### BYCATCH IN COMMERCIAL GILLNET AND PURSE SEINE FISHERIES IN PUGET SOUND FOR CHUM SALMON

Report prepared for the Puget Sound Harvesters Association (PSHA) by Stephen B. Mathews, Aug. 2016

I have written three previous reports on these issues for Puget Sound Harvesters Association (PSHA), a commercial fishing group (Mathews, 2012; Mathews, 2012b; Mathews, 2013). The PSHA asked me to revisit such issues in light of recent circumstances. I therefore considered the following observations, records, and information sources: (1) current Apple Cove Point purse seine test fishing catches of Chinook and coho salmon incidental to the chum test catches that are used for run prediction; (2) response by Washington Department of Fish and Wildlife (WDFW) to my previous recommendations to them for improving and reporting upon their bycatch sampling programs for gillnetting and purse seining; (3) recent salmon catch data for the chum salmon season; and (4) the WDFW Concise Explanatory Statements (CES) for Puget Sound Commercial Salmon Regulations, 2014 and 2015.

In my previous reports I expressed that the Apple Cove Point test catches of Chinook and coho per 1000 chums in such test sets are among the best existing data for estimating the bycatch of Chinook and coho by purse seines in the ensuing fishery. Arguably, the test fishing location may not be representative of the full fishing area to the south. But since seiners can't legally land Chinook and coho, and the WDFW on-board observer sampling of purse seining during recent chum seasons was statistically inadequate in several regards (see Mathews, 2012b and Mathews, 2013), then the Apple Cove Point test data was my favored choice for estimating purse seine bycatch rates. Trained observers are on board the chartered purse seine test boat for the full time of each set, not always the case with the WDFW on- board sampling. Also, the Apple Cove Point bycatch levels of Chinook tended to be in line with those of historical on board observations of fall purse seining for Puget Sound chums (Jensen, 1954; Fiscus, 1964; Cole, 1975).

Table 1 is an up-date of my previous reporting on the Apple Cove Point test catches for 1996-2011. For Chinook the recent results are well known. For three years (2012-2014) Chinook bycatch rates were relatively low. But for 2015 the highest Chinook bycatch of 20 years occurred, 512 Chinook in 29 test sets. Single sets of over 100 chinook occurred. That unusual 2015 abundance of immature Chinook was also apparent in the adjacent sport fishery, which was closed by WDFW emergency order (according to my personal communication with Bill Patton, Northwest Indian Fishery Commission, NWIFC). The degree to which 2015 should be considered an outlier, and the degree to which the test location is representative of the full fishing grounds, may be debated. But these current test fishing results only amplify my previous conclusion that bycatch mortalities of Chinook during the chum season are substantially higher for purse seiners than for gillnetters. The 6 ¼ inch minimum mesh for gillnetters does better at allowing immature Chinook to avoid the nets (swim through them) than the smaller mesh of the purse seines, 3½ to 4 inch, with 5-inch top strip.

The same advantage of gillnets over purse seines also applies for coho, though to a lesser degree than for Chinook. Puget Sound coho tend to be smaller than chums and thus better able to swim through the 6 ¼ inch mesh, which is optimal for chums. In the recent four years (2012-2015) the Apple Cove Point purse seine test fishery bycatch rates ranged between 18-33 coho per 1000 chums (Table 1). The 2012 bycatch rate by Puget Sound gillnetters (Areas 10 and 11) was, by two independent measures, less than half that of the 2012 Apple Cove Point test fishery coho bycatch rate of 20 coho per 1000 chums. Gillnet fish tickets show the 2012 fishery bycatch rate to be 6.9 coho per 1000 chums, while the WDFW observer sampling of 2012 sets showed 9.6 coho per 1000 chum (Mathews, 2012b). For the next three years the gillnet bycatch

rates of coho per 1000 chums, according to fish tickets, were much less than from the Apple Cove Point purse seine test sets:

	GN fish ticket coho/1000 chums	PS Apple Cove Point coho/1000 chums
2013	4.6	18.0
2014	3.1	18.2
2015	0.5	32.6

The difference between the gillnet and the test fishing purse seine rates was greatest for 2015. Puget Sound coho were very small in average weight that year and of critically low abundance. It should be of no surprise that the selective advantage of gillnetting (taking chums while avoiding most coho) would be best in a year of small average coho size.

