

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

QUESTIONS: 1, 3, 4, 5, 16, 26, 28, 29, and 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 (tules) 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, weir removals 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 2012-2017 in the lower Columbia River (not including Buoy 10). The total harvest of lower river fall Chinook in this fishery ranged from zero in 2017 to 722 in 2013 and averaged 223 fish. In the Buoy 10 fishery, the majority of the time the fishery is non-MSF for fall Chinook, but there were times when MSF regulations were in place. Buoy 10 had MSF periods in 2013-2015 and 2016. The total harvest of lower river fall Chinook in this fishery ranged from zero in 2014 to 1,630 in 2013 and averaged 926 fish (Table 1A).

Seine fisheries were authorized during 2014-2016. The total harvest of lower river fall Chinook in purse seines ranged from 92 in 2014 to 477 in 2015 and averaged 247 fish. The total harvest of lower river fall Chinook in beach seines ranged from one in 2016 to 76 in 2014 and averaged 39 fish (Table 1A). Harvest of hatchery coho in seine fisheries is shown in Table 4A. Beach seines averaged 202 hatchery coho harvested and purse seines averaged 552 hatchery coho harvested.

Table 1A: Lower River Tule Hatchery Fish Harvested in Mark-Selective Fisheries

	Buoy 10	L. Col. Sport	Beach Seine	Purse Seine	Total
2012	-	45	-	-	45
2013	1,630	722	-	-	2,352
2014	-	96	76	239	411
2015	1,433	287	39	477	2,236
2016	640	189	1	271	1,101
2017	-	-	-	-	-

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.

Table 4A: 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

¹Coho 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) for primary fall Chinook populations, have declined by an average of 18% (Table 1B: 2010-2017 Average pHOS for Selected Primary Fall Chinook Populations). Table 1B (below) displays pHOS values from primary populations of fall Chinook and Figure 1.1 shows average pHOS values by year for these same populations.

Table 1B: 2010-2017 Average pHOS for Selected Primary Fall Chinook Populations

Population	2010	2011	2012	2013	2014	2015	2016	2017	Average		MA BIOP pHOS Goal
									2010- 2012	2013- 2017	
Elochoman/ Skamokawa Avg NOR = 111	89%	94%	70%	82%	78%	76%	75%	33%	84%	69%	≤50%
Mill, Abernathy, Germany Avg NOR = 77	94%	92%	86%	81%	94%	92%	78%	83%	90%	85%	≤50%
Coweeman Avg NOR = 794	29%	12%	12%	32%	4%	2%	6%	14%	18%	12%	<10%
Toutle Avg NOR = 379	88%	87%	74%	48%	49%	37%	54%	47%	83%	47%	≤30%
Washougal Avg NOR = 798	89%	85%	74%	67%	35%	54%	60%	41%	83%	51%	≤30%
Average	75%	69%	62%	57%	46%	46%	50%	46%	69%	49%	

