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Third Annual MSC Surveillance Report
Alaska Salmon Fishery

Prepared for Pacific Seafood Processors Association

Certificate No: **MRAG-F-0046**

MRAG Americas, Inc.
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1. General Information

Fishery name	Alaska Salmon Fishery		
Unit(s) of assessment	**Species**: Five species of Pacific salmon: • Chinook Salmon – *Oncorhynchus tshawytscha* • Sockeye Salmon – *Oncorhynchus nerka* • Pink Salmon – *Oncorhynchus gorbuscha* • Chum Salmon – *Oncorhynchus keta* • Coho Salmon – *Oncorhynchus kisutch* **Area**: The Alaska Salmon Fishery operates within the EEZ of the USA, in the rivers and coastal waters of the US State of Alaska. All areas except Prince William Sound are certified. **Method of capture**: Purse seine, drift gillnet and set gillnet are used variously across the 13 certified UoCs within the Alaska Salmon Fishery. Troll gear is also used in Southeast Alaska and Yakutat UoCs, beach seines are also used in the Yukon River and Kodiak UoCs, while fishwheels, dip nets, and beach seines are also used in the Yukon River UoC.		
Date certified	12th November, 2013	Date of expiry	11th November, 2018
Surveillance level and type	Surveillance level 5, On-site surveillance audit. See Appendix 5 for details.		
Date of surveillance audit	November 15th and 16th, 2016		
Surveillance stage (tick one)	1st Surveillance		
	2nd Surveillance		
	3rd Surveillance	X	
	4th Surveillance		
	Other (expedited etc)		
Surveillance team	Lead assessor: Amanda Stern-Pirlot; Assessor(s): Ray Beamesderfer, Scott Marshall		
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2. Background

This report contains the findings of the **third** surveillance cycle in relation to the Alaska salmon fishery.

The clients' responses to the Conditions of Certification were set out in the Client Action Plan (CAP), which were appended to the Alaska Salmon Public Certification Reports (PCR; IMM 2013). Progress associated with the actions set forth in the CAPs was examined as a part of this surveillance audit. For each Condition, the report sets out progress to date. This progress has been evaluated by MRAG Americas Audit Team (set out below as 'Progress on condition') against the commitments made in the CAPs. This assessment includes a re-evaluation of the scoring allocated to the relevant Performance Indicators (PIs) in the original MSC assessment under 'Status of condition' in each of Tables 5-11, below. Where the requirements of a Condition are met, the PI is re-scored at 80 or more and the Condition is "closed". Two further conditions were closed following this 3rd surveillance audit, and updated Performance Indicator rationales are given in Appendix 1.

The section on individual conditions progress also contains the findings from the first surveillance audit conducted by Intertek Fisheries Certification, excerpted directly from IFC (2015) and from the second surveillance (MRAG Americas 2016).

Update by Species

Chinook Salmon

For the last 10 years, Chinook salmon runs in Alaska have been well below the long term average and the state embarked on a major research project to understand the reason(s) for the decline http://www.adfg.alaska.gov/index.cfm?adfg=chinookinitiative.main. Catches in 2015 (Table 1) remained severely depressed especially in Western Alaska, while catches permitted under the Pacific Salmon Treaty in Southeast Alaska rebounded substantially as far north migrating stocks that spawn in the Pacific Northwest and Southern British Columbia were healthy.

Among Chinook salmon stocks, 50 of 62 systems met escapement goals and escapements into 10 systems exceeded the upper bound of their goal range. Most system's escapements were well above the lower bound of the goal range (Figure 1). Notably, escapements in to the large Alaskan and Transboundary rivers were all well above the lower bound of their goal range.

Table 1. Harvest in thousands if fish, by species and Unit of Certification in 2015.

Unit of Certification	Chinook	Sockeye	Coho	Pink	Chum
Southeast	329	1,305	1,735	33,900	6,625
Yakutat	1	83	130	69	1
Copper-Bering	23	1,750	137	0	0
Lower Cook Inlet	1	96	4	4,300	112
Upper Cook Inlet	11	2,600	216	48	276
Bristol Bay	57	36,700	38	2	1,100
Yukon River	0	0	0.1	3	359
Kuskokwim River	8	56	148	0	21
Kotzebue	0	0	0	0	301
Norton Sound	0	0	154	64	153
Kodiak	8	3,100	411	33,000	776
Chignik	0	1,600	82	2,000	111
Peninsula - Aleutians	54	5,900	323	16,282	768
Total	492	53,190	3,378.1	89,668	10,603

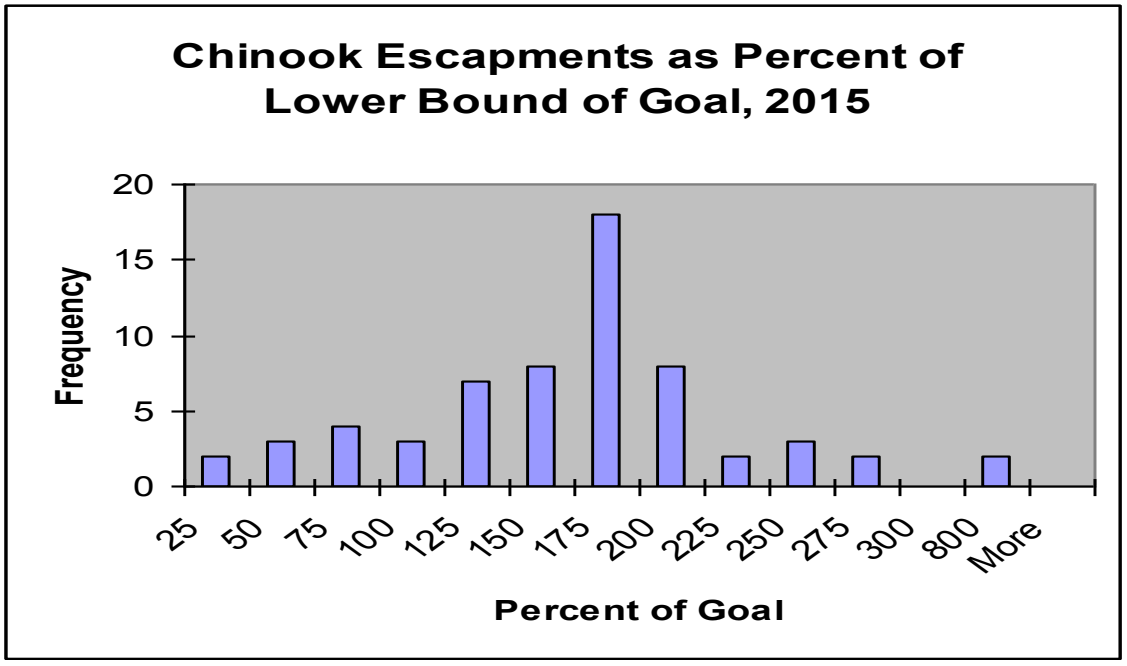

Figure 1. Escapements of Chinook salmon stocks expressed as a percent of the lower bound of the goal range in 2015.

Sockeye Salmon

The 2015 Sockeye harvest (Table 1) was well above the recent 10-year average harvest, primarily because of the strong return to Bristol Bay. Among Sockeye stocks, 63 of 73 systems met escapement goals and escapements into 38 systems exceeded the upper bound of their goal range. Most system's escapements were well above the lower bound of the goal range (Figure 2).

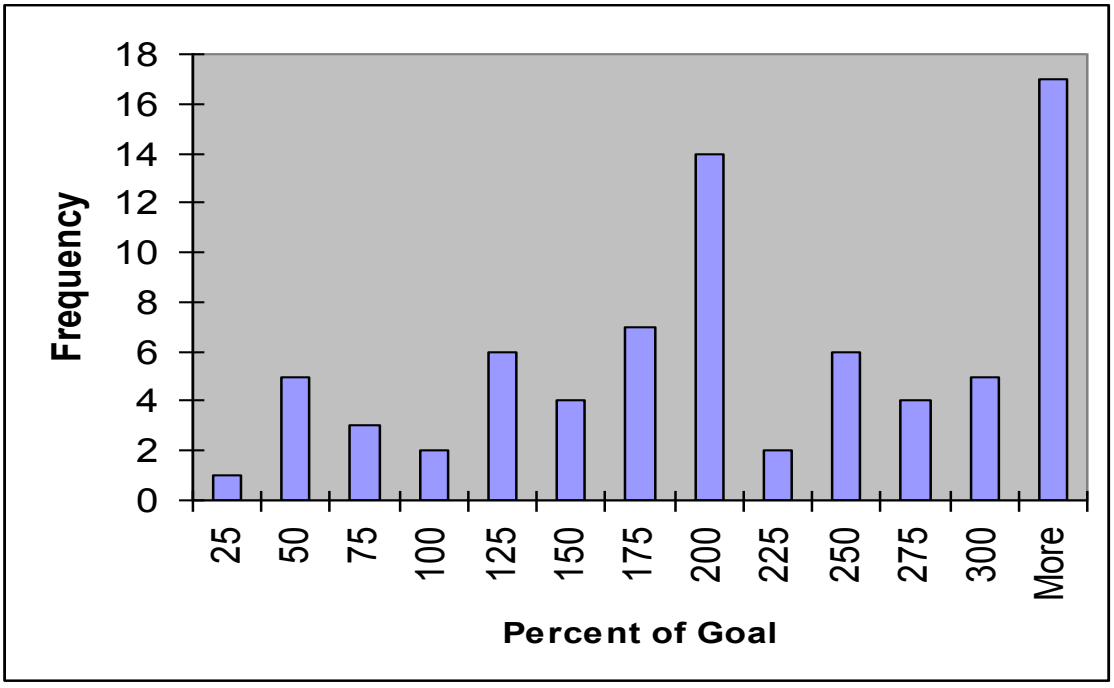

Figure 2. Escapements of Sockeye salmon stocks expressed as a percent of the lower bound of the goal range in 2015.

Coho Salmon

The 2015 catch of 3.38 million (Table 1) was about half recent year's average harvest. Among Coho stocks, 24 of 27 systems met escapement goals and escapements into 9 systems exceeded the upper bound of their goal range. Most system's escapements were well above the lower bound of the goal range (Figure 3).

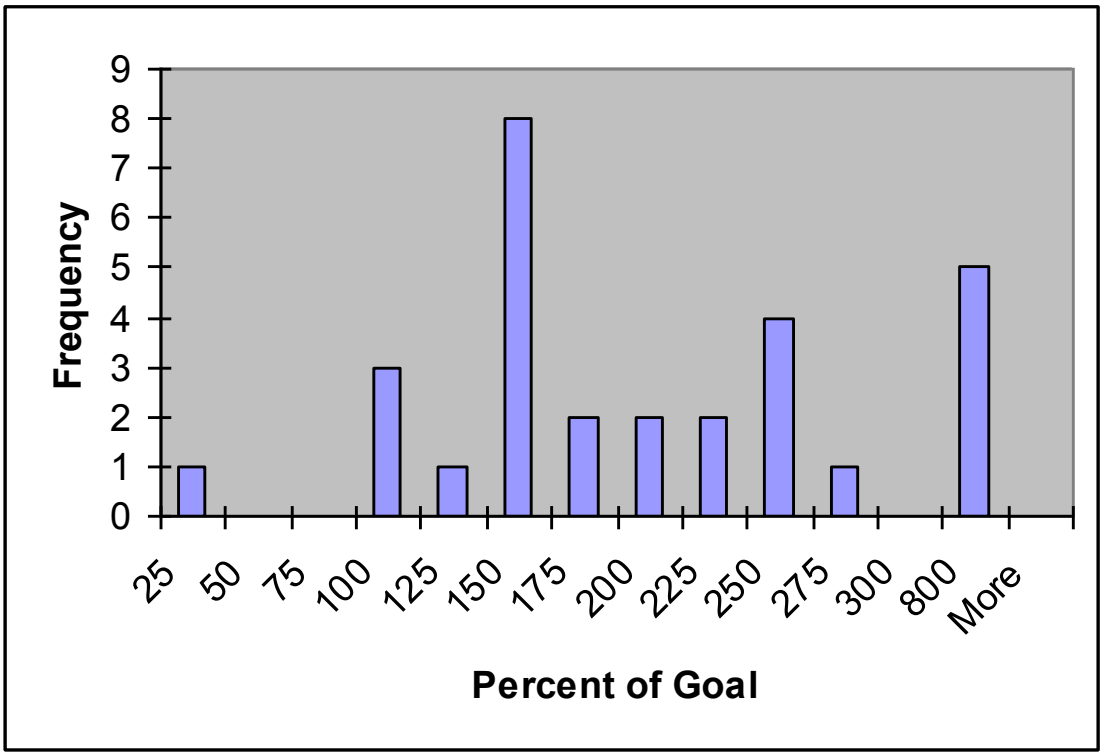

Figure 3. Escapements of Coho salmon stocks expressed as a percent of the lower bound of the goal range in 2015.

Chum Salmon

The Chum salmon harvest in 2015 (Table 1) was similar to recent year's harvests and large hatchery runs continued in Southeast. Among Chum stocks, 40 of 47 systems met escapement goals and escapements into 21 systems exceeded the upper bound of their goal range. Most system's escapements were well above the lower bound of the goal range (Figure 4).

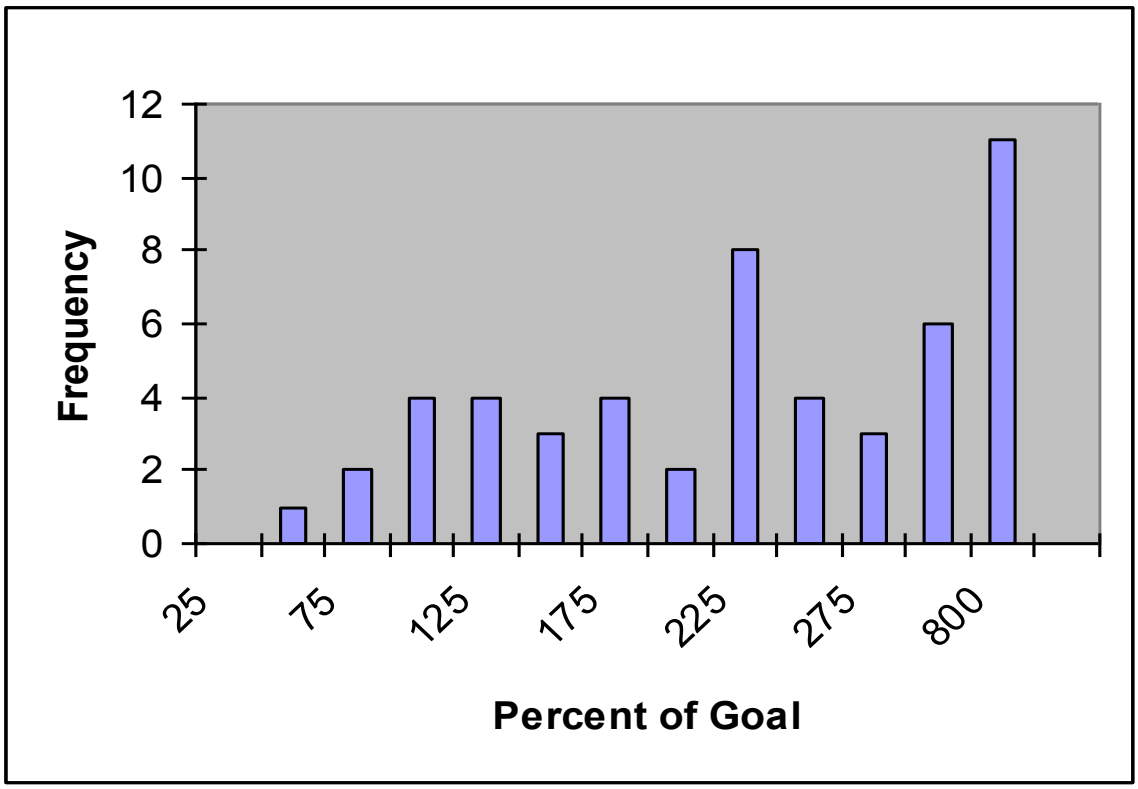

Figure 4. Escapements of Chum salmon stocks expressed as a percent of the lower bound of the goal range in 2015.

Pink Salmon

The 2015 pink salmon catch was 89.7 million (Table 1). Among pink stocks, 29 of 29 systems met escapement goals and escapements into 26 systems exceeded the upper bound of their goal range. About half of the stocks had escapements more than 800% of the lower bound of their goal range (Figure 5).

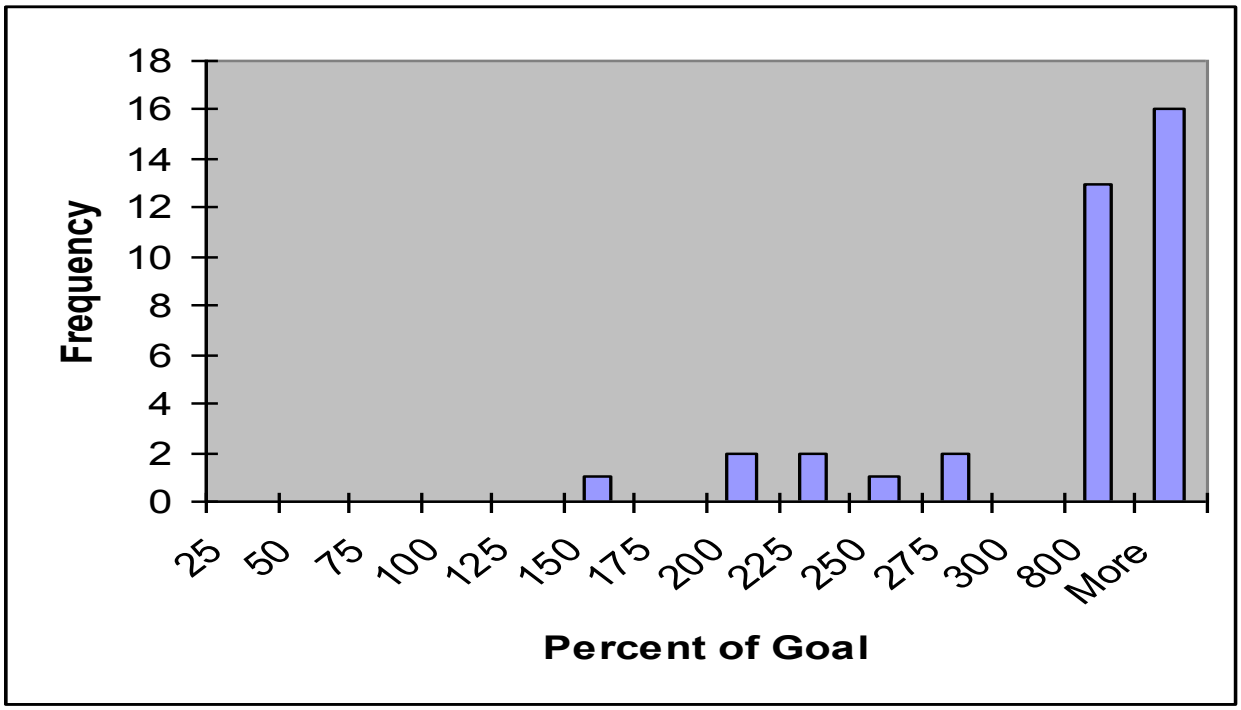

Figure 5. Escapements of pink salmon stocks expressed as a percent of the lower bound of the goal range in 2015.

Update by Area

Southeast Alaska UoC

The Southeast Alaska UoC consists of Alaska waters between Cape Fairweather on the north and Dixon Entrance on the south.

There are three gear groups that harvest salmon in Southeast Alaska (SEAK). The troll fishery primarily targets Coho, Chinook and Chum salmon. Drift gillnet fisheries target Sockeye, Chum, pink and Coho salmon. The purse seine fishery targets Pink, Chum, and Sockeye salmon.