WDFW might question the accuracy of fish ticket data, implying that gillnetters don't sufficiently report their coho catches. I'll return to that concern later with some data summarized from my previous reports.

In those previous reports I made several recommendations to WDFW for improving their bycatch sampling and estimation programs: first, that they summarize and complete reports for public/scientific consumption on their various incidental bycatch sampling programs; second, that their purse seine sampling methodology is potentially biased because a substantial portion of their on board observations are only of the final dumping and catch sorting, not the full set; and third that they should use similar, if not exactly the same, sampling forms for gillnets and purse seines.

My first recommendation is obvious. Bycatch of ESA concern species could cause severe restrictions of or re-allocations within certain gear types. It is irresponsible to collect such potentially disruptive information and then sit on it or cherry pick from it to sway fishing regulations. In 2012 I was shown a data bank that PSHA obtained from WDFW consisting of observations of 3,407 purse seine sets and 194 gillnet sets made during 2000-2010. The methodology of observation was variable. I have asked WDFW for reports on these observations, but have received none. They do refer to this data bank in 2011 and 2012 CES's with such unsubstantiated conclusions as these: it is adequate for bycatch management of purse seines (I paraphrase); or "marine mammal bycatch may also be a problem with gillnets" (exact phrase from 2012 CES).

The PSHA then asked me to analyze specifics sets of 2011 and 2012 WDFW on board sampling data, obtained by PSHA through public disclosure:

- (1) Hood Canal gillnet during 2011 chum season-97 samples
- (2) Puget Sound gillnet during 2011 chum season-47 samples
- (3) Puget Sound purse seine during 2011 chum season-81 samples
- (4) Puget Sound purse seine during 2011 pink season-104 samples
- (5) Hood Canal gillnet during 2012 chum season-49 samples
- (6) Puget Sound gillnet during 2012 season-52 samples
- (7) Puget Sound purse seine during 2012 chum season-7 samples
- (8) Puget sound purse seine during 2012 sockeye season-93 samples

My analyses of these data are in Mathews, 2012b and Mathews, 2013. I asked the WDFW Puget Sound Salmon Manager in a May 30, 2016 letter (Appendix 1) for any reports they may have completed in which these 2011 and 2012 samples were objectively summarized. I received no answer to that request in spite of two follow-up e-mails, and conclude that they have no such reports or summaries. In fact, for all the thousands of bycatch observations of Puget Sound commercial fisheries prompted by ESA concerns, I have found only one completed report (Erstad et al, 1996). That old bycatch study was for gillnetting during the fall chum season; it found no bycatch of such ESA concern species as marbled murrelet or harbor porpoise.

In that May 30 letter I also asked if WDFW had updated their purse seine and gillnet sampling forms to make them consistent and accurate. My reasons for recommending this are discussed in Mathews, 2012b. The PSHA had written WDFW Director Unsworth a May 20, 2015 letter asking for such a form modification (Appendix 2), which was acknowledged by Dr. Unsworth in his June 23, 2015 return letter (Appendix 3). I received no reply to my form modification question, and assume WDFW has not complied. If they are not currently sampling it would be reasonable that they have not yet made the promised form changes, but I request knowing where all this stands.

I read the 2014 and 2015 CES's with respect to WDFW's current discussions of and opinions on bycatch mortalities. There are continuing statements contrary to facts, scientific literature, or my data-based opinions as per my previous reports. In the 2015 CES they conclude with bold certainty that: "---the majority of Chinook and coho salmon encountered by (purse seine) gear will survive being sorted and returned to the water". That statement is simply not true for immature Chinook according to all the literature. Most of these are gilled or badly descaled in a large purse seine load of target fish. There is science based evidence that most mature Chinook and coho could survive release from a well handled purse seine haul. But whether or not the majority do so from an actual fishery, the evidence is scant. If 10 or 20 coho come aboard in a haul of hundreds of chums, the recovery box option, as required, becomes questionable. Then the best option is probably to sort them out and get them overboard as fast as possible. This could work, but no one has measured the survivability of coho is such a real fishery circumstance, nor would it be easy to do. "May" survive would be a more accurate statement than "will" survive. Anyone who has crewed aboard or sampled aboard a seiner could list many variables that would affect survival of released bycatch.