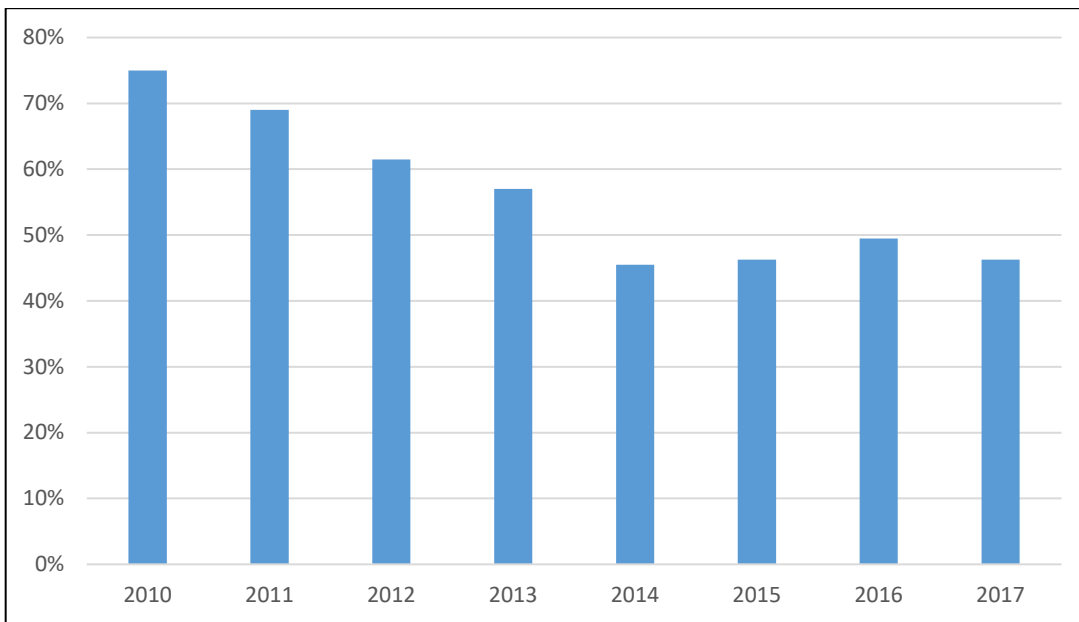


Figure 1.1. Average pHOS Values for Primary Populations of Fall Chinook

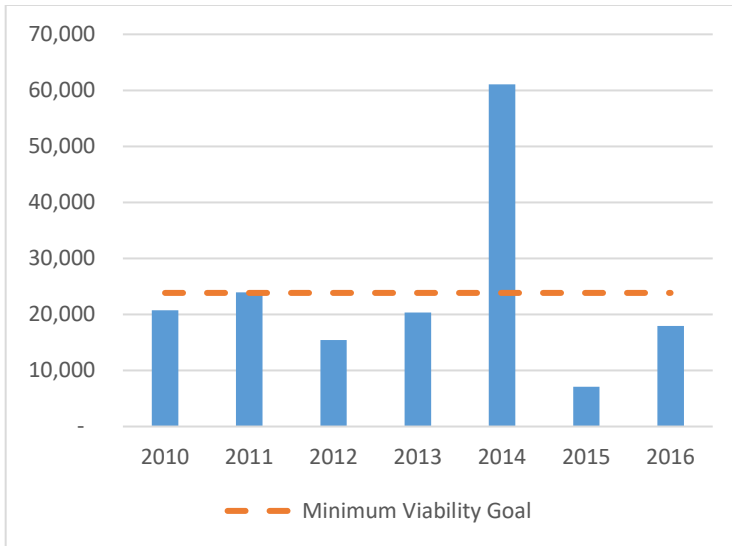


Figure 1.2. 2010-2016 Lower Columbia Natural Origin Coho Spawning Abundance.

Appendix Figure 2 (above) shows the 2010-2016 Lower Columbia Natural Origin Coho Abundance compared to the minimum viability goal from the Recovery Plan; 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:

Mark-selective fisheries occurred in ocean sport fisheries during 2013-2015 (Table 1C). These fisheries were not considered in the Policy, but would contribute to reductions in pHOS for Columbia River fall Chinook stocks. Coho sport fisheries in the ocean are mark-selective almost always. Lower Columbia River tributary sport fisheries (below Bonneville Dam) are mostly mark-selective for Chinook and coho which also contributes to pHOS reductions.

Table 1C. Summary of Mark-Selective Chinook Fisheries in North of Falcon Ocean Areas 1-4.

Year	Mark Selective Chinook Fishery	Season (actual seasons same as planned)
2013	Coastwide Quota of 8,000 marked Chinook	Area 3/4: May 10-11, 17-18, June 22-28
		Area 2: June 8-22
		Area 1: June 8-21
2014	Coastwide Quota of 9,000 marked Chinook	Area 3/4: May 16-17, 23-24, 31-June 13
		Area 2: May 31-June 13
		Area 1: May 31-June 13
2015	Coastwide Quota of 10,000 marked Chinook	Area 3/4: May 15-16, 22-23, 30-June 12
		Area 2: May 30-June 12
		Area 1: May 30-June 12
2016	None	
2017	None	

Recreational Advisory Group/Public Comments:

Consider the role that the recreational anglers can play in mopping up hatchery fish. We recommend WDFW pursue a joint-state grant to train recreational and commercial fisherman to release tules. Suggest that we show natural origin fish numbers – high pHOS can be masked by the low numbers of natural origin fish.

