Willapa Bay Salmon Advisory Group Meeting

Montesano District Office

November 17, 2018

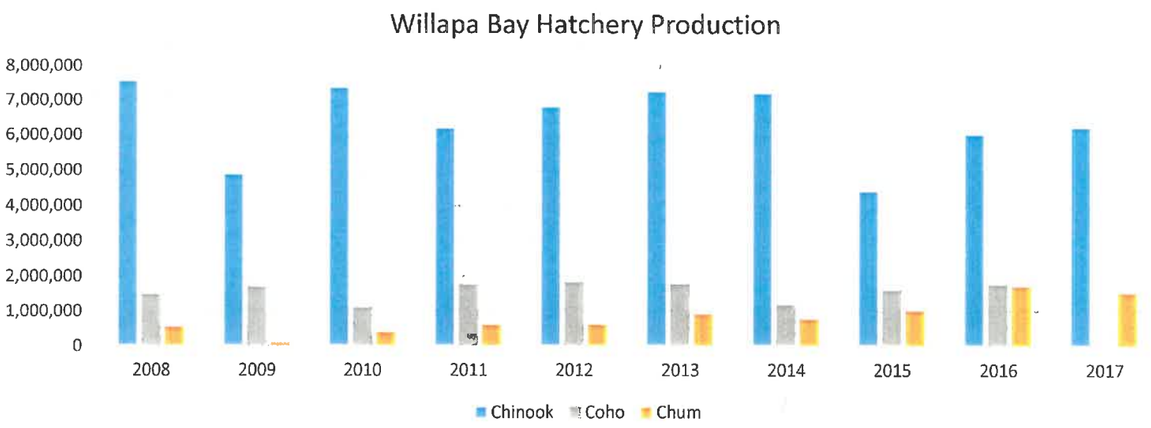
10am – 2pm

10:00	Introductory Comments
10:10	Willapa Bay Hatchery Randy Aho – Hatchery Reform and Operations Manager
10:30	Stock Assessment Program Lyle Jennings – District 17 Area Biologist
11:00	Recreational Fisheries Monitoring Program Barbara McClellan – Willapa Bay Implementation Biologist
11:30	Commercial Fisheries Monitoring Program Barbara McClellan – Willapa Bay Implementation Biologist
12:00	Break
12:15	Review of Relevant Data and General Discussion
1:30	Briefing on November FWC Meeting
1:45	Public Comment
2:00	Adjourn

Washington Department of FISH and WILDLIFE

Washington Department of FISH and WILDLIFE

Willapa Bay Hatchery Production



Brood Year		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Fall Chinook	Forks Creek	2,056,400	2,400,546	3,398,300	3,189,750	3,227,824	3,166,719	3,221,073	379,192	359,538	365,864
	Naselle	3,412,000	865,000	882,000	878,100	940,800	850,000	749,265	788,229	2,499,279	2,531,859
	Nemah	2,094,950	1,614,729	3,102,436	2,143,965	2,670,865	3,260,505	3,264,062	3,259,623	3,185,438	3,358,383
	WB Total	***7,563,350***	***4,880,275***	***7,382,736***	***6,211,815***	***6,839,489***	***7,277,224***	***7,234,400***	***4,427,044***	***6,044,255***	***6,256,106***
Coho											
	Forks Creek	604,900	289,200	338,100	337,693	330,505	319,069	336,043	313,354	309,977	N/A
	Naselle	863,255	1,385,790	755,971	1,410,260	1,489,246	1,441,950	833,365	1,277,431	1,447,124	N/A
	Nemah	0	0	0	0	0	0	0	0	0	0
	WB Total	***1,468,155***	***1,674,990***	***1,094,071***	***1,747,953***	***1,819,751***	***1,761,019***	***1,169,408***	***1,590,785***	***1,757,101***	***0***
Chum											
	Forks Creek	39,200	55,700	256,100	219,500	282,000	313,300	147,600	339,938	605,130	514,029
	Naselle	0	0	0	83,350	120,000	302,610	321,629	335,013	508,341	506,445
	Nemah	487,700	22,550	129,772	291,164	198,200	296,662	300,730	331,625	590,905	500,930
	WB Total	***526,900***	***78,250***	***385,872***	***594,014***	***600,200***	***912,572***	***769,959***	***1,006,576***	***1,704,376***	***1,521,404***

Willapa Bay
Stock Assessment Program

Lyle Jennings
Willapa Bay Stock Assessment Biologist
November 17, 2018
Willapa Bay Policy Review Advisory Workshop

Spawning Escapement Key Terms

- **Index Survey:** A section of stream that is surveyed every 7 – 10 days. Every redd in this section is speciated, flagged and tracked for the duration of its redd life.
- **Supplemental Survey:** Also known as a "Supp." This is a section of river walked during the peak spawn timing of a species. This is only a snapshot of what this reach of river has to offer and is expanded in correlation to a similar index.
- **Unsurveyed Reaches:** These are areas of known spawning habitat not surveyed, but accounted for by expansions.

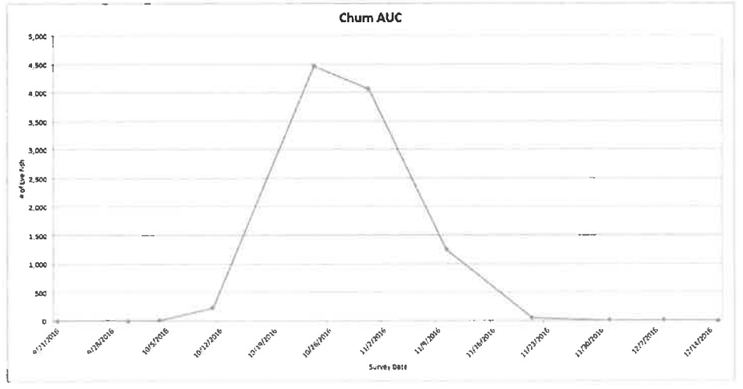
Key Terms: Cont.

- **Redd Accounting:** A spawning escapement methodology utilizing the numbers of redds in Indexes, to expand supplemental surveys done during peak spawn timing.

Photo: Ryan Zimmer

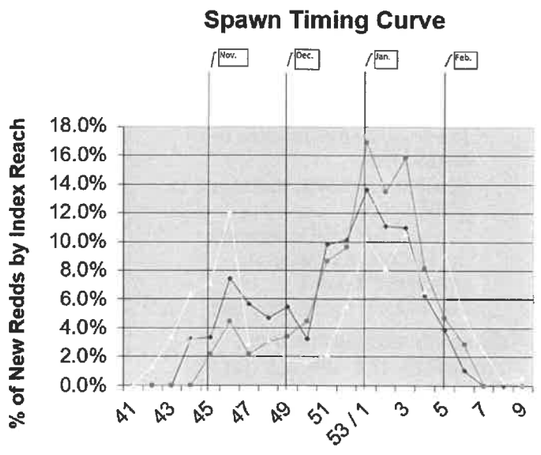
Key Terms: Cont.

- Area Under the Curve (AUC): A spawner escapement methodology utilizing live counts to plot a curve of number of live fish over time and calculating the area under the curve.



Escapement Methodology: Redd Accounting

- The Redd Accounting escapement methodology is utilized for Chinook and Coho
- Due to the large number river miles, only a small proportion can be indexes that are walked on a weekly basis.
  - Indexes allow us to capture the spawn timing curve in order to accurately expand the supplemental surveys.
- Supplemental surveys are used to cover a greater portion of the spawning habitat during the peak spawn timing.



Redd Accounting: Cont.

- Unsurveyed reaches are expanded with redds per mile from surveys of similar geographic location and stream order.
- The total number of redds are expanded to total fish utilizing a standard fish per redd.
  - Chinook are 2.5 fish per redd
  - Coho are 2 fish per redd

Photo: Ryan Zimmer

Redd Accounting Cont.