Approximately 2.2 million salmon were harvested in the 2015 Southeast Alaska troll fishery. The harvest included 270 thousand Chinook, 7 thousand Sockeye, 1.2 million Coho, 260 thousand pink and 425 thousand Chum salmon. The Chinook salmon harvest ranked 7th highest since statehood, while the Coho salmon harvest ranked 27th highest and the Chum salmon harvest ranked 7th highest on record. The preliminary estimated Alaska hatchery contribution of Chinook salmon to the troll fishery, including hatchery terminal harvest, was 22 thousand fish. A total of 369 thousand Coho salmon produced by Alaska hatcheries were harvested by the troll fleet. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-05.pdf

The 2015 common property purse seine harvest included approximately 30 thousand Chinook, 908 thousand Sockeye, 284 thousand Coho, 32.2 million pink, and 2.9 million Chum salmon. The 2015 purse seine harvest was the 20th largest since statehood. The 2015

drift gillnet common property fisheries harvested 5.3 million salmon. The total common property drift gillnet harvest consisted of approximately 29 thousand Chinook, 390 thousand Sockeye, 251 thousand Coho, 1.4 million pink, and 3.3 million Chum salmon. The gillnet harvest was the second highest since statehood. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-10.pdf

In 2015, nine of 11 Chinook salmon stocks in SEAK met or exceed the lower bound of their escapement goals. A total 58,644 Chinook were estimated to have escaped in the 11 systems, which is more than the sum of the lower bound of the 12 systems' escapement goal of 42,945. The two largest systems in the region are the Taku and Stikine had a combined escapement of 42,500 and both these system's escapements were within their goal ranges. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-05.pdf

Twelve of 13 Sockeye systems met their escapement goal. McDonald Lake, a former stock of concern met its goal. Escapements to six stocks were above their goal range. Coho escapements to the Region were within or above goals or recent years average counts. Returns to the region's largest systems, the Chilkat and Taku rivers, were within BEG range. Summer Chum escapements goals to all three of the index regions were met. Runs of fall Chum were all within the goal range. The total estimated escapement of pink salmon was 12.4 million and management targets for pink salmon were met in all 15 Districts. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-10.pdf

Yakutat UoC

The Yakutat UoC consists of Alaska waters between Cape Suckling on the north and Cape Fairweather on the south. Set net fisheries in the Yakutat area typically target Sockeye salmon during June and July and Coho salmon during August and September. In the East Alsek River, the Sockeye fishery occurs from late July through August. Historically, the harvest of pink salmon was incidental, but higher prices in recent years increased the incentive to target pink salmon. The 2015 Yakutat set gillnet fishery harvest was approximately 300 thousand salmon, 17% below the recent 10 year average. The total harvest included 900 Chinook, 83 thousand Sockeye, 130 thousand Coho, 69 thousand pink and 700 Chum salmon. Biological escapement goals for Sockeye were met in all but one system. There are no hatcheries in the Yakutat Area. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-22.pdf

Prince William Sound UoC

The Prince William Sound area is not currently certified.

Copper/Bering Districts UoC

The Copper/Bering UoC consists of Alaska waters between Hinchinbrook Island/Point Whitshed on the north and Cape Suckling on the south. This area includes the mouths of the Copper and Bering Rivers. Copper River drains over 27,000 square miles of interior Alaska while the Bering River drainage is only a few hundred square miles.

Harvest in the Copper River District was composed of 23 thousand Chinook, 1.75 million Sockeye and 137 thousand Coho. The Sockeye catch was composed of an estimated 137 thousand Sockeye from the Gulkana Hatchery program. The aerial survey program estimated an escapement index of 66,200 Sockeye to the Copper River Delta and this is within the escapement goal range. The preliminary in-season sonar estimate of sockeye escapement past the Miles Lake counting site was 1.3 million, well above the goal range of 360,000 to 750,000. The preliminary estimate of in-river Chinook abundance indicates a run that was above the lower bound of the escapement goal. The estimated escapement of 41,700 Coho into systems of the Copper River Delta is within the escapement goal range.

The harvest in the Bering River District was composed of 15 thousand Sockeye and 49 thousand Coho salmon. Aerial surveys of Sockeye and Coho salmon escapements were within the escapement goal range. http://www.adfg.alaska.gov/FedAidPDFs/SP16-07.pdf

Lower Cook Inlet UoC

The Lower Cook Inlet management area includes the waters north of Cape Douglas, west of Cape Fairfield, and south of Anchor Point. Set gill nets and purse seines are used in this area.

The 2015 commercial common property salmon harvest was composed of 4.3 million pink, 96 thousand Sockeye, 112 thousand Chum 4 thousand Coho, and 800 Chinook salmon.

The Lower Cook Inlet Management Area's streams are dominated by pink salmon and escapements were very good in 2015; four systems within goal range and 14 above goal range.

Eight small Sockeye systems were surveyed and escapements were below goal range in three systems, within goal range in two, and above goal range in three systems. Two of three Chinook escapements were within goal range.

There is a modest pink salmon enhancement program in the area and cost recovery fisheries harvested 2.24 million pink salmon. There is also a modest Sockeye salmon enhancement program in the area. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-19.pdf

Upper Cook Inlet UoC

The Upper Cook Inlet (UCI) commercial fishing area is that portion of Cook Inlet north of the latitude of the Anchor Point Light. All five species of Pacific salmon are commercially harvested. Set gillnets are the only gear permitted in the Northern District while both set and drift gillnets are used in the Central District. The use of seine gear is restricted to the Chinitna Bay Sub-district, where they have been fished only sporadically. The 2015 commercial harvest was composed of 2.6 million Sockeye, 48 thousand pink, 276 thousand Chum, 216 thousand Coho and 11 thousand Chinook.

There are 21 Chinook systems with escapement goals in UCI. Escapements were met in 17 systems, were not met in three systems and no data was collected in one system. Three of seven Sockeye escapements were with their goal range and escapements in remaining four systems exceed their goal range. Coho escapements were strong in the two systems with goals. The Chum salmon escapement in Clearwater Creek was above the goal range. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-14.pdf and http://www.adfg.alaska.gov/FedAidPDFs/FMS16-04.pdf

Bristol Bay UoC

The Bristol Bay management area includes the area east of a line from Cape Newenham to Cape Menshikof in the eastern Bering Sea. The area includes nine major river systems: Naknek, Kvichak, Alagnak, Egegik, Ugashik, Wood, Nushagak, Igushik, and Togiak rivers. Production from these rivers provides the largest commercial fishery for Sockeye salmon in the world. Drift gillnet and set gillnet are used in the area.

The 2015 Sockeye salmon run into Bristol Bay was 59.1 million fish, providing for a harvest of 36.7 million. Sockeye escapement goals were met or exceeded in all systems. The commercial harvest included 57 thousand Chinook salmon, 1.1 million Chum salmon, 2 thousand pink salmon and 38 thousand Coho salmon. The Chinook escapement goal for the Nushagak River was met. Budget constraints prevented escapement estimation for Coho in the Nushagak in 2015. There are no hatchery programs in Bristol Bay. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-13.pdf

Yukon River UoC

The Yukon Management Area is part of the Arctic-Yukon-Kuskokwim Region (AYK) and includes the Alaska portion of the Yukon River and nearby marine waters along the Bering Sea coast. The Yukon River is the largest river in Alaska, originating in British Columbia and the Yukon Territory and flowing over 2,300 miles to the Bering Sea. Commercial salmon fishing occurs throughout the 1,200 miles of the Alaska mainstem portion of the river, plus the lower 225 miles of the Tanana River and lower 12 miles of the Anvik River. The Yukon River Salmon Agreement between the United States and Canada factors in strongly with the management of Chinook and fall Chum salmon. Canadian waters are responsible for approximately 50% of the production of Yukon River Chinook salmon and a large fraction of the fall Chum salmon. In keeping with Treaty requirements, the Alaska Board of Fisheries made it a priority to protect the earliest returning fish beginning in 2013 because they are bound for Canada.

A directed Chinook salmon commercial fishery has not occurred since 2007, and commercial harvest through 2011 was incidental during the summer and fall Chum directed fisheries. The commercial sale of Chinook salmon has been prohibited since 2012. The total 2015 preliminary commercial harvest for the Yukon Area in Alaska was 359 thousand summer Chum, 3 thousand pink salmon and 113 Coho salmon. Escapement goals for the two summer Chum salmon systems with goals was met in 2015, but the main stem sonar count of 1.4 million was about 30% lower than the recent five year escapement. Chinook salmon escapement goals for all five surveyed areas were met or slightly exceeded in 2015, including the cross border escapement into Canada. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/623677826.pdf

There is no commercial-level hatchery production in the US Yukon River area, but there is small hatchery production of Chinook and Coho salmon to support recreational fisheries near Fairbanks.

Kuskokwim UoC

The Kuskokwim Management Area is part of the Arctic-Yukon-Kuskokwim Region and includes the Kuskokwim River and the rivers that drain into Kuskokwim Bay. The area includes three active commercial fishing districts, each managed as an independent terminal fishery. Gillnets are the only permitted gear.

The 2015 commercial harvest in the Kuskokwim Area was 8 thousand Chinook, 56 thousand Sockeye, 148 thousand Coho and 21 thousand Chum salmon. The total escapement of 155,464 Chinook into the Kuskokwim River exceeds the upper bound of the goal range. Seven of 11 Chinook escapement goals in the smaller systems were met, two were below goal and two were above goal. Escapements of Chum salmon in the two systems where counts were made in 2015 showed one system was just under its goal range and one system met its goal. Coho escapement goals into the three surveyed systems were met or exceeded. Sockeye escapement goals were met or exceeded in the four surveyed systems. There is no commercial-level hatchery production in the Kuskokwim area. http://www.adfg.alaska.gov/FedAidPDFs/FMS16-04.pdf

Kotzebue UoC

The Kotzebue Area is part of the AYK Region and it includes all waters from Cape Prince of Wales to Point Hope, i.e., north of Norton Sound. This region supports the northern most commercial fishery in Alaska. Chum salmon are the most abundant commercial species and the catch in 2015 was 301 thousand. No Chum salmon systems were surveyed in 2015. There is no commercial-level hatchery production in Kotzebue.

Norton Sound UoC

The Norton Sound Area is part of the AYK Region and includes waters of the Norton Sound District and the Port Clarence District. Set gillnets are used in this area and fishing effort is usually concentrated in the marine waters near river mouths. The commercial harvest in 2015 was composed of 154 thousand Coho, 64 thousand pink and 153 thousand Chum. Coho escapements in the two systems with goals were above goal ranges. Pink salmon escapements were substantially more than goals and Chum escapements were met or more than goals. There is no commercial-level hatchery production in Norton Sound.

http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/628912565.pdf

Kodiak UoC

The Kodiak area is part of the Westward Region and includes the Kodiak Island archipelago and the south side of the Alaska Peninsula from Cape Douglas southwest to where it adjoins the Chignik Management Area. Purse seines and set gill net are the dominant gear types. A few beach seine permits have been issued.

There were extensive periods of Chinook non-retention in the purse seine fishery in 2015. Even with this protection, 8087 Chinook salmon were incidentally harvested. The Sockeye catch of 3.1 million was well above the recent year's average harvest. About 238 thousand of the Sockeye harvested were from the enhanced Spiridon Lake project. The pink salmon catch of 33.0 million was about 50% greater than the recent 10 year average. About 5 million of this catch occurred in the Kitoi Bay hatchery terminal harvest area. The catch of 411 thousand Coho was about 25% more than recent years' average catch. The catch of 770 thousand Chum salmon was average for the last 10 years. http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/kodiak/2015KodiakSalmonSeasonSummary.pdf

Neither of the two Chinook salmon streams on Kodiak met escapement goals in 2015. Nine of 12 Sockeye systems met, or exceed escapement goals. The mainland district pink salmon goal was met, and the escapement to the Kodiak Island District was slightly above its goal. The Chum salmon escapement in the Mainland District was slightly above goal while the escapement to the Kodiak District was about twice its goal. Escapements to three of the four of the Coho index systems were slightly above their lower bound of their sustainable goal and the escapement to one system was slightly below its goal range. http://www.adfg.alaska.gov/FedAidPDFs/FMS16-04.pdf

Chignik UoC

The Chignik Management Area is part of the Westward Management Region and is located on the south side of the Alaska Peninsula, approximately 250 miles southwest of Kodiak. The Chignik salmon fishery focuses on Sockeye salmon in waters close to the mouth of the Chignik River. Fishing also occurs in districts along the south side of the Alaska Peninsula to harvest pink and Chum salmon. Purse seines are used in this area.

The Sockeye salmon harvest of 1.6 million fish was slightly more than the recent 10 year average harvest. Escapements of both the early and late run Sockeye retuning to the Chignik River system were substantially more than the goal range. The pink salmon harvest of 2.0 million was almost twice the recent 10-year average harvest. Pink salmon escapements were substantially above the goal range. The Chum salmon harvest of 101 thousand was well below recent 10 year average harvest. The escapement of Chum salmon was about four times more than the goal. The catch of 82 thousand Coho was below the recent 10 year average harvest. The Chignik River Chinook salmon escapement was within the goal range. There is no commercial hatchery production in Chignik. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-01.pdf

Peninsula/Aleutian Islands UofC

The Peninsula/Aleutian Islands Area is part of the Westward Management Region and has four Districts. The south side of the Alaska Peninsula is adjacent to the southern boundary of the Chignik Management Area. The Aleutian Islands District and Atka-Amlia Islands District extend southwest from Unimak Island and encompasses all of the Aleutian Islands to the Russian border and the Pribilof Islands. The Northern Peninsula District extends along the northern side of the Alaska Peninsula from Cape Sarichef on Unimak Island to Cape Menshikof near Port Heiden where it joins Bristol Bay.

The Peninsula fishery primarily targets Sockeye salmon. Harvested Sockeye originate along the north side of the Alaska Peninsula, and stocks bound for Bristol Bay. Significant numbers of pink and Chum salmon are also caught. Purse seines and drift gill nets are allowed. Most all the harvest occurs in the North and South Peninsula Districts.

The harvest in the North Peninsula District was 2,843 Chinook, 2.7 million Sockeye, 57 thousand Coho, 12 thousand pinks and 192 thousand Chum salmon. The Chinook escapement goal for Nelson River was met. Escapements to five Sockeye systems were above goal while two systems did not meet their goal in 2015. Escapements to the two Coho systems with goals were larger than their respective goals. Pink salmon escapement of 264 thousand was five times the recent odd year average escapement. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-03.pdf

The harvest in the South Peninsula District was 51 thousand Chinook, 3.2 million Sockeye, 266 thousand Coho 16.67 million pink and 676 thousand Chum salmon. Sockeye escapements into two systems met goals, while one system did not meet its goal. The pink salmon escapement index of 7.8 million was over twice the upper bound of its goal range. Chum salmon escapements into the three districts with goals were all above their goal ranges. There are no significant hatchery programs in the area. http://www.adfg.alaska.gov/FedAidPDFs/FMR16-02.pdf

Stocks of Concern

The Alaska Department of Fish and Game (ADF&G) and the Board of Fisheries (BOF) have a process to designate and classify a salmon stock as a “Stock of Concern” (SOC). A SOC designation may be appropriate if a stock is not meeting expectations for harvest, and/or escapement. If a stock is not consistently meeting harvest levels even though escapement levels are being met, it may be classified as a “Stock of Yield Concern”. If a stock has not met its escapement goal in three of five years it may be classified a “Stock of Management Concern”.

The BOF makes the designation based on a recommendation by ADF&G. The SOC designation triggers the requirement to identify factors likely causing the decline, and to develop a plan to increase abundance and/or harvests. When a stock is classified as one of Yield Concern, research is typically directed at the run to better understand limiting factor(s) while ensuring management action continues to provide for escapements to remain with the goal range.

As of 2015 there are eight stocks of management stocks of concern, and five stocks of yield concern (2). No new stocks of concern have been designated since 2012. http://www.adfg.alaska.gov/FedAidPDFs/FMS16-04.pdf

Table 2. Alaska's listing of Stocks of Concern in 2015.

UoC	System	Species	Year Designated	Level of Concern	Year Last Reviewed
UCI	Susitna (Yentna) River	Sockeye	2007	Yield	2013

UoC	System	Species	Year Designated	Level of Concern	Year Last Reviewed
UCI	Chuitna River	Chinook	2010	Management	2013
UCI	Theodore River	Chinook	2010	Management	2013
UCI	Lewis River	Chinook	2010	Management	2013
UCI	Alexander Creek	Chinook	2010	Management	2013
UCI	Willow Creek	Chinook	2010	Yield	2013
UCI	Goose Creek	Chinook	2010	Management	2013
UCI	Sheep Creek	Chinook	2013	Management	2013
Yukon	Yukon River	Chinook	2000	Yield	2015
Norton Sound	Norton Sound Sub-district 5 & 6	Chinook	2003	Yield	2015
Norton Sound	Norton Sound Sub-district 2 & 3	Chum	2000	Yield	2015
Norton Sound	Norton Sound Sub-District 1	Chum	2006	Yield	2015
Kodiak	Karluk River	Chinook	2010	Management	2013
Peninsula/Aleutians	Swanson Lagoon	Sockeye	2012	Management	2015

Table 3. TAC and Catch Data. Note TACs are not provided because this fishery is not managed through a TAC.

TAC	**Year**	**2016**	**Amount**	**n/a**	
UoA share of TAC	**Year**	**2016**	**Amount**	**n/a**	
UoC share of TAC	**Year**	**2016**	**Amount**	**n/a**	
Total green weight catch by UoC	**Year (most recent)**	**2016**	**Amount**	**Species**	**Catch (tons)**
				Chinook	2,427.88
				Chum	59,825.6
				Coho	13,863.12
				Pink	77,777.79
				Sockeye	140,627.39
	Year (second most recent)	**2015**	**Amount**	**Species**	**Catch (tons)**
				Chinook	2,481.19
				Chum	56,333.40
				Coho	10,439.12
				Pink	154,502.58
				Sockeye	138,128.63

Table 4. Summary of Assessment Conditions

Condition number	Performance indicator (PI)	Status	PI original score	PI revised score
1	1.3.1-SEAK	On target	60	N/A
2	1.3.2-SEAK	Closed at 3rd audit	70	80
3	1.3.3 & 2.5.2-SEAK	Closed at 3rd audit	1.1.1: 60 2.5.2: 75	1.1.1: 80 2.5.2: 80
4	1.3.1, 1.3.2 &1.3.3-Copper/Bering District	Closed at 2nd audit	1.3.1: 60 1.3.2: 70 1.3.3: 60	1.3.1: 80 1.3.2: 80 1.3.3: 80
5	1.3.1, 1.3.3 & 2.5.2-Kodiak	On target	1.3.1: 60 1.3.3: 60 2.5.2: 75	N/A
6	1.1.2-Chignik	Closed at 1st audit	70	90

3. Assessment Process

The surveillance audit process as defined in the MSC Fishery Certification Requirements version 2.0 was followed in this audit.

Information supplied by the clients and management agencies was reviewed by the assessment team ahead of the onsite meeting, and discussions with the clients, hatchery operators, and management agencies centered on the content within the provided documentation. In cases where relevant documentation was not provided in advance of the meeting, it was requested by the assessment team and subsequently supplied during, or shortly after the meeting.

Thirty days prior to the audit site visit, all stakeholders from the full assessment were informed of the visit and the opportunity to provide information to the auditors in advance of, or during, the site visit. We received no requests from outside stakeholders to take part in meetings or provide information remotely.

The audit visit was held at the offices of the Douglas Island Pink and Chum (DIPAC) hatchery in Juneau, AK on November 15th and 16th.

The following participants were in attendance:

Name	Affiliation
Amanda Stern-Pirlot	MRAG Americas, Assessment team
Ray Beamesderfer	R2 Consulting, Assessment team
Scott Marshall	SLMarshall Fisheries, Assessment team
Erin Wilson	MRAG Americas, Fishery Consultant
Dave Gaudet	Pacific Seafood Processors Association (PSPA), Client
Glenn Reed (15th only)	PSPA, client
Tommy Sheridan	Silver Bay Seafoods
Tina Fairbanks	Executive Director, Kodiak Regional Aquaculture Association
Mike Wells	Valdez Fisheries Development Assoc
Alex Wertheimer	FishHeads Technical Services
Eric Prestegard	DIPAC
David Reggiani (phone)	Executive Director, Prince William Sound Aquaculture Corporation
John Burke (Phone)	Southern Southeast Regional Aquaculture Association (SSRAA)
Steve Reifenstuhl (Phone)	Northern Southeast Regional Aquaculture Association (NSRAA)
Scott Kelly (15th only)	Commercial Fishery Division Director, ADFG
Tom Gemmell (16th only)	Journalist

The table below summarizes the agenda for the meetings.