Commercial Advisory Group/Public Comments:

Goals of Policy were not justified by the science. No evidence that conservation has been improved.

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.

Recreational Advisory Group/Public Comments:

Commission should know that Upriver Brights are not all naturally produced.

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 (Table 4A), although none have been consistently utilized (See Question #1 also). 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.

Table 4A: 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

Table 4A 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

¹Coho tangle net and seine fisheries first implemented in 2013 and 2014, respectively.

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. (Tidwell et al. 2017)
 - 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.

Recreational Advisory Group/Public Comments:

Predation by marine mammals is river wide and we do not have a good handle on what it is. We not only have predation at Bonneville, but in the lower river and in the tributaries. There are no good estimates for these sections. Wants commission to know that staff is doing an amazing job on marine mammals.

Commercial Advisory Group/Public Comments:

Increased predation in SAFE areas is high and reduces number of smolts released.

References:

Chasco, B.E., et al. 2017. Competing tradeoffs between increasing marine mammal predation and fisheries harvest of Chinook salmon. Scientific Reports 7:15439. Online journal at www.nature.com/scientificreports.

Tidwell, K.S., B.K. van der Leeuw, L.N. Magill, B.A. Carrothers, and R.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.

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: Table 16A shows differences between the two state's policies prior to 2017. In March 2017, the Oregon commission modified their Policy and fewer differences remain. The remaining differences between the two states are:

- Spring Chinook
 - Washington Policy does not allow for any mainstem fishing beginning in 2017.
 - Oregon Policy says mainstem tangle net fisheries can occur if impacts are not needed in Select Areas.
- Summer Chinook

- Washington applies the unused commercial share to sport fisheries above Bonneville Dam or to spawning escapement. Oregon applies the unused share to escapement.
- Fall Chinook allocation
 - Washington, 2017-2018: Subject to the adaptive management provisions of the policy, the Department will manage Chinook salmon fisheries consistent with the Guiding Principles. The Department will assign no more than 75% of the ESA-impact for lower Columbia River tule fall Chinook to mainstem recreational fisheries to meet management objectives and the balance (not less than 25%) to: off-channel commercial fisheries; mainstem commercial fisheries that target Upriver Bright fall Chinook upstream of the Lewis River; and mainstem commercial fisheries that harvest Washington Lower River Hatchery Chinook with selective gear to help reduce strays.
 - Washington, beginning in 2019: Subject to the adaptive management provisions of the policy, the Department will manage Chinook salmon fisheries consistent with the Guiding Principles. The Department will assign no more than 80% of the ESA-impact for lower Columbia River tule fall Chinook to mainstem recreational fisheries to meet management objectives and the balance (not less than 20%) to: off-channel commercial fisheries; mainstem commercial fisheries that target Upriver Bright fall Chinook; and mainstem commercial fisheries that harvest Washington Lower River Hatchery Chinook with selective gear to help reduce strays.
 - Oregon rule allocates 70% or most constraining stock to the sport fishery and 30% to the commercial fishery. Allocation for the most constraining stock and has a 2% limit for impacts for alternative gear, which comes out of the commercial allocation.
 - Zone 4-5 gillnet fishery – Washington Policy allows for only alternate gear beginning in 2019. Oregon Policy allows for gill nets. For 2017-2018, subject to the adaptive management provisions of the policy, the presumptive path provides for mainstem gill net fisheries to target URB fall Chinook in the area upstream of the Lewis River where the incidental take of lower river tule Chinook is reduced.

