Chinook Salmon Harvest Performance Report for Skokomish and Puyallup River Chinook Salmon: 2011-2014 Fishing Years

Preliminary Draft

1/26/2018

Introduction

In the 2017 Puget Sound Co-manager Chinook Harvest Plan (Parker and Unsworth 2017), the co-managers 'agreed to produce a performance report to assess fishery management actions affecting achievement of objectives specified in the Puget Sound Chinook Harvest Plan for Puyallup and Skokomish management units'. This agreement acknowledged to update previous assessments with recently available information for 2013, 2014, and 2015 season. However, all requisite data for a 2015 post-season FRAM run are not currently available and a full assessment of model, forecast, and management errors are not possible. Available information for the 2015 fishing season for commercial catch and observed natural escapements have been provided to NOAA (PSTIT and WDFW 2016) as well as recreational catch through March 31, 2016 in PSTIT and WDFW (2017).

The Biological Opinion further stated in the Terms and Conditions, '…5(a)i(a) the report will include a review of past performance as well as recently available information for the 2013, 2014, 2015" (emphasis added). While there was no commitment in the co-manager submission to review past performance assessments, this report will incorporate information from 2011 and 2012 fishing season. The following assessment outlined below is intended to develop an evaluation to comply with Terms and Conditions 5(a)i(a-c).

Within the 2017 Biological Opinion, NOAA also provided an additional Term and Condition to the reporting component beyond what co-managers committed to in their Harvest Plan submittal. Term and Condition 5(a)i(d), requires a post-season accounting of the best available information on run-sizes, terminal harvest rates, and all pertinent events and observations related to management of the terminal fisheries in 2016 and 2017. The best available information (escapement and terminal net catch) to inform such accounting for 2016 has already been provided to NOAA in the 2016 Postseason Harvest and Escapement Report (PSTIT and WDFW 2017) submitted on September 28, 2017. Information on the 2017 fishing season, will not be available for several months, but would be preliminarily available sometime in February in information reported to NOAA under Term and Condition 5(b) of the 2017 BIOP. Until a complete accounting of all terminal fishery impacts are available, estimation of terminal runsize and terminal harvest rates would be premature and inaccurate.

In 2017, the Chinook FRAM model was updated with more a current brood year (brood years 2005-2008) base period dataset. Prior to this, the Chinook FRAM model relied on an older base period data set (1974-1979 brood years). All data provided in this report are derived from pre- and post-season FRAM models utilizing the old base period.

Methods

Assessment for T&C 5(a)i(a-c):

Pre-season Chinook FRAM model runs used in this assessment were: "Chin1811final0706", "Chin1512_Final April 9 updated descriptions", "Final Chin1213 NT Sport Skok Update (3yr) Trty Skok (6yr) Original PSF-mrd 7-25-13", and "FinalChin2814 – PostPFMCRevision" for fishery years 2011, 2012, 2013, and 2014, respectively. Post-season FRAM model runs

conducted on 5-December-2017 using the old-base period were utilized for post-season comparisons.

Model Error

Model error is evaluated by comparing pre-season FRAM ER estimates with post-season FRAM ER estimates. While the post-season runs used here represent the best available post-season information, it is important to note the following differences between pre- and post-season modeling methodologies that can cause ERs to differ:

- Methods used to determine abundances of age-2 Chinook varied between pre- and post-season runs. For pre-season modeling, the age-2-from-3 methodology was implemented beginning in 2014 and was used for stocks that lacked Age-2 forecasts. This method uses abundances of age-3 fish (in that same model run) to determine the abundance of age-2 fish. Prior to 2014, when age-2 forecasts were not provided they would have been modeled using a static input. In post-season runs, age-2 abundances were derived for all stocks using the age-2-from-3 methodology on a brood year basis, meaning that age-2 abundances in year 'x' were derived using age-3 abundances from year 'x+1'. While this creates a biological link between age-2 and age-3 abundances, it can create a disconnect between the pre- and post-season model runs. Age-2-methodlogy differences between pre- and postseason are responsible for adding an approximately 1.5% exploitation to Puyallup stock (average over 2011-14 period). Going forward the age-2-from-3-methodlogy will be implemented pre-season as well as post-season, thus addressing the source of this discrepancy.
- In the 2011-14 pre-season model runs, WCVI and NBC sport fishery inputs were developed using AABM catches only. During development of the new Chinook FRAM base period, however, it was identified that Puget Sound Chinook stocks were also intercepted in the ISBM portions of these fisheries. Thus, when post-season catches were compiled, both the AABM and ISBM catches were included. This results in additional impacts being assigned to these fisheries in post-season runs resulting in the addition of approximately 1.1% ER on Puyallup and 0.8% on Skokomish (2011-14 average) Going forward these fisheries will be modeled with ISBM catches included in pre-season as well as post-season runs, thus addressing the source of this discrepancy.
- Catches for most northern (Alaska and Canada) fisheries are obtained through PSC Chinook Technical Committee reports and are only available in terms of annual catch. Apportioning of total catch into time steps is done by modelers using the best information available at the time. As a results, there have been inconsistencies in the way that annual catches in some fisheries have been allocated to individual time steps, making it difficult to compare pre- and post-season mortalities within time steps. Due to this, for the purposes of northern fishery assessment in this report, we recommend only comparing annual totals.
- The units in which Skokomish natural Chinook were forecasted varied both between years of pre-season runs and between pre- and post-season runs. For 2011-12 pre-season runs, the forecast for Skokomish natural Chinook placed all natural spawners (regardless

of origin or mark-status) in the "Natural Unmarked" category. As data improved, forecasts for 2013-14 pre-season placed all natural spawners (regardless of origin) in the "Natural" category, but did provide a breakout by mark-status. During post-season modeling exercises, considerable effort was devoted to compiling the observed terminal abundances, resulting in natural spawning abundances that were apportioned by both origin and mark-status. While exploitation rates should be relatively robust to these differences, comparisons of natural-origin abundances and AEQ impacts by ad clip and HOR/NOR are not appropriate for 2011-2012 and are slightly biased in 2013-2014.

It is also worth noting that a comparison of the preseason and postseason FRAM runs presented here is constrained by impacts of forecast error for the management units and Aggregate FRAM stocks of interest in this report, as well as all other Chinook FRAM stocks in the model.

For evaluation purposes, pre-season exploitation rates (ER) were compared with post-season ERs both in terms of absolute error and relative error. Absolute error was calculated as:

$$\text{Absolute Difference } (\Delta_A) = \text{Post-season ER} - \text{Pre-season ER} \quad (1)$$

Relative error was calculated as:

$$\text{Relative Error } (\Delta_R) = (\text{Absolute Difference } (\Delta_A) / \text{Pre-season ER}) * 100$$

Based on co-manager discussions, consistent thresholds were identified to highlight fisheries of interest with measurable impacts to Puyallup River fall Chinook Salmon and Skokomish River fall Chinook Salmon. Thresholds were determined in order to eliminate from further consideration fisheries with minimal impacts to either stock of interest. For instance Skagit Bay net fishery resulted in ~2,000% relative error on Puyallup un-marked Chinook although pre and postseason AEQ impacts were both <0.05 fish. Therefore, fisheries with absolute error greater than 0.1% and relative error greater than either 25% or 50% were highlighted for further assessment. Additionally, fisheries with greater than 1.0% absolute error, regardless of relative error rate were also highlighted for further assessment.

Although specific harvest management objectives were not defined for the marked components for either Management Units, they are an important component of the overall management strategies co-managers implement for these stocks. Impacts to the marked component are noted briefly in text with more detailed data provided in the Appendices.

Management Error

Based on results of the "Model Error" analysis (see above), the "Management Error" assessment narrows the focus to those fisheries which exceeded the set threshold triggers noted in "Model Error" assessment. The "Management Error" assessment utilized the FRAM "fishery mortality report", which describes total impact to all FRAM Chinook stocks in a fishery by timestep, to evaluate whether specific fisheries were impacting more Chinook Salmon overall, than expected pre-season based on adult equivalent (AEQ) mortality of all stocks encountered in the fishery during each timestep. For assessment purposes, aggregate fisheries (e.g. SEAK, Canadian, etc.) were disaggregated to evaluate specific fisheries performance. For instance, Canadian fisheries are all separated into their individual components (i.e. WCVI sport, N/C BC net fishery, etc.).

Furthermore, the 'Management Error' assessment evaluates impacts from those fisheries which exceed the threshold trigger, on the specifc management units of interest by time step. This assessment utilized the FRAM 'Stock mortality reports' which estimates the specific fishery impacts on individual FRAM stocks. Because both the Puyallup River fall and Skokomish River fall Chinook are components of aggregate FRAM stocks, (Mid-Puget Sound fall fingerling and Hood Canal fall fingerling, respectively), the unmarked aggregate abundances (Appendix A Table 30-Table 33 and Appendix B Table 38-Table 41) were apportioned into specific management units based on proportions of the total aggregate abundance that each individual stock makes up. AEQ mortalities on the Hood Canal FF and Mid-Puget sound FF aggregate were taken from TAMM tables 2dF and were multiplied by breakout proportions on input page to calculate AEQ impacts on Skokomish and Puyallup marked and unmarked. However, the breakout proportions were affected by the Skokomish input differences between pre2011-12, pre 2013-14 and post 2011-14. Comparing pre-post AEQ impacts by ad clip and hatchery/natural are not appropriate for 2011-2012 and are slightly biased in 2013-2014

Taken together, the Fishery Mortality Reports and Stock Mortality Reports help evaluate potential management concerns in the fisheries versus potential concerns as a result of the FRAM/forecasting issues. As noted previously, it is imperative to recognize the changes in the Skokomish TAMM Input methodologies when drawing conclusions regarding the AEQ impacts on un-marked, as well as marked, Skokomish River fall Chinook Salmon.

Forecast Error

Forecast error, defined as the assessed difference (absolute and relative percent difference) between pre-season expectations and post-season observations, is evaluated for both management units and aggregate FRAM stocks. This assessment further compares the observed escapement with both the FRAM pre-season estimated escapement as well as the UMT and LAT thresholds. As described below for each stock, the UMT and LAT are the anticipated escapement ranges that the specified ER objectives are expected to provide.

Forecast Error is also constrained by Model Error and Management Error considering both factors can influence what the FRAM model estimates reaching the Terminal and/or extreme terminal areas and since terminal run-size is confounded by pre-terminal fishery impacts. As a result, forecast error is not expressly tied to inconsistency in forecasting methodology. This assessment attempts to evaluate these combined constraining factors by also assessing the Aggregate Stock starting cohort size using the FRAM Population Statistics output, but is constrained by development of the age-2-from-3 methodology implemented in 2014.

RESULTS

Puyallup Fall Chinook MU

Fishery impacts on the Puyallup Fall Chinook management unit (MU) exceeded the implemented exploitation rate objective of 50% Total ER three out of the four years between 2011 and 2014 (Table 1). Several fisheries throughout the entire migratory range of Puyallup River Fall Chinook Salmon had greater levels of impacts than estimated pre-season based on FRAM pre-season and post-season model results. From 2011 through 2014, positive absolute and relative errors ranged over several magnitudes for the unmarked component of the MU (Table 2). Several fisheries had consistent positive errors on the unmarked component across all four years including SEAK fisheries, Treaty Ocean troll, as well as marine sport fisheries in Areas 5, 6, 7, 9, 10, 11, 12, and 13. However, only marine sport fisheries in Areas 6, 9, 10, and 11 exceeded pre-season impacts above the threshold triggers for all four years. Absolute error in these marine sport fisheries ranged from 0.1% to 1.7%, while relative error ranged from 30% to 178%. The largest positive absolute error on the unmarked component occurred in Canadian fisheries in 2012 and 2014, which resulted in ERs 10 percentage points higher than expected (Table 2). In SUS fisheries, the greatest absolute error on unmarked Puyallup Chinook occurred in freshwater sport fisheries in 2011 and 2013, at 4.32% and 1.94% respectively. After applying the threshold criteria, the greatest relative error (383%) occurred in the Area 13 sport fishery in 2011 (Table 2).

Fishery impacts on the marked component showed better consistency in error, although ER exceedances occurred throughout the migratory range as well (Appendix A.)

Table 1. Total pre-season and post-season exploitation rate estimates for Puyallup River fall Chinook Salmon, 2011-2014.

Management Year	Pre-season ER Estimate (Total)	Post-season ER Estimate (Total)	**Absolute Difference**
2011	48.3%	52.3%	**4%**
2012	48.5%	60.4%	**12%**
2013	50.0%	44.9%	**-5%**
2014	49.5%	60.5%	**11%**
Avg.		54.5%	**5%**

Table 2. Puyallup unmarked Chinook ER absolute and relative error rates in fisheries from 2011 to 2014. Pink highlighted cells denote fisheries with ≥0.1% absolute error and relative error between 25% and 50%. Red highlighted cells denote fisheries with absolute error ≥0.1% and relative error greater than 50% or absolute error >1.0%.

	2011		2012		2013		2014		AVERAGE	
Fish_Name	Abs Err	Rel Err	Abs. Err	Rel. Err.	Abs. Err	Rel. Err.	Abs. Err.	Rel. Err	Abs. Err.	Rel. Err
SEAK	0.1%	46%	0.2%	71%	0.0%	21%	0.0%	16%	**0.1%**	**38%**
Canadian	-3.5%	-15%	10.4%	65%	-5.9%	-36%	10.0%	51%	**2.7%**	**16%**
NT Trl	0.4%	47%	0.6%	41%	-0.3%	-19%	-0.2%	-14%	**0.1%**	**14%**
Tr Trl	1.6%	100%	1.9%	68%	0.1%	4%	0.4%	14%	**1.0%**	**46%**
1,2,3:4 Spt	-0.1%	-40%	0.3%	162%	-0.2%	-51%	0.0%	13%	**0.0%**	**21%**
Misc. PFMC	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Cen OR Trl	0.0%	-50%	0.0%	-54%	0.0%	56%	0.0%	68%	**0.0%**	**5%**
Ar 7 Sport	0.7%	148%	0.0%	8%	0.4%	96%	0.4%	78%	**0.4%**	**82%**
NT 7:7ANet	0.1%	30%	-0.1%	-89%	-0.1%	-50%	0.0%	11%	**0.0%**	**-24%**
Tr 7:7ANet	0.0%	11%	-0.2%	-86%	-0.1%	-49%	0.3%	128%	**0.0%**	**1%**
NT 7BCDNet	0.0%	-66%	0.0%	-21%	0.0%	-57%	0.0%	-31%	**0.0%**	**-44%**
Tr 7BCDNet	-0.1%	-66%	0.1%	82%	0.0%	-21%	0.0%	31%	**0.0%**	**6%**
Tr JDF Trl	-1.0%	-76%	-1.0%	-86%	-0.1%	-17%	0.2%	25%	**-0.5%**	**-38%**
Ar 5 Sport	0.2%	51%	0.1%	30%	0.3%	74%	0.1%	19%	**0.2%**	**44%**
NT JDF Net	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr JDF Net	-0.1%	-84%	0.2%	296%	-0.1%	-77%	0.1%	66%	**0.0%**	**50%**
Ar 8-1 Spt	0.1%	443%	0.0%	38%	0.0%	95%	0.0%	-39%	**0.0%**	**134%**
NT SkagNet	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr SkagNet	0.0%	0%	0.0%	2744%	0.0%	-100%	0.0%	-100%	**0.0%**	**636%**
Area8D Spt	0.0%	0%	0.0%	182%	0.0%	181%	0.0%	92%	**0.0%**	**114%**
NT StSnNet	0.0%	-85%	0.0%	-100%	0.0%	-97%	0.0%	-100%	**0.0%**	**-95%**
Tr StSnNet	-0.1%	-82%	0.0%	-84%	-0.1%	-87%	0.0%	-98%	**-0.1%**	**-88%**
NT TulaNet	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr TulaNet	0.0%	15%	0.0%	-62%	0.0%	-1%	0.0%	1%	**0.0%**	**-12%**
Ar 9 Sport	0.3%	49%	0.2%	30%	1.0%	178%	1.1%	133%	**0.6%**	**97%**
Ar 6 Sport	0.2%	70%	0.2%	156%	0.1%	32%	0.1%	51%	**0.2%**	**77%**
Tr 6B:9Net	-0.2%	-100%	-0.1%	-98%	-0.1%	-76%	-0.1%	-87%	**-0.1%**	**-90%**
A 10 Sport	1.7%	147%	0.5%	40%	1.6%	117%	0.5%	51%	**1.1%**	**89%**
A 11 Sport	0.5%	124%	0.2%	47%	0.1%	46%	0.3%	104%	**0.3%**	**80%**
NT10:11Net	-0.1%	-99%	0.0%	-98%	-0.1%	-97%	0.0%	-94%	**-0.1%**	**-97%**
Tr10:11Net	-0.2%	-89%	0.0%	-54%	0.0%	-14%	0.0%	193%	**-0.1%**	**9%**
A 10A Sprt	0.0%	-100%	0.0%	-100%	0.0%	-100%	0.0%	0%	**0.0%**	**-75%**
Tr 10A Net	0.0%	-60%	0.0%	-64%	0.0%	-54%	0.0%	-50%	**0.0%**	**-57%**
A 10E Sprt	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr 10E Net	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
A 12 Sport	0.0%	91%	0.0%	19%	0.0%	349%	0.0%	156%	**0.0%**	**154%**
NT HC Net	0.0%	0%	0.0%	-92%	0.0%	-100%	0.0%	-100%	**0.0%**	**-73%**
Tr HC Net	0.0%	-28%	0.1%	125%	0.0%	-17%	0.0%	95%	**0.0%**	**44%**
A 13 Sport	0.2%	383%	0.0%	33%	0.1%	173%	0.0%	49%	**0.1%**	**160%**
NT SPS Net	0.0%	-100%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**-25%**
Tr SPS Net	0.0%	147%	0.0%	-48%	0.0%	32%	0.0%	-26%	**0.0%**	**26%**
NT 13A Net	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr 13A Net	-0.2%	-51%	-0.2%	-63%	-0.1%	-64%	-0.1%	-66%	**-0.2%**	**-61%**
FW Sport	4.3%	155%	-0.2%	-8%	1.9%	55%	-0.7%	-37%	**1.4%**	**41%**
FW Net	-0.8%	-6%	-1.3%	-7%	-3.5%	-18%	-1.6%	-9%	**-1.8%**	**-10%**
Total ER	4.1%	8%	11.9%	24%	-5.1%	-10%	11.0%	22%	**5.4%**	**11%**
PS Sport	3.9%		1.2%		3.6%		2.5%		**2.8%**	
FW Sport	4.3%		-0.2%		1.9%		-0.7%		**1.4%**	
PS NT Net	-0.1%		-0.1%		-0.2%		-0.0%		**-0.1%**	
PS PT Tr Net	-0.9%		-0.3%		-0.6%		0.2%		**-0.4%**	
PS Tr Troll	-1.0%		-1.0%		-0.1%		0.2%		**-0.5%**	
PS Term Tr Net	-0.8%		-1.3%		-3.5%		-1.6%		**-1.8%**	
Northern	-3.4%		10.6%		-5.9%		10.0%		**2.8%**	
PFMC	2.0%		2.8%		-0.3%		0.3%		**1.2%**	

In 2011, SEAK fisheries combined exceeded preseason exploitation rates by 0.1% however AEQ impacts were lower post season, likely due to forecast error. Overall, more AEQ fish were impacted than estimated preseason in the SEAK troll and sport fisheries during specific timesteps (Table 3), resulting in greater impacts to un-marked Puyallup Chinook in those specific fisheries and timesteps, although the total season impact was lower than expected (Table 3). The overall greater harvest in these northern fisheries resulted in slightly greater AEQ mortalities to unmarked Puyallup Chinook (Table 4). Due to the methods used to apportion annual catches from northern fisheries (Canada and SEAK) in FRAM timesteps, the performance of northern fisheries is best analyzed as a season total (elaborated in methods). However, changes to preseason expected harvest across timesteps will result in differing impacts to Puget Sound chinook stocks due to differing stock compositions in each timestep. In SUS fisheries, total AEQ mortality in timestep 3 ranged from -65% relative error in Area 11 sport fishery to 158% relative error in Area 6 sport fishery. As a result, there were greater impacts to un-marked Puyallup Chinook in many of these fisheries in Timestep 2 (Table 4). Troll fisheries (NT Area 2 and Treaty Area 3:4) in the Ocean also exceeded pre-season catch expectations by approximately 30% in Timestep 2 (Table 3), with varying levels of impact on un-marked Puyallup Chinook (Table 4). In SUS fisheries during timestep 4, San Juan Islands non-treaty net fisheries harvested substantially more Chinook than anticipated; 46 harvested compared to nine expected pre-season (Table 3).

In 2012, two fisheries in Canada harvested fish in timestep 2 that were not modeled in the domestic pre-season process. The North Coast BC Net and WCVI Sport harvested harvested over 10,000 during timestep 2 (Table 5) although only the WCVI sport fishery had any measurable impact on un-marked Puyallup Chinook, harvesting 18 AEQ fish compared to the zero expected (Table 6). In SUS fisheries under PFMC control, both Treaty and Non-treaty troll exceeded expected impacts during both Timesteps 2 and 3, while 3:4 Sport exceeded impact levels during timestep 2 (Table 5). Although these overages had substantial impacts on the aggregate Mid-Puget Sound stock, because of the proportion of un-marked Puyallup Chinook in the aggregate, only the Treaty Troll fishery had a measurable exceedance with minimal differences in the 3:4 Sport fishery and Area 1 Non-treaty troll (Table 6). In Puget Sound fisheries, marine sport fisheries (Areas 5, 6, 9, and 10) as well as Treaty 7BCD and Hood Canal net fisheries exceeded pre-season harvest expectations. However, of these fisheries only the Area 6 sport fishery and the Treaty Juan de Fuca net fishery had greater impacts on Puyallup un-marked Chinook during timestep 3 than estimated pre-season (Table 6).

In 2013, only fisheries in the SUS, primarily sport fisheries, exceeded pre-season expectations. Marine sport fisheries in areas 5, 6, 7, and 10 as well as the FW sport fishery had greater impacts during timestep 2, while marine sport fisheries in areas 6 and 9 had greater overall impacts during timestep 3 (Table 7). These exceedances resulted in higher impacts in many of these fisheries on un-marked Puyallup River Chinook (Table 8). However, Area 6 sport had slightly lower impacts on un-marked Puyallup Chinook (Table 8), despite having the greatest overall exceedance in total AEQ impacts (Table 7). Despite impacting fewer overall fish than anticipated pre-season, sport fisheries in Area 13 during Timestep 3 had higher impacts on unmarked Puyallup Chinook than estimated pre-season (Table 8).

In 2014, an array of Northern fisheries exceeded pre-season AEQ harvest expectations, including the WCVI net fishery which wasn't expected to harvest any Chinook during 2014, but ended up harvesting nearly 7,000 AEQ fish (Table 9) resulting in six un-marked Puyallup chinook being impacted compared to the zero expected pre-season (Table 10). Several other Northern fisheries also exceeded their expected impacts on un-marked Puyallup Chinook particularly in timesteps 2 and 3 (Table 10). Very few fisheries in Puget Sound exceeded overall AEQ impacts during timesteps 2 and 3 (Table 9). Despite this condition, several fisheries had greater impacts on un-marked Puyallup Chinook during timesteps 3 and 4 (Table 10).

