Comprehensive Review of the Columbia River Basin Salmon Management Policy C-3620 2013-2017

CATEGORY A *(draft 05/12/2018)*

RECREATION

QUESTIONS: *9, 23, 24,* 25

Question 25

Question paraphrase: Has the Department made any progress on the use of logbooks in the recreational fisheries?

Policy citation: Logbooks: Evaluate the benefits of requiring licensed recreational fishing guides and charters to maintain and use logbooks. …evaluate the use of volunteer trip reports in private boat fisheries. (pg. 13)

Specific question: What has been done over the course of the Policy with regard to this paragraph?

Analysis: Nothing has been achieved on this component of the Policy during 2013-2017. Logbook requirements for guides was not approved by the state legislature. Legislature directed Washington Department of Fish and Wildlife to hold meetings with the salmon and steelhead guide license industry to explore guide license structures in order to improve fishing experience, meet conservation objectives and provide an economic well-being. These meetings allowed for conversations around ways to improve trip information for Washington Department of Fish and Wildlife, such as creating a mobile application.

COMMERCIAL

QUESTIONS: 17, 18, 22, 27, 28

Question 17

Question paraphrase: Has the Department made progress in implementing the Marine Stewardship council certification program?

Policy citation: Develop a program that seeks to implement Marine Stewardship Council or other certification of salmon fisheries in the Columbia River as sustainably managed fisheries. (pg. 11)

Specific question: *What has been done over the course of the Policy to develop this program?*

Analysis: Nothing was done on this component of the Policy during 2013-2017.

Supplemental staff comments:
This program was reviewed by the two states around 2008-2009 with the commercial fishers to determine if some of the fisheries in place at that time could be certified under the MSC program. The conclusion at that time was that there were fisheries that would likely meet the criteria but there was no effort to work on this, primarily because of the cost of certification.

In recent years, alternatives to the MSC process have been developed. Alaska has developed a Responsible Fishery Management (RFM) program for many of their fisheries, which has been certified by the UN Food and Agriculture Organization's Global Sustainable Seafood Initiative (GSSI). It is a much less costly alternative than MSC, and has similar benefits. At present, it is exclusively for Alaskan fisheries, but within the next year, it may broaden to include other fisheries. Even though it may be a less costly alternative to MSC, it may still be most beneficial if it is done on a regional basis as it likely will never be cost effective for small fisheries such as the lower Columbia commercial fishery without including other fisheries in the program. Other avenues to achieve a sustainability label on Columbia River fisheries includes the Monterey Bay Aquarium Seafood Watch program, local community supported seafood/fishery programs and a newly developed University of Washington's Sustainable Seafood reporting website.

Question 18

Question paraphrase: Has the Department made progress in implementing a buyback program?

Policy citation: Gill Net License Buyback Program: Aggressively pursue a program to buyback non-tribal gill net permits… (and)…other tools to reduce the number of gillnet permits. (pg. 11)

Specific question: *What has been done over the course of the Policy with regard to this paragraph?*

Analysis: In December 2016, the department collaborated with Responsive Management, a firm specializing in attitudes toward natural resources. The firm was hired to help evaluate a potential program to buy back state-issued Columbia River gill net licenses, and asked for input from selected commercial fishers to help develop a survey. The survey was subsequently abandoned, and the Department has begun a new process starting with involvement from commercial stakeholders. Washington Department of Fish and Wildlife staff met with commercial stakeholders beginning in 2017. The most recent meeting occurred in February 2018 and staff are now working on a schedule of regular meetings and are in the process of working with the stakeholders to develop a plan moving forward including goals, objectives and options for a program. This program is also seeking ways to explore options to find funding and the appropriate process to allow a buyback program to succeed. Oregon Department of Fish and Wildlife staff have agreed to be involved in the discussions.

Question 22

Question paraphrase: Has the Department made progress on developing new off-channel sites in Washington?

Policy citation: Off-Channel Commercial Fishing Sites. Seek…new off-channel sites in Washington... (pg. 13)

Specific question: *What has been done over the course of the Policy with regard to this paragraph?*

Analysis: WDFW started releasing spring Chinook from Cathlamet Channel Net Pens (CCNP) beginning in 2014 (See Question #15) with the intent of creating a new off-channel fishery in Washington, but based on test fishing results and poor smolt survival, a new fishery never materialized. ODFW investigated a number of new off-channel fishing areas, including one in Washington.

Supplemental staff comments:

Table 22A: Overall assessment of potential new Select Area sites following adult test fishing and juvenile acclimation evaluations.

Evaluation Site	Adult Assessment	Juvenile Assessment
Clifton Channel	Excessive catch of upriver spring Chinook	Lacking acclimation infrastructure Questionable homing source/ potential for straying
Westport Slough	Spring: OK for development Fall: natural origin Coho present	Lacking acclimation infrastructure; access permission contingent on Kerry West expansion Potential straying to Clatskanie
Bradbury Slough	Upriver spring Chinook catch could lead to ineffectual use of SA allocation	Insufficient homing source; potential for straying
Coal Creek Slough	OK for spring	Lacking acclimation infrastructure No access permission at existing dock Potential water quality issues (temperature D.O.)

Question 27

Question paraphrase: What were the results from monitoring the 2017 commercial fishery and how do they compare with expectations?

Policy citation: In 2017 and 2018, the Department shall estimate the encounters of sturgeon and steelhead in the gill net fishery upstream of the Lewis River through onboard or other field methods, with particular respect to Group B steelhead. (pg. 14)

Specific question: *Provide the information garnered as a result of the monitoring in 2017, and how it compares to pre-season allocations and expectations*.

Analysis: WDFW and ODFW staff monitored the commercial fishery upstream of the Lewis River in 2017 in August and September (Table 27B). Monitoring occurred during each weekly fishing period. Preseason expectations were only made for the month of August and were not made for sturgeon. Compared to preseason expectation during August, steelhead handle was 51% of expectations, Chinook harvest was 32% of expectations and the immediate mortality rate for steelhead was 49% of expectations. Monitoring results for August are shown in Table27A and compares preseason expectations and actual estimates. A summary of the monitoring efforts for 2017 are shown in table 27B.

Table 27A: Results From Monitoring August Zone 4-5 Commercial Fishery, 2017

	Chinook Catch (Aug 22-Sep 1)	Steelhead Handle	Steelhead Immediate Mortality rate	Steelhead per fishing day	Steelhead/ Chinook Ratio	Group B Index Steelhead %	Group B Steelhead Handle
2017 Preseason	43,964	746	48.9%	149	0.017	5%	26
2017 Actual	13,959	384	23.8%	77	0.027	4%	15

Table 27B: 2017 Fall Zone 4-5 Gillnet Fishery Observation Summary

Date	Vessels	Drifts	Chinook	Coho	Steelhead A-Index	Steelhead B-Index	Observed Steelhead Mortality Rate	White Sturgeon	Comment
Aug 22-23	19	106	581	5	28	0	25%	130	No B-Index steelhead handled
Aug 24-25	20	97	473	5	18	2	20%	103	All observed steelhead mortalities were A-Index fish
Aug 27-28	20	93	1,110	30	22	1	30%	121	All observed steelhead mortalities were A-Index fish
Aug 29-30	19	82	315	8	5	0	0%	60	No B-Index steelhead handled
Aug 31-Sep 1	20	92	296	5	5	0	40%	50	No B-Index steelhead handled
Sep 17-18	14	68	460	47	6	4	56%	125	One steelhead with unknown condition
Sep 19-20	16	103	503	101	25	8	13%	102	All observed steelhead mortalities were A-Index fish
Totals	128	641	3,738	201	109	15	24%	691	

Question 28

Question paraphrase: Did the Department seek funding to estimate release mortalities in recreational fisheries?

Policy citation: …seek funding to improve estimates of salmon release mortality in recreational mark-selective fisheries during the summer and early fall months when water temperatures are high. (pg. 14)

Specific question: *What has been done to achieve this directive?*

Analysis: Nothing was done on this component of the Policy during 2013-2017.

TRIBAL

QUESTIONS: 6, 7

Question 6

Question Paraphrase: Has the Department met the needs of the Colville Tribe and terms of the agreements?

Policy citation: Meet Colville tribal subsistence and ceremonial needs consistent with agreements with the Confederated Tribes of the Colville Reservation (pg. 9)

Specific question: *Has this occurred over the course of Policy 3620 being in effect?*

Analysis: WDFW and the Colville Confederated Tribes (CCT) developed an agreement in 2007 for management of salmon and steelhead stocks originating from the Colville Reservation. That agreement ("Agreement between the Confederated Tribes of the Colville Reservation and the Washington Department of Fish and Wildlife on Jointly managed salmon and steelhead populations") is currently the working document that WDFW and CCT use in annual fishery management. The agreement focuses on conservation objectives and harvest sharing above Priest Rapids Dam between sport and tribal fisheries, but also includes harvest allocation guidelines between sport and CCT for summer/fall Chinook, spring Chinook, and sockeye. CCT harvest of summer steelhead is limited to incidental harvests during other tribal fisheries. The parties to this agreement are in the process of updating the agreement.

This analysis only focused on that part of the agreement that deals with allocation of summer Chinook above and below Priest Rapids Dam. The agreement referenced above, includes a harvest rate schedule for sport and tribal fisheries above Priest Rapids Dam based on run size. During 2013-2017, based on the post-season run size, the Colville Tribe got at least their allocation during three of the five years. Their fisheries were not constrained in the other two

years. Their average allocation during these years was 53% and their actual harvest averaged 50% (Table 6A, shown below).

Table 6A: Colville Tribal Summer Chinook Allocation

	Colville Planned Allocation	Colville Actual Allocation
2013	50%	54%
2014	55%	55%
2015	>55%	68%
2016	55%	46%
2017	50%	27%
Average	53%	50%

*Allocation as a percent of sport/tribal allocation above Priest Rapids Dam

Question 7

Question paraphrase: Has the Department met the needs of the Wanapum Tribe?

Policy citation: Provide Wanapum Band fishing opportunity consistent with RCW 77.12.453 ("Salmon fishing by Wanapum (Sokulk) Indians"). (pg. 10)

Specific question: *Has this occurred over the course of Policy 3620 being in effect?*

Analysis: Yes, this has occurred. In 1981, the legislature recognized that salmon fishing was culturally important to the Wanapum Indians and authorized the WDFW Director to issue ceremonial and subsistence permits. RCW 77.12.453 states "The director may issue permits to members of the Wanapum band of Indians to take salmon for ceremonial and subsistence purposes. The department shall establish the areas in which the permits are valid and shall regulate the times for and manner of taking the salmon. This section does not create a right to fish commercially."

During 2013-2017, the Wanapum Band harvested an average of 28 spring Chinook, 210 summer Chinook, 470 sockeye and 251 fall Chinook (Table 7A).

Table 7A: Harvest by Wanapum Band

	Spring Chinook	Summer Chinook	Sockeye	Fall Chinook
2013	8	240	92	475
2014	37	152	814	238
2015	58	284	522	221
2016	35	218	659	242
2017	2	158	263	78
Average	28	210	470	251

MANAGEMENT

QUESTIONS: *1, 3,* 4, 5, 16, *26,* 29, 40

Question 5

Question paraphrase: What has the Department done to reduce salmon predation?

Policy citation: …reduced predation by fish, birds, and marine mammals. (pg. 9)

Specific question: *What has the Department done to reduce salmon predation by these three animal groups over the course of the Policy?*

Analysis:

- Fish – Considerable effort, with significant positive results.
    - WDFW is the lead agency for the Columbia River Predator Control Program (Pikeminnow sport-reward and dam angling components) that is funded by Bonneville Power Administration and has been implemented system wide since 1991. Recent evaluations indicate that the Pikeminnow Program has consistently achieved the program exploitation goal of annually harvesting 10-20% of predator sized (≥250mm FL) Northern Pikeminnow from within the program area. Analysis of our most recent recapture data indicates that 2017 exploitation was 17.4%. Based on this level of exploitation, it is estimated that 2018 predation levels on juvenile salmonids will be 24% (range: 17-41%) lower than pre-program levels.
    - WDFW Implemented new warmwater recreational fishery regulations that should increase harvest and decrease predation. There has not been an evaluation of their efficacy.
- Birds – Agency involvement in regional efforts, with mixed results.
    - Sand Island Caspian Tern colony predation rate has greatly diminished due to relocation and Bald Eagle predation. In 2016, predation on steelhead smolts was 6% compared to the long-term average of 22%. New colonies are forming upstream in the Columbia Basin.
    - WDFW supported US Army Corps program for lethal removal of part of the population of Double-crested Cormorants nesting on Sand Island, however some portion of the colony has simply relocated to the Megler Astoria Bridge, creating new problems.
- Marine Mammals – Considerable effort, but ongoing negative trend.
    - Regional efforts are still underway to gain additional authority under the Marine Mammal Protection Act to reduce predation by California and Steller Sea Lions, and Harbor Seals. Marine mammal predation effects continue to be significant, with recent papers in scientific journals estimating more Columbia River origin adult salmonids taken by marine mammals than taken in sport and commercial fisheries combined (Chasco, B.E., et al. 2017).

- In 2017, at Bonneville Dam, Washington Department of Fish and Wildlife and Oregon Department of Fish and Wildlife removed 24 California Sea Lions. Still, steelhead impact was considerable. The Army Corp of Engineers estimated that Sea Lions consumed 9% of the very poor 2017 return of steelhead in the Bonneville Dam area. No estimate of downstream impacts on steelhead are available. The executive Summary of 2017 report by the U.S. Army Corps of Engineers can be found in the Image 1.
- 2016 and 2017 the National Marine Fisheries Service's studies of spring Chinook predation in the lower Columbia provided estimates of losses of 19k and 24k respectively, or 7% and 11% of the total run, respectively.
- Idaho, Oregon and Washington Governors have submitted letters of support to congressional delegation to provide additional flexibility for state management to reduce predation on salmon, steelhead, sturgeon and lamprey. H.R. 2083, the Endangered Salmon and Fisheries Protection Act, is sponsored by Oregon and Washington and has cleared the Natural Resource Committee (Senate companion bill S. S 1702). If this legislation passes, it would allow local agencies quicker and more efficient intervention of pinnipeds in the Columbia and Willamette rivers, but still limit lethal removal.

Question 16

Question paraphrase: Are Washington and Oregon policies and regulations the same?

Policy citation: Seek to maintain consistent and concurrent policies between Oregon and Washington. (pg. 11)

Specific question: *What policies and regulations are inconsistent or non-concurrent between the States of Washington and Oregon for Columbia River fisheries, as of December 31, 2017?*

Analysis: Appendix C shows differences between the two state's policies as of June 27, 2017. Summer Chinook, sockeye, coho and chum have the same or very similar policies/regulations between the two states. More specifically to the subtle difference with summer Chinook, WDFW applies the unused share to escapement or recreational fisheries while ODFW applies the unused share directly to escapement. The differences are:

- Spring Chinook – Washington Policy provides for mainstem recreational fisheries but no mainstem commercial fisheries. Oregon regulations allow for mainstem fisheries with tangle net or other selective gear if impacts are not needed in Select Areas.