WDFW does not evaluate the condition of bycatch of salmon in Puget Sound purse seines, or effectiveness of live-boxes aboard seiners. They have had low cost opportunities to do so. In 2011 WDFW had full-time observers aboard Puget Sound seiners during an experimental pink salmon fishery in Area 10. Nothing consistent was recorded regarding the condition of some 1,570 coho and 336 Chinook taken incidentally to 45,701 pinks during 104 sets. Nor was the use or success of live boxes for recovery prior to release recorded. The Northwest Indian Fisheries Commission (NWIFC) runs the Apple Cove Point chum test fishery. They would likely cooperate with a WDFW observer aboard for bycatch observations and experiments.

WDFW states in the 2015 CES: "Fewer (than by purse seine) scientific studies have been conducted on mortality rates for coho and Chinook salmon encountered by gillnets". This, as if to imply that there is lots of good scientific evidence for their earlier "majority" survival claim for purse seines. In fact, there have been a number of studies on mortality of salmon in gillnets which tend to support the obvious- that a salmon gilled for an unlimited time in a gillnet, a purse seine, or any other capture device that uses a net is most likely dead or moribund. That's why Puget Sound gillnetters are most often allowed to keep their

salmon bycatch, and are managed by other sensible alternatives to minimize bycatch or mortality, such as mesh size, time and area closures, quota limits, length of soak time, live box use, limited participation, bird strips, etc. In SE AK, allowance is made for utilization of purse seine bycatch of Chinook, recognizing the likelihood that the majority of these will die from their capture stress, contrary to claims by WDFW. In fact, there have been bycatch survival experiments with gillnet type of deployment using relatively small mesh (tangle gear) that catches by the teeth or jaws; reasonable ("majority") survival has been shown.

The 2015 CES continues with: "In recent years WDFW has increased on-board monitoring of gillnet vessels with the objective of comparing levels of bycatch estimated from direct observation of gillnet bycatch of Chinook and coho to levels estimated by commercial fish tickets". Fine. But where is the WDFW analysis? The data was available for 2011 and 2012. It is now 2016. Why have they not brought facts to bear on such conjecture? My previous reports show that for coho bycatch during the chum season, fish tickets would be perfectly adequate for gillnet catch management or gear comparison:

	Fish ticket coho/1000 chums	Observed coho/1000chums
2011 Puget Sound gillnet	2.6	1.1
2011 Hood Canal gillnet	9.7	8.2
2012 Puget Sound gillnet	6.9	9.6
2012 Hood Canal gillnet	10.6	8.0
Average	7.4	6.2

In three out of four cases the fish ticket estimate of coho bycatch was greater than from direct observer sampling. There are estimation errors for both, but the number of fish in either case was substantial; enough to conclude with high certainty that the gillnetters are playing by the rules, and reporting the coho they catch on tickets.

Continuing with WDFW concerns (insinuations) that gillnetters might be skewing the data by not reporting bycatch on fish tickets, the 2015 CES states: "For both Areas 10/11 and 12/12b gillnet data show a higher rate of (Chinook) encounters than reported on fish tickets". Again, no facts are presented in objective format or previously completed reports. Here are the numbers of chinook during the chum season, from my previous reports-actual fish seen or recorded on fish tickets. There are so few by either measure, that it makes their statement inaccurate.

	Observed # of Chinook	Fish ticket # of Chinook
2011 Puget Sound gillnet	5	4
2011 Hood Canal gillnet	2	0
2012 Puget Sound gillnet	2	4
2012 Hood Canal gillnet	4	2

There is a possibility for error in the fish ticket process-at first sale, at electronic copying, etc. In the thousands of electronically recorded tickets I looked at in Mathews, 2012, I saw some obvious errors of serious magnitude. For example, in 1999 there was a fish ticket record of an Area 10,11 purse seine catch

during the chum season of 246 Chinook weighing 2,119 pounds. Clearly this was actually chums, according to average weight per fish and catches adjacent in time and space. I deleted it from analysis. Not doing so would have enormously inflated any estimate of the Chinook bycatch by seiners. Nor is observing just a fraction of the total gillnet fishing effort without sampling error. Furthermore, if the odd Chinook observed in a gillnet did not make it to a fish ticket, it should be stressed that these are mostly small, immature Chinook with low commercial value. The only sensible conclusion an objective person could draw from the few Chinook either observed or from tickets is that gillnetters take an insignificant number of Chinook relative to the target catch of chums. That 6¼ inch web works very well at protecting small Chinook. The random speculation by WDFW is intended (in my perception) to distort the facts and data negatively for the gillnet gear group.