Table 3. 2011 AEQ total fishery mortality report for fisheries with positive error in ER assessment on Puyallup River fall Chinook salmon.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**Pre**	**Post**	**Relative Error**
SEAK Troll	93,329	27,261	-71%	120,223	170,655	42%	10,772	45,500	322%	**224,324**	**243,416**	**9%**
SEAK Sport	23,727	34,475	45%	32,922	25,466	-23%	650	0	-100%	**57,299**	**59,941**	**5%**
NT 3:4 Trl	6,231	8,760	41%	5,326	4,612	-13%	0	0	0%	**11,557**	**13,372**	**16%**
Tr 3:4 Trl	16,220	9,342	-42%	18,846	23,988	27%	5,597	1,037	-81%	**35,066**	**33,330**	**-5%**
NT 2 Troll	8,405	6,981	-17%	3,862	5,352	39%	0	0	0%	**12,267**	**12,333**	**1%**
Ar 7 Sport	0	0	0%	2,608	4,963	90%	4,120	3,782	-8%	**6,728**	**8,745**	**30%**
NT 7:7ANet	0	0	0%	2,590	3,542	37%	9	46	411%	**2,599**	**3,588**	**38%**
Ar 5 Sport	0	0	0%	6,469	5,972	-8%	412	481	17%	**6,881**	**6,453**	**-6%**
Ar 8-1 Spt	0	0	0%	516	214	-59%	3,685	1,235	-66%	**4,201**	**1,449**	**-66%**
Ar 9 Sport	0	0	0%	6,513	3,440	-47%	2,509	763	-70%	**9,022**	**4,203**	**-53%**
Ar 6 Sport	0	0	0%	1,595	4,109	158%	1,040	1,020	-2%	**2,635**	**5,129**	**95%**
A 10 Sport	79	0	-100%	3,425	4,809	40%	2,749	412	-85%	**6,253**	**5,221**	**-17%**
A 11 Sport	758	563	-26%	8,873	3,078	-65%	1,315	412	-69%	**10,946**	**4,053**	**-63%**
A 13 Sport	198	60	-70%	1,338	1,277	-5%	246	184	-25%	**1,782**	**1,521**	**-15%**
FW Sport	0	0	0%	2,359	2,308	-2%	0	0	0%	**2,359**	**2,308**	**-2%**

Table 4. 2011 AEQ stock mortalities of unmarked Puyallup Fall Chinook by timesteps 2, 3, and 4 for fisheries with positive error in the exploitation rates

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
Fishery Name	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**PRE**	**POST**	**Relative Error**
SEAK Troll	2	1	-73%	4	4	10%	2	3	21%	**8**	**7**	**-9%**
SEAK Sport	1	1	26%	2	1	-37%	0	0	0%	**3**	**2**	**-16%**
NT 3:4 Trl	18	17	-7%	11	6	-42%	0	0	0%	**30**	**24**	**-21%**
Tr 3:4 Trl	39	19	-51%	36	62	73%	43	5	-88%	**75**	**81**	**8%**
NT 2 Troll	6	4	-37%	2	2	10%	0	0	0%	**8**	**6**	**-25%**
Ar 7 Sport	0	0	0%	10	17	68%	13	12	-1%	**23**	**30**	**30%**
NT 7:7ANet	0	0	0%	9	6	-33%	0	0	0%	**9**	**6**	**-33%**
Ar 5 Sport	0	0	0%	14	13	-10%	4	2	-53%	**18**	**15**	**-19%**
Ar 8-1 Spt	0	0	0%	0	0	-6%	0	1	371%	**1**	**2**	**183%**
Ar 9 Sport	0	0	0%	23	18	-22%	8	6	-20%	**32**	**25**	**-22%**
Ar 6 Sport	0	0	0%	3	8	140%	10	4	-64%	**13**	**12**	**-10%**
A 10 Sport	1	0	-100%	46	65	40%	7	6	-19%	**54**	**70**	**30%**
A 11 Sport	3	4	22%	13	15	22%	4	4	1%	**20**	**24**	**18%**
A 13 Sport	0	0	-100%	1	4	183%	0	1	277%	**2**	**5**	**151%**
FW Sport	0	0	0%	132	177	34%	0	0	0%	**132**	**177**	**34%**

Table 5. 2012 AEQ total fishery mortality report for fisheries with positive error in ER assessment on Puyallup River fall Chinook salmon.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**Pre**	**Post**	**Relative Error**
SEAK Troll	83,514	22,497	-73%	115,503	184,068	59%	22,825	33,794	48%	**221,842**	**240,359**	**8%**
N/C BC Net	0	1,484	#DIV/0!	2,834	1,297	-54%	0	0	0%	**2,834**	**2,781**	**-2%**
BCOutSport	16,534	15,307	-7%	50,208	38,656	-23%	0	474	#DIV/0!	**66,742**	**54,437**	**-18%**
WCVI Troll	17,134	18,980	11%	32,032	18,492	-42%	9,628	2,725	-72%	**58,794**	**40,197**	**-32%**
WCVI Sport	0	8,800	#DIV/0!	59,875	71,133	19%	0	0	0%	**59,875**	**79,933**	**33%**
N GS Sport	1,386	3,872	179%	14,827	16,876	14%	2	0	-100%	**16,215**	**20,748**	**28%**
S GS Sport	1,029	3,684	258%	3,876	2,298	-41%	60	0	-100%	**4,965**	**5,982**	**20%**
BC JDF Spt	1,411	4,166	195%	10,874	14,725	35%	1,756	344	-80%	**14,041**	**19,235**	**37%**
NT 3:4 Trl	9,518	13,309	40%	7,829	14,568	86%	0	0	0%	**17,347**	**27,877**	**61%**
Tr 3:4 Trl	23,580	24,437	4%	24,111	37,651	56%	6,811	275	-96%	**47,691**	**62,088**	**30%**
Ar 3:4 Spt	722	933	29%	6,332	5,752	-9%	0	0	0%	**7,054**	**6,685**	**-5%**
Tr 2 Troll	788	522	-34%	1,005	484	-52%	0	0	0%	**1,793**	**1,006**	**-44%**
Ar 2 Sport	7,876	7,186	-9%	21,117	10,744	-49%	0	0	0%	**28,993**	**17,930**	**-38%**
NT 1 Troll	6,667	8,385	26%	2,441	3,799	56%	0	0	0%	**9,108**	**12,184**	**34%**
Tr 7BCDNet	0	0	0%	12,879	16,024	24%	163	1	-99%	**13,042**	**16,025**	**23%**
Ar 5 Sport	0	0	0%	6,457	7,196	11%	579	445	-23%	**7,036**	**7,641**	**9%**
Tr JDF Net	8	0	-100%	500	1,224	145%	54	4	-93%	**562**	**1,228**	**119%**
Ar 9 Sport	0	0	0%	5,798	7,306	26%	2,471	2,242	-9%	**8,269**	**9,548**	**15%**
Ar 6 Sport	0	0	0%	1,591	6,289	295%	1,542	1,424	-8%	**3,133**	**7,713**	**146%**
A 10 Sport	74	8	-89%	3,570	4,547	27%	2,796	208	-93%	**6,440**	**4,763**	**-26%**
A 11 Sport	686	544	-21%	8,201	4,993	-39%	1,294	667	-48%	**10,181**	**6,204**	**-39%**
Tr HC Net	0	0	0%	4,223	12,453	195%	14	3	-79%	**4,237**	**12,456**	**194%**

Table 6. 2012 AEQ stock mortalities of unmarked Puyallup Fall Chinook by timesteps 2, 3, and 4 for fisheries with positive error in the exploitation rates.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**PRE**	**POST**	**Relative Error**
SEAK Troll	2	0	-94%	4	1	-68%	3	6	112%	**9**	**7**	**-21%**
N/C BC Net	0.0	0.3	#DIV/0!	1	0	-72%	0	0	0%	**1**	**1**	**-43%**
BCOutSport	4	1	-81%	94	61	-36%	0	0	0%	**98**	**61**	**-37%**
WCVI Troll	75	49	-34%	150	55	-63%	22	5	-75%	**247**	**110**	**-56%**
WCVI Sport	0	18	#DIV/0!	249	178	-29%	0	0	0%	**249**	**195**	**-21%**
N GS Sport	0	0	0%	3	3	-10%	0	0	0%	**3**	**3**	**-10%**
S GS Sport	5	11	123%	6	3	-58%	0	0	-100%	**11**	**14**	**19%**
BC JDF Spt	7	4	-34%	40	43	8%	19	2	-90%	**65**	**49**	**-25%**
NT 3:4 Trl	38	16	-58%	15	15	-2%	0	0	0%	**53**	**31**	**-42%**
Tr 3:4 Trl	81	30	-63%	41	47	13%	38	1	-98%	**122**	**77**	**-37%**
Ar 3:4 Spt	0	0	-58%	8	8	1%	0	0	0%	**8**	**8**	**-2%**
Tr 2 Troll	1	0	-36%	0	0	-58%	0	0	0%	**1**	**1**	**-43%**
Ar 2 Sport	1	1	-1%	0	0	0%	0	0	0%	**1**	**1**	**-1%**
NT 1 Troll	1	0	-72%	1	1	112%	0	0	0%	**2**	**2**	**2%**
Tr 7BCDNet	0	0	0%	4	3	-31%	0	0	0%	**4**	**3**	**-31%**
Ar 5 Sport	0	0	0%	13	7	-49%	4	2	-54%	**17**	**8**	**-50%**
Tr JDF Net	0	0	0%	3	4	51%	0	0	0%	**3**	**4**	**51%**
Ar 9 Sport	0	0	0%	18	7	-60%	7	5	-28%	**25**	**12**	**-51%**
Ar 6 Sport	0	0	0%	3	5	53%	4	2	-58%	**7**	**7**	**-5%**
A 10 Sport	1	0	-100%	48	28	-42%	6	1	-91%	**54**	**29**	**-48%**
A 11 Sport	2	1	-39%	11	6	-46%	3	2	-45%	**16**	**9**	**-45%**
Tr HC Net	0	0	0%	2	2	-15%	0	0	0%	**2**	**2**	**-15%**

Table 7. 2013 AEQ total fishery mortality report for fisheries with positive error in ER assessment on Puyallup River fall Chinook salmon.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**Pre**	**Post**	**Relative Error**
Ar 7 Sport	0	0	0%	2,500	5,583	123%	3,764	3,717	-1%	**6,264**	**9,300**	**48%**
Ar 5 Sport	0	0	0%	6,227	11,170	79%	799	293	-63%	**7,026**	**11,463**	**63%**
Ar 9 Sport	0	0	0%	5,827	5,587	-4%	2,591	2,748	6%	**8,418**	**8,335**	**-1%**
Ar 6 Sport	0	0	0%	1,694	4,470	164%	1,911	2,348	23%	**3,605**	**6,818**	**89%**
A 10 Sport	84	0	-100%	3,579	5,317	49%	3,855	760	-80%	**7,518**	**6,077**	**-19%**
A 11 Sport	643	594	-8%	5,088	2,456	-52%	1,830	465	-75%	**7,561**	**3,515**	**-54%**
A 13 Sport	263	214	-19%	1,361	1,283	-6%	354	40	-89%	**1,978**	**1,537**	**-22%**
FW Sport	0	0	0%	2,469	2,803	14%	0	0	0%	**2,469**	**2,803**	**14%**

Table 8. 2013 AEQ stock mortalities of unmarked Puyallup Fall Chinook by timesteps 2, 3, and 4 for fisheries with positive error in the exploitation rates.

	Timestep 2			Timestep 3			Timestep 4			Total (TS 2-4)		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error
Ar 7 Sport	0	0	0%	3	6	110%	4	3	-36%	7	9	22%
Ar 5 Sport	0	0	0%	5	7	41%	2	0	-76%	7	8	8%
Ar 9 Sport	0	0	0%	6	8	42%	3	7	132%	9	16	74%
Ar 6 Sport	0	0	0%	1	1	-8%	2	1	-33%	3	3	-22%
A 10 Sport	0	0	-100%	18	25	41%	4	5	25%	22	30	36%
A 11 Sport	1	1	-33%	2	2	-13%	2	2	4%	5	4	-10%
A 13 Sport	0	0	-33%	0	1	134%	0	0	-33%	1	1	51%
FW Sport	0	0	0%	57	56	-2%	0	0	0%	57	56	-2%

Table 9. 2014 AEQ total fishery mortality report for fisheries with positive error in ER assessment on Puyallup River fall Chinook salmon.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**Pre**	**Post**	**Relative Error**
WCVI Net	0	19	#DIV/0!	0	6,680	#DIV/0!	0	22	#DIV/0!	**0**	**6,721**	**#DIV/0!**
GeoStr Net	0	82	#DIV/0!	540	1,287	138%	30	0	-100%	**570**	**1,369**	**140%**
WCVI Troll	31,188	38,152	22%	59,180	59,291	0%	16,517	18,814	14%	**106,885**	**116,257**	**9%**
WCVI Sport	0	8,951	#DIV/0!	72,767	67,311	-7%	0	0	0%	**72,767**	**76,262**	**5%**
N GS Sport	3,699	7,250	96%	16,143	31,778	97%	107	121	13%	**19,949**	**39,149**	**96%**
S GS Sport	5,009	5,494	10%	5,209	7,165	38%	814	98	-88%	**11,032**	**12,757**	**16%**
BC JDF Spt	3,684	3,106	-16%	15,848	13,871	-12%	3,313	2,823	-15%	**22,845**	**19,800**	**-13%**
Ar 7 Sport	0	0	0%	3,501	4,580	31%	4,140	3,392	-18%	**7,641**	**7,972**	**4%**
Tr 7:7ANet	0	0	0%	3,623	5,026	39%	26	1	-96%	**3,649**	**5,027**	**38%**
Tr JDF Trl	671	707	5%	408	80	-80%	4,669	3,391	-27%	**5,748**	**4,717**	**-18%**
Tr JDF Net	34	0	-100%	1,269	1,063	-16%	18	19	6%	**1,321**	**1,082**	**-18%**
Ar 9 Sport	0	0	0%	4,480	3,524	-21%	1,885	2,230	18%	**6,365**	**5,754**	**-10%**
Ar 6 Sport	0	0	0%	4,549	3,303	-27%	1,730	2,380	38%	**6,279**	**5,683**	**-9%**
A 10 Sport	73	0	-100%	1,779	1,594	-10%	628	492	-22%	**2,480**	**2,086**	**-16%**
A 11 Sport	531	588	11%	3,249	2,459	-24%	585	260	-56%	**4,365**	**3,307**	**-24%**

Table 10. 2014 AEQ stock mortalities of unmarked Puyallup Fall Chinook by timesteps 2, 3, and 4 for fisheries with positive error in the exploitation rates.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**PRE**	**POST**	**Relative Error**
WCVI Net	0	0	0%	0	6	#DIV/0!	0	0	#DIV/0!	**0**	**6**	**#DIV/0!**
GeoStr Net	0.0	0.2	#DIV/0!	0	0	161%	0	0	0%	**0**	**1**	**291%**
WCVI Troll	34	56	63%	65	109	68%	15	30	107%	**114**	**195**	**72%**
WCVI Sport	0	9	#DIV/0!	66	99	51%	0	0	0%	**66**	**108**	**65%**
N GS Sport	0	0	0%	1	2	135%	0	0	0%	**1**	**2**	**135%**
S GS Sport	7	10	45%	2	4	82%	2	0	-87%	**10**	**14**	**34%**
BC JDF Spt	4	4	9%	16	32	95%	12	20	62%	**32**	**56**	**72%**
Ar 7 Sport	0	0	0%	3	5	55%	3	7	111%	**6**	**12**	**83%**
Tr 7:7ANet	0	0	0%	3	7	140%	0	0	0%	**3**	**7**	**140%**
Tr JDF Trl	1	2	21%	0	0	0%	8	11	37%	**10**	**13**	**23%**
Tr JDF Net	0	0	-100%	2	4	90%	0	0	0%	**2**	**4**	**77%**
Ar 9 Sport	0	0	0%	7	11	70%	4	14	261%	**11**	**26**	**142%**
Ar 6 Sport	0	0	0%	2	2	2%	2	4	135%	**4**	**6**	**57%**
A 10 Sport	0	0	-100%	10	15	48%	3	6	122%	**14**	**21**	**57%**
A 11 Sport	1	3	239%	2	4	105%	1	1	52%	**4**	**8**	**119%**

Forecast performance for Puyallup Fall Chinook Salmon run-size varied by marked and unmarked stock components across years. The un-marked hatchery post-season estimate tended to be higher than pre-season estimates while the un-marked natural and marked hatchery components were lower in post-season estimates (Table 11). These relationships are also apparent for the aggregate Mid-Sound stock components (Table 11). Overall, the proportion of the Mid-Sound Aggregate made up by Puyallup un-marked Chinook ranged from 14% to 31% pre-season, while post-season proportions ranged from only 11% to 18% (Table 12).

Table 11. Pre-season and post-season forecast performance from 2011-2014 for Puyallup Fall Chinook salmon and the Mid-Puget Sound FRAM aggregate Fall stock.

	2011			2012			2013			2014		
	Pre-Season Forecast	Post-Season ETRS	Rel. Error	Pre-Season Forecast	Post-Season ETRS	Rel. Error	Pre-Season Forecast	Post-Season ETRS	Rel. Error	Pre-Season Forecast	Post-Season ETRS	Rel. Error
Puyallup Chinook												
Marked Hatchery	6,914	5,908	-15%	7,289	3,723	-49%	8,471	6,525	-23%	8,724	6,310	-28%
Unmarked Hatchery	510	1,023	101%	108	202	87%	85	53	-38%	87	88	1%
Unmarked Naturals	2,766	647	-77%	3,134	787	-75%	1,128	732	-35%	871	709	-19%
Total	10,190	7,578	-26%	10,531	4,712	-55%	9,684	7,310	-25%	9,682	7,107	-27%
Mrkd:Unmkrd Ratio	2.1	3.5	68%	2.2	3.8	67%	7.0	8.3	19%	9.1	7.9	-13%
Mid-PS Chinook												
Marked Hatchery	43,176	30,976	-28%	31,070	34,581	11%	38,398	34,481	-10%	37,495	19,922	-47%
Unmarked Hatchery	3,262	3,637	11%	3,730	3,457	-7%	2,635	3,014	14%	2,743	2,109	-23%
Unmarked Naturals	7,355	2,126	-71%	6,179	3,532	-43%	3,989	3,813	-4%	3,506	2,004	-43%
Total	53,793	36,739	-32%	40,979	41,570	1%	45,022	41,308	-8%	43,744	24,035	-45%
Mrkd:Unmkrd Ratio	4.1	5.4	32%	3.1	4.9	58%	5.8	5.1	-13%	6.0	4.8	-19%

Abundance management thresholds for Puyallup River fall Chinook MU are based on composite hatchery-origin (HOR) and natural-origin (NOR) spawners. The low abundance threshold (LAT) during these years was 500 spawners to the entire basin. The upper management threshold was 500 spawners in the South Prairie (SPC)/Wilkeson Creek basin which was expected to result in complete seeding of the entire basin. Estimated natural spawning escapement estimates (HOR+NOR) for Puyallup exceeded the LAT of 500 basinwide spawners from 2011 through 2016, and has been on an increasing trend since 2012 (Figure 1). Escapements in the SPC/Wilkeson Creek basin ranged from 265 in 2012 to 578 in 2016 (Figure 1). With an average escapement of 464 adults to SPC/Wilkeson from 2011-2016, fall Chinook Salmon escapements to the Puyallup River have been near the expected level for fully seeding the habitat with three out of the six recent years exceeding that level (Figure 1; SPC/Wilkeson >500 spawners).

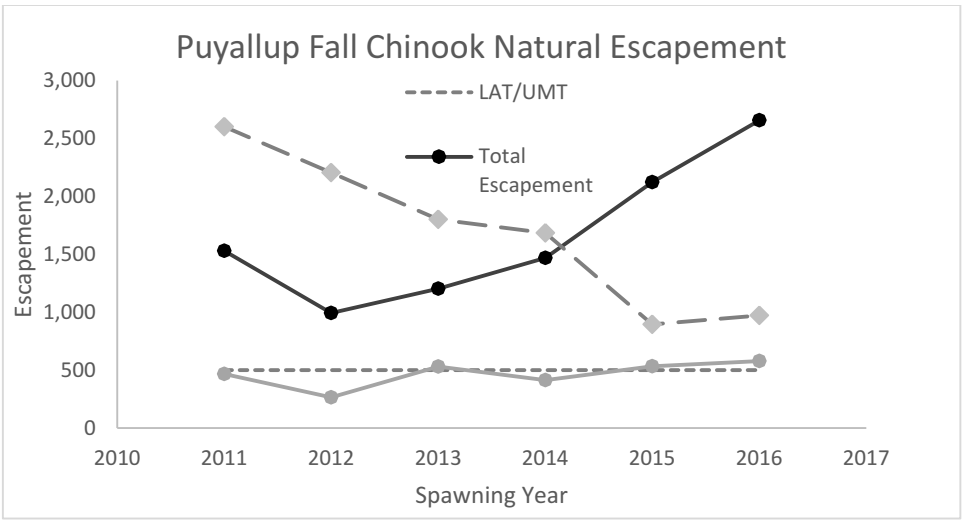

Figure 1. Puyallup River fall-run Chinook Salmon natural (NOR + HOR), South Prairie Creek (SPC) and Wilkeson Creek, and pre-season FRAM spawning escapement estimates, 2011-2016. The dashed grey line denotes the Low Abundance Threshold (LAT= 500 total basin escapement) and Upper Management Threshold (UMT=500 escapement in SPC/Wilkeson) for reference.

Table 12. Mid-Sound Chinook Stock Aggregate marked (Mrkd) and un-marked (UnMrkd) composition, 2011 – 2014.

2011				
	% of Mrkd Agg.		% of UnMrkd Agg.	
Stock Name	Pre-Season	Post-Season	Pre-Season	Post-Season
Grovers Ck. Hat. - 10	4.3%	5.4%	12.3%	21.7%
Lk. Washington Hatchery	25.0%	14.7%	1.2%	2.0%
Lk Washington Natural	0.0%	0.0%	11.3%	13.7%
Duwamish-Green Hatchery	33.2%	39.2%	9.8%	18.0%
Natural	0.0%	0.0%	31.4%	11.3%
Gorst Creek Hat. - 10E	20.4%	20.1%	2.7%	3.8%
Puyallup River Hatchery	17.0%	20.5%	4.9%	18.1%
Natural	0.0%	0.0%	26.4%	11.4%
2012				
	% of Mrkd Agg.		% of UnMrkd Agg.	
Stk Name	Pre-Season	Post-Season	Pre-Season	Post-Season
Grovers Ck. Hat. - 10	5.1%	5.1%	11.4%	18.0%
Lk. Washington Hatchery	21.2%	25.6%	1.3%	11.3%
Lk Washington Natural	0.0%	0.0%	9.8%	22.3%
Duwamish-Green Hatchery	27.7%	38.8%	5.7%	12.5%
Natural	0.0%	0.0%	20.5%	19.2%
Gorst Creek Hat. - 10E	20.3%	19.0%	17.9%	2.7%
Puyallup River Hatchery	25.7%	11.5%	1.1%	2.8%
Natural	0.0%	0.0%	31.7%	11.1%
2013				
	% of Mrkd Agg.		% of UnMrkd Agg.	
Stk Name	Pre-Season	Post-Season	Pre-Season	Post-Season
Grovers Ck. Hat. - 10	5%	6%	16%	23%
Lk. Washington Hatchery	20%	14%	5%	7%
Lk Washington Natural	0%	0%	16%	34%
Duwamish-Green Hatchery	30%	29%	13%	11%
Natural	0%	0%	26%	7%
Gorst Creek Hat. - 10E	21%	32%	3%	5%
Puyallup River Hatchery	24%	19%	1%	1%
Natural	0%	0%	17%	12%
2014				
	% of Mrkd Agg.		% of UnMrkd Agg.	
Stk Name	Pre-Season	Post-Season	Pre-Season	Post-Season
Grovers Ck. Hat. - 10	4%	7%	19%	32%
Lk. Washington Hatchery	13%	12%	2%	6%
Lk Washington Natural	0%	0%	11%	12%
Duwamish-Green Hatchery	38%	29%	18%	11%
Natural	0%	0%	30%	17%
Gorst Creek Hat. - 10E	21%	19%	4%	2%
Puyallup River Hatchery	24%	32%	1%	2%
Natural	0%	0%	14%	18%

Post-season assessment of the starting (Timestep 1) cohort for Mid-Puget Sound unmarked Chinook Salmon, indicates substantially greater age-2 abundance across nearly all years as well as age-3 in most years, while age-4 and age-5 abundance are fairly consistent pre- and post-season (Figure 2). Considering that observed terminal run-sizes for Mid-Puget Sound Chinook were either similar or slightly under forecast (Table 11), the large differences in starting cohort abundance, suggests a possibly greater harvest impact in pre-terminal fisheries than expected pre-season during most years, but this is obviously constrained by the revised age-2 from 3 methodology implemented in 2014 post-season modeling efforts and the post-season FRAM runs.