- Fall Chinook

  During 2017-2018, WDFW will assign no more than 75% of the ESA-impact for lower Columbia River tule and Upriver Bright fall Chinook to mainstem recreational fisheries to meet management objectives and the balance (not less than 25%) to commercial fisheries. Oregon will assign no more than 70% of the ESA-impact for

lower Columbia River tule and Upriver Bright fall Chinook, whichever is the most constraining, to mainstem recreational fisheries to meet management objectives and the balance (not less than 30%) to commercial fisheries; 2% of the commercial allocation impacts can be used for alternative gear.

Beginning in 2019, WDFW will assign no more than 80% of the ESA-impact for lower Columbia River tule and Upriver Bright fall Chinook to mainstem recreational fisheries to meet management objectives and the balance (not less than 20%) to mainstem commercial fisheries; only alternative commercial gear can be used in the mainstem. Oregon will assign no more than 70% of the ESA-impact for lower Columbia River tule and Upriver Bright fall Chinook, whichever is the most constraining, to mainstem recreational fisheries to meet management objectives and the balance (not less than 30%) to commercial fisheries; 2% of the commercial allocation impacts can be used for alternative gear; gill nets may be used in Zones 4-5.

- Other – Washington policy includes additional guidance under the general provisions section of the policy such as buy back and logbooks, whereas Oregon does not provide guidance.

Question 29

Question paraphrase: What has the Department done to improve fishery management tools?

Policy citation: Improve Management Tools. Explore and develop alternative approaches to improve pre-season forecasts of run size and timing; in-season updates of run-size estimates; and in-season estimates of the harvest impacts by fishery. (pg. 14)

Specific question: *What has been done to achieve these three objectives?*

Analysis: WDFW staff, in partnership with co-managers, are continuously trying to advance methods to improve estimates of run forecasts, run timing and harvest impacts in fisheries. This is an on-going, continuous process that occurs as part of the regular activities of the fishery managers. Improvements in the management tools as described in the Policy, relies on reliable data input, such as accurate accounting of run sizes and harvest.

WDFW has have been working on a variety of tasks to improve our management tools that would ultimately lead to improved estimates of run forecasts, timing and harvest impacts. One example is shown below:

- Forecasting models are ranked according to a simple forecast performance metric. For each model considered, hypothetical forecasts for past years are generated and the absolute prediction error (APE) as a percent of the actual return is calculated:

  APE= (|predicted – actual|/actual)*100

The model with the smallest median APE can be used when considering which model is selected for the forecast, and provides a more objective criterion for selecting competing forecast models. Environmental variables will continue to be explored and incorporated to improve predictability in the forecasts.

Question 40

Question paraphrase: What regulations or policies are not concurrent with Oregon?

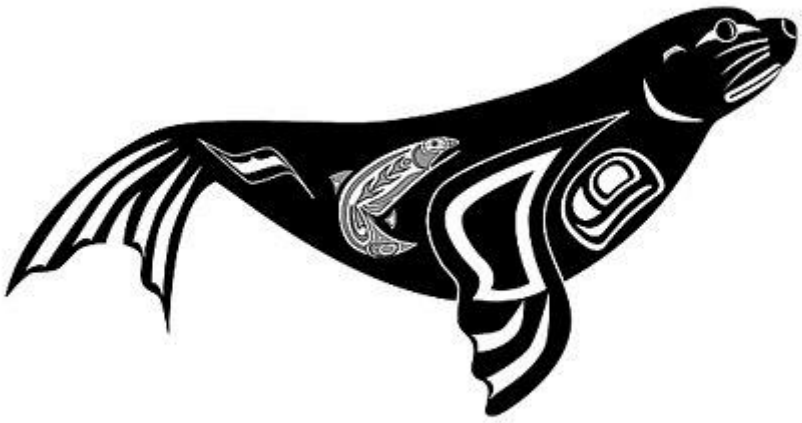
Policy citation: Concurrent regulations between the two states (pg. 21)

Specific question: *What regulations or management policies are currently not concurrent between the two states?* This question is a cross reference with question/footnote 16.

Analysis: See answer to Question #16.

MANAGEMENT APPENDIX
5. Reduced predation by fish, birds, and marine mammals. (pg. 9)

EVALUATION OF PINNIPED PREDATION ON ADULT SALMONIDS AND OTHER FISH IN THE BONNEVILLE DAM TAILRACE, 2017



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March 5, 2017

Past reports and more information on the Pinniped Monitoring Program at Bonneville Lock and Dam can be found at the following link:
http://pweb.crohms.org/tmt/documents/FPOM/2010/Task%20Groups/Task%20Group%20Pinnipeds/

The correct citation for this report is: Tidwell, K.S., B.K. van der Leeuw, L.N. Magill, B.A. Carrothers, and H. Wertheimer. 2017. EVALUATION OF PINNIPED PREDATION ON ADULT SALMONIDS AND OTHER FISH IN THE BONNEVILLE DAM TAILRACE, 2017. U.S. Army Corps of Engineers, Portland District Fisheries Field Unit. Cascade Locks, OR. 54pp.

EXECUTIVE SUMMARY

California sea lions (CSL; *Zalophus californianus*) and Steller sea lions (SSL; *Eumetopias jubatus*) aggregate at the base of Bonneville Dam, where they feed on Pacific salmon and steelhead (*Oncorhynchus spp.*) which are protected under the Endangered Species Act. As directed by a Biological Opinion, the U.S. Army Corps of Engineers has been monitoring the seasonal presence, abundance, and predation activities of pinnipeds at the dam since 2002. Monitoring is conducted during the Focal Sampling Period (FSP; approximately January – May), and additional abundance monitoring is conducted when animals are present outside of the FSP.

The following is a summary of the 2017 FSP and the fall/winter season:

PRESENCE AND ABUNDANCE:

- Abundance monitoring began on August 15, 2016 when the first pinniped returned to the dam and terminated on June 2, 2017 when the last pinniped was documented at the dam.
- An average of 15.4 ± S.E. 1.3 SSLs per day were observed during the FSP.
- An average of 5.1 ± S.E. 0.6 CSLs per day were observed during the FSP.

PREDATION

- The FSP including predation monitoring, started January 10, 2017 and ended on June 2, 2017.
- An estimated 5,384 (CI 4,671 – 6,042) adult salmonids were consumed by pinnipeds in 2017, which equates to 4.7% of all salmonids passing the dam during the season.
- An estimated 4,951 (CI 4,276 – 5,585) spring Chinook salmon (*O. tshawytscha*) were consumed, which equates to 4.5% of the run during the FSP.

- An estimated 322 (CI 144 – 454) summer and winter steelhead (*O. mykiss*) were consumed, which equates to 9.0% of the run during the FSP.

MANAGEMENT AND DETERRENCE

- Physical barriers – excluded pinnipeds from entering fishways.
    - Continued placement of SLEDS should be maintained.
- Boat and dam-based hazers used 4,956 non-lethal deterrence devices.
    - Hazing provides circumspect benefits that merit better evaluation.
- Wildlife managers branded 18 and removed 24 CSLs, and branded 12 SSLs.
    - Branding allows unique identification(s) and should be emphasized.
    - A management plan for SSLs should be developed and implemented at Bonneville Dam.

We documented an increasingly high number of Steller sea lions during 2017. Spring Chinook were consumed at similar levels as 2016, but were primarily consumed by Steller sea lions, which is the first instance where Steller sea lions consumption was markedly greater than California sea lion consumption. The low run size and high percentage of steelhead consumed by pinnipeds in 2017 is alarming, and warrants particular attention from fish and wildlife managers.

ALLOCATION

QUESTIONS: *30, 31, 32, 33, 34, 35, 36*

ALTERNATIVE GEAR

QUESTIONS: *10, 11, 12, 13, 14, 19, 33*

ECONOMICS

QUESTIONS: *2, 8, 15, 20, 21, 37, 38, 39*

Comprehensive Review of the Columbia River Basin Salmon Management Policy C-3620 2013-2017

CATEGORY B *(draft 05/12/2018)*

RECREATION

QUESTIONS: 9, 23, 24, *25*

Question 9

Question paraphrase: Has the recreational fishery been prioritized in the mainstem and has the commercial fishery been prioritized in off-channel areas?

Policy citation: …prioritize recreational fisheries in the mainstem and commercial fisheries in off-channel areas of the lower Columbia River. (pg. 10)

Specific question: *Has this occurred over the course of Policy 3620 being in effect?*

Analysis: Recreational fisheries have been prioritized in planning process. For spring fisheries, the preseason commercial fishery planning process prioritizes the amount of incidental harvest of upriver stocks in spring SAFE fisheries, which typically consumes a high percentage of the commercial allocation of upriver impacts and leaves little or no impacts for scheduling any mainstem fisheries. This essentially establishes exclusive recreational access to the mainstem fisheries.

Fall fishery planning is more complicated, but still incorporates a recreational priority. Tules are readily harvested in recreational fisheries in the estuary while URBs are not as vulnerable to recreational gear in that area. Since mainstem commercial Chinook fisheries have been largely eliminated below the Lewis River mouth and commercial coho fisheries have recently been very limited. This has created a default recreational exclusive zone downstream of the Lewis River during August and September.

Question 23

Question paraphrase: What science was used by the Department for the barbless hook regulation?

Policy citation: Barbless Hooks (pg. 13)

Specific question: *What information was provided at the time of Policy 3620 adoption regarding the scientific basis of a difference in fish mortality due to the use of barbed vs. barbless hooks? What was the rationale or basis for this provision of the Policy at the time of its adoption?*

Analysis: A barbless hook rule for the mouth of the Columbia River to McNary Dam was considered and approved by the Commission in February 2010 after substantial public comment and discussion. The Commission directed that implementation be contingent upon the adoption of a similar rule by the Oregon Fish and Wildlife Commission. However, the Oregon Fish and Wildlife Commission subsequently declined to support the barbless hook rule, and Washington did not implement the rule.

Building on the previous Commission action, discussions were reinitiated with Oregon in 2012 during the bi-state Columbia River Fishery Management Workgroup process. The workgroup recommended implementing barbless hooks in 2013 for salmon and steelhead. The Commission approved that recommendation and included the following general Provision: "Implement in 2013 the use of barbless hooks in all mainstem Columbia River and tributary fisheries for salmon and steelhead." We are not aware that any information on the scientific basis of a difference in mortality due to the use of barbed vs. barbless hooks was presented during consideration of the policy.

The rationale for the adoption of the barbless hook rule was to maximize survival rates for released wild fish and contribute to the recovery of wild salmon and steelhead runs in the Columbia River. In discussions with stakeholders and Commissioners, staff acknowledged that we do not have statistical evidence that the use of barbless hooks will reduce the mortality rate of fish that are released in the Columbia River. However, we were aware that several studies had found lower mortality rates for barbless hooks in marine fisheries for salmon, and in freshwater fisheries for trout.

A study that is ongoing in the Cowlitz River is expected to provide additional information. The Cowlitz River study is comparing gear types (including barbed hooks versus barbless hooks), hooking location and water temperatures across all species; 2018 is the second year of a 3-year study.

Question 24

Question paraphrase: What tributaries in Washington are exempt from the barbless hook regulation?

Policy citation: Barbless Hooks…and tributary fisheries for salmon and steelhead (pg. 13)

Specific question: *As of December 31, 2017, what tributary sport fisheries for salmon and steelhead operate under a regulation that does not require the use of barbless hooks but allows for their voluntary use?*
Analysis: When the Policy was adopted, the barbless hook requirement was put into place in the mainstem Columbia River and the Columbia River tributaries. After additional consideration, a number of tributaries were included in an exception to the barbless hook requirement. The rationale was primarily the absence of or negligible numbers of ESA-listed

species. The original list was updated during the recent rule simplification process (2018) and are shown below and in Appendix Table R with the rationale. Oregon requires barbless hooks in the Columbia River but not in their tributaries.

- Deep River. Year round – Salmon net pen program.
- Elochoman River. Saturday before Memorial Day – July 31 – Hatchery summer run steelhead.
- Cowlitz River. From boundary markers at the mouth to barrier dam – June 1-July 31 – Hatchery summer run steelhead.
- South Fork Toutle River. Saturday before Memorial Day-July 31 – Hatchery summer run steelhead.
- Green River. From mouth to Miner's Creek – Saturday before Memorial Day -July 31 – Hatchery summer run steelhead.
- Mayfield Lake. Year round – Hatchery rainbows, winter steelhead, fall Chinook, and coho.
- Wind River. From mouth to 400' below Shipherd Falls – March 16-June 30 – Hatchery spring Chinook.
- Wind River. From 100' above Shipherd Falls to 800 yds. downstream of Carson National Fish Hatchery – May 1-June 30 – Hatchery spring Chinook.
- Drano Lake. March 16-June 30 – Hatchery spring Chinook.
- Drano Lake. October 1-December 31 – Hatchery fall Chinook and coho.
- Klickitat River. From mouth to Fisher Hill Bridge – August 1-January 31 – Hatchery fall Chinook and coho.

COMMERCIAL
QUESTIONS: *17, 18, 22, 27, 28*

TRIBAL
QUESTIONS: *6, 7*

MANAGEMENT
QUESTIONS: 1, 3, 4, *15, 16,* 26, *29, 40*

Question 1

Question paraphrase: What conservation benefits have occurred as a result of the Policy?

Policy citation: The objectives of this Policy are to promote orderly fisheries (particularly in waters in which the states of Washington and Oregon have concurrent jurisdiction), advance the conservation and recovery of wild salmon and steelhead …(pg. 8).

Specific Question: *Were there specific improvements in conservation benefits that were expected to occur since 2013? Since the Policy has been in effect, have conservation limits in the covered fisheries been achieved and has the trajectory of recovery of stocks involved advanced in a positive manner?*

Additional Question: Can we drill down more on contributors to pHOS mitigation? Specifically, can we understand how policy allocation and gear type requirements might be contributing to or hindering pHOS mitigation?

Analysis: One stated purpose of the Policy is to "advance the conservation and recovery of wild salmon and steelhead." Additional information is provided in the "Decision Support Document for Columbia River Basin Salmon Management Policy, Draft January 12, 2013" (DCS). It states "The draft Policy is projected to contribute to conservation through a reduction in the number of hatchery-origin fall Chinook and coho (with the possible exception of the Grays River) in natural spawning areas." The DCS also explained that the draft Policy was not projected to reduce fishery impacts on wild salmon, since "fisheries for all species of salmon in the lower Columbia are constrained by federal Incidental Take Permits with ESA impact limits (spring Chinook, sockeye, fall Chinook, coho and chum) or other conservation objectives (summer Chinook)" and therefore, "impacts will simply be reallocated from the commercial fishery to the recreational fishery – not reduced."

This analysis focuses on lower river fall Chinook and coho. Conservation benefits associated with the Policy were expected to reduce the expected proportion of hatchery origin fall Chinook and coho on the spawning grounds (pHOS). Three things contribute to pHOS reductions; hatchery releases, weirs and fisheries. WDFW hatchery releases of fall Chinook averaged 23.5 million during 1995-1999, 17.5 million during 2000-2008, 16.6 million during 2009-2011 and 14.5 million during 2012-2017. Fish released during 2009-2011 would be returning beginning in 2011 and fish released during 2012-2017 would be contributing to pHOS values beginning in 2014.