Date	Time	Issue	Lead	Documents
Nov 15	9:00 am	Opening Meeting	Amanda Stern-Pirlot	none
	9:10 am	Review Condition 1	Dave Gaudet	PPT and Documents
	9:30 am	Review Conditions 3 and 2	Dave Gaudet	A Review of Best Practices for Hatchery Chum Salmon Releases at Remote Sites in Southeast Alaska An Analysis of Southeast Alaska Hatchery Chum Salmon Data to

				Look for Differences in Rates of Straying Between Fish Released from Incubation Facilities and Remote Sites
	10:00 am	Break		
	11:30am	Update on ADF&G	Scott Kelley	
	noon	lunch		
	1:30 pm	Review Condition 5	Tina Fairbanks	Condition 5 Document
	4:00pm	Wrap up discussion and closing meeting for surveillance audit	Assessment Team	N/A
Nov 16	9:00 am	Discuss Issues for Scope Extension of Prince William Sound into the current assessment	Dave Gaudet, Alex Wertheimer, MRAG Assessment Team, others	
	2:00 pm	Closing meeting for PWS scope extension assessment	Assessment Team	N/A

Standards and Guidelines used:

MSC Certification Requirements version 2.0 (for process requirements)
MSC Certification Requirements version 1.3 (for performance requirements, including AK salmon assessment tree)
Guidance to the MSC Certification Requirements version 2.0 (for process requirements)
Guidance to the MSC Certification Requirements version 1.3 (for performance requirements, including AK salmon assessment tree)
MSC Surveillance Reporting Template version 1.0.

4. Results

The following tables contain information on the agreed client action plans, milestones set, and progress against each of the fishery's conditions. Note the milestones and action plans were written when Alaska Seafood Processors Association (ASPA) was the client and ASPA is the entity which signed up to the action plan. Pacific Seafood Processors Association (PSPA) is now the client, and in investigating what actions were due for this second surveillance audit and progress to date, as well as new information available to the team that was not available to the previous assessment team, it became clear to the assessment team and PSPA that some of the milestones and actions in the action plan require modification per FCR clause 7.23.13.3. All year 1 progress is excerpted directly from IFC 2015.We have identified deleted original language with strikeout, and new language with orange font.

Table 5. Condition 1—SEAK [1]

Performance Indicator(s) & Score(s)	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
	1.3.1	Enhancement activities do not negatively impact wild stocks or substitute for a stock rebuilding strategy.	**60**
Condition	By the end of 2023, the SG 80 scoring requirements must be met in full. This will be achieved when it has been demonstrated that: a) (PI 1.3.1, SG80a): It is highly likely that the Chum salmon enhancement activities in SEAK do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of wild Chum salmon stocks.		
Milestones	Initiation of an independent peer review of the study plan was delayed by changes in the certificate holder between completion of this action plan and the second surveillance. In the interim, a comprehensive study plan was developed by a science panel composed of current and retired scientists from ADF&G, University of Alaska, aquaculture associations, and National Marine Fisheries Service. Major elements of the study design were implemented from 2013-2015 including sampling and analysis of Chum salmon otoliths in representative natural production areas throughout southeast Alaska. Given the scientific rigor of the study design provided by science team and advanced stage of study implementation, PSPA has concluded that a peer review of the study at this stage of implementation would be more effectively focused on study conclusions than on the planned study design. Toward that end, PSPA has proposed the following revision in action milestones to address condition one. Year 1: ~~ASPA will commission an independent peer review of the study plan.~~ Monitor the development and implementation of a rigorous scientific hatchery/wild interaction study. ~~Year 2:~~ ~~ASPA will provide the peer review and a report on the findings of the peer review and, where appropriate, provide a rationale for incorporation of reviewer recommendations to the study plan.~~ Years ~~3-9:~~2-3:		

[1] *The action plan for Condition 1 was modified when PSPA assumed clientship from ASPA in October 2016. Modifications were deemed acceptable by the assessment team according to FCR 7.23.13.3, in light of the first three years' progress of the ADFG hatchery-wild study, and new information regarding the study design that was not available to the previous assessment team when the action plan was initially drafted. Modifications to the action plan are identified using "track changes" and orange text.*

	Provide annual reports on progress of the investigation, including straying and genetic findings. Year 4 Provide an interim technical report summarizing results of investigations including straying and genetic findings for years 1-4. Review possible management actions for potential implementation as appropriate to ameliorate adverse effects if found. Years 5-9: Provide annual reports on progress of the investigation, including straying and genetic findings. Year 10: Provide a detailed technical report, including peer review of the final report demonstrating that it is highly likely that Chum salmon enhancement activities in SEAK do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of wild Chum salmon stocks.
Client Action plan	See above under 'milestones'
Progress on Condition [Year 1]	An independent peer review of the Hatcheries Research study plan was not undertaken or commissioned by ASPA this year. ASPA was advised by ADF&G that, in the absence of agreement for an independent peer review from the study's participants, such a review would not have a positive impact on the study design. Nevertheless, the assessment team was informed at the site visit by ADF&G that a review was warranted and that they would seek to initiate a review by diverse-minded scientists. ADF&G discussed the value of undertaking an independent review at a meeting with the industry contributors in Anchorage in December 2014. No agreement was reached at that meeting to initiate an independent peer review, but it is understood that ADF&G will continue to look to initiate such a study during the next 6 months. The Client Action Plan for year one called for ASPA to commission an independent peer review of the Hatcheries Research study plan currently being implemented by ADF&G (http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.current_research This peer review has yet to be commissioned. ADF&G implemented the hatchery research, in part, in order to provide a basis for PAR evaluations in the wake of aggressive industry efforts to increase hatchery production of pink and Chum salmon in Prince William Sound and Southeast Alaska. An initial $5 million to fund the study was secured through legislative appropriation and industry contributions. The ADF&G web site (see above) describes the study design process (but not the details of study design): "*ADF&G organized a science panel composed of current and retired scientists from ADF&G, University of Alaska, aquaculture associations, and National Marine Fisheries Service. Panel members have broad experience in salmon enhancement, management, and wild and hatchery interactions*." Unfortunately, early efforts by the science panel were rushed, and the detailed study plan was not completed by the time ADF&G released the request for proposals for the field sampling. The actual study design reportedly has gone through change and has never been fully made public. During the 2012 site visit the assessment team raised questions about the robustness of the study design, which was unclear at the time, and suggested the need for an external peer review consistent with those done for similarly contentious ADF&G studies, such as WASSIP. ADF&G informed the Assessment Team in 2012, the Audit Team in 2014, and the client, that a peer review of the study plan was warranted and ADF&G would take steps to implement an independent review by scientists from diverse perspectives. Eric Volk, ADF&G Chief Fisheries Scientist, mentioned that the industry contributors would need to approve the proposed peer review. Further discussions with Eric also

	suggested that a third-party peer review, commissioned by the client but without the support of study contributors, would not have a significant or positive effect on the planning and implementation of the study. The assessment team understands and agrees with the Eric Volk assessment but nevertheless is disappointed that an independent study has yet to be commissioned. Furthermore, given the high cost of this investigation, it is critical to ensure the study is properly designed for testing hypotheses.
Progress on Condition [Year 2]	An independent peer review of the Hatcheries Research study plan was not undertaken or commissioned by the original certificate holder at the time that PSPA assumed the certificate. A scientifically rigorous study design has been developed by a science panel composed of current and retired scientists from ADF&G, University of Alaska, aquaculture associations, and National Marine Fisheries Service. Panel members have broad experience in salmon enhancement, management, and wild and hatchery interactions. The panel identified three objective questions: 1. What is the genetic stock structure of pink and Chum salmon in each region? 2. What is the extent and annual variability in straying of hatchery pink salmon in Prince William Sound (PWS) and Chum salmon in PWS and Southeast Alaska (SEAK)? 3. What is the impact on fitness (productivity) of wild pink and Chum salmon stocks due to straying of hatchery pink and Chum salmon? The science panel designed a long-term research project to address these questions. A study plan was prepared and in July of 2012, after funds were appropriated by the Alaska Legislature, ADF&G solicited proposals from entities interested in conducting a research program to address interaction of wild and hatchery pink and Chum salmon in PWS and SEAK. Prince William Sound Science Center (PWSSC), in conjunction with Sitka Sound Science Center (SSSC), submitted the successful proposal and the contract was approved to conduct a portion of this project. The study design may be found at http://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/research/rfp_hatchery_fish_interaction.pdf. A detailed study implementation plan may be found at http://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/research/pwssc_h-w_proposal_6-29-12.pdf. Work on this project began in the summer of 2012. Annual reports of study implementation and initial results for 2012, 2013 and 2014 are available at http://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesResearch.findings_updates. This study provided estimates of the incidence of hatchery-origin spawners in representative natural production areas of Chum salmon. Hatchery Chum salmon in SEAK Alaska are universally marked with hatchery-specific thermal otolith patterns. Hatchery fractions in 32 SEAK streams were found to be low (15% or less) in the large majority of streams surveyed during the three years of study to date. This information provides strong evidence that the Chum salmon enhancement activities in SEAK are unlikely to have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of wild Chum salmon stocks in most significant natural production areas. Sampling of natural production areas to estimate proportions of hatchery-origin spawners is now complete. Further research is ongoing on the relative fitness of hatchery and wild Chum salmon in selected streams.
Progress on Condition [Year 3]	Work on the hatchery interactions study continued with sampling in 2015 to estimate hatchery contributions of Chum Salmon in representative natural spawning areas of Southeast Alaska (as well as Pink Salmon in Prince William Sound). This was the fourth year of five scheduled years with additional sampling scheduled for selected research streams to determine relative fitness of hatchery and wild origin spawners.

	Results of 2015 sampling were provided in a summary and PowerPoint provided to the surveillance team. An annual project progress report is expected to be published in December 2016. ADF&G has also issued a contract to prepare a research article on hatchery study results.
Status of condition	Condition 1 is open and on target. A rigorous plan for addressing the condition has been developed and is being implemented. Annual study results have been provided in summary reports for 2012-2015.

Table 6. Condition 2-SEAK

Performance Indicator(s) & Score(s)	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
	1.3.2-SEAK	**Effective enhancement and fishery strategies are in place to address effects of enhancement activities on wild stock status.**	**70**
Condition	By the end of the fourth year of certification, the SG 80b scoring requirements must be met for Chum salmon. This will be achieved when it has been demonstrated that: a) (PI 1.3.2, SG80b): There is some objective basis for confidence that the strategy is effective, based on evidence that the strategy is achieving the outcome metrics used to define the minimum detrimental impacts (e.g., related to verifying and achieving acceptable proportions of hatchery-origin fish in the natural spawning escapement).		
Milestones	To meet the intent of this condition, ADF&G and other entities as appropriate will continue to monitor straying of Chum salmon in Northern Southeast Inside (NSI) subarea streams as part of their long term hatchery research program. They will identify possible approaches to reduce stray levels. Action milestones for addressing this condition are as follows: Year 1: ADF&G and hatchery operators will continue to monitor representative streams in NSI for straying, as outlined in the recently launched hatchery straying and fitness study. (e.g., equivalent to random sampling of 18 NSI streams in 2010 (29% of total available)). PSPA will review these efforts and provide a progress report showing hatchery/wild Chum salmon composition on the spawning grounds. Year 2: PSPA will consult with hatchery operators and ADF&G on possible stray reduction strategies in conjunction with continued monitoring of representative streams for stray proportions as part of the hatchery study plan. A progress report will be provided. Year 3: PSPA will begin preparation of a report examining methods of controlling hatchery strays. A progress report will be provided. Year 4: PSPA will present a report on controlling hatchery strays, demonstrating: a) There is some objective basis for confidence that the management strategy is effective, based on evidence that the strategy is achieving the outcome metrics used to define the minimum detrimental impacts (e.g., related to verifying and achieving acceptable proportions of hatchery-origin fish in the natural spawning escapement).		
Client action plan	See above under ‘milestones’.		
Progress on Condition [Year 1]	The Prince William Science Center and its sub-contracting partner, Sitka Sound Science Center, have completed the second season of a three year field study designed to determine the extent and annual variability in straying of Chum salmon in Southeast Alaska. This work is expected to continue again during the 2015 season with the final report due at the end of March 2016. The proportion of hatchery fish in wild stock streams was estimated using methods that closely follow those used by Piston & Heinl (2012). Nearly all of the hatchery		

produced Chum salmon returning to Southeast Alaska have been thermally marked, the exceptions being Chum salmon produced by the Tamgass hatchery near Metlakatla, AK. The proportion of fish of hatchery origin in a wild stock stream can be estimated by collecting otoliths from spawned-out fish present in the stream. The collected otoliths are then sent to the ADF&G Mark Lab in Juneau for reading and determination of hatchery or wild origin. Piston and Heinl (2012) tended to visit their study streams 2-3 times during the spawning season while this study collected otoliths 3-4 times.

Four streams were examined in 2012, while 33 and 32 streams were sampled in 2013 and 2014 (see table below) Sampling was spread across the three subregions of Southeast Alaska with the majority of the effort being concentrated in the Northern Southeast Inside subregion (Table 1). The proportions of fish of hatchery origin for each of the sampling events from 2008 through 2013 are presented in Tables 2, 3, and 4. Not all of the samples from 2014 have been read and verified by the ADF&G Mark Lab; consequently, the reporting for 2014 is not complete. Estimates of the overall proportion of hatchery fish present by stream and year were not made or presented here. The final estimates will need to take into account run timing to each stream and it was felt that it would be best if those responsible for making the estimates were to do so and not have potentially competing estimates be presented here.

	Southern	Northern Southeast	
Year	Southeast	Inside	Outside
2008	1	5	3
2009	4	8	3
2010	5	17	3
2011		16	
2012		4	
2013	5	25	3
2014	5	24	3

Twenty-five Northern Southeast Inside (NSI) streams were sampled for stray hatchery Chum salmon in 2013 and 24 streams were sampled in 2014. Other areas of Southeast Alaska were sampled as well. Raw data showing daily proportion of hatchery Chum salmon in each stream were presented in tables. Additional effort is needed to analyze the data and calculate the proportion of spawners that are hatchery Chum salmon in each stream and in NSI as a whole. These estimates should be compared with stream-specific and NSI-region estimates presented in previous ADF&G reports. They should also be compared with release locations, including remote release sites.

Numerous additional Chum salmon (and other salmon species) were approved for annual release into Southeast Alaska in 2013 and 2014 (ADF&G 2013, ADF&G 2014). These releases include fish transferred to remote release locations, which may contribute to increased rather than decreased straying in the near future.

Progress on condition [Year 2]

The Prince William Science Center and its sub-contracting partner, Sitka Sound Science Center, have completed the third season of a three year field study designed to determine the extent and annual variability in straying of Chum salmon in Southeast Alaska.

The proportion of hatchery fish in wild stock streams was estimated using methods that closely follow those used by Piston & Heinl (2012). Nearly all of the hatchery produced Chum salmon returning to Southeast Alaska have been thermally marked. The proportion of fish of hatchery origin in a wild stock stream can be estimated by collecting otoliths from spawned-out fish present in the stream. The collected otoliths are then sent to the ADF&G Mark Lab in Juneau for reading and determination of hatchery or wild origin.

	Four streams were examined in 2012, while 32-33 streams were sampled in 2013, 2014, and 2015. Sampling was spread across the three subregions of Southeast Alaska with the majority of the effort being concentrated in the Northern Southeast Inside subregion. PSPA (2016a) summarizes information related to this condition provided by the PSPA at the second annual surveillance. This includes a summary of initial estimates of the proportion of hatchery Chum salmon estimated for natural production areas of SEAK and a review of alternatives for limiting hatchery impacts on wild production based on ADFG's SEAK Comprehensive salmon hatchery management plan. Presentations were also made at the second surveillance by Alex Wertheimer on the precautionary management approach to Alaska salmon hatchery management (Wertheimer 2016) and by Ron Josephson of ADFG on results of the hatchery study (Josephson 2016). At the first surveillance, the team noted that additional Chum salmon (and other salmon species) were approved for annual release into Southeast Alaska in 2013 and 2014 (ADF&G 2013, ADF&G 2014), and that these releases include fish transferred to remote release locations, which may contribute to increased rather than decreased straying in the near future. However, the first surveillance team noted that good progress has been made with sampling of strays. In Year 2, the assessment team anticipated the need for a description of how ongoing actions are consistent with a strategy to minimize the numbers and proportions of hatchery fish interbreeding with wild fish in natural spawning areas, consistent with the requirements of the MSC SamFAM guidelines (MSC 2012, MSC 2014), and a description of a strategy to reduce straying if straying levels in 2013 and 2014 exceed MSC guidelines. At the second surveillance, results of escapement assessments for hatchery fish were presented along with the review of alternatives for limiting straying. This review satisfied the milestone for surveillance 2 specified in the client action plan.
Progress on Condition [Year 3]	To address this condition, the client provided: 1) a review of best practices for hatchery Chum salmon release at remote release sites in Southeast Alaska (PSPA 2016g); 2) an evaluation of current remote release sites for Summer Chum in Southeast Alaska relative to best management practices (PSPA 2016h); and 3) An analysis of Southeast Alaska hatchery Chum Salmon data to look for differences in rates of straying between fish released from incubation facilities and remote sites (PSPA 2016h). Best practices were identified (PSPA 2016g) based on a review of the scientific literature regarding hatcheries and a Comprehensive Salmon Enhancement Plan for Southeast Alaska (ADFG 2004). Best practices were defined to include: *Release site selection* • Choose an imprint/release site with a strong and consistent supply of fresh water • Choose a remote release site that is unaffected by water from the rearing site but still shares general characteristics of the stock's native stream. • Choose a release site that is not proximal to the natal streams of any highly significant wild stocks of the same species or other species with similar run timing and habitat utilization characteristics. • Choose a site location and release timing that minimizes potential near-shore interaction with wild stocks. *Imprinting to the release site* • Transfer fish to the imprint/release site as early as possible during juvenile rearing • Allow smolts to migrate downstream volitionally from their freshwater rearing site to saltwater. • Immerse smolts in the imprint freshwater for a minimum of three weeks and release the fish only when they are fully smolted.

	Terminal area function • Delineate a terminal area that both confines returning adults and facilitates their harvest. • Allow returning adults clear access to adequate freshwater habitat in their home stream or quickly harvest them in salt water immediately adjacent to their home stream. • Design a terminal harvest area management plan that effectively maximizes the quality of fish harvested while minimizing any potential undesirable outcomes. Current remote release sites for Summer Chum in Southeast Alaska were reviewed relative to best management practices (PSPA 2016h). Southern Southeast Regional Aquaculture Association (SSRAA) remote release sites include Nakat Inlet, Kendrick Bay/McLean Arm, Anita Bay, and Neck Creek. Northern Southeast Regional Aquaculture Association (NSRAA) remote release sites include Takatz (hatchery at Kasnyku Bay) and Deep Inlet (hatchery at Medvejie/Bear Cove). Douglas Island Pink and Chum, Inc. (DIPAC) remote release sites include Limestone Inlet, Thane at Sheep Creek, Amalga Harbor, and Boat Harbor. All current remote release sites were reported to meet the outlined best practices. PSPA (2016i) summarized the incidence of straying by hatchery Chum Salmon including releases from remote acclimation sites. A total of 31 streams were sampled for Chum Salmon in Southeast Alaska during 2013-2015 in the hatchery-wild interaction study. This study estimated a relatively low incidence of hatchery Chum salmon straying regionwide with annual estimates of 5.4-9.2% of natural spawning summer Chum salmon composed of hatchery-origin fish. PSPA (2016i) compared the contributions of remote and on-site releases numbers of hatchery fish observed in natural production areas. This comparison showed a marginally greater incidence of straying by fish from remote rather than on-site releases, while acknowledging the limitations of the study in the ability to control for other variables. The hatchery-wild interaction study design was not intended to examine the relative stray rates of on-site vs. remote release sites. Sample sites and sample sizes were not representative test and control sites for remote vs. on-site releases. Estimates were influenced by proximity of sample streams to release sites. However, this information was adequate to determine that remote releases do not substantially increase straying of fish from remote release sites. The incidence of hatchery origin fish from either on site or remote releases was low in relation to acceptable impact guidelines for artificial production based on percentage of hatchery origin spawners (pHOS) in natural production areas (CR 2.0 Box GSC1 pg. 496). This information indicates that implementation of best management practices has effectively limited the incidence of straying of hatchery-origin Chum Salmon from remote release sites.
Status of condition	Following review of new information provided through surveillance audit three, **Condition 2 is closed**. Rescoring of the PI 1.3.2 for the Southeast Alaska unit is given in Appendix 1, below. This condition was closed ahead of schedule based on a series of reports provided by the PSPA at the third annual surveillance. A monitoring program has been implemented to quantify the incidence of Chum hatchery straying into natural production areas – this information provides a basis for further evaluation of the effects of remote releases. A review of scientific literature and current enhancement plans identified best management practices for limiting straying. A review of current hatchery programs demonstrated that current remote releases are consistent with best management practices. Analysis of otolith samples collected in natural production areas demonstrated a low incidence of straying of hatchery Chum salmon from on-site and remote release sites (PSPA 2016j). These reports demonstrated that there is some objective basis for confidence that the management strategy is effective, based on evidence that the strategy is achieving the outcome metrics used to define the minimum detrimental impacts (e.g., related to verifying and achieving acceptable proportions of hatchery-origin fish in the

	natural spawning escapement).