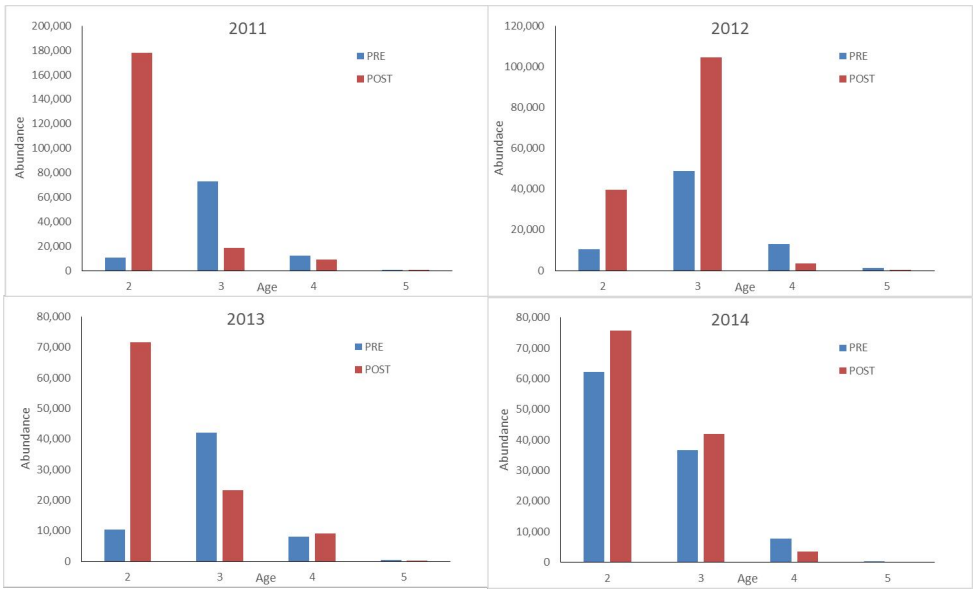

Figure 2. Starting cohort abundance of Unmarked Mid-Puget Sound aggregate stock during Timestep 1 in 2011, 2012, 2013, and 2014. 2011-2013 Age 2 abundances should be interpreted with caution due the use of static age-2 scalars in preseason FRAM runs (elaborated in methods).

Although the exploitation rate management objectives for Puyallup River fall Chinook has been exceeded in the three out of four years between 2011 and 2014, escapement estimates have been above the critical LAT and near the level considered fully seeding the available habitat. Northern fisheries in Canada are of concern especially in 2012 and 2014 where ER impacts were exceeded preseason expectations by 10 percentage or more; the greatest absolute difference observed in this assessment. Of notable interest are fisheries which had no modeled pre-season impact with subsequent harvest in post-season models. While it is unclear if these discrepancies are a result of the inclusion of ISBM sport fisheries in post-season runs, whether pre-season FRAM model inputs from Canada are received/translated accurately, whether these fisheries were actually not anticipated to occur, or some combination of these factor, it warrants further consideration by the appropriate management panels. Both Treaty and Non-treaty Ocean troll fisheries under PFMC control in Areas 3:4 were managed within in-season quotas and guidelines, however, post-season impacts on Puyallup were greater than expected in 2011 and 2012. Since this time, provisions have been put in place to limit the proportion of catch allowed in Non-treaty troll fisheries in Areas 3:4. In examining the causes of increased impacts in 2011 and 2012, it was discovered that an adjustment to the sublegal encounters in these fisheries that was used in 2011 and 2012 pre-season modeling had inadvertently been removed in the respective post-season model runs. This resulted in numbers of sublegal encounters in these fisheries that were 3 to 7 times higher in the post-season runs and, thus, higher exploitation rates on Puyallup Chinook, among other stocks. This discrepancy will be addressed in future post-season modeling exercises. Within Puget Sound fisheries, particular attention is necessary in marine sport fisheries as well as odd-year freshwater sport fisheries which are addressed below. San Juan Island net could be a concern but are likely related to Fraser River sockeye forecasts which have not materialized in recent years. The co-managers adaptive management of terminal

net fishery management and FRAM/TAMM model input development has resulted in this fishery performing consistent with pre-season expectations.

Marine Area Sport Fisheries

Chronic exceedance of preseason-modeled impacts on unmarked Puyallup chinook occurred during all four years in marine sport fisheries in areas 6, 9, 10, and 11 and three out of four years in areas 5 and 7. On average, area 9 and 10 exceedances were the greatest at 0.63% and 1.07% respectively (Table 2). Across all marine sport fisheries from 2011-2014, absolute error surpassed preseason expectation by ≈2.8% (Table 2). One contributing factor to this overage was a difference in how age-2 fish were modeled in pre vs post-season. From 2011-2013, low static recruit scalars were used to model age-2 abundances. The co-managers identified this issue and a technical fix was developed and used in 2014 preseason planning (elaborated in methods section). The age-2 scalar issue resulted in a ≈2% ER exceedance on unmarked Puyallup chinook from marine area sport fisheries from 2011-2013 (Table 13).

Table 13. Pre- vs post-season modeling differences arising from static age-2 recruit scalars, which were addressed prior to the 2014 season.

Year	Pre-season	Pre 2s-3s Method	Difference
2011	48.30%	50.80%	2.50%
2012	48.50%	50.30%	1.80%
2013	50.00%	51.80%	1.80%
2014	2 from 3's method used		0.00%
11-13 Average			**2.03%**

After accounting for post-season ER differences arising from the age-2 recruit scalars, marine sport fisheries still significantly exceed pre-season ER's in some years. As noted above, the greatest contributors to this annual exceedance are areas 9 and 10 (but also include 5, 6, 7, and 11). Much of the overage can be attributed to poor forecast performance. From 2011-14, post season UM abundances were ≈54% of their preseason forecast using total UM abundances, leading to marine area sport fisheries in many years having higher post season ER's even when fisheries performed well below preseason expectations (e.g. 2011 and 2012 in marine area 9 sport fishery).

Marine area sport fisheries that contributed to ER overages on Puyallup UM chinook in areas 5, 6, 7, 9, 10, and 11, had a variety of season structures and management guidelines. For the years being assessed, all of these fisheries were mark-selective with the exception of area 5 in the winter (converted to MSF in 2014-15 season) and area 7 in the summer. Fisheries that were intensively creeled, such as area 9 and 10, were managed with in-season triggers while others like area 6 in the summer were managed as a total season. Since 2014, WDFW has increased the number of mark-selective fisheries that utilize in-season triggers to ensure fisheries do not exceed pre-season modeled encounters. Area 7 is one area that exceeded preseason ER's in 2013 and 2014 and since that time, effort in this fishery has increased. WDFW acknowledges the increasing trend in effort in this fishery and is taking active steps in 2018 preseason planning to address this issue. In 2011 and 2013 area 13 sport impacts exceeded preseason expectations,

which are likely due to increased effort during Pink salmon return years. Since the time period used in this assessment, the increased catches in area 13 have been incorporated into our preseason modeling.

It is important to also point out that the Chinook FRAM base period was updated utilizing CWT recoveries from fishing years 2007-2013 compared to the old base period from 1979-1982. This updated base period was used for the first time in 2017 pre-season planning and has since undergone an additional round of model calibration to address identified shortcomings. The base period update is intended to more accurately reflect contemporary fishery trends. For Puyallup chinook, the base period update on average results in a net decrease in total exploitation (60.3% to 53.4% Total ER, 2005-14 avg.), including a modest decrease in pre-terminal SUS exploitation rates (11.3% to 9.6% SUS ER, 2005-14 avg.). For 2011-2014, total exploitation rates on Puyallup UM chinook calculated from the new base period are ≈ 6% lower relative to the old base period and specifically the impact of marine area 10 sport on Puyallup has decreased by ≈50%.

Freshwater Puyallup Sport Fisheries

Freshwater sport fisheries also exceeded preseason expectations in 2011 and 2013, at 4.3% and 1.9% over preseason ER's. Conversely, both even years are under their preseason modelled ER's suggesting in-river Pink Salmon fisheries that occur in odd years are the likely cause of the overage. During this time, Pink Salmon abundances were increasing in the Puyallup and angler effort outpaced our modeled expectations along with the associated chinook impacts. Since this time, sport angler effort during the pink fishery has stabilized and our modeled impacts should be more accurate on unmarked chinook in odd years. Similarly, as with marine area fisheries, poor forecast performance played a role in post-season overages.

Skokomish River Fall Chinook

Fishery impacts on Skokomish River fall Chinook salmon exceed the 50% Total ER objective in three out of four years between 2011 and 2014, as projected by the most recent set of postseason FRAM runs (Table 14). Fisheries throughout the migratory range of Skokomish River Fall Chinook Salmon showed positive errors in performance. Relatively few fisheries had consistent positive error on the unmarked component across all years from 2011-2014 (Table 15). Although Areas 6 and 7 marine sport fisheries and Treaty Hood Canal and FW net fisheries had positive errors across all years assessed, after applying the defined threshold criteria only the treaty Hood Canal net fishery exceeded threshold impacts for all four years (Table 15). Absolute error in this fishery ranged from 2.232% to 3.97% while relative error ranged from 35% to 82% (Table 15). After applying the threshold criteria, the greatest absolute error on the unmarked component occurred in the FW net fishery in 2012 while the greatest relative error occurred in the Area 6 marine sport fishery (Table 15). Fishery impacts on the marked component showed better consistency in error, although ER exceedances occurred throughout the migratory range as well (Appendix B).

Table 14. Total pre-season and post-season exploitation rate estimates for Skokomish River fall Chinook Salmon, 2011-2014.

Management Year	Pre-season ER Estimate (Total)	Post-season ER Estimate (Total)	**Absolute Difference**
2011	50.0%	57.3%	**7%**
2012	47.9%	59.6%	**12%**
2013	49.4%	49.4%	**0%**
2014	49.8%	59.0%	**9%**

Table 15. Skokomish unmarked Chinook ER absolute and relative error rates in fisheries from 2011 through 2014. Pink highlighted cells denote fisheries with ≥0.1% absolute error and relative error between 25% and 50%. Red highlighted cells denote fisheries with absolute error ≥0.1% and relative error greater than 50% or absolute error >1.0%.

	2011		2012		2013		2014		AVERAGE	
Fishery Name	Abs. Err.	Rel. Err.	Abs. Err.	Rel. Err.	Abs. Err.	Rel. Err.	Abs. Err.	Rel. Err.	Abs. Err.	Rel. Err.
SEAK	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Canadian	3.3%	19%	-1.1%	-8%	0.2%	2%	3.6%	23%	**1.5%**	**9%**
NT Trl	0.2%	30%	0.9%	89%	-0.3%	-26%	-0.1%	-8%	**0.2%**	**21%**
Tr Trl	0.5%	35%	1.8%	73%	-0.7%	-24%	0%	0%	**0.4%**	**21%**
1,2,3:4 Spt	0.0%	-5%	0.1%	15%	-0.6%	-58%	0.0%	0%	**-0.1%**	**-12%**
Misc. PFMC	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Cen OR Trl	-0.1%	-70%	0.0%	12%	0.0%	2%	0.1%	103%	**0.0%**	**12%**
Ar 7 Sport	0.8%	44%	0.2%	11%	1.6%	116%	0.9%	54%	**0.9%**	**56%**
NT 7:7ANet	0.0%	8%	-0.1%	-89%	-0.1%	-39%	0.0%	-25%	**0.0%**	**-36%**
Tr 7:7ANet	0.0%	-14%	-0.2%	-86%	-0.1%	-39%	0.1%	54%	**-0.1%**	**-21%**
NT 7BCDNet	0.0%	134%	0.0%	-44%	0.0%	-73%	0.0%	-52%	**0.0%**	**-9%**
Tr 7BCDNet	0.1%	114%	0.0%	31%	0.0%	-52%	0.0%	-8%	**0.0%**	**21%**
Tr JDF Trl	-0.1%	-24%	-0.6%	-83%	-0.1 %	-16%	0.1%	30%	**-0.7%**	**-92%**
Ar 5 Sport	0.0%	6%	0.1%	36%	0.0%	2%	0.0%	-13%	**0.0%**	**8%**
NT JDF Net	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr JDF Net	-0.2%	-69%	0.0%	18%	-0.1%	-65%	0.1%	23%	**-0.1%**	**-23%**
Ar 8-1 Spt	-0.3%	-46%	-0.3%	-65%	-0.4%	-86%	-0.3%	-65%	**-0.3%**	**-66%**
NT SkagNet	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr SkagNet	0.0%	0%	0.0%	1005%	0.0%	-100%	0.0%	-100%	**0.0%**	**201%**
Area8D Spt	0.0%	0%	0.0%	-47%	0.0%	234%	0.0%	93%	**0.0%**	**70%**
NT StSnNet	0.0%	0%	0.0%	-100%	0.0%	-97%	0.0%	0%	**0.0%**	**-49%**
Tr StSnNet	0.0%	-66%	0.0%	-98%	0.0%	-86%	0.0%	-97%	**0.0%**	**-87%**
NT TulaNet	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr TulaNet	0.0%	0%	0.0%	-93%	0.0%	-5%	0.0%	-9%	**0.0%**	**-27%**
Ar 9 Sport	-0.7%	-48%	-0.2%	-16%	-0.2%	-13%	0.4%	37%	**-0.2%**	**-10%**
Ar 6 Sport	0.1%	48%	0.2%	155%	0.0%	12%	0.0%	18%	**0.1%**	**58%**
Tr 6B:9Net	-0.4%	-100%	-0.3%	-97%	-0.2%	-87%	-0.2%	-91%	**-0.3%**	**-94%**
A 10 Sport	0.1%	28%	-0.1%	-31%	-0.2%	-48%	0.0%	18%	**-0.1%**	**-8%**
A 11 Sport	-0.1%	-26%	-0.1%	-20%	-0.2%	-67%	0.0%	24%	**-0.1%**	**-22%**
NT10:11Net	-0.1%	-98%	-0.1%	-98%	-0.1%	-99%	-0.1%	-96%	**-0.1%**	**-98%**
Tr10:11Net	-0.3%	-99%	0.0%	-100%	0.0%	-88%	0.0%	-89%	**-0.1%**	**-94%**
A 10A Sprt	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr 10A Net	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
A 10E Sprt	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr 10E Net	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
A 12 Sport	0.0%	2%	-0.4%	-36%	-0.2%	-32%	0.4%	54%	**0.0%**	**-3%**
NT HC Net	0.0%	-100%	0.0%	-96%	0.0%	-100%	0.0%	-100%	**0.0%**	**-99%**
Tr HC Net	3.1%	78%	4.0%	82%	2.3%	35%	3.0%	42%	**3.1%**	**59%**
A 13 Sport	0.1%	96%	0.0%	-23%	0.0%	-13%	0.0%	-3%	**0.0%**	**14%**
NT SPS Net	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr SPS Net	0.0%	-8%	0.1%	29%	0.0%	3%	0.0%	3%	**0.0%**	**7%**
NT 13A Net	0.0%	0%	0.0%	0%	0.0%	0%	0.0%	0%	**0.0%**	**0%**
Tr 13A Net	-0.2%	-39%	-0.2%	-79%	-0.1%	-62%	-0.1%	-55%	**-0.2%**	**-59%**
FW Sport	0.2%	11%	1.4%	57%	-0.7%	-29%	-1.0%	-38%	**0.0%**	**0%**
FW Net	1.6%	11%	6.6%	46%	0.2%	1%	2.2%	17%	**2.7%**	**19%**
TOTAL	7.3%	15%	11.7%	24%	0.0%	0%	9.2%	18%	**7.0%**	**14%**
PS Sport	0.0%		-0.6%		0.5%		1.4%		**0.3%**	
FW Sport	0.2%		1.4%		-0.7%		-1.0%		**0.0%**	
PS NT Net	-0.1%		-0.2%		-0.2%		-0.1%		**-0.2%**	
PS PT Tr Net	-1.1%		-0.6%		-0.7%		-0.1%		**-0.6%**	
PS Tr Troll	-0.1%		-0.6%		-0.1%		0.1%		**-0.2%**	
PS Term Tr Net	4.7%		10.5%		2.5%		5.3%		**5.8%**	
Northern	3.3%		-1.1%		0.2%		3.6%		**1.5%**	
PFMC	0.6%		2.8%		-1.6%		0.0%		**0.5%**	

Differences in the methodologies used for Skokomish stock FRAM inputs (see Forecast Error section below) have a direct impact on Skokomish un-marked AEQ impact estimates assessed in this section. As a result, all comparisons in the following assessment regarding Skokomish un-marked Chinook must recognize that methodology changes have some level of influence on the results.

During 2011, several northern fisheries in Canada exceeded their expected overall total AEQ impacts. As described in the methods, timestep breakouts in Northern fisheries should be interpreted with caution but do contribute to pre vs post season AEQ impact differences, including some fisheries that were modeled pre-season to have zero impacts during specific timesteps (Table 16). As a result of these differences, unmarked Skokomish fall Chinook were impacted at higher levels than expected pre-season, particularly in N/C BC troll, WCVI Sport, and BC JDF Sport and net fisheries (Table 17). In PFMC ocean fisheries, non-treaty troll fisheries in Areas 3:4 exceeded pre-season impact expectations during timestep 2 (Table 16). As a result, AEQ impacts on unmarked Skokomish Chinook salmon exceeded pre-season expectations (Table 17). In Puget Sound fisheries, sport fisheries in marine areas 6, 7, and 10 exceeded pre-season AEQ impacts on all stocks (Table 16) during timesep 3. Additionally, treaty net fisheries in 7BCD and terminal and FW net fisheries exceeded pre-season overall AEQ impacts in timestep 3. As a result, all of these fisheries had greater than expected impacts on Skokomish unmarked Chinook in timestep 3 ranging from 3% relative error in the FW net fishery to 174% in the Area 10 sport fishery (Table 17).

During 2012, both treaty and non-treaty ocean troll fisheries in Areas 3:4 exceeded their total pre-season AEQ impacts (Table 18) with increased impacts on unmarked Skokomish chinook (Table 19). In Puget Sound, marine sport fisheries in areas 5 and 6, as well as Treaty net fisheries Hood Canal and South Puget Sound exceeded overall AEQ impacts during timestep 3 or 4 (Table 18). Additionally, both the FW sport and net fisheries exceeded pre-season impacts (Table 18). All of these Puget Sound fisheries had greater impacts than excepted pre-season on both unmarked Skokomish Chinook (Table 19).

In 2013, only two fisheries exceeded threshold impacts. In Puget Sound fisheries, marine sport fishery in areas 7 as well as treaty net fisheries in Hood Canal exceeded their expected overall AEQ impacts during timestep 3 (Table 20) and resulted in greater impacts to unmarked Skokomish Chinook (Table 21).

In 2014, several Canadian sport and troll fisheries exceeded pre-season AEQ expected impacts as did the WCVI net fishery, which was not modeled to have any Chinook impacts (Table 22). However, only the WCVI sport and WCVI net fisheries exceeded the pre-season expectations for AEQ impacts on unmarked Skokomish Chinook during timestep 2 and 3, respectively (Table 23). In PFMC ocean fisheries, Central Oregon non-treaty troll fisheries had substantial increases in overall AEQ impacts across all timesteps (Table 22) but did not exceeded its pre-season AEQ impacts on unmarked Skokomish Chinook (Table 23). In Puget Sound fisheries, marine sport fisheries in areas 6, 7, and 9 as well as treaty net fisheries in Hood Canal exceeded pre-season AEQ expected impacts during at least one timestep (Table 22). However, the marine sport fishery in Area 12 had greater AEQ impact on unmarked Skokomish Chinook during timestep 2

(Table 23) despite having an overall lower total AEQ impact (Table 22). Freshwater net fisheries were well below the overall AEQ estimated impacts as well as impacts on unmarked Skokomish Chinook (Table 23).