Operation of weirs in the lower Columbia River for pHOS control began in 2008 and continues today. Most recently, weirs have been operated in the Grays, Elochoman, Coweeman, Toutle, Kalama and Washougal rivers. The primary objective of these weirs is pHOS reduction for fall Chinook, but operation of these weirs also provides critical data about the population abundance and timing. The weirs also help with pHOS reduction for coho, but to a lesser degree as most of the weirs are not operational during the peak of coho migration. There are a number of challenges to operating these weirs successfully (meaning effectively reducing pHOS) including, river flows and natural origin abundance (NOR). Low flows can reduce recruitment into the traps thus reducing the collection of hatchery fish and can cause delays in passing natural origin fish upstream. High flows can result in damage to the weirs causing them to be inoperable and can result in hatchery fish passing above the weirs. Low NOR abundance can make the weir objective harder to achieve because it requires very high weir efficiency to meet pHOS goals. The weirs with the highest success rate at removing hatchery fish are those that have permanent infrastructure to hold the weir in place (Elochoman, Toutle (Green River) and

Kalama. Because of these challenges, weir efficiency rates (how effective the weirs are at stopping fish from going above the weir unintentionally) can be quite variable ranging from 8%-100% during 2010-2017.

Fisheries can contribute to pHOS objectives by removing hatchery fish for harvest. This can occur in mark-selective (MSF) and non-mark-selective fisheries. During MSF fisheries, hatchery fish are harvested (marked fish) and wild fish (or unmarked fish) are released. MSF can be effective when the mark rate on hatchery fish is high and the mortality rate of released fish is low or if wild/unmarked fish are constraining to fisheries (i.e. to remain within ESA impact limits).

The Policy included two fishery related objectives to control pHOS, one week of MSF in the mainstem sport fishery and an increased use of alternative mark-selective gears in mainstem commercial fisheries. MSF sport fisheries occurred during xxx to xxx.

Alternative gear fisheries occurred during xx to xx.

Coho tangle net fisheries occurred during 2013-2015 and are planned for 2018. Tangle nets are a mark-selective gear as they allow for hatchery fish (fin-clipped) to be kept and unclipped fish (including natural origin) to be released with a low release mortality rate (24%/30%). Results from 2013-2015 fisheries are shown below and shaded.

Appendix Table I continued: Mainstem Commercial Harvest by Gear Type (2010-2017)

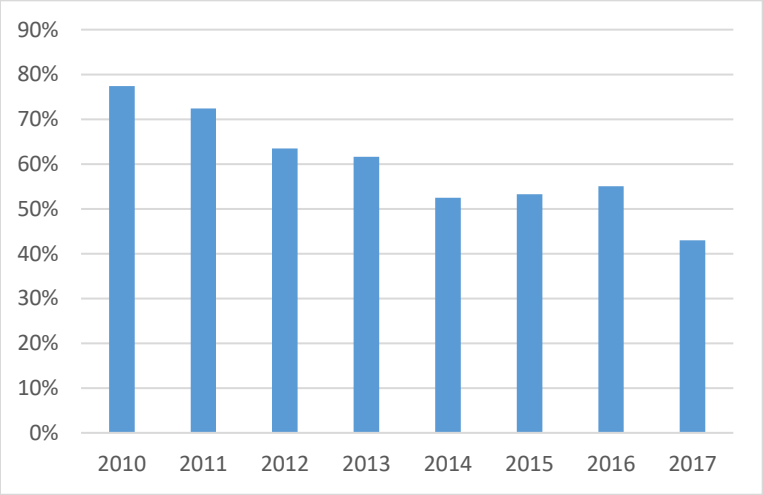
	Coho					
	Zone 1-5 Gill Net	Zone 4-5 Gill Net	Coho 6" Gill Net	Coho Tangle Net [1]	Beach Seine [1]	Purse Seine [1]
2010	6,374	1,339	11,207	--	--	--
2011	5,316	5,517	2,649	--	--	--
2012	838	889	888	--	--	--
2013	598	2,385	1,952	4,831	--	--
2014	0	7,360	43,867	18,234	509	561
2015	61	597	2,217	993	58	529
2016	0	665	0	0	39	565
2017	0	931	0	0	0	0
[1]Coho tangle net and seine fisheries first implemented in 2013 and 2014, respectively.						

During the past five years, the proportions of hatchery-origin fall Chinook spawners in natural spawning areas (pHOS) have declined by an average of 25% (Appendix Table D: 2010-2017 Average pHOS for Selected Primary Fall Chinook Populations). The specific management actions or other factors contributing to this decline include a variety of hatchery reform and

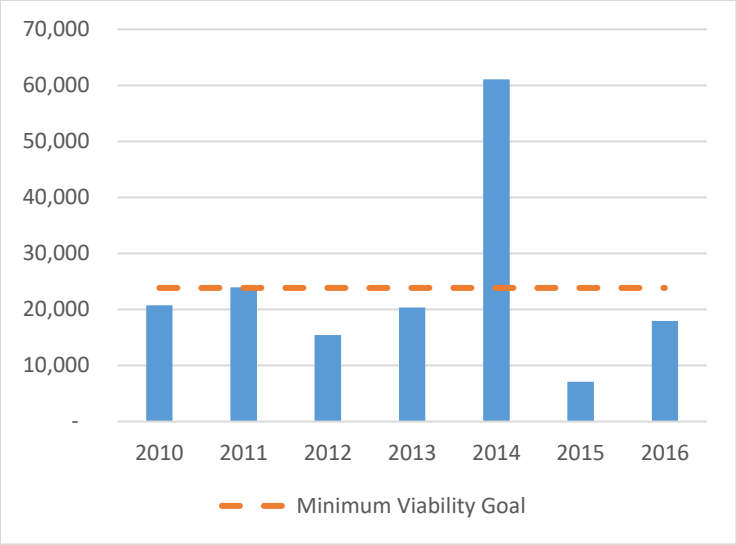
fishery management actions. Appendix D**Error! Reference source not found.** (below) displays pHOS values from primary populations of fall Chinook and Appendix Figure 1 shows average pHOS values by year for these same populations.

Appendix Table D. 2010-2017 Average pHOS for Selected Primary Fall Chinook Populations

Population	2010	2011	2012	2013	2014	2015	2016	2017	Average 2010-2012	Average 2013-2017	MA BIOP pHOS Goal
Elochoman / Skamokawa	89%	96%	70%	83%	79%	77%	75%	32%	85%	69%	≤50%
Mill, Abernathy, Germany	94%	90%	87%	80%	93%	91%	75%	79%	90%	84%	≤50%
Coweeman	29%	12%	12%	32%	4%	2%	6%	14%	18%	12%	<10%
Toutle	85%	78%	75%	45%	51%	42%	59%	49%	80%	49%	≤30%
Washougal	89%	85%	74%	67%	35%	54%	60%	41%	83%	51%	≤30%
Average	77%	72%	63%	62%	52%	53%	55%	43%	71%	53%	



Appendix Figure 1. Average pHOS Values for Primary Populations of Fall Chinook



Appendix Figure 2. 2010-2016 Lower Columbia Natural Origin Coho Spawning Abundance.

Appendix Figure 2 (above) shows the 2010-2016 Lower Columbia Natural Origin Coho Abundance compared to the minimum viability goal; showing no significant changes in the escapement trend during the first four years of policy implementation. The abundance of coho is closer to the viability goals, but there are still issues with pHOS values in many populations. Staff did not provide any information for spring Chinook, summer Chinook or sockeye population status because the conservation goals of the Policy focus on fall Chinook and coho populations.

Supplemental Staff Comments:

Question 3

Question paraphrase: Have fisheries focused on abundant wild stocks as well as hatchery stocks?

Policy citation: The Department will... increasingly focusing on the harvest of abundant hatchery fish (pg. 9).

Specific question: *Was there discussion during Policy development and adjustment about why it would not be prudent to also focus harvest on healthy wild stocks, such as wild Upriver Bright fall Chinook or wild sockeye salmon? Has the harvest focused on abundant hatchery stocks or has it also focused on abundant wild stocks?*

Analysis: The Commission and staff repeatedly discussed the fishery importance of naturally-produced Upriver Bright Fall Chinook salmon (URB) during the bi-state workgroup and Commission processes. Based on these discussions and sections of the Policy associated with URB, staff do not interpret the Policy to preclude fisheries directed at this stock. Currently, during the fall season, the focus of sport and commercial fisheries are on the healthy hatchery

and wild upriver stocks such as Upriver Bright fall Chinook. The lower river fall Chinook stocks have been a constraint to both Columbia River and ocean fisheries over the past five years. As a result, fall season Chinook fisheries have focused in the area above the Lewis River as most of the lower river Chinook stocks are destined for tributaries downstream of this area.

Question 4

Question Paraphrase: What mark-selective fisheries have occurred?

Policy Citation: The Department… will seek to implement mark-selective salmon and steelhead fisheries, or other management approaches that are at least as effective, in achieving spawner and broodstock management objectives (pg. 9)

Specific Question: *Has there been new mark selective fisheries authorized since the Policy has been in effect, and if so, what is an evaluation of the change?*

Analysis: New mark selective fisheries have been authorized since the Policy has been in effect (Appendix Table I), although none have been consistently utilized. The Policy included a goal of one week of MSF during September downstream of the Lewis River. MSF sport fisheries in this section occurred during 2013-2017. However there was no MSF in the Buoy 10 fishery during 2017 as sufficient impacts remained during in-season management for a non-selective fishery as the fishery was able to stay open through Labor Day.

Coho tangle net fisheries occurred during 2013-2015, but were not implemented in 2016 or 2017 (2017 was due to steelhead conservation concerns). Beach seine and purse seine fisheries were authorized in 2014-2016, under the emerging commercial fisheries rules (See Question #19). Floating traps and pound nets have been tested since the Policy has been in effect, but no public fisheries for these gears have been authorized to date.

Appendix Table I: Mainstem Commercial Harvest by Gear Type (2010-2017)

	Spring Chinook		Summer Chinook	Fall Chinook					
	Gill Net	Tangle Net	Gill Net	Zone 1-5 Gill Net	Zone 4-5 Gill Net	Coho 6" Gill Net	Coho Tangle Net [1]	Beach Seine [1]	Purse Seine [1]
2010	75	8,966	4,684	10,949	19,538	654	--	--	--
2011	2,518	2,021	5,010	15,019	35,748	652	--	--	--
2012	7	6,111	1,692	6,220	30,505	146	--	--	--
2013	937	1,276	1,868	3,926	78,549	569	1,862	--	--
2014	1,624	2,450	2,743	0	94,962	2,018	1,988	1,337	1,457
2015	2,881	4,350	3,944	2,465	74,603	2,255	1,893	681	2,312
2016	1,316	2,297	2,990	0	57,940	0	0	2	1,113
2017	0	0	0	0	19,398	0	0	0	0

Appendix Table I continued: Mainstem Commercial Harvest by Gear Type (2010-2017)

	Coho					
	Zone 1-5 Gill Net	Zone 4-5 Gill Net	Coho 6" Gill Net	Coho Tangle Net [1]	Beach Seine [1]	Purse Seine [1]
2010	6,374	1,339	11,207	--	--	--
2011	5,316	5,517	2,649	--	--	--
2012	838	889	888	--	--	--
2013	598	2,385	1,952	4,831	--	--
2014	0	7,360	43,867	18,234	509	561
2015	61	597	2,217	993	58	529
2016	0	665	0	0	39	565
2017	0	931	0	0	0	0
[1]Coho tangle net and seine fisheries first implemented in 2013 and 2014, respectively.						

Question 26

Question paraphrase: Has the Department made any progress on implementing outreach and enhanced monitoring of fisheries?

Policy citation: …implementing outreach programs to increase compliance with recreational fishing rules; seeking means to increase the effectiveness of enforcement programs; and conducting enhanced fishery monitoring that more accurately accounts for harvest and fishing-related mortality. (pg. 13)

Specific question: *What has been accomplished with regard to these three commitments?*

Analysis: Increased monitoring of the commercial fishery occurred during 2017 (see Question 27). Regarding the Enforcement program, there has been no change within the program to increase the effectiveness of enforcement directly due to the implementation of Columbia River Policy. Changes that have been made over the last two years directly support the Columbia River Policy. What has been implemented is the prioritizing of officer patrol time and efficiency during times of high user presence on the water through several means including:

1. Filling officer vacancies in key locations along the Columbia River (one new officer in Woodland, Carson and Goldendale, and one new Sergeant along the Columbia River).
2. Priority patrol planning and execution as part of the NOAA Joint Enforcement Agreement (JEA) with specific patrol commitments on the Columbia River concurrent waters in Regions 3, 5 and 6
3. Increased communication with Fish Program staff regarding implementation and enforceability of seasons and rules, when appropriate

4. Increased communication with Oregon State Patrol to include joint patrol planning for operations on Columbia River concurrent waters
5. A project is underway to explore changes to the enforcement code and how the effectiveness of Officers is enhanced when encountering violations in the field
6. As part of the JEA, enforcement has conducted outreach with schools (Longview, Vancouver, Yakima to name a few) where Officers visit elementary school students to talk about fisheries and enforcement)
7. Officers have been asked to meet with fishing groups to increase communication
8. Increased monitoring of the Zone 4-5 commercial fishery occurred in 2017. See Question #27.

ALLOCATION
QUESTIONS: 30, 31, 32, 33, 34, 35, 36

Question 30

Question paraphrase: What was the actual allocation sharing of spring Chinook between sport and commercial fisheries and how did it compare to the Policy?

Policy citation: The presumptive path for the management of spring Chinook salmon fisheries is summarized in Appendix Table A (pg. 14)

Specific question: *In comparison to the values in Appendix A, what were the actual impact sharing values beginning in 2013, and what was the actual commercial fishing gear usage in the years involved?*

Analysis: Policy Appendix Table A refers to allocation of ESA impacts to the various fisheries. With spring Chinook management, the Catch Balance provision in the *U.S. v Oregon* Management Agreement are usually more constraining than ESA impacts and this results in ESA impacts not being achieved. Catch Balance shares were 88% for sport fisheries and 95% for commercial fisheries (Appendix Table U).

Question 31

Question paraphrase: Did the spring Chinook management buffer keep the non-treaty fisheries from exceeding the ESA guidelines?

Policy citation: Fishery Management Buffer (spring Chinook) (pg. 14)

Specific question: *Did the management buffer approach work over the course of the Policy, or were ESA impacts exceeded since 2012?*

Analysis: The management buffer was effective in maintaining non-Indian ESA impacts within the overall non-Indian guidelines. Non-Indian ESA impact rates were not exceeded during 2013-2015 and averaged 87% of the total during that period (Appendix Table V).

Appendix Table V: Comparison of Upriver Spring Chinook Impacts Used Versus Allowed.

	Total Impacts Used	Total ESA Impacts Allowed	% of Total Impacts Used
2013	1.40%	1.70%	82%
2014	1.66%	2.00%	83%
2015	1.91%	2.20%	87%
2016	1.70%	1.90%	89%
2017	1.40%	1.50%	93%
Average	1.61%	1.86%	87%

Question 32

Question paraphrase: What was the actual allocation sharing of spring Chinook within the sport fishery and how did it compare to the Policy?

