

2015 LOWER COLUMBIA RIVER FALL SEINE FISHERY

Joint Columbia River Management Staff

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May 2016



Photo by A. Stephenson

Acknowledgements

The author would like to express appreciation to the following people for their contribution to this report. For their insight and review of the report: Robin Ehlke (WDFW), John North (ODFW), Geoffrey Whisler (ODFW), Howard Takata (ODFW), Thomas Wadsworth (WDFW) and Cindy LeFleur (WDW). For in-season oversight: Tucker Jones (ODFW). For database expertise: Greg Lippert (WDFW) and Michelle Groesbeck (WDFW). To the WDFW and ODFW field technicians who conducted the on-board fisheries observations and for the cooperation of the commercial fishermen who participated in this fishery.

Background

In 2013, the Washington and Oregon Fish and Wildlife commissions (Commissions) adopted policies and rules implementing guiding principles and management strategies for a new fisheries framework for lower Columbia River non-Indian commercial fisheries. One policy objective was to develop alternative forms of commercial fishing gear. Washington's policy objectives required the Washington Department of Fish and Wildlife (WDFW) to "...develop and implement selective-fishing gear and techniques for commercial mainstem fisheries to optimize conservation and economic benefits" (Washington Fish and Wildlife Commission Policy Decision C-3620).

Since 2009, Oregon Department of Fish and Wildlife (ODFW) and WDFW fisheries staff has been evaluating alternative gear types for use in lower Columbia River commercial fisheries. The use of two particular gear types, beach and purse seines, were outlawed in the State of Washington in 1935 and in the State of Oregon in 1950. In recent years, legislation and regulations by both states have allowed for the use of these gear types for research and commercial purposes. The intent of using these two gear types is to allow for a mark-selective fishery where fish are captured alive. The live capture of fish allows for hatchery stocks of salmon, marked with an adipose fin-clip or left ventral fin-clip, to be retained for harvest while allowing for the live release of unmarked (unclipped) salmon and all steelhead. 2015 was the second year that a non-Indian commercial seine fishery was conducted in the lower mainstem Columbia River from Bonneville Dam downstream to the mouth.

The mainstem commercial seine fishery, as with all other non-Indian commercial fisheries on the Columbia River, was established by the Columbia River Compact (Compact). The Compact consists of the directors of ODFW and WDFW or their delegates acting on behalf of the commissions of both agencies.

In 2014, the allowable Endangered Species Act (ESA) impacts on listed stocks of salmon and steelhead for this fishery were taken from impacts set aside for research fisheries. 2015 was the first year the seine fishery utilized ESA impacts set aside for non-Indian commercial fisheries. Under guidance from both Commissions, the allowable ESA impacts on tule fall Chinook salmon for non-Indian fisheries are shared between commercial and recreational fisheries. Sharing guidelines currently allocate no more than 70% of the available impacts for tule fall Chinook salmon to the mainstem recreational fisheries and the balance, no less than 30%, to: "off-channel commercial fisheries; mainstem commercial fisheries that target Upriver Bright fall Chinook; and, if selective gear is developed during the transition period, mainstem commercial fisheries that harvest Washington Lower river Hatchery Chinook to help reduce strays." (Washington Fish and Wildlife Commission Policy Decision C-3620). Because impacts available to the commercial fisheries are limited, the 2015 seine fishery was restricted in scope to provide a reasonable economic return for participants while minimizing the effects on mainstem gillnet opportunities. Pre-season modelling for the seine fishery was based on using 10% or less of the non-Indian commercial impacts for lower Columbia River tule fall Chinook salmon or wild B-run steelhead, whichever was more constraining. This sub-allocation of available commercial impacts for the seine fishery was negotiated with the commercial fishing industry during the North of Falcon process, an annual event where representative from federal, state and tribal governments and the recreational and commercial fishing industries meet.

As in 2014, the seine fishery in 2015 took place during the latter part of August and throughout the month of September. This fishery focused on the return of Columbia River hatchery fall Chinook salmon (*Oncorhynchus tshawytscha*) as well as hatchery Coho salmon (*Oncorhynchus kisutch*). All unmarked Chinook and Coho salmon were released during this fishery, as well as all steelhead (*Oncorhynchus mykiss*), sturgeon and other by-catch.

The objectives of the 2015 commercial seine fishery were to:

1. Determine the steelhead to Chinook salmon ratios by gear type and fishing zone.
2. Estimate the Chinook and Coho salmon catch rates for each gear type under real-world fishing conditions.
3. Compare the immediate mortalities to those observed during previous research.

In addition to the commercial seine fishery, a research seine study was conducted in 2015 by ODFW using research impacts. This study was conducted below Bonneville Dam in non-Indian commercial fishing Zone 5 (Figure 1). The objectives of this research were to determine the stock composition of fall Chinook salmon captured in purse and beach seines in this area, and to determine if the stock composition of the seine-caught fish in Zone 5 differs from the stock composition of fish caught with gillnets in the same area. Results of this study will be presented in a separate report.