- Carcass Sampling
  - Scales: Used for age composition
  - Mark Status: Natural or Hatchery Origin Spawner (NOS/HOS)
  - CWT Tag: Stock Composition
  - Pre or post spawn status of all female fish
  - 50 Coho carcasses recovered in 2017.
    - < 0.5% of Total Escapement
  - 1,314 Chinook carcasses recovered in 2017.
    - 14.2% of Total Escapement
- Once an escapement is complete, the carcass data is used to break out the NOS and HOS on the spawning grounds.

Photo: Ryan Zimmer

Escapement Methodology: AUC

- The Chum escapement utilizes the Area Under the Curve (AUC) escapement methodology.
  - This method is better suited for species that are mass spawners.
- An avg. fish life to account for fish counted twice.
  - Chum have a 10 Day fish life
- A regression model has been used in Willapa Bay in order to expand 3 surveys across the basin.

Photo: Ryan Zimmer

Increased Coverage of Spawning Habitat

CHINOOK		INDEXES				SUPPLEMENTALS			
BASIN	Miles of Spawning Habitat	Pre 2016 Surveys (mi.)		Currently Surveyed (mi.)		Pre 2016 Surveys (mi.)		Currently Surveyed (mi.)	
North	38.6	1.5	4%	1.5	4%	8.4	22%	8.4	22%
Willapa	75.0	5.5	7%	5.5	7%	28.5	38%	28.5	38%
Palix	3.4	1.6	47%	1.6	47%	1.0	29%	1.0	29%
Nemah	18.6	0.0	0%	5.7	31%	15.7	84%	11.6	62%
Naselle	49.3	2.0	4%	2.6	5%	28.9	59%	28.3	57%
Bear	8.5	0.0	0%	0.8	9%	1.8	21%	3.7	44%
TOTAL	**193.4**	**10.6**	**5%**	**17.7**	**9%**	**84.3**	**44%**	**81.5**	**42%**

COHO		INDEXES				SUPPLEMENTALS			
BASIN	Miles of Spawning Habitat	Pre 2016 Surveys (mi.)		Currently Surveyed (mi.)		Pre 2016 Surveys (mi.)		Currently Surveyed (mi.)	
North	102.4	5.0	4.9%	6.0	6%	23.4	23%	22.4	22%
Willapa	92.9	3.7	4.0%	6.6	7%	25.3	27%	22.4	24%
Palix	10.8	0.0	0.0%	1.6	15%	2.7	25%	1.1	10%
Nemah	48.0	0.0	0.0%	7.2	15%	8.1	17%	4.3	9%
Naselle	85.2	3.7	4.3%	6.6	8%	19.8	23%	16.9	20%
Bear	11.6	0.0	0.0%	1.4	12%	1.8	16%	3.9	34%
TOTAL	**350.9**	**12.4**	**3.5%**	**29.4**	**8%**	**81.1**	**23%**	**71.0**	**20%**

Index Expansions since 2015

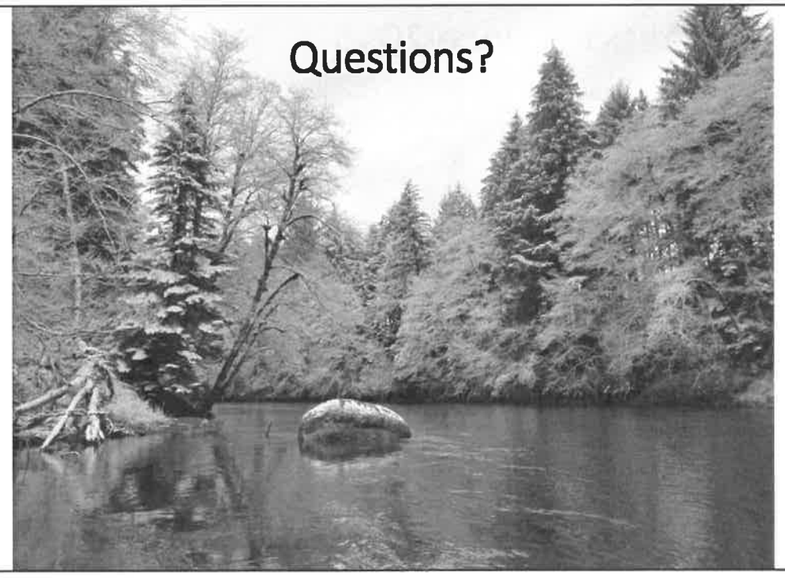
- 16 new Coho Indexes
- 6 new Chinook Indexes
- Full suite of Historical Chum Indexes
  - Increased from 3 to 10 Index surveys
  - Coverage for Chum, Chinook and Coho in the 6 major basins of Willapa Bay

Photo: Ryan Zimmer

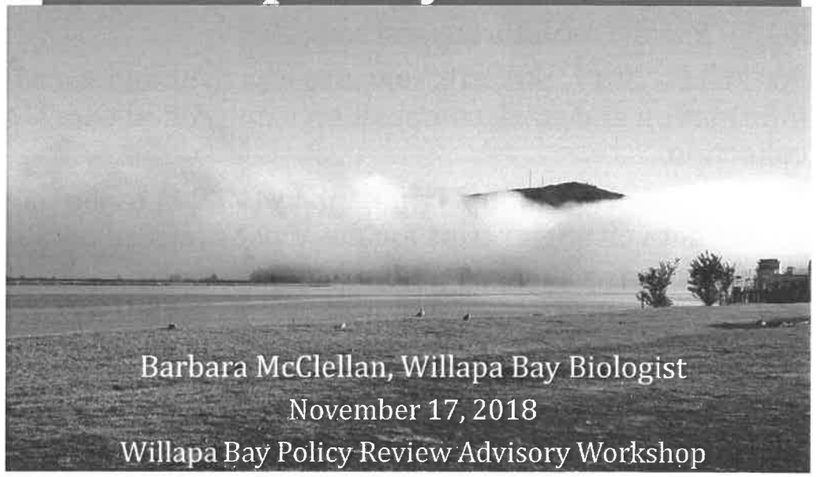
Looking to the Future

- Evaluate escapement goals by species
- Validate spawning habitat frame by species
- Increase understanding of spawner density correlated by habitat unit types
  - Relationships between indexes and supps to unsurveyed reaches
  - Intrinsic potential models
- Increase collection of environmental data
  - Gravel movement (scour/deposit)
  - Temperature profiles

Photo: Ryan Zimmer



Willapa Bay Fisheries



Barbara McClellan, Willapa Bay Biologist
November 17, 2018
Willapa Bay Policy Review Advisory Workshop

Marine Recreational Fishery

Prior to 2015 –

- Fishery was based on pre-season plan through NOF
- No active monitoring of the marine recreational fishery in Willapa Bay

Marine Recreational Fishery cont.

In 2015 – Started monitoring and sampling

- For 2015 – 2017, the main purpose was to assess encounter information and stock composition using coded wire tag collection.
- Also provided Voluntary Trip Reports (VTR's) to the public to collect data on angler trips for those not sampled dockside.
- In 2016 & 2017, increased monitoring by adding genetic collection through recreational volunteer help.
  - 2016 – 15 volunteers, 22 samples collected
  - 2017 – 20 volunteers, 27 samples collected

Marine Recreational Fishery cont.

2016 – 2017:

- Two strata system: Monday – Thursday and Friday – Sunday
- Randomly chose two days/strata = 4 days/stat week
- Dockside monitoring began August 1st once we switched to Willapa specific regulations
- Dockside sampling mainly at Tokeland and throughout the day to cover the tides

	# Dockside Interviews	# Anglers Sampled	# VTRs Collected	# Anglers in VTRs
2016	1,414	3,348	73	168
2017	885	2,046	34	81

Marine Recreational Fishery cont.