Policy citation: The Department will provide to the Commission each year a briefing on the effectiveness of fishery management actions in meeting spring Chinook recreational fishery allocation objectives throughout the Columbia River basin. The Commission may consider changes to the recreational allocation in this Policy in the future to balance recreational fishery objectives in the areas below Bonneville Dam, above Bonneville Dam, and in the Snake River. (pg. 15)

Specific question: *Was this accomplished with the agenda item presented by Bill Tweit at the September Commission meeting in Port Angeles?*

Analysis: The Commission has not changed guidance on upriver/downriver recreational allocation. They did receive a briefing on several aspects of the allocation in September 2017. Following that briefing, and in preparation for meetings with stakeholders in eastern WA who have expressed concerns about the allocation and about management performance, staff have continued to work on this issue. Preliminary results are that achieving this has been problematic (Appendix Table), but a full analysis must examine whether the opportunity to harvest 25% was precluded. And if so, what factors were responsible. In 2017, an in-season reduction in the run size resulted in little real fishing opportunity upstream of Bonneville Dam, ven though the final run size was close to the forecast. This was an unusual circumstance; other factors have had more influence on harvest management decisions in other years under the Policy. Summaries by year are included in the Appendix.

Question 33

Question paraphrase: What was the actual allocation sharing of summer Chinook between sport and commercial fisheries and how did it compare to the Policy? What were the results of testing alternative gears?

Policy citation: The presumptive path for the management of summer Chinook salmon fisheries is summarized in Appendix Table B (pg. 15)

Specific question: *In comparison to the values in Appendix B, what were the actual impact sharing values beginning in 2013? Were alternative gears tested and if so, what were the results in comparison to the gill net fishery option?*

Analysis: Staff was unable to conduct the analysis necessary to answer this question. Some information is provided in Appendix Table X(summer Chinook harvest sharing between sport and commercial fisheries). Sport fisheries averaged 82% of their allocation and commercial averaged 84% of their allocation.

Appendix Table X: Summer Chinook Harvest Sharing

	Commercial			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	2,585	2,145	1,954	91%
2014	1,893	2,601	2,790	107%
2015	1,646	4,068	3,938	97%
2016	2,633	2,513	3,050	121%
2017	781	949	47	5%
Average				84%

Appendix Table X continued: Summer Chinook Harvest Sharing

	Below Priest Rapids Sport			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	3,160	2,621	2,068	79%
2014	2,840	3,901	2,944	75%
2015	3,842	9,492	6,938	73%
2016	6,142	5,864	4,271	73%
2017	3,125	3,797	4,115	108%
Average	613	811	436	82%

See Question 12 for more information on alternative gears tested during the summer Chinook fisheries as they pertain to ESA-impacts on Snake River sockeye. No alternative gear fisheries were implemented for summer Chinook. Annual harvest sharing tables can be found in the Appendix.

Question 34

Question paraphrase: What was the actual allocation sharing of summer Chinook above and below Priest Rapids Dam and how did it compare to the Policy?

Policy citation: Percent of non-treaty allocation assigned to fisheries above Priest Rapids Dam (summer Chinook) (pg. 16)

Specific question: *How do these allocation targets compare to actual values for the years in question?*

Analysis: During 2013-2017, fisheries below Priest Rapids Dam averaged 92% of their allocation. The fisheries above Priest Rapids Dam averaged 63% of their allocation (Appendix Table Y). Staff was unable to conduct the analysis necessary to answer this question. The tables in this review do not fully answer the question. An in-depth analysis of the performance at meeting recreational allocation objectives requires an examination of whether or not the opportunity to harvest the allocation was provided. Harvest alone is not the best measure of achieving recreational allocation objectives, as sufficient fish may have been present and other factors such as water condition or lack of effort may have reduced harvest. Fisheries below Priest Rapids Dam include sport and commercial. Those above Priest Rapids Dam include sport, Wanapum tribal and Colville tribal fisheries. Annual harvest sharing tables can be found in the Appendix.

Appendix Table Y: Summer Chinook Harvest Sharing Above and Below Priest Rapids Dam

	Below Priest Rapids Dam			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	10,005	8,684	7,940	91%
2014	8,733	11,142	10,374	93%
2015	10,488	22,251	19,567	88%
2016	15,275	14,720	13,661	93%
2017	8,406	9,246	8,662	94%
Average				92%

Appendix Table Y continued: Summer Chinook Harvest Sharing Above and Below Priest Rapids Dam

	Above Priest Rapids Dam			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	10,906	9,884	6,355	64%
2014	9,830	12,882	6,647	52%
2015	10,512	20,340	15,517	76%
2016	13,900	13,553	7,973	59%
2017	8,694	9,768	6,061	62%
Average				63%

Question 35

Question paraphrase: What was the actual allocation sharing below Priest Rapids Dam and how did it compare to the Policy?

Policy citation: Nontreaty Sharing Below Priest Rapids Dam (summer Chinook) (pg. 16)

Specific question: *How do the allocation targets in this section compare to actual values for the years in question?*

Analysis: See response to Question #34 above. Staff was unable to conduct the analysis necessary to answer this question. The tables in this review do not fully answer the question. Annual harvest sharing tables can be found in the Appendix.

Question 36

Question paraphrase: What was the actual allocation sharing of sockeye, fall Chinook and coho between sport and commercial fisheries and how did it compare to the Policy?

Policy citation: Sockeye, Fall Chinook and Coho Salmon (pg. 17)

Specific question: *For each of the species sections remaining in the report, the retrospective analysis/evaluation should be done in a similar manner as to the questions posed in this document for spring and summer Chinook. In comparison to the values on page 10, what were the actual impact sharing values beginning in 2013 (**for sockeye salmon**)?*

Analysis: Sockeye sport fisheries in the lower Columbia (below Priest Rapids Dam) occur at a lower level than in the upper Columbia and are mostly caught incidentally to Chinook or steelhead fisheries. During 2013-2017, sport fisheries used 36% of their allocation and commercial fisheries used 23% of their allocation (Appendix Table Z).

In comparison to the values in Appendix C, what were the actual impact sharing values beginning in 2013 (**for tule fall Chinook salmon**)?

See Appendix Table AA.

In comparison to the values in Appendix D, what were the actual impact sharing values beginning in 2013 (**for Upriver Bright fall Chinook salmon**)?

See Appendix Table BB.

In comparison to the values in Appendix E, what were the actual impact sharing values beginning in 2013 (**for coho salmon**)?

See Appendix Table CC.

ALLOCATION APPENDIX

30. The presumptive path for the management of spring Chinook salmon fisheries is summarized in Appendix Table A (pg. 14)

Table U: Spring Chinook Catch Balance Shares

	Mainstem Gear Used	SAFE Gear Used	Comm Catch Balance Used	Comm Catch Balance Allowed	% Comm Catch Balance Used	Sport Catch Balance Used	Sport Catch Balance Allowed	% Sport Catch Balance Used
2013	TN/GN	GN	1,757	2,624	67%	6,330	7,593	83%
2014	TN/GN	GN	3,621	4,911	74%	17,349	19,347	90%
2015	TN/GN	GN	6,528	6,376	102%	19,381	24,836	78%
2016	TN/GN	GN	3,285	3,335	99%	13,043	13,756	95%
2017	No Season	GN	463	347	133%	7,316	7,760	94%
Average					95%			88%

31. Fishery Management Buffer (spring Chinook) (pg. 14)

Table V: Comparison of Upriver Spring Chinook Impacts Used Versus Allowed

	Total Impacts Used	Total ESA Impacts Allowed	% of Total Impacts Used
2013	1.40%	1.70%	82%
2014	1.66%	2.00%	83%
2015	1.91%	2.20%	87%
2016	1.70%	1.90%	89%
2017	1.40%	1.50%	93%
Average	1.61%	1.86%	87%

32. Effectiveness of fishery management actions in meeting spring Chinook recreational fishery allocation objectives throughout the Columbia River basin. The Commission may consider changes to the recreational allocation in this Policy in the future to balance recreational fishery objectives in the areas below Bonneville Dam, above Bonneville Dam, and in the Snake River. (pg. 15)

Table W: Sport Allocation of Upriver spring Chinook Between Geographic Areas

	Below Bonneville				Bonneville to WA/OR				Upper Columbia/Snake			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	7,829	6,168	5,343	87%	1,044	822	613	75%	575	603	374	62%
2014	14,717	15,682	13,572	87%	1,962	2,091	2,231	107%	1,414	1,574	1,546	98%
2015	14,960	19,316	15,689	81%	1,995	2,615	1,696	65%	1,613	2,904	1,996	69%
2016	10,877	10,767	10,167	94%	1,450	1,436	1,480	103%	1,493	1,561	1,397	89%
2017	11,089	6,334	7,198	114%	1,479	845	18	2%	1,419	582	101	17%
Avg.				92%				70%				67%

Summaries by year are included in the Appendix.

33. The presumptive path for the management of summer Chinook salmon fisheries is summarized in Appendix Table B (pg. 15)

Table X: Summer Chinook Harvest Sharing

	Commercial				Below Priest Rapids Sport			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	2,585	2,145	1,954	91%	3,160	2,621	2,068	79%
2014	1,893	2,601	2,790	107%	2,840	3,901	2,944	75%
2015	1,646	4,068	3,938	97%	3,842	9,492	6,938	73%
2016	2,633	2,513	3,050	121%	6,142	5,864	4,271	73%
2017	781	949	47	5%	3,125	3,797	4,115	108%
Average				84%	613	811	436	82%

Summaries by year are included in the appendix.

34. Percent of non-treaty allocation assigned to fisheries above Priest Rapids Dam (summer Chinook) (pg. 16)

Table Y: Summer Chinook Harvest Sharing Above and Below Priest Rapids Dam

	Below Priest Rapids Dam				Above Priest Rapids Dam			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	10,005	8,684	7,940	91%	10,906	9,884	6,355	64%
2014	8,733	11,142	10,374	93%	9,830	12,882	6,647	52%
2015	10,488	22,251	19,567	88%	10,512	20,340	15,517	76%
2016	15,275	14,720	13,661	93%	13,900	13,553	7,973	59%
2017	8,406	9,246	8,662	94%	8,694	9,768	6,061	62%
Average				92%				63%

Summaries by year are included in the appendix.

36. Sockeye Salmon (pg. 17)

Table Z: Sockeye Allocation

	Comm impacts used	Comm impact allocation	Comm Share Allocated	% Comm Share Used	Sport impacts used	Sport impact allocation	Sport Share Allocated	% Sport Share Used
2013	0.08%	0.30%	30%	27%	0.31%	0.70%	70%	44%
2014	0.05%	0.30%	30%	16%	0.18%	0.70%	70%	25%
2015	0.09%	0.30%	30%	29%	0.22%	0.70%	70%	32%
2016	0.10%	0.30%	30%	34%	0.27%	0.70%	70%	39%
2017	0.02%	0.20%	20%	8%	0.32%	0.80%	80%	40%
Average	0.07%	0.28%	28%	23%	0.26%	0.72%	72%	36%

Table AA: Preseason and Post-Season Summary of Tule Fall Chinook

	Comm Used	Comm Allowed	% Comm Used	Sport Used	Sport Tule Allowed	% Sport Tule Used
2013	2.81%	2.48%	113%	6.47%	5.50%	118%
2014	1.55%	2.39%	65%	5.80%	5.57%	104%
2015	2.90%	2.61%	111%	4.50%	6.09%	74%
2016	5.29%	3.39%	156%	5.14%	7.85%	65%
2017	0.66%	2.86%	23%	6.33%	6.27%	101%
Average			94%			92%

Table BB: Preseason and Post-Season Summary of URB Fall Chinook

	Comm URB Used	Comm URB Allowed	% Comm URB Used	Sport URB Used	Sport URB Allowed	% Sport URB Used
2013	6.07%	8.39%	72%	4.95%	6.61%	75%
2014	7.79%	7.39%	105%	4.44%	4.62%	96%
2015	4.70%	5.62%	84%	6.50%	6.83%	95%
2016	8.14%	7.32%	111%	6.48%	7.31%	89%
2017	4.27%	4.32%	99%	7.73%	7.69%	101%
Average			94%			91%

Table CC: Coho Allocation for Mainstem Columbia River Fisheries

	Commercial				Sport			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2015	118,947	32,626	3,938	12%	55,858	41,890	6,938	17%
2016	46,744	36,095	3,050	8%	24,267	11,975	4,271	36%
Average				10%				26%

ALTERNATIVE GEAR
QUESTIONS: 10, 11, 12, 13, 14, 19, 33

Question 10

Question paraphrase: Have gill nets been phased out of the mainstem? Did a thorough evaluation occur?

Policy citation: Subject to the adaptive management provisions of this Policy, and after thorough evaluation, seek to phase out the use of non-selective gill nets (pg. 10)

Specific question: *Did this evaluation occur? If so, attach in the submission for the March 2018 Commission meeting; if not, what has stalled this evaluation?*

Analysis: The Phase out of gillnet gear for fall Chinook fisheries directed at healthy and harvestable URBs has been constrained by the lack of suitable gear alternatives. This issue was the subject of substantial analysis and Commission review in 2016/17, and resulted in a Commission decision to modify the Policy to support an additional two years (2017-18) of large mesh gillnet mainstem fisheries directed at URB fall Chinook. Purse seines and other small mesh gears have high encounter rates for steelhead, so even though the long-term mortality rate for steelhead released from these gears is low, the high encounter rates result in allowable steelhead mortalities being exceeded while substantial numbers of harvestable URBs remain. In contrast, the very low encounter rate of wild steelhead in large mesh gillnets, even though it is coupled with a higher long-term mortality rate, supports considerably more URB commercial harvest opportunity. In the last three years, the only alternative to scheduling large mesh gillnet fisheries above the Lewis River for harvest of URBs is to forego a large part of the nontreaty share of URBs. Recreational harvesters would not be able to make up for enough of the foregone harvest, thereby compromising the objective of maintaining and enhancing the economic well-being and stability of the commercial fishing industry.

The Commission only supported use of large mesh gillnets in the mainstem for URB harvest through 2018. Despite ongoing efforts there still are not any viable alternatives to large mesh gillnet that will be ready by 2019. The Commission will likely need to revisit this aspect of the Policy prior to 2019 pre-season planning.

Question 11

Question paraphrase: What is the definition of non-selective gill nets?

Policy citation: Seek to phase out the use of non-selective gill nets. (pg. 10)

Specific question: *In the development and implementation of this Policy, what was the working definition of non-selective given the selectivity differences between large mesh gillnets used in the fall Zone 4 and 5 fisheries and the smaller mesh gillnets that have been used for coho or sockeye salmon? If non-selectivity between hatchery and wild salmon of the same size is the concept of this provision, what is the purpose of the "non-selective" adjective?*

Analysis: Non-selective gill nets were not specifically defined in the Policy. Guiding Principle 8 of the Policy states: "subject to the adaptive management provisions of this Policy, and after thorough evaluation, seek to phase out the use of non-selective gill nets in non-tribal fisheries in the mainstem Columbia River, and transition gillnet use to off-channel areas." This guiding principle was developed through the bi-state Columbia River Fishery Management Workshop. The Policy elaborates on this guiding principle in subsequent sections and staff have generally relied upon the greater specificity of these latter sections in the application of the Policy. This resulted in an interpretation of "non-selective gill nets" as gill nets that target salmon of the size appropriate for gilling salmon. Generally, salmon gill nets are 8-inch minimum mesh for Chinook and 6-inch mesh for coho. The current fall commercial fishery occurring in Zones 4-5 uses a 9-inch minimum mesh net and, by this interpretation, is a non-selective fishery for hatchery and wild Chinook salmon and a selective fishery providing protection for steelhead because most of the steelhead pass through the large mesh and are not caught.