Continuing with WDFW concerns about gillnetting, here is some more convoluted speculation from the 2015 CES, based on no facts: "Without decrease in effort in 7/7A (Straits and San Juan Islands) gillnet fisheries, estimated increase of incidental take of marbled murrelets from the chum fisheries might have exceeded the limits set forth in the (USFWS) current Biological Opinion---". Notwithstanding the vague term "estimated increase", or whether they are referring to inner Puget Sound or those outer areas, I am unaware that a single marbled murrelet has ever been observed in any net anywhere by WDFW. I saw none in the 2011 and 2012 observer data. There were none seen by Erstad et al, 1996, in that earlier sampling of the Puget Sound gillnet fishery. Maybe one of these birds has been found by WDFW someplace else in a gillnet sampling study, but none of these has been properly concluded with a report of scientific or otherwise literate format.

WDFW's 2015 Concise Explanatory Statement (CES) that furthers my belief that WDFW has an unbalanced opinion of gillnetting versus purse seining on Puget Sound is:" Puget Sound purse seine fisheries are designated as a Category III fishery with a remote likelihood or no known serious injuries to marine mammals, and have no requirements beyond reporting any injuries or mortalities". National Marine Fisheries (NMFS) is the agency that ultimately sets the marine mammal category for a fishery. NMFS relies on its own research plus that of other agencies and institutions. If these other agencies don't adequately report on their observer bycatch programs, NMFS would not get all the facts. Facts such as these, that were in the WDFW data sets I saw but have yet to be presented by WDFW in any of their reports, as best I can tell: On 8/30/2011 about 3:30 PM a seiner chartered for evaluating an experimental pink salmon fishery was observed by a WDFW person aboard to have a harbor porpoise tangled in the net. According to the hard to decipher handwriting in the tiny space on the sampling form allowed for relevant detail it was "released". A harbor seal pup was seen by a WDFW observer during the 2011 Puget Sound chum season in a purse seine set. It too was "released"; that was all that was recorded. These two observations could be contrary to "a remote likelihood ----- (of) serious injury to marine mammals".

WDFW reports in their 2015 CES that: "Prior to 2011, sampling and monitoring programs implemented by WDFW have been focused on purse seine fisheries to obtain mortality estimates on non-target salmonids". What are these programs? What were such mortality estimates? Where are the reports? This agency is not alone in amassing data without adequately and objectively summarizing and reporting so others can know what went on. Until they do, WDFW should avoid referring to specifics that support arbitrary rule making.

After further review detailed in this report, I am critical of WDFW choosing sides of one gear group over another without objective reason or proper analysis of the data they or others collect and then draws arbitrary conclusions that become the record.

### REFFERENCES

Cole, D.L. 1975. The incidental capture of blackmouth (Oncorhynchus tshawytcha) by the net fisheries of Puget Sound. MS Thesis, University of Washington. 75 pp.

Erstad, P., S. Jeffries, and D. Pierce. 1996. Report for the Puget Sound fishery observer program on Management Areas 10/11 and 12/12b: non-treaty chum gillnet fishery. Final Report, Wash. Dept. Fish and Wildlife. Olympia, WA. 14pp.

Fiscus, G. 1964. The incidental catch of immature chinook salmon by purse seines in Puget Sound. State Dept. Fisheries 74<sup>th</sup> Annual Report. p 17.

Jensen, H. 1954. The effects of the purse seine fishery on immature chinook. Mimeographed report of the Marine Fisheries Research and Management Puget Sound Investigations, 1954. Wash. Dept. Fish. pp 73-80. (Available Washington State Library, Olympia, WA).

Mathews, S.B. 2012. Salmonid bycatch in targeted chum salmon fisheries of Puget Sound. Contract Report for Puget Sound Harvesters no. 1004. 29 pp.

