First Annual Surveillance Report
Gulf of Alaska Pollock Fishery

Certificate No.: MML-FC-007

Moody Marine Ltd.

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1.0 GENERAL INFORMATION

Scope against which the surveillance is undertaken: MSC Principles and Criteria for Sustainable Fishing as applied to the Pollock Fishery.

Species: Pollock (*Theragra chalcogramma*)

Area: Gulf of Alaska (GOA)

Methods of capture: Trawl

Date of Surveillance Visit:	**9-13th May 2011**			
Initial Certification	**Date: 30th September 2010**		**Certificate No.: MML-FC-007**	
Surveillance stage	**1st**	**2nd**	**3rd**	**4th**
Surveillance team:	**Lead Auditor: Paul Knapman** **Team members: Jake Rice, Don Bowen, Susan Hanna**			
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2.0 RESULTS, CONCLUSIONS AND RECOMMENDATIONS

This report contains the findings of the first surveillance audit in relation to the At Sea Processors Association (APA) Pollock Fishery in the Gulf of Alaska (GOA). The surveillance audit was carried out in accordance with the Marine Stewardship Council (MSC) Fisheries Certification Methodology (FCM) Version 6 (1).

An announcement of the surveillance site visit was sent to recognised stakeholders on 14th April 2011 and published on the MSC website advising stakeholders that the audit site visit would take place the week of 9th May. (See appendix A).

The surveillance team – Jake Rice, Don Bowen, Susan Hanna and Paul Knapman - met with members of the client group and staff at the Alaska Fisheries Science Center (AFSC) (National Marine Fisheries Service – NOAA Fisheries) between 10th and 12th May 2011. Information and evidence was gathered on the status of the stock, the performance of the fishery throughout the year, measures to meet the Conditions of Certification and changes in management.

The following section is set out as a table within which general information about the status of the stock and the fishery for this reporting period is provided along with the surveillance team's observations, conclusions and recommendations on the current status of the fishery and the client's progress toward meeting the Conditions of Certification.

The table includes the original assessment scoring guideposts and scoring commentary and the requirements of the original Condition alongside the heading 'Activity assessed'. This identifies the areas in which the fishery was determined to perform below the level required by the MSC standard during the initial assessment, and the required actions to address these issues.

As required by the MSC certification methodology, APA produced an Action Plan setting out the stages involved in addressing the Conditions raised. This is set out in the table alongside the heading 'APA Action Plan'.

According to the terms of the Action Plan, the client has provided information on the work undertaken to date alongside the 'APA Progress Report'.

This progress has been evaluated by the Moody Marine surveillance team ('Observations' and 'Conclusion') against:

1. the commitments made in the Action Plan;
2. the intent of the original Condition; and,
3. the original scoring indicator, guideposts and commentary.

The influence of any overall legislative and management changes in the fishery are also taken into consideration.

When the Condition has been judged to have been met, a re-evaluation of the scoring allocated to the relevant Performance Indicator(s) in the original MSC assessment will be included within the evaluation, and if the score is 80 or more, then the Condition is closed.

	Comments
	Stock status
Activity assessed	Moody Marine asked APA to prepare an update on the GOA Pollock stock status for 2010. The intent of this section is to bring background information up to date and so to allow subsequent condition information to be evaluated in light of the current situation. Alaska Fisheries Science Center (AFSC) scientists updated assessments for eastern Bering Sea (EBS), Aleutian Islands (AI), and Gulf of Alaska (GOA) pollock during November, 2010. The assessments are available at: www.afsc.noaa.gov/REFM/Stocks/assessments.htm. The assessments were reviewed by the Bering Sea and Aleutian Islands (BSAI) and GOA groundfish "plan teams." The teams are convened by the North Pacific Fishery Management Council (NPFMC). In December the assessments and plan-team reviews were considered by the NPFMC Science and Statistical Committee (SSC). Using this information, the SSC provided recommendations for overfishing (OFL) and acceptable biological catch (ABC) amounts for the 2011 fishing year. Subsequently, the NPFMC adopted a total allowable catch (TAC) for each stock. The discussion below summarizes the issues considered and the results obtained for Alaska pollock during this annual "harvest specifications" process. A description of the process and a summary of the results for 2010 are provided by the NPFMC (2010a,b). See also the summary at: www.afsc.noaa.gov/Quarterly/ond2010/divrptsREFM10.htm. **Gulf of Alaska Pollock Fishery** **Assessment Structure and Input Data** There were no changes to the age-structured assessment model for 2010. All of the "standard" assessment input data updates were included in the revised model except for the NMFS bottom-trawl survey, which is a biennial survey and was not conducted during 2010. These new data included (1) biomass and length compositions from the annual summer bottom-trawl survey of GOA near-shore areas conducted by the ADF&G; (2) biomass and age compositions from the 2010 NMFS acoustic, water-column (EIT) survey of the Shelikof Strait spawning grounds; (3) age compositions from the 2009 NMFS bottom-trawl survey; and (4) total catches and age compositions from the 2009 fishery. As in recent years, the EIT survey was carried out during the spawning period (late winter-early spring), and was expanded to investigate known spawning aggregations north of the Shumagin Islands, in Sanak Island gully, and along the Chirikof-area shelf break. Results from all of these surveys are used to provide estimates of pollock biomass and its distribution over the GOA shelf as well as the expected length and age composition of the biomass during the fishery (Guttormsen and Jones 2010). The reference model for GOA pollock does not estimate the NMFS bottom-trawl survey catchability endogenously, but rather fixes this parameter at one (1.0). A likelihood profile for the survey catchability developed from alternative model runs with catchability estimated endogenously shows that a survey catchability of about 0.65 yields the highest likelihood value (Dorn et al. 2010, Figure 1.19). Model estimation with survey catchability less than one results in higher estimated stock sizes and thus higher $F_{40\%}$ ABC tonnages. As such, the choice to fix the bottom-trawl survey catchability at 1.0 in the GOA assessment represents a "hidden"

element of conservatism in the model, since estimates of stock biomass and yield are lower when catchability is fixed at 1.0.

Survey Results

The 2010 Shelikof Strait echo-integration trawl survey showed a biomass estimate of 429,730 tons, an increase of 62 percent over 2009. Most of the increase was due to increased biomass of pollock larger than 42 cm — a proxy for spawning biomass (Dorn et al. 2010, Figure 1.5). This increase in recruitment to the spawning stock began in 2009 after the stock reached a low point in 2008. Additional EIT surveys covered the Shumagin Islands spawning area, Sanak Gully, Morzhovoi Bay, Pavlov Bay, Chirikof, and Marmot Bay. In comparison to 2009, biomass estimates were lower in the western GOA, and generally higher in the central GOA (Figure 1.6). Also, an exploratory survey along the Kenai Peninsula and through Prince William Sound found significant quantities of pre-spawning pollock (more than 100,000 tons) although it is uncertain whether these aggregations have always been present at the observed level of abundance.