Question 12

Question paraphrase: What alternative gears have been developed and what were the performance characteristics?

Policy citation: In a manner consistent with the Department's licensing authorities, develop… alternative selective-fishing gear and techniques for commercial mainstem fisheries. (pg. 10)

Specific question: *What alternative gears have been developed over the course of the Policy and what are their performance characteristics compared to selective-fishing gear and techniques used prior to the Policy?*

Analysis: Numerous alternative gears have been tested to measure and evaluate the feasibility of providing sufficient catch and the ability to release non-targeted fish unharmed. The majority of these gears (arrow net, troll, hook and line, tributary weir, fish wheel) had an expected lower chance of success of implementation. The following alternative gears were more likely to succeed and have been tested and evaluated to better understand limitations and successes in implementation based upon perceived catch rates, gear cost and mortality rates. Appendix Table J compares the fishery type with an assessment of each major metric.

Beginning in 2016, the Wild Fish Conservancy (WFC) has worked with a Columbia River commercial fisher to install and test a pound net at a traditional pound net site in the lower Columbia, under a Scientific Collectors Permit issued by WDFW. The initial results, reported to the Commission in fall 2017, appear promising in terms of Chinook and coho catch rates, as well as short-term mortality of steelhead and unmarked Chinook and coho. However, the long-term mortalities for these have yet to be established. The WFC staff are continuing to analyze their data, and will submit them to a peer review process. For 2018, WDFW and the WFC are in the planning process to transition the pound net operation to a test-fishing mode, to provide additional information on the commercial viability of this tool for fall fisheries. If that is not successful, WFC will operate the pound net under the terms of a Scientific Collectors Permit. The pound net concept is still in feasibility testing, and is several years away from implementation assuming that the feasibility tests are successful.

Question 13

Question paraphrase: What alternative gears have been implemented into permanent rules?

Policy citation: In a manner consistent with the Department's licensing authorities …Implement alternative selective-fishing gear and techniques for commercial mainstem fisheries. (pg. 10)

Specific question: *What alternative gears/techniques have been implemented (into "permanent" allowable regulation) over the course of the Policy?*

Analysis: Tangle nets are not specifically defined in permanent rule but are written into the Washington Administrative Code (WAC) language for emergency rules. The rules associated with tangle nets are clearly defined and are written the same each year.

Seine fisheries have operated under the "emerging commercial fishery rule" in the Columbia River as described in RCW 77.70.180. Purse seines are a legal gear in Washington and are codified in WAC 220.350.120. Drag seines (beach seines) are under WAC 220.350.040. Seines would have to be authorized for use in the Columbia River through a change to RCW 77.50.030.

See response to Question 19 for a more comprehensive evaluation of the development of alternative gear fisheries.

Question 14

Question paraphrase: What incentives have been provided to commercial fishers to implement alternative gears?

Policy citation: Provide incentives to commercial fishers to develop and implement these gear and techniques. (pg. 10)

Specific question: *What incentives have been provided to commercial fishing license holders over the course of the Policy?*

Analysis: Some incentives have been provided on an individual basis, additional incentives might be necessary before full implementation. To date, the Department has invested over $8 million in the development of alternative selective fishing gear, including substantial grants and contracts with commercial fishers to develop, deploy and test gear, some of which has supported individual acquisition of alternative gears. In addition, on occasion fishing periods and locations have been open for alternative gear and not open to the gillnet fishery.

Question 19

Question paraphrase: What has occurred regarding alternative gear funding, development, testing and implementation?

Policy citation: Development and Implementation of Alternative Selective Gear: The Department will investigate and promote the funding, development, testing, and implementation of alternative selective gear. Work with Oregon to develop incentives for those commercial fishers who agree to use these gear and techniques. (pg. 11)

Specific question: *What has been done over the course of the Policy with regard to this paragraph?*

Analysis:

Funding/Incentives

- NMFS provided $1.9 million during the initial phase of testing alternative gear in 2009. No incentive funding has been provided. Full implementation of alternative gears has not been realized.

Development

- Alternative gears chosen were based upon known selective methods in other regions during prior years or are known to be feasible economically for fishers to purchase new gear.
- Strategize sample designs and fishery implementation to phase in alternative gear targeting hatchery fish.

Testing

- Phase one evaluates the effectiveness in capturing fish, protecting wild fish and measure short-term mortality rates.

- The initial study during 2011-2012 (Holowatz et al. 2014) attempted to release fish captured in purse and beach seine fisheries using PIT tags and other tagging methods to recapture fish passing Bonneville and other dams.
- The radio telemetry study resulted in fish captured with alternative gear had a lower probability to swim past Bonneville Dam than those that avoided the gear.
- Our follow-up study utilized holding tanks to monitor short-term mortality rates over 48 hours from 2017 (Appendix Figure 6).
- The purse seine fishery and Bonneville Dam provided the treatment and control groups, respectively, to assess short-term mortality over 48 hours and measure recapture probability at dams.
- Short-term mortality rates appear to be lower for Chinook than Holowatz (2014), but similar for steelhead when compared with Rawding et al. 2016.
- Survival rates are likely higher than what would occur in actual fisheries due to low catches. The study occurred after the peak of the run when the river begins to cool and study was conducted further upstream (Zone 5) of seine fisheries (Zone 1-3).
- Phase 2 considers the economic viability for fishers and industry based on catch rates and ex-vessel values (Appendix Table N, Table O, and Table P).
- Tangle net fisheries are easier to transition from gill nets than other gear, but catches can be low during poor coho runs.
- Seine fisheries are more costly to transition to, but provide sufficient catch that materializes into a sustainable income. Yet like all other fisheries, this fishery will be limited from the associated impacts of the most constraining stock.
- Pound nets are a costly and labor-intensive transition but has the potential to provide a meaningful income for fishers. The 2018 test fishery will gain more understanding of this alternative gear's capabilities.

Implementation

- Utilize "emerging commercial fishery rule" in the Columbia River as described in RCW 77.70.180 and scientific collection permits to test fisheries implement fisheries.
- Following evaluation of several fisheries, implementation of fisheries began with a limited entry for purse seine fisheries.
- Full implementation of alternative gear has been limited due to learning how the gear operates, trade-offs (i.e. catch rates, ESA-impacts, financial cost) and ability to fully understand the performance measures.

Incentives – see answer to Question 14.

Question 33

Question paraphrase: What was the actual allocation sharing of summer Chinook between sport and commercial fisheries and how did it compare to the Policy? What were the results of testing alternative gears?

Policy citation: The presumptive path for the management of summer Chinook salmon fisheries is summarized in Appendix Table B (pg. 15)

Specific question: *In comparison to the values in Appendix B, what were the actual impact sharing values beginning in 2013? Were alternative gears tested and if so, what were the results in comparison to the gill net fishery option?*

Analysis: Staff was unable to conduct the analysis necessary to answer this question. Some information is provided in Appendix Table X(summer Chinook harvest sharing between sport and commercial fisheries). Sport fisheries averaged 82% of their allocation and commercial averaged 84% of their allocation.

Appendix Table X: Summer Chinook Harvest Sharing

	Commercial			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	2,585	2,145	1,954	91%
2014	1,893	2,601	2,790	107%
2015	1,646	4,068	3,938	97%
2016	2,633	2,513	3,050	121%
2017	781	949	47	5%
Average				84%

Appendix Table X continued: Summer Chinook Harvest Sharing

	Below Priest Rapids Sport			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	3,160	2,621	2,068	79%
2014	2,840	3,901	2,944	75%
2015	3,842	9,492	6,938	73%
2016	6,142	5,864	4,271	73%
2017	3,125	3,797	4,115	108%
Average	613	811	436	82%

See Question 12 for more information on alternative gears tested during the summer Chinook fisheries as they pertain to ESA-impacts on Snake River sockeye. No alternative gear fisheries were implemented for summer Chinook. Annual harvest sharing tables can be found in the Appendix.

ALTERNATIVE GEAR APPENDIX

12. Develop… (pg. 10)

Table J: Comparison of fishery type with an assessment of each major metric

Gear	Pre/Post 2013 Policy	Catch Rates	Bycatch	Released Fish Condition	Gear Investment Cost	Chance of Success
Merwin Trap	Pre	Low	Low	Moderate	High	Low
Tangle Net	Post	Low	Low	Fair	Low	Moderate
Purse Seine – Summer	Post	Moderate	High	Good	High	Low
Beach Seine – Summer	Post	Low	High	Good	Moderate	Low
Purse Seine - Fall	Both	High	Moderate	Good	High	Moderate
Beach Seine - Fall	Both	High	High	Good	Moderate	High
Purse Seine – Shad	Post	High	Moderate	Good	High	High
Pound Net – Fall	Post	Moderate	High	Good	High	Moderate

19. Development and Implementation of Alternative Selective Gear (pg. 11)

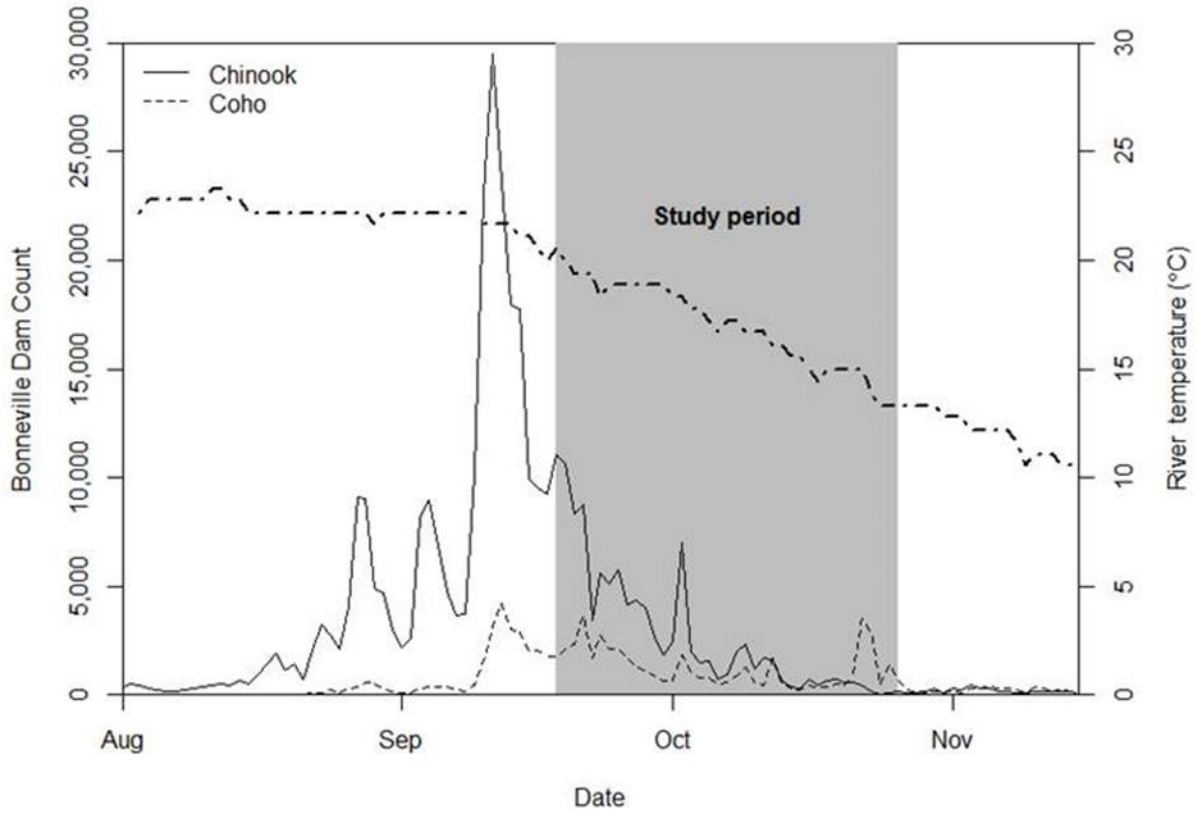


Figure 6: Purse seine study (2017) timeline to assess short-term mortality rates

Table N: Seine fishery ex-vessel value for fall Chinook

Year	Gear	Days Fished	Permits Fished	Deliveries	Chinook Landed	Mark Rate	Avg. Wt(lb)	Avg. $/lb	Avg. Value/Fish	Total Ex-Vessel
2014	Beach	12	6	20	1,337	44%	13.1	$1.52	$19.93	$26,647
	Purse	15	4	19	1,457	33%	13.5	$1.47	$19.74	$28,760
	Total	27	10	39	2,794	38%	13.3	$1.49	$19.83	$55,407
2015	Beach	6	3	6	681	64%	10.9	$1.39	$15.21	$10,360
	Purse	14	4	19	2,312	38%	10.4	$1.71	$17.77	$41,075
	Total	20	7	25	2,993	41%	10.5	$1.63	$17.18	$51,434
2014-	Avg.	24	9	32	2,894	39%	11.9	$1.56	$18.51	$54,420

[1] Includes adults and jacks.

Table O: Seine fishery ex-vessel value for coho

Year	Gear	Days Fished	Permits	Deliveries	Coho Landed	Mark Rate	Avg. Wt(lb	Avg. $/lb	Avg. Value/F	Total Ex-Vessel
2014	Beac	12	6	20	509	35%	7.8	$1.22	$9.56	$4,864
	Purs	15	4	19	561	29%	7.7	$1.09	$8.43	$4,729
	Total	27	10	39	1,070	32%	7.8	$1.15	$8.96	$9,593
2015	Beac	6	3	6	58	32%	6.8	$1.50	$10.19	$591
	Purs	14	4	19	529	46%	5.7	$1.52	$8.74	$4,624
	Total	20	7	25	587	44%	5.8	$1.52	$8.88	$5,215
2014-	Avg.	24	9	32	829	38%	6.8	$1.34	$8.92	$7,404

[1] Includes adults and jacks.