Table 16. 2011 AEQ total fishery mortality report for fisheries with positive error in ER assessment.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
Fishery Name	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**Pre**	**Post**	**Relative Error**
N/C BC Net	0	3,520	#DIV/0!	2,939	3,481	18%	0	0	0%	**2,939**	**7,001**	**138%**
GeoStr Net	0	3	#DIV/0!	158	571	261%	19	0	-100%	**177**	**574**	**224%**
BC JDF Net	0	0	0%	0	175	#DIV/0!	0	1	#DIV/0!	**0**	**176**	**#DIV/0!**
N/C BC Trl	36,958	73,293	98%	75,224	7,470	-90%	372	0	-100%	**112,554**	**80,763**	**-28%**
WCVI Sport	0	5,938	#DIV/0!	53,264	100,165	88%	0	0	0%	**53,264**	**106,103**	**99%**
N GS Sport	1,435	4,106	186%	15,251	20,547	35%	2	0	-100%	**16,688**	**24,653**	**48%**
S GS Sport	1,041	2,906	179%	4,109	2,795	-32%	60	247	312%	**5,210**	**5,948**	**14%**
BC JDF Spt	1,406	1,766	26%	10,759	16,967	58%	1,757	3,162	80%	**13,922**	**21,895**	**57%**
NT 3:4 Trl	6,231	8,760	41%	5,326	4,612	-13%	0	0	0%	**11,557**	**13,372**	**16%**
NT 1 Troll	4,495	3,447	-23%	1,780	600	-66%	0	0	0%	**6,275**	**4,047**	**-36%**
Ar 7 Sport	0	0	0%	2,608	4,963	90%	4,120	3,782	-8%	**6,728**	**8,745**	**30%**
Tr 7BCDNet	0	0	0%	13,036	13,112	1%	174	0	-100%	**13,210**	**13,112**	**-1%**
Ar 6 Sport	0	0	0%	1,595	4,109	158%	1,040	1,020	-2%	**2,635**	**5,129**	**95%**
A 10 Sport	79	0	-100%	3,425	4,809	40%	2,749	412	-85%	**6,253**	**5,221**	**-17%**
Tr HC Net	0	0	0%	3,504	7,679	119%	3	3	0%	**3,507**	**7,682**	**119%**
A 13 Sport	198	60	-70%	1,338	1,277	-5%	246	184	-25%	**1,782**	**1,521**	**-15%**
FW Net	0	0	0%	6,312	11,761	86%	0	0	0%	**6,312**	**11,761**	**86%**

Table 17. 2011 AEQ stock mortalities of unmarked Skokomish Fall Chinook by timesteps 2, 3, and 4 for fisheries with positive error in the exploitation rates.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**PRE**	**POST**	**Relative Error**
N/C BC Net	0	0	0%	1	1	-5%	0	0	0%	**1**	**1**	**-5%**
GeoStr Net	0	0	0%	0	0	0%	0	0	0%	**0**	**0**	**0%**
BC JDF Net	0	0	0%	0	1	#DIV/0!	0	0	0%	**0**	**1**	**#DIV/0!**
N/C BC Trl	10	23	124%	9	0	-100%	2	0	-100%	**21**	**23**	**12%**
WCVI Sport	0	29	#DIV/0!	190	296	56%	0	0	0%	**190**	**325**	**71%**
N GS Sport	0	0	0%	0	0	0%	0	0	0%	**0**	**0**	**0%**
S GS Sport	0	0	0%	1	1	-5%	0	0	0%	**1**	**1**	**-5%**
BC JDF Spt	1	1	-5%	160	225	40%	2	4	89%	**163**	**229**	**40%**
NT 3:4 Trl	14	23	64%	18	15	-15%	0	0	0%	**32**	**39**	**20%**
NT 1 Troll	1	2	89%	0	0	0%	0	0	0%	**1**	**2**	**89%**
Ar 7 Sport	0	0	0%	72	97	35%	34	44	29%	**106**	**141**	**33%**
Tr 7BCDNet	0	0	0%	3	5	89%	0	0	0%	**3**	**5**	**89%**
Ar 6 Sport	0	0	0%	4	9	137%	8	7	-5%	**11**	**16**	**42%**
A 10 Sport	0	0	0%	9	23	174%	13	3	-80%	**22**	**26**	**19%**
Tr HC Net	0	0	0%	222	366	65%	0	0	0%	**222**	**366**	**65%**
A 13 Sport	1	0	-100%	1	4	373%	2	2	-5%	**4**	**6**	**66%**
FW Net	0	0	0%	813	836	3%	0	0	0%	**813**	**836**	**3%**

Table 18. 2012 AEQ fishery mortality report for fisheries with positive error in ER assessment.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
Fishery Name	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**Pre**	**Post**	**Relative Error**
NT 3:4 Trl	9,518	13,309	40%	7,829	14,568	86%	0	0	0%	**17,347**	**27,877**	**61%**
Tr 3:4 Trl	23,580	24,437	4%	24,111	37,651	56%	6,811	275	-96%	**47,691**	**62,088**	**30%**
Ar 5 Sport	0	0	0%	6,457	7,196	11%	579	445	-23%	**7,036**	**7,641**	**9%**
Ar 6 Sport	0	0	0%	1,591	6,289	295%	1,542	1,424	-8%	**3,133**	**7,713**	**146%**
Tr HC Net	0	0	0%	4,223	12,453	195%	14	3	-79%	**4,237**	**12,456**	**194%**
Tr SPS Net	0	0	0%	5,201	3,900	-25%	17	20	18%	**5,218**	**3,920**	**-25%**
FW Sport	0	0	0%	5,094	12,639	148%	0	0	0%	**5,094**	**12,639**	**148%**
FW Net	0	0	0%	6,593	18,046	174%	0	0	0%	**6,593**	**18,046**	**174%**

Table 19. 2012 AEQ stock mortalities of unmarked Skokomish Fall Chinook by timesteps 2, 3, and 4 for fisheries with positive error in the exploitation rates.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**PRE**	**POST**	**Relative Error**
NT 3:4 Trl	31	43	38%	31	65	106%	0	0	0%	**63**	**108**	**72%**
Tr 3:4 Trl	67	74	10%	85	159	86%	29	2	-94%	**182**	**235**	**29%**
Ar 5 Sport	0	0	0%	15	20	34%	6	4	-22%	**21**	**25**	**19%**
Ar 6 Sport	0	0	0%	4	15	296%	5	4	-7%	**9**	**19**	**128%**
Tr HC Net	0	0	0%	307	494	61%	0	0	0%	**307**	**494**	**61%**
Tr SPS Net	0	0	0%	18	20	13%	0	0	0%	**18**	**20**	**13%**
FW Sport	0	0	0%	158	220	39%	0	0	0%	**158**	**220**	**39%**
FW Net	0	0	0%	915	1,175	28%	0	0	0%	**915**	**1,175**	**28%**

Table 20. 2013 AEQ fishery mortality report for fisheries with positive error in ER assessment.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
Fishery Name	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**Pre**	**Post**	**Relative Error**
Ar 7 Sport	0	0	0%	2,500	5,583	123%	3,764	3,717	-1%	**6,264**	**9,300**	**48%**
Tr HC Net	0	0	0%	7,341	8,566	17%	23	1	-96%	**7,364**	**8,567**	**16%**

Table 21. 2013 AEQ stock mortalities of unmarked Skokomish Fall Chinook by timesteps 2, 3, and 4 for fisheries with positive error in the exploitation rates.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**PRE**	**POST**	**Relative Error**
Ar 7 Sport	0	0	0%	47	105	124%	12	10	-15%	**59**	**115**	**96%**
Tr HC Net	0	0	0%	270	336	24%	0	0	0%	**270**	**336**	**24%**

Table 22. 2014 AEQ fishery mortality report for fisheries with positive error in ER assessment.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
Fishery Name	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**Pre**	**Post**	**Relative Error**
WCVI Net	0	19	#DIV/0!	0	6,680	#DIV/0!	0	22	#DIV/0!	**0**	**6,721**	**#DIV/0!**
N/C BC Trl	68,668	88,758	29%	122,547	71,525	-42%	241	7	-97%	**191,456**	**160,290**	**-16%**
WCVI Troll	31,188	38,152	22%	59,180	59,291	0%	16,517	18,814	14%	**106,885**	**116,257**	**9%**
WCVI Sport	0	8,951	#DIV/0!	72,767	67,311	-7%	0	0	0%	**72,767**	**76,262**	**5%**
N GS Sport	3,699	7,250	96%	16,143	31,778	97%	107	121	13%	**19,949**	**39,149**	**96%**
S GS Sport	5,009	5,494	10%	5,209	7,165	38%	814	98	-88%	**11,032**	**12,757**	**16%**
BC JDF Spt	3,684	3,106	-16%	15,848	13,871	-12%	3,313	2,823	-15%	**22,845**	**19,800**	**-13%**
Cen OR Trl	13,489	66,561	393%	67,045	101,655	52%	1,118	18,116	1520%	**81,652**	**186,332**	**128%**
Ar 7 Sport	0	0	0%	3,501	4,580	31%	4,140	3,392	-18%	**7,641**	**7,972**	**4%**
TR JDF Trl	671	707	5%	408	80	-80%	4,669	3,391	-27%	**5,748**	**4,717**	**-18%**
TR 7:7A Net	0	0	0%	5,026	3,623	-28%	1	26	2,500%	**5,027**	**3,649**	**-27%**
Ar 9 Sport	0	0	0%	4,480	3,524	-21%	1,885	2,230	18%	**6,365**	**5,754**	**-10%**
A 12 Sport	0	0	0%	1,037	898	-13%	1,241	71	-94%	**2,278**	**969**	**-57%**
Tr HC Net	0	0	0%	8,709	4,499	-48%	25	26	4%	**8,734**	**4,525**	**-48%**
FW Net	0	0	0%	9,602	3,680	-62%	0	0	0%	**9,602**	**3,680**	**-62%**

Table 23. 2014 AEQ stock mortalities of unmarked Skokomish Fall Chinook by timesteps 2, 3, and 4 for fisheries with positive error in the exploitation rates.

	Timestep 2			Timestep 3			Timestep 4			**Total (TS 2-4)**		
FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	**PRE**	**POST**	**Relative Error**
WCVI Net	0	0	0%	0	2	#DIV/0!	0	0	0%	**0**	**2**	**#DIV/0!**
N/C BC Trl	8	5	-36%	5	2	-68%	1	0	-100%	**14**	**7**	**-52%**
WCVI Troll	100	50	-50%	153	66	-57%	108	49	-55%	**361**	**165**	**-54%**
WCVI Sport	0	11	#DIV/0!	164	66	-60%	0	0	0%	**164**	**78**	**-53%**
N GS Sport	0	0	0%	0	0	0%	0	0	0%	**0**	**0**	**0%**
S GS Sport	0	0	0%	2	1	-52%	0	0	0%	**2**	**1**	**-52%**
BC JDF Spt	3	2	-36%	146	63	-57%	5	2	-52%	**153**	**67**	**-56%**
Cen OR Trl	0	0	0%	4	2	-42%	0	0	0%	**4**	**2**	**-42%**
Ar 7 Sport	0	0	0%	62	37	-41%	13	6	-55%	**75**	**43**	**-43%**
TR JDF Trl	6	3	-50%	1	0	-100%	15	7	-53%	**22**	**10**	**-54%**
Tr 7:7ANet	0	0	0%	9	6	-39%	0	0	0%	**9**	**6**	**-39%**
Ar 9 Sport	0	0	0%	36	16	-56%	10	8	-20%	**46**	**24**	**-48%**
A 12 Sport	0	0	0%	15	17	13%	17	1	-94%	**32**	**18**	**-43%**
Tr HC Net	0	0	0%	323	170	-47%	1	1	-4%	**324**	**171**	**-47%**
FW Net	0	0	0%	605	262	-57%	0	0	0%	**605**	**262**	**-57%**

Forecast performance for Skokomish Fall Chinook Salmon varied by marked and unmarked stock components across years. However, different methods were used to populate the 2011-2012 pre-season runs, the 2013-2014 pre-season runs, and the 2011-2014 post season runs. In the 2011 and 2012 preseason runs, all natural spawners (including HOR-Unmarked, HOR-Marked and NOR-Uunmarked) were entered into the cell for Skokomish natural unmarked. For the 2013-2014 pre-season runs there was a methodology change, and Skokomish River natural row contains all the natural spawners split into columns by mark status. In the 2013-2014 pre-season runs the Skokomish River natural unmarked cell contains all unmarked spawners of both hatchery and natural origin. For all of the post-season runs, hatchery origin fish that spawned naturally were put in the Skokomish River Hatchery row, nothing was put in the Skokomish River natural marked cell, the Skokomish River natural unmarked cell now contains only NOR fish, and a hatchery stray rate field was added. During 2011 and 2012, both the marked and unmarked components destined for the hatchery exceeded pre-season forecast expectations while the marked and unmarked natural spawning component returned at lower rates (Table 24). During 2013 and 2014, all components of the Skokomish MU returned at lower levels than expected (Table 24).

Table 24. Pre-season and post-season TRS forecast performance from 2011-2014 for Skokomish Fall Chinook salmon and the Hood Canal FRAM aggregate fall stock.

	2011			2012			2013			2014		
	Pre-season [c]	Post-season [c]	Rel. Error	Pre-season [c]	Post-season [c]	Rel. Error	Pre-season [c]	Post-season [c]	Rel. Error	Pre-season [c]	Post-season [c]	Rel. Error
Skokomish Chinook												
Hatchery - Marked [a]	26,098	39,169	50%	28,847	49,786	73%	41,251	33,502	-19%	46,386	11,273	-76%
Hatchery - Unmarked [a]	1,873	2,957	58%	1,965	3,386	72%	2,746	2,294	-16%	3,054	794	-74%
Natural Spawners-Marked [b]	1,811	1,164	-36%	2,378	1,306	-45%	2,776	1,451	-48%	2,697	704	-74%
Natural Spawners-Unmarked [b]	183	157	-14%	242	227	-6%	281	271	-4%	274	145	-47%
Hood Canal Aggregate	40,566	60,933	50%	47,261	89,696	90%	69,059	68,516	-1%	84,155	22,639	-73%

[a] This is the Hatchery TRS excluding natural spawners

[b] Natural Spawners includes HORs and NORs

[c] TAMM inputs were modified to be consistent with TAMM used during pre-season runs 2013-2014

Table 25. Hood Canal stock Aggregate composition 2011 – 2014.

2011				
	% of Mrkd Agg.		% of UnMrkd Agg.	
Stk Name	Pre-Season	Post-Season	Pre-Season	Post-Season
Area 12B tribs natural	0.0%	0.0%	3.4%	8.3%
Hoodsport hat Fing	27.6%	29.6%	0.6%	1.3%
Hoodsport hat Year	100.0%	100.0%	0.0%	100.0%
Enetai hatchery	0.0%	0.0%	0.0%	0.0%
Skokomish R. natural	0.0%	0.0%	48.9% [a]	2.9% [c]
Skokomish R. hatchery	72.4%	70.4%	45.9%	86.9%
Area 12C-D tribs natural	0.0%	0.0%	1.2%	0.6%

2012				
	% of Mrkd Agg.		% of UnMrkd Agg.	
Stk Name	Pre-Season	Post-Season	Pre-Season	Post-Season
Area 12B tribs natural	0.0%	0.0%	4.0%	10.5%
Hoodsport hat Fing	31.1%	40.2%	0.3%	0.3%
Hoodsport hat Year	100.0%	100.0%	0.0%	100.0%
Enetai hatchery	0.0%	0.0%	0.0%	0.0%
Skokomish R. natural	0.0%	0.0%	54.2% [a]	6.0% [c]
Skokomish R. hatchery	68.9%	59.8%	40.7%	82.4%
Area 12C-D tribs natural	0.0%	0.0%	0.8%	0.7%

2013				
	% of Mrkd Agg.		% of UnMrkd Agg.	
Stk Name	Pre-Season	Post-Season	Pre-Season	Post-Season
Area 12B tribs natural	0.0%	0.0%	7.4%	20.2%
Hoodsport hat Fing	32.1%	46.2%	0.6%	0.4%
Hoodsport hat Year	100.0%	100.0%	0.0%	0.0%
Enetai hatchery	0.0%	0.0%	0.0%	0.0%
Skokomish R. natural	4.3% [b]	0.0%	8.4% [b]	7.2% [c]
Skokomish R. hatchery	63.6%	53.8%	82.2%	69.7%
Area 12C-D tribs natural	0.0%	0.0%	1.4%	2.5%

2014				
	% of Mrkd Agg.		% of UnMrkd Agg.	
Stk Name	Pre-Season	Post-Season	Pre-Season	Post-Season
Area 12B tribs natural	0.0%	0.0%	12.1%	12.3%
Hoodsport hat Fing	37.8%	43.0%	0.8%	1.1%
Hoodsport hat Year	100.0%	100.0%	0.0%	0.0%
Enetai hatchery	0.0%	0.0%	0.0%	0.0%
Skokomish R. natural	3.4% [b]	0.0%	7.0% [b]	13.1% [c]
Skokomish R. hatchery	58.7%	57.0%	78.1%	68.9%
Area 12C-D tribs natural	0.0%	0.0%	2.0%	4.6%

[a] In 2011 and 2012, the Skokomish River un-marked natural component pre-season input comprised all natural spawning fish regardless of origin of marked status.
[b] In 2013 and 2014, the Skokomish pre-season input broke out natural spawners by mark status but not by origin.
[c] All post-season runs apportioned natural spawning abundance by both mark status and origin.

A 50% exploitation rate was expected to provide on average a spawning escapement of 1,200 natural spawners (NOR + HOR) to the spawning grounds with a range of 800 (e.g. the natural spawning component of the LAT) to 1,650 (e.g the natural spawner component of the UMT). Estimated natural spawning escapement estimates (HOR + NOR) from 2011 through 2017 averaged 2,179 natural spawners for the Skokomish River fall Chinook salmon and ranged from 432 in 2015, which was below the natural spawning portion of the LAT, to 8,058 in 2017, greatly exceeding the pre-season expectation of 1,330 and the natural spawning portion of the UMT (Figure 3). The 2017 escapement was the highest estimated escapement for Skokomish River Fall Chinook since at least 1987 based on data provided by PSIT and WDFW (2013). Excluding the high escapement estimate in 2017, the average natural spawning escapement from 2011 through 2016 was still 1,200 spawners; consistent with co-managers intended goals.

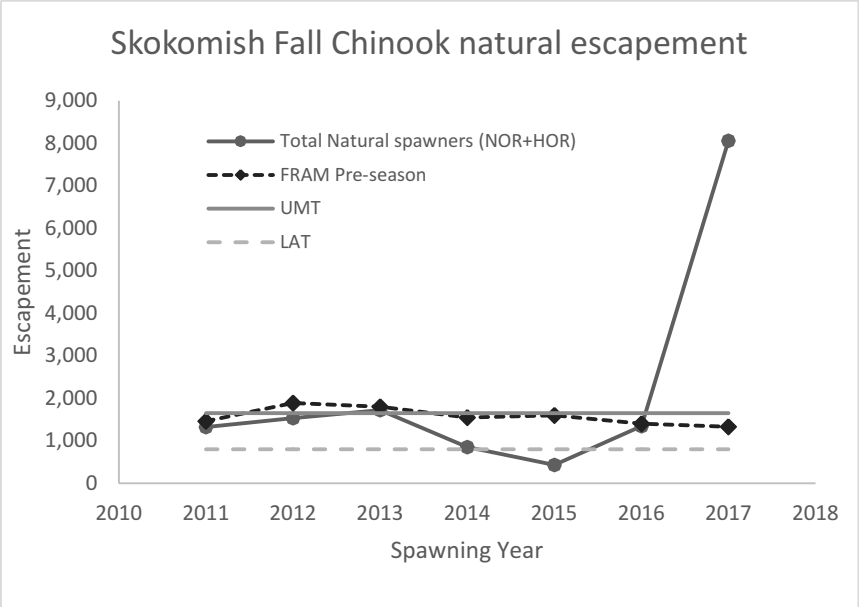

Figure 3. Skokomish River fall-run Chinook Salmon natural (NOR + HOR) pre-season FRAM and observed escapement estimates, 2011-2017. Dashed grey line denotes Low Abundance threshold and solid grey line denotes Upper Management Threshold objectives.

Starting cohort abundance in Timestep 1 for Hood Canal Aggregate stock indicates a strong 2008 brood year class in post-season assessments for 2011 and 2012 (Figure 4). These years were dominated by very strong hatchery returns in Hood Canal to George Adams (Skokomish River), as well as Hoodsport Hatchery. However in 2013 and 2014, starting cohort abundance was substantially lower for both marked and unmarked Hood Canal aggregate stock. Based on the strong hatchery years preceding 2013, forecasts anticipated similar return levels for hatchery stocks which did not materialize in 2013 and 2014, thus the much lower observed run-sizes.

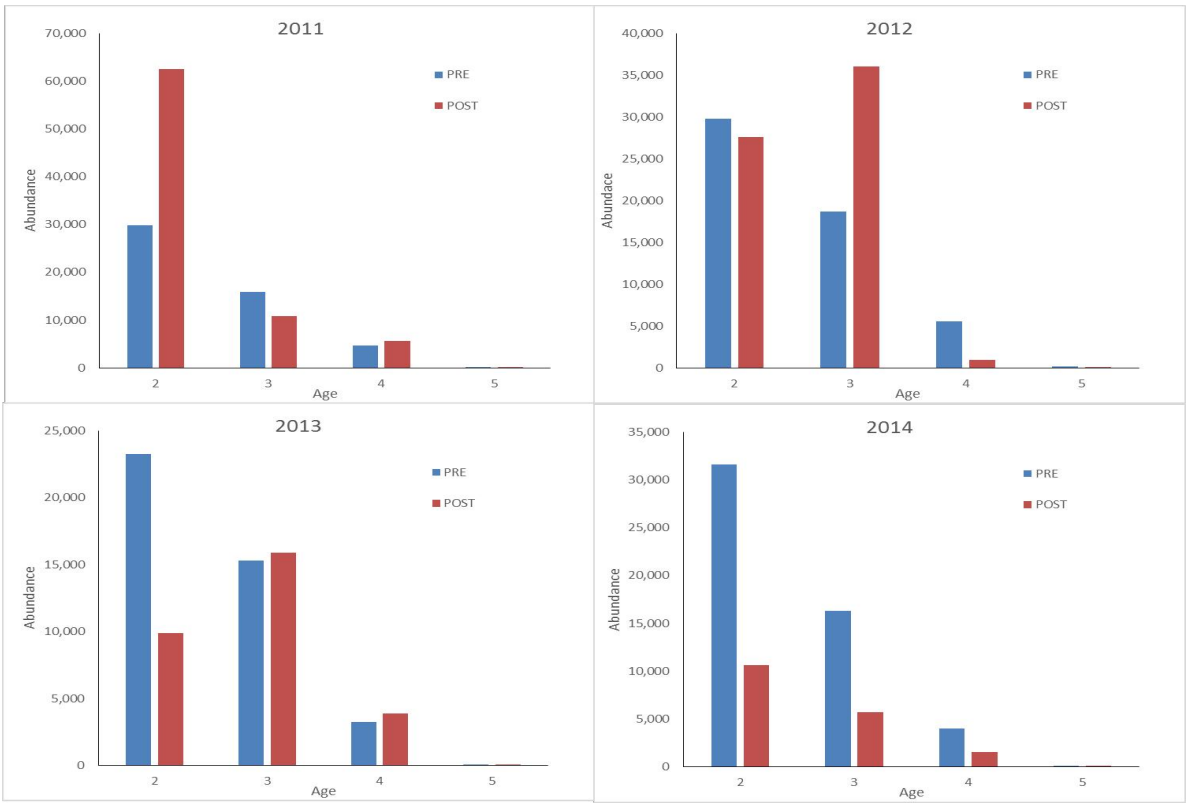

Figure 4. Starting cohort abundance of Unmarked Hood Canal aggregate stock during Timestep 1 in 2011, 2012, 2013, and 2014. 2011-2013 Age 2 abundances should be interpreted with caution due the use of static age-2 scalars in preseason FRAM runs (elaborated in methods).

Impacts from Northern fisheries in Canada are of concern for Hood Canal Aggregate stock and Skokomish fall Chinook. Of notable interest are fisheries which had no modeled pre-season impact with subsequent harvest in post-season models. While it is unclear if these discrepancies are a result of the inclusion of ISBM sport fisheries in post-season runs, whether pre-season FRAM model inputs from Canada are received/translated correctly, whether these fisheries were actually not anticipated to occur and did, or some combination of these factor, the concern warrants further consideration by the appropriate management panels. Ocean fisheries under PFMC control exceeded pre-season ER levels in three of the four years evaluation. Both Treaty and Non-treaty Ocean troll fisheries under PFMC control in Areas 3:4 were managed within in-season quotas and guidelines, however, post-season impacts on Puyallup were greater than expected in 2011 and 2012. Since this time, provisions have been put in place to limit the proportion of catch allowed in Non-treaty troll fisheries in Areas 3:4. In examining the causes of increased impacts in 2011 and 2012, it was discovered that an adjustment to the sublegal encounters in these fisheries that was used in 2011 and 2012 pre-season modeling had inadvertently been removed in the respective post-season model runs. This resulted in numbers of sublegal encounters in these fisheries that were 3 to 7 times higher in the post-season runs and, thus, higher exploitation rates on Puyallup Chinook, among other stocks. This discrepancy will be addressed in future post-season modeling exercises. Within Puget Sound, particular attention is necessary in marine sport fisheries especially for marine areas 5, 6, and 7 as well as terminal and freshwater net fisheries.

Previous performance reports have noted adaptive management efforts for the freshwater net fishery being implemented starting in 2014 (Grayum and Unsworth 2015). While observed ER estimates in the FW net fishery were higher than expected pre-season, the overall catch of unmarked Chinook in the FW and terminal net fisheries were 50%-60% lower than anticipated in 2014 (Table 22) suggesting that the higher impacts observed are influenced to a large degree by the fact that the observed return was ~75% what was forecasted (Table 24). In 2016 and 2017, the co-managers implemented a more conservative approach to address the exceedance of the currently established FRAM ER ceiling of 50%, which involved changes in terminal and extreme terminal harvest strategies. Consistent with the objectives of the 2017 Skokomish Chinook Recovery Plan (SIT and WDFW 2017) of 1) Reintroduction of spring Chinook, 2) Stabilization of the extant George Adams summer/fall population, and 2) Experimental effort to develop a true fall Chinook population from the extant hatchery stock, the co-managers have already begun implementation of changes to fisheries. Specifically, changes related to the latter of the objectives were made under the Addendum to 2014 Plan for Management of Fall Chinook in the Skokomish River (SIT and WDFW 2014 and SIT and WDFW 2015).