Table 16A: Summary of recent Commission decisions regarding Harvest Reform compared to the 2010-12 base period. Updated 2017.06.27

Topic	Stock/Issue	2010-12 (Pre-Harvest Reform)	WA Policy (Policy C-3620)	OR Policy (Enhanced Commercial Rebalance)
Allocations/ Fisheries	Upriver Spring Chinook	60/40 S/C; pre/post update; Tnet/large mesh; shared S/C run buffer	80/20 S/C; no mainstem fishery; no run size buffer on commercial impacts	80/20 S/C; post-update only; Tnet or other selective gears if developed; SAFE priority for Comm impacts; no run buffer on SAFE commercial impacts; unused sport impacts shall be re-allocated to commercial; unused commercial impacts will <u>not</u> be re-allocated to sport
	Summer Chinook	50/50 S/C; large mesh	80/20 S/C; ≤75% for MS comm; no gillnet; gear TBD; if commercial share unused, re-allocate to sport fisheries or escapement upstream of Bonneville Dam	80/20 S/C; SAFE priority; MS Comm opportunity restricted to Alt gears TBD; if commercial share unused, re-allocate to escapement upstream of Bonneville Dam
	Fall Chinook	Ave 59/41 S/C for LRH;	≤75/≥25 S/C for LRH/URB; Z4-5 large mesh in 2017-18; ≤80%/≥20% S/C with selective gear >2018	≤70/≥30 S/C of most constraining CHF stock; large mesh in Z4-5 allowed; ≤2% of commercial allocation for Alt gears.
	Sockeye	No Policy; majority to sport	80%/20% S/C; commercial for incidental	≈80/20 S/C; commercial for incidental
	Coho	No Policy; majority of impacts to commercial	No formal split; SAFE and MS Z4-5 1 st priority for impacts; sport fisheries 2 nd ; mainstem coho 3 rd	No formal split; SAFE and MS Z4-5/hatchery coho 1 st priority for impacts; sport fisheries 2 nd ; mainstem coho 3 rd
	Chum	Sport closed; commercial incidental to coho	No target fisheries; sport retention prohibited; commercial incidental mortality ok	Retention prohibited; commercial incidental mortality ok
Gears	Coho Tnet	NA	Allowed	Allowed
	Coho 6" Gillnet	Allowed	Prohibited	Prohibited
	Conservation set-aside (CSA) fall seine fishery	NA	No CSA; moderate seine fishery expected	Small alternative gear fishery expected using ≤2% of commercial allocation
Select Area Production	SAFE CHS	1.55M	Not addressed	3.34M
	SAFE SAB	1.45M	Not addressed	1.0M (capped by MA)
	SAFE CHF (non-SAB)	6.42M	Not addressed; 3.875M (capped by MA)	3.875M (capped by MA)
	SAFE COH	4.29M	Not addressed; 5.255M (capped by MA)	5.255M (capped by MA)
Other	Zone 4-5 monitoring	Occasional	Dedicated during 2017-18	Dedicated during 2017-18
	Buyback	NA	Aggressively pursue	NA
	SAFE barbless	Barbed	Barbless	Barbed effective 2/1/17
	LWR Barbless	Barbed	NA	Barbed effective 2/1/17
	YBCZ	NA	NA	Maintained

Commercial Advisory Group/Public Comments:

There are many who are concerned by the discrepancies between Washington and Oregon regulations. We need to have one policy for both states.

Recreational Advisory Group/Public Comments:

We would like to see the commission hold to the original agreement. There is a lot of history that got us to this point.

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

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.

Commercial Advisory Group/Public Comments:

We have concerns about who is running the Cowlitz Study. We would like full disclosure of who is involved, including all the members of Mt Hood Environmental, and where the funding is coming from.

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

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TRIBAL
QUESTIONS: 6, and 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: 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. 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

Comprehensive Review of the Columbia River Basin Salmon
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2013-2017

RECREATIONAL

QUESTIONS: 9, 23, 24, and 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: Yes, recreational fisheries have been prioritized in the mainstem and commercial fisheries have been prioritized in the Select Areas. The allocations in the policy automatically prioritizes recreational fisheries providing about 70%-80% of the allocation of fish or ESA impacts.