The above table was Table 9 from Oregon Department of Fish and Wildlife's Exhibit Agenda Item Summary Updated 1-12-17

Table P: Coho tangle net fishery ex-vessel value

Year	Days Fished	Deliveries	Coho Landed [1]	Mark Rate	Avg. Wt (lb)	Avg. $/lb	Avg. Value/Fish	Total Ex- Vessel Value
2013	8	174	4,831	77%	6.1	$1.87	$11.44	$55,251
2014	9	242	18,234	83%	6.3	$1.20	$7.54	$137,556
2015	3	102	993	67%	5.7	$1.65	$9.36	$9,299
Avg.	7	173	8,019	76%	6	$1.57	$9.45	$67,369

The above table was Table 14 from Oregon Department of Fish and Wildlife's Exhibit Agenda Item Summary Updated 1-12-17

33. The presumptive path for the management of summer Chinook salmon fisheries is summarized in Appendix Table B (pg. 15)

Table X: Summer Chinook Harvest Sharing

	Commercial				Below Priest Rapids Sport			
	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed	Preseason Allowed	Postseason Allowed	Actual Harvest	% of Allowed
2013	2,585	2,145	1,954	91%	3,160	2,621	2,068	79%
2014	1,893	2,601	2,790	107%	2,840	3,901	2,944	75%
2015	1,646	4,068	3,938	97%	3,842	9,492	6,938	73%
2016	2,633	2,513	3,050	121%	6,142	5,864	4,271	73%
2017	781	949	47	5%	3,125	3,797	4,115	108%
Average				84%	613	811	436	82%

Summaries by year are included in the Appendix

ECONOMICS
QUESTIONS: 2, 8, 15, 20, 21, 37, 38, 39

Question 2

Question paraphrase: What economic enhancements were expected to occur for the recreational and commercial fisheries and did they occur?

Policy citation: The objectives of this Policy are to …, and…enhance the economic well-being and stability of the fishing industry in the state (pg. 8)

Specific question: *Were there specific economic enhancement goals or targets that were anticipated to be achieved for sport and commercial fisheries over the course of the Policy, and if so, have they been achieved?*

Analysis: Answering the second part of this question requires more analysis than could be conducted in time for this presentation. Preliminary analyses have provided somewhat conflicting assessments, requiring more in-depth examinations than the catch tables that are provided. The material provided below is responsive to the first part of this question.

There were several expectations in the "Decision Support Document for Columbia River Basin Salmon Management Policy, Draft January 12, 2013" regarding this question. Basically, the Policy was expected to increase recreational angler trips and increase economic impacts to the commercial fishery through increased production in off-channel areas and implementation of alternative gears.

Shown below are several excerpts from the "Decision document":

"Recreational angler trips in the transition period (2013-2016) are projected to increase by about 13% and in the long term by about 22% across the spring Chinook, summer Chinook, and fall Chinook fisheries."

"Key assumptions include:
1) Alternative selective commercial fishing gear is implemented and catches are consistent with CWG expectations. For example, the CWG analysis expects a catch of 27,441 fall Chinook by alternative selective commercial fishing gear in 2017.
2) Off-channel artificial production programs are implemented as recommended by the CWG."

"Ex-vessel Value of Commercial Fishery (revised from CWG report16). The ex-vessel value of the commercial fishery in the transition period is projected to increase by ~18,805 (0.5%) in 2013 to ~ $761,009 (~20%) in 2016. For the period 2017 through 2021, the annual ex-vessel value of commercial fisheries is projected to increase by ~$231,755 (6%) in 2017 to ~519,022 (14%) in 2021.
2) Recreational Angling Trips (from CWG report). The total number of angler trips in the transition period (2013-2016) is projected to increase by about 13% and in the long term by about 22%."

"Synopsis. The draft Policy supports the development and implementation of fisheries using alternative selective-fishing gear and techniques to provide commercial fishing opportunities to catch hatchery salmon in the mainstem of the Columbia River while limiting impacts to wild stocks of conservation concern. Implementation of alternative selective gears is essential to achieve the economic expectations for commercial fishers and is expected to provide conservation benefits."

As stated in the answer to Question #1, implementation of alternative gear fisheries as a replacement for gill nets did not occur as planned. Increased production in Select Areas did occur in some areas (See Appendix Table E).

Appendix Table F and Table G show recreational angler trips and catch during 2010-2017. Angler trips ranged from a high of 459,700 trips in 2014 to a low of 313,200 trips in 2017 for all seasons combined. Sport harvest of all species ranged from a high of 146,500 fish in 2015 to a

low of 71,700 fish in 2010. Appendix Figure shows spring season angler trips relative to upriver spring Chinook run size. Appendix Table H shows commercial catch by species from 2010-2017. Commercial catch ranged from a high of 179,100 fish in 2014 to a low of 20,300 fish in 2017.

Question 8

Question paraphrase: What progress has been made on achieving overall economic well-being and stability of both commercial and recreational fisheries?

Policy citation: …seek to enhance the overall economic well-being and stability of Columbia River fisheries. (pg. 10)

Specific question: See question/footnote 2 as a cross-referenced question.

Analysis: See Question #2 and Question #37

Question 15

Question paraphrase: Have the off-channel areas been economically enhanced compared to before the Policy was implemented?

Policy citation: Enhance the economic benefits of off-channel commercial fisheries. (pg. 10)

Specific question: *Have the economic benefits of off-channel commercial fisheries been enhanced over the course of the Policy in comparison to the period prior to the Policy?*

Analysis: The following information provides a good summary of efforts to enhance off-channel fisheries on the Washington side of the river. Efforts on the Oregon side have been more successful, but are not analyzed or incorporated in this review, so the analysis is incomplete.

WDFW began the Cathlamet Channel Net Pen (CCNP) program with the intent of providing an additional off-channel area for spring Chinook fisheries. From 2014-2017, an average of 142,200 spring Chinook were released from the net pens, compared to a goal of 250,000 fish (Appendix Table K). All of the fish released had a coded-wire tag implanted, but the recoveries of these fish over all of the years was only 12 fish in the Columbia River, and 4 in ocean fisheries. No recoveries have occurred in Cathlamet Channel. WDFW conducted test fishing from 2013 to 2017 (test fishing is ongoing for 2018). Results from test fishing are shown in Appendix Table L. ODFW increased releases into their Select Areas beginning 2013 (Appendix Table E, Question #2).

Currently, the only off-channel fishery in Washington waters is in Deep River. Spring Chinook were released until 2013 and then discontinued. Fall Chinook releases averaged 1.1 million smolts from 2010-2017 (Appendix Figure 4). Fall Chinook releases have been discontinued due to implementation of the Mitchell Act Biological Opinion (BIOP). Coho releases averaged 750,000 smolts from 2010-2017 (Appendix Figure 5). Commercial harvest of coho averaged 12,800 during 2010-2012 and 11,500 during 2013-2017 (Appendix Table M). Staff was unable to conduct the analysis necessary to answer this question. The tables in this review do not fully answer the question.

Additional economic information is included in Appendix Table DD, Table EE, Table FF, Table GG.

Question 20

Question paraphrase: Were additional opportunities for the commercial fishery provided during the transition phase?

Policy citation: Additional opportunities for mainstem commercial fisheries in the transition period. (pg. 12)

Specific question: *Were additional opportunities provided over the course of the Policy, and if not, why not?*

Analysis: Staff was unable to conduct the analysis necessary to answer this question adequately. It is unclear to staff whether the large mesh gillnet fisheries upstream of the Lewis River that are directed at URB Chinook constitute the kind of "additional opportunity" meant by the Policy. This fishery is directed at harvestable wild Chinook that cannot be caught using other gears, and can be considered both as selective for exclusion of steelhead and non-selective for Chinook.

Question 21

Question paraphrase: Were additional opportunities for the commercial fishery provided during in the long term?

Policy citation: Additional opportunities for mainstem commercial fisheries in the long term. (pg. 12)

Specific question: *Were additional opportunities provided over the course of the Policy, and if not, why not?*

Analysis: Not analyzed in this document.

Question 22

Question paraphrase: Has the Department made progress on developing new off-channel sites in Washington?

Policy citation: Off-Channel Commercial Fishing Sites. Seek…new off-channel sites in Washington... (pg. 13)

Specific question: *What has been done over the course of the Policy with regard to this paragraph?*

Analysis: WDFW started releasing spring Chinook from Cathlamet Channel Net Pens (CCNP) beginning in 2014 (See Question #15) with the intent of creating a new off-channel fishery in Washington, but based on test fishing results and poor smolt survival, a new fishery never materialized. ODFW investigated a number of new off-channel fishing areas, including one in Washington. Appendix Table Q provides a summary of their findings.

Appendix Table Q: Overall assessment of potential new Select Area sites following adult test fishing and juvenile acclimation evaluations.

Evaluation Site	Adult Assessment	Juvenile Assessment
Clifton Channel	• Excessive catch of upriver spring Chinook	• Lacking acclimation infrastructure • Questionable homing source/ potential for straying
Westport Slough	• Spring: OK for development • Fall: natural origin Coho present	• Lacking acclimation infrastructure; access permission contingent on Kerry West expansion • Potential straying to Clatskanie
Bradbury Slough	• Upriver spring Chinook catch could lead to ineffectual use of SA allocation	• Insufficient homing source; potential for straying
Coal Creek Slough	• OK for spring	• Lacking acclimation infrastructure • No access permission at existing dock • Potential water quality issues (temperature D.O.)

Question 37

Question paraphrase: What were the catches and economic expectations of the sport and commercial fisheries and were they achieved when compared to different run sizes?

Policy citation: (Adaptive Management). State-managed fisheries pursuant to this Policy will be adaptive and adjustments may be made to mainstem fisheries if policy objectives, including catch or economic expectations for commercial or recreational fisheries, are not achieved consistent with the principles of this plan. (pg. 20).

Specific question: *What were the catch and economic expectations for commercial and recreational fisheries by year, and were they achieved when the results are adjusted or normalized for differences in run sizes?*

Analysis: Staff was unable to conduct the analysis necessary to completely answer this question, but the tables and graphs in the Appendix provide some economic information. Most of the economic tables and graphs are included in this section in the Appendix. Generally, the data presented is not normalized for differences in run sizes, meaning that increases or decreases in harvest may be more related to the salmon abundance than the Policy itself.

Appendix Table DD. Comparison of expected (pre-reform) and actual (post-reform) ex-vessel value for the non-treaty commercial fishery during the Harvest Reform (Table provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Figure 7. Annual ex-vessel value of non-Indian mainstem (MS) and Select Area (SAFE) commercial salmon fisheries in the lower Columbia River compared to total adult Chinook and coho returns (Information provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Figure 8. Number of salmon landed in non-treaty commercial mainstem (MS) and Select Area (SAFE) fisheries in the lower Columbia River, and annual adult salmon returns, 2010-2017 (Table provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Table EE. Observed ex-vessel value of lower Columbia River commercial fisheries, 2013-2016 Table provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Table FF. Expected ex-vessel value of lower Columbia River commercial fisheries under pre-reform (2010-12) average allocation and Select Area releases, 2013-2016 (Table provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Table GG. Difference between observed and expected (with pre-Policy allocations) ex-vessel value of lower Columbia River commercial fisheries resulting from CR Fisheries Reform allocation shifts and Select Area releases, 2013-2016 (Table provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Figure 9. Comparison of percent difference in actual ex-vessel values during the transition period (2013-2016) (Table provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Table HH. Summary of gains in fishing days and angler trips due to allocation changes for lower Columbia River recreational Chinook fisheries, by year and season, 2013-16 (Table provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Table II. Comparison of CR Fisheries Reform modeled angler trips with comparable actual angler trips, 2013-16 (Table provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Figure 10. Changes in seasonal angler effort due to Harvest Reform-related allocation increases for the 2013-16 lower Columbia recreational fisheries (Table provided by ODFW/Oregon Fish and Wildlife Commission meeting documents).

Appendix Table JJ. Relationship of Recreational Catch and Effort to Runsize below Bonneville Dam.

Question 38

Question paraphrase: If the catches and economic expectations were not achieved what was done to determine why and were corrections made?

Policy citation: If these (catch and economic) expectations are not achieved, efforts will be made to determine why and to identify actions necessary to correct course. (pg. 20)

Specific question: *Were there instances of this happening? If so, describe when and what efforts were made.*

Analysis: Staff was unable to conduct the analysis necessary to answer this question.

Question 39

Question paraphrase: Did any of the expectations regarding catch, economics, off-channel limitations, legal/financial issue, conservation objectives or other circumstances occur that would require the Department to reconsider the fishery management strategy of the Policy and if so what changes occurred?

Policy citation: Reconsideration of state-managed mainstem fisheries may take place under the following circumstances: (pg. 20)

1. Lower than anticipated catch and economic expectations to the commercial salmon fishing industry, or
2. Insufficient space within off-channel sites to accommodate the commercial fleet, or
3. Biological, fiscal and/or legal circumstances that delay or preclude implementation of alternative selective gear, buyback of commercial fishing permits, and/or additional off-channel hatchery investments, or
4. Management objectives are not achieved for commercial or recreational fisheries, or

5. Conflicts with terms of U.S. v Oregon management agreements with Columbia River Tribes, or
6. Failure to meet conservation objectives.

Specific question: *Did any of the circumstances above occur, were fisheries reconsidered in a regulatory forum, and what changes were adopted?*

Analysis: Staff was unable to conduct the full analysis necessary to answer this question. Adaptive management provisions were used in most of the years under review primarily in reference to mainstem commercial fisheries in the spring season. Appendix A in the Policy for spring Chinook shows tangle nets may be used in the mainstem during 2014-2016. However, under the adaptive management provision, gill nets were allowed for the May fisheries when the catch of shad in tangle nets becomes an obstacle to using those nets.

ECONOMIC APPENDIX
2. Enhance the economic well-being and stability of the fishing industry in the state (pg. 8)

Table E: Summary of Select Area production goals and actual releases

Species/Stock	Period	Release Year	Total Release Goals	Total Actual Releases	% of Goal	First Adult Return Year
Spring Chinook	Pre-Transition	2010[a]	1,550,000	1,535,200	99%	2012
		2011[a]	1,550,000	1,290,700	83%	2013
		2012[a]	1,550,000	1,529,300	99%	2014
	Transition	2013	2,050,000	1,829,200	89%	2015
		2014[b]	1,950,000	1,846,600	95%	2016
		2015[b]	1,950,000	1,747,300	90%	2017
		2016[b]	1,950,000	1,958,800	100%	2018
	Long Term	2017+[b]	2,200,000			2019
Coho	Pre-Transition	2010[a]	4,290,000	4,009,700	93%	2011
		2011[a]	4,290,000	3,811,000	89%	2012
		2012[a]	4,290,000	3,995,800	93%	2013
	Transition	2013	5,090,000	4,536,700	89%	2014
		2014	5,090,000	4,814,400	95%	2015

		2015[c]	5,090,000	4,709,300	93%	2016
		2016[c]	5,090,000	5,589,500	110%	2017
	Long Term	2017+[c]	6,090,000			2018
SAB Fall Chinook	Pre-Transition	2010	1,450,000	914,200	63%	2012
		2011	1,450,000	1,356,900	94%	2013
		2012	1,450,000	1,358,000	94%	2014
	Transition	2013	1,950,000	1,850,300	95%	2015
		2014	1,950,000	2,227,400	114%	2016
		2015	1,950,000	1,670,700	86%	2017
		2016	1,950,000	621,900	32%	2018
	Long Term	2017+	2,200,000			2019

[a] Includes additional 250,000 spring Chinook and 120,000 Coho production specified as part of 2008 OFWC Allocation Policies.

[b] 350,000 spring Chinook production from WDFW (Deep River) was discontinued in 2014.

[c] 200,000 Coho production from WDFW scheduled for release beginning in 2015 was discontinued due to budget cuts.