Table 7. Condition 3-SEAK

	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
Performance Indicator(s) & Score(s)	**1.3.3, 2.5.2-SEAK**	PI 1.3.3: Relevant information is collected and assessments are adequate to determine the effect of enhancement activities on wild stock status PI 2.5.2: There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function NB: In recognition of their interlinked nature, the text of this condition was drafted to address the deficiencies identified for both PI 1.3.3 and PI 2.5.2. The MSC agreed to this variation from CR 27.11.1.1.	**1.3.3: 60** **2.5.2: 75**
Condition	By the end of the fourth year of certification, the SG 80 scoring requirements for PI 1.3.3, and the SG80e scoring requirements for PI 2.5.2 must be met in full. This will be achieved when it has been demonstrated that: a) (PI 1.3.3, SG80a): Sufficient relevant information is available on the contribution of enhanced Chinook, Coho, pink and Chum salmon to the harvest and wild escapement of the stocks. b) (PI 1.3.3, SG80b): The assessment includes estimates of the impacts of enhancement activities on wild stock status, productivity and diversity. (PI 2.5.2, SG80e): There is a tested and evaluated artificial production strategy, if necessary, with sufficient monitoring in place and evidence is available to reasonably ensure with high likelihood that strategy is effective in achieving the SG 80 outcome.		
Milestones	The assessment team concluded that a key issue with regard to these Indicators is the effect of remote releases on increased stray rates of Chum, Chinook, and Coho salmon, and the potential that a reduction in remote releases (or other ways to improve homing) might be used to reduce straying. Action milestones for addressing this condition are as follows: Year 1: PSPA will review ongoing ADF&G efforts to estimate numbers of wild and hatchery Chum salmon harvested in mixed stock fisheries where the proportion of hatchery fish is demonstrated or likely to be more than minimal (facilitated by previous and ongoing studies). This includes review of data informing the extent to which remote releases of hatchery Chum salmon stray to spawning streams. PSPA will prepare a risk assessment for Chinook and Coho salmon straying (e.g., based on CWT recoveries, release numbers, harvests of local hatchery Chinook and Coho salmon, and local wild salmon abundance), and design field studies to estimate Chum salmon straying in selected streams. A progress report will be provided. Year 2: PSPA will develop an approach to implement the risk assessment and field studies developed in Year 1. PSPA will provide a progress report based on data provided by ADF&G.		

	Year 3: PSPA, using available data, will estimate numbers of wild and hatchery salmon harvested in mixed stock fisheries, including fish released from remote release sites. PSPA will provide a progress report. PSPA, using all available data collected by ADF&G will estimate remote release and direct-release strays on the spawning grounds, including the Northern Southeast Inside (NSI) subarea, and test whether fish released remotely have higher straying rates. PSPA will provide a progress report to include approaches to control straying. Year 4: Continue to estimate numbers of wild and hatchery salmon harvested in mixed stock fisheries, including from remote release sites. If NSI Chum salmon stray rates are exceeding levels as set out in MSC guidelines (i.e. SamFAM), PSPA will develop and seek implementation of approaches to reduce straying. Otherwise, demonstrate that sufficient relevant information is available on the contribution of enhanced Chinook, Coho, pink and Chum salmon to the harvest and wild escapement of the stocks. The assessment includes estimates of the impacts of enhancement activities on wild stock status, productivity and diversity. There is a tested and evaluated artificial production strategy, if necessary, with sufficient monitoring in place and evidence is available to reasonably ensure with high likelihood that strategy is effective in achieving the SG 80 outcome.
Client action plan	See 'milestones' above.
Progress on Condition [Year 1]	*Chum Salmon* All of the Chum salmon produced in hatcheries in Southeast Alaska with the possible exception of those produced by the Tamgass Hatchery near Metlakatla, Alaska, are thermally marked. Southern Southeast Regional Aquaculture Association (SSRAA) has sampled otoliths from traditional mixed stock fisheries at Ketchikan and Petersburg since 2005. Brunette *et al*. (2013) reports on the estimates of hatchery contribution of Chum salmon to Southern Southeast Alaska net fisheries for 2006-2010 with the reporting of contribution estimates for 2011-2014 presently being prepared (ADF&G Ketchikan). Douglas Island Pink and Chum Inc. (DIPAC) evaluated the harvest at specific delivery locations in northern Southeast Alaska while Northern Southeast Regional Aquaculture Association (NSRAA) has sampled terminal harvest fisheries. The ADF&G does not have a coordinated region-wide program to sample and evaluate mixed-stock harvests for hatchery contributions (Gray *et al*. 2014; Brunette *et al*. 2013). The Prince William Science Center and its sub-contracting partner, Sitka Sound Science Center, have completed the second season of a three-year field study designed to determine the extent and annual variability in straying of Chum salmon in Southeast Alaska. This work is expected to continue again during the 2015 season with the final report due at the end of March 2016. The project proposal can found here: http://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/research/pwssc_h-w_proposal_6-29-12.pdf . A summary of the data collected for the Chum salmon straying study to date can be found in the response to Condition 2. *Coho Salmon* Coho salmon are produced by thousands of streams in Southeast Alaska.

Many of these streams produce only a few fish and little is known about the system. ADF&G assesses the status of the Coho salmon stock by trends in abundance and escapement for 14 indicator systems spread across the area, and concluded that the stocks appear to be in excellent condition (Shaul *et al*. 2011). Approximately 19-20 million Coho salmon smolt are released annually in Southeast Alaska at numerous sites (Shaul *et al*. 2011). Hatcheries contributed an average of 19% of the Coho salmon in the Southeast Alaska commercial harvest between 2001 and 2010 (Shaul *et al*. 2011); although it appears that recent contributions have been approaching 30% (L. Shaul, ADF&G, per comm.). A retrospective study of historical CWT returns from streams where wild Coho salmon had been tagged as fry or smolt was undertaken by Shaul (2010). A total of 4,558 tags were recovered from adults in 34 systems from the years 1976-2007. Seventy four of the recovered tags had been placed in fish released outside of the system where they were recovered; of theses 21 were wild fish and 53 were of hatchery origin (Shaul 2010). While no conclusion about the level of straying for Coho salmon could be drawn from this study, 98% of the recovered tags were found in their natal stream (Shaul *et al*. 2011). The number of wild Coho salmon streams in close proximity to the large releases of hatchery Coho salmon suggests that a straying study may be warranted. A very superficial discussion of the study logistics indicated that a straying study for Coho salmon would not be as easy to undertake as with pink and Chum salmon since not all Coho salmon are marked and the carcasses disappear very quickly from the spawning grounds.

Chinook Salmon

Chinook salmon are known to occur in 34 rivers in, or draining into, the Southeast region of Alaska (Der Hovanisian *et al*. 2011). ADF&G assesses the status of the Chinook salmon stock by trends in abundance and escapement for 11 drainages spread across the area and judged the monitored systems to be healthy (Der Hovanisian *et al*. 2011). Approximately 3 million Chinook salmon smolts are released annually in Southeast Alaska with the release sites being generally located away from the wild Chinook salmon systems. Hatcheries contributed an average of 19% of the Chinook salmon in the Southeast Alaska commercial harvest between 2001 and 2010 (Der Hovanisian *et al*. 2011). Very limited straying information has been collected from adipose clipped fish returning to the major Chinook salmon systems. These data are not published and are inappropriate for making estimates of straying rates. That being said, very few of the CWT's recovered at these sites have been strays. Ed Jones ADF&G described a dataset from the Taku River where 4 out of 606 tags recovered were considered strays. These tags were recovered over the period 1994 through 2013. Likewise, 8 out of 872 tags recovered from the Unuk River between 1996 and 2014 were considered strays (per comm., Phillip Richards, ADF&G).

Chum Salmon

Brunette *et al*. (2013) provided an excellent review of hatchery Chum salmon contributions to commercial purse seine and gillnet fisheries in southern Southeast Alaska. Hatchery percentages often varied with year, indicating annual monitoring is needed to estimate composition in many fisheries. In northern Southeast Alaska, hatcheries estimate the overall contribution of hatchery fish to the commercial catch, but estimates were not provided for key mixed-stock fisheries.

Hatchery Chum salmon stray data for each region of Southeast Alaska were provided (see Table 1 of Condition 2). No information was provided on strays that originated from remote release sites. It is unclear whether remote release Chum salmon have a unique thermal mark, but data collected through the ongoing study may provide information regarding the relative straying rates of onsite versus remote released Chum salmon.

Coho and Chinook Salmon

ASPA examined available Coho salmon data and concluded that a straying

	study may be warranted for streams near the release sites. However, relatively few Coho salmon are currently marked & Coho salmon carcasses can be difficult to recover. Additional discussion of study feasibility with key Coho salmon experts in SEAK, such as Leon Shaul, is warranted. The assessment team recognizes that Chinook salmon released at the site of their hatchery rearing are less prone to stray than fish released from remote sites. For Chinook salmon, the assessment team needs an initial risk assessment that might be based on expanded hatchery CWT recoveries on sampled streams, or recovered at hatchery racks, relative to total Chinook salmon returning to the respective recovery site. The assessment team recognizes that expansion of hatchery CWT recoveries can lead to highly imprecise estimates but it may provide sufficient information for a risk assessment as to whether an additional straying investigation is warranted.
Progress on Condition [Year 2]	*Chum Salmon* All of the Chum salmon produced in hatcheries in Southeast Alaska are thermally marked. Regionwide Chum salmon harvests in purse seine and gillnet commercial fisheries are sampled for otoliths to estimate hatchery-specific contributions (PSPA 2016b). Otolith sampling also occurs in representative streams to assess the incidence of hatchery straying into natural production areas. This study is described in greater detail under Condition 2. A summary of the data collected for the Chum salmon straying study can be found in PSPA 2016b. Brunette et al. (2013) provided an excellent review of hatchery Chum salmon contributions to commercial purse seine and gillnet fisheries in southern Southeast Alaska. Hatchery percentages often varied with year, indicating annual monitoring is needed to estimate composition in many fisheries. Additional information was provided at the second surveillance on hatchery Chum salmon contributions to all traditional SEAK purse seine and gillnet fisheries and escapements based on more recent hatchery study results. No information was provided on strays that originated from remote release sites. However, this analysis is planned for the next assessment. *Coho Salmon* Coho salmon are produced by thousands of streams in Southeast Alaska. ADF&G assesses the status of the Coho salmon stock by trends in abundance and escapement for 14 indicator systems spread across the area, and concluded that the stocks appear to be in excellent condition (Shaul et al. 2011). Approximately 19-20 million Coho salmon smolt are released annually in Southeast Alaska at numerous sites (Shaul et al. 2011). Hatcheries contributed an average of 19% of the Coho salmon in the Southeast Alaska commercial harvest between 2001 and 2010 (Shaul et al. 2011), although it appears that recent contributions have been approaching 30% (L. Shaul, ADF&G, per comm.). A retrospective study of historical CWT returns from streams where wild Coho salmon had been tagged as fry or smolt was undertaken by Shaul (2010). A total of 4,558 tags were recovered from adults in 34 systems from the years 1976-2007. Seventy four of the recovered tags had been placed in fish released outside of the system where they were recovered; of these 21 were wild fish and 53 were of hatchery origin (Shaul 2010). This study determined that 98% of the recovered Coho tags were found in their natal stream (Shaul et al. 2011). PSPA examined available Coho salmon data. A low incidence of straying has been identified into natural production areas where sampling has occurred. Given the scale and distribution of wild Coho throughout SEAK, risks of a significant hatchery impact on natural production appear to be low. While significant straying of hatchery fish may occur into some streams in the vicinity of some hatchery programs, the large majority of wild production areas are likely to

	contain few or no hatchery Coho, Existing information is sufficient to assess risks and to conclude that an additional straying investigation is not warranted for Coho salmon. *Chinook Salmon* Chinook salmon are known to occur in 34 rivers in, or draining into the Southeast region of Alaska (Der Hovanisian et al. 2011). ADF&G assesses the status of the Chinook salmon stock by trends in abundance and escapement for 11 drainages spread across the area and judged the monitored systems to be healthy (Der Hovanisian et al. 2011). Approximately 3 million Chinook salmon smolts are released annually in Southeast Alaska with the release sites being generally located away from the wild Chinook salmon systems. Hatcheries contributed an average of 19% of the Chinook salmon in the Southeast Alaska commercial harvest between 2001 and 2010 (Der Hovanisian et al. 2011). Straying information has been collected from coded wire tagging studies of fish returning to the major Chinook salmon systems. Very few of the CWT's recovered at these sites or to hatchery sites have been strays. For instance, just 4 out of 606 tags recovered from the Taku River from 1994 through were considered strays. Likewise 8 out of 872 tags recovered from the Unuk River between 1996 and 2014 were considered strays (per comm., Phillip Richards, ADF&G). For Chinook salmon, hatchery CWT recoveries in sampled areas provides strong evidence that a low incidence of straying by hatchery-origin Chinook poses little risk to the large majority of wild populations. Existing information is sufficient to assess risks and to conclude that an additional straying investigation is not warranted for Chinook salmon.
Progress on Condition [Year 3]	See Year 3 progress summaries for Conditions 1 and 2. A monitoring program has been implemented to quantify the incidence of Chum hatchery straying into natural production areas – this information provides a basis for further evaluation of the effects of remote releases. Analysis of otolith samples collected in natural production areas demonstrated a low incidence of straying of hatchery Chum salmon from on-site and remote release sites (PSPA 2016j).
Status of condition	Following review of new information provided through surveillance audit three, **Condition 3 is closed**. Rescoring of the PIs 1.3.3 and 2.5.2 for the Southeast Alaska unit are given in Appendix 1. Information provided through the second annual surveillance was adequate to address this condition for Chinook and Coho. Information provided through the third annual surveillance was adequate to address this condition for Chum salmon.

Table 8. Condition 4—Copper/Bering Districts

	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
Performance Indicator(s) & Score(s)	**1.3.1 1.3.2 1.3.3 Copper/Bering District**	PI 1.3.1: Enhancement activities do not negatively impact wild stocks or substitute for a stock rebuilding strategy PI 1.3.2: Effective enhancement and fishery strategies are in place to address effects of enhancement activities on wild stock status PI 1.3.3: Relevant information is collected and assessments are adequate to determine the effect of enhancement activities on wild stock status	**PI 1.3.1: 60 PI 1.3.2: 70 PI 1.3.3: 60**
Condition	By the end of the fourth year of certification, the SG 80 scoring requirements must be met in full. This will be achieved when it has been demonstrated that: a) (PI 1.3.1, SG80a): It is highly likely that the Gulkana hatchery enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of Copper/Bering District stocks of Sockeye salmon, b) (PI 1.3.2, SG80b): There is some objective basis for confidence that the strategy is effective, based on evidence that the strategy is achieving the outcome metrics used to define the minimum detrimental impacts (e.g., related to verifying and achieving acceptable proportions of hatchery-origin fish in the natural spawning escapement), c) (PI 1.3.3, SG80a): Sufficient relevant information is available on the contribution of enhanced Sockeye salmon to the harvest and wild escapement of the wild Sockeye salmon stock, d) (PI 1.3.3, SG80b): The assessment includes estimates of the impacts of enhancement activities on wild Sockeye salmon stock status, productivity and diversity.		
Milestones	The Copper River/Bering District fishery will remain conditional until it is established that the Gulkana Hatchery enhancement activities do not have a significant negative impact on the productivity and diversity of wild stocks. A key outcome for this condition is to demonstrate acceptable straying of hatchery Sockeye salmon while also meeting the spawning escapement goals for the wild stock. Action milestones for addressing this condition are as follows: Year 1: Using existing information available from ADF&G and PWSAC, PSPA will prepare a review of the Gulkana Hatchery, including an examination of potential impacts of hatchery Sockeye salmon on wild stocks. A key metric for evaluating impact is the proportion of hatchery Sockeye salmon on the spawning grounds. Year 2: PSPA will consult with ADF&G and develop a plan utilizing escapement surveys to assess impacts of Gulkana Hatchery Sockeye salmon on wild stocks. Year 3: PSPA will seek to implement the plan and provide a progress report. Year 4: PSPA will seek to demonstrate that the plan is implemented then demonstrate that the plan is capable of achieving an appropriately low level of hatchery fish in the		

	spawning escapement thereby effectively minimizing detrimental impacts, and therefore: a) It is highly likely that the Gulkana Hatchery enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of Copper/Bering District stocks of Sockeye salmon, b) There is some objective basis for confidence that the strategy is effective, based on evidence that the strategy is achieving the outcome metrics used to define the minimum detrimental impacts (e.g., related to verifying and achieving acceptable proportions of hatchery-origin fish in the natural spawning escapement), c) Sufficient relevant information is available on the contribution of enhanced Sockeye salmon to the harvest and wild escapement of the wild Sockeye salmon stock, d) The assessment includes estimates of the impacts of enhancement activities on wild Sockeye salmon stock status, productivity and diversity.
Client action plan	See above under 'milestones.'
Progress on Condition [Year 1]	This condition is a continuation of the unmet Condition 29 from the 2009 audit: "*Conduct a review of the Gulkana Sockeye hatchery program with emphasis on potential impacts to wild stocks*" (Knapman *et al.* 2009). The 2012 Assessment Team added the emphasis for this new Condition 4: "*A key metric for evaluating impact is the proportion of hatchery Sockeye salmon on the spawning grounds*." ADF&G released the final review (Stopha 2013), written specifically as a response to the 2009 condition, although the overall objective was slightly wide of the mark: "*An Evaluation of the Gulkana Salmon Hatchery for Consistency with Statewide Policies and Prescribed Management Practices*." This review, although an imperfect match with the Condition, contains information useful for evaluating progress towards evaluating impact of the hatchery program on wild stocks. The Client Update notes the following from Stopha (2013): The donor stock for the Gulkana Hatchery is indigenous to the Gulkana River watershed, consistent with the State of Alaska Genetics Policy which is designed to minimize hatchery impacts on wild stocks. The Gulkana Hatchery is an integrated hatchery program where the hatchery broodstock is composed of up 40% naturally produced fish—a program that minimizes the opportunity for domestication selection to alter the genetic makeup of the hatchery stock. A third-party project by an NGO assessed straying of Gulkana Hatchery fish into Upper Copper River tributaries in 2008 (Bidlack and Valentine 2009). One-hundred percent of the spawners returning to the hatchery release site were of hatchery origin; no spawners observed in proximal spawning areas were of hatchery origin. The contribution of Gulkana Hatchery fish to the escapement was taken into account when establishing the Copper River escapement goal (300,000L 500,000U); the escapement has been near or above the upper bound every year since 2003. The Assessment Team noted in Stopha (2013) that the current hatchery operator is functioning within stricter compliance of State of Alaska policies and practices than did Alaska Department of Fish and Game FRED Division when it operated the hatchery from 1973-1993.
Progress on Condition [Year 2]	Gulkana hatchery produces Sockeye fry from spring-fed streamside incubators. Significant natural production also occurs in nearby spring areas. Naturally-produced Sockeye move downstream after emergence to rear in Paxson Lake. Hatchery-origin fish are released from the hatchery to supplement the Paxson Lake population. Hatchery fry are also outplanted upstream in Summit Lake and in nearby