In contrast, the 2010 biomass estimate from the ADF&G bottom-trawl survey, at 124,110 tons, was down about 15 percent from the 2009 estimate. However, the biomass estimate is up about 60 percent from the mean value during 2006-2008, and reflects the recruitments of a large mode of small pollock (about 45 cm) observed during the 2008 survey (Dorn et al. 2010, Figure 1.8). The 2009 NMFS bottom trawl survey was substantially higher (2.4 times) than the 2007 survey, and showed higher than anticipated numbers of five year old pollock (2004 year class) as well as large numbers of the 2008 year class. The next NMFS bottom-trawl survey is scheduled for 2011.

The short-term concern with GOA pollock has been the low survey estimates of spawning biomass for Shelikof Strait and other spawning areas in 2007, 2008, and 2009. In previous years, concerns about spawning activity in Shelikof Strait were lessened by additional winter survey efforts which, in aggregate, showed estimates of spawning biomass that approximated the model estimate. In 2010, estimates of spawning biomass in Shelikof Strait increased substantially and biomass estimates from all areas were higher by 86 percent. The 2010 estimates also confirmed the above average 2007 year class, which was evident in both the 2008 and 2009 surveys (Dorn et al. 2010, Table 1.10).

Analysis of recruitment and spawner productivity shows that since 1980 strong year classes have recruited every four to six years, and that strong and weak year classes have been produced at high and low levels of spawning biomass. For example, the 1972 year class, one of the strongest on record, was produced by a spawning biomass estimate close to the current level (Dorn et al. 2010, p. 70).

Stock Status

Table 1 summarizes the evolution of the status of the GOA pollock stock since 2002. GOA pollock is managed using the TIER 3 harvest control rules. The over-fishing mortality rate is set as the $F_{35\%}$ fishing rate, and this rate combined with an estimate of age 3+ biomass provides an OFL tonnage. The maximum target-fishing rate is determined as the $F_{40\%}$ fishing rate and, when combined with an estimate of age 3+ biomass, provides the maximum allowable ABC. The reproductive biomass associated with $F_{40\%}$ fishing is the stock-status benchmark for GOA pollock: should stock reproductive biomass drop below this benchmark, then target fishing mortality rates are reduced via the "automatic rebuilding" algorithm that forms part of the harvest control rule. The $B_{35\%}$ biomass, a commonly used proxy for the B_{MSY} benchmark when knowledge of stock-recruitment relationships is uncertain, is included in Table 1 for comparison.

Table 3. Gulf of Alaska Pollock Stock Status, 2002-2010.

	2002	2003	2004	2005	2006	2007	2008	2009	2010
- - - Thousands of Metric Tons - - -									
Exploitation Benchmarks [a]									
ABC	51.8	47.9	64.7	85.2	80.4	62.2	53.6	41.6	75.5
OFL	75.5	69.4	91.1	144.3	110.1	87.2	72.1	58.6	103.2
$B_{35\%}$ [b]	420	434	400	392	384	388	416	434	484
$B_{40\%}$ [b]	480	496	458	448	440	442	474	496	552
Stock Status									
Begin-Year Biomass (Age 3+)	1,130	993	841	709	543	558	537	652	1,136
Spawning Biomass (males and females)	284	280	336	416	424	326	322	364	396
Total Allowable Catch	51.8	47.9	64.7	85.2	80.4	62.2	53.6	41.6	75.5
Total Catch	50.7	49.5	62.8	80.1	70.5	51.8	52.1	42.4	75.2

Source: Chapter 1, GOA SAFE Reports 2002-2010.
[a] Includes the western, central, and west Yakutat portions of the GOA (NMFS areas 610-640).
[b] Equilibrium estimate under average recruitment (males and females).

Since 2002 the reproductive potential of the GOA pollock stock has remained relatively stable while the begin-year age 3+ biomass has slowly declined. During this time the age 3+ biomass has been supported mainly by recruitment from the 1999 and 2000 year classes (Dorn et al. 2010, Figure 1.21). With the ageing of these year classes, stock spawning biomass now approximates the $B_{30\%}$ benchmark, and the assessment model results track the NMFS bottom-trawl survey fairly well (Figure 1.17). Because the stock is above one-half of its $B_{35\%}$ stock size, it is not considered to be overfished. In addition, future projections of stock reproductive biomass indicate that the stock is not approaching an overfished condition.

To evaluate the probability that spawning biomass will drop below the $B_{20\%}$ threshold, the stock was projected forward for five years with harvests calculated using the spawning biomass estimated for each year and the authors' modified constant-buffer harvest control rule (see below). The likelihood of future spawning biomass was then sampled using Markov chain Monte Carlo analysis. This projection incorporates uncertainty in stock status, uncertainty in the estimate of $B_{20\%}$, and variability in future recruitment (Dorn et al. 2010). The results indicate that the probability of the stock dropping below $B_{20\%}$ is negligible in future years.

	Harvest Specifications for 2011 As noted above, the TIER 3 harvest control rules provide a tonnage "buffer" between the max ABC and the proxy MSY harvest (the OFL tonnage), as required by the 1996 US Sustainable Fisheries Act. The purpose of the buffer is to provide a margin of safety so that assessment errors will not likely result in a harvest greater than the MSY harvest. In 2001, a relatively high GOA pollock TAC based on the maximum ABC allowed by the TIER 3 rules was established, although it was not entirely harvested. However, in 2002 new resource-survey information suggested that GOA pollock abundance was lower than projected in the 2001 assessment. In retrospect, had the entire TAC been harvested in 2001, the OFL would have been slightly exceeded (Dorn et al. 2001). Subsequent analysis of the structure of the TIER 3 rules showed that the size of the MSY buffer decreased as stock reproductive biomass dropped below the $B_{50\%}$ benchmark, and that below the $B_{40\%}$ benchmark, true spawning biomass cannot be more than about eight percent lower than estimated biomass to avoid overfishing (Dorn et al. 2001). Because there will always be some probability of exceeding the $F_{40\%}$ rate due to imprecise stock assessments, and because the GOA pollock biomass has steadily declined since the mid-1980s for reasons that remain unknown, the authors of the GOA pollock assessment developed an alternate "constant-buffer" or "author's F" harvest control rule that essentially increases the "spawning-biomass space" between the maximum ABC and OFL fishing rates (Dorn et al. 2010, Figure 1.25 bottom panel). Since 2002 the recommended ABCs in the GOA pollock assessments have used the "constant-buffer" harvest control rule as a further measure to ensure a precautionary GOA pollock harvest (for this reason the maxABC label is not used in Table 1). Although the NMFS bottom-trawl survey was not conducted in 2010, new information from the winter EIT surveys and the ADF&G groundfish survey was available. These surveys confirmed earlier surveys which indicated the 2007 year class was likely the largest since 2000. For 2011 the projected estimate of spawning biomass is about 398,000 tons, which is about 29 percent of the unfished biomass. Because this estimate is less than the $B_{40\%}$ benchmark, the GOA pollock stock is managed using the TIER 3b harvest control rules, and the maxF_{ABC} fishing rate must be reduced according to the automatic rebuilding schedule. With automatic rebuilding, the TIER 3b rules provide an OFL of 118,030 tons and a maxABC of 102,940 tons for 2011. Applying the "constant buffer" calculation to the TIER 3b rules yields a recommended "author's ABC" of 88,620 tons, a decrease of 14 percent from the maxABC, but an increase of 17 percent from the 2010 ABC. Both the GOA Plan Team and the SSC agreed with the OFL and ABC recommended for 2011 in the 2010 assessment (NPFMC 2010b; SSC 2010). The NPFMC adopted the SSC recommendations, and set the 2011 pollock TAC at 86,970 tons for the combined GOA areas to the west of east Yakutat (the reduction from 88,620 tons is due to the allocation of 1,650 tons to the Alaska-waters pollock fishery in Prince William Sound). **Ecosystem Considerations** The North Pacific experienced mostly cooler than normal upper ocean temperatures in its eastern and northern portions from fall 2009 through summer 2010. A La Nina began developing in the spring and summer of 2010 and strengthened over the remainder of the year and then began to weaken during the 2011 spring. A La Niña