Table F: Mainstem Recreational Angler Trips in the Columbia River Below Bonneville Dam

Year	Spring	Summer	Fall-Mainstem	Fall-Buoy 10	Total
2010	186,132	70,661	114,285	52,300	423,378
2011	154,895	75,818	147,343	49,409	427,465
2012	127,919	80,733	128,831	65,070	402,553
2013	109,655	52,037	141,481	65,767	368,940
2014	145,642	53,661	143,946	107,522	450,771
2015	151,173	50,555	131,374	108,213	441,315
2016	126,826	58,067	133,300	94,950	413,143
2017	63,303	41,595	114,721	93,547	313,166

Average 2010-2012	156,315	75,737	130,153	55,593	417,799
Average 2013-2017	119,320	51,183	132,964	94,000	397,467

NOTE: Angler trips do not reflect differences in run sizes each year.

Table G: Mainstem Sport Catch of Salmon and Steelhead by Season

Year	Spring	Summer		Fall-Mainstem			Fall-Buoy 10		Total
	Chinook	Chinook	Sockeye	Chinook	Coho	Steelhead	Chinook	Coho	
2010	29,247	2,539	218	17,326	1,584	6,034	6,807	7,980	71,735
2011	11,694	5,160	1,427	28,169	1,667	12,053	10,919	7,614	78,703
2012	13,332	2,897	3,948	22,438	884	5,618	18,550	7,385	75,052
2013	6,950	1,832	502	31,879	951	6,139	22,594	7,620	78,467
2014	15,728	1,980	938	26,336	5,761	6,375	26,788	57,744	141,650
2015	19,586	5,928	958	41,525	995	4,212	36,422	36,859	146,485
2016	12,666	3,080	744	25,133	1,317	1,862	17,780	9,181	71,763
2017	9,047	3,516	264	26,138	3,114	237	28,398	18,834	89,548
Average 2010-2012	18,091	3,532	1,864	22,644	1,378	7,902	12,092	7,660	75,163
Average 2013-2017	12,795	3,267	681	30,202	2,428	3,765	26,396	26,048	105,583

NOTE: Harvest does not reflect differences in run sizes each year.

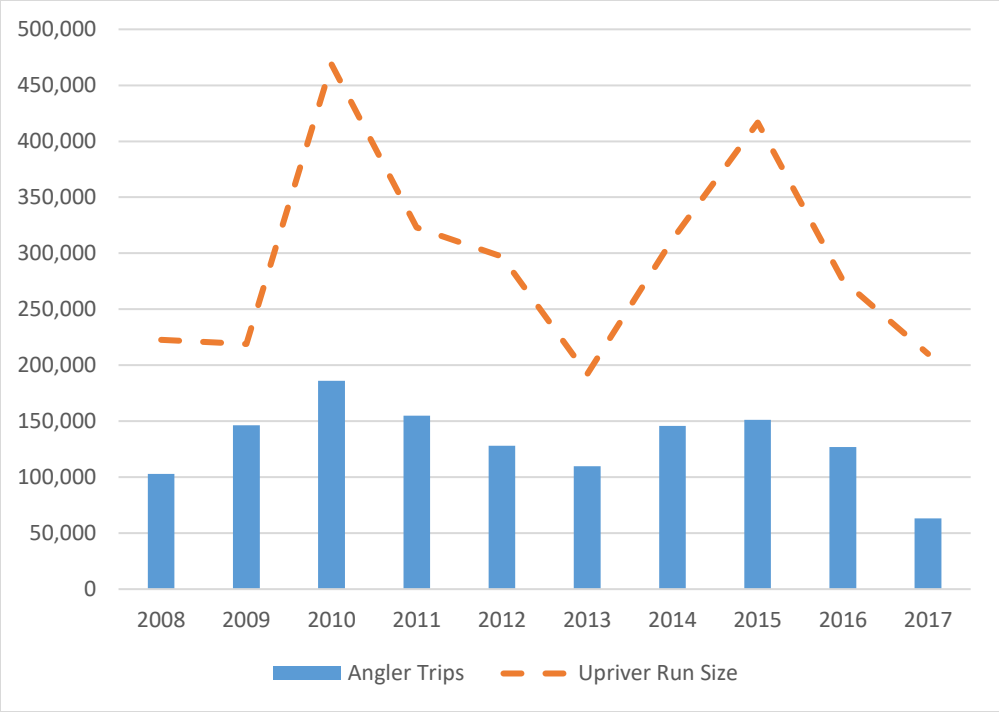


Figure 3: Mainstem Spring Chinook Angler Trips versus Upriver Run Size

Table H: Mainstem Commercial Catch by Species[1]

Year	Spring Chinook	Summer Chinook	Fall Chinook	Coho	Total Salmon
2010	9,041	4,684	31,141	18,920	63,786
2011	4,539	5,010	51,419	13,482	74,450
2012	6,118	1,692	36,871	2,615	47,296
2013	2,213	1,868	84,906	9,766	98,753
2014	4,074	2,743	101,762	70,531	179,110
2015	7,231	3,944	84,238	4,479	99,892
2016	3,613	2,990	59,055	1,269	66,927
2017	-	-	19,398	931	20,329
Average 2010-2012	6,566	3,795	39,810	11,672	61,844
Average 2013-2017	3,426	2,309	69,872	17,395	93,002

[1] Catch for all mainstem gears. Include adults and jacks.

15. Enhance the economic benefits of off-channel commercial fisheries. (pg. 10)

Table K: Releases of Spring Chinook in Cathlamet Channel Net Pens

Number of Spring Chinook Planted			
2014	2015	2016	2017
200,000	140,864	107,856	119,944

Table L: Cathlamet Channel Research Test Fishing, 2013 – 2017

	Days of Test Fishing	Adult Chin Handled		
		Total	Lower River	Upriver
2013	17	104	52	52
2014	20	184	83	101
2015	21	315	60	255
2016	20	282	108	174
2017	18	649	177	472

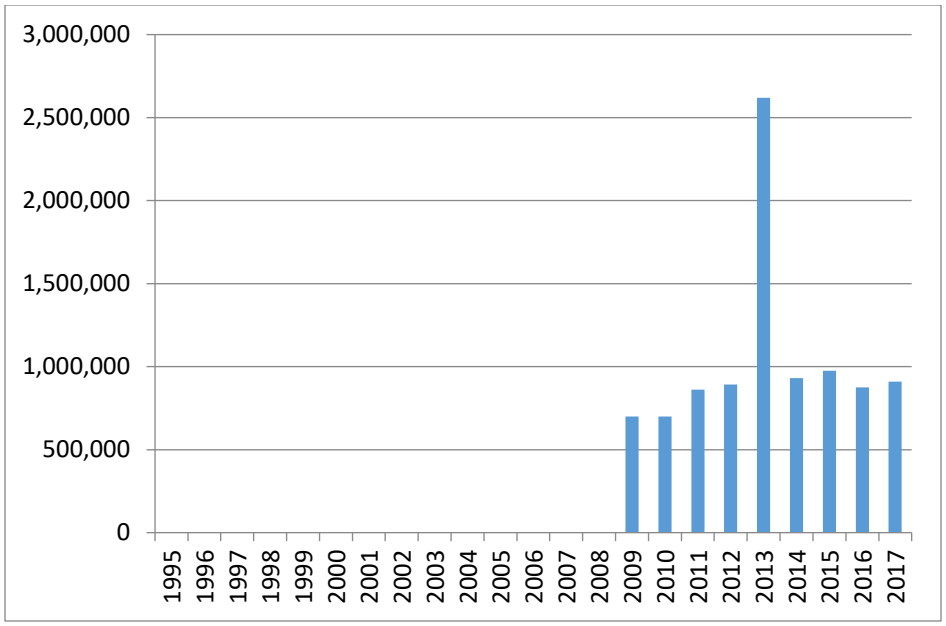


Figure 4: Fall Chinook Releases in Deep River

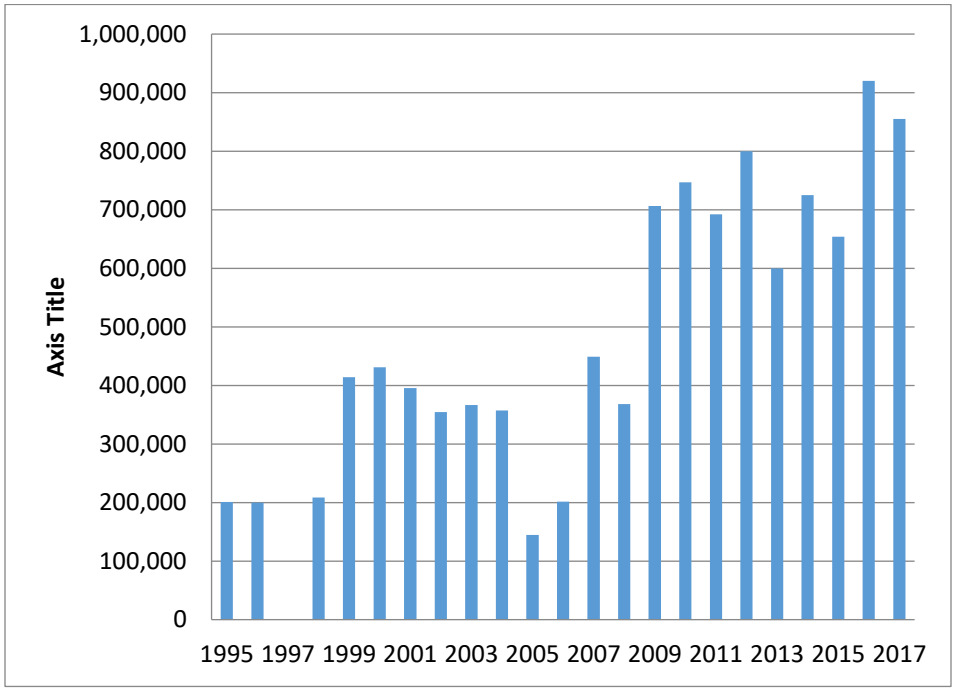


Figure 5: Coho Releases in Deep River

Table M: Commercial Coho Harvest in Deep River Select Area

Year	Coho Harvest
2010	19,260
2011	15,083
2012	3,932
2013	10,002
2014	27,255
2015	4,519
2016	6,162
2017	9,382
2010-2012 Average	12,758
2013-2017 Average	11,464

37. …catch or economic expectations for commercial or recreational fisheries (pg. 20)

Table DD: Comparison of expected (pre-reform) and actual (post-reform) ex-vessel value for the non-treaty commercial fishery during the Harvest Reform

Fishery	Stock	2013			
		Expected	Actual	Difference ($)	Difference (%)
Mainstem Gillnet	Spring Chinook	$262,673	$202,405	($60,269)	-23%
	Summer Chinook	$192,223	$144,962	($47,260)	-25%
	Zone 4-5 Fall Chinook	$3,475,916	$2,812,736	($663,179)	-19%
	Coho	$28,742	$39,486	$10,744	37%
Select Area Gillnet	Spring Chinook	$730,514	$747,281	$16,766	2%
	Fall Chinook	$779,085	$779,085	$0	0%
	Coho	$569,780	$569,780	$0	0%

Mainstem Seine	Chinook	$0	$0	--	--
	Coho	$0	$0	--	--
Mainstem Tangle Net	Coho	$0	$86,085	$86,085	--
Total Commercial		$6,038,933	$5,381,820	($657,113)	-11%

		2014			
Fishery	Stock	Expected	Actual	Difference ($)	Difference (%)
Mainstem Gillnet	Spring Chinook	$550,820	$322,675	($228,145)	-41%
	Summer Chinook	$204,169	$172,266	($31,903)	-16%
	Zone 4-5 Fall Chinook	$2,868,149	$2,575,129	($293,020)	-10%
	Coho	$534,392	$460,466	($73,926)	-14%
Select Area Gillnet	Spring Chinook	$336,492	$353,896	$17,404	5%
	Fall Chinook	$497,362	$497,362	$0	0%
	Coho	$1,456,864	$1,622,922	$166,058	11%
Mainstem Seine	Chinook	$0	research	--	--
	Coho	$0	research	--	--
Mainstem Tangle Net	Coho	$0	$162,732	$162,732	--
Total Commercial		$6,448,248	$6,167,447	($280,801)	-4%

Fishery	Stock	2015			
		Expected	Actual	Difference ($)	Difference (%)
Mainstem Gillnet	Spring Chinook	$777,035	$580,660	($196,374)	-25%
	Summer Chinook	$289,034	$206,307	($82,727)	-29%
	Zone 4-5 Fall Chinook	$3,547,915	$2,515,140	($1,032,775)	-29%
	Coho	$102,809	$78,612	($24,197)	-24%
Select Area Gillnet	Spring Chinook	$737,727	$925,104	$187,376	25%
	Fall Chinook	$359,096	$378,842	$19,746	5%
	Coho	$252,187	$297,190	$45,003	18%
Mainstem Seine	Chinook	$0	$51,434	$51,434	--
	Coho	$0	$5,215	$5,215	--
Mainstem Tangle Net	Coho	$0	$49,624	$49,624	--
Total Commercial		$6,065,803	$5,088,127	($977,676)	-16%

Fishery	Stock	2016			
		Expected	Actual	Difference ($)	Difference (%)
Mainstem Gillnet	Spring Chinook	$567,787	$415,641	($152,146)	-27%
	Summer Chinook	$385,105	$275,108	($109,997)	-29%
	Zone 4-5 Fall Chinook	$2,799,595	$2,799,595	$0	0%
	Coho	$0	$0	--	--
Select Area Gillnet	Spring Chinook	$752,673	$926,477	$173,804	23%
	Fall Chinook	$270,947	$301,281	$30,334	11%
	Coho	$371,363	$428,588	$57,226	15%
Mainstem Seine	Chinook	$0	$26,894	$26,894	--
	Coho	$0	$6,392	$6,392	--
Mainstem Tangle Net	Coho	$0	$0	--	--
Total Commercial		$5,147,470	$5,179,976	$32,506	1%

Fishery	Stock	2013-2016 Total			
		Expected	Actual	Difference ($)	Difference (%)
Mainstem Gillnet	Spring Chinook	$2,158,315	$1,521,381	($636,934)	-30%
	Summer Chinook	$1,070,531	$798,644	($271,888)	-25%
	Zone 4-5 Fall Chinook	$12,691,575	$10,702,600	($1,988,975)	-16%
	Coho	$665,943	$578,564	($87,379)	-13%
Select Area Gillnet	Spring Chinook	$2,557,406	$2,952,756	$395,350	15%
	Fall Chinook	$1,906,489	$1,956,570	$50,080	3%
	Coho	$2,650,194	$2,918,480	$268,286	10%
Mainstem Seine	Chinook	$0	$78,328	$78,328	--
	Coho	$0	$11,607	$11,607	--
Mainstem Tangle Net	Coho	$0	$298,441	$298,441	--
Total Commercial		$23,700,454	$21,817,371	($1,883,083)	-8%

