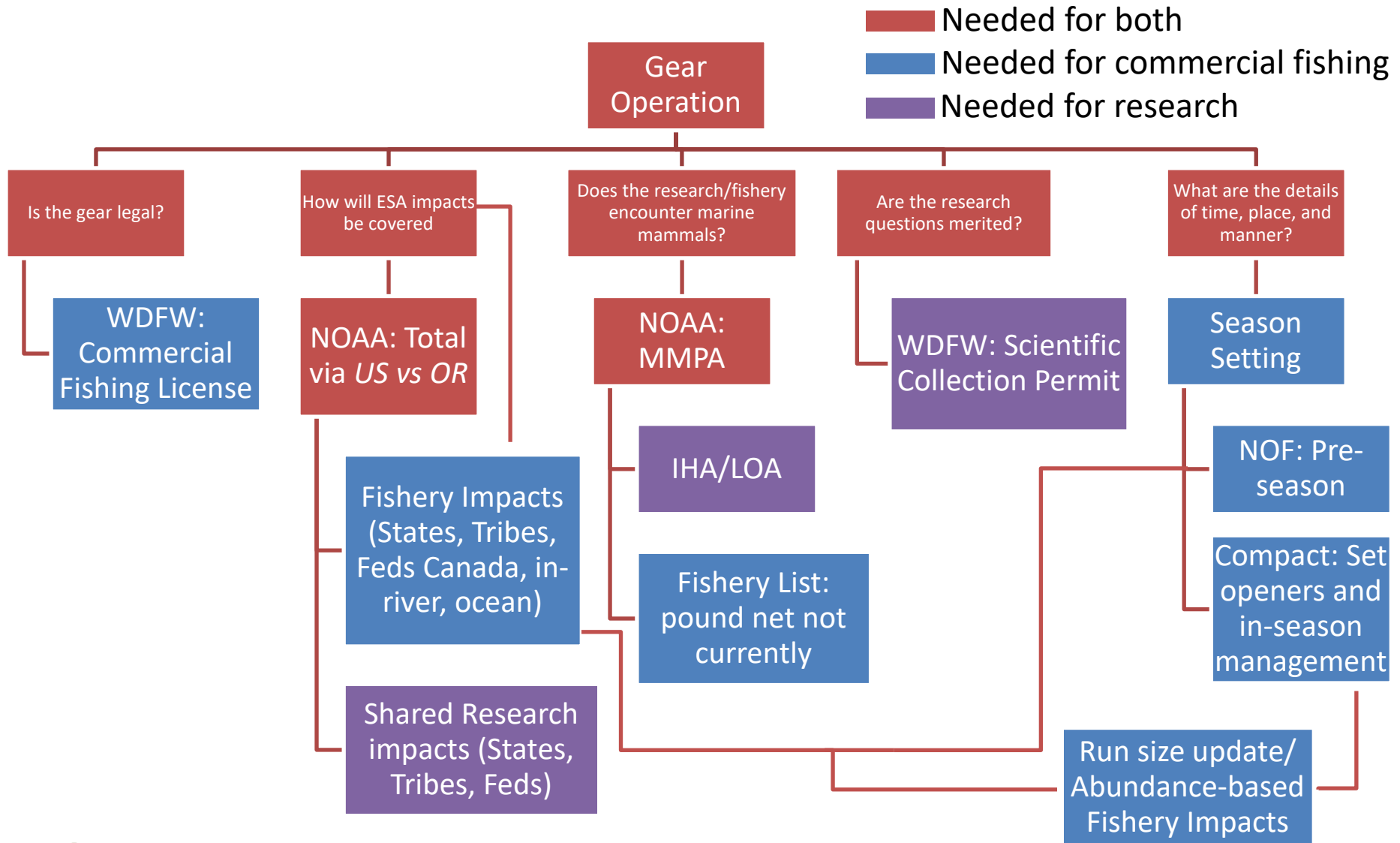


WFC Research Impacts Request

- WDFW and ODFW have a request from WFC to use fisheries impacts for pound net research in 2023
 - Research for further assessment of mortality rates for Chinook, steelhead, and possibly coho
 - A potential shift in policy to use fisheries impacts for research
- Staff received a report from WFC on February 1st to consider info to date on the passive handle technique



Regulatory Considerations



Summary

- Policy Direction is to continue to work with industry and other stakeholders on developing and implementing alternative gear
- Pound nets are one potential tool in our toolbox
- Regardless of the tool used, we manage within harvest constraints
 - Using a tool mark-selectively makes sense in some scenarios (e.g., high mark rates of target stocks)
 - Other fishing methods make sense in other scenarios (e.g., bycatch avoidance when high steelhead encounter)
- We still have work to do with understanding pound net commercial potential, best assessed in our emerging commercial fishery, particularly on economic viability and pinniped habituation



Questions?