In 2018 through Fish & Wildlife Commission guidance, we changed our monitoring program to evaluate not only the stock composition but to now include monitoring effort, estimating catch per unit effort (CPUE), and more thoroughly estimate Willapa-origin marked and unmarked Chinook impacts for the entire recreational fishery through September 30th.

Marine Recreational Fishery cont.

2018:

- July 1st – began monitoring under Ocean Area 2 rules and using Ocean Sampling Program (OSP) protocols
  - Used OSP estimates for Chinook then applied a coded wire tag analysis of recoveries to estimate Willapa-origin Chinook marked and unmarked impacts by stat week

- August 1st - Willapa specific regulations and monitoring shifted from OSP to the region

Marine Recreational Fishery cont.

2018 continued:

- Dockside sampling
- Boat survey
- Test fishing
- Trailer Count at Smith Creek and south bay locations
- VTRs
- Volunteer genetic collection

Marine Recreational Fishery cont.

2018 continued:

- Dockside sampling
  - Similar setup as 2016 and 2017 with two strata and randomly chosen days within each strata
  - Used data collected dockside for # boats sampled and missed as well as # anglers in the sample
  - Expanded both to account for days we were not on the dock
  - Calculated a CPUE for AD Chinook Kept then expanded that to calculate the total number of AD Chinook Kept by strata by stat wk
  - Applied the average % local data from genetic data collected since 2015 to calculate the number of Willapa-origin AD Chinook impacts

Marine Recreational Fishery cont.

2018 continued:

- Similar process for UM Chinook Released except accounted for all possible encounters first then apply the marine area mortality to calculate the number of Willapa-origin UM Chinook impacts.

- Similar process for Coho but no encounters or impacts to account for since all were allowed to be retained. Coho needed to be expanded to account for non-sampled days in the each strata.

	# Boats Sampled	# Anglers Sampled	Expanded # Total Boats	Expanded # Total Anglers	Sample Rate
2018	1,950	4,549	3,575	8,216	55%

Marine Recreational Fishery cont.

2018 continued:

- Boat Survey
  - Purpose is to assess proportional effort by launch location
  - Conducted one day/strata each week
  - Calculated % of those sampled on the water returning to either Tokeland and/or South Bend combined compared to any other location
- Test Fishing
  - Purpose to collect additional genetic samples from unmarked Chinook
  - Additional encounter information of unmarked Chinook
- Trailer Count
  - Each dockside sample day at Tokeland, a trailer count taken at Smith Creek
  - A count was taken in the south bay at the Naselle Wildlife Refuge and Nahcotta dock six times through five weeks in August to check for any effort
    - Only two trailers were counted over those five weeks

Marine Recreational Fishery cont.

2018 continued:

- VTR's
  - Continued providing these as with previous years to collect data on angler trips.

- Volunteer Genetic Collection
  - Similar to previous years with recreational volunteer help
  - 16 volunteers

Commercial Fishery

On-board Monitoring Sample Rate

Prior to 2015 –

- Monitored at a 1% rate or less of the total individual landings
- Had limited staff in order to cover the number of boats that fished

Since 2015 –

- With some additional funds acquired, more on-board monitoring has been possible

Year	On-board Monitoring Rate
2015	29.8%
2016	20.2%
2017	20.4%
2018 *to-date*	*26.7%*

Commercial Fishery

Fish House Sampling

- Purpose is to collect scales for age composition and CWT's for stock composition

	Objective	Avg Sample Rate 2015 - 17
Chinook	20% CWT's	28.81%
Coho	20% CWT's	30.22%
Chum	10% Scales	14.40%

Commercial Fishery

- All data collected from these monitoring programs seeds the impacts by area summary
- This is our full accounting of our harvest and impacts associated with the commercial fishery
- This allows us to compare pre-season expected harvest and impacts to actual harvest in order to inform in-season management actions

Transparency

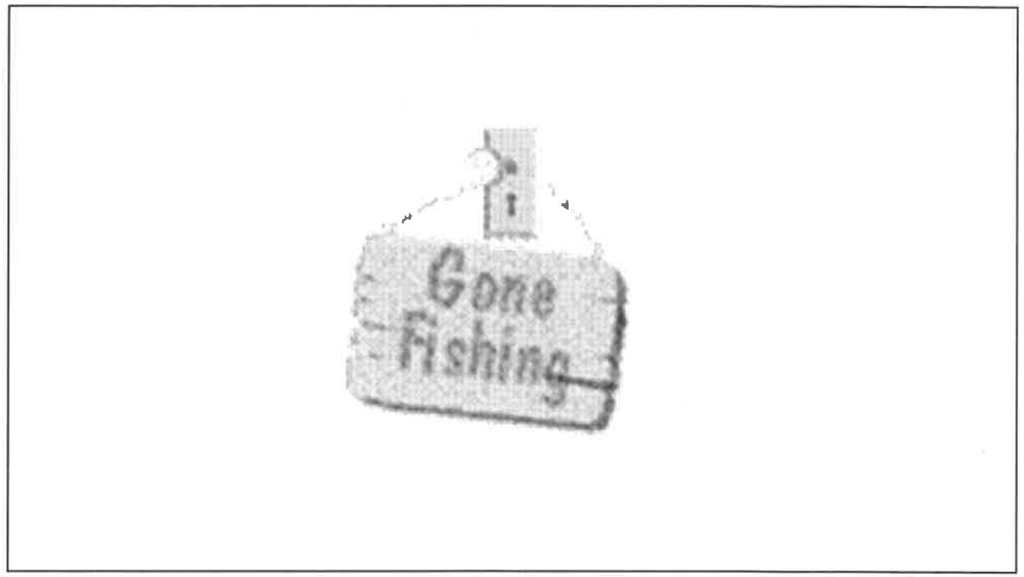
- Weekly updates for both fishery provided via email and website throughout the duration of each fishery
  - In-season Catch Estimation (recreational)
  - Impact by area summary (commercial)

- Total landed harvest for both fisheries have been posted on the website weekly

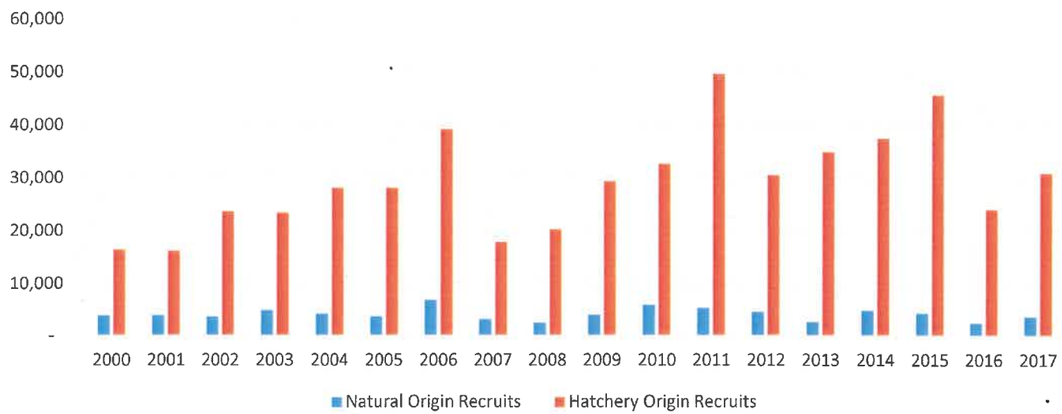
Future

- Addition of the marine area control zone, added a new CWT code to database to assess stock composition between the control zone and the rest of the bay