	event generally brings a weaker Aleutian low than normal, and cool upper ocean conditions along the west coast of North America, and for Alaska waters (Zador and Gaichas 2010). For 2010, new GOA ecosystem information included updated descriptions of zooplankton sampling data and a modeling exercise to investigate the utility of juvenile salmon growth and temperature change as one-year-ahead predictors of age-one pollock recruitment. For GOA pollock, juvenile sockeye salmon from the Karluk River on Kodiak Island were chosen as the indicator species due to their spring migration through Shelikof Straight. A preliminary analysis showed that neither factor was capable of capturing the observed changes in the available estimates of age-one pollock in the GOA. Prior to 2004, the ecosystem considerations that routinely influenced the setting of the ABCs for GOA pollock were not stated explicitly in the stock assessment. In 2004 a standard format for considering the linkages between the pollock fishery and the GOA ecosystem was adopted, and an ecosystem-level trophic map is now included in the assessment. The trophic map is developed from summer food habits data collected from NMFS bottom-trawl surveys during 1990-2005 and includes both adult and juvenile pollock biomass components. The largest consumers of adult GOA pollock are arrowtooth flounder, Pacific halibut and Pacific cod, Steller sea lions, and the pollock trawl fishery, with consumption by arrowtooth, halibut and cod making up about 72 percent of total adult pollock mortality. Other significant adult pollock consumers include sablefish, other adult pollock, and pinnipeds other than SSLs. These second-tier pollock consumers account for an estimated 11 percent of total adult mortality. For juvenile pollock, the largest consumers are arrowtooth flounder, adult pollock, and piscivorous birds, which together account for about 70 percent of estimated total juvenile mortality (Dorn et al. 2010, Figures 1.30-1.31). As for the diet of GOA pollock, all ages are primarily zooplanktivorous during the summer growing season (more than 80 percent of the diet by weight for both adults and juveniles). By far the largest components are copepods and euphausiids, but for adults, in some years, gelatinous zooplankton and shrimp also make up a large fraction of the diet (Dorn et al. 2010, Figures 1.29-1.30). For the 2010 GOA pollock assessment, ecosystem considerations focused on estimates of the relative levels of pollock predation by pollock, Pacific cod, Pacific halibut, and arrowtooth flounder. Of these predators, pollock and arrowtooth flounder consume smaller pollock (age one) while arrowtooth, cod and halibut consume adult pollock. As it turns out, pollock fishing has a lesser effect within the ecosystem as fishing mortality is small in proportion to predation mortality for GOA pollock (Aydin et al. 2007). Of the predators of pollock, arrowtooth flounder has the largest impact on adult pollock, and the pollock stock assessment author notes that competition between arrowtooth and Steller sea lions for food may be underappreciated (Dorn et al. 2010). The above-mentioned concerns about predator biomass and the relatively low level of GOA pollock biomass motivated in part the continued application of the author's F_{ABC} adjustment, which for 2011 provided a 14 percent reduction from the maxABC of the stock assessment model. **References** Aydin, K., Gaichas, S., Ortiz, I., Kinzey, D., and N. Friday. 2007. A Comparison of the Bering Sea, Gulf of Alaska, and Aleutian Islands Large Marine Ecosystems Through Food Web Modeling. NOAA Technical Memorandum

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Observations	The 2010 assessment of Gulf of Alaska pollock by NMFS staff was methodologically the same as the preceding assessment, with survey and fisheriy-dependent data sets all updated with the most recent information. The assessment projects the spawning biomass (male and female)) in 2011 to be approximately 398 kmt, which is less that the B40% benchmark for this stock of 549 kmt, but well above the limit reference point of ½ B35% of 240 kmt. The assessment estimated the 2010 spawning biomass to be 21 % larger than the SSB in 2009, and projects the SSB to continue to increase in the near future under current exploitation rates, due to improved recruitment from the 2007 year-class. This is the first above average yearclass since 1999 and 2000, the two year-classes which have largely supported the SSB and harvests for the second half of the past decade. The 2011 ABC consistent with the Tier 3b harvest control rule is 103 kmt, but with an additional buffer explained in the MSC certification assessment report for this stock, the quota for 2011 has been set at 88,620 t. The decline in this stock through the 2000s was attributed to recruitment of a series of year-classes well below average, with the poor year-classes thought to be caused by unfavourable environmental conditions for larval and juvenile survival, not depletion of spawners. As the spawning biomass declined the harvest control rule in place for the stock, including the additional “constant buffer” reduced both catches and exploitation rate, such that the spawning biomass did not reach the limit reference point for the stock, even at its lowest level. With improved recruitment to spawning biomass is increasing, supporting the value of the harvest control rule and automatic buffer as a measure for ensuring sustainable exploitation of the target species in the fishery.
Conclusions	The stock is not current overfished nor at risk of being overfished in the near future. Ecosystem studies are suggesting that predation mortality may be a greater source of mortality than the fishery, and these results are being explored further.

	Comments
Activity assessed	Three Conditions were set for the GOA pollock fishery. Condition 1, 2b and 3 all relate to the effects of fishing on threatened Chinook salmon. Condition 2a relates to Stellar Sea lion. The assessment team recommended in the Public Certification Report that in order to meet the Chinook salmon related Conditions, research could be conducted to provide a more precise estimate of the stream of origin of the Chinook salmon bycatch and that the client should act accordingly on the results of the research. The three performance indicators and related scoring guideposts that resulted in their respective Conditions are set out below: **Performance Indicator 2.2.3** Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch. **Scoring Guidepost 100** Accurate and verifiable information is available on the amount of all bycatch and the consequences for the status of affected populations. Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty. Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty. Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species. **Scoring Guidepost 80** Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery. Information is sufficient to estimate outcome status with respect to biologically based limits. Information is adequate to support a partial strategy to manage main bycatch species. Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy). **Scoring Guidepost 60** Qualitative information is available on the amount of main bycatch species affected by the fishery. Information is adequate to broadly understand outcome status with respect to biologically based limits. Information is adequate to support measures to manage bycatch. **Score** 75 **Scoring Rationale** With the exception of Chinook salmon the fishery meets all of the scoring issues of SG80, and a few of the SG100, and so a score of 75 is given. A higher score would be achieved if there was more information available on the stream of origin of the

bycatch salmon in the GOA pollock fishery, and it was demonstrated that bycatch was negligible in relation to conservation and management requirements.