Mathews, S.B. 2012b. Analysis of bycatch data collected by Washington Department of Fish and Wildlife in Areas 10, 11, and 12 during 2011 Puget Sound non-tribal gillnet and purse seine fisheries. Contract Report for Puget Sound Salmon Commission. 40 pp.

Mathews, S.B. 2013. Bycatch in non-Indian gillnet and purse seine fisheries for Puget Sound chum salmon: 2012 sampling observations and discussion. Contract Report for Puget Sound Harvesters. 21 pp.

Year	No. of	Total	Total	Total	Chinook/	Coho/set	Chinook per	Coho per
	sets	Chums	Chinook	coho	set		1000 chums	1000 chums
1996	47	5143	201	319	4.28	6.79	39.08	62.03
1997	22	303	3	42	0.14	1.91	9.9	138.61
1998	27	7266	59	118	2.18	4.37	8.12	16.24
1999	26	1293	93	8	3.58	0.31	71.92	6.19
2000	32	4425	215	103	6.72	3.22	48.59	23.28
2001	29	20719	48	320	1.66	11.03	2.32	15.44
2002	31	13161	74	195	2.39	6.29	5.62	14.81
2003	29	8764	32	354	1.1	12.21	3.65	40.39
2004	36	14844	254	463	7.06	12.86	17.11	31.19
2005	34	6860	34	217	1	6.38	4.96	31.63
2006	29	11665	107	97	3.69	3.34	9.17	8.32
2007	28	4742	82	100	2.93	3.57	17.29	21.09
2008	36	3934	29	70	0.8	1.94	7.37	17.79
2009	35	4280	19	68	0.54	1.94	4.44	15.89
2010	36	8385	13	80	0.36	2.22	1.55	9.54
2011	30	3409	6	39	0.2	1.3	1.76	11.44
2012	29	10743	27	214	0.93	7.38	2.51	19.92
2013	28	7788	32	140	1.14	5	4.11	17.98
2014	29	7723	12	140	0.41	4.83	1.55	18.13
2015	29	7334	512	239	17.66	8.24	69.81	32.59
Total	622	145447	1852	3326				
Average					2.98	5.35	12.73	22.87

Table 1. Numbers of chum, Chinook, and coho salmon in the Apple Cove Point purse seine test fishery, 1996-2015.

Appendix 1. page 1 of 2

May 30, 2016

Kendall Henry Puget Sound Commercial Salmon Manager Washington Dept. of Fish & Wildlife 600 Capitol Way North Olympia, WA 98501-1091

Dear Ms. Henry:

I am Steve Mathews, author of three consulting reports for the Puget Sound Harvesters Association/P.S. Salmon Commission on comparative incidental catch mortalities between non-native gillnetters and purse seiners during the fall Puget Sound chum fishery. We spoke by phone before, and I thank you for the time and information you gave me then.

If you read my reports you know I was critical of the considerable difference between the WDFW on-board sampling forms for gillnetters versus purse seiners. The seine forms had less prompts and spaces for recording constructional and deployment aspects of the gear than the gill net forms. The seine forms also had less prompts and spaces than the gill net forms for recording details on numbers and condition of incidentally caught species or on condition of target fish that perhaps had been damaged beyond salability by marine mammals. I felt that such form disparities could lead to unintended bias when comparing estimates of incidental catch mortalities between the two gears. I further suggested that the WDFW should modify these forms so as to make them as similar as deployment differences between the two gears might allow.

Pete Knutson, of the Harvesters, made these points in a May 20, 2015 letter to the WDFW Director. Dr. Unsworth's reply to him of July 23, 2015, acknowledging these concerns, said that adjustments in these two sets of forms would be made by WDFW to make them more similar.

Could you send me copies of these two sets of forms as so adjusted? (E-mail: sbmathews38@yahoo.com or by USPS, address at the end of this letter). Will WDFW be doing on-board incidental catch sampling of either seine or gill net fisheries during 2016? Regarding seine sampling, I would hope that observers be aboard for the entire time of each set, similar to gill net sampling protocols. For your 2012 sampling during the chum season, it was apparent from the data and confirmed by you and others there, that for many of the purse seine sets, only the payload dumping process was observed by samplers, but not the full haulback. Such would potentially miss fish gilled in the net or birds and mammals entangled along the net, unlikely to have been retained by the seine crews to show to a sampler jumping aboard for just the payload observation.