	Crosswind Lake – neither of these lakes support significant wild Sockeye production due to a lack of spawning habitat. A review of the Gulkana Hatchery was performed in 2012 by ADF&G (Stopha 2013) largely in response to a previous certification review by the Marine Stewardship Council (Chaffee et al. 2007). This review provides substantive new information that was not available during the assessment. ADF&G through their review, determined that Prince William Sound Aquaculture Corporation was in compliance with its hatchery permit, annual management plans and other agreements with the Department. The donor stock for the Gulkana Hatchery is indigenous to the Gulkana River watershed, consistent with the State of Alaska Genetics Policy which is designed to minimize hatchery impacts on wild stocks. Roberson & Holder (1993) describe the initial egg takes as coming from aquifer springs located within 400m of the hatchery with additional gametes coming from fish collected at Gunn Creek on Summit Lake. The Gulkana Hatchery is an integrated hatchery program (Mobrand et al. 2005) where the hatchery broodstock is composed of individuals of both hatchery and naturally produced origins, at times approaching 40-50% naturally produced fish. All emergent fry since 2000 (1999 brood year) have been treated with strontium chloride to place distinctive marks on the otoliths of the fry. Sockeye salmon otoliths can then be examined at various life stages for presence or absence of marks created by strontium chloride to identify whether the fish is of hatchery origin. An informal study designed to assess straying into Upper Copper River tributaries was undertaken in 2008 by Bidlack & Valentine (2009). In this work six known Sockeye salmon spawning sites, Swede Lake, Dickey Lake, Upper Fish Lake, lower Paxson Lake, Mentasta Lake, and Gunn Creek were opportunistically sampled (Figure 1). Seventy or more readable otoliths were collected from all sites with the exception of Dickey Lake where only 14 readable otoliths were obtained. One-hundred percent of the spawners returning to the hatchery release site were of hatchery origin; no spawners observed in proximal spawning areas were of hatchery origin. No fish with strontium chloride marks were found in five of the locations with all of the otoliths obtained from Gunn Creek being marked (Table 9). Gunn Creek is the release site for fish released into Summit Lake. Interestingly, there were no marked fish found out of 71 examined from Upper Fish Lake, the closest sampling site to the Gulkana Hatchery. The commercial, subsistence, and personal use fisheries for Sockeye salmon in the Copper River are sampled for the presence and absence of otolith marked fish in order to estimate the contribution of Gulkana Hatchery fish to the fisheries. The Gulkana Hatchery contributed approximately 14% to the total upriver return of Sockeye salmon to the Copper River for the 2003 through 2013 seasons (Appendix A.2 of Sheridan et al. 2014). Sockeye salmon escapement goals for the Copper River are evaluated every three years with the most recent being completed in the fall of 2014 (Moffitt et al. 2014). The contribution of Gulkana Hatchery fish to the escapement was taken into account when establishing the escapement goal. The present goal was set in 2003 at 300,000 to 500,000 Sockeye salmon passing the Miles Lake sonar; this escapement goal has been achieved or exceeded every year since 2003 (Appendix A.2 of Sheridan et al. 2014). New information was also provided at the second annual surveillance on escapement of Copper River Sockeye relative to established escapement goals. This information demonstrated that established goals for wild Sockeye in the Copper River basin are consistently achieved or exceeded with wild fish (PSPA 2016c). This includes delta-spawning population which is similarly timed with the Gulkana stock.

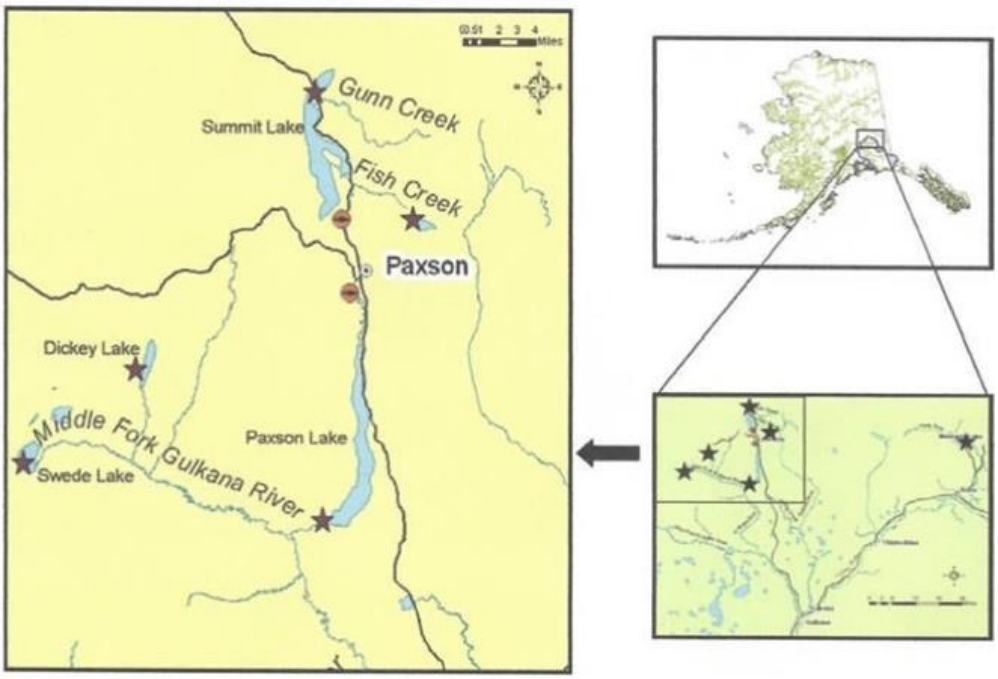

Figure 6. Sample site locations (denoted by stars) and hatchery locations (round fish symbols). Upper inset shows Copper River watershed within the State of Alaska. Lower inset shows six survey sites (one furthest right is Mentasta Lake). (Source: Bidlack & Valentine 2009).

Table 9. Sample site locations, dates and numbers collected, sex ratio of samples, and otolith markings. (Source: Bidlack & Valentine 2009).

Date	Site	Samples	Readable	% hatchery origin
8/22/2208	Swede Lake	96	94	0
8/22/2208	Dickey Lake	14	14	0
8/24/2208	Upper Fish Lake	72	71	0
8/25/2208	Mentasha Lake	96	94	0
9/25/2208	Paxson Lake (south end)	96	83	0
9/26/2208	Gunn Creek	74	70	100
		448	426	

New information was provided at the second annual surveillance on the incidence of hatchery-origin fish in natural production areas of the Gulkana River basin based on analysis of historical coded wire tag recapture data (PSPA 2016c). This information corroborated more recent otolith sampling results that showed a negligible contribution of hatchery-origin Sockeye to natural spawning areas outside the vicinity of the hatchery (Table 9). Returns to Summit Lake and Crosswind Lake which are barren of natural production, were comprised entirely of hatchery fish. In addition, results of cast sampling in the Copper River Delta, which stocks have the same run timing as the Gulkana hatchery stock, showed no hatchery strays were found there. Results are consistent with studies in other areas which demonstrate that Sockeye home very strongly to natal systems and hatchery acclimation sites. A strong homing instinct is consistent with a genetic complex stock structure documented for Sockeye. Patterns of inter-population genetic differences could not have been established or maintained if Sockeye straying was significant.

This condition is a continuation of the unmet Condition 29 from the 2009 audit: “Conduct a review of the Gulkana Sockeye hatchery program with emphasis on potential impacts to wild stocks” (Knapman et al. 2009). The 2012 Assessment Team added the emphasis for this new Condition 4: “A key metric for evaluating

	impact is the proportion of hatchery Sockeye salmon on the spawning grounds." Surveillance 1 observed that the current hatchery operator is functioning within stricter compliance of State of Alaska policies and practices than did Alaska Department of Fish and Game FRED Division when it operated the hatchery from 1973-1993. In total, new information provided since the assessment has demonstrated that: 1) harvest is effectively apportioned between hatchery and wild fish and 2) hatchery-origin fish comprise a relatively insignificant proportion of wild spawners in areas outside of the hatchery vicinity.
Progress on condition [year 3]	No further update in year three; this condition was closed in year 2.
Status of condition	Following review of new information provided during surveillance audits one and two, **Condition 4 is closed**. Rescoring of PIs 1.3.1, 1.3.2, and 1.3.3. for the Copper/Bering unit are given in Appendix 1, below. Analysis of archived coded wire tag data eliminated the need to conduct new studies. Multiple lines of evidence based on the information provided demonstrate a high likelihood that the Gulkana hatchery enhancement activities do not have significant negative impacts on wild Sockeye stocks based on current production strategies and outcome metrics on the contribution of enhanced Sockeye salmon to the harvest and wild escapement of the wild Sockeye salmon stock.

Table 10. Condition 5-Kodiak

	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
Performance Indicator(s) & Score(s)	**1.3.1** **1.3.3** **2.5.2**	PI 1.3.1: Enhancement activities do not negatively impact wild stocks or substitute for a stock rebuilding strategy PI 1.3.3: Relevant information is collected and assessments are adequate to determine the effect of enhancement activities on wild stock status PI 2.5.2: There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function NB: In recognition of their interlinked nature, the text of this condition was drafted to address the deficiencies identified for PI 1.3.1, PI 1.3.3 and PI 2.5.2. The MSC agreed to this variation from CR 27.11.1.1.	**PI 1.3.1: 60** **PI 1.3.3: 60** **PI 2.5.2: 75**
Condition	By the end of the ~~fifth~~ ninth year of certification, the SG 80 scoring requirements for PI 1.3.1 and PI 1.3.3, and the SI 80e requirements for PI 2.5.2, must be met in full. With respect to the current hatchery programs at Pillar Creek and Kitoi Bay for Chinook, Coho, Pink and Chum salmon, this will be achieved when it has been demonstrated that: a) (PI 1.3.1, SG80a) it is highly likely that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of wild stocks. b) (PI 1.3.3, SG80a) sufficient relevant information is available on the contribution of enhanced Chinook, Coho, pink and Chum salmon to the harvest and wild escapement of the stocks. c) (PI 1.3.3, SG80b) the assessment includes estimates of the impacts of enhancement activities on wild stock status, productivity and diversity. d) (PI 2.5.2, SG80e) there is a tested and evaluated artificial production strategy, if necessary, with sufficient monitoring in place and evidence is available to reasonably ensure with high likelihood that strategy is effective in achieving the SG 80 outcome.		
Milestones	To satisfy the intent of this condition, PSPA will monitor and review study plans by KRAA and ADF&G to develop a Chum and pink salmon mark and recovery plan, including sampling of selected streams for rates of straying. Year 1: Monitor and review plan for 100% marking of hatchery Pink and Chum salmon and for select sampling on spawning grounds and in fisheries. PSPA will provide a report. Year 2: For Chinook and Coho salmon, PSPA will conduct a risk assessment to evaluate whether or not releases might contribute to more than minimal proportions of hatchery fish on the spawning grounds. PSPA will provide a		

	report. Year 3: KRAA will share with PSPA an estimate of the total cost to outfit Kitoi Hatchery with thermal marking equipment including annual operation costs to mark pink and Coho salmon. KRAA and PSPA will investigate data and research alternatives to assess the impact of hatchery pink salmon on wild stocks (in the absence of marking) per the language in the performance indicator and present these to the assessment team. ~~PSPA will seek implementation of the plan and will provide a progress report.~~ Year 4: KRAA will sample the Kodiak fishery for Chum salmon and will initiate stream sampling for Chum within a 50km radius of Kitoi hatchery on the same timeline as stream sampling for Pink. PSPA will provide a report. KRAA will provide an update on plans for marking pink and Coho salmon at Kitoi Hatchery and results of any new research findings regarding the impact of Kodiak hatchery pink salmon on wild populations based on available data in the absence of marking. ~~PSPA will provide a progress report, identifying any concerns that the SG80 level of performance will not be met and, if so, potential plan revisions necessary to meet SG80.~~ Year 5: KRAA will continue to sample the Kodiak fishery for Chum salmon, and will initiate stream sampling for Chum within a 50km radius of Kitoi hatchery on the same timeline as stream sampling for Pink. If appropriate, PSPA will ~~seek~~ ensure during years 5-9 implementation of plan revisions devised in Year 4, or otherwise demonstrate that: a) It is highly likely that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of wild stocks. b) Sufficient relevant information is available on the contribution of enhanced Chinook, Coho, pink and Chum salmon to the harvest and wild escapement of the stocks. c) The assessment includes estimates of the impacts of enhancement activities on wild stock status, productivity and diversity. d) There is a tested and evaluated artificial production strategy, if necessary, with sufficient monitoring in place and evidence is available to reasonably ensure with high likelihood that strategy is effective in achieving the SG 80 outcome. Should revisions as mentioned above need to be implemented, achievement of (a) – (d) above must be demonstrated by the end of year 9.
Client action plan	See above under ‘milestones.’
Progress on Condition [Year 1]	Kodiak Regional Aquaculture Association (KRAA) operates the Kitoi Bay and Pillar Creek Hatcheries in the Kodiak area. The Kitoi Bay Hatchery produces Chum, pink, Coho, and Sockeye salmon to enhance the common property salmon fisheries. The Pillar Creek Hatchery produces Sockeye salmon to enhance the common property fisheries as well as Coho salmon, Chinook salmon, and rainbow trout to enhance sport fishing opportunities on the Kodiak road system. Both hatcheries have been found to be operating in accordance with Alaska policies and prescribed practices (Musslewhite 2011a, 2011b). All Chum salmon produced at the Kitoi Bay Hatchery are thermally marked by making use of the difference in temperature between the water sources used for incubation. None of the pink salmon are thermally marked. The difference in water temperature between incubation sources has diminished by the time the pink salmon embryos reach the critical marking stage and no funds are available for heating equipment. The Kitoi Bay Hatchery was recently

	remodeled and considerations were made for installing the equipment necessary for marking pink salmon (per comm. Tina Fairbanks, Executive Director KRAA). At this time there is no marking requirement for Chum, pink or Coho salmon at the Kitoi Bay Hatchery while there is a marking requirement for all Sockeye salmon produced (Musslewhite 2011a, 2014 Annual Management Plan, Kitoi Bay Hatchery, Kodiak Regional Aquaculture Association, obtained from ADF&G, Juneau). No evaluation of straying of Chum or pink salmon has been undertaken in the Kodiak area since the early 1980's. In addition, no sampling of the common property fisheries to determine the enhanced contribution is performed. Acceptance of the request for increased Chum salmon production at Kitoi Bay allows green egg take to increase from 28 to 36 million eggs in 2014 (ADF&G 2014). All Chum salmon are reportedly marked. Chinook salmon, produced by Pillar Creek Hatchery, are reportedly released for sport rather than commercial fisheries, whereas numerous Coho salmon released from Kitoi Bay (~1.4 million) are largely for commercial purposes. No pink salmon have been marked even though more than 100 million pink salmon fry are released each year. Coho salmon (and Chinook salmon for sport) are not marked. It is noted that all hatchery late-run Sockeye salmon are now required to be otolith marked (ADF&G 2014). Some progress has been made towards meeting this condition, in that all Chum salmon are marked. However, while marking of pink salmon has been considered, a plan for marking them has not been developed. Also, other than a proposed action and study of a specific remote release of Chum salmon, no monitoring of stray pink and Chum salmon has been planned or performed. No monitoring of hatchery fish in mixed-stock fishery locations has been planned. Progress for Condition 5 is therefore 'behind target' at this year 1 audit. No additional milestones are considered necessary, but an action plan to mark hatchery pink salmon and to monitor relevant spawning grounds and fisheries for the contribution by hatchery fish (i.e., completion of the Year 1 milestone) is needed. It is noted that, in the event that a condition is not back 'on target' within 12 months of falling 'behind target', the MSC directs that the CAB shall consider progress to be inadequate and suspend or withdraw the certificate for the Kodiak UoC (MSC 2013a).
Progress on Condition [Year 2]	Kodiak Regional Aquaculture Association (KRAA) operates the Kitoi Bay and Pillar Creek Hatcheries in the Kodiak area. The Kitoi Bay Hatchery produces Chum, pink, Coho, and Sockeye salmon to enhance the common property salmon fisheries. The Pillar Creek Hatchery produces Sockeye salmon to enhance the common property fisheries as well as Coho salmon, Chinook salmon, and rainbow trout to enhance sport fishing opportunities on the Kodiak road system. Both hatcheries have been found to be operating in accordance with Alaska policies and prescribed practices (Musslewhite 2011a, 2011b). No evaluation of straying of Chum or pink salmon has been undertaken in the Kodiak area. In addition, no sampling of the common property fisheries to determine the enhanced contribution is performed. Current estimates of the commercial harvest of hatchery-produced fish are based on catches in the vicinity of Kitoi Bay. There is a marking requirement for late-run Sockeye salmon produced at Kitoi Bay Hatchery (Musslewhite 2011a, 2014 Annual Management Plan, Kitoi Bay Hatchery, Kodiak Regional Aquaculture Association, obtained from ADF&G, Juneau). Sockeye are being marked at both hatcheries with the "dry" method.