Condition 1 for GOA pollock
The client is required to ensure that by the second annual audit adequate information is available to determine the risk posed by the fishery to Chinook salmon stocks.

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Performance Indicator 2.3.1
The fishery meets national and international requirements for protection of ETP species.

The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.

Scoring Guidepost 100
There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.

There is a high degree of confidence that there are no significant detrimental effects (direct and indirect) of the fishery on ETP species.

Scoring Guidepost 80
The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.

Direct effects are highly unlikely to create unacceptable impacts to ETP species.

Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.

Scoring Guidepost 60
Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.

Known direct effects are unlikely to create unacceptable impacts to ETP species.

Score
75

Scoring Rationale
The fishery meets all of the scoring issues for SG60. However, with the limited data on the river of origin composition of the Chinook bycatch the assessment team concluded that the fishery did not achieve the second scoring issue of the SG 80, i.e. Direct effects are highly unlikely to create unacceptable impacts to ETP species.

Condition 2b for GOA pollock
The client is required to ensure that by the second annual audit:

The effects of the fishery on Chinook salmon stocks on the Lower Columbia and Upper Willamette Rivers (listed as threatened under the Endangered Species Act) are highly unlikely to create unacceptable impacts.

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Performance Indicator 2.3.3

	Relevant information is collected to support the management of fishery impacts on ETP species, including information : • for the development of the management strategy; • to assess the effectiveness of the management strategy; and • to determine the outcome status of ETP species. **Scoring Guidepost 100** Information is sufficient to quantitatively estimate outcome status with a high degree of certainty. Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species. **Scoring Guidepost 80** Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts. Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species. **Scoring Guidepost 60** Information is adequate to broadly understand the impact of the fishery on ETP species. Information is adequate to support measures to manage the impacts on ETP species. Information is sufficient to qualitatively estimate the fishery related mortality of ETP species. **Score** 75 **Scoring Rationale** The fishery satisfies all of the components of SG60 but does not meet the first scoring issue of SG80 as information at present is not sufficient to determine that the fishery is not a threat to protection and recovery of the two ESA “threatened” Chinook salmon stocks. **Condition 3 for GOA pollock** The client is required to ensure that by the second annual audit information is sufficient to determine whether the fishery is a threat to protection and recovery of the Chinook salmon stocks on the Lower Columbia and Upper Willamette Rivers and, if so, to measure trends and support a full strategy to manage impacts.

<table>
<tr><td>APA Action Plan</td><td>Background for Condition

Based on analysis of coded wire tags (CWT), spring-run, Chinook salmon from the Columbia River are the only populations of US Endangered Species Act salmon that have appeared in the bycatch of the Gulf of Alaska (GOA) federal groundfish fisheries (Balsiger 2008). Spring-run salmon enter fresh water in March through June to spawn in upstream tributaries, generally emigrate from fresh water as yearlings, and tend to migrate north along the coast. Except for one coded wire tag (CWT) recovery from the Upper Columbia River, bycatch in the GOA groundfish fisheries 1984-2006 includes only Chinook from the Lower Columbia River (LCR) and Upper Willamette River (UMR) Evolutionarily Significant Units (the Willamette River is a tributary of the Columbia River that enters near Portland, Oregon). Most Chinook bycatch in the GOA groundfish fisheries is taken by the pollock fishery. Chinook salmon from the LCR and UWR ESUs are observed more frequently in GOA than BSAI fisheries because the GOA is closer to the streams from which the stocks originate (NMFS 2007, 2009).

The LCR ESU contains four spring-run Chinook populations (runs), although it is believed that eight to ten historical runs (most spring Chinook) were extirpated by dams that blocked access to high-elevation habitat (about 60 percent of historical habitat is no longer accessible). Seven spring-run hatchery propagation programs are also part of the ESU. The remaining natural runs are not considered to be self-sustaining, either due to a small run size, extensive hatchery influence, or both. Damage by humans to this important salmon life-history type remains a concern as high hatchery production presents genetic and ecological risks to the remaining natural populations (Good et al. 2005, NMFS 2007, 2008a).

The Upper Willamette River (UWR) Chinook salmon ESU includes all naturally spawned populations of spring-run Chinook salmon in the Clackamus River, and in the Willamette River and its tributaries above Willamette Falls, Oregon. Historically, spring Chinook spawned in nearly all east-side tributaries above Willamette Falls (seven populations). During 1952-1968, the US Army Corps of Engineers constructed dams on all major east-side tributaries, blocking access to nearly 400 miles of spawning and rearing areas (a third of the ESU habitat). Current abundance of natural fish is estimated less than ten thousand, with self-sustaining populations only in the Clackamas and McKenzie rivers. Increases in spawners in the last three four years (early 2000s) in the largest remaining natural population (McKenzie River) was considered encouraging (Good et al. 2005, NMFS 2007).

Seven hatchery propagation programs are also considered part of the ESU. Although the number of adult, spring-run Chinook crossing Willamette Falls is in the same range it has been in for the last 50 years (about 20,000–70,000), 90 percent of these fish are now hatchery produced. The majority of the natural-origin populations in this ESU are at very low abundance levels (less than a few hundred fish). The relatively large hatchery populations makes discerning trends in natural production difficult (NMFS 2008a,b).