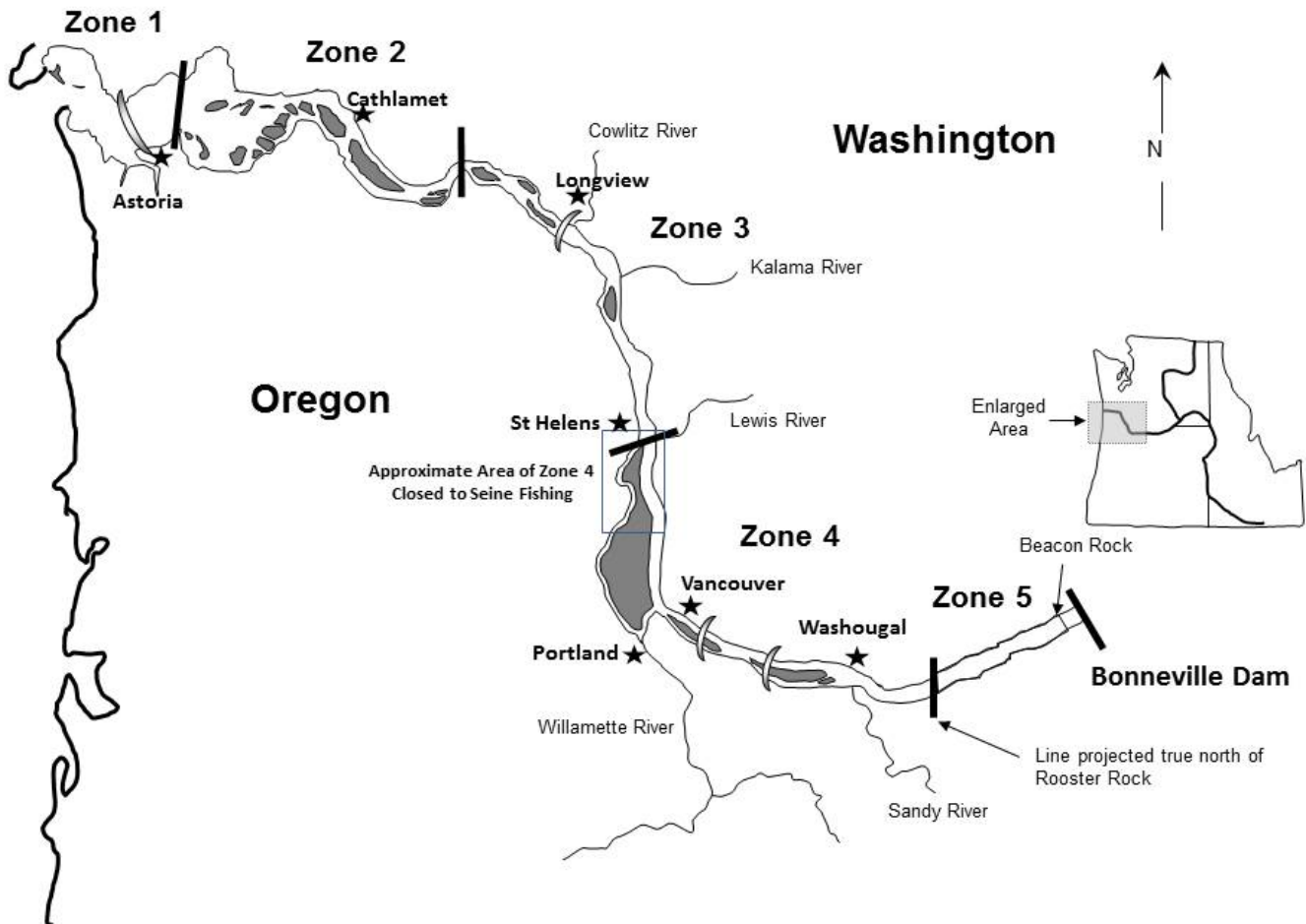


Figure 1. Lower Columbia River non-Indian commercial fishing zones.

2015 Seine Fishery Permits

On August 4, 2015, a public meeting to discuss the 2015 seine fishery was held in Rainier, Oregon by the Columbia River Joint Staff, which is made up of members of ODFW and WDFW fisheries management staff. A similar meeting was held in 2014 and proved useful for establishing guidelines for the fishery. The meeting was attended by the current permit holders and members of the Columbia River Commercial Advisory Group. The meeting provided an opportunity for staff to relay the tenants of the current policy as well as the objectives of the fishery. The permit holders had the opportunity to meet staff and other permit holders, as well as ask questions and provide input regarding the gear specifications and season structure.

The seine fishery in 2015, as in 2014, was a limited entry fishery. Washington residents were required to have an emerging fishery license and an experimental fishery permit. Oregon residents were required to have an experimental gear permit. As in 2014, there were six beach seine permits and four purse seine permits available through a lottery system. The application process was limited to those who held a current Columbia River commercial salmon license with commercial landings from either mainstem Columbia River or Select Area fisheries in the previous two calendar years.