- Active monitoring of recreational freshwater fisheries to assess harvest and encounters

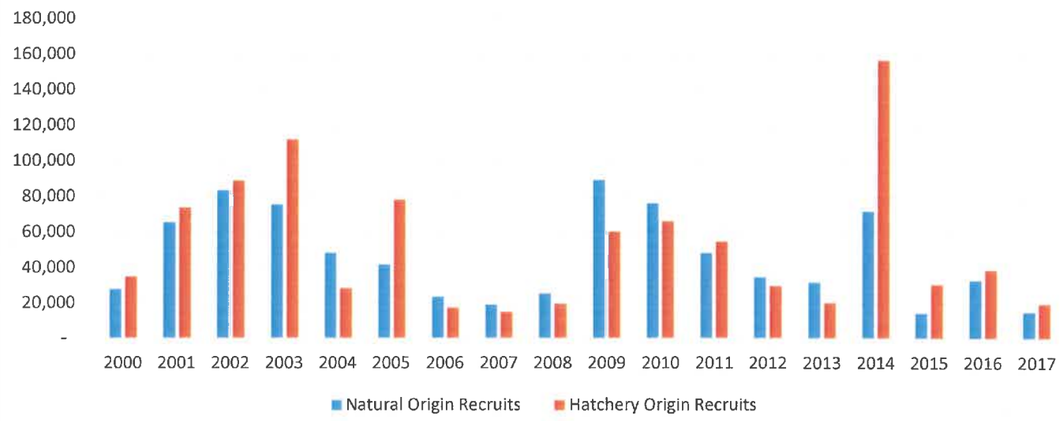

Gone
Fishing

Willapa Bay Chinook Total Runsize



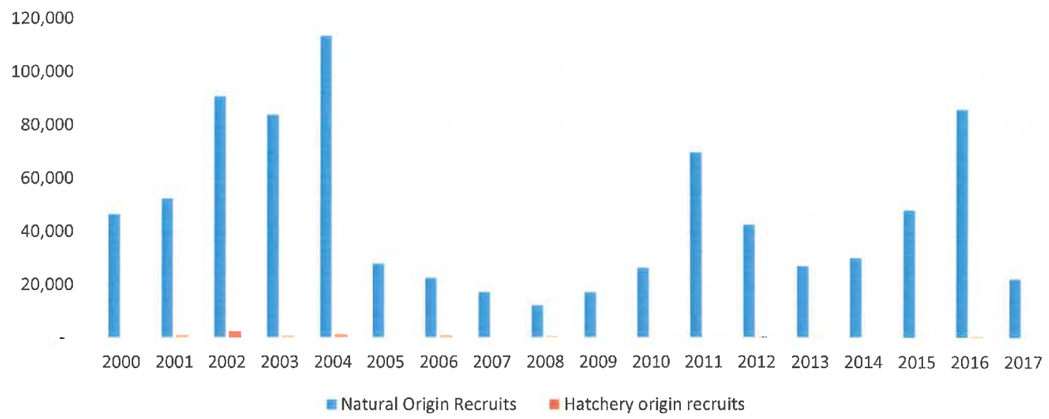
Year	NOR	HOR	Total
2000	3,859	16,363	20,222
2001	3,914	16,124	20,038
2002	3,622	23,607	27,229
2003	4,862	23,323	28,185
2004	4,192	28,063	32,255
2005	3,662	28,096	31,758
2006	6,778	39,190	45,968
2007	3,150	17,808	20,958
2008	2,504	20,193	22,697
2009	4,016	29,323	33,340
2010	5,874	32,606	38,480
2011	5,288	49,656	54,944
2012	4,541	30,474	35,015
2013	2,646	34,866	37,512
2014	4,849	37,436	42,285
2015	4,328	45,662	49,991
2016	2,427	24,003	26,430
2017	3,700	30,917	34,617

Willapa Bay Coho Total Runsize



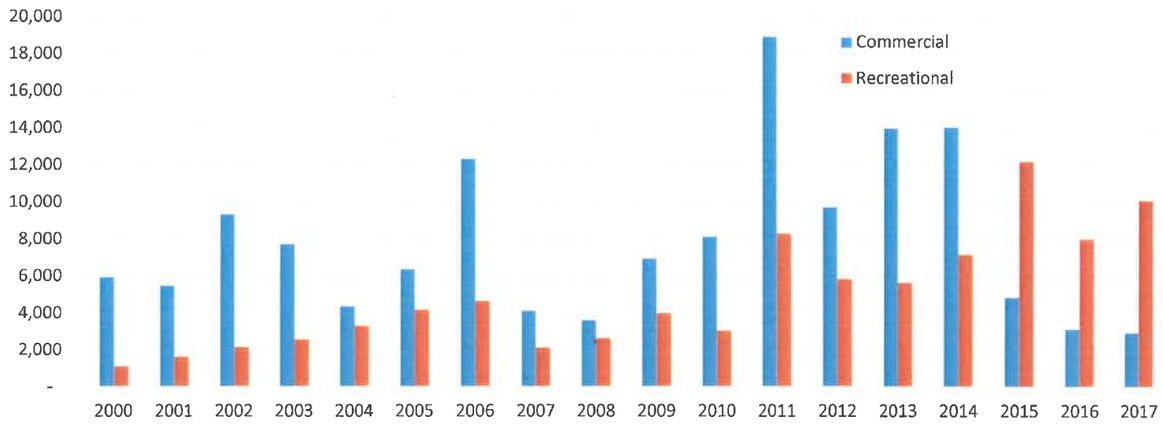
Year	NOR	HOR	Total
2000	28,037	34,968	63,005
2001	65,679	73,902	139,581
2002	83,598	89,045	172,643
2003	75,557	112,214	187,771
2004	48,385	28,354	76,739
2005	41,754	78,221	119,975
2006	23,637	17,477	41,114
2007	19,247	15,008	34,255
2008	25,592	19,671	45,263
2009	89,413	60,300	149,713
2010	76,321	66,176	142,497
2011	48,355	54,677	103,032
2012	34,686	29,638	64,324
2013	31,827	20,292	52,119
2014	71,939	156,970	228,909
2015	14,502	30,667	45,169
2016	32,934	38,818	71,752
2017	15,196	19,767	34,963

Willapa Bay Chum Total Runsize



Year	NOR	HOR	Total
2000	46,666	293	46,958
2001	52,512	1,038	53,550
2002	90,862	2,360	93,222
2003	83,979	798	84,777
2004	113,535	1,223	114,758
2005	27,992	139	28,131
2006	22,665	821	23,486
2007	17,356	312	17,668
2008	12,302	687	12,989
2009	17,288	156	17,444
2010	26,429	272	26,701
2011	69,744	58	69,802
2012	42,589	480	43,069
2013	27,129	512	27,642
2014	30,132	144	30,276
2015	48,234	392	48,626
2016	86,000	693	86,693
2017	22,374	246	22,620

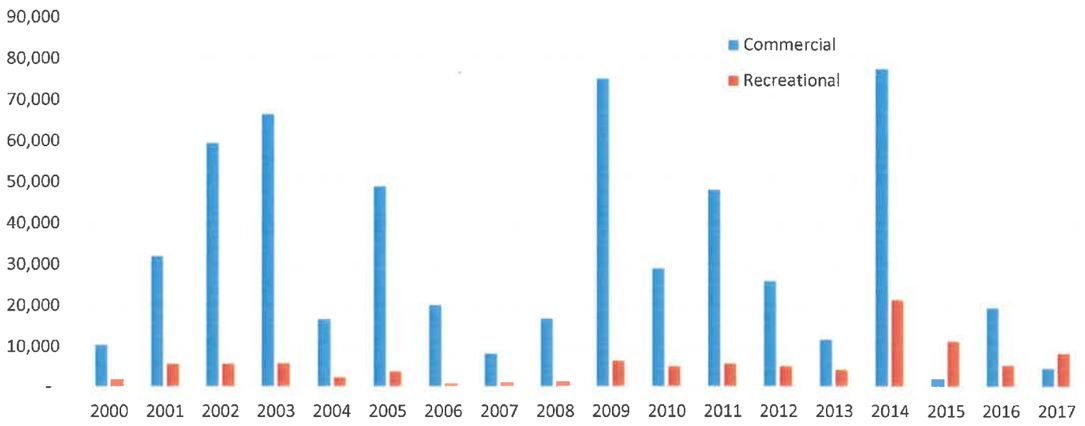
Willapa Bay Chinook Total Landed Harvest