In recent years, George Adams Chinook salmon have exhibited more and more advanced return timing, such that returns to the hatchery have been observed as early as June. To minimize overlap in timing with the introduced spring population, hatchery broodstock collection protocols and targeted harvest again will be implemented in 2018 to substantially reduce or eliminate early returns in June and July, such that river entry timing of George Adams returns begins in late July, peaking in late August.

For a period of at least two brood cycles (seven years starting in 2018) fishing pressure will be increased in the Skokomish River (consistent with the SCSCI) and Area 12C during the month of July to remove early George Adams returns. Fisheries directed at the earlier component of summer/fall Chinook salmon will occur in Area 12C and the Skokomish River (as per the SCSCI) through the fourth week of August. Skokomish River fisheries will include openings in the mainstem below SR 106, between SR 106 and US 101, and in Purdy Creek (as per the SCSCI). Skokomish River fisheries will commence the first week of July, with regulations for use of hook & line, dip-net, gillnet, and beach seine gear (consistent with the SCSCI).

Commercial fisheries in Area 12C will be closed during the month of September, with the Skokomish River closed for the month of September thru the first week of October in order to provide escapement for the “late-timed” Chinook salmon population. Coho directed fisheries will begin October 1 in Area 12C and by the second week of October in the Skokomish River.

Mark selective sport fisheries will be implemented in Area 12 and commercial non-treaty beach seine fisheries in the Hoodsport Hatchery Zone 12C-12H which target hatchery Chinook salmon while meeting management thresholds for wild Chinook salmon stocks. Similar fisheries may occur in-river below the Highway 101 Bridge where the co-managers agree they are compatible with tribal fisheries and recovery goals.

As the later run-timing of the George Adams stock emerges, co-managers expect that opportunity targeting the peak of the run will continue to provide significant harvest benefits in late July and August. Again, this will be followed by the complete closure of the in-river commercial fisheries during September, except ceremonial and subsistence. This closure will

increase the escapement of later-timed hatchery recruits (i.e. those entering the river in September and October, which are expected to have higher natural production potential, particularly as habitat constraints can be alleviated). Although the terminal harvest rate on this later-timed component will be managed consistent with the total ER ceiling of 50%, it is expected that the total ER on the late-timed component of the Skokomish River Chinook run (predominantly George Adams hatchery-reared fish) will be less than 35%.

Should co-manager efforts to rebuild a late timed life history prove successful, this sub-population may also be added to the FRAM, for pre-season planning and post-season assessment. The co-managers plan to estimate escapement for the late-timed Chinook salmon by combining to two strategies: first, by using live fish counts and hatchery rack returns from after September 20, and second, by redds constructed and carcasses sampled in the river after October 1 (these dates will be adaptively managed as new data becomes available over the duration of this plan).

The operating assumption in implementing this objective is that migration and spawn timing can be genetically managed to promote two peaks, an earlier returning and spawning peak similar to the current hatchery program and a later returning and spawning peak that would be more likely to be successful spawning in the wild. Preliminary genetic analyses indicate that the George Adams stock likely has adequate genetic diversity to respond to selection and evidence of heritability for migration and spawn timing. Genetic data will continue to be collected for the detection of the premature and mature migration allele. Because of unknown factors, such as heritability (a statistical measure of how much change might occur because of selection), correlations of return timing and spawn timing, or annual variation in smolt-to-adult survival rates, will be assessed on an annual basis. Also, coded-wire tag (CWT) recoveries will be used to estimate terminal area harvest rates. However, since these fish are un-marked, the co-managers will rely on pre-terminal harvest rates of early-timed George Adams Chinook salmon to develop an exploitation rate for late timed Chinook salmon. Specific management objectives (e.g. harvest rate or exploitation rate ceilings, and thresholds) will be developed for pre-terminal and terminal fisheries.

The co-managers' will continue to monitor natural escapement, age composition, and spawning distribution of spring and the summer/fall/late-timed Chinook components, to inform subsequent recovery planning decisions.

Marine Area Sport Fisheries

Puget Sound marine area sport fisheries, on average exceeded preseason impacts on Skokomish unmarked chinook by 0.35%. The sport fishery in marine area 7 outperformed preseason expectations in each year during the assessment and was the largest contributor to that overage at ≈0.89% absolute error on average. As described in the Puyallup section, some of this overage in 2011-2013 can be attributed to the age 2 methodology change in FRAM. However, area 7 sport effort has outpaced our preseason modeling consistently for these years. WDFW is addressing this issue in our preseason planning in 2018. Area 6 sport also exceeded preseason exploitation rates with ≈0.1% absolute error on average. This fishery performed over preseason-modeled expectations in 2011 and 2012 but under in 2013 and 2014 suggesting in-season abundances that differed from preaseason expectations led to the overages.

Freshwater Sport Fisheries

Skokomish freshwater sport fisheries exceeded preseason ER's in both 2011 and 2012. Returning abundances as noted above were less than anticipated preseason in both years, which accounts for much of this overage. For the last 2 years (2016 and 2017), sport fisheries have not taken place on the Skokomish river and if/when the in-river sport fishery takes place again, WDFW will take care in modeling the fishery to ensure effort and catch are adequately modeled.

Literature Cited

Grayum, M. and J. Unsworth. 2015. Letter to Mr. Robert Turner, NMFS Asst. Regional Administrator, re: 2015-2016 Puget Sound Chinook Harvest Plan submission. April 28th, 2015.

Parker, J. and J. Unsworth. 2017. Letter to Mr. Barry Thom, NMFS WCR Regional Administrator, re: 2017-2018 Puget Sound Chinook Harvest Plan submission. April 14th, 2017.

Puget Sound Indian Tribes and Washington Department of Fish and Wildlife (PSIT and WDFW) 2013. Puget Sound Chinook Harvest Management Performance Assessment, 2003-2010. July 2013.

Grayum, M. and J. Unsworth. 2015. Letter to Mr. Robert Turner, NMFS Asst. Regional Administrator, re: 2015-2016 Puget Sound Chinook Harvest Plan submission. April 28th, 2015.

Puget Sound Treaty Indian Tribes and Washington Department of Fish and Wildlife (PSTIT and WDFW). 2016. Puget Sound Chinook Comprehensive Harvest Management Plan: Annual Report for the 2015-2016 Fishing Season. November 2016. 122 p.

Puget Sound Treaty Indian Tribes and Washington Department of Fish and Wildlife (PSTIT and WDFW). 2016. Puget Sound Chinook Comprehensive Harvest Management Plan: Annual Report for the 2016-2017 Fishing Season. May 2017. 141 p.

Skokomish Indian Tribe and Washington Department of Fish and Wildlife (SIT and WDFW). 2014. 2014 Plan for Management of Fall Chinook in the Skokomish River. Skokomish Indian Tribe and Washington Department of Fish and Wildlife, October 2014.

Skokomish Indian Tribe and Washington Department of Fish and Wildlife (SIT and WDFW). 2015. Addendum to the 2014 Plan for Management of Fall Chinook in the Skokomish River (SIT and WDFW 2015). Skokomish Indian Tribe and Washington Department of Fish and Wildlife, October 2015.

Skokomish Indian Tribe and Washington Department of Fish and Wildlife (SIT and WDFW). 2017. Recovery Plan for Skokomish River Chinook Salmon 2017 Update. Skokomish Indian Tribe and Washington Department of Fish and Wildlife, June 2017.

APPENDICES

Appendix A. Following are tables of data used to develop the Puyallup River fall Chinook Salmon harvest Performance assessment including data on the marked Puyallup and marked and unmarked Mid-Puget Sound aggregate stock.

Table 26. 2011 fishing pre-season and post-season FRAM ER comparison of absolute and relative error estimates for Puyallup River unmarked and marked fall Chinook salmon across all individual fisheries.

		UNMARKED				MARKED			
Fish_Name	YEAR	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference
SEAK Troll	2011	0.2%	0.3%	0.1%	66.4%	0.2%	0.3%	0.1%	76.4%
SEAK Net	2011	0.0%	0.0%	0.0%	-79.5%	0.0%	0.0%	0.0%	-68.9%
SEAK Sport	2011	0.1%	0.1%	0.0%	42.3%	0.1%	0.1%	0.0%	33.6%
N/C BC Net	2011	0.0%	0.1%	0.1%	305.8%	0.0%	0.1%	0.1%	217.9%
WCVI Net	2011	0.4%	0.0%	-0.3%	-88.9%	0.4%	0.0%	-0.3%	-88.8%
GeoStr Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	352.9%
BC JDF Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	#VALUE!
BCOutSport	2011	1.9%	1.2%	-0.7%	-38.9%	1.9%	1.4%	-0.5%	-25.4%
N/C BC Trl	2011	0.5%	0.4%	-0.1%	-27.6%	0.5%	0.3%	-0.2%	-33.1%
WCVI Troll	2011	13.0%	8.4%	-4.6%	-35.4%	13.0%	9.0%	-4.0%	-30.7%
WCVI Sport	2011	5.1%	7.1%	2.0%	40.1%	5.1%	8.0%	2.9%	56.6%
GeoS Troll	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JS/GS/JDF Sport	2011	1.9%	2.0%	0.2%	8.8%	1.9%	2.3%	0.4%	23.8%
NT 3:4 Trl	2011	0.6%	1.0%	0.3%	52.0%	0.6%	0.9%	0.3%	48.7%
Tr 3:4 Trl	2011	1.6%	3.2%	1.7%	104.1%	1.5%	2.8%	1.3%	85.3%
Ar 3:4 Spt	2011	0.1%	0.1%	-0.1%	-40.1%	0.1%	0.1%	0.0%	-25.0%
NoWACstNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 2 Troll	2011	0.2%	0.2%	0.1%	41.2%	0.2%	0.2%	0.1%	35.7%
Tr 2 Troll	2011	0.0%	0.0%	0.0%	-55.3%	0.0%	0.0%	0.0%	-51.2%
Ar 2 Sport	2011	0.0%	0.0%	0.0%	-37.5%	0.1%	0.0%	0.0%	-64.6%
NT GHb Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr GHb Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WillapaNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 1 Troll	2011	0.0%	0.0%	0.0%	-19.1%	0.0%	0.0%	0.0%	-18.7%
Ar 1 Sport	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ColRvr Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Buoy10 Spt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cen OR Trl	2011	0.0%	0.0%	0.0%	-49.8%	0.0%	0.0%	0.0%	-66.2%
Cen OR Spt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Troll	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Sport	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Trl	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Spt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 7 Sport	2011	0.5%	1.2%	0.7%	147.7%	1.4%	1.4%	0.1%	4.0%
NT 7:7ANet	2011	0.2%	0.2%	0.1%	30.3%	0.2%	0.3%	0.0%	12.5%
Tr 7:7ANet	2011	0.2%	0.3%	0.0%	10.8%	0.2%	0.3%	0.0%	15.3%
NT 7BCDNet	2011	0.1%	0.0%	0.0%	-66.5%	0.1%	0.0%	0.0%	-47.0%
Tr 7BCDNet	2011	0.1%	0.0%	-0.1%	-65.6%	0.1%	0.0%	0.0%	-49.7%
Tr JDF Trl	2011	1.3%	0.3%	-1.0%	-76.2%	1.3%	0.3%	-1.0%	-78.6%
Ar 5 Sport	2011	0.4%	0.6%	0.2%	51.5%	1.2%	1.2%	0.0%	0.4%
NT JDF Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr JDF Net	2011	0.2%	0.0%	-0.1%	-83.7%	0.2%	0.0%	-0.1%	-80.1%
Ar 8-1 Spt	2011	0.0%	0.1%	0.1%	442.8%	0.0%	0.1%	0.1%	382.5%
NT SkagNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SkagNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Area8D Spt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-87.2%
NT StSnNet	2011	0.0%	0.0%	0.0%	-84.8%	0.0%	0.0%	0.0%	-84.8%
Tr StSnNet	2011	0.1%	0.0%	-0.1%	-81.9%	0.1%	0.0%	-0.1%	-81.3%
NT TulaNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr TulaNet	2011	0.0%	0.0%	0.0%	15.0%	0.0%	0.0%	0.0%	45.7%
Ar 9 Sport	2011	0.7%	1.0%	0.3%	48.8%	1.9%	1.4%	-0.5%	-26.6%
Ar 6 Sport	2011	0.3%	0.5%	0.2%	69.9%	0.5%	0.9%	0.5%	93.8%
Tr 6B:9Net	2011	0.2%	0.0%	-0.2%	-100.0%	0.1%	0.0%	-0.1%	-100.0%
A 10 Sport	2011	1.1%	2.8%	1.7%	147.1%	3.6%	6.0%	2.4%	66.8%
A 11 Sport	2011	0.4%	0.9%	0.5%	123.8%	1.1%	1.2%	0.1%	8.4%
NT10:11Net	2011	0.1%	0.0%	-0.1%	-98.8%	0.1%	0.0%	-0.1%	-99.0%
Tr10:11Net	2011	0.3%	0.0%	-0.2%	-88.8%	0.2%	0.0%	-0.2%	-89.7%
A 10A Sprt	2011	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr 10A Net	2011	0.0%	0.0%	0.0%	-60.4%	0.0%	0.0%	0.0%	-62.4%
A 10E Sprt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10E Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 12 Sport	2011	0.0%	0.1%	0.0%	91.5%	0.0%	0.1%	0.0%	61.7%
NT HC Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-100.0%
Tr HC Net	2011	0.0%	0.0%	0.0%	-27.6%	0.0%	0.0%	0.0%	1.0%
A 13 Sport	2011	0.0%	0.2%	0.2%	383.1%	0.1%	0.2%	0.1%	93.2%
NT SPS Net	2011	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr SPS Net	2011	0.0%	0.0%	0.0%	147.9%	0.0%	0.0%	0.0%	136.3%
NT 13A Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 13A Net	2011	0.5%	0.2%	-0.2%	-51.1%	0.4%	0.2%	-0.2%	-51.5%
FW Sport	2011	2.8%	7.1%	4.3%	154.7%	19.7%	21.9%	2.2%	11.1%
FW Net	2011	13.2%	12.4%	-0.8%	-5.9%	12.0%	11.2%	-0.8%	-6.6%

Table 27. 2012 fishing pre-season and post-season FRAM ER comparison of absolute and relative error estimates for Puyallup River unmarked and marked fall Chinook salmon across all individual fisheries.

		UNMARKED				MARKED			
Fish_Name	YEAR	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference
SEAK Troll	2012	0.2%	0.4%	0.2%	114.7%	0.2%	0.4%	0.2%	90.1%
SEAK Net	2012	0.0%	0.0%	0.0%	-10.2%	0.0%	0.0%	0.0%	-54.9%
SEAK Sport	2012	0.1%	0.0%	0.0%	-41.1%	0.0%	0.0%	0.0%	-12.8%
N/C BC Net	2012	0.0%	0.0%	0.0%	45.3%	0.0%	0.0%	0.0%	-8.7%
WCVI Net	2012	0.3%	0.0%	-0.3%	-86.3%	0.5%	0.0%	-0.5%	-92.7%
GeoStr Net	2012	0.0%	0.0%	0.0%	-28.4%	0.0%	0.0%	0.0%	-56.5%
BC JDF Net	2012	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
BCOutSport	2012	2.2%	3.7%	1.5%	67.9%	3.7%	3.2%	-0.5%	-12.6%
N/C BC Trl	2012	0.6%	0.3%	-0.2%	-44.3%	0.4%	0.3%	-0.1%	-21.2%
WCVI Troll	2012	5.6%	6.6%	1.0%	18.7%	7.9%	5.8%	-2.0%	-25.6%
WCVI Sport	2012	5.6%	11.8%	6.2%	110.3%	7.6%	10.4%	2.8%	36.7%
GeoS Troll	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JS/GS/JDF Sport	2012	1.8%	3.9%	2.1%	118.8%	2.4%	3.5%	1.1%	46.5%
NT 3:4 Trl	2012	1.2%	1.8%	0.6%	54.0%	1.0%	1.8%	0.8%	76.4%
Tr 3:4 Trl	2012	2.8%	4.6%	1.9%	67.6%	2.4%	4.7%	2.3%	97.3%
Ar 3:4 Spt	2012	0.2%	0.5%	0.3%	162.1%	0.3%	0.4%	0.1%	36.1%
NoWACstNet	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 2 Troll	2012	0.3%	0.2%	-0.1%	-38.7%	0.2%	0.1%	-0.1%	-39.3%
Tr 2 Troll	2012	0.0%	0.0%	0.0%	88.7%	0.0%	0.0%	0.0%	9.1%
Ar 2 Sport	2012	0.0%	0.1%	0.0%	162.0%	0.1%	0.1%	0.0%	14.8%
NT GHb Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr GHb Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WillapaNet	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 1 Troll	2012	0.0%	0.1%	0.1%	175.9%	0.0%	0.1%	0.1%	114.3%
Ar 1 Sport	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ColRvr Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Buoy10 Spt	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cen OR Trl	2012	0.0%	0.0%	0.0%	-54.4%	0.0%	0.0%	0.0%	-33.2%
Cen OR Spt	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Troll	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Sport	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Trl	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Spt	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 7 Sport	2012	0.4%	0.5%	0.0%	7.8%	1.6%	1.5%	-0.1%	-7.9%
NT 7:7ANet	2012	0.1%	0.0%	-0.1%	-88.8%	0.1%	0.0%	-0.1%	-95.7%
Tr 7:7ANet	2012	0.2%	0.0%	-0.2%	-85.9%	0.3%	0.0%	-0.3%	-91.7%
NT 7BCDNet	2012	0.1%	0.1%	0.0%	-21.5%	0.1%	0.1%	0.0%	-27.5%
Tr 7BCDNet	2012	0.1%	0.1%	0.1%	81.7%	0.1%	0.1%	0.1%	68.1%
Tr JDF Trl	2012	1.2%	0.2%	-1.0%	-86.1%	1.7%	0.2%	-1.6%	-91.1%
Ar 5 Sport	2012	0.4%	0.5%	0.1%	30.4%	1.3%	1.4%	0.1%	6.1%
NT JDF Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr JDF Net	2012	0.1%	0.3%	0.2%	296.1%	0.1%	0.2%	0.1%	138.0%
Ar 8-1 Spt	2012	0.0%	0.0%	0.0%	38.1%	0.0%	0.0%	0.0%	104.0%
NT SkagNet	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SkagNet	2012	0.0%	0.0%	0.0%	2744.2%	0.0%	0.0%	0.0%	1477.5%
Area8D Spt	2012	0.0%	0.0%	0.0%	181.7%	0.0%	0.0%	0.0%	237.9%
NT StSnNet	2012	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr StSnNet	2012	0.0%	0.0%	0.0%	-83.9%	0.0%	0.0%	0.0%	-80.4%
NT TulaNet	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr TulaNet	2012	0.0%	0.0%	0.0%	-62.3%	0.0%	0.0%	0.0%	-51.6%
Ar 9 Sport	2012	0.6%	0.7%	0.2%	29.7%	1.9%	2.2%	0.3%	13.1%
Ar 6 Sport	2012	0.2%	0.4%	0.2%	156.0%	0.7%	1.5%	0.8%	104.2%
Tr 6B:9Net	2012	0.1%	0.0%	-0.1%	-97.5%	0.1%	0.0%	-0.1%	-97.1%
A 10 Sport	2012	1.2%	1.7%	0.5%	40.3%	4.5%	5.0%	0.4%	9.7%
A 11 Sport	2012	0.4%	0.5%	0.2%	46.8%	1.3%	1.2%	-0.1%	-5.7%
NT10:11Net	2012	0.0%	0.0%	0.0%	-98.2%	0.0%	0.0%	0.0%	-96.4%
Tr10:11Net	2012	0.0%	0.0%	0.0%	-53.9%	0.0%	0.0%	0.0%	-44.5%
A 10A Sprt	2012	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr 10A Net	2012	0.0%	0.0%	0.0%	-63.7%	0.0%	0.0%	0.0%	-55.3%
A 10E Sprt	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10E Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 12 Sport	2012	0.0%	0.0%	0.0%	19.0%	0.0%	0.0%	0.0%	-5.1%
NT HC Net	2012	0.0%	0.0%	0.0%	-91.9%	0.0%	0.0%	0.0%	-95.9%
Tr HC Net	2012	0.0%	0.1%	0.1%	124.6%	0.0%	0.1%	0.0%	83.3%
A 13 Sport	2012	0.0%	0.0%	0.0%	32.9%	0.2%	0.1%	0.0%	-29.6%
NT SPS Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SPS Net	2012	0.0%	0.0%	0.0%	-48.0%	0.0%	0.0%	0.0%	-37.4%
NT 13A Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 13A Net	2012	0.3%	0.1%	-0.2%	-62.5%	0.3%	0.1%	-0.2%	-59.8%
FW Sport	2012	2.1%	1.9%	-0.2%	-7.6%	14.0%	9.8%	-4.3%	-30.5%
FW Net	2012	20.1%	18.8%	-1.3%	-6.6%	16.0%	17.2%	1.2%	7.4%

Table 28. 2013 fishing pre-season and post-season FRAM ER comparison of absolute and relative error estimates for Puyallup River unmarked and marked fall Chinook salmon across all individual fisheries.