In 2014, the majority of the fish from the seine fishery were caught in lower Columbia River commercial fishing Zone 1 off of Sand Island and in Zone 4 off of Bachelor Island (Figure 1). In 2015, a more comprehensive set of data was desired to help ascertain the stock composition of fall Chinook salmon caught with seines throughout the lower Columbia River, information that is needed for modelling future fisheries in the area. In 2015, the seine fishery was only open in Zones 2, 3, and the upper portion of Zone 4 in an attempt to fill in stock composition and catch rate data gaps from the previous year.

An initial letter of interest, along with an application, was mailed out on May 21, 2015 to all Columbia River commercial fishing license holders. The information was also posted on the WDFW and ODFW websites (<http://www.dfw.state.or.us/fish/OSCRP/CRM/>). Eight applications were received by the initial deadline of June 8, 2015. All applicants met the permit criteria and were awarded a permit. Of the eight permits that were awarded at that time, two of the permits were not purchased by the applicants. Therefore, in the first round, four beach seine and two purse seine permits were issued.

On August 6, 2015, a second letter was sent out to solicit additional interest in the remaining two beach seine and two purse seine permits. The second round of permits were restricted to Zones 2 and 3, excluding the upper section of Zone 4, since the majority of the first-round permit holders initially indicated they planned on fishing in Zone 4. Individuals who had received a permit in the first round were allowed to apply for one additional permit from the second round if they so desired. The second round resulted in the issuing of one additional beach seine and two additional purse seine permits. One of the second-round purse seine permits was awarded to a first-round purse seine permit holder. Prior to the beginning of the season, two of the beach seine permit holders dropped out of the fishery for personal reasons. Once the second round of applications for permits was opened, applications could be accepted throughout the 2015 fall fishing period, although no additional parties applied for a permit once the season began in late August. The 2015 season consisted of three beach seine and four purse seine permits.

Some permit holders who held permits for the same gear type combined their efforts and developed a form of cooperative (co-op). This helped the fishermen pool their resources and work more efficiently. As a result of these co-ops, staff developed protocols so that only one permit was fished at a time. In 2015, the three beach seine permit holders worked together, pooling their resources to try and fill their permits. By the end of the season, two of the three beach seine permittees had landings on their permits. Two of the purse seiners also worked cooperatively later in the season.

Post-Release Mortality Rates

Post-release mortality rates for each salmonid species by gear type were recommended by the *U.S. v Oregon* Technical Advisory Committee for the 2015 seine fishery (Table 1). The mortality rates used in 2015 differed slightly from those used in 2014. The understanding was that the 2015 rates would remain in place for future seine fisheries until or unless additional information became available that would warrant a change. These mortality rates, along with the pre-season salmonid forecasts, were used prior to the season to help fishery managers determine the number of fish available for harvest and to establish a season structure for this fishery. These rates were applied both in-season and post-season to the fish released from this fishery to track the impacts on ESA-listed salmon and steelhead.

Table 1. 2015 Seine fishery post-release mortality rates.

Species	Beach Seine	Purse Seine
Chinook	33%	21%
Coho	38%	29%
Steelhead	5%	2%

Individual Fishing Quotas

Individual fishing quotas (IFQ) were established for each salmonid species by gear type (Table 2). The IFQs in 2015 were decreased slightly from the previous year. The IFQs were determined pre-season and were included in the letter of interest that was sent out to potential permittees. The IFQs served multiple purposes, one of which was to help the applicants determine in advance the costs and benefits of participating in the fishery. Other purposes of the IFQs were to distribute the catch fairly among participants and to help ensure that the seine fishery remained within its allowed sub-allocation. Once any one of the three IFQ criteria was met, whether it was the number of Chinook or Coho salmon kept or the number of steelhead released (i.e., handled), the permit was considered ‘full’ and fishing would cease. If fish of the other harvestable salmon species (Chinook or Coho salmon) were still available in the IFQ when the quota for the other species was met, those fish could also be retained in the final fishing set. For example, if the Chinook salmon quota was met during the middle of a set, only allowable Coho salmon remaining could be retained until that final set was complete.

Both jack and adult hatchery salmon could be retained in this mark-selective fishery, but only the adult salmon counted towards the IFQs. Any Chinook salmon greater than or equal to 24 inches in total length and any Coho salmon greater than or equal to 20 inches in total length was considered an adult fish.

Table 2. 2015 Seine fishery individual fishing quotas.

Species	Beach Seine	Purse Seine
Adult Chinook	400	650
Adult Coho	150	200
Steelhead handle	180	150

Season Structure

The 2015 seine fishery season was adopted by the Compact at the August 11, 2015 Compact hearing (Appendix A). This and all other Columbia River Joint State Action Notices can be found on WDFW or ODFW websites at: <http://wdfw.wa.gov/fishing/crc/> or http://www.dfw.state.or.us/fish/OSCRP/CRM/action_notes.asp. A total of fifteen fishing periods were set starting August 24th and ending September 30th. As the season progressed, the Compact set two additional periods at the September 2nd Compact hearing and an additional six periods at the September 10th Compact hearing. Overall, the fishery was open for a total of 23 fishing periods. The open hours for each period were from 6:00 a.m. to 8:00 p.m. through September 11th and from 6:30 a.m. to 7:30 p.m. after September 11th. The seine fishery was a daytime fishery only.