Year	Commercial	Recreational		
		Marine 2-1	Freshwater	Total
2000	5,922	379	726	1,106
2001	5,459	312	1,316	1,628
2002	9,312	567	1,568	2,135
2003	7,699	1,072	1,480	2,553
2004	4,349	1,219	2,066	3,285
2005	6,354	2,488	1,666	4,155
2006	12,318	2,630	2,010	4,640
2007	4,108	970	1,144	2,114
2008	3,595	1,766	861	2,626
2009	6,929	2,278	1,698	3,976
2010	8,113	1,602	1,431	3,033
2011	18,907	3,716	4,557	8,273
2012	9,694	2,547	3,282	5,828
2013	13,966	1,275	4,358	5,633
2014	14,016	3,213	3,948	7,161
2015	4,840	5,785	6,400	12,184
2016	3,142	3,097	4,897	7,994
2017	2,942	4,441	5,636	10,077

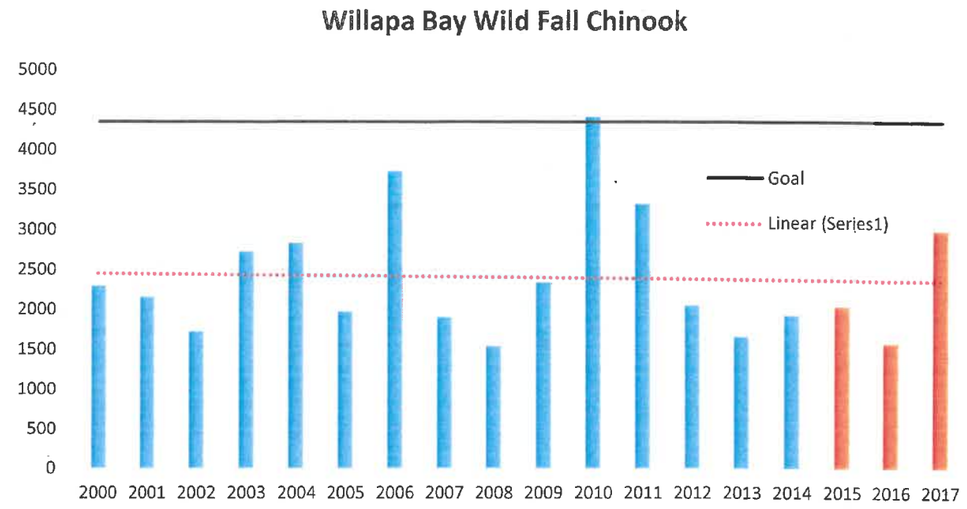
		REC 2-1	Rec FW	Total Rec
Catch	Coho	354	1,426	1,780
	Comm	818	4,889	5,707
2000	10,326	282	5,396	5,678
2001	31,913	581	5,254	5,835
2002	59,435	235	2,126	2,361
2003	66,470	673	3,219	3,892
2004	16,533	237	574	811
2005	48,929	244	711	955
2006	19,948	593	634	1,227
2007	8,189	2,947	3,514	6,461
2008	16,692	189	4,864	5,053
2009	75,095	2,351	3,366	5,717
2010	28,901	1,461	3,591	5,052
2011	47,985	1,248	2,987	4,235
2012	25,783	11,006	10,215	21,221
2013	11,560	8,612	2,544	11,156
2014	77,475	1,427	3,843	5,270
2015	1,926	5,020	3,190	8,210
2016	19,324			
2017	4,615			

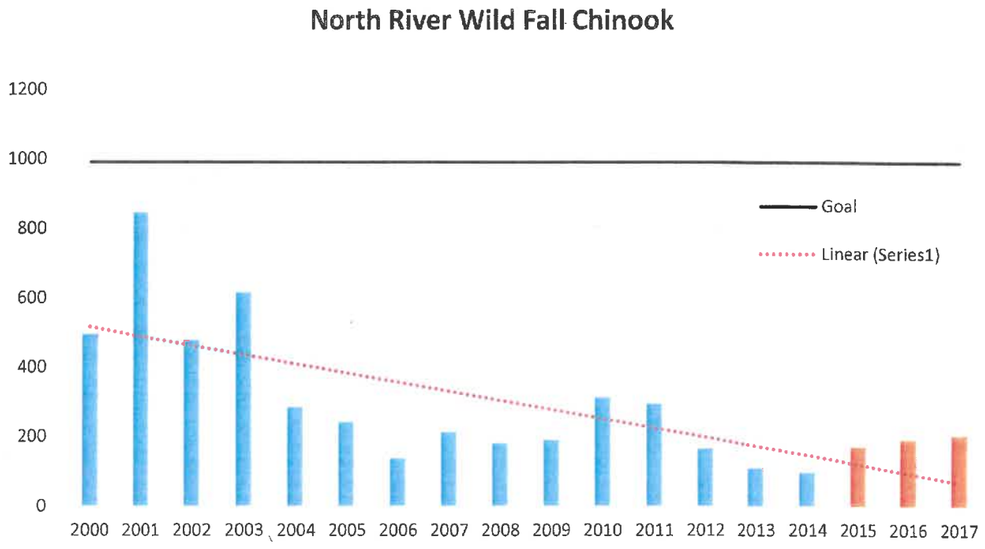
Willapa Bay Coho Total Landed Harvest



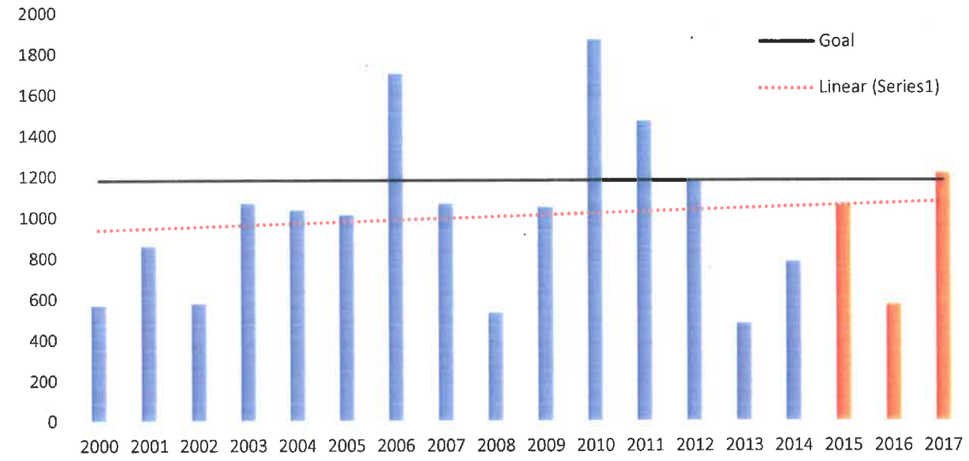
Year	Commercial	Recreational		
		Marine 2-1	Freshwater	Total
2000	10,326	354	1,426	1,780
2001	31,913	818	4,889	5,707
2002	59,435	282	5,396	5,678
2003	66,470	581	5,254	5,835
2004	16,533	235	2,126	2,361
2005	48,929	673	3,219	3,892
2006	19,948	237	574	811
2007	8,189	244	711	955
2008	16,692	593	634	1,227
2009	75,095	2,947	3,514	6,461
2010	28,901	189	4,864	5,053
2011	47,985	2,351	3,366	5,717
2012	25,783	1,461	3,591	5,052
2013	11,560	1,248	2,987	4,235
2014	77,475	11,006	10,215	21,221
2015	1,926	8,612	2,544	11,156
2016	19,324	1,427	3,843	5,270
2017	4,615	5,020	3,190	8,210