For both ESUs, currently accessible stream habitat kilometers are greatly reduced from historical conditions, and recent runs have been dominated by hatchery fish that supply "put and take" commercial and recreational harvests in Washington and British Columbia. Available abundance data shows LCR spring-Chinook escapement fluctuating between 4,000 and 10,000 during the 1990s. Hatchery programs were more successful during the 2000s, with returns generally above 10,000 and exceeding 45,000 in 2004 (NMFS 2008a, Table 8.10.2.1-6). Total UMR</td></tr>
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	adults are shown fluctuating around 4,000 fish but near 20,000 fish in 2003 before decreasing somewhat to about 12,000 fish in 2004 (BPA 2005). **Bycatch Monitoring Using Coded-Wire Tags** The High Seas Salmon Research Program of the University of Washington routinely tags and monitors Pacific salmon species. CWTs from Chinook salmon were recovered from areas around Kodiak in 1994, 1997, and 1999. The majority of tags from non-Alaska Chinook salmon were from British Columbia. The program has also found CWTs from Coho salmon from the Alaska Cook Inlet region and from southeast Alaska throughout the southeastern and central GOA (NPFMC 2009a). Bycatch of the LCR and UMR Chinook in the GOA groundfish fisheries is monitored using coded wire tags, and results for 1984-2007 are reported by Balsiger (2008). The North Pacific Groundfish Observer Program (GOP) trains fishery observers to check bycatch salmon for a missing adipose fin while measuring length, and to collect snouts from fin-clipped salmon for CWT recovery. The found CWTs are used to estimate the number of hatchery and natural-origin salmon from ESA-listed ESUs in the bycatch. The estimation procedure includes a sampling expansion factor and a hatchery-marking expansion factor to account for changes in observer sampling and hatchery marking efforts. Since 1984 there have been, respectively, 23 and 92 CWT recoveries from LCR and UWR hatchery Chinook in the GOA groundfish fisheries. The LCR recoveries range from 0-5 annually and total estimated bycatch of LCR Chinook ranges from 0-242 fish annually. But for most years total bycatch of LCR hatchery Chinook is estimated to be less than 15 fish. For UWR Chinook, CWT recoveries range from 0-20 annually, with total estimated bycatch of UWR hatchery Chinook ranging from 0-245 annually. However, in most years the estimated total bycatch of UWR hatchery Chinook is less than 70 fish (Balsiger 2008). **Bycatch Monitoring Using DNA Analysis** Bycatch monitoring using DNA analysis depends on the development and maintenance of salmon genetic baselines that cover the Pacific Rim between Korea and California (NPAFC 2009). These datasets of genetic information were developed cooperatively by multiple parties across international boundaries. For example, during the early 2000s an eight-laboratory US and Canadian collaboration funded by the Chinook Technical Committee of the Pacific Salmon Commission evaluated 62 candidate DNA microsatellite loci, and 13 loci were chosen for use based on their robustness and consistency under multiple laboratory conditions. The Pollock Conservation Cooperative Research Center (PCC RC) contributed to this effort with $183,000 of funding for DNA analysis of Chinook salmon bycatch in Alaskan trawl fisheries. From these efforts a baseline that included about 110 populations from Southeast Alaska, Canada and the US Pacific Northwest was created. Unfortunately, several aspects of the methods used to conduct microsatellite-loci analysis are difficult to master and this limits the usefulness of the baseline (Templin et al. 2005). Single nucleotide polymorphisms (SNPs) are another class of DNA markers suitable for analysis and for which easily transferable and repeatable methods have been developed. This aspect of SNPs analysis allows more researchers to take advantage of the "common use" benefits of a baseline of genetic information. The Pacific Salmon Commission has stated that future improvements to its Chinook salmon baseline will focus on SNPs discovery, and it is now funding research to

discover and evaluate new SNP markers (Templin et al. 2005).

The SNPs baseline for Chinook salmon is most advanced for stocks in Alaska (Seeb and Seeb 2006). The Alaska Department of Fish and Game (ADFG) has identified 33 Chinook salmon SNPs and most are now being surveyed in the major salmon-producing drainages of Alaska. Analysis of populations from southeast Alaska will be complemented by a Pacific Salmon Commission-funded survey of SNPs in 35 populations of Chinook salmon from southeast Alaska, British Columbia, Washington, Oregon, Idaho, and California. In addition, at least four populations from the Kamchatka Peninsula are included in the baseline (Templin et al. 2005). A fairly well developed SNPs baseline also exists for chum salmon. During 2003-2006, the PCC RC supported SNPs-based stock-of-origin analysis for chum salmon with $300,000 of UAF research grants. Methods were developed to reduce 1) ascertainment bias stock identification and 2) the quantity and cost of chemical reagents (Gharrett and Garvin 2006).

Bycatch Sampling

Obtaining representative samples of salmon bycatch in the Alaska pollock fisheries presents challenges. To address some of them, the pollock industry funded a sampling design study with money penalties from the BSAI rolling hot-spot program (Pella and Geiger 2009). In addition, the AFSC implemented changes in observer assignments in the 2009 BSAI pollock fishery that increased sampling rates so to provide a more robust sampling effort that could support a representative analysis of salmon bycatch. This experience will make easier the development of sampling programs for the GOA pollock fishery.

The AFSC now possess in-house capacity to genotype 22,000 salmon per year beginning in 2011 when BSAI Amendment 91 (pollock fishery Chinook salmon bycatch limits) will come into force (DeMaster 2009). Plans call for laboratory processing rates to complete stock-of-origin analysis for both Chinook and chum salmon within six months of the end of each BSAI pollock season given a five-percent-of-bycatch sample size. A collaborating genetics laboratory has been contracted to provide additional capacity for genotyping DNA extracts, and researchers at the University of Alaska in Fairbanks (UAF) will assist with the genetic analysis of chum salmon bycatch. AFSC expects in-house analytical capacity to be sufficient for needs of the Pacific Salmon Commission, ADFG, and Alaska groundfish managers in 2011 and beyond. The NPFMC has requested that a salmon bycatch sampling program like that planned for the BSAI pollock fishery be implemented in the GOA pollock fishery (NPFMC 2009a).

Bycatch sampling in the GOA groundfish fisheries occurs less often than for the BSAI fisheries because the fraction of catches observed is lower. For example, during 2004-2007 only 31 percent of the pollock catch was observed in the western and central areas of the GOA (NPFMC 2009a). Also unlike the BSAI fishery, vessels operators in the GOA are required by regulation to discard prohibited species (including Chinook salmon) at sea. Due to the relatively low fraction of catch observed, estimates of salmon bycatch are not very precise, and the estimated number of incidentally caught salmon is sometimes considerably inflated (Balsiger 2008, Bonney 2009). Federal managers are now considering revisions to the GOA observer program that will improve bycatch sampling (NPFMC 2008, 2009b). Hence, within a few years estimates of salmon bycatch in the GOA pollock fishery should improve considerably.