Gear and Fishery Requirements

The specifics of the fishing gear were outlined in the August 11th and two subsequent Columbia River Compact/Joint State Action Notices. The regulations outlined the details of the following: who could participate, the season structure, sanctuaries, gear types, allowable sales, salmonid handling and sorting criteria including sort times (which were limited to 75 minutes), a mandatory observer program and catch reporting requirements. The specifications of each of these areas can be found in more detail in the Compact Notice at the end of this document.

Data Collection

Each permit holder was required to have at least one observer from WDFW or ODFW present at all times during fishing operations. General data was collected for each fishing set in addition to the catch and release data. A fishing set was defined as the time from when the seine was first laid out until the last fish in the set was handled. The data were recorded on datasheets, entered into a datalogger and then downloaded into a database. General data collected for each set included: the permit identification number, date, set number, fishing zone, gear type, drift location name, GPS coordinates, water temperature, layout start time, sort start time, sort stop time, net length, net depth, and mesh size. The kept catch, all adipose-clipped, was separated into categories by life stage, adults or jacks, and by species, Chinook or Coho salmon. Data collected for released salmon included whether they were alive or dead and whether or not they had an adipose fin. Additional data collected for steelhead included stock information which was determined by length. Steelhead with a fork length (FL) greater than or equal to 78 cm were considered B-run, while steelhead less than 78 cm FL were considered A-run. White sturgeon and all other fish species caught and released during each set were also tallied.

Results from the Fishery

Due to a delay in the issuing of the permits, no seine fishing took place until August 31st. Of the 23 days available for seine fishing, fishing occurred on 15 different days (Table 3). No fishing took place during the final four days of the season as most of the fishers had filled or nearly filled one or more their IFQs by that point in time. There were also a couple of days in the middle of the season when no one fished. The two beach seine permittees that had landings in 2015 fished for a total of six days between September 2nd and 11th. The remaining beach seiner fished as part of a cooperative in Zone 4, but did not land any fish under his own permit, which was for Zones 2 and 3. The beach seiners terminated their fishing operations by mid-September. The four purse seine permits were fished over a period of 14 days between August 31st and September 23rd.

Table 3. 2015 Dates seine permittees fished.

PermitID	GearType	Dates Fished
2015001	Beach Seine	9/2/2015
		9/9/2015
		9/10/2015
2015002	Beach Seine	9/3/2015
		9/8/2015
		9/11/2015
2015007	Purse Seine	8/31/2015
		9/1/2015
		9/2/2015
		9/3/2015
		9/8/2015
		9/9/2015
		9/11/2015
		9/14/2015
9/15/2015		
2015008	Purse Seine	9/11/2015
		9/14/2015
		9/15/2015
		9/17/2015
2015009	Purse Seine	9/15/2015
		9/16/2015
		9/21/2015
		9/22/2015
		9/23/2015
2015010	Purse Seine	9/1/2015
		9/2/2015
		9/3/2015
		9/21/2015
		9/23/2015

Net Length and Mesh Size

Under the gear regulations adopted by the Compact, the net length for both beach and purse seines was not to exceed 200 fathoms. In 2015, the beach seines ranged in length from 130 to 155 fathoms and the purse seines ranged in length from 150 to 195 fathoms. Several of the permittees increased their net length by 35 to 45 fathoms after their initial fishing efforts. The mesh size, which was restricted to 3.5 inches maximum, applied to both gear types.

Sets per day

On average, the beach seiners fished more sets per day than the purse seiners. The four purse seine permits fished an average of four sets per day. The two beach seine permits that fished averaged six sets per day under one permit and nine sets per day under the other permit.

Sort Times

The total sort time for both gear types per regulation could not exceed 75 minutes. The sort time for beach seines was defined as the elapsed time from when the outer towed end of the net first contacted the shore or block until the net was emptied of fish. For the purse seines, the sort time was defined as the elapsed time from when all the rings were pursed and out of the water until the net was emptied of fish. Of a total 138 sets for both gear types, the sort time exceeded 60 minutes only three times during the season. Only one purse seiner reached the 75 minute limit during one set and had to release the fish remaining in the set at that time. On average, sort times were 18 minutes for the 47 beach seine sets and 23 minutes for the 91 purse seine sets. Overall, the sort times were considerably lower than the allowable time limit.

Fishing Locations

The beach seiners fished exclusively in Zone 4 off Caterpillar Island, just downstream of Vancouver, Washington (Figure 1). The purse seiners fished out of Cathlamet, Washington in a few different locations all within Zone 2, including the Cathlamet Channel. The seiners tended to fish in the same area throughout the season once they found a location where they could effectively catch fish. This likely enabled them to be more successful in their efforts but did not provide catch information distributed throughout the geographic area as was hoped for the fishery.