Willapa Bay Wild Fall Chinook Spawner Escapements

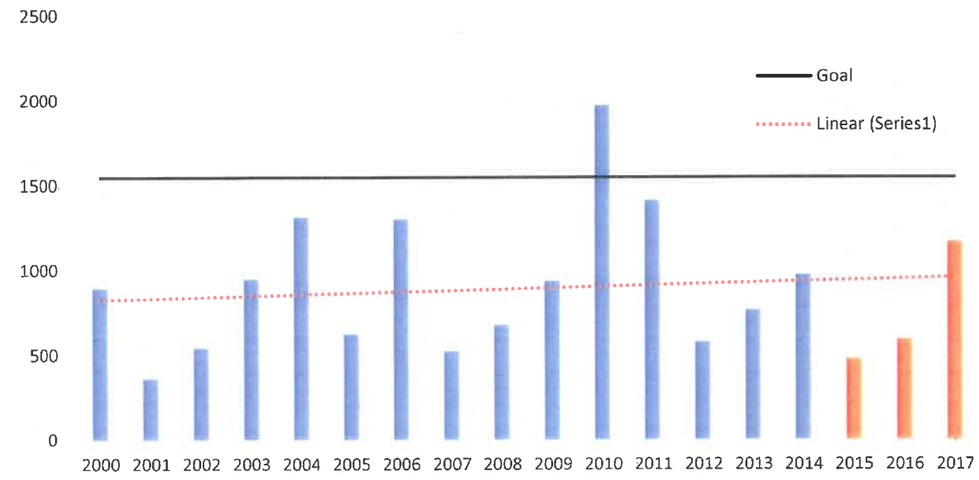




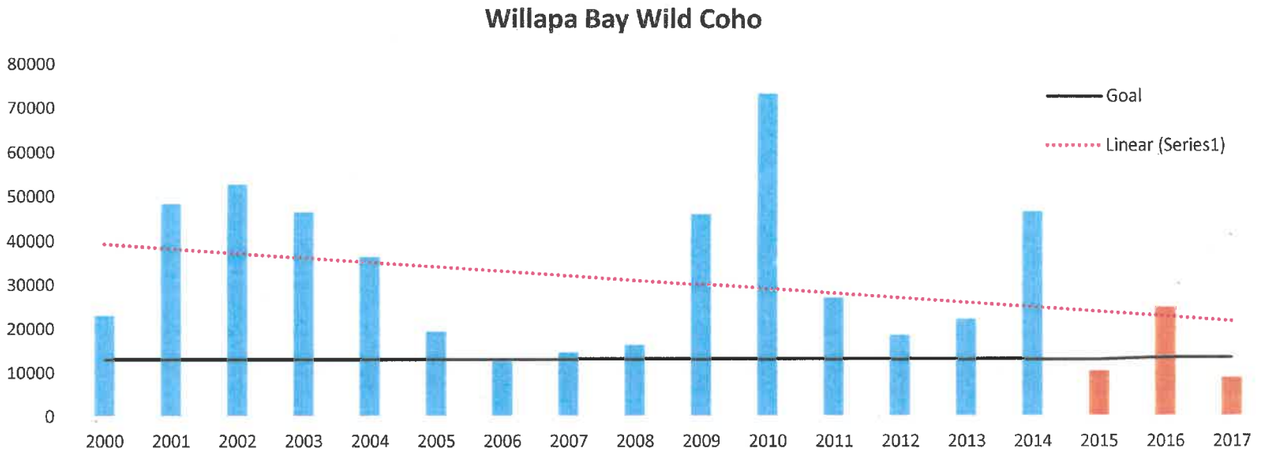
Willapa River Wild Fall Chinook



Naselle River Wild Fall Chinook

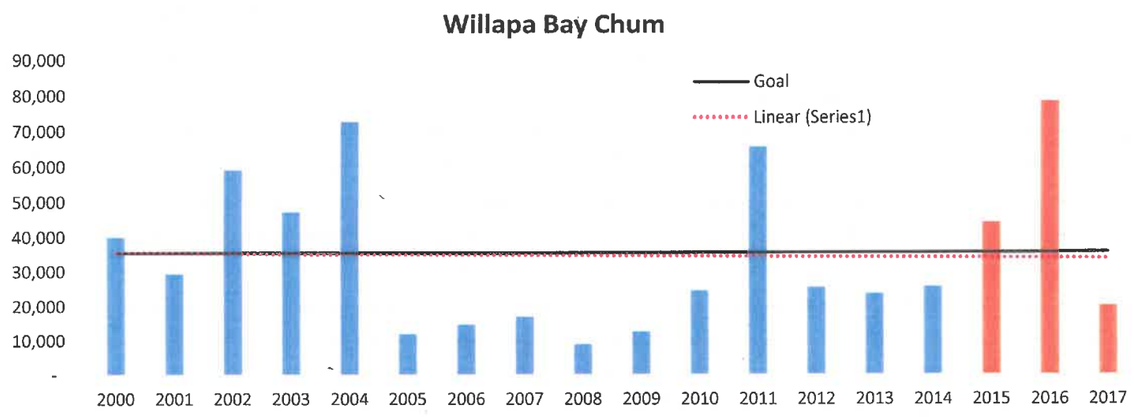


Willapa Bay Coho Spawner Escapement



Spawner Escapement																					
Basin	North R./Smith Cr. - 5286			Willapa River - 4,030			Palix/Niawiakum /Bone - 251			Nemah River - 994			Naselle River - 2,091			Bear River - 438			TOTAL - 13,600		
WB Return Year	NOS	HOS	Total	NOS	HOS	Total	NOS	HOS	Total	NOS	HOS	Total	NOS	HOS	Total	NOS	HOS	Total	NOS	HOS	Total
2000	12,210	0	12,210	6,278	2,842	9,120	333	0	333	1,184	806	1,990	2,761	0	2,761	265	0	265	23,031	3,648	26,679
2001	23,018	0	23,018	9,372	4,422	13,794	1,308	0	1,308	4,598	3,306	7,904	9,694	24	9,718	424	0	424	48,414	7,752	56,166
2002	24,329	0	24,329	15,714	3,517	19,231	546	0	546	1,322	4,218	5,540	8,951	5,967	14,918	1,874	0	1,874	52,736	13,702	66,438
2003	21,498	0	21,498	13,178	3,089	16,267	418	0	418	1,062	3,468	4,530	9,237	2,917	12,154	1,076	0	1,076	46,469	9,474	55,943
2004	16,072	0	16,072	8,668	1,832	10,500	1,274	0	1,274	2,662	3,959	6,621	6,615	2,205	8,820	1,176	0	1,176	36,467	7,996	44,463
2005	9,523	59	9,582	4,052	6,214	10,266	96	96	192	1,401	2,639	4,040	2,570	4,081	6,651	1,827	0	1,827	19,469	13,089	32,558
2006	6,198	144	6,342	2,227	907	3,134	374	0	374	1,430	238	1,668	1,743	387	2,130	653	0	653	12,624	1,677	14,301
2007	6,765	423	7,188	2,775	2,081	4,856	268	0	268	849	1,131	1,980	3,456	0	3,456	562	0	562	14,675	3,635	18,310
2008	7,282	0	7,282	3,387	1,303	4,690	132	198	330	2,463	411	2,874	3,026	257	3,283	102	0	102	16,392	2,169	18,561
2009	26,530	134	26,664	9,410	1,046	10,456	364	0	364	1,860	2,324	4,184	6,564	1,046	7,610	1,372	0	1,372	46,099	4,551	50,650
2010	37,678	292	37,970	10,851	5,008	15,859	1,514	0	1,514	10,168	847	11,015	11,688	4,574	16,262	1,944	0	1,944	73,843	10,721	84,564
2011	12,826	96	12,922	6,751	1,080	7,831	237	237	473	2,765	851	3,616	3,738	2,366	6,104	791	0	791	27,108	4,629	31,737
2012	8,223	88	8,311	4,516	521	5,037	304	0	304	2,326	0	2,326	2,771	1,155	3,926	508	0	508	18,648	1,764	20,412
2013	10,710	0	10,710	4,327	2,163	6,490	392	0	392	2,248	749	2,997	3,952	1,107	5,059	655	0	655	22,284	4,019	26,303
2014	24,254	0	24,254	6,513	8,186	14,699	888	0	888	6,787	0	6,787	6,834	4,623	11,457	1,484	0	1,484	46,760	12,809	59,569
2015	4,392	732	5,124	2,434	2,059	4,493	256	0	256	2,204	0	2,204	687	3,929	4,616	393	0	393	10,366	6,720	17,086
2016	10,839	0	10,839	5,096	1,853	6,949	844	0	844	3,693	0	3,693	3,566	3,864	7,430	912	0	912	24,950	5,717	30,667
2017	5,178	0	5,178	1,106	2,212	3,318	242	0	242	1,594	0	1,594	433	2,471	2,904	350	0	350	8,903	4,683	13,586

Willapa Bay Chum Spawner Escapements



STREAM NAME	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
BEAR RIVER					7,369													
ELLSWORTH CR	4,452	7,988	9,508	18,032	6,610	1,229	1,160	1,715	2,877	1,680	6,363	12,201	3,486	2,377	5,434	10,482	15,404	3,213
TRIB					1,058													
DAVIS CR					970													
WILLIAMS CR					17,625													
CANON RIVER	8,314	6,718	13,627	12,682	17,973	1,970	2,672	3,284	1,830	2,306	5,039	12,459	4,569	2,955	3,771	9,574	9,525	2,211