		UNMARKED				MARKED			
Fish_Name	YEAR	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference
SEAK Troll	2013	0.2%	0.2%	0.1%	32.4%	0.1%	0.2%	0.1%	64.5%
SEAK Net	2013	0.0%	0.0%	0.0%	-75.7%	0.0%	0.0%	0.0%	-70.5%
SEAK Sport	2013	0.0%	0.0%	0.0%	3.9%	0.0%	0.0%	0.0%	1.7%
N/C BC Net	2013	0.0%	0.0%	0.0%	42.8%	0.0%	0.0%	0.0%	8.6%
WCVI Net	2013	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
GeoStr Net	2013	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
BC JDF Net	2013	0.0%	0.0%	0.0%	65.0%	0.0%	0.0%	0.0%	25.5%
BCOutSport	2013	1.8%	1.5%	-0.3%	-16.2%	2.2%	2.2%	-0.1%	-3.4%
N/C BC Trl	2013	0.6%	0.3%	-0.3%	-52.3%	0.5%	0.2%	-0.3%	-53.6%
WCVI Troll	2013	5.0%	2.4%	-2.6%	-52.8%	5.7%	2.7%	-3.0%	-53.2%
WCVI Sport	2013	6.2%	4.0%	-2.2%	-35.9%	6.9%	4.7%	-2.3%	-32.7%
GeoS Troll	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JS/GS/JDF Sport	2013	3.0%	2.5%	-0.5%	-16.8%	3.2%	2.8%	-0.4%	-11.5%
NT 3:4 Trl	2013	1.1%	0.9%	-0.2%	-20.9%	1.0%	0.8%	-0.2%	-20.3%
Tr 3:4 Trl	2013	3.2%	3.3%	0.1%	4.7%	2.9%	2.9%	0.0%	-0.6%
Ar 3:4 Spt	2013	0.3%	0.1%	-0.1%	-46.1%	0.3%	0.2%	-0.1%	-39.2%
NoWACstNet	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 2 Troll	2013	0.4%	0.4%	0.0%	-6.0%	0.4%	0.3%	0.0%	-7.3%
Tr 2 Troll	2013	0.0%	0.0%	0.0%	-85.8%	0.0%	0.0%	0.0%	-84.4%
Ar 2 Sport	2013	0.0%	0.0%	0.0%	-88.8%	0.1%	0.0%	-0.1%	-88.2%
NT GHb Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr GHb Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WillapaNet	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 1 Troll	2013	0.0%	0.0%	0.0%	-68.2%	0.0%	0.0%	0.0%	-65.5%
Ar 1 Sport	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ColRvr Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Buoy10 Spt	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cen OR Trl	2013	0.0%	0.0%	0.0%	55.6%	0.0%	0.0%	0.0%	50.4%
Cen OR Spt	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Troll	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Sport	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Trl	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Spt	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 7 Sport	2013	0.4%	0.8%	0.4%	96.4%	1.5%	1.8%	0.3%	20.1%
NT 7:7ANet	2013	0.2%	0.1%	-0.1%	-49.7%	0.3%	0.1%	-0.2%	-55.6%
Tr 7:7ANet	2013	0.3%	0.1%	-0.1%	-49.4%	0.3%	0.2%	-0.2%	-49.4%
NT 7BCDNet	2013	0.1%	0.0%	0.0%	-56.8%	0.1%	0.0%	0.0%	-50.7%
Tr 7BCDNet	2013	0.1%	0.1%	0.0%	-21.1%	0.1%	0.1%	0.0%	-9.9%
Tr JDF Trl	2013	0.8%	0.7%	-0.1%	-16.9%	0.9%	0.6%	-0.3%	-28.5%
Ar 5 Sport	2013	0.4%	0.8%	0.3%	74.2%	1.3%	1.7%	0.4%	31.9%
NT JDF Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr JDF Net	2013	0.1%	0.0%	-0.1%	-77.4%	0.2%	0.0%	-0.1%	-74.6%
Ar 8-1 Spt	2013	0.0%	0.0%	0.0%	94.5%	0.0%	0.0%	0.0%	81.2%
NT SkagNet	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SkagNet	2013	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Area8D Spt	2013	0.0%	0.0%	0.0%	181.4%	0.0%	0.0%	0.0%	184.3%
NT StSnNet	2013	0.0%	0.0%	0.0%	-96.8%	0.0%	0.0%	0.0%	-96.8%
Tr StSnNet	2013	0.1%	0.0%	-0.1%	-87.1%	0.1%	0.0%	-0.1%	-87.1%
NT TulaNet	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr TulaNet	2013	0.0%	0.0%	0.0%	-1.2%	0.0%	0.0%	0.0%	-7.8%
Ar 9 Sport	2013	0.6%	1.5%	1.0%	178.0%	1.7%	2.7%	1.0%	61.4%
Ar 6 Sport	2013	0.2%	0.3%	0.1%	31.8%	0.8%	1.2%	0.4%	48.7%
Tr 6B:9Net	2013	0.1%	0.0%	-0.1%	-76.0%	0.1%	0.0%	-0.1%	-80.2%
A 10 Sport	2013	1.3%	2.9%	1.6%	117.3%	4.4%	7.1%	2.7%	61.0%
A 11 Sport	2013	0.3%	0.4%	0.1%	45.9%	0.9%	0.7%	-0.2%	-19.7%
NT10:11Net	2013	0.1%	0.0%	-0.1%	-97.1%	0.1%	0.0%	-0.1%	-97.4%
Tr10:11Net	2013	0.1%	0.1%	0.0%	-14.0%	0.1%	0.1%	0.0%	-20.6%
A 10A Sprt	2013	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr 10A Net	2013	0.0%	0.0%	0.0%	-54.1%	0.0%	0.0%	0.0%	-53.2%
A 10E Sprt	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10E Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 12 Sport	2013	0.0%	0.0%	0.0%	348.9%	0.0%	0.0%	0.0%	117.0%
NT HC Net	2013	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr HC Net	2013	0.1%	0.0%	0.0%	-16.6%	0.1%	0.1%	0.0%	-8.0%
A 13 Sport	2013	0.0%	0.1%	0.1%	173.1%	0.2%	0.2%	0.0%	27.1%
NT SPS Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SPS Net	2013	0.0%	0.0%	0.0%	32.3%	0.0%	0.0%	0.0%	32.6%
NT 13A Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 13A Net	2013	0.2%	0.1%	-0.1%	-63.7%	0.2%	0.1%	-0.1%	-64.5%
FW Sport	2013	3.5%	5.4%	1.9%	55.3%	18.1%	27.8%	9.6%	53.2%
FW Net	2013	19.0%	15.5%	-3.5%	-18.3%	16.5%	13.4%	-3.1%	-18.6%

Table 29. 2014 fishing pre-season and post-season FRAM ER comparison of absolute and relative error estimates for Puyallup River unmarked and marked fall Chinook salmon across all individual fisheries.

		UNMARKED				MARKED			
Fish_Name	YEAR	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference
SEAK Troll	2014	0.2%	0.3%	0.0%	19.1%	0.2%	0.3%	0.0%	3.1%
SEAK Net	2014	0.0%	0.0%	0.0%	67.1%	0.0%	0.0%	0.0%	14.9%
SEAK Sport	2014	0.0%	0.0%	0.0%	-22.5%	0.0%	0.0%	0.0%	-3.1%
N/C BC Net	2014	0.0%	0.0%	0.0%	-14.8%	0.0%	0.0%	0.0%	-24.5%
WCVI Net	2014	0.0%	0.4%	0.4%	#VALUE!	0.0%	0.3%	0.3%	#VALUE!
GeoStr Net	2014	0.0%	0.0%	0.0%	367.8%	0.0%	0.0%	0.0%	234.6%
BC JDF Net	2014	0.0%	0.0%	0.0%	-54.4%	0.0%	0.0%	0.0%	-67.6%
BCOutSport	2014	2.5%	2.0%	-0.5%	-20.8%	2.6%	1.4%	-1.1%	-44.1%
N/C BC Trl	2014	0.5%	0.3%	-0.2%	-39.1%	0.5%	0.4%	-0.1%	-21.6%
WCVI Troll	2014	8.4%	13.9%	5.5%	65.2%	8.4%	10.7%	2.2%	26.7%
WCVI Sport	2014	4.9%	7.7%	2.9%	58.8%	4.9%	6.1%	1.3%	25.9%
GeoS Troll	2014	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
JS/GS/JDF Sport	2014	3.2%	5.1%	1.9%	59.0%	3.2%	4.0%	0.8%	26.0%
NT 3:4 Trl	2014	0.8%	0.6%	-0.2%	-20.6%	0.8%	0.6%	-0.1%	-18.4%
Tr 3:4 Trl	2014	3.1%	3.5%	0.4%	14.1%	2.9%	3.0%	0.1%	3.1%
Ar 3:4 Spt	2014	0.2%	0.2%	0.0%	15.2%	0.2%	0.2%	0.0%	-15.9%
NoWACstNet	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 2 Troll	2014	0.3%	0.2%	-0.2%	-52.9%	0.3%	0.1%	-0.2%	-57.7%
Tr 2 Troll	2014	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%	-24.5%
Ar 2 Sport	2014	0.0%	0.0%	0.0%	1.5%	0.1%	0.0%	-0.1%	-63.1%
NT GHb Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr GHb Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WillapaNet	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 1 Troll	2014	0.1%	0.3%	0.2%	210.4%	0.1%	0.2%	0.1%	147.4%
Ar 1 Sport	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ColRvr Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Buoy10 Spt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cen OR Trl	2014	0.0%	0.0%	0.0%	68.4%	0.0%	0.0%	0.0%	94.5%
Cen OR Spt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Troll	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Sport	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Trl	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Spt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 7 Sport	2014	0.5%	0.9%	0.4%	78.1%	1.5%	2.1%	0.7%	44.6%
NT 7:7ANet	2014	0.2%	0.2%	0.0%	10.5%	0.2%	0.1%	-0.1%	-32.6%
Tr 7:7ANet	2014	0.2%	0.5%	0.3%	127.8%	0.2%	0.4%	0.1%	60.2%
NT 7BCDNet	2014	0.0%	0.0%	0.0%	-30.8%	0.0%	0.0%	0.0%	-35.5%
Tr 7BCDNet	2014	0.0%	0.1%	0.0%	30.9%	0.0%	0.0%	0.0%	22.3%
Tr JDF Trl	2014	0.7%	0.9%	0.2%	25.3%	0.7%	0.7%	0.0%	-4.3%
Ar 5 Sport	2014	0.5%	0.6%	0.1%	18.9%	1.6%	1.5%	0.0%	-1.5%
NT JDF Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr JDF Net	2014	0.2%	0.3%	0.1%	65.6%	0.2%	0.2%	0.0%	23.8%
Ar 8-1 Spt	2014	0.1%	0.0%	0.0%	-39.2%	0.1%	0.0%	0.0%	-49.5%
NT SkagNet	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SkagNet	2014	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Area8D Spt	2014	0.0%	0.0%	0.0%	91.7%	0.0%	0.0%	0.0%	105.4%
NT StSnNet	2014	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr StSnNet	2014	0.0%	0.0%	0.0%	-97.8%	0.0%	0.0%	0.0%	-97.6%
NT TulaNet	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr TulaNet	2014	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	-2.3%
Ar 9 Sport	2014	0.8%	1.8%	1.1%	132.5%	1.6%	3.1%	1.5%	90.2%
Ar 6 Sport	2014	0.3%	0.4%	0.1%	51.0%	1.1%	1.5%	0.4%	36.0%
Tr 6B:9Net	2014	0.1%	0.0%	-0.1%	-87.4%	0.1%	0.0%	-0.1%	-89.8%
A 10 Sport	2014	1.0%	1.5%	0.5%	51.0%	2.3%	3.4%	1.1%	50.5%
A 11 Sport	2014	0.3%	0.6%	0.3%	103.6%	0.8%	1.3%	0.5%	56.1%
NT10:11Net	2014	0.0%	0.0%	0.0%	-93.8%	0.0%	0.0%	0.0%	-95.3%
Tr10:11Net	2014	0.0%	0.1%	0.0%	192.6%	0.0%	0.1%	0.0%	177.3%
A 10A Sprt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10A Net	2014	0.0%	0.0%	0.0%	-49.7%	0.0%	0.0%	0.0%	-42.0%
A 10E Sprt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10E Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 12 Sport	2014	0.0%	0.1%	0.0%	156.0%	0.0%	0.1%	0.0%	41.8%
NT HC Net	2014	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr HC Net	2014	0.1%	0.1%	0.0%	95.5%	0.0%	0.1%	0.0%	69.7%
A 13 Sport	2014	0.1%	0.1%	0.0%	49.4%	0.2%	0.2%	0.0%	17.8%
NT SPS Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SPS Net	2014	0.0%	0.0%	0.0%	-25.6%	0.0%	0.0%	0.0%	-18.5%
NT 13A Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 13A Net	2014	0.2%	0.1%	-0.1%	-66.4%	0.2%	0.1%	-0.1%	-63.3%
FW Sport	2014	1.9%	1.2%	-0.7%	-36.7%	8.1%	7.8%	-0.3%	-3.9%
FW Net	2014	17.8%	16.2%	-1.6%	-9.2%	16.4%	16.3%	-0.1%	-0.6%

Table 30. 2011 marked and unmarked Mid-Puget Sound fall Chinook Salmon AEQ mortalities and relative errors across Timesteps 2 through 4.

		Marked									Unmarked								
		Timestep 2			Timestep 3			Timestep 4			Timestep 2			Timestep 3			Timestep 4		
Fishery ID	Fishery Name	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error
1	SEAK Troll	29	9	-69.0%	47	66	40.4%	32	61	90.6%	7	2	-71.4%	12	14	16.7%	7	9	28.6%
3	SEAK Sport	11	17	54.5%	23	17	-26.1%	2	0	-100.0%	3	4	33.3%	6	4	-33.3%	0	0	0.0%
4	N/C BC Net	0	28	#DIV/0!	20	18	-10.0%	0	0	0.0%	0	6	#DIV/0!	4	3	-25.0%	0	0	0.0%
6	GeoStr Net	0	0	0.0%	2	6	200.0%	0	0	0.0%	0	0	0.0%	0	1	#DIV/0!	0	0	0.0%
7	BC JDF Net	0	0	0.0%	0	9	#DIV/0!	0	0	0.0%	0	0	0.0%	0	2	#DIV/0!	0	0	0.0%
11	WCVI Sport	0	227	#DIV/0!	3,373	3,551	5.3%	0	0	0.0%	0	41	#DIV/0!	770	564	-26.8%	0	0	0.0%
13	N GS Sport	0	0	0.0%	37	21	-43.2%	0	0	0.0%	0	0	0.0%	8	3	-62.5%	0	0	0.0%
14	S GS Sport	47	114	142.6%	68	27	-60.3%	8	12	50.0%	11	20	81.8%	15	4	-73.3%	2	2	0.0%
15	BC JDF Spt	70	51	-27.1%	677	482	-28.8%	320	379	18.4%	18	10	-44.4%	155	75	-51.6%	73	58	-20.5%
16	NT 3:4 Trl	240	302	25.8%	154	117	-24.0%	0	0	0.0%	59	58	-1.7%	36	22	-38.9%	0	0	0.0%
17	Tr 3:4 Trl	514	330	-35.8%	489	1,000	104.5%	602	90	-85.0%	126	66	-47.6%	114	209	83.3%	136	18	-86.8%
20	NT 2 Troll	76	61	-19.7%	26	38	46.2%	0	0	0.0%	18	12	-33.3%	6	7	16.7%	0	0	0.0%
36	Ar 7 Sport	0	0	0.0%	138	283	105.1%	762	387	-49.2%	0	0	0.0%	33	59	78.8%	40	42	5.0%
37	NT 7:7ANet	0	0	0.0%	151	121	-19.9%	0	0	0.0%	0	0	0.0%	28	20	-28.6%	0	0	0.0%
38	Tr 7:7ANet	0	0	0.0%	156	129	-17.3%	0	0	0.0%	0	0	0.0%	35	22	-37.1%	0	0	0.0%
42	Ar 5 Sport	0	0	0.0%	736	529	-28.1%	54	38	-29.6%	0	0	0.0%	46	44	-4.3%	12	6	-50.0%
45	Ar 8-1 Spt	0	0	0.0%	2	4	100.0%	10	37	270.0%	0	0	0.0%	1	1	0.0%	1	5	400.0%
53	Ar 9 Sport	0	0	0.0%	959	494	-48.5%	302	169	-44.0%	0	0	0.0%	75	62	-17.3%	26	22	-15.4%
54	Ar 6 Sport	0	0	0.0%	183	365	99.5%	138	80	-42.0%	0	0	0.0%	11	28	154.5%	31	12	-61.3%
56	A 10 Sport	12	0	-100.0%	2,069	2,713	31.1%	297	124	-58.2%	3	0	-100.0%	147	219	49.0%	22	19	-13.6%
57	A 11 Sport	192	145	-24.5%	454	328	-27.8%	87	96	10.3%	10	13	30.0%	40	52	30.0%	14	15	7.1%
64	A 12 Sport	0	0	0.0%	3	9	200.0%	19	16	-15.8%	0	0	0.0%	1	2	100.0%	3	2	-33.3%
67	A 13 Sport	20	4	-80.0%	60	94	56.7%	4	18	350.0%	1	0	-100.0%	4	12	200.0%	1	4	300.0%
69	Tr SPS Net	0	0	0.0%	5	5	0.0%	0	2	0.0%	0	0	0.0%	1	1	0.0%	0	0	0.0%
72	FW Sport	0	0	0.0%	2,227	2,131	-4.3%	0	0	0.0%	0	0	0.0%	132	177	34.1%	0	0	0.0%

Table 31. 2012 marked and unmarked Mid-Puget Sound fall Chinook Salmon AEQ mortalities and relative errors across Timesteps 2 through 4.

		Marked									Unmarked								
		Timestep 2			Timestep 3			Timestep 4			Timestep 2			Timestep 3			Timestep 4		
Fishery ID	Fishery Name	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error
1	SEAK Troll	19	6	-68.4%	31	51	64.5%	51	168	229.4%	7	1	-85.7%	12	9	-25.0%	8	40	400.0%
4	N/C BC Net	0	10	#DIV/0!	18	9	-50.0%	0	0	0.0%	0	2	#DIV/0!	3	2	-33.3%	0	0	0.0%
8	BCOutSport	24	31	29.2%	1,792	1,848	3.1%	0	0	0.0%	11	5	-54.5%	287	436	51.9%	0	0	0.0%
10	WCVI Troll	1,005	1,559	55.1%	2,490	1,692	-32.0%	398	174	-56.3%	229	354	54.6%	457	394	-13.8%	66	39	-40.9%
11	WCVI Sport	0	574	#DIV/0!	3,766	5,515	46.4%	0	0	0.0%	0	128	#DIV/0!	757	1,275	68.4%	0	0	0.0%
13	N GS Sport	0	0	0.0%	56	82	46.4%	0	0	0.0%	0	0	0.0%	9	19	111.1%	0	0	0.0%
14	S GS Sport	59	350	493.2%	103	81	-21.4%	8	0	-100.0%	15	79	426.7%	19	19	0.0%	1	0	-100.0%
15	BC JDF Spt	39	146	274.4%	603	1,321	119.1%	308	60	-80.5%	20	31	55.0%	121	307	153.7%	58	14	-75.9%
16	NT 3:4 Trl	315	532	68.9%	179	498	178.2%	0	0	0.0%	115	113	-1.7%	46	106	130.4%	0	0	0.0%
17	Tr 3:4 Trl	691	1,043	50.9%	496	1,726	248.0%	675	27	-96.0%	247	215	-13.0%	126	337	167.5%	115	6	-94.8%
18	Ar 3:4 Spt	14	17	21.4%	148	243	64.2%	0	0	0.0%	1	1	0.0%	24	57	137.5%	0	0	0.0%
21	Tr 2 Troll	10	14	40.0%	4	4	0.0%	0	0	0.0%	2	3	50.0%	1	1	0.0%	0	0	0.0%
22	Ar 2 Sport	54	73	35.2%	1	1	0.0%	0	0	0.0%	3	7	133.3%	0	0	0.0%	0	0	0.0%
26	NT 1 Troll	8	13	62.5%	15	45	200.0%	0	0	0.0%	3	2	-33.3%	2	10	400.0%	0	0	0.0%
36	Ar 7 Sport	0	0	0.0%	98	79	-19.4%	717	809	12.8%	0	0	0.0%	32	15	-53.1%	28	43	53.6%
40	Tr 7BCDNet	0	0	0.0%	36	72	100.0%	0	0	0.0%	0	0	0.0%	11	18	63.6%	0	0	0.0%
42	Ar 5 Sport	0	0	0.0%	574	759	32.2%	74	55	-25.7%	0	0	0.0%	40	48	20.0%	12	13	8.3%
44	Tr JDF Net	1	0	-100.0%	47	136	189.4%	0	0	0.0%	0	0	0.0%	9	32	255.6%	0	0	0.0%
45	Ar 8-1 Spt	0	0	0.0%	2	3	50.0%	10	26	160.0%	0	0	0.0%	0	0	0.0%	1	2	100.0%
53	Ar 9 Sport	0	0	0.0%	667	722	8.2%	281	546	94.3%	0	0	0.0%	56	53	-5.4%	20	34	70.0%
54	Ar 6 Sport	0	0	0.0%	142	680	378.9%	219	194	-11.4%	0	0	0.0%	10	36	260.0%	11	11	0.0%
56	A 10 Sport	11	2	-81.8%	1,960	2,857	45.8%	281	62	-77.9%	2	0	-100.0%	146	201	37.7%	18	4	-77.8%
57	A 11 Sport	180	169	-6.1%	357	417	16.8%	84	107	27.4%	7	10	42.9%	33	42	27.3%	10	13	30.0%
64	A 12 Sport	0	0	0.0%	2	12	500.0%	17	10	-41.2%	0	0	0.0%	0	1	#DIV/0!	1	1	0.0%
66	Tr HC Net	0	0	0.0%	22	49	122.7%	1	0	-100.0%	0	0	0.0%	6	12	100.0%	0	0	0.0%
67	A 13 Sport	19	4	-78.9%	57	53	-7.0%	3	10	233.3%	1	0	-100.0%	3	4	33.3%	1	1	0.0%

Table 32. 2013 marked and unmarked Mid-Puget Sound fall Chinook Salmon AEQ mortalities and relative errors across Timesteps 2 through 4.

		Marked									Unmarked								
		Timestep 2			Timestep 3			Timestep 4			Timestep 2			Timestep 3			Timestep 4		
Fishery ID	FisheryName	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error
1	SEAK Troll	19	7	-63.2%	35	30	-14.3%	17	86	405.9%	4	1	-75.0%	7	6	-14.3%	2	10	400.0%
3	SEAK Sport	6	11	83.3%	12	6	-50.0%	0	0	0.0%	1	2	100.0%	2	1	-50.0%	0	0	0.0%
4	N/C BC Net	0	10	#DIV/0!	21	10	-52.4%	0	0	0.0%	0	2	#DIV/0!	3	1	-66.7%	0	0	0.0%
5	WCVI Net	0	0	0.0%	2	8	300.0%	0	0	0.0%	0	0	0.0%	0	1	#DIV/0!	0	0	0.0%
7	BC JDF Net	0	0	0.0%	5	6	20.0%	0	0	0.0%	0	0	0.0%	1	1	0.0%	0	0	0.0%
13	N GS Sport	0	0	0.0%	48	32	-33.3%	0	0	0.0%	0	0	0.0%	6	3	-50.0%	0	0	0.0%
14	S GS Sport	286	95	-66.8%	145	29	-80.0%	15	0	-100.0%	44	15	-65.9%	20	4	-80.0%	2	0	-100.0%
15	BC JDF Spt	169	194	14.8%	758	1,033	36.3%	365	47	-87.1%	35	39	11.4%	107	138	29.0%	50	6	-88.0%
17	Tr 3:4 Trl	1,001	1,009	0.8%	641	467	-27.1%	374	246	-34.2%	181	189	4.4%	100	87	-13.0%	49	41	-16.3%
30	Cen OR Trl	1	0	-100.0%	8	11	37.5%	0	0	0.0%	0	0	0.0%	2	2	0.0%	0	0	0.0%
36	Ar 7 Sport	0	0	0.0%	83	241	190.4%	776	690	-11.1%	0	0	0.0%	15	47	213.3%	23	22	-4.3%
42	Ar 5 Sport	0	0	0.0%	657	856	30.3%	82	25	-69.5%	0	0	0.0%	28	59	110.7%	11	4	-63.6%
45	Ar 8-1 Spt	0	0	0.0%	2	1	-50.0%	8	16	100.0%	0	0	0.0%	0	0	0.0%	1	2	100.0%
53	Ar 9 Sport	0	0	0.0%	622	717	15.3%	310	643	107.4%	0	0	0.0%	32	68	112.5%	17	59	247.1%
54	Ar 6 Sport	0	0	0.0%	199	357	79.4%	241	234	-2.9%	0	0	0.0%	8	11	37.5%	10	10	0.0%
56	A 10 Sport	12	0	-100.0%	2,139	3,367	57.4%	329	242	-26.4%	2	0	-100.0%	95	200	110.5%	22	41	86.4%
57	A 11 Sport	186	149	-19.9%	242	152	-37.2%	97	80	-17.5%	5	5	0.0%	10	13	30.0%	11	17	54.5%
64	A 12 Sport	0	0	0.0%	2	12	500.0%	9	10	11.1%	0	0	0.0%	0	2	#DIV/0!	0	1	#DIV/0!
67	A 13 Sport	20	22	10.0%	61	71	16.4%	4	4	0.0%	1	1	0.0%	2	7	250.0%	1	1	0.0%
72	FW Sport	0	0	0.0%	2,411	2,747	13.9%	0	0	0.0%	0	0	0.0%	57	56	-1.8%	0	0	0.0%

Table 33. 2014 marked and unmarked Mid-Puget Sound fall Chinook Salmon AEQ mortalities and relative errors across Timesteps 2 through 4.