Water Temperatures

Observers collected water temperature data for each set by using a PINPOINT® calibrated thermometer. Onboard the purse seine vessels the probe was lowered to a depth of five feet for one minute. At the beach seine sites, an agency observer waded into the water to about waist deep and lowered the probe to the bottom for one minute. Water temperatures during the beach seining ranged from 63°F to 72°F, with an average temperature of 68°F. Water temperatures during the purse seining ranged from 66°F to 71°F, with an average temperature of 68°F.

Catch and Release Data

One or two ODFW or WDFW observers monitored each seine fishing operation, recording all of the set information, as well as the number of kept and released salmon, and the number of released steelhead, sturgeon, and any other by-catch. For logistical purposes, in 2015, ODFW monitored the beach seine operations and WDFW monitored the purse seine operations.

Nearly all of the adipose fin-clipped Chinook and Coho salmon were retained for harvest, with the exception of a few fish that escaped during sorting or those that were released intentionally once the sort time was exceeded or an IFQ was met. All steelhead, regardless of their stock or adipose disposition, were tallied and released.

The following two tables summarize the adipose fin-clipped Chinook and Coho salmon that were kept (there were no left ventral clips observed in the 2015 seine fishery), the marked and unmarked Chinook and Coho salmon that were released (both alive and dead), and all categories of steelhead that were released for each fisher by gear type for each day fished (Tables 4 and 5). Released salmon were not separated by life stage in the field, so the numbers in the following tables for released Chinook and Coho salmon include both jack and adult fish. Table 6 shows the mark rates (adipose clips) for adult Chinook and Coho salmon.

Table 4. 2015 Purse seine kept and released salmonid data (Zone 2).

Date	Permittee	# Sets	Kept Chinook Salmon			Kept Coho Salmon			Released Salmon				Released Steelhead				Total
			Marked Adults	Marked Jacks	Total	Marked Adults	Marked Jacks	Total	Marked Chinook	Unmarked Chinook	Marked Coho	Unmarked Coho	A		B		
													Unmarked	Marked	Unmarked	Marked	
8/31/2015	2015007	4	25	2	27	4	0	4	2	22	0	3	0	3	0	0	3
9/1/2015	2015007	3	5	0	5	1	0	1	0	16	0	0	1	0	0	0	1
9/1/2015	2015010	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/2/2015	2015007	6	105	5	110	5	0	5	0	90	2	4	6	4	0	1	11
9/2/2015	2015010	3	5	0	5	0	0	0	0	3	0	1	0	0	0	0	0
9/3/2015	2015007	6	39	1	40	8	0	8	0	51	0	17	1	0	1	0	2
9/3/2015	2015010	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/8/2015	2015007	5	246	14	260	14	0	14	0	307	0	15	5	12	6	4	27
9/9/2015	2015007	2	6	0	6	0	0	0	0	12	0	0	1	0	1	0	2
9/11/2015	2015007	5	102	4	106	3	0	3	2	163	0	6	3	4	1	3	11
9/11/2015	2015008	4	176	11	187	18	2	20	0	250	0	17	2	9	4	6	21
9/14/2015	2015007	4	98	6	104	10	1	11	1	170	1	9	0	0	2	2	4
9/14/2015	2015008	4	213	7	220	11	0	11	1	293	0	15	0	5	3	1	9
9/15/2015	2015007	1	19	1	20	5	1	6	1	33	0	6	0	0	0	0	0
9/15/2015	2015008	4	127	1	128	13	0	13	1	192	0	20	0	1	3	8	12
9/15/2015	2015009	4	56	1	57	2	0	2	0	121	0	9	2	1	1	2	6
9/16/2015	2015009	4	138	6	144	26	3	29	2	244	1	31	2	2	4	1	9
9/17/2015	2015008	2	134	4	138	40	0	40	97	322	1	59	0	4	6	8	18
9/21/2015	2015009	4	79	14	93	37	4	41	1	201	1	32	3	6	2	5	16
9/21/2015	2015010	6	236	11	247	111	1	112	0	506	0	116	4	12	11	8	35
9/22/2015	2015009	4	75	4	79	60	1	61	1	197	0	48	2	10	5	7	24
9/23/2015	2015009	4	150	4	154	63	2	65	0	304	0	130	4	4	5	6	19
9/23/2015	2015010	6	157	25	182	78	5	83	1	420	1	85	3	10	3	10	26
Totals		91	2,191	121	2,312	509	20	529	110	3,917	7	623	39	87	58	72	256

Note: Released salmon includes both jacks and adults, released alive or dead. "Marked" is adipose fin-clipped. All data are preliminary and subject to change.

Table 5. 2015 Beach seine kept and released salmonid data (Zone 4).