S.F. WILLAPA RIVER					372													
TRAP CREEK					273													
BITTER CREEK					4,743													
LOWER SALMON CREEK	3,834	4,133	5,086	6,448	6,418	1,377	1,195	1,406	1,203	1,264	4,390	13,180	4,136	6,197	7,357	7,075	7,126	1,911
Sub-Total	16,600	18,839	28,221	37,162	63,411	4,576	5,027	6,405	5,910	5,250	15,792	37,840	12,191	11,529	16,562	27,131	32,055	7,335
WILLAPA BAY TOTAL ESC	**40,030**	**29,389**	**59,243**	**47,347**	**72,923**	**11,924**	**14,717**	**17,085**	**9,008**	**12,629**	**24,546**	**65,764**	**25,519**	**23,642**	**25,612**	**44,147**	**78,725**	**20,191**

Willapa Bay Wild Chinook Impact Rates

2015

Metric		Basin	Objective	Pre-Season		Actual	
				#	%	#	%
Runsize		Willapa	-	1,431	-	1,617	-
		Naselle	-	1,836	-	2,019	-
		Total	-	3,835	-	4,329	-
Spawners		Willapa	1,181	1,145	97.0%	1,064	90.1%
		Naselle	1,547	1,490	96.3%	483	31.2%
		Total	4,353	3,100	71.2%	2,043	46.9%
Commercial Impacts		Willapa	-	208	14.5%	122	7.5%
		Naselle	-	303	16.5%	314	15.6%
		Total	-	581	19.2%	515	11.9%
Recreational Impacts	Marine 2-1	Willapa	-	57	4.0%	161	10.0%
		Naselle	-	21	1.1%	88	4.4%
		Total	-	79	2.1%	255	5.9%
	Freshwater	Willapa	-	21	1.5%	81	5.0%
		Naselle	-	22	1.2%	45	2.2%
		Total	-	75	1.9%	193	4.5%
	Total	Willapa	-	78	5.5%	242	15.0%
		Naselle	-	43	2.3%	133	6.6%
		Total	-	154	4.0%	448	10.3%
Willapa Bay Totals		Willapa	20%	286	**20.0%**	364	**22.5%**
		Naselle	20%	346	**18.8%**	447	**22.1%**
		Total	20%	735	**19.2%**	963	**22.2%**

2016

Metric		Basin	Objective	Pre-Season		Actual	
				#	%	#	%
Runsize		Willapa	-	1,426	-	1,055	-
		Naselle	-	1,622	-	919	-
		Total	-	3,261	-	2,428	-
Spawners		Willapa	1,181	1,148	97.2%	575	48.7%
		Naselle	1,547	1,307	84.5%	597	38.6%
		Total	4,353	2,610	60.0%	1,580	36.3%
Commercial Impacts		Willapa	-	169	11.9%	97	9.2%
		Naselle	-	281	17.3%	173	18.8%
		Total	-	493	15.1%	298	12.3%
Recreational Impacts	Marine 2-1	Willapa	-	80	5.6%	146	13.8%
		Naselle	-	12	0.7%	32	3.5%
		Total	-	92	2.8%	179	7.4%
	Freshwater	Willapa	-	30	2.1%	12	1.1%
		Naselle	-	21	1.3%	20	2.2%
		Total	-	66	2.0%	42	1.7%
		Willapa	-	110	7.7%	158	15.0%

Willapa Bay Wild Coho Harvest Rates

2015

Metric		Objective	Pre-Season		Actual	
			#	%	#	%
Runsize			38,505		14,502	
Spawners		13,090	26,795	204.7%	10,366	79.2%
Commercial Harvest			8,963	23.3%	440	3.0%
Recreational Harvest	Marine 2-1		767	2.0%	2,775	19.1%
	Freshwater		1,981	5.1%	498	3.4%
	Total		2,748	7.1%	3,273	22.6%
Willapa Bay Total Harvest			**13,706**	**35.6%**	**3,713**	**25.6%**

2016

Metric		Objective	Pre-Season		Actual	
			#	%	#	%
Runsize			37,069		32,934	
Spawners		13,600	26,012	191.3%	24,950	183.5%
Commercial Harvest			6,367	17.2%	5,628	17.1%
Recreational Harvest	Marine 2-1		2,043	5.5%	403	1.2%
	Freshwater		2,647	7.1%	1,613	4.9%
	Total		4,690	12.7%	2,015	6.1%
Willapa Bay Total Harvest			**11,057**	**29.8%**	**7,643**	**23.2%**

2017

Metric		Objective	Pre-Season		Actual	
			#	%	#	%
Runsize			34,425		15,196	
Spawners		13,600	20,719	152.3%	8,903	65.5%
Commercial Harvest			8,063	23.4%	2,781	18.3%
Recreational Harvest	Marine 2-1		3,183	9.2%	1,588	10.5%
	Freshwater		2,461	7.1%	1,074	7.1%
	Total		5,644	16.4%	2,662	17.5%
Willapa Bay Total Harvest			**13,707**	**39.8%**	**5,443**	**35.8%**