Has WDFW completed any reports or other written analyses for public consumption on your 2011 and 2012 gill net and purse seine incidental catch sampling in Areas 10, 11, 12 – for either chum or pink seasons? If so, I would like to compare your analysis of these data with mine as presented in my reports to the Harvesters/Commission.

Thank you for providing the adjusted forms, for considering my suggestions for improving the seine sampling process, and for any written material that WDFW may have completed on those 2011-2012 samples.

Sincerely yours, Stephen B. Mathews P.O. Box 18126 Coffman Cove, AK 99918 Phone: 907-329-2139

- ----

Appendix 2.



Harvesters Association 1900 W. Nickerson St. Suite 116, PMB 210 Seattle, WA 98119

May 20, 2015

Jim Unsworth, WDFW Director 600 Capitol Way North Olympia, WA 98501

Dear Director Unsworth:

For the last three years our association, Puget Sound Harvesters Association, has requested in writing, that WDFW institute sampling procedures for by-catch data collection that are objective and unbiased towards any particular gear group.

In his 2013 work, attached, University of Washington emeritus Professor of Fisheries Stephen Mathews, criticized WDFW sampling procedures of the non-treaty net fisheries in Puget Sound. He found that the data collection, forms and protocols for sampling of the non-treaty purse seine fleet were inadequate and not up to the same standards as the procedures used to evaluate impacts of the non-treaty gillnet fisheries.

This work was submitted to WDFW, as was his 2012 study of non-treaty bycatch in Puget Sound, also attached.

It is critical for the health of Puget Sound that scientific objectivity guide the sampling procedures upon which run abundance and incidental impacts upon related species are based. It is particularly important that the purse seine fishery be objectively monitored since they take the overwhelming share of the State-managed fishery. This is a critical conservation issue.

Mathews found the following disparities in sampling procedures conducted by WDFW on the gillnet and purse seine nontreaty fisheries. These are reflected in substantially different data collection forms. Mathews observes the following:

- No net depth data is requested from the purse seine operators, unlike the gillnet operators. This is a critical omission as it
  places in question run abundance estimates derived from catch per unit of effort (CPUE) data relative to historical CPUE
  data. It is widely acknowledged that purse seine net depth is substantially deeper today than in the past, yet WDFW does
  not collect data which would allow accurate run size estimate adjustment from the Apple Tree Cove test fishery or from inseason fish ticket data.
- Gillnet observations are conducted with observers aboard the vessel during the entire net retrieval process, whereas purse seine observations are often hailing data, or direct observation only in the final stages of net retrieval. This biases comparative bycatch data as "gillers" entangled during the retrieval process are not necessarily recorded. Hailing data also suffers from potential bias inherent in self-reporting.
- On page 8-9 Mathews notes the disparity between the gillnet and purse seine sampling forms. He notes that there is no space to record condition of fish caught on the purse seine forms, unlike the gillnet forms. The lack of a dedicated entry for condition of fish generates no data regarding condition of purse seine released fish using recovery boxes, unlike the sampling done aboard gillnet vessels. On the gillnet form, there are dedicated lines for 22 species of fish, 11 species of birds and 4 species of marine mammals. On the purse seine forms there is a simple one line for the commercially caught salmon and a line for the "other" species which comprise 37 separate line items on the gillnet form. There is also no space for observer comments after each setting of the net on the purse seine form, unlike the gillnet form.
- Our Puget Sound Harvesters Board members have taken aboard WDFW observers multiple days each fishing season. We have cooperated extensively. However, given the Washington Department of Fish and Wildlife's repeated refusal to produce an unbiased data collection form for the two net fleets, our fishermen will be reluctant to further facilitate data collection.

#### We will support the observer program, if it is run according to objective criteria applied uniformly.

We again request the Washington Department of Fish and Wildlife observe unbiased testing protocols and use standardized data collection forms for the two non-treaty net fleets in Puget Sound.