Bycatch Impacts and Fishery Management

	There are now no Chinook bycatch limits on the GOA groundfish fisheries although the incidental take statement for the LCR and UWR Chinook biological opinions allows 40,000 fish. Chinook salmon bycatch in the GOA groundfish trawl fisheries remained stable at roughly 20,000 fish during the period 1990-2009, and did not show the pronounced increases observed in the BSAI pollock fishery 2003-2007. Also in contrast to the BSAI pollock fishery, the GOA fishery has not been rationalized and so is of very short duration (management now organizes a limited-access, derby fishery). The seasonal quotas are harvested rapidly by a small-boat, shore-plant-based catcher-vessel fleet all less than 125 feet long and all subject to at most 30 percent observer coverage (NPFMC 2009a). A suite of Chinook salmon bycatch reduction measures is now being considered for the GOA groundfish fisheries. All of the alternatives except the status quo implement some form of area closure, but so far only for pelagic gear. The options include wide-area closures "triggered" by high Chinook bycatch as well as week-to-week "hot-spot" closures based on changes in salmon abundance on the pollock grounds. Due to the short seasons, it is not anticipated that a week to week hot-spot avoidance program will work well for the GOA pollock fishery (NPFMC 2009a). The CWT recoveries provide estimates of average annual bycatch of LCR and UWR hatchery Chinook by the GOA groundfish fisheries of 20 and 62 fish during 1984-2006. About 75 percent of this bycatch is taken by the pollock fishery. With natural spawners less than ten percent of total LCR and UWR runs (NMFS 2008a), there may be expected another small number of LCR and UWR natural spawners in the GOA groundfish bycatch each year, with perhaps three quarters of these taken by the pollock fishery. For the simple circumstance where the marine distributions of natural and hatchery LCR and UWR spring Chinook are the same, the average annual bycatch of natural LCR and UWR Chinook in the GOA pollock fishery 1984-2006 may be on the order of two and six fish, respectively. For spring Chinook, virtually all production in the Washington portion of the LCR is of hatchery origin, and Oregon populations of spring Chinook are also subject to significant hatchery influence. The LCR and UWR hatchery populations are managed to meet escapement goals. Mark-selective fisheries are now used below Bonneville Dam during the spring season to limit impacts to natural spawners. These changes in ocean and fresh water fisheries management are estimated to have reduced average mortality from 50 percent per year up through 1994 down to about 25 percent since 1995 (NMFS 2008a, Table 8.10.3.6-1). Due to the collective conservation restrictions for many Columbia Basin Chinook populations, hatchery escapement goals have been exceeded in recent years, and NMFS expects future escapement goals will be met. But feelings about hatchery programs are ambivalent (Good et al 2005, NMFS 2008a). Large numbers of hatchery fish have contributed to more intensive mixed-stock fisheries, which probably overexploited wild populations already weakened by habitat degradation. And hatchery programs are associated with the spread of disease and genetic depression. It is clear from the below description of hatchery operations in the Columbia Basin that the intended purpose of the LCR and UWR hatchery Chinook taken by the GOA pollock fishery was to support US west coast commercial, recreational, and tribal fisheries. The CWT information indicates that roughly half of the Chinook caught by the BSAI fishery are age three and the others age four, and NMFS indicates the fraction of age three Chinook surviving to spawn is about 60 percent and 85 percent for age four (NMFS 2009). Under these circumstances, the 22 and 62 LCR and UWR hatchery Chinook taken on average in

	the GOA pollock fishery 1984-2006 could be expected to have reduced abundance in terminal coastal-ocean and fresh-water fishing areas by 16 and 42 Chinook on average per year, respectively. Today, because nearly 90 percent of the Chinook salmon and steelhead habitat originally available in the Columbia Basin has been lost or degraded, fish produced by hatcheries comprise the vast majority of the annual returns to the basin. Annual returns of salmon and steelhead would be reduced by up to ninety percent and there would be little or no tribal, recreational, or commercial fishing opportunity without hatcheries. Hatchery programs support tribal, recreational and commercial fisheries. The primary purpose of the nearly two hundred hatchery programs that operate in the Columbia Basin is to compensate for Federal and public and private utilities projects. Other hatchery programs are designed to conserve genetic resources, and in some cases, are used to help improve viability after the factors limiting viability are addressed. As an unintended consequence of providing these benefits, there is the potential for hatchery programs to increase the extinction risk and threaten the long-term viability of natural populations. For example, because the progeny of hatchery fish that spawn in the wild are known to be less likely to survive and return as adults than the progeny of natural-origin spawners, the fitness of a spawning aggregate or natural population is likely to decline (termed, outbreeding depression) if hatchery and natural-origin fish interbreed (NMFS 2008a, p. 5-37). **Proposed Actions for the Conditions** The assessment report includes a demand for an analysis to provide a more precise estimate of the stream of origin of the Chinook salmon bycatch. It is a matter of opinion whether the available CWT-based analysis of the effects of the GOA pollock fishery on Chinook salmon stocks from the LCR and UWR is sufficient to conclude that the known effects are highly unlikely to create unacceptable impacts; or that information is sufficient to determine whether the fishery is a threat to protection and recovery of the stocks. In 2007 the NMFS Northwest Region Office produced a supplemental biological opinion concerning the effects of the BSAI pollock fishery on these stocks, but did not reconsider information related to the GOA fishery (NMFS 2007). A subsequent report required by the biological opinion indicates the GOA groundfish fisheries slightly exceeded the 40,000 Chinook incidental take limit during 2007, and that 87 percent of this bycatch was in the pollock fishery. However, about half of the estimated bycatch was due to extrapolation-related bycatch over-estimates in the pollock fishery (Balsiger 2008). It is possible to estimate the stock composition of Chinook salmon bycatch in the GOA pollock fishery using DNA analysis, and a program to collect and analyze Chinook bycatch tissue samples from the BSAI fishery is expected to be in place for the 2011 season (DeMaster 2009). The APA proposes to begin a “companion” project to initiate research on the origin of Chinook salmon bycatch in the GOA pollock fishery that builds from experience and expertise in place to secure DNA analysis in the BSAI pollock fishery. A sampling effort is proposed that will cover at least the 2012 fishing year. If a new regulation mandating full retention of Chinook bycatch is in place by 2011, then it may be possible to obtain samples from both the 2011 and 2012 pollock fisheries. The research project will be managed by personnel in Kodiak hired and coordinated by the Alaska Groundfish Data Bank (AGDB).