			Kept Chinook Salmon			Kept Coho Salmon			Released Salmon				Released Steelhead				
Date	Permittee	# Sets	Marked	Marked	Total	Marked	Marked	Total	Marked	Unmarked	Marked	Unmarked	A		B		Total
			Adults	Jacks		Adults	Jacks		Chinook	Chinook	Coho	Coho	Unmarked	Marked	Unmarked	Marked	
9/2/2015	2015001	9	44	16	60	5	1	6	0	31	3	33	13	28	0	0	41
9/3/2015	2015002	5	48	9	57	12	1	13	1	18	0	20	2	13	1	1	17
9/8/2015	2015002	5	78	13	91	4	0	4	0	39	0	15	3	13	0	1	17
9/9/2015	2015001	8	218	39	257	14	1	15	0	133	0	18	11	44	4	4	63
9/10/2015	2015001	10	102	23	125	7	0	7	1	77	0	23	5	30	6	6	47
9/11/2015	2015002	9	82	9	91	13	0	13	0	46	0	10	8	24	1	3	36
Totals		46	572	109	681	55	3	58	2	344	3	119	42	152	12	15	221

Note: Released salmon includes both jacks and adults, released alive or dead. "Marked" is adipose fin-clipped. All data are preliminary and subject to change.

Table 6. 2015 Seine fishery mark rates for adult Chinook and Coho salmon.

Gear Type	Date	Zone	Vessels	Sets	Adult Chinook			Adult Coho		
					Marked	Unmarked	Mark Rate	Marked	Unmarked	Mark Rate
Beach	9/2/2015	4	1	9	44	30	59%	5	33	13%
	9/3/2015	4	1	5	48	17	74%	12	20	38%
	9/8/2015	4	1	5	78	36	68%	4	15	21%
	9/9/2015	4	1	8	218	122	64%	14	18	44%
	9/10/2015	4	1	10	102	71	59%	7	23	23%
	9/11/2015	4	1	9	82	44	65%	13	10	57%
	Subtotal		6	46	572	320	64%	55	119	32%
Purse	8/31/2015	2	1	4	25	20	56%	4	3	57%
	9/1/2015	2	2	7	5	15	25%	1	0	100%
	9/2/2015	2	2	9	110	85	56%	5	5	50%
	9/3/2015	2	2	8	39	47	45%	8	17	32%
	9/8/2015	2	1	5	246	281	47%	14	15	48%
	9/9/2015	2	1	2	6	11	35%	0	0	0%
	9/11/2015	2	2	9	278	380	42%	21	23	48%
	9/14/2015	2	2	8	311	427	42%	21	24	47%
	9/15/2015	2	3	9	202	317	39%	20	35	36%
	9/16/2015	2	1	4	138	225	38%	26	30	46%
	9/17/2015	2	1	2	134	297	31%	40	56	42%
	9/21/2015	2	2	10	315	651	33%	148	143	51%
	9/22/2015	2	1	4	75	181	29%	60	46	57%
	9/23/2015	2	2	10	307	665	32%	141	206	41%
	Subtotal		23	91	2,191	3,602	38%	509	603	46%
Total			29	137	2,763	3,922	41%	564	722	44%

Note: Marked fish includes kept adult fish only. The number of unmarked adults for each set is estimated by applying the proportion of adults in the total kept catch for beach and purse seines combined (0.92 for Chinook and 0.96 for Coho) to the released unmarked fish for the set. "Marked" is adipose fin clipped.

IFQs

One beach seine permittee came close to meeting the IFQ for Chinook salmon, 364 out of a possible 400 (Table 7). Two purse seine permittees reached or came very close to their IFQ for Chinook salmon, 645 and 650 out of 650. The other two purse seine permittees came close to reaching their IFQs for Coho salmon, 188 and 189 out of 200, which reduced the total number of Chinook salmon they could harvest because they ceased fishing at that point in time. The majority of the Coho salmon were caught later in the season, in mid to late September. Only one beach seine permittee handled anywhere near the steelhead handle limit, 151 out of the possible 180, or 84%.

Table 7. 2015 Number of fish kept and released by percentage of individual fishing quota.

Permittee	Gear Type	Total # Sets	Kept Marked			Kept Marked			Released		
			Adult Chinook	IFQ	% of IFQ used	Adult Coho	IFQ	% of IFQ used	Steelhead	IFQ	% of IFQ used
2015001	Beach	27	364	400	91%	26	150	17%	151	180	84%
2015002	Beach	19	208	400	52%	29	150	19%	70	180	39%
2015003	Beach	0	0	400	0%	0	150	0%	0	180	0%
2015007	Purse	36	645	650	99%	50	200	25%	61	150	41%
2015008	Purse	14	650	650	100%	82	200	41%	60	150	40%
2015009	Purse	20	498	650	77%	188	200	94%	74	150	49%
2015010	Purse	21	398	650	61%	189	200	95%	61	150	41%
Total		137	2,763	3,800	73%	564	1,250	45%	477	1,140	42%

Immediate mortalities

Immediate release mortalities were fish found dead in the gear when it was brought in. Unmarked mortalities were released into the river. The 2015 seine fishery included 12 adult Chinook salmon and five adult Coho salmon immediate mortalities (Table 8). Purse seines accounted for all but one of the adult salmon immediate mortalities, though the purse seines also accounted for 86% of all salmon handled in the fishery. All jack immediate mortalities were in the purse seines, the majority of which were unmarked Chinook.