	Marking of late-run Sockeye salmon began in 2012 and was followed in 2013 by 100% marking of late-run Sockeye at both Pillar Creek and Kitoi Bay Hatcheries. Initial returns occurred in 2015. Historical information on hatchery contributions is also available from scale pattern analysis and a straying study conducted in Perenosa Bay (PSPA 2016d). Chum salmon produced at Kitoi Bay Hatchery are thermally marked by making use of the difference in temperature between deep and shallow lake withdrawal water sources used for incubation. Marking of 100% of Chum salmon began in 2014. The first otolith-marked Chum will return in 2016 but the marked age class will comprise a small portion of the total return. Marking was required by ADFG as a condition of approval for a requested increase in Chum salmon production at Kitoi Bay from 28 to 36 million eggs in 2014 (ADF&G 2014). More than 100 million pink salmon fry are released each year, and none have been marked. Thermal otolith marking is not feasible with existing water systems because the difference in water temperature between incubation sources has diminished by the time the pink salmon embryos reach the critical marking stage. The egg mass in each incubator is too large for effective dry marking for pinks. The Kitoi Bay Hatchery was recently remodelled, and considerations were made for installing the equipment necessary for marking pink salmon. At this time there is no marking requirement by ADF&G for pink salmon at the Kitoi Bay Hatchery. A marking requirement could be implemented if the program sought to increase pink salmon production. However, the KRAA Board of Directors have not committed to marking of pink salmon at this time given costs relative to perceived value to management. Chinook and Coho salmon produced by Pillar Creek Hatchery are released for sport rather than commercial fisheries, whereas numerous Coho salmon released from Kitoi Bay (~1.4 million) are largely for commercial purposes. Experimental marking of a portion of the Coho production has been implemented at Pillar Creek Hatchery using the dry method. At the second annual surveillance, Tina Fairbanks of KRAA reviewed the current status of the Kodiak hatchery program (Fairbanks 2016), Dave Gaudet of PSPA presented results of a risk assessment for releases of Chinook and Coho salmon (Gaudet 2016a), and PSPA also provided a summary of marking and marking sampling plans associated with Kodiak Hatchery salmon production (PSPA 2016d). A plan for marking and sampling of Chum salmon has been developed and is being implemented. Marking of hatchery Chum is underway and an assessment plan for hatchery contributions to the harvest and natural spawning escapement was presented at the second surveillance. This progress was made because a requested Chum salmon production increase was granted and a marking provision was included as part of the proposal and permitting process. Access to different water temperatures in shallow and deep water intakes of the lake water source for the hatchery provided a ready means of implementing an effective otolith marking program for Chum salmon. Hatchery Sockeye salmon are similarly being marked and the contribution of hatchery Sockeye to harvest and escapement is under assessment. Most Sockeye production is destined for barren lakes where no significant natural production of Sockeye occurs due adult passage barriers. Questions regarding risks of hatchery Chinook and Coho salmon contributing more than minimal proportions of hatchery fish on the spawning grounds were addressed by an assessment provide by PSPA at the second surveillance. This assessment demonstrated that releases were concentrated on road-accessible streams for terminal sport harvest purposes, release sites were well separated from significant natural production areas were the majority of natural production of Chinook and Coho occurs on Kodiak Island, and that studies in other areas of

	Alaska have demonstrated a low propensity for straying of these species. In addition, experimental marking of Coho salmon has been implemented and is being evaluated for further use. A plan for implementation of marking of Kodiak hatchery pink salmon has not been completed at this time. Marking alternatives have been considered and a mark sampling program outlined (PSPA 2016d). However, no commitment was made to initiate marking of pink salmon. The only feasible alternative for marking of the large volume of pink production is by use of the wet method. This would require use of diesel boilers for temperature control. Hatchery water systems have been configured to allow for installation of the necessary heating systems. However, implementation plans have not been funded.
Progress on Condition [Year 3]	At the third surveillance, a corrective action plan was provided to address a need for assessment of hatchery pink salmon contributions to natural spawning populations on Kodiak. This plan was prepared to address the Responsible Fisheries Management reassessment for SAI Global Trust, but is also applicable to this MSC condition. This plan includes: 1) summaries of current pink salmon production information, 2) a sampling plan for Kodiak pink salmon in the fishery and representative natural spawning areas, 3) cost estimates for implementation of the sampling plan, and 4) options and costs for implementing a comprehensive thermal marking program. The plan identifies a nine-year (2017-2025) schedule for completing a benefit-risk analysis, creating a funding plan and implementing a program. The schedule identifies marking of pink salmon no sooner than 2023 and marking will require identification of funds. The KRAA Action plan provides the following rationale for the plan schedule: • Although marking is not required for pink salmon at Kitoi Bay at this time, ADF&G has stipulated that increases in production for all salmon hatcheries statewide will only be approved if marking is a component of the proposal for the increase. • Over the past 5 years, KRAA has invested staff time and cash funds toward implementation of marking for several species of salmon at both of its facilities. • KRAA has also invested approximately $55,000 toward preliminary engineering designs for equipment required to thermally mark pink salmon at its Kitoi facility – which is the focus of the present condition. KRAA is also committed to investing additional cash next year in order to produce final engineering designs. • The timeline associated with Action Item 3, which allows KRAA and AFDF to develop a funding plan, may be shortened should funding be secured ahead of the stated target dates. It is the goal of all the parties to see this action item completed ahead of the stated schedule. • In 2016, pink salmon returns across Alaska, including in Kodiak, were significantly below predictions, which reduces subsequent funding to KRAA which is based on an enhancement tax on the resource. The returns were so poor that Governor Walker declared it a disaster and has requested federal disaster relief funds. This may also open up some opportunity for funding for KRAA, but disaster relief usually takes time. • In 2016, as a result of pink salmon shortfalls and unprecedented environmental conditions, Kitoi Bay Hatchery fell short of its annual goal of 215 million pink salmon eggs and was able to collect only 94.6 million eggs (44% of the stated goal). This shortfall will impact returns and potential revenue in 2018 and beyond. These circumstances make the creation of a funding plan even more critical to the success of the Corrective Action Plan. • KRAA's pursuit of alternate marking strategies for other species and

	commitment to the final engineering and cost estimates of a marking system that would allow for thermal marking of pink salmon (as well as other species as necessary) demonstrates good faith, and, in combination with the Corrective Action Plan, represents a reasonable and attainable path to marking pink salmon at Kitoi Bay Hatchery. A letter dated 8 December 2016 from KRAA to Julie Decker of the Alaska Fisheries Development Foundation indicates KRAA's commitment to implementation of a marking and evaluation program for pink salmon at Kitoi Bay Hatchery. The KRAA Bard has determined that funding outside of KRAA's typical funding streams (cost recovery and Salmon Enhancement Tax) would be required in order to implement otolith marking and evaluation. This report satisfies the client action plan milestone for the third surveillance which indicates that KRAA will: 1) share with PSPA an estimate of the total cost to outfit Kitoi Hatchery with thermal marking equipment including annual operation costs to mark pink and Coho salmon; and 2) investigate data and research alternatives to assess the impact of hatchery pink salmon on wild stocks (in the absence of marking). However, the plan schedule may not be sufficient to satisfy Condition 5 within the term of the current assessment (expiring in 2018). The surveillance team recommends revision of the plan to include alternatives for marking a subsample of pink salmon production and a phased approach to sampling with phase I involving fishery sampling and phase II sampling of natural spawning areas contingent on phase I results.
Status of condition	At the first annual surveillance, this condition was considered "behind target" because a plan for marking pink salmon had not been developed and no monitoring of hatchery fish in mixed-stock fishery locations or of stray pink and Chum salmon in natural spawning locations had been planned or performed. In the interim, KRAA has moved ahead with 100% marking of Chum salmon and has identified opportunities for monitoring hatchery contributions to the harvest when significant numbers of marked Chum salmon return beginning in 2017. Hatchery contribution patterns in fisheries are expected to provide guidance to future sampling efforts in the spawning escapement where necessary. This program is effectively on schedule for Chum marking and assessment. Sockeye marking and assessment is underway. A pilot program for Coho marking has been initiated. A risk assessment for hatchery Chinook and Coho was completed for the second annual surveillance and determined by the assessment team to adequately satisfy the corresponding year 2 milestone for this condition. Implementation of the client action plan for this condition has been complicated by the change in fishery certificate holder and a lack of coordination by the previous certificate holder with KRAA regarding details of the action plan. KRAA is developing alternatives for pink salmon marking and reconfigured hatchery systems in order to facilitate marking at a future date. However, pink salmon marking has been determined to be more complicated than Chum salmon marking due to particularities of production and facility configuration. Nevertheless, substantive efforts have been made to implement actions for assessing hatchery contributions to the fishery and escapement consistent with this condition. Therefore, this condition is considered "on target" for the purposes of the third surveillance, according to the action plan as rewritten following the 2nd annual audit to account for the exceptional circumstances related to communication and commitment issues in the original drafting causing a delay in efforts by

	KRAA to progress with monitoring and pink salmon marking. The new timeline in the action plan will allow sufficient opportunity to ameliorate adverse impacts found in new and ongoing monitoring and research efforts, similar to what has been done for Condition 1. The condition remains open and at risk of falling "behind target" at reassessment next year if progress against the plan developed by KRAA is not considered sufficient to satisfy the 4th milestone of the action plan.

Table 11. Condition 6- Chignik

Performance Indicator(s) & Score(s)	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
	1.1.2	Limit and target reference points or operational equivalents are appropriate for the wild production components of the stock	**60/80**
Condition	By the end of the fourth year of certification, the SG 80 scoring requirements must be met in full. This will be achieved when it has been demonstrated that: (PI 1.1.2, SG80a) Reference points are appropriate for the wild stock and can be estimated, (PI 1.1.2, SG80b) The limit reference point (e.g., lower end of the Sustainable Escapement Goal or equivalent) is set above the level at which there is an appreciable risk of impairing reproductive capacity, (PI 1.1.2, SG80c) The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome and, (PI 1.1.2, SG80e) Where the wild stock is a management unit comprised of more than one subcomponent, it is highly likely that the target and limit reference points are consistent with maintaining the inherent diversity and reproductive capacity of each stock subcomponent.		
Milestones	The annual harvest of Coho salmon may in some years not qualify under MSC standards as an IPI species and a target reference point may be needed to show that the fishery is managed to meet MSC standards. This condition will be met with the following actions: Year 1: ASPA will consult with ADF&G and prepare a memo describing the approach for managing local Chignik Coho salmon to ensure that the spawning escapement is adequate. Year 2: ASPA will review and provide an initial report on existing information available from ADF&G on the harvest and escapement of local Chignik Coho during the fishing period. Year 3: ASPA will provide an updated report if new information becomes available. Year 4: ASPA will provide a final report demonstrating that ADF&G management strategies achieve the SG80 scoring requirements: a) Reference points are appropriate for the wild stock and can be estimated. b) The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. c) The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome. d) Where the wild stock is a management unit comprised of more than one subcomponent, it is highly likely that the target and limit reference points are consistent with maintaining the inherent diversity and reproductive capacity of each stock subcomponent.		
Client	See above under ‘milestones.’		

action plan	
Progress on Condition [Year 1]	Escapement goals are established for Chinook salmon (BEG), Sockeye salmon (SEG), pink salmon (SEG) and Chum salmon (SEG) in the Chignik Management Area (Figure 1). All of these goals are based on counts past a weir on the Chignik River with the pink and Chum salmon goals also incorporating peak aerial survey observations for neighboring streams (Sagalkin et al. 2013). At this time there are no plans for establishing an escapement goal for Coho salmon to the Chignik River. The Chignik Weir is typically operated from approximately late May through the first few days of September with the peak Coho salmon escapement occurring after the weir is pulled. Harvests of Coho salmon are generally incidental to the Sockeye salmon fishery. An examination of the harvest by year of the five species of salmon caught in the Chignik Bay District and Outer Chignik Bay Section illustrate that the Coho salmon harvest is a small component of the total salmon harvest and strongly suggests it is an IPI species (Inseparable or Practically Inseparable). Coho salmon comprised less than 6% of the total salmon harvest for all years between 1995 and 2014 and contributed less than 15% of the total late season salmon harvest for 14 out of the last 15 seasons. The ADF&G obtained a grant through the Alaska Sustainable Salmon Fund (AKSSF) to examine the late season escapement of salmon after the weir was pulled for the 2012 through 2016 seasons. The project used DIDSON sonar for counting and gillnetting for species apportionment. The project has been run into late September the past three years. Less than 15% of the Coho salmon escapement was enumerated by the weir during the evaluation to date. The exploitation rate for Coho salmon was estimated for 2012-2014 and found to be less than 0.16 for all three seasons. At this time, there is no funding commitment for operating the DIDSON project after the 2016 season. A modeling study has been undertaken by Timothy Walsworth and Daniel Schindler, School of Aquatic and Fishery Sciences, University of Washington, where historic Coho salmon escapements to the Chignik River were estimated. A manuscript describing the work is presently in journal review. The estimates were made using a Bayesian hierarchical model which made use of run timing information obtained by weir counts for seasons that ran into late September (1922-1936) and the recent DIDSON estimates, to estimate the escapement for years when weir counting was stopped in early September (1995-2011). While it appears that estimates of total escapement can be made using this method, these estimates were based on very little information and an evaluation of the methodology needs to be undertaken to determine if it would be useful for use in setting escapement goals. Coho salmon in the Chignik Management Area are largely captured incidentally to Sockeye salmon. This year, the client provided important information showing that the harvest rate on Chignik Lake system Coho salmon during implementation of the commercial fishery is currently low: 12.8% in 2012, 6.8% in 2013, and 15.8% in 2014. Also, the harvest rate on the entire Chignik Lake system Coho salmon population is somewhat lower than estimated here because some Coho salmon continue to enter the watershed after fishing ends and after the Didson sonar counts that ended in late September.

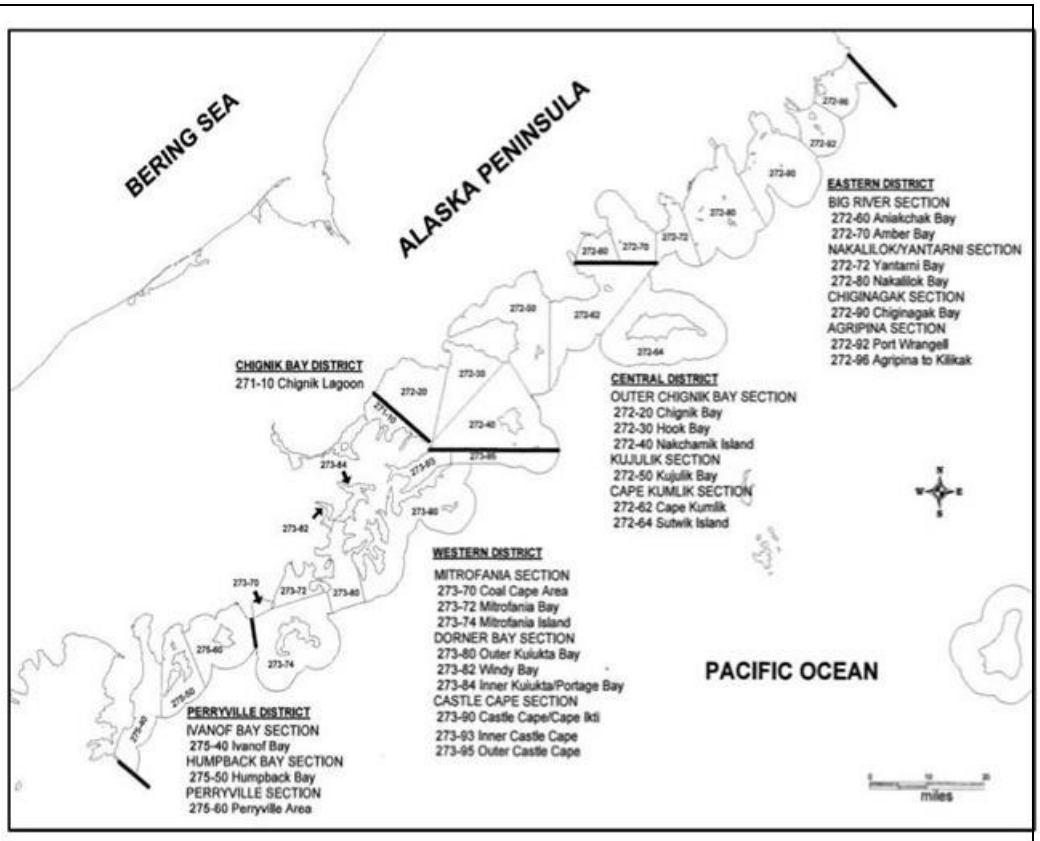

Figure 7. Chignik Management Area illustrating district and section boundaries, and statistical areas.

Table 12. Salmon harvest by year and the percent of that harvest made up of Coho salmon for the complete season (12a) and for the later part of the salmon season (12b). Salmon harvests are from the Chignik Bay District and Outer Chignik Bay Section (Figure 1; Statistical areas 271-10, 272-20, 272-30, and 272 40). These harvests do not include the entire Chignik Management Area, but they do largely reflect harvests of Sockeye, Chinook, and Coho salmon returning to the Chignik Lake system.

12a	Harvest for the Complete season					
Year	Coho	Chinook	Sockeye	Pink	Chum	% Coho
2000	43,428	811	1,441,425	188,585	51,159	2.6%
2001	24,818	1,366	1,240,560	399,691	52,216	1.5%
2002	11,802	896	1,009,285	20,216	11,550	1.1%
2003	44,659	2,611	1,044,707	128,211	20,362	3.7%
2004	37	2,337	697,043	2,380	505	0.0%
2005	1,073	2,765	1,103,952	150,167	6,512	0.1%
2006	8,517	2,055	803,051	105,823	9,945	0.9%
2007	17,037	777	588,435	414,209	13,732	1.7%
2008	52,674	323	573,006	469,759	37,009	4.9%
2009	13,601	729	939,507	184,222	43,763	1.2%
2010	38,356	2,945	971,235	139,177	155,565	3.0%
2011	11,404	2,577	1,897,189	158,921	75,982	0.5%
2012	8,908	1,154	1,313,092	45,744	44,320	0.6%
2013	8,382	1,071	1,775,317	221,562	33,239	0.4%
2014	17,205	2,008	246,707	65,719	15,528	5.2%

12b	Harvest between August 1 the end of the season

Year	Coho	Chinook	Sockeye	Pink	Chum	% Coho
2000	34,222	138	168,140	116,892	21,564	11.2%
2001	19,844	137	476,990	240,149	18,183	2.7%
2002	11,283	44	119,611	16,639	6,708	7.9%
2003	41,822	205	196,970	61,739	11,261	15.5%
2004	4	44	5,284	708	90	0.1%
2005	133	6	5,263	18,355	592	0.5%
2006	7,529	16	72,121	80,476	1,839	4.9%
2007	14,496	25	95,938	273,166	6,582	3.9%
2008	50,970	63	167,307	302,723	16,731	10.5%
2009	9,985	38	135,959	91,314	18,662	4.1%
2010	30,854	95	163,700	72,982	58,405	10.5%
2011	6,987	268	51,650	91,330	20,883	4.3%
2012	7,803	39	96,994	20,214	7,687	6.2%
2013	4,399	16	121,896	124,339	8,087	1.7%
2014	11,469	511	55,132	27,476	4,652	13.1%

Table 13. Number of Coho salmon enumerated past the Chignik weir during weir operations and past the DIDSON sonar after the weir was discontinued for the season. The Coho salmon harvest is the season total from the Chignik Bay District and Outer Chignik Bay Section (Figure 1; Statistical areas 271-10, 272-20, 272¬30, and 272 40).

	Escapement Counts			%	Harvest	**Exploitation rate**
Year	Weir	DIDSON	Total	counted		
2012	2,663	66,812	69,475	3.8%	8,908	0.128
2013	16,783	106,249	123,032	13.6%	8,382	0.068
2014	15,572	93,383	108,955	14.3%	17,205	0.158

Final days of DIDSON counting: 2012: September 28, 2013: September 27, 2014: September 26

From 2011-2014, harvested Coho salmon represented 3.1% of the total Chignik salmon catch by weight. This percentage exceeds the 2% threshold for an exemption to the MSC's Inseparable/Practically Inseparable (IPI) requirements, but is within the 2% - 15% range over which IPI requirements can be applied, as confirmed through an accepted variation request (VR) submitted to the MSC in March 2013 (http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/pacific/alaska-salmon/new-client-2nd-reassessment-downloads). It also falls below the 5% IPI threshold now adopted by the MSC for the SamFAM in the new Certification Requirements (MSC 2014). Given the new information on harvest rate and run timing, the assessment team is now satisfied that the IPI requirements should be applied to the Chignik Coho salmon stock. An assessment of the Chignik Coho salmon performance against PI 2.1.1 - 2.1.3 and Annex CH4.2 was therefore undertaken, the results of which are provided in the section on IPI species, below. This analysis showed that Chignik Coho salmon scores 80 for PIs 2.1.1, 2.1.2 and 2.1.3, and that it meets the requirements of Annex CH4.2; hence, Chignik Coho salmon is considered to meet the IPI requirements.

Status of condition	Condition 6 was closed at the Year 1 audit, and Chignik Coho salmon are eligible to enter further certified chains of custody. There is no further Year 2 or 3 updates.

5. Conclusion

The fishery has met the schedule for addressing conditions of certification to date, with revisions to the action plan identified in previous surveillances. Four of six conditions have been closed as of completion of the third surveillance audit. However, the remaining open conditions are unlikely to be closed during the current certification period, as is reflected in the current action plan timelines.

No changes in the fishery have occurred that would detrimentally affect the performance of this fishery against the MSC Standard and the fishery continues to meet the requirements of MSC certification. MSC Certification should therefore continue.

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Appendices

Appendix 1. Re-scoring evaluation tables

Performance Indicators 1.3.1, 1.3.2, and 1.3.3 for the Copper/Bering District UoC were rescored as a result of the 2nd surveillance audit. Performance Indicator 1.3.2, 1.3.3, and 2.5.2 for the Southeast Alaska UoC was rescored as a result of the 3rd surveillance audit. Updates to the text from the original report made as a result of surveillance are given in orange.