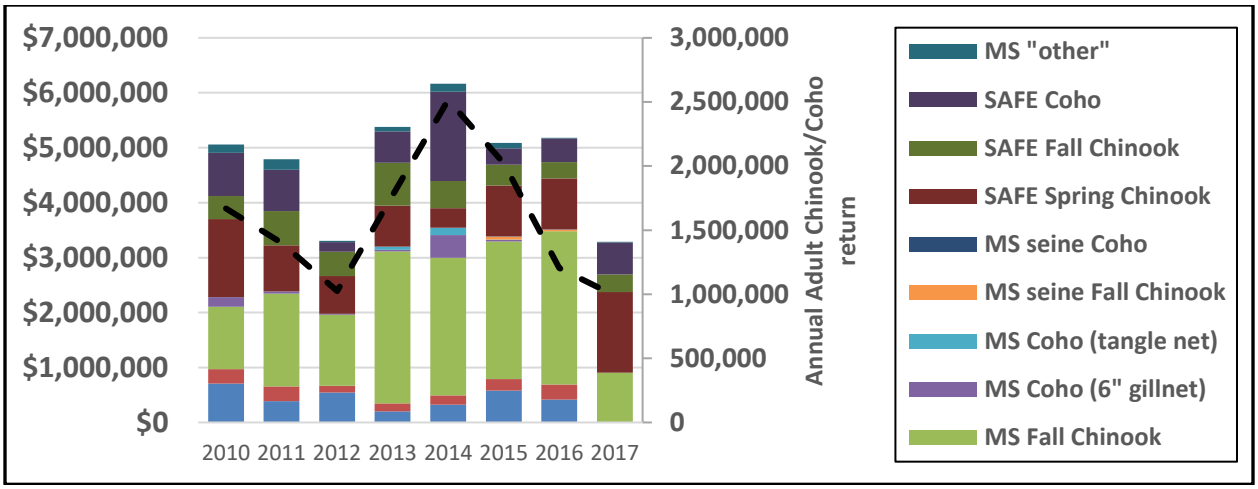


Figure 7: Annual ex-vessel value of non-Indian mainstem (MS) and Select Area (SAFE) commercial salmon fisheries in the lower Columbia River compared to total adult Chinook and Coho returns, 2010-2017

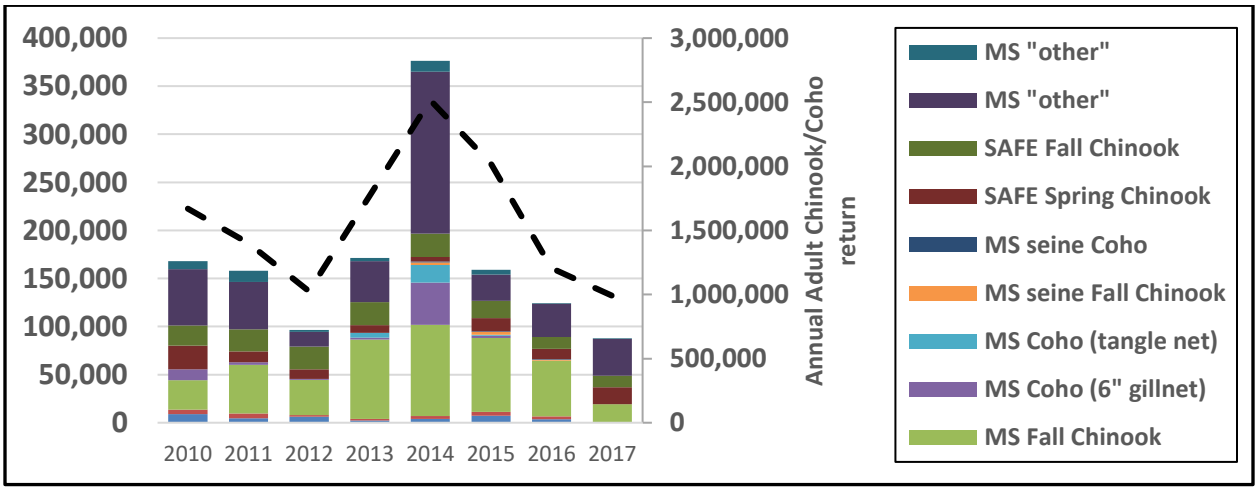


Figure 8: Number of salmon landed in non-treaty commercial mainstem (MS) and Select Area (SAFE) fisheries in the lower Columbia River, and annual adult salmon returns, 2010-2017

Table EE: Observed ex-vessel value of lower Columbia River commercial fisheries, 2013-2016

Fishery	Target Stock	2013	2014	2015	2016	Average
Mainstem Gill net	Spring Chinook	$202,405	$322,675	$580,660	$415,641	$380,345
	Summer Chinook	$144,962	$172,266	$206,307	$275,108	$199,661
	Z4-5 Fall Chinook	$2,812,736	$2,575,129	$2,515,140	$2,799,595	$2,675,650
	Coho	$39,486	$460,466	$78,612	No Fishery	$144,641
Select Area Gill net	Spring Chinook	$747,281	$353,896	$925,104	$926,477	$738,189
	Fall Chinook	$779,085	$497,362	$378,842	$301,281	$489,142
	Coho	$569,780	$1,622,922	$297,190	$428,588	$729,620
Mainstem Seine	Fall Chinook	No Fishery	Research	$51,434	$26,894	$19,582
	Coho	No Fishery	Research	$5,215	$6,392	$2,902
Mainstem Tangle net	Coho	$86,085	$162,732	$49,624	No Fishery	$74,610
Total		$5,381,820	$6,167,447	$5,088,127	$5,179,976	$5,454,343

The above table was Table 30 from Oregon Department of Fish and Wildlife's Exhibit Agenda Item Summary Updated 1-12-17.

Table FF: Expected ex-vessel value of lower Columbia River commercial fisheries under pre-reform (2010-12) average allocations and Select Area releases, 2013-2016

Fishery	Target Stock	2013	2014	2015	2016	Average
Mainstem Gill net	Spring Chinook	$262,673	$550,820	$777,035	$567,787	$539,579
	Summer Chinook	$192,223	$204,169	$289,034	$385,105	$267,633
	Z4-5 Fall Chinook	$3,475,916	$2,868,149	$3,547,915	$2,799,595	$3,172,894
	Coho	$28,742	$534,392	$102,809	$0	$166,486
Select Area Gill net	Spring Chinook	$730,506	$336,488	$737,714	$752,673	$639,351
	Fall Chinook	$779,085	$497,362	$359,096	$270,947	$476,622
	Coho	$569,780	$1,456,875	$230,139	$371,363	$662,548
Total		$6,038,925	$6,448,255	$6,043,741	$5,147,470	$5,925,113

The above table was Table 31 from Oregon Department of Fish and Wildlife's Exhibit Agenda Item Summary Updated 1-12-17.

Table GG: Difference between observed and expected (with pre-Policy allocations) ex-vessel value of lower Columbia river commercial fisheries resulting from CR Fisheries Reform allocation shifts and Select Area releases, 2013-2016

Fishery	Target Stock	2013	2014	2015	2016	Average
Mainstem Gill net	Spring Chinook	$(60,269)	$(228,145)	$(196,374)	$(152,146)	$(159,234)
	Summer Chinook	$(47,260)	$(31,903)	$(82,727)	$(109,997)	$(67,972)
	Z4-5 Fall Chinook	$(663,179)	$(293,020)	$(1,032,775)	$0	$(497,244)
	Coho	$10,744	$(73,926)	$(24,197)	$0	$(21,845)
Select Area Gill net	Spring Chinook	$16,766	$17,404	$187,376	$173,804	$98,838
	Fall Chinook	$0	$0	$19,746	$30,334	$12,520
	Coho	$0	$166,058	$45,003	$57,226	$67,072
Mainstem Seine	Fall Chinook	$0	$0	$51,434	$26,894	$19,582
	Coho	$0	$0	$5,215	$6,392	$2,902
Mainstem Tangle net	Coho	$86,085	$162,732	$49,624	$0	$74,610
Total		$(657,113)	$(280,801)	$(977,676)	$32,506	$(470,771)

The above table was Table 32 from Oregon Department of Fish and Wildlife's Exhibit Agenda Item Summary Updated 1-12-17.

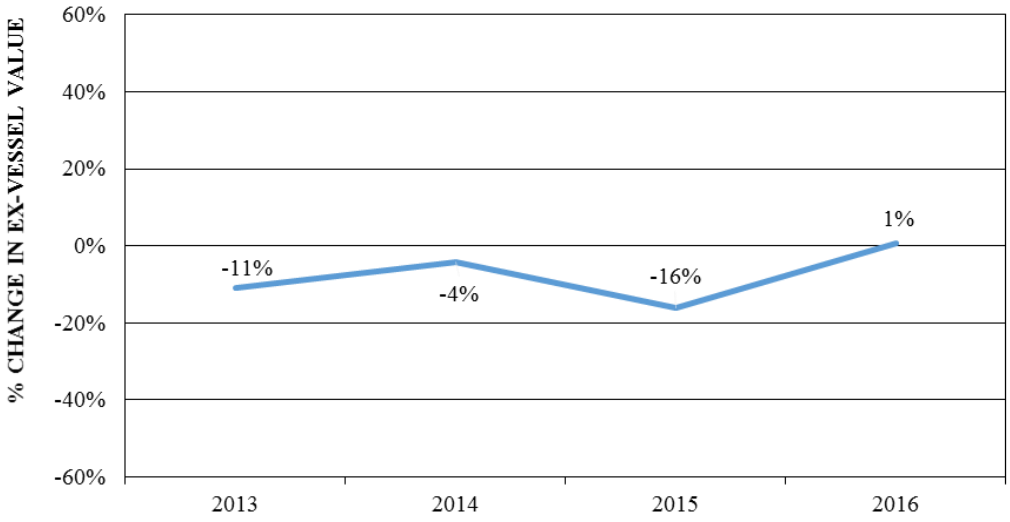


Figure 9: Comparison of percent difference in actual ex-vessel values during the transition period (2013-16)
This was Figure 10 from Oregon Department of Fish and Wildlife's Exhibit Agenda Item Summary Updated 1-12-17.

Table HH: Summary of gains in fishing days and angler-trips due to allocation changes for lower Columbia River recreational Chinook fisheries, by year and season, 2013-16

			2013	2014	2015	2016
Spring		Fishing Days Gained	0	5	2	1
		Angler-Trips Gained	0	10,788	10,321	6,497
Summer		Fishing Days Gained	0	0	0	0
		Angler-Trips Gained	0	0	0	0
Fall	Buoy 10	Non-MSF Days Gained	5	6	2	0
		Angler-Trips Gained	4,560	1,015	907	0
	Below Lewis River	Non-MSF Days Gained	3	6	5	0
		Angler-Trips Gained	2,470	2,265	10,402	0
	Fall Total	Non-MSF Days Gained	8	12	7	0
		Angler-Trips Gained	7,030	3,280	11,309	0
All Seasons Total		Fishing Days Gained	8	17	9	1

	Angler-Trips Gained	7,030	14,068	21,630	6,497

The above table was Table 22 from Oregon Department of Fish and Wildlife's Exhibit Agenda Item Summary Updated 1-12-17.

Table II: Comparison of CR Fisheries Reform modeled angler trips with comparable actual angler trips, 2013-16

Angler Trips	Reform Assumptions (Tables C1-3)				Observed Results				
(<Bonn)	"Baseline"	2013-2016		2017+	2013	2014	2015	2016	Average
Spring	165,362	175,376		180,453	109,655	145,642	151,173	126,826	133,324
Summer	25,000	33,746	45,047	70,000	52,037	53,661	50,555	58,067	53,580
Fall	160,000	175,000		175,000	207,248	251,468	239,587	228,238	231,635
Total	350,362	384,122 - 395,423		425,453	368,940	450,771	441,315	410,746	418,539

The above table was Table 21 from Oregon Department of Fish and Wildlife's Exhibit Agenda Item Summary Updated 1-12-17.

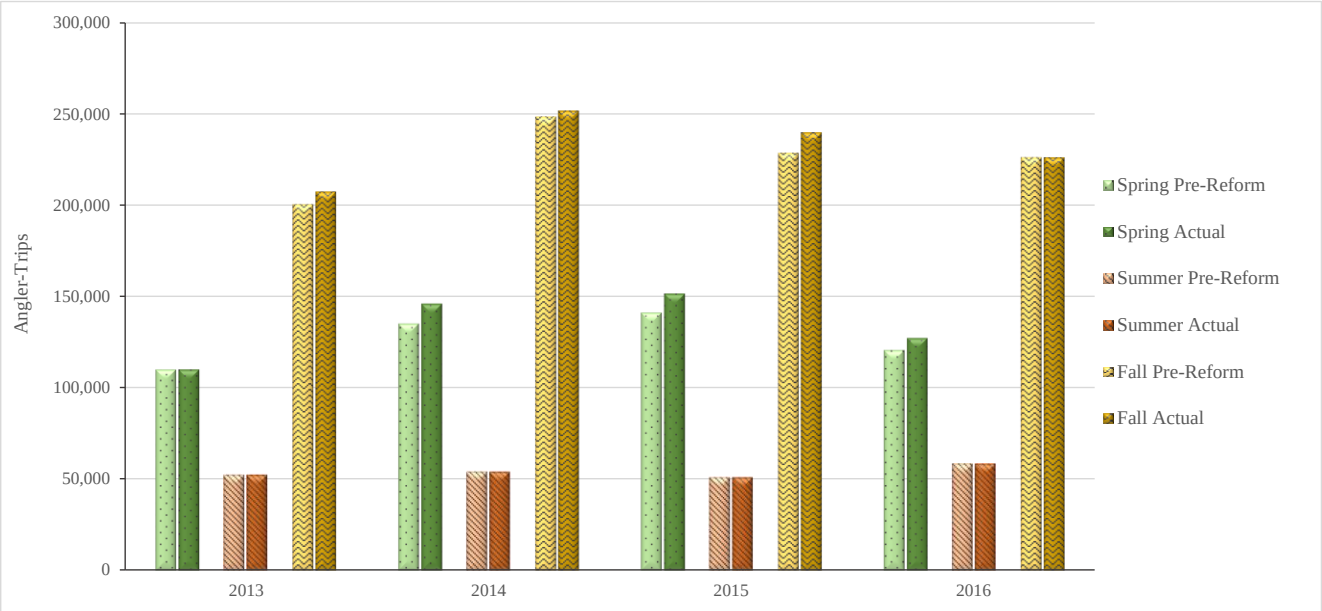


Figure 10: Changes in seasonal angler effort due to Harvest Reform-related allocation increases for the 2013-16 lower Columbia recreational fisheries

This was Figure 6 from Oregon Department of Fish and Wildlife's Exhibit Agenda Item Summary Updated 1-12-17.

Table JJ: Relationship of Recreational Catch and Effort to Runsize Below Bonneville Dam

Year	Spring Chinook		Fall Chinook	
	Effort/Run Size	Catch/Run Size	Effort/Run Size	Catch/Run Size
2010	40.0%	6.3%	25.4%	3.7%
2011	48.6%	3.7%	31.7%	6.3%
2012	43.4%	4.5%	36.9%	7.8%
2013	58.4%	3.7%	16.3%	4.3%
2014	47.2%	5.1%	21.7%	4.6%
2015	36.1%	4.7%	18.4%	6.0%
2016	46.0%	4.6%	35.5%	6.7%
2017	30.1%	4.3%	43.8%	11.5%
2010-2012 Average	43.5%	5.0%	30.9%	5.8%
2013-2017 Average	42.6%	4.6%	23.4%	5.8%