Table 8. 2015 Immediate mortalities released from the seine fishery.

GearType	Species	LifeStage	AdiposeFin	Total
Beach Seine	Chinook	Adult	Marked	1
Purse Seine	Chinook	Adult	Marked	1
	Chinook	Jack	Marked	1
	Chinook	Adult	Unmarked	10
	Chinook	Jack	Unmarked	14
	Coho	Jack	Marked	1
	Coho	Adult	Unmarked	5
	Coho	Jack	Unmarked	3
	Total			

By-Catch

In 2015 more non-salmonid by-catch was caught by the beach seines than purse seines (Table 9). A small number of white sturgeon was caught in the seine fishery, all in the purse seines. This included nine sub-legal white sturgeon, less than 38 inches FL, and five sturgeon greater than 38 inches FL. Although regulations permitted the retention of shad, none of the by-catch was kept during this fishery.

Table 9. 2015 By-catch in the seine fishery.

GearType	ByCatch Species	Number Caught
Beach Seine	Carp	13
	Northern	2
	Smallmouth Bass	28
	Starry Flounder	2
	Sucker	153
Purse Seine	Sub-legal Sturgeon	9
	> Sub-legal sturgeon	5
	Shad	20
	Starry Flounder	8

Summary

In 2015, a non-Indian commercial seine fishery took place between August 24th and September 30th in the Columbia River downstream of Bonneville Dam. It was actively fished from August 31st to September 23rd. A total of seven of the ten possible permits were issued, six of which had fish landings. The beach seiners fished exclusively in Zone 4 and the purse seiners fished exclusively in Zone 2. The two active beach seine permits filled 91% and 52% of their Chinook salmon IFQs. Two of the purse seiners reached their Chinook salmon IFQ (99% and 100 %.) The other two purse seine permits completed 94% and 95% of their Coho salmon IFQs.

Of the salmon kept and released in the 2015 seine fishery, 85% were fall Chinook salmon and 15% were Coho salmon. The four purse seine permits kept 2,312 Chinook salmon and 529 Coho salmon and released 3,893 unmarked Chinook salmon, 615 unmarked Coho salmon and 256 steelhead. The three beach seine permits kept 681 Chinook salmon and 58 Coho salmon, and released 344 unmarked Chinook salmon, 119 unmarked Coho salmon and 221 steelhead. Overall, nearly 3,000 Chinook salmon and 600 Coho salmon were retained in the 2015 seine fishery, including both jack and adult salmon. 55% of the total number of adult Chinook salmon available in the fishery (2,763 out of a possible 5000 fish) were harvested, and 33% of the possible adult Coho Salmon available (564/1700) were harvested.

The overall mark rates were low for adult Chinook (41%) and Coho salmon (44%), similar to what was observed in 2014, though the mark rate for adult Chinook salmon was considerably higher for the beach seines (64%) than purse seines (38%). The mark rates for adult Coho salmon were more similar between gear types, 46% for purse seines and 32% for beach seines.

The beach seiners kept a higher percentage of jack Chinook salmon than the purse seiners. In the purse seines, jack Chinook salmon made up 5% of the total Chinook salmon kept and jack Coho salmon made up less than 4% of the total Coho salmon kept. In the beach seines, jack Chinook salmon made up 16% of the total Chinook salmon kept and jack Coho salmon made up 5% of the total Coho salmon kept.

In 2015, the number of steelhead handled included 221 fish in the beach seines and 256 fish in the purse seines, a total of 477 for both gear types. The mark rate for steelhead was 68%. A total of 154 unclipped steelhead were handled in both gear types. Since not all juvenile hatchery steelhead are adipose fin-clipped, a small proportion of those fish could have been unclipped hatchery fish. Of the total steelhead handled, 157 were B-run, 70 of which were unclipped, and 320 were A-run, 81 of which were unclipped. The ratio of steelhead to marked adult Chinook was 1:3 for the beach seines and was 1:9 in the purse seines.

The immediate mortality rate for fish caught in this fishery was extremely low, less than 0.4% of the total number of salmon and steelhead handled.

The 2015 commercial seine fishery was one component of the overall non-Indian commercial fishing in the lower Columbia River. It provided an opportunity to collect additional information on the feasibility of these gear types in the context of full-scale Columbia River commercial fisheries. All three objectives for this fishery were addressed, including: the collection of steelhead to Chinook salmon ratios by gear type and fishing zone, the Chinook and Coho salmon catch rates by gear type under real-world fishing conditions, and the collection of immediate mortality rates for these two gear types. Further analysis is needed to compare the immediate mortality rates to previous research. For the second year, fishing effort was not distributed widely throughout the lower Columbia River, complicating the modelling of potential full-fleet fisheries. Additional data for beach seining in Zones 2 and 3 and purse seining in Zones 1 and 3 would facilitate more representative full-fleet modeling.