Willapa Bay Wild Chum Harvest Rates

2015

Metric		Objective	Pre-Season		Actual	
			#	%	#	%
Runsize			39,994		48,234	
Spawners		35,400	35,986	101.7%	44,147	124.7%
Commercial Harvest			3,704	9.3%	3,116	6.5%
Recreational Harvest	Marine 2-1		0	0.0%	9	0.0%
	Freshwater		304	0.8%	176	0.4%
	Total		304	0.8%	185	0.4%
Willapa Bay Total Harvest			**4,008**	**10.0%**	**3,301**	**6.8%**

2016

Metric		Objective	Pre-Season		Actual	
			#	%	#	%
Runsize			47,555		86,000	
Spawners		35,400	42,855	121.1%	78,725	222.4%
Commercial Harvest			4,425	9.3%	5,546	6.4%
Recreational Harvest	Marine 2-1		0	0.0%	20	0.0%
	Freshwater		275	0.6%	195	0.2%
	Total		275	0.6%	215	0.3%
Willapa Bay Total Harvest			**4,700**	**9.9%**	**5,762**	**6.7%**

2017

Metric		Objective	Pre-Season		Actual	
			#	%	#	%
Runsize			57,726		22,374	
Spawners		35,400	51,932	146.7%	20,191	57.0%
Commercial Harvest			5,507	9.5%	482	2.2%
Recreational Harvest	Marine 2-1		0	0.0%	9	0.0%
	Freshwater		287	0.5%	141	0.6%
	Total		287	0.5%	150	0.7%
Willapa Bay Total Harvest			**5,794**	**10.0%**	**632**	**2.8%**

2018 Willapa Bay Marine Area Recreational Catch Estimate

PRELIMINARY/DRAFT

CHK = Chinook
AD = Adipose clipped (hatchery origin)
UM = Unmarked

CPUE = Catch per unit effort
Effort = An individual angler trip

July (Ocean 2 Rules

Stat Week	Anglers	Estimated Total Chinook Kept	Total Chinook CPUE	Estimated Total AD Chinook Kept	**Willapa Origin Chinook AD Impacts**	Estimated Total UM Chinook Kept	**Willapa Origin Chinook UM Impacts**	Estimated Total Coho Kept	Estimated Total AD Coho Kept	Estimated Total UM Coho Kept	Coho CPUE
26	72	1	0.014	1	**0**	0	**0**	0	0	0	0.000
27	206	27	0.130	26	**8**	1	**0**	1	1	0	0.005
28	202	19	0.096	16	**5**	3	**1**	0	0	0	0.000
29	202	14	0.071	10	**3**	4	**1**	0	0	0	0.000
30	255	31	0.123	24	**7**	7	**2**	1	1	0	0.004
31	102	8	0.078	6	**2**	2	**1**	0	0	0	0.000
Season Total	1,038	101	0.097	83	**25**	18	**5**	2	2	0	0.002

August

Stat Week	Dates	Strata	Strata Description	# Boats Sampled	# Boats Not Sampled	# Total Boats	Expanded # Total Boats	Sample Rate	# Anglers Sampled	# Anglers per boat	Expanded # Total Anglers	# CHK AD Kept	# CHK UM Kept	CHK AD CPUE	Expanded # CHK AD Kept	**# WB Origin CHK AD Impacts**	# CHK UM Released	CHK UM CPUE	Estimated CHK UM Encounters	Estimated Total CHK UM Impacts	**# WB Origin CHK UM Impacts**	# Coho AD Kept	Coho AD CPUE	Expanded # Coho AD Kept	# Coho UM Kept	Coho UM CPUE	Expanded # Coho UM Kept	Total Coho CPUE (AD+UM)	Total Expanded # Coho Kept (AD + UM)
31	8/1 - 8/2	1	Wed-Thur	11	0	11	25	45%	23	2.09	51	0	0	0.000	0	**0**	0	0.000	0	0	**0**	0	0.000	0	0	0.000	0	0.000	0
31	8/3 - 8/5	2	Fri-Sun	150	10	160	178	84%	362	2.41	430	17	0	0.047	20	**13**	12	0.033	14	2	**1**	2	0.006	2	0	0.000	0	0.006	2
32	8/6 - 8/9	1	Mon-Thur	84	2	86	192	44%	174	2.07	397	18	0	0.103	41	**27**	6	0.034	14	2	**1**	3	0.017	7	0	0.000	0	0.017	7
32	8/10 - 8/12	2	Fri-Sun	120	2	122	204	59%	271	2.26	460	45	0	0.166	76	**50**	5	0.018	8	1	**1**	2	0.007	3	1	0.004	2	0.011	5
33	8/13 - 8/16	1	Mon-Thur	110	9	119	265	41%	245	2.23	591	36	0	0.147	87	**56**	8	0.033	19	3	**2**	2	0.008	5	1	0.004	2	0.012	7
33	8/17 - 8/19	2	Fri-Sun	249	16	265	443	56%	662	2.66	1,177	111	0	0.168	197	**129**	25	0.038	44	6	**4**	11	0.017	20	6	0.009	11	0.026	30
34	8/20 - 8/23	1	Mon-Thur	187	3	190	423	44%	415	2.22	940	91	0	0.219	206	**134**	16	0.039	36	5	**3**	9	0.022	20	2	0.005	5	0.027	25
34	8/24 - 8/26	2	Fri-Sun	222	9	231	386	58%	543	2.45	944	62	3	0.114	108	**70**	18	0.033	31	4	**3**	20	0.037	35	10	0.018	17	0.055	52
35	8/27 - 8/30	1	Mon-Thur	143	4	147	328	44%	315	2.20	722	35	0	0.111	80	**52**	16	0.051	37	5	**3**	13	0.041	30	6	0.019	14	0.060	44
35	8/31 - 9/2	2	Fri-Sun	348	27	375	418	83%	860	2.47	1,033	144	0	0.167	173	**113**	50	0.058	60	8	**5**	78	0.091	94	29	0.034	35	0.124	128
36	9/3 - 9/6	1	Mon-Thur	133	6	139	310	43%	263	1.98	612	41	1	0.156	95	**62**	16	0.061	37	5	**3**	24	0.091	56	13	0.049	30	0.141	86
36	9/7 - 9/9	2	Fri-Sun	82	6	88	147	56%	198	2.41	355	8	0	0.040	14	**9**	7	0.035	13	2	**1**	25	0.126	45	11	0.056	20	0.182	65
37	9/10 - 9/13	1	Mon-Thur	41	5	46	103	40%	76	1.85	190	2	0	0.026	5	**3**	2	0.026	5	1	**0**	18	0.237	45	6	0.079	15	0.316	60
37	9/14 - 9/16	2	Fri-Sun	35	14	49	82	43%	72	2.06	168	6	1	0.083	14	**9**	3	0.042	7	1	**1**	22	0.306	51	15	0.208	35	0.514	87
38	9/17 -9/20	1	Mon-Thur	20	2	22	49	41%	39	1.95	96	0	0	0.000	0	**0**	0	0.000	0	0	**0**	3	0.077	7	2	0.051	5	0.128	12
38	9/21/2018	2	Fri	4	2	6	7	60%	10	2.50	17	0	0	0.000	0	**0**	0	0.000	0	0	**0**	0	0.000	0	0	0.000	0	0.000	0
39	9/27/2018	1	Thur	2	0	2	2	90%	4	2.00	4	0	0	0.000	0	**0**	0	0.000	0	0	**0**	0	0.000	0	0	0.000	0	0.000	0
39	9/28 - 9/30	2	Fri - Sun	9	0	9	15	60%	17	1.89	28	0	0	0.000	0	**0**	0	0.000	0	0	**0**	2	0.118	3	1	0.059	2	0.176	5
				1,950	117	2,067	3,575	55%	4,549	2.33	8,216	616	5	0.135	1,118	**728**	184	0.040	326	46	**30**	234	0.051	423	103	0.023	192	0.074	615