Supplemental Staff Comments

For spring fisheries, 80% is allocated for the recreational fishery in the mainstem and 20% allocated for commercial fisheries within the Select Areas. 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.

Recreational Advisory Group/Public Comments

- How do we define prioritized?
- Take into account what happens in season versus what was planned.
- Staff was asked to provide actual catches by species for each sector. This summary will be provided in the economic section.

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: Building on the previous Commission action (see below), 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 significant difference in mortality due to the use of barbed vs. barbless hooks was presented during consideration of the policy.

Supplemental Staff Comments

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.

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 there was not statistical evidence available to support the reduction of 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 release mortality study using barbless hooks concluded in 2014 and confirmed a 10-12% release mortality rate on spring Chinook in the Yakima River.

An on-going joint study with Mount Hood Environmental, Tacoma Power and Washington Department of Fish and Wildlife in the Cowlitz River is expected to provide additional information with regards survival rates within recreational salmon and steelhead fisheries. The Cowlitz River study is comparing gear types (including barbed hooks versus barbless hooks), hooking location and water temperatures across all species (summer/winter steelhead, coho, spring/fall chinook); 2018 is the second year of a 3-year study. The objectives of the study are

to determine whether use of barbless hooks increases survival, quantify the capture efficiency of barbed and barbless hooks while angling, use data collected in this study in conjunction with creel and catch record card data to model the impacts of barbless regulations on rates of wild fish mortality and hatchery fish harvest in two fisheries—a hatchery fish intensive fishery and a naturally supported catch-and-release fishery.

Recreational Advisory Group/Public Comments

- Oregon commission handled this differently. Oregon staff have recommended removal of barbless. Mortality is affected by where the hook was in the fish, not whether the hook is barbed/treble/etc.
- The recreational fishery has an on-going release mortality rate study that should have merit for future use.
- Additionally, anglers have made anecdotal claims of experiencing lower landing rates/efficiency with the use of barbless hooks that could potentially lead to a higher pHOS or hatchery surplus.

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 to provide the option to use barbed hooks on hatchery-focused fisheries. 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 Table 24A with the rationale. Oregon requires barbless hooks in the Columbia River but not in their tributaries.

Table 24A: Columbia River tributaries that allow that allow the use of barbed hooks

Tributary	Boundary and Season	Rationale
Cowlitz River	From boundary markers at the mouth to barrier dam – June 1-July 31	Hatchery summer run steelhead
Deep River	Year round	Salmon net pen program
Drano Lake	March 16-June 30	Hatchery spring Chinook
Drano Lake	October 1-December 31	Hatchery fall Chinook and coho
Elochoman 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
Klickitat River	From mouth to Fisher Hill Bridge – August 1-January 31	Hatchery fall Chinook and coho
Mayfield Lake	Year round	Hatchery rainbows, winter steelhead, fall Chinook, and coho
South Fork Toutle River	Saturday before Memorial Day-July 31	Hatchery summer run steelhead
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

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 was done to on this component of the Policy during 2013-2017.

Supplemental Staff Comments

Sampling programs are not without their limitations; 1) sampling programs are costly, 2) data is needed is time sensitive, 3) data gaps, 4) bias of handle/release information and 5) better understanding of the different fishing sectors.

The Legislature has authorized Washington Department of Fish and Wildlife the ability to require logbooks. Additionally the state legislature and has 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 economic well-being. These meetings are continuing through the summer of 2018 and will include conversations around ways to improve trip information for the Department, such as creating a mobile application and/or building off of the Volunteer (Salmon) Trip Report Program.

Recreational Advisory Group/Public Comments

- Doesn't understand what the purpose would be.
- Please take into account that there is already a large creel sampling program. This seems to imply that the current sampling program isn't good enough. Current sampling programs continue to be capable of providing necessary harvest and effort data for managers.
- There are concerns that the logbooks single out fishing guide community. If you're only gathering guide data without sport data, how will the data be used?