	The GOA pollock fishery has four seasons (A-D) in three fishing areas (610, 620, and 630). Compared to the BSAI fishery, the seasons are very short, perhaps one to three days in area 610 and seven to ten days in areas 620 and 630. The short seasons, and that many boats often fish together in the same local area, is expected to simplify the task of obtaining a representative sample of the bycatch. Determining the stock mixture at any one area and time (season) point with an acceptable level of confidence requires a sample of about 400 Chinook. Because processing plants are few in number and all already employ observers to record the groundfish catch, collecting tissue samples at the processing plants is economically feasible whereas on vessels it is not. The sampling design will be developed by AGDB with assistance from the APA, ADFG, NMFS, and researchers at the UAF. Tissue samples will be taken from Chinook at shore plants using protocols developed by the AFSC. Samples will be collected either by NMFS fishery observers or plant quality-assurance personnel. The samples will be aggregated and held in cold storage at the processing plants and then shipped to an analytical laboratory. How the sampling design will be put into operation is uncertain at this moment. Because Chinook salmon is a PSC species, by regulation it must be discarded at sea. In practice, Chinook salmon in the pollock catch are difficult to find, and so are discarded both at sea and at the processing plants. Also, it is suspected that salmon discarded at sea are larger (easier to find) than the salmon remaining among the pollock catch and discarded by shore plants (Bonney 2009). Depending on the frequency of Chinook size sorting prior to discard, obtaining a representative sample may require samples from both discard (size) "strata" in proportion, but it is not feasible to collect samples from pollock vessels. One solution to this sampling difficulty would be a regulation that requires pollock vessels to retain and deliver all bycatch salmon to a processing plant. AGDB has testified in support of full retention of salmon bycatch in the GOA groundfish fisheries, and the NPFMC has now requested that the bycatch reduction analysis "discuss what would be required to implement full retention of salmon in the GOA groundfish fisheries" (NPFMC 2010). If a new regulation to require full retention of salmon is in place by 2011, then it may be possible to collect tissue samples during the entire 2011 pollock fishery. An alternative, less preferable solution to ensure representative sampling would be the authorization by NMFS of an Experimental Fishing Permit (EFP) that would allow pollock vessels to voluntarily retain all Chinook salmon bycatch for delivery at a processing plant (i.e., participants would be exempt from the mandatory discard rule now in place). Fishermen would sign up for the program at the beginning of the season, and participants would be required to retain and land all Chinook bycatch. Preliminary discussions with AGDB and NMFS indicate that the EFP approach is viable, although there is not sufficient time before the start of the 2011 season to develop and authorize the EFP. Nevertheless, the APA and AGDB plan to begin the development of an EFP during 2010 such that, in the absence of a new mandatory retention regulation, representative Chinook tissue samples could be collected during the 2012 fishery. The EFP, if required, would also be managed by AGDB from Kodiak. The proposed project also includes genotyping and stock mixture analysis using either microsatellite loci or SNPs. The analysis method will be determined by the availability of genotyping services. The AFSC Auke Bay laboratory possesses the capability to analyze Chinook salmon DNA using the microsatellite loci baseline

although most of its genotyping capacity has been allocated to analysis of samples from the BSAI fishery. Significant genotyping capacity is likely to become available at the ADFG Gene Conservation Laboratory (GCL) beginning in the second half of 2012 after completion of the western Alaska salmon stock identification program. The GCL would use a SNP baseline, with total analysis costs expected to be about $25.00 per salmon. For the proposed project, it is anticipated that at most 5,000 samples would be obtained over the course of a fishing year (four seasons). As such, anticipated genotyping and mixture analysis costs are in vicinity of $125,000.00 per fishing year.

Reporting of project milestones and results will occur during annual surveillance audits. It should be known by winter of 2010 whether new mandatory retention regulations will be forthcoming and whether sampling may be possible during 2011. If not, then sampling will begin during 2012. In any event, spare capacity for genotyping and mixture analysis is unlikely to become available before the fall of 2012, thus no bycatch composition results are expected before the third surveillance audit. The proposed project includes a commitment by the GOA pollock industry of funding for the collection and analysis of samples from a single fishing year (either 2011 or 2012). A progress report will be provided at the first surveillance audit.

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APA Progress Report	**Recent Developments in Fishery Bycatch and Management** The fishery for pollock in the GOA is entirely shore-based with approximately 90 percent of the catch taken with pelagic trawls. The fishery is conducted under limited-access, Olympic-style harvest rules with four seasons, each of which typically lasts only several days. During winter months fishing effort targets pre-spawning aggregations in Shelikof Strait, Marmot Bay, and near the Shumagin Islands. Fishing in the fall is less predictable, but typically occurs on the east side of Kodiak Island and in near-shore waters along the Alaska Peninsula. An analysis of catcher-vessel participation in the fishery shows that about a 30 percent of the vessels are less than 60 feet in length, and that most of these smaller vessels fish in the Western GOA area (NPFMC 2011). At the October 2010 meeting the NPFMC took final action to restructure the North Pacific Groundfish Observer Program. The restructured program has two coverage categories - 100 percent and less than 100 percent. Virtually all of the vessels in the

	GOA pollock fishery will fall into the less than 100 percent coverage category. Observer coverage for vessels and processors in this coverage category would be managed under an exvessel-fee-based observer-service delivery model. The fee would be assessed on the exvessel value of the landed catch weight (a three-year rolling average is used to calculate the exvessel prices for groundfish). The fee percentage is set in regulation at 1.25 percent of the exvessel value of the groundfish harvested and the percentage will be reviewed annually by the NPFMC. The selection of vessels and processors that must carry an observer under the restructured program would be determined by the NMFS through a sampling and deployment plan (i.e., observer coverage rates [trips or vessels] would not be in regulation). NMFS will release an observer report by the first of September each year. The report will contain the proposed stratum and coverage rates for the deployment of observers in the following calendar year, as well as a detailed accounting of the financial aspects of the program. NMFS will also prepare an annual report on observer program participation, including information on how industry participants have adapted to the new program. The number of Chinook salmon caught in the Central and Western GOA pollock fisheries and the rate at which they are caught varies by year. In the Central GOA the fewest Chinook salmon were caught in 2009 (2,123 fish) while the most Chinook were caught in 2007, when an estimated 31,647 fish were taken (this latter estimate is thought to be biased high, see Balsiger 2007 for details). In 2010 an exceptionally large bycatch of Chinook salmon occurred in the Western GOA, primarily during the fall D-season, and this resulted in a total WGOA Chinook bycatch of 31,581 fish. During 2010, 1.23 Chinook salmon were caught for every ton of Western GOA pollock catch, and this “rate” of Chinook bycatch was more than ten-times the average Chinook bycatch rate from 2003-2009. GOA-wide, total 2010 Chinook bycatch in the pollock fishery was estimated to be 43,915 fish. The unexpected, large Chinook bycatch in the fall of 2010 precipitated a storm of protests from GOA salmon fishermen and fishery dependent communities throughout Alaska. In response the NPFMC noticed the public at its December 2010 meeting that an expedited analysis of alternatives to control Chinook bycatch in the GOA pollock fisheries would be initiated and given the highest staff priority (NPFMC 2010). The measures under consideration included setting prohibited species catch (PSC) limits in the Central and Western GOA for Chinook salmon, which once attained would close the pollock fishery in those areas. The range of PSC limits included 15,000, 22,500, or 30,000 fish, applied to the Western and Central GOA fisheries together. The limit would then be apportioned among the areas based on the relative historic pollock catch in each area, or the relative historic Chinook bycatch in each area, or some ratio of pollock catch and Chinook bycatch. In order to reduce the uncertainty associated with GOA bycatch estimates, expanded observer coverage could be required for vessels smaller than 60 feet as an interim measure, until the observer program restructuring is implemented. At its April meeting in Anchorage, the NPFMC adopted a preliminary preferred alternative that identifies a combined PSC limit of 22,500 Chinook for the Western and Central GOA pollock fisheries. The limit would be apportioned between the two areas based on a combination historic pollock catch and Chinook bycatch during the time periods 2001-2006 and 2008-2009. The preliminary preferred alternative would also implement an interim observer requirement of 30 percent coverage for trawl vessels of less than 60 feet while directed fishing for pollock in the Central or Western GOA. This interim requirement would expire once the observer restructuring program is implemented because the new observer program is slated to

provide for observer coverage on vessels of less than 60 feet. In addition, all vessels fishing for WGOA and CGOA pollock would be responsible for full retention of Chinook salmon caught incidentally to their groundfish harvest. This new retention requirement should allow the NMFS to work with the industry to improve observed and extrapolated Chinook salmon bycatch estimates and their timeliness. The NPFMC noticed the public that it would take final action on measures to limit Chinook bycatch in the GOA pollock fisheries at its June 2011 meeting in Nome, Alaska.