Evaluation Table: PI 1.3.1 – UOC 4: Copper/Bering Districts

PI 1.3.1		Enhancement activities do not negatively impact wild stocks or substitute for a stock rebuilding strategy	
SG	**Issue**	**Met? (Y/N)**	**Justification/Rationale**
60	**a**	**Y**	It is **likely** that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of wild stocks. The fishery meets this level of performance because it can be argued that it is likely that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of wild stocks.
80	**a**	**~~N~~Y**	It is **highly likely** that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of wild stocks. The enhancement activity in the Copper/Bering Districts UoC is the egg box program for Sockeye salmon at Gulkana Hatchery. Condition 29 from the 2007 MSC assessment of the Alaska salmon fishery was to "*Conduct a review of the Gulkana Sockeye hatchery program with emphasis on potential impacts to wild stocks*." When the fourth audit was undertaken for the previous assessment, a review was apparently scheduled but no results were available. It was therefore accepted that Condition 29 should be reviewed at reassessment, and either closed out or carried over in to a new certification if the fishery was recertified, depending on progress. ~~ADF&G has taken a somewhat precautionary stance by not approving permit alteration requests for increased production and additional points of stocking. Nevertheless, the results of a Gulkana review were not available to the assessment team at the time of writing this new assessment report (April 2013). As such, the fishery does not meet this level of performance and, consistent with MSC guidance (MSC 2013a), existing Condition 29 is effectively carried over to this new assessment as new Condition 4.~~ ~~It may, though, be noted that the fourth audit conclusion for Condition 29 stated: "*It is difficult to determine from these hatchery evaluations whether the evaluation of the Gulkana Hatchery in 2012 will be sufficiently detailed to meet the intent of this condition*." With that in mind, it is also important that controversies surrounding PWSAC's recent requests to increase the permitted release numbers (permit alteration request or PAR ADF&G 2009a, Regnart 2010) uncovered potential issues including genetics, pathology, and management that will need to be addressed in the review if the fishery is to meet the SG80 level of performance for PIs 1.3.1, 1.3.2 and 1.3.3 in the Copper/Bering UoC.~~ ADF&G released the final review (Stopha 2013), written specifically as a response to the 2009 condition, although the overall objective was slightly wide of the mark: "An Evaluation of the Gulkana Salmon Hatchery for Consistency with Statewide Policies and Prescribed Management Practices."

			The donor stock for the Gulkana Hatchery is indigenous to the Gulkana River watershed, consistent with the State of Alaska Genetics Policy which is designed to minimize hatchery impacts on wild stocks. The Gulkana Hatchery is an integrated hatchery program where the hatchery broodstock is composed of up 40% naturally produced fish—a program that reduces the opportunity for domestication selection to alter the genetic makeup of the hatchery stock. A third-party project by an NGO assessed straying of Gulkana Hatchery fish into Upper Copper River tributaries in 2008 (Bidlack and Valentine 2009). One-hundred percent of the spawners returning to the hatchery release site were of hatchery origin; no spawners observed in proximal spawning areas were of hatchery origin. The contribution of Gulkana Hatchery fish to the escapement was taken into account when establishing the Copper River escapement goal (300,000L - 500,000U); the escapement has been near or above the upper bound every year since 2003. Surveillance 1 observed that the current hatchery operator is functioning within stricter compliance of State of Alaska policies and practices than did Alaska Department of Fish and Game FRED Division when it operated the hatchery from 1973-1993. New information provided at the second surveillance from historical coded wire tagging studies corroborated more recent results of otolith marking studies which showed virtually no straying of Gulkana Hatchery Sockeye into other natural spawning areas. In total, new information provided since the assessment has demonstrated that: 1) harvest is effectively apportioned between hatchery and wild fish and 2) hatchery-origin fish comprise a relatively insignificant proportion of wild spawners in areas outside of the hatchery vicinity. This meets the SG80, and leads to closing out the condition.
100	**a**	**N**	There is a **high degree of certainty** that the enhancement activities do not have significant negative impacts on the local adaptation, reproductive performance and productivity or diversity of wild stocks.
			The fishery does not meet this level of performance.
References			ADF&G (2009a), MSC (2013a), Regnart (2010).

UNIT OF CERTIFICATION		**OVERALL PERFORMANCE INDICATOR SCORE:**	**CONDITION NUMBER (if relevant)**
4	**COPPER/BERING**	~~**60**~~ **80**	**4**

Evaluation Table: PI 1.3.2 – UOC 4: Copper/Bering Districts

PI 1.3.2		Effective enhancement and fishery strategies are in place to address effects of enhancement activities on wild stock status	
SG	**Issue**	**Met? (Y/N)**	**Justification/Rationale**
60	**a**	**Y**	**Practices and protocols** are in place to protect wild stocks from significant detrimental impacts of enhancement. The fishery meets this level of performance because there are genetic and pathology policies and hatchery permitting regulations in place to protect wild stocks from detrimental impacts of enhancement.
	b	**Y**	The practices and protocols in place are **considered likely** to be effective based on plausible argument. The fishery meets this level of performance because the practices and protocols in place are considered likely to be effective based on plausible argument.
80	**a**	**Y**	There is a **partial strategy** in place to protect wild stocks from significant detrimental impacts of enhancement. The fishery meets this level of performance because here is a **partial strategy** in place.
	b	**~~N~~Y**	There is **some objective basis for confidence** that the strategy is effective, based on evidence that the strategy is achieving the outcome metrics used to define the minimum detrimental impacts (e.g., related to verifying and achieving acceptable proportions of hatchery-origin fish in the natural spawning escapement). ~~No comprehensive studies have been conducted on the effect of stocking of Gulkana Hatchery Sockeye into Crosswind and Summit lakes. Neither straying studies nor studies of genetic impacts have been done. Biologists attest that '*managing wild stock Sockeye salmon spawning escapement for the Copper River is complicated by large returns of enhanced fish with similar run timing ...*" (ADFG 2009a). The fishery does not meet this level of performance, and Existing Condition 29 is carried over to this new assessment as new Condition 4 (see notes in PI 1.3.1, SG 80a). This will need to be completed in order for the fishery to meet this level of performance.~~ ADF&G released the final review (Stopha 2013), written specifically as a response to the 2009 condition, although the overall objective was slightly wide of the mark: "An Evaluation of the Gulkana Salmon Hatchery for Consistency with Statewide Policies and Prescribed Management Practices." The donor stock for the Gulkana Hatchery is indigenous to the Gulkana River watershed, consistent with the State of Alaska Genetics Policy which is designed to minimize hatchery impacts on wild stocks. The Gulkana Hatchery is an integrated hatchery program where the hatchery broodstock is composed of up 40% naturally produced fish—a program that reduces the opportunity for domestication selection to alter the genetic makeup of the hatchery stock. A third-party project by an NGO assessed straying of Gulkana Hatchery fish into Upper Copper River tributaries in 2008 (Bidlack and Valentine 2009). One-hundred percent of the spawners returning to the hatchery release site were of hatchery origin; no spawners observed in proximal spawning areas were of hatchery origin. The contribution of Gulkana Hatchery fish to the escapement was taken into account when establishing the Copper River escapement goal (300,000L - 500,000U); the escapement has been near or above the

			upper bound every year since 2003. Surveillance 1 observed that the current hatchery operator is functioning within stricter compliance of State of Alaska policies and practices than did Alaska Department of Fish and Game FRED Division when it operated the hatchery from 1973-1993. New information provided at the second surveillance from historical coded wire tagging studies corroborated more recent results of otolith marking studies which showed virtually no straying of Gulkana Hatchery Sockeye into other natural spawning areas. In total, new information provided since the assessment has demonstrated that: 1) harvest is effectively apportioned between hatchery and wild fish and 2) hatchery-origin fish comprise a relatively insignificant proportion of wild spawners in areas outside of the hatchery vicinity. The combination of compliance with hatchery guidelines and tagging results showing virtually no straying provides an objective basis for concluding that the strategy is effective, meeting the SG80 and leading to closing out the condition.
100	**a**	**N**	There is a **comprehensive strategy** in place to protect wild stocks from significant detrimental impacts of enhancement. The fishery does not meet this level of performance.
	b	**N**	There is **clear evidence** that the strategy is successfully protecting wild stocks from significant detrimental impacts of enhancement. The fishery does not meet this level of performance.
References			ADF&G (2009a).

UNIT OF CERTIFICATION		**OVERALL PERFORMANCE INDICATOR SCORE:**	**CONDITION NUMBER (if relevant)**
4	**COPPER/BERING**	~~**70**~~ **80**	**4**

Evaluation Table: PI 1.3.3 – UOC 4: Copper/Bering Districts

PI 1.3.3		Relevant information is collected and assessments are adequate to determine the effect of enhancement activities on wild stock status	
SG	**Issue**	**Met? (Y/N)**	**Justification/Rationale**
60	**a**	**Y**	Some relevant information is available on the contribution of enhanced fish to the harvest and wild escapement of the stock. The fishery meets this level of performance because the return of hatchery fish is estimated based upon strontium marks.
	b	**Y**	The effect of enhancement activities on wild stock status, productivity and diversity are taken into account. The fishery meets this level of performance because area managers take into account the effect of enhancement activities when making management decisions.
80	**a**	**~~N~~ Y**	Sufficient relevant information is available on the contribution of enhanced fish to the harvest and wild escapement of the stock. Contribution of enhanced fish to harvest is estimated based upon preseason forecasts and recovery of strontium marks in the fishery (Botz *et al*. 2012). ~~However, no research has been reported on the potential impacts of hatchery strays into wild stock escapement, so the fishery does not meet this level of performance. New Condition 4, a development of existing Condition 29 that was carried over from the previous certification, needs to be completed in order for the fishery to meet this level of performance (see notes in PI 1.3.1, SG 80a).~~
	b	**~~N~~ Y**	The assessment includes estimates of the impacts of enhancement activities on wild stock status, productivity and diversity. ~~As for SI 80a, the fishery does not meet this level of performance, and new Condition 4 needs to be completed in order for the fishery to meet this level of performance. (see notes in PI 1.3.1, SG 80a).~~ ADF&G released the final review (Stopha 2013), written specifically as a response to the 2009 condition, although the overall objective was slightly wide of the mark: "An Evaluation of the Gulkana Salmon Hatchery for Consistency with Statewide Policies and Prescribed Management Practices." The donor stock for the Gulkana Hatchery is indigenous to the Gulkana River watershed, consistent with the State of Alaska Genetics Policy which is designed to minimize hatchery impacts on wild stocks. The Gulkana Hatchery is an integrated hatchery program where the hatchery broodstock is composed of up 40% naturally produced fish—a program that reduces the opportunity for domestication selection to alter the genetic makeup of the hatchery stock. A third-party project by an NGO assessed straying of Gulkana Hatchery fish into Upper Copper River tributaries in 2008 (Bidlack and Valentine 2009). One-hundred percent of the spawners returning to the hatchery release site were of hatchery origin; no spawners observed in proximal spawning areas were of hatchery origin. The contribution of Gulkana Hatchery fish to the escapement was taken into account when establishing the Copper River escapement goal (300,000L - 500,000U); the escapement has been near or above the upper bound every year since 2003. Surveillance 1 observed that the current hatchery operator is functioning

			within stricter compliance of State of Alaska policies and practices than did Alaska Department of Fish and Game FRED Division when it operated the hatchery from 1973-1993. New information provided at the second surveillance from historical coded wire tagging studies corroborated more recent results of otolith marking studies which showed virtually no straying of Gulkana Hatchery Sockeye into other natural spawning areas. In total, new information provided since the assessment has demonstrated that: 1) harvest is effectively apportioned between hatchery and wild fish and 2) hatchery-origin fish comprise a relatively insignificant proportion of wild spawners in areas outside of the hatchery vicinity. This information leads to estimates of minimal impacts to wild stocks, meeting the SG80 and leading to closing out the condition.
100	**a**	**N**	A comprehensive range of relevant information is available on the contribution of enhanced fish to the harvest and wild escapement of the stock.
			The fishery does not meet this level of performance.
	b	**N**	The assessment is appropriate and takes into account the major features relevant to the biology of the species and the effects of any enhancement activities on the wild stock status, productivity and diversity.
			The fishery does not meet this level of performance.
References			ADF&G (2009a), Botz *et al*. (2012).

UNIT OF CERTIFICATION		**OVERALL PERFORMANCE INDICATOR SCORE:**	**CONDITION NUMBER (if relevant)**
4	**COPPER/BERING**	~~**60**~~ **80**	**4**

Evaluation Table: PI 1.3.2 – UoC 1: SEAK

PI 1.3.2		Effective enhancement and fishery strategies are in place to address effects of enhancement activities on wild stock status	
SG	**Issue**	**Met? (Y/N)**	**Justification/Rationale**
60	**a**	**Y**	**Practices and protocols** are in place to protect wild stocks from significant detrimental impacts of enhancement.
			The impact of enhancement activities on wild stocks of all five salmon species (i.e., Sockeye, Chinook, Coho, pink and Chum) has been considered under the enhancement PIs 1.3.1, 1.3.2 and 1.3.3. Current policies and regulations are in place statewide that are precautionary and regulate enhancement activities. The fishery exceeds this performance level.
	b	**Y**	The practices and protocols in place are **considered likely** to be effective based on plausible argument.
			The fishery exceeds this performance level.
80	**a**	**Y**	There is a **partial strategy** in place to protect wild stocks from significant detrimental impacts of enhancement.
			Chinook, Coho and pink salmon exceed this level of performance. A range of policies, statutes and regulations promote the protection of wild salmon. These include Salmon Regional Planning Plans, ADF&G Genetics Policy, the FRED Division Statute 1971, the PNP Hatchery Permitting Statute, the Regional Planning Statute 1976, the BOF Hatchery Management Policy, Fish Transport Regulations 1981, the PNP Regulations 1985, the Genetics Policy 1985, the Pathology Policy 1988, Wild and Enhanced Stock Statute 1992, Sockeye Salmon Culture Policy 1994, and the BOF Sustainable Salmon Policy 2000. The Policy for Management of Sustainable Salmon Fisheries (5AAC 39.222) requires that '*effects and interactions of introduced or enhanced salmon stocks on wild salmon stocks should be assessed; wild salmon stocks and fisheries on those stocks should be protected from adverse impacts from artificial propagation and enhancement efforts*'. Also, that '*Plans and proposals for development or expansion of salmon fisheries and enhancement programs should effectively document resource assessments, potential impacts, and other information needed to assure sustainable management of wild salmon stocks.*' Policy for the Management of Mixed-Stock salmon fisheries (5AAC 39.220) accords the highest priority to the conservation of wild salmon stocks. The Regional Planning Team Review Regulation (5AAC 40.170) provides review criteria which must be considered and include provisions for the protection of the naturally occurring stocks from any adverse effects which may originate from a proposed hatchery. Within SEAK, past practices of using pen reared Sockeye salmon have been designed to recover depressed stocks from overharvest or poor survival and lead to recovery. However, the establishment of an OEG that has no limit on the composition of hatchery components for Hugh Smith Lake adult returns in meeting escapements is not precautionary but does meet the requirement of a partial strategy, in particular because there have been no enhancement activities since 2003, and the last adults from that stocking program returned to the lake in 2007 (Brunette & Piston 2011). Similarly, monitoring of escapements from indicator stocks and monitoring hatchery composition has provided ADF&G with needed data to regulate future hatchery releases and remote release sites and constitutes a partial strategy, but does not address potential competitive effects nor does their appear to be a complete strategy as to
	b	**~~N~~Y**	There is **some objective basis for confidence** that the strategy is effective, based on evidence that the strategy is achieving the outcome

PI 1.3.2		Effective enhancement and fishery strategies are in place to address effects of enhancement activities on wild stock status	
SG	**Issue**	**Met? (Y/N)**	**Justification/Rationale**
			minimum detrimental impacts (e.g., related to verifying and achieving acceptable proportions of hatchery-origin fish in the natural spawning escapement). Sockeye releases have previously been used to supplement poor rates of return at McDonald and Hugh Smith Lakes, and Sockeye have been planted at many other lakes in Southeast Alaska, usually to support the recovery of depressed stocks or to seed systems for the purpose of developing new fisheries (Heinl *et al*. 2011). On occasion, pen reared Sockeye have been used to provide a source of adult returns back to the lake, but this is not carried out at present. Sockeye, Chinook, Coho and pink salmon exceed this level of performance. For Chum salmon, the assessment team noted the high levels of hatchery salmon relative to wild Chum salmon, and the levels of straying that have been observed in the NSI (Piston and Heinl 2012a; 2012b). As such, the assessment team concluded that there was concern that the hatchery management strategies were not being implemented to the extent that the fisheries would meet this level of performance. ~~A condition is therefore introduced (Condition 2).~~ ~~Condition 2 is closely related to the one introduced for SI 80a in PI 1.3.1. Essentially, the assessment team sees two options that would allow the Chum fishery to meet the SG80 level of performance for this SI. The first option is to reduce production levels and/or straying rates so that introgression and demographic effects are no longer a concern. The second option is to demonstrate that higher levels of straying, as previously observed, do not significantly negatively impact wild stocks (e.g., the study by ADF&G (2012f)), which is discussed in Condition 1).~~ The MSC guidance for this PI states that "*A likelihood of minimizing the numbers and proportions of hatchery fish interbreeding with wild fish in natural spawning areas would be expected to be supported by the use and evaluation of proven artificial production and harvest management strategies. Common examples typically include: a) Ensuring release at sites and with strategies that are likely to maximize imprinting and homing, and b) Scaling hatchery release numbers to a level that is consistent with not exceeding hatchery stray benchmarks in concert with other strategies*"**.** The assessment team also notes that the efficient harvest of hatchery fish without over-harvesting the wild-component is another approach for reducing stray salmon. The preferred option is to minimize straying, especially given the long period need to conduct the fitness study. A monitoring program has been implemented to quantify the incidence of Chum hatchery straying into natural production areas – this information provides a basis for further evaluation of the effects of remote releases. A review of scientific literature and current enhancement plans identified best management practices for limiting straying (PSPA 2016h). A review of current hatchery programs demonstrated that current remote releases are consistent with best management practices (PSPA 2016i). Analysis of otolith samples collected in natural production areas demonstrated a low incidence of straying of hatchery Chum salmon from on-site and remote release sites (PSPA 2016j). These reports demonstrated that there is some objective basis for confidence that the management strategy is effective, based on evidence that the strategy is achieving the outcome metrics used to define the minimum detrimental impacts (e.g., related to verifying and achieving acceptable proportions of hatchery-origin fish in the natural spawning escapement). This meets the SG80,

			leading to closing out the condition.
100	**a**	**N**	There is a **comprehensive strategy** in place to protect wild stocks from significant detrimental impacts of enhancement.
			SEAK enhancement and fishery strategies for Sockeye, Chinook, Coho and pink salmon meet this performance level based on regulations, policies and practices of ADF&G. Chum salmon hatched and reared in aquaculture facilities compose the majority of the harvest in SEAK and there is not a comprehensive strategy in place that has examined risks and limits to hatchery contributions and their ecosystem impacts, specifically as related to competition with wild stocks. The current system of reviewing PARs from each hatchery that wishes to expand, will likely result in ultimate failure if there is not an over-reaching guideline as to how much enhancement will be allowed in total before risks outweigh benefits. This component of the strategy falls short of this level of performance.
	b	**N**	There is **clear evidence** that the strategy is successfully protecting wild stocks from significant detrimental impacts of enhancement.
			SEAK enhancement and fishery strategies for Sockeye, Chinook, Coho and pink salmon meet this performance level based on escapement levels of wild salmon into respective streams and responsiveness of the Department to change strategies if wild salmon do not meet the lower end of the escapement goals consistently. Sockeye and Chum salmon, and therefore the SEAK fishery overall, do not meet this level of performance.
References			Brunette & Piston (2011), Heinl *et al*. (2011), Piston & Heinl (2011a), Piston & Heinl (2012a).