Commercial Advisory Group/Public Comments

- Commercial Advisory encouraged use of log books for guides. OR and WA have never put anything for limited entry guide boats. There isn't enough room for the amount of people going fishing.
- Feels log books would help fill data gaps.

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COMMERCIAL
QUESTIONS: 17, 18, 22, and 27

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.

Commercial Advisory Group/Public Comments:

- Improve information availability about commercial fisheries. Feels there is a lack of availability for locals business to sell Columbia River salmon. Acknowledge lack of information on commercial fishery online. We need to inform people that there is a commercial fishery. If you can advertise to sell the sport fishery why not commercial? The answer shouldn't be that you have to catch your own fish to eat.

- Issue with 'Eat Wild' flyer. WDFW Marketing did the flyer with intention to sell licenses. Frustrating to keep trying to get information to consumers
 - Monterey Bay Aquarium is where seafood information comes from – sustainability seafood. Downgraded Columbia River coho from yellow to red.
- Lack of availability for local CR salmon
 - Restaurateur spoke at commission meeting in Astoria. Cannot feed them Columbia River salmon.
 - There's a lack of information about commercial fisheries and local restaurants are not able to serve Columbia River salmon.

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 project 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.

Commercial Advisory Group/Public Comments:

We have concerns about how the value of the licenses will be measured. We would like to encourage staff to look at what they were worth when the policy was put in place, which is not the same as the value now.

Recreational Advisory Group/Public Comments:

Literature search: Look at other buyback programs to see what has worked and not. It feels like progress is being stonewalled and no progress is being made – this needs to be in the record.

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 by ODFW 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.)

Commercial Advisory Group/Public Comments:

The data that is being measured may not be an actual reflection of what is happening in the Select Areas. Since the data is from sales we are not counting the number of participants who don't catch anything. We'd also like to note, expansion of Select Areas can also mean

additional impacts needed to prosecute. Balance economics with production cost. Not going to pencil out.

Recreational Advisory Group/Public Comments:

No, we have not found new areas, but that we have increased production in SAFE areas. Progress can be defined in different ways – more fish being caught in SAFE areas than before. Washington does not pay its share for production of SAFE fish.

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 Table 27A and compares preseason expectations and actual estimates. A summary of the monitoring efforts for 2017 are shown in table 27B.

Commercial Advisory Group/Public Comments:

There was concern about the liability of having observers on board. Continue to hear that we still need more data. Make the step for the commission to describe what the information means. Be more aggressive in your own science. Be clear and precise – these aren't kill nets. Used appropriately it's can be good for harvest

Recreational Advisory Group/Public Comments:

Want to see expanded estimates for the whole fishery, not just August. Would also like to see expanded estimates for sturgeon, including number of oversize sturgeon handled. Pointed out that the steelhead/Chinook ratio was higher than expected. The group was disappointed to hear there would not be a mandatory observer program this year.

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	4%	26
2017 Actual	13,959	407	23.8%	81	0.029	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	

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Policy Review Themes**

Recreational

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 Question 23 Barbless hooks
 Question 24 Barbless hook exemptions
 Question 25 Logbooks

Commercial

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 Question 18 Buyback
 Question 22 New SAFE areas
 Question 27 2017 monitoring results
 Question 28 Funding for release mortality rate

Tribal

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Allocation

Question 30 Spring Chinook allocation
 Question 31 Spring Chinook buffer
 Question 32 Spring Chinook allocation sport
 Question 33 Summer Chinook allocation
 Question 34 Summer Chinook allocation- above PRD
 Question 35 Summer Chinook allocation- below PRD
 Question 36 Allocation sockeye, fall Chin, coho

Alt Gear

Question 10 Gill nets phased out
 Question 11 Definition of non-selective gill nets
 Question 12 Alternative gear development
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Management

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