		Marked									Unmarked								
		Timestep 2			Timestep 3			Timestep 4			Timestep 2			Timestep 3			Timestep 4		
Fishery ID	Fishery Name	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error	PRE	POST	Relative Error
1	SEAK Troll	6	3	-50.0%	56	38	-32.1%	78	45	-42.3%	1	1	0.0%	9	7	-22.2%	12	13	8.3%
2	SEAK Net	0	0	0.0%	7	5	-28.6%	0	0	0.0%	0	0	0.0%	1	1	0.0%	0	0	0.0%
5	WCVI Net	0	1	#DIV/0!	0	101	#DIV/0!	0	3	#DIV/0!	0	0	0.0%	0	30	#DIV/0!	0	1	#DIV/0!
6	GeoStr Net	0	3	#DIV/0!	6	8	33.3%	0	0	0.0%	0	1	#DIV/0!	1	2	100.0%	0	0	0.0%
10	WCVI Troll	1,418	1,130	-20.3%	2,755	1,977	-28.2%	626	514	-17.9%	221	277	25.3%	420	542	29.0%	95	151	58.9%
11	WCVI Sport	0	215	#DIV/0!	2,764	1,858	-32.8%	0	0	0.0%	0	47	#DIV/0!	425	491	15.5%	0	0	0.0%
13	N GS Sport	2	2	0.0%	35	31	-11.4%	2	1	-50.0%	0	0	0.0%	5	9	80.0%	0	0	0.0%
14	S GS Sport	278	208	-25.2%	101	78	-22.8%	65	5	-92.3%	43	48	11.6%	15	21	40.0%	10	1	-90.0%
15	BC JDF Spt	142	103	-27.5%	683	585	-14.3%	510	353	-30.8%	25	21	-16.0%	105	157	49.5%	79	98	24.1%
17	Tr 3:4 Trl	1,073	622	-42.0%	603	407	-32.5%	308	192	-37.7%	174	142	-18.4%	94	101	7.4%	47	56	19.1%
18	Ar 3:4 Spt	30	18	-40.0%	95	45	-52.6%	0	0	0.0%	3	2	-33.3%	14	13	-7.1%	0	0	0.0%
21	Tr 2 Troll	10	3	-70.0%	5	4	-20.0%	0	0	0.0%	2	1	-50.0%	1	1	0.0%	0	0	0.0%
22	Ar 2 Sport	46	10	-78.3%	2	1	-50.0%	0	0	0.0%	3	2	-33.3%	0	0	0.0%	0	0	0.0%
26	NT 1 Troll	32	46	43.8%	14	21	50.0%	0	0	0.0%	5	11	120.0%	2	6	200.0%	0	0	0.0%
30	Cen OR Trl	0	1	#DIV/0!	9	10	11.1%	0	0	0.0%	0	0	0.0%	1	2	100.0%	0	0	0.0%
36	Ar 7 Sport	0	0	0.0%	132	128	-3.0%	705	593	-15.9%	0	0	0.0%	21	25	19.0%	21	34	61.9%
37	NT 7:7ANet	0	0	0.0%	107	43	-59.8%	0	0	0.0%	0	0	0.0%	13	12	-7.7%	0	0	0.0%
38	Tr 7:7ANet	0	0	0.0%	131	125	-4.6%	0	0	0.0%	0	0	0.0%	19	35	84.2%	0	0	0.0%
40	Tr 7BCDNet	0	0	0.0%	22	16	-27.3%	0	0	0.0%	0	0	0.0%	4	4	0.0%	0	0	0.0%
42	Ar 5 Sport	0	0	0.0%	815	489	-40.0%	67	29	-56.7%	0	0	0.0%	44	42	-4.5%	4	3	-25.0%
44	Tr JDF Net	4	0	-100.0%	88	68	-22.7%	0	0	0.0%	1	0	-100.0%	13	19	46.2%	0	0	0.0%
53	Ar 9 Sport	0	0	0.0%	537	508	-5.4%	400	553	38.3%	0	0	0.0%	43	56	30.2%	26	72	176.9%
54	Ar 6 Sport	0	0	0.0%	452	255	-43.6%	196	270	37.8%	0	0	0.0%	14	11	-21.4%	10	18	80.0%
56	A 10 Sport	17	0	-100.0%	1,104	1,005	-9.0%	166	148	-10.8%	3	0	-100.0%	68	77	13.2%	17	29	70.6%
57	A 11 Sport	146	172	17.8%	227	210	-7.5%	102	59	-42.2%	5	13	160.0%	14	22	57.1%	6	7	16.7%
59	Tr10:11Net	0	0	0.0%	11	21	90.9%	2	0	-100.0%	0	0	0.0%	2	5	150.0%	0	0	0.0%
64	A 12 Sport	0	0	0.0%	4	19	375.0%	22	3	-86.4%	0	0	0.0%	1	4	300.0%	2	0	-100.0%
66	Tr HC Net	0	0	0.0%	25	25	0.0%	1	1	0.0%	0	0	0.0%	4	7	75.0%	0	0	0.0%
67	A 13 Sport	17	26	52.9%	57	34	-40.4%	16	3	-81.3%	1	3	200.0%	4	4	0.0%	2	1	-50.0%

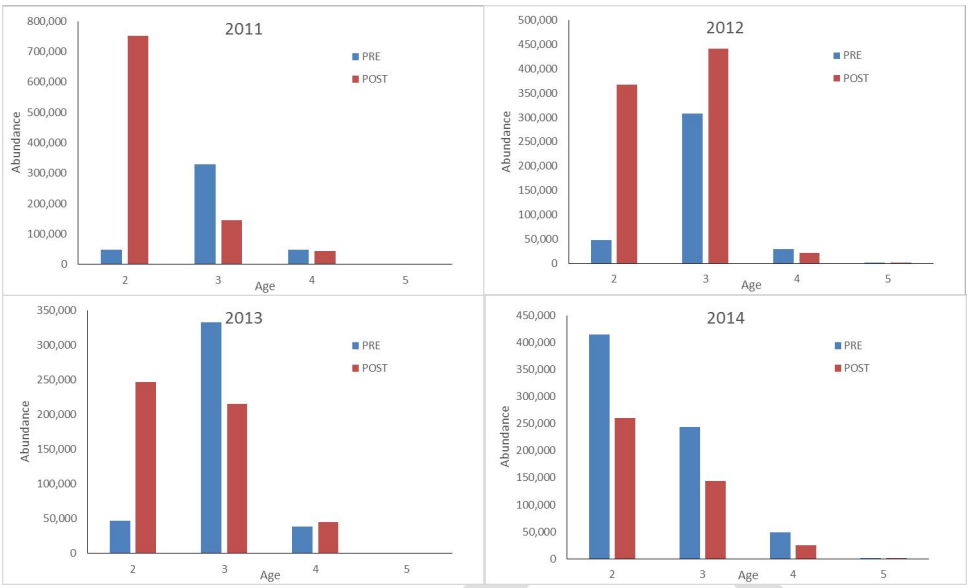

Figure 5. Starting cohort abundance of Marked Mid-Puget Sound aggregate stock during Timestep 1 in 2011, 2012, 2013, and 2014.

Appendix B. Following are tables of data used to develop the Skokomish River fall Chinook Salmon Harvest Performance assessment including data on the marked Puyallup and marked and unmarked Mid-Puget Sound aggregate stock.

Table 34. 2011 fishing pre-season and post-season FRAM ER comparison of absolute and relative error estimates for Skokomish River unmarked and marked fall Chinook salmon across all individual fisheries.

		UNMARKED				MARKED			
Fish_Name	YEAR	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference
SEAK Troll	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SEAK Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SEAK Sport	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N/C BC Net	2011	0.0%	0.0%	0.0%	3.2%	0.0%	0.0%	0.0%	-19.9%
WCVI Net	2011	0.2%	0.0%	-0.1%	-92.1%	0.2%	0.0%	-0.2%	-92.3%
GeoStr Net	2011	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
BC JDF Net	2011	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
BCOutSport	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N/C BC Trl	2011	0.4%	0.4%	0.1%	21.5%	0.4%	0.4%	0.1%	16.0%
WCVI Troll	2011	10.6%	9.5%	-1.0%	-9.6%	11.2%	9.7%	-1.5%	-13.6%
WCVI Sport	2011	3.3%	6.2%	2.9%	85.6%	3.2%	6.2%	3.0%	91.2%
GeoS Troll	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JS/GS/JDF Sport	2011	2.9%	4.4%	1.5%	51.6%	2.4%	3.9%	1.5%	62.3%
NT 3:4 Trl	2011	0.6%	0.7%	0.2%	28.6%	0.5%	0.7%	0.2%	34.2%
Tr 3:4 Trl	2011	1.5%	2.0%	0.5%	35.4%	1.5%	2.1%	0.7%	45.6%
Ar 3:4 Spt	2011	0.0%	0.1%	0.0%	118.9%	0.1%	0.1%	0.1%	83.5%
NoWACstNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 2 Troll	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 2 Troll	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 2 Sport	2011	0.4%	0.4%	-0.1%	-14.4%	0.5%	0.4%	-0.1%	-21.5%
NT GHb Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr GHb Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WillapaNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 1 Troll	2011	0.0%	0.0%	0.0%	78.8%	0.0%	0.0%	0.0%	11.0%
Ar 1 Sport	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ColRvr Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Buoy10 Spt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cen OR Trl	2011	0.1%	0.0%	-0.1%	-70.1%	0.1%	0.0%	-0.1%	-66.7%
Cen OR Spt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Troll	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Sport	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Trl	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Spt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 7 Sport	2011	1.9%	2.7%	0.8%	44.2%	3.0%	3.1%	0.8%	27.3%
NT 7:7ANet	2011	0.2%	0.2%	0.0%	8.1%	0.2%	0.2%	0.0%	-13.2%
Tr 7:7ANet	2011	0.2%	0.2%	0.0%	-13.8%	0.2%	0.2%	0.0%	-11.0%
NT 7BCDNet	2011	0.0%	0.1%	0.0%	134.0%	0.0%	0.1%	0.0%	100.5%
Tr 7BCDNet	2011	0.1%	0.1%	0.1%	114.0%	0.1%	0.1%	0.1%	85.6%
Tr JDF Trl	2011	0.4%	0.3%	-0.1%	-24.4%	0.8%	0.3%	-0.5%	-60.3%
Ar 5 Sport	2011	0.3%	0.3%	0.0%	6.3%	0.8%	0.7%	-0.1%	-13.6%
NT JDF Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr JDF Net	2011	0.3%	0.1%	-0.2%	-69.2%	0.2%	0.1%	-0.2%	-67.7%
Ar 8-1 Spt	2011	0.6%	0.3%	-0.3%	-46.0%	1.2%	0.6%	-0.6%	-49.3%
NT SkagNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SkagNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Area8D Spt	2011	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	-80.5%
NT StSnNet	2011	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	-80.7%
Tr StSnNet	2011	0.0%	0.0%	0.0%	-65.7%	0.0%	0.0%	0.0%	-73.0%
NT TulaNet	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr TulaNet	2011	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	32.3%
Ar 9 Sport	2011	1.5%	0.8%	-0.7%	-48.0%	4.1%	2.0%	-2.2%	-52.1%
Ar 6 Sport	2011	0.2%	0.3%	0.1%	48.2%	0.3%	0.6%	0.2%	71.4%
Tr 6B:9Net	2011	0.4%	0.0%	-0.4%	-100.0%	0.4%	0.0%	-0.4%	-100.0%
A 10 Sport	2011	0.4%	0.5%	0.1%	28.5%	0.7%	0.6%	-0.1%	-15.7%
A 11 Sport	2011	0.4%	0.3%	-0.1%	-25.8%	0.6%	0.4%	-0.2%	-28.8%
NT10:11Net	2011	0.1%	0.0%	-0.1%	-98.2%	0.2%	0.0%	-0.2%	-98.3%
Tr10:11Net	2011	0.3%	0.0%	-0.3%	-99.0%	0.4%	0.0%	-0.4%	-99.2%
A 10A Sprt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10A Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 10E Sprt	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10E Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 12 Sport	2011	1.0%	1.0%	0.0%	2.1%	1.3%	1.3%	-0.1%	-6.4%
NT HC Net	2011	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr HC Net	2011	3.9%	7.0%	3.1%	78.3%	3.7%	6.4%	2.7%	73.0%
A 13 Sport	2011	0.1%	0.1%	0.1%	96.1%	0.1%	0.2%	0.0%	40.5%
NT SPS Net	2011	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	-0.1%	-100.0%
Tr SPS Net	2011	0.3%	0.3%	0.0%	-8.5%	0.3%	0.3%	0.0%	-5.8%
NT 13A Net	2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 13A Net	2011	0.6%	0.4%	-0.2%	-39.3%	0.6%	0.4%	-0.2%	-36.4%
FW Sport	2011	2.2%	2.5%	0.2%	10.8%	10.7%	8.1%	-2.6%	-24.4%
FW Net	2011	14.3%	16.0%	1.6%	11.4%	13.0%	15.2%	2.2%	16.7%

Table 35. 2012 fishing pre-season and post-season FRAM ER comparison of absolute and relative error estimates for Skokomish River unmarked and marked fall Chinook salmon across all individual fisheries.

		UNMARKED				MARKED			
Fish_Name	YEAR	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference
SEAK Troll	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SEAK Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SEAK Sport	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N/C BC Net	2012	0.0%	0.0%	0.0%	-40.3%	0.0%	0.0%	0.0%	-47.1%
WCVI Net	2012	0.2%	0.0%	-0.2%	-87.8%	0.2%	0.0%	-0.1%	-88.6%
GeoStr Net	2012	0.0%	0.0%	0.0%	-78.6%	0.0%	0.0%	0.0%	-89.8%
BC JDF Net	2012	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
BCOutSport	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N/C BC Trl	2012	0.4%	0.3%	-0.1%	-25.1%	0.4%	0.3%	-0.1%	-28.9%
WCVI Troll	2012	5.3%	4.1%	-1.3%	-23.8%	5.5%	3.8%	-1.7%	-31.5%
WCVI Sport	2012	4.5%	7.0%	2.5%	56.7%	4.3%	6.6%	2.4%	55.1%
GeoS Troll	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JS/GS/JDF Sport	2012	3.2%	1.1%	-2.1%	-65.9%	2.8%	1.2%	-1.6%	-58.0%
NT 3:4 Trl	2012	1.0%	1.9%	0.9%	92.9%	0.9%	1.8%	0.8%	89.8%
Tr 3:4 Trl	2012	2.4%	4.2%	1.8%	73.0%	2.3%	3.8%	1.5%	64.7%
Ar 3:4 Spt	2012	0.1%	0.1%	0.0%	-36.8%	0.4%	0.2%	-0.2%	-56.3%
NoWACstNet	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 2 Troll	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 2 Troll	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 2 Sport	2012	0.7%	0.8%	0.2%	23.3%	0.7%	0.9%	0.1%	18.5%
NT GHb Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr GHb Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WillapaNet	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 1 Troll	2012	0.0%	0.0%	0.0%	-24.2%	0.0%	0.0%	0.0%	-25.8%
Ar 1 Sport	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ColRvr Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Buoy10 Spt	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cen OR Trl	2012	0.1%	0.1%	0.0%	12.5%	0.1%	0.1%	0.0%	-5.6%
Cen OR Spt	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Troll	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Sport	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Trl	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Spt	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 7 Sport	2012	1.9%	2.1%	0.2%	10.7%	2.8%	2.5%	-0.3%	-12.1%
NT 7:7ANet	2012	0.1%	0.0%	-0.1%	-89.1%	0.1%	0.0%	-0.1%	-93.4%
Tr 7:7ANet	2012	0.2%	0.0%	-0.2%	-86.3%	0.2%	0.0%	-0.2%	-87.2%
NT 7BCDNet	2012	0.1%	0.0%	0.0%	-43.5%	0.1%	0.0%	-0.1%	-72.9%
Tr 7BCDNet	2012	0.0%	0.1%	0.0%	31.0%	0.1%	0.0%	0.0%	-37.2%
Tr JDF Trl	2012	0.8%	0.1%	-0.6%	-82.6%	0.8%	0.1%	-0.7%	-85.3%
Ar 5 Sport	2012	0.3%	0.4%	0.1%	36.4%	0.8%	1.2%	0.4%	47.2%
NT JDF Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr JDF Net	2012	0.1%	0.2%	0.0%	18.1%	0.1%	0.2%	0.0%	27.4%
Ar 8-1 Spt	2012	0.5%	0.2%	-0.3%	-64.7%	1.1%	0.2%	-0.9%	-81.5%
NT SkagNet	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SkagNet	2012	0.0%	0.0%	0.0%	1004.6%	0.0%	0.0%	0.0%	429.9%
Area8D Spt	2012	0.0%	0.0%	0.0%	-47.1%	0.0%	0.0%	0.0%	-31.7%
NT StSnNet	2012	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr StSnNet	2012	0.0%	0.0%	0.0%	-97.9%	0.0%	0.0%	0.0%	-97.2%
NT TulaNet	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr TulaNet	2012	0.0%	0.0%	0.0%	-93.5%	0.0%	0.0%	0.0%	-91.6%
Ar 9 Sport	2012	1.3%	1.1%	-0.2%	-15.6%	3.8%	3.6%	-0.3%	-6.9%
Ar 6 Sport	2012	0.1%	0.3%	0.2%	154.9%	0.4%	1.3%	0.9%	199.1%
Tr 6B:9Net	2012	0.3%	0.0%	-0.3%	-97.3%	0.3%	0.0%	-0.3%	-97.7%
A 10 Sport	2012	0.4%	0.3%	-0.1%	-31.3%	0.7%	0.2%	-0.5%	-71.7%
A 11 Sport	2012	0.4%	0.3%	-0.1%	-20.4%	0.5%	0.3%	-0.3%	-46.6%
NT10:11Net	2012	0.1%	0.0%	-0.1%	-98.2%	0.1%	0.0%	-0.1%	-99.1%
Tr10:11Net	2012	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
A 10A Sprt	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10A Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 10E Sprt	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10E Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 12 Sport	2012	1.0%	0.6%	-0.4%	-35.9%	2.4%	1.6%	-0.9%	-35.8%
NT HC Net	2012	0.0%	0.0%	0.0%	-96.5%	0.0%	0.0%	0.0%	-96.7%
Tr HC Net	2012	4.8%	8.8%	4.0%	82.1%	4.4%	7.3%	2.8%	62.9%
A 13 Sport	2012	0.1%	0.0%	0.0%	-23.3%	0.1%	0.0%	-0.1%	-55.7%
NT SPS Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SPS Net	2012	0.3%	0.4%	0.1%	29.3%	0.3%	0.3%	0.1%	27.4%
NT 13A Net	2012	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 13A Net	2012	0.3%	0.1%	-0.2%	-79.2%	0.3%	0.1%	-0.2%	-81.5%
FW Sport	2012	2.5%	3.9%	1.4%	57.3%	11.4%	14.8%	3.4%	30.0%
FW Net	2012	14.4%	21.0%	6.6%	45.5%	13.1%	20.1%	7.0%	53.5%

Table 36. 2013 fishing pre-season and post-season FRAM ER comparison of absolute and relative error estimates for Skokomish River unmarked and marked fall Chinook salmon across all individual fisheries.

		UNMARKED				MARKED			
Fish_Name	YEAR	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference
SEAK Troll	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SEAK Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SEAK Sport	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N/C BC Net	2013	0.0%	0.0%	0.0%	-45.2%	0.0%	0.0%	0.0%	-58.1%
WCVI Net	2013	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
GeoStr Net	2013	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
BC JDF Net	2013	0.0%	0.0%	0.0%	-58.7%	0.0%	0.0%	0.0%	-76.7%
BCOutSport	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N/C BC Trl	2013	0.4%	0.2%	-0.2%	-45.1%	0.4%	0.2%	-0.2%	-38.4%
WCVI Troll	2013	4.3%	2.7%	-1.6%	-37.8%	4.3%	2.4%	-1.9%	-44.9%
WCVI Sport	2013	4.5%	3.8%	-0.7%	-14.9%	4.2%	3.5%	-0.7%	-17.3%
GeoS Troll	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JS/GS/JDF Sport	2013	3.2%	5.9%	2.7%	83.9%	3.0%	7.1%	4.1%	134.7%
NT 3:4 Trl	2013	1.0%	0.7%	-0.2%	-23.7%	0.9%	0.7%	-0.2%	-23.6%
Tr 3:4 Trl	2013	2.9%	2.2%	-0.7%	-24.4%	2.8%	2.0%	-0.7%	-25.8%
Ar 3:4 Spt	2013	0.2%	0.2%	-0.1%	-28.6%	0.4%	0.3%	-0.1%	-22.5%
NoWACstNet	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 2 Troll	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 2 Troll	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 2 Sport	2013	0.8%	0.3%	-0.5%	-67.1%	0.8%	0.2%	-0.6%	-75.6%
NT GHb Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr GHb Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WillapaNet	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 1 Troll	2013	0.0%	0.0%	0.0%	-78.7%	0.0%	0.0%	0.0%	-76.5%
Ar 1 Sport	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ColRvr Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Buoy10 Spt	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cen OR Trl	2013	0.1%	0.1%	0.0%	2.0%	0.1%	0.1%	0.0%	-23.5%
Cen OR Spt	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Troll	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Sport	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Trl	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Spt	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 7 Sport	2013	1.4%	3.1%	1.6%	116.0%	2.2%	2.8%	0.6%	25.3%
NT 7:7ANet	2013	0.2%	0.1%	-0.1%	-39.3%	0.2%	0.1%	-0.1%	-58.5%
Tr 7:7ANet	2013	0.3%	0.2%	-0.1%	-38.9%	0.3%	0.1%	-0.2%	-52.8%
NT 7BCDNet	2013	0.1%	0.0%	0.0%	-73.4%	0.1%	0.0%	-0.1%	-85.0%
Tr 7BCDNet	2013	0.0%	0.0%	0.0%	-51.5%	0.1%	0.0%	0.0%	-72.7%
Tr JDF Trl	2013	0.5%	0.4%	-0.1%	-15.6%	0.5%	0.4%	-0.1%	-28.7%
Ar 5 Sport	2013	0.4%	0.4%	0.0%	1.8%	0.9%	0.8%	0.0%	-5.4%
NT JDF Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr JDF Net	2013	0.2%	0.1%	-0.1%	-65.5%	0.2%	0.1%	-0.1%	-59.8%
Ar 8-1 Spt	2013	0.4%	0.1%	-0.4%	-86.4%	1.1%	0.1%	-1.0%	-91.0%
NT SkagNet	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SkagNet	2013	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Area8D Spt	2013	0.0%	0.0%	0.0%	233.9%	0.0%	0.0%	0.0%	329.1%
NT StSnNet	2013	0.0%	0.0%	0.0%	-96.5%	0.0%	0.0%	0.0%	-95.6%
Tr StSnNet	2013	0.0%	0.0%	0.0%	-86.1%	0.0%	0.0%	0.0%	-82.2%
NT TulaNet	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr TulaNet	2013	0.0%	0.0%	0.0%	-5.0%	0.0%	0.0%	0.0%	22.0%
Ar 9 Sport	2013	1.2%	1.1%	-0.2%	-13.0%	3.4%	3.0%	-0.4%	-11.6%
Ar 6 Sport	2013	0.2%	0.2%	0.0%	11.8%	0.5%	0.6%	0.1%	24.2%
Tr 6B:9Net	2013	0.2%	0.0%	-0.2%	-86.7%	0.2%	0.0%	-0.2%	-88.4%
A 10 Sport	2013	0.5%	0.3%	-0.2%	-47.7%	0.9%	0.2%	-0.7%	-75.5%
A 11 Sport	2013	0.3%	0.1%	-0.2%	-66.5%	0.4%	0.1%	-0.3%	-72.9%
NT10:11Net	2013	0.1%	0.0%	-0.1%	-99.3%	0.1%	0.0%	-0.1%	-99.6%
Tr10:11Net	2013	0.0%	0.0%	0.0%	-88.1%	0.0%	0.0%	0.0%	-93.3%
A 10A Sprt	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10A Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 10E Sprt	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10E Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 12 Sport	2013	0.7%	0.5%	-0.2%	-32.2%	1.7%	0.8%	-1.0%	-55.5%
NT HC Net	2013	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr HC Net	2013	6.6%	8.9%	2.3%	35.1%	5.8%	6.6%	0.8%	13.4%
A 13 Sport	2013	0.1%	0.1%	0.0%	-12.7%	0.1%	0.1%	0.0%	-25.6%
NT SPS Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SPS Net	2013	0.3%	0.3%	0.0%	3.5%	0.3%	0.3%	0.0%	-1.7%
NT 13A Net	2013	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 13A Net	2013	0.2%	0.1%	-0.1%	-62.3%	0.2%	0.1%	-0.1%	-60.5%
FW Sport	2013	2.4%	1.7%	-0.7%	-29.3%	12.8%	9.6%	-3.2%	-24.8%
FW Net	2013	15.5%	15.7%	0.2%	1.4%	14.4%	15.5%	1.1%	7.9%

Table 37. 2014 fishing pre-season and post-season FRAM ER comparison of absolute and relative error estimates for Skokomish River unmarked and marked fall Chinook salmon across all individual fisheries.