UNIT OF CERTIFICATION		**OVERALL PERFORMANCE INDICATOR SCORE:**	**CONDITION NUMBER (if relevant)**
1	**SEAK**	~~70~~80	~~2~~

Evaluation Table: PI 1.3.3 – UoC 1: SEAK

PI 1.3.3		Relevant information is collected and assessments are adequate to determine the effect of enhancement activities on wild stock status	
SG	**Issue**	**Met? (Y/N)**	**Justification/Rationale**
60	**a**	**Y**	Some relevant information is available on the contribution of enhanced fish to the harvest and wild escapement of the stock.
			The impact of enhancement activities on wild stocks of all five salmon species (i.e., Sockeye, Chinook, Coho, pink and Chum) has been considered under the enhancement PIs 1.3.1, 1.3.2 and 1.3.3. There are some relevant data available on straying and hatchery contribution to the harvest along with a significant number of long term estimates of escapement that were used to establish escapement goals for all species. The Sockeye, Chinook, Coho and pink fisheries exceed this level of performance. The Chum fishery meets this level of performance,
	b	**Y**	The effect of enhancement activities on wild stock status, productivity and diversity are taken into account.
			The fisheries for Sockeye and pink salmon exceed this level of performance. The fisheries for Chinook, Coho and Chum meet this level of performance because there are good policies and regulations in place that require that the effect of enhancement activities on wild stock status, productivity and diversity are taken into account.
80	**a**	**~~N~~Y**	Sufficient relevant information is available on the contribution of enhanced fish to the harvest and wild escapement of the stock.
			Sufficient relevant information is available through thermal marking of Sockeye in some systems on a short-term basis, and coded-wire tagging of Sockeye, Chinook and Coho more routinely, such that these species can be said to meet this level of performance. Pink salmon exceed this level of performance. Given high levels of Chum hatchery production and the relatively low abundance of wild Chum salmon, the assessment team considers that the evaluation of the effect of fishery harvest on wild Chum salmon is important. ~~For several years, the contribution of hatchery Chum to the mixed stock fishery was monitored, but this is no longer the case. The Chum fishery therefore does not meet this level of performance, and a condition is introduced (Condition 3).For Condition 3, we that note that this is likely to be facilitated by the near 100% thermal marking of hatchery Chum in SEAK, and anticipate that ADF&G's ongoing study in the region (ADF&G 2012f) may help the fishery to meet this condition.~~ All of the Chum salmon produced in hatcheries in Southeast Alaska are thermally marked. A 10-yr study of hatchery-wild interactions has been implemented for Chum Salmon in Southeast Alaska. This study provided estimates of the incidence of hatchery-origin spawners in representative natural production areas of Chum salmon. Hatchery fractions in 32 SEAK streams were found to be low (15% or less) in the large majority of streams surveyed during the three years of study to date. Coho salmon are produced by thousands of streams in Southeast Alaska. ADF&G assesses the status of the Coho salmon stock by trends in abundance and escapement for 14 indicator systems spread across the area, and concluded that the stocks appear to be in excellent condition (Shaul et al. 2011). Approximately 19-20 million Coho salmon smolt are released annually in Southeast Alaska at numerous sites. Hatcheries

			contributed an average of 19% of the Coho salmon in the Southeast Alaska commercial harvest between 2001 and 2010, although it appears that recent contributions have been approaching 30%. A retrospective study of historical CWT returns from streams where wild Coho salmon had been tagged as fry or smolt was undertaken by Shaul (2010). A total of 4,558 tags were recovered from adults in 34 systems from the years 1976-2007. Seventy four of the recovered tags had been placed in fish released outside of the system where they were recovered; of these 21 were wild fish and 53 were of hatchery origin (Shaul 2010). This study determined that 98% of the recovered Coho tags were found in their natal stream (Shaul et al. 2011). Given the scale and distribution of wild Coho throughout SEAK, risks of a significant hatchery impact on natural production appear to be low. While significant straying of hatchery fish may occur into some streams in the vicinity of some hatchery programs, the large majority of wild production areas are likely to contain few or no hatchery Coho, Existing information is sufficient to assess risks and to conclude that an additional straying investigation is not warranted for Coho salmon. Chinook salmon are known to occur in 34 rivers in, or draining into the Southeast region of Alaska (Der Hovanisian et al. 2011). ADF&G assesses the status of the Chinook salmon stock by trends in abundance and escapement for 11 drainages spread across the area and judged the monitored systems to be healthy (Der Hovanisian et al. 2011). Approximately 3 million Chinook salmon smolts are released annually in Southeast Alaska with the release sites being generally located away from the wild Chinook salmon systems. Hatcheries contributed an average of 19% of the Chinook salmon in the Southeast Alaska commercial harvest between 2001 and 2010 (Der Hovanisian et al. 2011). Straying information has been collected from coded wire tagging studies of fish returning to the major Chinook salmon systems. Very few of the CWT's recovered at these sites or to hatchery sites have been strays. For instance, just 4 out of 606 tags recovered from the Taku River from 1994 through were considered strays. Likewise, 8 out of 872 tags recovered from the Unuk River between 1996 and 2014 were considered strays (per comm., Phillip Richards, ADF&G). For Chinook salmon, hatchery CWT recoveries in sampled areas provides strong evidence that a low incidence of straying by hatchery-origin Chinook poses little risk to the large majority of wild populations. Existing information is sufficient to assess risks and to conclude that an additional straying investigation is not warranted for Chinook salmon. The information for Coho, Chum, and Chinook is sufficient to estimate the contribution of enhanced fish to the harvest and escapement of wild stocks, meeting the SG80 and leading to closing out the condition.
	b	~~N~~Y	The assessment includes estimates of the impacts of enhancement activities on wild stock status, productivity and diversity.

			For Sockeye, typically, fry are planted directly in to lakes with broodstock being acquired from the same stock from where the fry are being restocked. Limnological studies are typically conducted prior, during and after stocking to evaluate of impact of stocking on lake productivity. Very low levels of straying occur in Sockeye so net productivity can be accurately assessed, and stocking typically does not occur in excess of lake productivity. Sockeye meets this level of performance. Pink salmon exceed this level of performance because the level of enhancement is so low in comparison to wild pink salmon production. ~~Although the assessment team is aware of some studies and assessments that include estimates of the impacts of enhancement activities on wild stock status of Chinook, Coho and Chum salmon, but it is not clear that this work has included consideration of the impact of enhancement on productivity and diversity of wild stocks. A condition is therefore introduced (Condition 3).~~ ~~For Condition 3, the assessment team is especially concerned that the effect of remote releases is accounted for in the assessments because remote-released salmon likely have a higher rate of straying. For Chum salmon, we that note that this is likely to be facilitated by the near 100% thermal marking of hatchery Chum in SEAK, and anticipate that ADF&G's ongoing study in the region (ADF&G 2012f) may help the fishery to meet this condition.~~ Impacts of enhancement activities on wild stock status, productivity and diversity are currently evaluated by reference to guidelines for percentages of hatchery origin fish in natural spawning areas. Appendix 6 of this report describes an adaptation of the default guidance for application to Pink and Chum salmon in Alaska certifications. The intent of this guidance is to help ensure that the majority of genetic diversity and productive capacity of the SMU is protected from risks of enhancement activities in freshwater production areas. The ongoing hatchery-wild interaction study will provide specific empirical information in the future on fitness of wild Chum populations in Southeast Alaska as affected by hatchery-origin natural spawners. This is sufficient to meet the SG80. See also the above explanations for Chum, Coho and Chinook Salmon.
100	**a**	**N**	A comprehensive range of relevant information is available on the contribution of enhanced fish to the harvest and wild escapement of the stock.
			Sampling of coded wire tags, genetic information, and otolith marks, provide a comprehensive range of relevant information on the harvests and escapements of enhanced fish into the common property harvests. In the case of Chum salmon, the information base has been limited for determining escapement strays, and it is uncertain if evaluations are going to be continued in problem areas in the future. Consequently, the data used to make determinations is not considered comprehensive by the assessment team. Sockeye, Chinook, Coho and Chum do not meet this level of performance. The level of pink production is so low that the fishery can be said to exceed this level of performance.
	b	**N**	The assessment is appropriate and takes into account the major features relevant to the biology of the species and the effects of any enhancement activities on the wild stock status, productivity and diversity.

			The assessment team found insufficient information on the effects of enhancement activities on the wild stock status, productivity and diversity of the wild stocks. Sockeye, Chinook, Coho and Chum salmon do not meet this level of performance. The level of hatchery pink production is so low that the fishery can be said to meet this level of performance.
References			ADF&G (2012f)
UNIT OF CERTIFICATION		**OVERALL PERFORMANCE INDICATOR SCORE:**	**CONDITION NUMBER (if relevant)**
1	**SEAK**	~~**60**~~**80**	~~**3**~~

Evaluation Table: PI 2.5.2 – UoC 1: SEAK

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or	
SG	**Issue**	**Met? (Y/N)**	**Justification/Rationale**
60	**a**	**Y**	There are **measures** in place, if necessary. The fishery exceeds this level of performance.
	b	**Y**	The **measures** take into account potential impacts of the fishery on key elements of the ecosystem. The fishery exceeds this level of performance.
	c	**Y**	The measures are considered likely to work, based on **plausible argument** (e.g., general experience, theory or comparison with similar The fishery exceeds this level of performance.
	e	**Y**	There is an established artificial production strategy in place, if necessary, that is expected to achieve the SG 60 outcome as a Enhancement occurs in SEAK (UoC 1), Copper/Bering (UoC 4), LCI (UoC 5), UCI (UoC 6) and Kodiak (UoC 12). These UoCs with enhancement exceed this level of performance. There is no or negligible enhancement in Yakutat, Bristol Bay, Yukon, Kuskokwim, Kotzebue, Norton Sound, Chignik, Peninsula/Aleutians, and so these UoCs also exceed this level of performance.
80	**a**	**Y**	There is a **partial strategy** in place, if necessary. The partial strategy involves the development of the escapement goals in the different UoCs that aim to maintain healthy wild salmon populations, and provide for other species such as bears, birds and fish that depend on Alaska salmon. All UoCs meet this level of performance.
	b	**Y**	The partial strategy takes into account **available information and is expected to restrain impacts** of the fishery on the ecosystem so as to **achieve** the Ecosystem Outcome 80 level of performance. The achievement of escapement goals effectively restrains the impacts of the fishery on the ecosystem such that the outcome of 80 is achieved.
	c	**Y**	The partial strategy is considered likely to work, based on **plausible argument** (e.g., general experience, theory or comparison with similar The fishery exceeds this level of performance.
	d	**Y**	There is **some evidence** that the measures comprising the partial strategy are being **implemented successfully.** The fishery exceeds this level of performance.
	e	**N – ~~UoC 1~~ UoC 12** **Y All other UoCs**	There is a tested and evaluated artificial production strategy, if necessary, with sufficient monitoring in place and evidence is available to reasonably ensure with high likelihood that strategy is effective in Policies in Alaska provide for protection of the ecosystem function using a precautionary approach, however this scoring indicator refers to the implementation and testing of a strategy to ensure that enhancement (e.g., hatcheries) are not impacting ecosystem function. The strategy also includes enhancement plans in each region. ADF&G recently implemented a review of all hatchery operations in Alaska; reports have been completed for Kodiak and Cook Inlet. In ~~SEAK and~~ Kodiak, conditions were introduced for PI 1.3.1 and 1.3.3 because the assessment team does not consider that monitoring of hatchery fish within mixed stock fisheries is sufficient to meet the SG80 level of performance. Therefore, ~~these~~

PI	2.5.2	There are measures in place to ensure the fishery does not pose a risk of serious or	
SG	**Issue**	**Met? (Y/N)**	**Justification/Rationale**
			this ~~two~~ UoC~~s~~ ~~do~~ does not meet the SG80 level of performance for this Scoring Issue either. The condition~~s~~ placed on ~~SEAK (Condition 3) and~~ Kodiak (Condition 5) ~~are~~ is therefore linked to this PI also. ~~For Condition 3, the assessment team is especially concerned that the effect of remote releases is accounted for in the assessments because remote-released salmon likely have a higher rate of straying. For Chum salmon, we that note that this is likely to be facilitated by the near 100% thermal marking of hatchery Chum in SEAK, and anticipate that ADF&G's ongoing study in the region (ADF&G 2012f) may help the fishery to meet this condition.~~ The assessment team was concerned with the effect of remote releases of Chum Salmon in Southeast Alaska. However, subsequent evaluations completed since the reassessment have determined that remote releases are conducted according to best management practices for reducing straying and that the incidence of straying of Chum salmon from on site and remote releases into natural spawning areas is relatively low. This confirms that a tested and effective artificial production strategy is in place for Southeast Alaska. With respect to Condition 5, it is noted that hatchery stocks of all species do not comprise a major part of the harvests in the Kodiak UoC to date, and so the concern raised by the assessment team with respect to meeting the SG 80 level of performance is primarily related to straying into other systems at the current levels of release. The assessment team notes that straying monitoring is facilitated by the near 100% otolith marking of hatchery fish or coded wire tag programs in other regions of the State. A tagging program, including sampling of systems with high risks of straying and commercial landings from areas where mixed wild and hatchery fish are likely, is therefore recommended, at least for pink and Chum releases. For Chinook and Coho releases, a risk assessment may suffice, but, if future hatchery programs result in significant expansion of releases, these analyses should be sufficiently robust to determine risks to wild stock productivity with the proposed expansions. A complete marking program, implemented as a standard part of the hatchery's operations, would provide greater certainty given future expansion plans. If such a program illustrates minimal risk to wild stocks, it can be terminated unless major expansions in releases occur. The KRAA and ADF&G can address this issue using other means but should have external peer reviewed analysis conducted in support of using existing data to support findings to remove this condition. In other regions of Alaska with hatchery production (i.e., Copper/Bering, LCI and UCI), it is considered that there is sufficient monitoring in place and evidence is available to reasonably ensure with high likelihood that strategy is effective in achieving the SG 80 outcome. These UoCs therefore meet this level of performance. There is no or negligible enhancement in Yakutat, Bristol Bay, Yukon, Kuskokwim, Kotzebue, Norton Sound, Chignik, Peninsula/Aleutians, and so these UoCs exceed this level of performance.
100	**a**	**N**	There is a **strategy** that consists of a **plan**, in place. Although there is a partial strategy comprised of elements of different policies, it is not clear that these combine to form a plan. As such, the fishery does not meet this level of performance.

	b	**N**	The **strategy**, which consists of a **plan**, contains measures to **address all main impacts of the fishery** on the ecosystem, and at least some of these measures are in place. The plan and measures are **based on well-understood** functio relationships between the fishery and the Components and elements of the ecosystem. This plan provides for **development of a full strategy that restrains impacts** on the ecosystem to ensure the fishery does
			Although there is a partial strategy comprised of elements of different policies, it is not clear that these combine to form a plan to address all the main impacts of the fishery on the ecosystem. As such, the fishery does not meet this level of performance.
	c	**Y**	The measures are considered likely to work based on **prior experience**, plausible argument or **information** directly from the fishery/ecosystems involved.
			Maintaining escapement goals provides a plausible argument that the measures will continue to work, such that species and communities that depend on Alaska salmon will be maintained. The fishery meets this level of performance.
	d	**Y**	There is evidence that the measures are being **implemented successfully**.
			The escapement goal report (Munro & Volk 2012) provides evidence that spawning objectives are typically being met, suggesting that the needs of species depending on Alaska salmon are met. The fishery meets this level of performance.
	e	**N – UoC 1 UoC 4 UoC 5 UoC 6 UoC 12** **Y – All other UoCs**	There is a comprehensive and fully evaluated artificial production strategy, if necessary, to verify with high confidence that the SG 100 outcomes are being achieved.
			The artificial production strategy has received some evaluation but it has not been fully and comprehensively evaluated (see SG80). As such, UoCs with enhancement (SEAK, Copper/Bering, LCI, UCI and Kodiak) do not meet this level of performance. There is no or negligible enhancement in Yakutat, Bristol Bay, Yukon, Kuskokwim, Kotzebue, Norton Sound, Chignik and Peninsula/Aleutians, and so these UoCs meet this level of performance.
References		Munro & Volk (2012).	

UoC		**Performance Indicator Score**	**CONDITION NUMBER (if relevant)**
1	**SEAK**	~~75~~80	~~3 (Linked to SEAK PI 1.3.3)~~
2	**Yakutat**	**90**	**N/A**

3	PWS	The PWS UoC is still in assessment	
4	Copper/ Bering	85	N/A
5	LCI	85	N/A
6	UCI	85	N/A
7	Bristol Bay	90	N/A
8	Yukon	90	N/A
9	Kuskokwim	90	N/A
10	Kotzebue	90	N/A
11	Norton Sound	90	N/A
12	Kodiak	75	5 (Linked to Kodiak PI 1.3.1 and 1.3.3)
13	Chignik	90	N/A
14	Peninsula/Aleuti	90	N/A

Appendix 2. Stakeholder submissions

No written or verbal stakeholder submissions were received.

Appendix 3. Surveillance audit information

Information provided by the client as cited in the report above are available upon request from MRAG Americas.

Appendix 4. Additional detail on conditions/ actions/ results

N/A

Appendix 5. Revised Surveillance Program

The following surveillance program was established following the 2nd annual audit for Alaska Salmon and remains unchanged following the 3rd audit.

Table 14. Fishery Surveillance Program

Surveillance Level	Year 1	Year 2	Year 3	Year 4
Level 5	*On-site surveillance audit*	*On-site surveillance audit*	*On-site surveillance audit and PWS scope extension*	*On-site surveillance audit & re-certification site visit.*

Appendix 6 – Guidelines for Hatchery Impacts

No objective criteria are identified in CR1.3 for evaluating hatchery impacts but guidance was subsequently developed in modifications to the default assessment tree for salmon fisheries in CR2.0. This guidance is not obligatory for either CR1.3 or CR2.0 but provides useful benchmark for evaluating the likelihood of negative hatchery impacts due to straying. Default guidelines for acceptable hatchery impacts are identified in Box GSC1 of CR2.0. The intent of this guidance is to help ensure that the majority of genetic diversity and productive capacity of the SMU is protected from risks of enhancement activities in freshwater production areas.

Default guidelines were based on the percentage of hatchery-origin fish spawning in natural production areas. Different guidelines are identified for "integrated" and "segregated" hatchery programs (Table 15).

> Integrated hatchery programs are those where a composite hatchery and wild population spawns in both the hatchery and the wild and the natural environment continues to drive adaptation and fitness. Integrated hatchery programs require regular incorporation of significant percentages of natural-origin spawners in the hatchery broodstock (pNOB) and limits on percentages on hatchery-origin spawners (pHOS) in natural spawning areas.
>
> Segregated hatchery programs are maintained as reproductively distinct or genetically segregated from wild production. Segregated programs do not involve continuing use of significant percentages of natural-origin fish in hatchery broodstock. In this case, more stringent limitations on pHOS from segregated programs are identified to avoid the potential for negative hatchery influences where the adaptation and fitness of the hatchery subpopulation is no longer driven by the natural environment.

According to CR2.0 guidance, the objective criteria identified based on pHOS are derived from studies on Chinook, Coho, Sockeye and Steelhead. The guidance also indicates that impact guidelines for Pink and Chum may be relaxed from these levels with sufficient justification. The basis for this distinction is that pink and chum salmon are released at early ages (a few months) which probably leads to a lower risk of genetic changes than in Chinook, Coho, Sockeye and Steelhead which are typically reared in the hatchery for one year. Specific numerical criteria are not identified.

Based on CR2.0 guidance, MRAG identified criteria in Table 16 for Pink and Chum Salmon. These criteria were adapted for use in a potential Prince William Sound assessment and are also applicable to Chum Salmon in Southeast Alaska. These guidelines incrementally increase allowable hatchery fractions from those developed for stream-rearing salmonid populations. This standard reflects differences in the life history of Pink and Chum Salmon characterized by a naturally higher incidence of inter-population straying. This pattern is evinced by a genetic stock structure for these species where inter-populations differences are small or negligible based on research conducted in PWS and Southeast Alaska. Pink and Chum Salmon often spawn in small streams and even inter-tidal habitats whose availability can vary considerably from year to year depending on environmental conditions. As a result, straying behavior is thought to be naturally much more common among these species than in freshwater rearing species like Chinook, Coho and Sockeye Salmon.

Table 15. Summary of default acceptable impact guidelines for artificial production based on percentage of hatchery origin spawners (pHOS) in natural production areas (CR 2.0 Box GSC1 pg. 496). Guidelines are derived from studies on freshwater-rearing Chinook, Coho, Sockeye and Steelhead species.

Program Type	Scoring Guidepost	Stock Management Unit	Populations
Integrated	60	pHOS ≤33%	pHOS <1% in >50% of populations
	80	Based on proportion of natural origin broodstock	
Segregated	60	pHOS ≤10%	
	80	pHOS ≤5%	

[a] *Populations should be representative of the productivity and genetic diversity of populations within the SMU.*

Table 16. Impact guidelines for percentage of hatchery origin spawners (pHOS) in natural production areas identified by this pre-assessment for of Pink and Chum Salmon based on guidance in CR 2.0 (Box GSC1 pg. 496).

Program Type	Scoring Guidepost	Stock Management Unit	Populations
Integrated	60	pHOS ≤33%	pHOS <5% in >50% of populations
	80	Based on proportion of natural origin broodstock	
Segregated	60	pHOS ≤20%	pHOS <5% in >50% of populations
	80	pHOS ≤10%	pHOS <1% in >50% of populations