Sincerely,

Pete Knutson PSHA Board Member Appendix 3. page 1 of 4



#### State of Washington DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N, Olympia, WA 98501-1091, (360) 902-2200, TDD (360) 902-2207 Main Office Location: Natural Resources Building, 1111 Washington Street SE, Olympia, WA

July 23, 2015

Mr. Pete Knutson Puget Sound Harvesters Association 1900 West Nickerson Street, Suite 116, PMB 210 Seattle, WA 98119

Dear Mr. Knutson:

Thank you for your recent letter on behalf of Puget Sound Harvesters Association (PSHA) requesting that the Washington Department of Fish and Wildlife (Department) use standardized data forms and objective sampling protocols for both purse seines and gillnets in our onboard observer monitoring program for commercial salmon fisheries in Puget Sound. With this response we will address points that PSHA made in your letter and discuss some of your ideas and suggestions for our monitoring program.

First, as some background information on the Department's monitoring program for commercial salmon fisheries in Puget Sound, the primary objective of our onboard observer program is to collect the most accurate and precise data possible using scientifically-based, objective sampling protocols applied equally to all gear types sampled. Onboard observers are trained to be objective scientific data collectors regardless of which type of vessel they are assigned to, and regardless of the particular data form being used. Samplers are trained to implement the sampling protocols detailed in the "Puget Sound Commercial Salmon Fisheries Monitoring Standard Operating Procedures" (SOP), which reflect the importance of accurately and objectively collecting data regardless of gear type. To ensure implementation of proper sampling protocols, observers are trained both pre-season in a classroom setting and in-season aboard commercial fishing vessels.

Recently Department representatives provided PSHA with copies of the latest versions of the purse seine and gillnet data forms. In prior responses to PSHA's concerns, including the Department's response to the PSHA-commissioned reports authored by Dr. Stephen Mathews, the Department has outlined the reasons for differences between the purse seine and gillnet data forms. The agency's data forms are designed to ensure that the necessary information from each gear is collected. While there are several similar data fields between the gillnet and purse seine forms (e.g., banner information such as date, launch and return time, area, weather, observer name, vessel name, as well as time of net deployment, number of retained catch by species, number of by-catch by species, notes/comments section, etc.), some variations in the structure of the two forms are necessary due to inherent differences in how the gears fish. As you know, gillnets are a passive gear, and the intent is to set a net that is invisible to the fish in the water and

## Appendix 3. page 2 of 4

Mr. Pete Knutson July 23, 2015 Page 2

wait for fish to become entangled in the net. Whereas, purse seines are an active gear, meaning that the purse seine operator sets their visible net in the water, and with a skiff at one end and the main vessel at the other, maneuvers the net to encircle the fish. These key differences in gear functionality correspond to regulations unique to each gear type and necessitate some differences between the two forms. For example, samplers collect mesh size information while aboard gillnet vessels because gillnets have a minimum mesh size requirement that changes throughout the season, depending on the permissible target species per management week. In contrast, the minimum mesh size of purse seines remains constant throughout the season, regardless of target species, and therefore the mesh size field is not included on the purse seine data form. As another example, purse seine nets remain open for an average of 20-30 minutes per set, and once the net closes, even though the net may still be in the water, the purse seine is no longer able to catch fish. Thus the time fished per set can be relatively fixed for purse seines. In contrast, gillnets catch salmon during any time a portion of the net is in the water, which can range from 45 minutes to over three hours, depending on the fishery. Therefore, to obtain best estimates of fishing effort from gillnet vessels, observers need to record the start and end time that the gillnet soaks in the water.

Regarding the recording of bycatch on the purse seine and gillnet data forms, Department samplers are trained to record any and all bycatch observed (by species, number, and condition), regardless of which form they are using. Observers are provided space on both the purse seine and gillnet forms to record bycatch information for fish species as well as non-fish species, such as birds and marine mammals. As PSHA points out, the purse seine form does not have a dedicated space to record condition of fish caught, unlike the gillnet forms. Nevertheless, when using the purse seine form observers are trained to record the number and condition of bycatch in the labeled spaces for fish species such as coho, Chinook adults, Chinook sub-adults (<22 inches), steelhead, and dogfish, and there is an additional larger space titled "Other Bycatch" in which samplers must record the number and condition of all other bycatch species, including seabirds and marine mammals. Furthermore, if the observer needs more space to record additional bycatch or other information, they will start another data sheet or write on the back of their existing form. We do not have enough space on each data form to include all possible species that may be encountered, as this would be impractical (considering that many species are very rarely encountered). Thus, we rely on trained scientific observers to record the species and condition of bycatch observed in the space provided.