		UNMARKED				MARKED			
Fish_Name	YEAR	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference	Pre-season ER	Post-Season ER	Absolute Difference	Relative Difference
SEAK Troll	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SEAK Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SEAK Sport	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N/C BC Net	2014	0.0%	0.0%	0.0%	-62.4%	0.0%	0.0%	0.0%	-70.1%
WCVI Net	2014	0.0%	0.1%	0.1%	#VALUE!	0.0%	0.1%	0.1%	#VALUE!
GeoStr Net	2014	0.0%	0.0%	0.0%	108.4%	0.0%	0.0%	0.0%	29.0%
BC JDF Net	2014	0.0%	0.0%	0.0%	-72.1%	0.0%	0.0%	0.0%	-82.7%
BCOutSport	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
N/C BC Trl	2014	0.3%	0.4%	0.0%	9.7%	0.3%	0.4%	0.1%	22.5%
WCVI Troll	2014	8.0%	9.8%	1.8%	22.8%	8.3%	8.8%	0.5%	6.0%
WCVI Sport	2014	3.6%	4.7%	1.0%	28.2%	3.5%	4.3%	0.9%	25.0%
GeoS Troll	2014	0.0%	0.0%	0.0%	#VALUE!	0.0%	0.0%	0.0%	#VALUE!
JS/GS/JDF Sport	2014	3.4%	4.0%	0.6%	17.3%	3.1%	4.4%	1.3%	41.3%
NT 3:4 Trl	2014	0.7%	0.6%	-0.2%	-22.8%	0.7%	0.5%	-0.2%	-24.0%
Tr 3:4 Trl	2014	2.5%	2.5%	0.0%	-0.3%	2.5%	2.3%	-0.2%	-6.2%
Ar 3:4 Spt	2014	0.3%	0.4%	0.1%	49.4%	0.5%	0.6%	0.1%	23.3%
NoWACstNet	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 2 Troll	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 2 Troll	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 2 Sport	2014	0.6%	0.5%	-0.1%	-22.0%	0.7%	0.4%	-0.3%	-42.5%
NT GHb Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr GHb Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WillapaNet	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NT 1 Troll	2014	0.1%	0.2%	0.1%	138.6%	0.1%	0.2%	0.1%	130.6%
Ar 1 Sport	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ColRvr Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Buoy10 Spt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cen OR Trl	2014	0.1%	0.2%	0.1%	103.0%	0.1%	0.2%	0.1%	62.0%
Cen OR Spt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Troll	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
KMZ Sport	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Trl	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
So Cal Spt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ar 7 Sport	2014	1.7%	2.6%	0.9%	54.4%	2.8%	3.1%	0.3%	9.8%
NT 7:7ANet	2014	0.2%	0.1%	0.0%	-25.3%	0.2%	0.1%	-0.1%	-48.1%
Tr 7:7ANet	2014	0.2%	0.3%	0.1%	54.0%	0.2%	0.3%	0.0%	23.3%
NT 7BCDNet	2014	0.0%	0.0%	0.0%	-51.5%	0.1%	0.0%	0.0%	-70.0%
Tr 7BCDNet	2014	0.0%	0.0%	0.0%	-8.2%	0.1%	0.0%	0.0%	-43.2%
Tr JDF Trl	2014	0.5%	0.6%	0.1%	30.2%	0.5%	0.6%	0.1%	10.6%
Ar 5 Sport	2014	0.4%	0.3%	0.0%	-12.6%	1.0%	0.8%	-0.2%	-21.6%
NT JDF Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr JDF Net	2014	0.3%	0.4%	0.1%	23.4%	0.3%	0.4%	0.1%	41.7%
Ar 8-1 Spt	2014	0.4%	0.1%	-0.3%	-65.1%	0.8%	0.2%	-0.6%	-73.4%
NT SkagNet	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SkagNet	2014	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Area8D Spt	2014	0.0%	0.0%	0.0%	92.8%	0.0%	0.0%	0.0%	141.3%
NT StSnNet	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr StSnNet	2014	0.0%	0.0%	0.0%	-97.4%	0.0%	0.0%	0.0%	-96.7%
NT TulaNet	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr TulaNet	2014	0.0%	0.0%	0.0%	-8.8%	0.0%	0.0%	0.0%	14.1%
Ar 9 Sport	2014	1.0%	1.4%	0.4%	37.2%	2.5%	3.5%	1.1%	43.2%
Ar 6 Sport	2014	0.2%	0.2%	0.0%	17.9%	0.8%	0.9%	0.1%	15.6%
Tr 6B:9Net	2014	0.2%	0.0%	-0.2%	-91.2%	0.2%	0.0%	-0.2%	-92.3%
A 10 Sport	2014	0.2%	0.2%	0.0%	17.8%	0.3%	0.2%	-0.1%	-23.2%
A 11 Sport	2014	0.1%	0.1%	0.0%	24.0%	0.3%	0.2%	0.0%	-16.3%
NT10:11Net	2014	0.1%	0.0%	-0.1%	-95.5%	0.1%	0.0%	-0.1%	-97.2%
Tr10:11Net	2014	0.0%	0.0%	0.0%	-88.5%	0.0%	0.0%	0.0%	-92.9%
A 10A Sprt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10A Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 10E Sprt	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 10E Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A 12 Sport	2014	0.7%	1.1%	0.4%	54.1%	1.7%	1.6%	-0.1%	-3.7%
NT HC Net	2014	0.0%	0.0%	0.0%	-100.0%	0.0%	0.0%	0.0%	-100.0%
Tr HC Net	2014	7.2%	10.2%	3.0%	42.3%	6.1%	8.3%	2.2%	36.1%
A 13 Sport	2014	0.1%	0.1%	0.0%	-2.5%	0.1%	0.1%	0.0%	-5.2%
NT SPS Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr SPS Net	2014	0.3%	0.3%	0.0%	3.1%	0.3%	0.3%	0.0%	-1.4%
NT 13A Net	2014	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tr 13A Net	2014	0.2%	0.1%	-0.1%	-55.2%	0.2%	0.1%	-0.1%	-55.5%
FW Sport	2014	2.6%	1.6%	-1.0%	-37.8%	14.9%	9.7%	-5.2%	-34.7%
FW Net	2014	13.4%	15.7%	2.2%	16.8%	12.5%	15.3%	2.8%	22.5%

Table 38. 2011 marked and unmarked Hood Canal fall Chinook Salmon AEQ mortalities and relative errors across Timesteps 2 through 4.

	Marked									Unmarked								
	Timestep 2		Relative	Timestep 3		Relative	Timestep 4		Relative	Timestep 2		Relative	Timestep 3		Relative	Timestep 4		Relative
Fishery Name	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error
N/C BC Net	0	0	0.0%	14	20	42.9%	0	0	0.0%	0	0	0.0%	1	1	0.0%	0	0	0.0%
GeoStr Net	0	0	0.0%	0	1	#DIV/0!	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
BC JDF Net	0	0	0.0%	0	22	#DIV/0!	0	0	0.0%	0	0	0.0%	0	1	#DIV/0!	0	0	0.0%
N/C BC Trl	93	417	348.4%	97	7	-92.8%	19	0	-100.0%	11	26	136.4%	9	0	-100.0%	2	0	-100.0%
WCVI Sport	0	533	#DIV/0!	1,896	5,806	206.2%	0	0	0.0%	0	32	#DIV/0!	200	330	65.0%	0	0	0.0%
N GS Sport	0	0	0.0%	0	1	#DIV/0!	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
S GS Sport	0	0	0.0%	12	12	0.0%	0	0	0.0%	0	0	0.0%	1	1	0.0%	0	0	0.0%
BC JDF Spt	12	16	33.3%	1,372	3,926	186.2%	25	80	220.0%	1	1	0.0%	169	250	47.9%	2	4	100.0%
NT 3:4 Trl	135	442	227.4%	182	303	66.5%	0	0	0.0%	15	26	73.3%	19	17	-10.5%	0	0	0.0%
Tr 3:4 Trl	290	443	52.8%	570	1,747	206.5%	272	232	-14.7%	31	25	-19.4%	59	94	59.3%	23	11	-52.2%
Ar 3:4 Spt	33	112	239.4%	11	30	172.7%	0	0	0.0%	1	3	200.0%	1	1	0.0%	0	0	0.0%
NT 1 Troll	12	27	125.0%	3	3	0.0%	0	0	0.0%	1	2	100.0%	0	0	0.0%	0	0	0.0%
Ar 7 Sport	0	0	0.0%	821	2,107	156.6%	917	1,764	92.4%	0	0	0.0%	76	108	42.1%	36	49	36.1%
NT 7:7ANet	0	0	0.0%	119	181	52.1%	0	0	0.0%	0	0	0.0%	9	9	0.0%	0	0	0.0%
NT 7BCDNet	0	0	0.0%	27	95	251.9%	0	0	0.0%	0	0	0.0%	2	5	150.0%	0	0	0.0%
Tr 7BCDNet	0	0	0.0%	40	130	225.0%	0	0	0.0%	0	0	0.0%	3	6	100.0%	0	0	0.0%
Ar 5 Sport	0	0	0.0%	424	622	46.7%	34	70	105.9%	0	0	0.0%	15	15	0.0%	3	4	33.3%
NT StSnNet	0	0	0.0%	2	1	-50.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
Tr TulaNet	0	0	0.0%	3	7	133.3%	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
Ar 6 Sport	0	0	0.0%	104	424	307.7%	87	148	70.1%	0	0	0.0%	4	10	150.0%	8	8	0.0%
A 10 Sport	5	0	-100.0%	113	526	365.5%	318	117	-63.2%	0	0	0.0%	9	26	188.9%	14	3	-78.6%
A 12 Sport	0	0	0.0%	516	680	31.8%	1,078	601	-44.2%	0	0	0.0%	47	35	-25.5%	73	18	-75.3%
Tr HC Net	0	0	0.0%	2,047	6,429	214.1%	1	2	100.0%	0	0	0.0%	215	368	71.2%	0	0	0.0%
A 13 Sport	30	14	-53.3%	18	107	494.4%	19	43	126.3%	1	0	-100.0%	1	5	400.0%	2	2	0.0%
FW Sport	0	0	0.0%	4,532	5,830	28.6%	0	0	0.0%	0	0	0.0%	127	130	2.4%	0	0	0.0%
FW Net	0	0	0.0%	5,499	10,925	98.7%	0	0	0.0%	0	0	0.0%	813	836	2.8%	0	0	0.0%

Table 39. 2012 marked and unmarked Hood Canal fall Chinook Salmon AEQ mortalities and relative errors across Timesteps 2 through 4.

	Marked									Unmarked								
	Timestep 2		Relative	Timestep 3		Relative	Timestep 4		Relative	Timestep 2		Relative	Timestep 3		Relative	Timestep 4		Relative
FisheryName	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error
BC JDF Net	0	0	0.0%	0	5	#DIV/0!	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
WCVI Sport	0	916	#DIV/0!	2,698	8,412	211.8%	0	0	0.0%	0	43	#DIV/0!	301	404	34.2%	0	0	0.0%
N GS Sport	0	0	0.0%	0	1	#DIV/0!	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
S GS Sport	0	1	#DIV/0!	22	52	136.4%	0	0	0.0%	0	0	0.0%	2	3	50.0%	0	0	0.0%
BC JDF Spt	12	198	1550.0%	1,725	1,405	-18.6%	28	17	-39.3%	1	10	900.0%	208	56	-73.1%	3	1	-66.7%
NT 3:4 Trl	293	1,013	245.7%	299	1,489	398.0%	0	0	0.0%	33	49	48.5%	33	73	121.2%	0	0	0.0%
Tr 3:4 Trl	637	1,724	170.6%	811	3,595	343.3%	333	31	-90.7%	71	84	18.3%	90	180	100.0%	31	2	-93.5%
Ar 2 Sport	74	282	281.1%	392	950	142.3%	0	0	0.0%	3	6	100.0%	42	46	9.5%	0	0	0.0%
Cen OR Trl	8	24	200.0%	66	116	75.8%	0	4	#DIV/0!	1	1	0.0%	7	6	-14.3%	0	0	0.0%
Ar 7 Sport	0	0	0.0%	860	2,096	143.7%	935	1,422	52.1%	0	0	0.0%	88	103	17.0%	37	29	-21.6%
Tr 7BCDNet	0	0	0.0%	37	52	40.5%	0	0	0.0%	0	0	0.0%	3	3	0.0%	0	0	0.0%
Ar 5 Sport	0	0	0.0%	457	1,567	242.9%	53	105	98.1%	0	0	0.0%	16	23	43.8%	6	5	-16.7%
Tr JDF Net	3	0	-100.0%	77	227	194.8%	0	0	0.0%	0	0	0.0%	9	10	11.1%	0	0	0.0%
Ar 6 Sport	0	0	0.0%	112	1,423	1170.5%	157	373	137.6%	0	0	0.0%	4	17	325.0%	5	5	0.0%
Tr HC Net	0	0	0.0%	2,677	9,920	270.6%	4	2	-50.0%	0	0	0.0%	297	489	64.6%	0	0	0.0%
Tr SPS Net	0	0	0.0%	165	468	183.6%	0	0	0.0%	0	0	0.0%	19	23	21.1%	0	0	0.0%
FW Sport	0	0	0.0%	4,935	12,419	151.7%	0	0	0.0%	0	0	0.0%	158	220	39.2%	0	0	0.0%
FW Net	0	0	0.0%	5,679	16,871	197.1%	0	0	0.0%	0	0	0.0%	915	1,175	28.4%	0	0	0.0%

Table 40. 2013 marked and unmarked Hood Canal fall Chinook Salmon AEQ mortalities and relative errors across Timesteps 2 through 4.

	Marked									Unmarked								
	Timestep 2		Relative	Timestep 3		Relative	Timestep 4		Relative	Timestep 2		Relative	Timestep 3		Relative	Timestep 4		Relative
Fishery Name	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error
WCVI Net	0	1	#DIV/0!	1	6	500.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
N GS Sport	0	0	0.0%	1	0	-100.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
S GS Sport	1	0	-100.0%	47	11	-76.6%	0	0	0.0%	0	0	0.0%	2	1	-50.0%	0	0	0.0%
BC JDF Spt	71	63	-11.3%	2,662	6,940	160.7%	52	8	-84.6%	4	4	0.0%	136	283	108.1%	3	1	-66.7%
Cen OR Trl	11	4	-63.6%	104	86	-17.3%	0	2	#DIV/0!	0	0	0.0%	5	6	20.0%	0	0	0.0%
Ar 7 Sport	0	0	0.0%	1,010	2,045	102.5%	1,093	738	-32.5%	0	0	0.0%	52	137	163.5%	13	13	0.0%
Ar 5 Sport	0	0	0.0%	719	796	10.7%	106	28	-73.6%	0	0	0.0%	11	16	45.5%	5	2	-60.0%
Ar 6 Sport	0	0	0.0%	195	343	75.9%	278	278	0.0%	0	0	0.0%	2	4	100.0%	5	5	0.0%
Tr HC Net	0	0	0.0%	5,275	6,418	21.7%	9	0	-100.0%	0	0	0.0%	266	344	29.3%	0	0	0.0%
Tr SPS Net	0	0	0.0%	251	261	4.0%	0	0	0.0%	0	0	0.0%	13	15	15.4%	0	0	0.0%
FW Net	0	0	0.0%	9,189	8,302	-9.7%	0	0	0.0%	0	0	0.0%	634	592	-6.6%	0	0	0.0%

Table 41. 2014 marked and unmarked Hood Canal fall Chinook Salmon AEQ mortalities and relative errors across Timesteps 2 through 4.

	Marked									Unmarked								
	Timestep 2		Relative	Timestep 3		Relative	Timestep 4		Relative	Timestep 2		Relative	Timestep 3		Relative	Timestep 4		Relative
Fishery Name	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error	PRE	POST	Error
WCVI Net	0	1	#DIV/0!	0	38	#DIV/0!	0	0	0.0%	0	0	0.0%	0	3	#DIV/0!	0	0	0.0%
N/C BC Trl	185	122	-34.1%	136	23	-83.1%	29	0	-100.0%	9	6	-33.3%	6	2	-66.7%	1	0	-100.0%
WCVI Troll	2,399	1,160	-51.6%	3,762	1,344	-64.3%	3,397	924	-72.8%	117	61	-47.9%	180	80	-55.6%	127	60	-52.8%
WCVI Sport	0	279	#DIV/0!	4,015	1,418	-64.7%	0	0	0.0%	0	14	#DIV/0!	193	81	-58.0%	0	0	0.0%
N GS Sport	2	1	-50.0%	7	2	-71.4%	0	0	0.0%	0	0	0.0%	0	0	0.0%	0	0	0.0%
S GS Sport	10	2	-80.0%	49	16	-67.3%	3	0	-100.0%	0	0	0.0%	2	1	-50.0%	0	0	0.0%
BC JDF Spt	70	26	-62.9%	3,354	1,642	-51.0%	120	40	-66.7%	3	2	-33.3%	171	77	-55.0%	6	3	-50.0%
Tr 3:4 Trl	1,425	416	-70.8%	1,465	501	-65.8%	338	132	-60.9%	66	23	-65.2%	69	28	-59.4%	14	9	-35.7%
Ar 3:4 Spt	436	211	-51.6%	109	16	-85.3%	0	0	0.0%	11	8	-27.3%	4	1	-75.0%	0	0	0.0%
NT 1 Troll	77	62	-19.5%	9	5	-44.4%	0	0	0.0%	3	3	0.0%	0	0	0.0%	0	0	0.0%
Cen OR Trl	6	8	33.3%	105	52	-50.5%	0	1	#DIV/0!	0	0	0.0%	5	3	-40.0%	0	0	0.0%
Ar 7 Sport	0	0	0.0%	1,553	688	-55.7%	1,664	507	-69.5%	0	0	0.0%	73	45	-38.4%	15	7	-53.3%
Tr 7:7ANet	0	0	0.0%	248	104	-58.1%	0	0	0.0%	0	0	0.0%	11	7	-36.4%	0	0	0.0%
Tr JDF Net	14	0	-100.0%	291	146	-49.8%	0	0	0.0%	1	0	-100.0%	15	7	-53.3%	0	0	0.0%
Ar 9 Sport	0	0	0.0%	2,313	1,134	-51.0%	548	252	-54.0%	0	0	0.0%	42	19	-54.8%	12	10	-16.7%
Ar 6 Sport	0	0	0.0%	542	156	-71.2%	335	187	-44.2%	0	0	0.0%	5	2	-60.0%	5	3	-40.0%
A 10 Sport	12	0	-100.0%	131	36	-72.5%	166	44	-73.5%	0	0	0.0%	5	2	-60.0%	4	2	-50.0%
A 11 Sport	60	30	-50.0%	74	22	-70.3%	160	31	-80.6%	1	1	0.0%	3	1	-66.7%	2	1	-50.0%
A 12 Sport	0	0	0.0%	897	589	-34.3%	1,049	44	-95.8%	0	0	0.0%	15	18	20.0%	18	1	-94.4%
Tr HC Net	0	0	0.0%	6,784	3,183	-53.1%	12	9	-25.0%	0	0	0.0%	323	180	-44.3%	1	1	0.0%
Tr SPS Net	0	0	0.0%	355	118	-66.8%	0	0	0.0%	0	0	0.0%	17	7	-58.8%	0	0	0.0%
FW Net	0	0	0.0%	8,998	3,418	-62.0%	0	0	0.0%	0	0	0.0%	605	262	-56.7%	0	0	0.0%

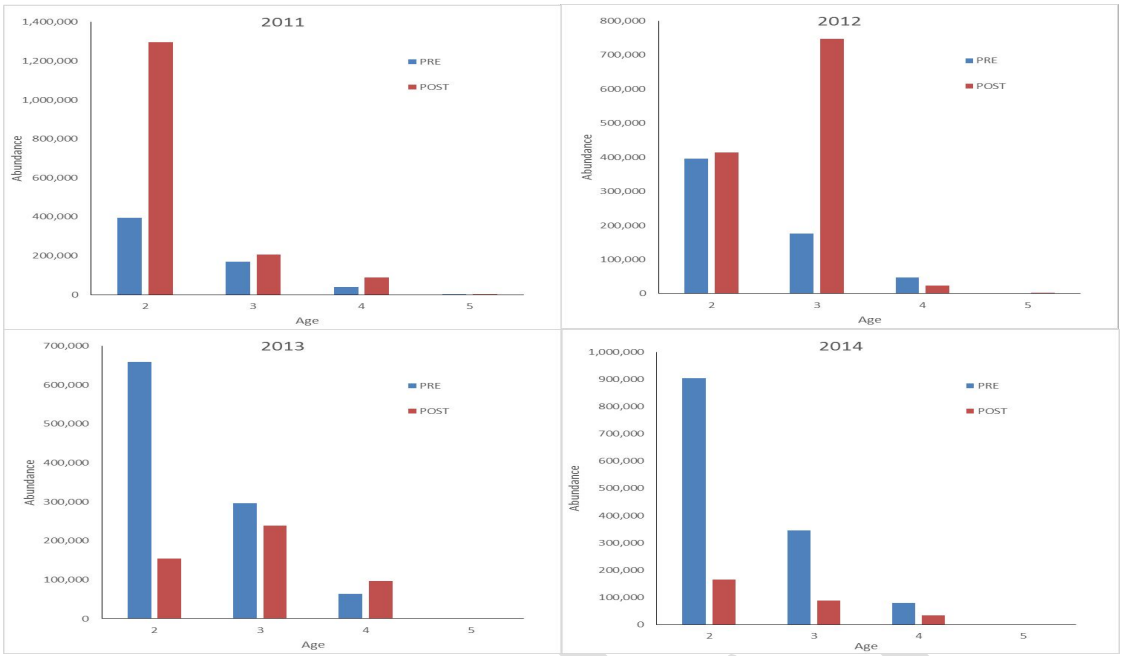

Figure 6. Starting cohort abundance of Marked Hood Canal aggregate stock during Timestep 1 in 2011, 2012, 2013, and 2014.