References

Washington Fish and Wildlife Commission Policy Decision. Columbia River Basin Salmon Management. Policy Number: C-3620. January 12, 2013.

Appendix A. Columbia River Compact/Joint State Action Notice

Below is the initial action notice for the seine fishery. The two subsequent notices, Sept. 2nd and Sept. 11th, added additional dates, but all other aspects of the fishery remained the same.

**COLUMBIA RIVER COMPACT/JOINT STATE
ACTION NOTICE**

Washington Department of Fish and Wildlife

August 11, 2015

THE FOLLOWING SEASONS WERE SET:

<i>2015 Non-Indian Mainstem Commercial Seine Fishery</i>	
Participants:	Those individuals possessing a 2015 seine permit issued by Washington or Oregon (Emerging Fishery license and Experimental Fishery Permit in WA, Experimental Gear Permit in OR). Permit holder/designated fisher must be present during fishing operations and have applicable permits/licenses in possession.
Season:	Daily open hours are 6:00 a.m. to 8:00 p.m. through September 11 and (13-14 hours) 6:30 a.m. to 7:30 p.m. thereafter.
Week 35	Monday August 24 and Wednesday August 26 2 periods
Week 36	Monday, Tuesday, Wednesday, and Thursday August 31 – September 3 4 periods
Week 37	Tuesday, Wednesday, and Thursday September 8-10 3 periods
Week 38	Monday September 14 and Wednesday September 16 2 periods
Week 39	Monday September 21 and Wednesday September 23 2 periods
Week 40	Monday September 28 and Wednesday September 30 2 periods
Area:	Mainstem Columbia River in Zones 2-3 (SMCRA 1B, 1C) through August 26 and Zones 2-3 plus upper Zone 4(SMCRA 1B, 1C and upper 1D) thereafter. Lower boundary for seine fishing in Zone 4 is described as a line from USCG light #10 “Red” on the Oregon shore at Henrici Landing across to a wing jetty on the Washington shore at river mile 90.25).
Sanctuaries:	Elokomin-B, Cowlitz, Kalama-B, Lewis-B, Sandy and Washougal Rivers, and Select Area commercial fishing sites.
Gear:	Beach seine or purse seine: <ul style="list-style-type: none"> - Only one seine net is allowed per (primary) vessel. - Mesh size restricted to a 3.5-inch maximum (inside of knot to outside of knot using hand tension stretched measure). - Net material to consist of 3-strand nylon, twine size \geq#12. - Seines may include a bunt of 1.0-2.0 inch knotless mesh. - Net length not to exceed 200 fathoms (NOT including associated lead nets). Net depth not to exceed 200 meshes (approximately 50 feet). - No restrictions on corkline, leadline, or use of stringers and slackers. - A chafing strip panel consisting of non-monofilament webbing (such as nylon seine web or polyethylene trawl web) is allowed on bottom of net; maximum panel depth is 5 feet. Chafing mesh not to exceed 3.5-inch stretched measure for beach seines and 5-inch stretched measure for purse seines. There are no restrictions associated with hangings used to connect the net to the chafing panel or the net or chafing panel to the leadline or corkline. - Red corks are required at 25-fathom intervals and red corks must be in contrast to the corks used in the remainder of the net.

<i>Continued on next page</i>	
Gear: (continued)	Lead net (optional for both gear types): <ul style="list-style-type: none"> - Only one lead net is allowed per fishing operation. - Lead nets may not exceed 100 fathoms in length. Lead nets may be constructed of 3-strand nylon webbing, twine size \geq#12, \leq3.5-inch mesh size (inside of knot to outside of knot using hand tension stretched measure) <u>OR</u> nylon or cotton webbing with mesh size \geq14-inches. Lead nets may not be vertically slackened. - Seine net and lead net may not be connected. - Lead nets must be retrieved daily.
Allowable Sales:	Adipose or left ventral fin-clipped Chinook, adipose-clipped Coho, pink, and sockeye salmon and shad. All legal salmon caught must be kept and sold. Allowable sales are subject to the Individual Fish Quotas (IFQs) as defined on individual permits.
Handling/ Sorting:	Hand sorting or use of a knotless dip net is required when sorting fish. All fish must be sorted and/or released prior to removing entire seine from water. Dry sorting not permitted.
Sort time:	Not to exceed 75 minutes. Beach seine - defined as the elapsed time from when the outer towed end of the net first contacts the shore or block until the net is emptied of fish. Purse Seine - defined as the elapsed time from when all rings are pursed and out of the water until the net is emptied of fish.
Observer Program:	Mandatory.
Catch Reporting:	24-hour quick reporting required for Washington buyers, pursuant to WAC 220-69-240. Electronic fish ticket submission required for Oregon buyers pursuant to OAR 635-006-0210.