In examining the latest version of the purse seine data form, which PSHA has received, we are confused at PSHA's claim that "*There is also no space for observer comments after each setting of the net on the purse seine form, unlike the gillnet form.*" Space for the observer to record comments is provided under the "Notes and/or Comments" heading at the bottom of the data recording space provided for each set (with four sets per page). As mentioned above, observers will start a new form or write on the back of their existing form if they need more space to write comments.

As a further point of clarification, the in-season update (ISU) models that the co-managers (state and tribes) use to update chum run size during the commercial chum fisheries in Hood Canal and South Sound do not depend on purse seine net depth data or any other data collected in the Appendix 3. page 3 of 4

Mr. Pete Knutson July 23, 2015 Page 3

observer monitoring program. Throughout each commercial chum fishing season in South Sound and Hood Canal, Department and tribal fishery managers hold weekly conference calls to scientifically review the input and output data of many different ISU models, and co-managers work together to discuss and agree on run size updates. The South Sound ISUs are derived by agreement on a run size estimate after the state and tribal co-managers review several different regression models, with some based on purse seine catch in the non-treaty commercial fishery and others based on data from the Apple Cove Point (ACP) test fishery. The models consist of different linear regressions that incorporate historical and current chum catches from either the Apple Cove Point (ACP) test fishery or non-treaty commercial purse seine catch data. These regression models include data collected over the past 33 years (depending on the specific model) and continue to show a strong predictive relationship over time in both the APC test fishery models and the commercial purse seine models. We would not expect to see such stability in the predictive capability of the ISU models if varying purse seine net depth over time impacted the catch per unit effort (CPUE). Also, the Hood Canal ISU model, agreed-to with the co-managers, predicts chum run size based on a direct linear relationship between the run size and cumulative-catch-per-cumulative-unit effort. This relationship is based upon the non-treaty commercial purse seine fishery in Areas 12, 12B, and 12C from the time period October 15-31 during the years 1997-2013. The predictive strength of the Hood Canal ISU model continues to improve over time with the recent addition of two more years of data (2012 and 2013), which we would not expect if varying purse seine net depth significantly impacted the CPUE of non-treaty purse seines.

As an additional point of clarification, contrary to Dr. Stephen Mathews' allegation, the Department does not use "hailing data" from purse seines—i.e., the idea that commercial fishers' report catch numbers to the sampler but the sampler did not actually observe the set. We instruct our observers to record only what they directly observe, and this instruction is clearly described in the SOP.

It is the Department's responsibility as manager of the fish resources of Washington State to monitor commercial salmon fisheries in Puget Sound, and we are legally required to do so via our onboard observer sampling program (RCW 77.12.071, Sampling of fish, wildlife, or shellfish by department employees). The Department would rather work with industry to increase familiarity and comfort with our data collection protocols, and we welcome your suggestions and input. As you know, in the past we have worked with the gillnet industry to collect data through our onboard observer program, with the most robust sampling occurring during the early 1990s in concurrence with the Endangered Species Act listing of marbled murrelets. During that time the Department worked productively with industry to design onboard observer sampling methods that would enable accurate data collection. These observer data were incorporated in the U.S. Fish and Wildlife Service (USFWS) Biological Opinion (USFWS Biological Opinion on proposed all-citizen Puget Sound Area commercial and recreational salmon fisheries, 2001). which concluded that mortality caused by gillnet fisheries appeared to be having a "relatively insignificant adverse effect" on the marbled murrelet population. In the interest of continuing this cooperative working relationship with industry, and considering your suggestions about our observer forms, we plan to make some adjustments to the forms to make them more similar while also facilitating accurate and efficient data collection from both gear types. For example,

# Appendix 3. page 4 of 4

Mr. Pete Knutson July 23, 2015 Page 4

we plan to add lines to the back of the purse seine form to record by-catch of fish, bird, and marine mammal species, similar to the gillnet form.

Thank you again for taking the time to write to convey your thoughts. If you have any additional questions or comments, please contact the Puget Sound Salmon Fishery Manager, Laurie Peterson, at (360) 902-2790, or the Puget Sound Commercial Fishery Manager, Kendall Henry, at (360) 902-2717.

Sincerely, work 0

James Unsworth, Ph.D. Director