Recent Developments in Stock-of-Origin Research

Templin and others (2011) have now assembled a comprehensive, open-access baseline of 45 single nucleotide polymorphisms (SNP) from 172 Chinook salmon populations ranging from Russia to California. The hierarchical genetic structure revealed by the SNP markers can be used to estimate the origins of Chinook salmon contributing to aggregates of migrating salmon encountered in freshwater or on the high seas. Tests of the accuracy and precision of stock composition of potential mixtures indicate that compositions can confidently be estimated to each of eleven broad-scale regions and many smaller, fine-scale regions. This was true whether the mixture was comprised entirely of individuals from a single region or from several regions.

The NMFS Alaska Region Office has provided its annual report for the Alaska groundfish fisheries salmon incidental catch and Endangered Species Act consultation. The report contains more detail than the 2009 report and provides new information on coded-wire tag (CWT) recoveries and genetic studies of Chinook bycatch planned for GOA pollock fishery. The report indicates that vessel observers in the GOA pollock fishery collected genetic samples and associated data only from Chinook and chum salmon encountered during their species composition samples (shore-plant observers did not collect any salmon genetic samples). For 2010, 8,506 Chinook salmon were sampled and 4,546 were measured. The report also states that, beginning in 2011, GOA salmon bycatch sampling procedures will be revised to be as consistent as possible with changes occurring in the Bering Sea pollock fishery. As such, genetic samples will be collected systematically from all salmon encountered in observed pollock hauls and deliveries. This should provide samples from throughout the observed deliveries in the GOA (Balsiger 2011, p. 3).

With regard to CWT analysis, the report now makes clear that sampling problems limit the ability to use CWT data to determine the contribution of salmon marked with a CWT to bycatch in the BSAI and GOA pollock fisheries. For most of the CWT recoveries in the GOA trawl fisheries, it is unknown whether the CWT were collected from inside or outside the sample. A sampling expansion factor can only be calculated from CWT recovered from inside a sample where the total number of sampled fish is known. Of the 69 documented CWT recoveries of Chinook salmon from ESA-listed ESUs in the GOA trawl fishery, only two CWT are known to have been recovered from inside the sample and two are known to have been recovered outside the sample. For the other 65 recoveries, it is unknown whether the CWT was recovered from inside or outside the sample.

Marking expansions can still be calculated for each CWT recovery from the mark expansion factors for each tag code. Because not all fish in a tag release group are actually tagged with a CWT, marking expansion factors account for the fraction of each release group that is tagged. Without being able to calculate total estimated contributions because of unknown sampling expansion factors, mark expansions offer the closest approximation to the contribution of Chinook salmon from ESA-

	listed ESUs for the CWT recovered from the BSAI and GOA groundfish fisheries. However, mark expansions should be considered a very minimal estimate for the actual total contribution of Chinook salmon from ESA-listed ESUs in the BSAI and GOA groundfish fisheries. By applying mark expansion factors, the estimated numbers of ESA-listed Chinook taken in the GOA trawl fisheries since 1984 are 112 Lower Columbia River fish, 275 Upper Willamette River fish, and one Upper Columbia River fish. To improve mark-expansion calculations of wild and hatchery Chinook, the NPFMC contracted with Cramer Fish Sciences to compile a database of CWT release groups of ESA-listed west coast salmonids based on Mark Center information. In 2011, a new contract was implemented, and CWT analyses in the BSAI and GOA will include a new summary table in the database on the annual production of stream type (spring run) Chinook salmon ESA-listed Evolutionary Significant Units (ESU) originating from Washington, Oregon, and Idaho. The database will include all production (counted and estimated, tagged and untagged) of both wild and hatchery components of each ESU on an annual basis, dating back to when each ESU was first defined by NMFS. With regard to genetic analysis, unlike the Bering Sea, limited sampling of the salmon bycatch has occurred in the GOA. For example, there are approximately 19 genetic samples from the 2007 B-season, 38 from 2008, and 10 from 2009. This small number of Chinook salmon bycatch samples is insufficient to represent the annual catch for stock composition analysis, especially for an average annual bycatch of 21,596 between 2007 and 2009. *Efforts are currently underway to improve genetic sampling in the GOA so that stock composition analysis of the GOA bycatch can be accurately completed.* More refined regional stock composition analyses than that currently available using the ADFG SNP baseline will require a combined approach using both CWT information (Celewycz et al. 2010) and increased baseline coverage of Pacific Northwest salmon populations (Balsiger 2011, p. 9). It is possible to estimate the stock composition of Chinook salmon bycatch in the GOA pollock fishery using a combination of DNA and CWT recovery analysis. For the GOA pollock fishery, new management measures anticipated to be adopted by the NPFMC in June, 2011 will, among other things, include new requirements for increased observer sampling of Chinook salmon bycatch on fishing vessels and in processing plants as well as a new requirement to retain all Chinook salmon bycatch. The measures may come into force during the second half of 2012 (pollock C- and D-season), or at the beginning of the 2013 fishing year at the latest. The requirement to retain all salmon bycatch is intended to support a new NMFS initiative to implement a plan for the systematic sampling of GOA salmon bycatch to support genetic and CWT analysis of the stock composition of the GOA bycatch (Balsiger 2011). As such, the APA proposes to work with the NMFS and the harvesting and processing sectors of the GOA pollock fishery to implement a plan for routine bycatch sampling that is representative of the bycatch and is of a magnitude and frequency sufficient to support DNA stock-of-origin analysis. A recent letter from the NPFMC to the NMFS Alaska Region and the Alaska Fishery Science Center requests that the NMFS provide information about what the likely timeline might be for preparing the 2011 samples for processing, and then for using the data to develop preliminary estimates of the stock composition of the bycatch (Oliver 2011). The letter also requests that NMFS provide an assessment of how observed-vessel bycatch sampling might be expanded to GOA shore plants under a full-retention

	requirement for salmon bycatch. It is anticipated that the NPFMC will adopt new management measures to control GOA Chinook bycatch at their June 2011 meeting. It is also expected that the NMFS will expand its salmon bycatch sampling program to GOA shore plants to take advantage of a full-retention requirement, and that the NMFS will also now provide the resources required to analyze the samples and determine the stock composition of the bycatch following more or less the same methods and timelines as for the bycatch sampling program now being carried out for the BSAI pollock fishery. A role for industry in the development of the sampling design and sample collection and analysis as proposed in the initial action plan for this Condition is not now viewed as necessary, although additional information concerning the specific characteristics of the NMFS sampling initiative will become available over the next few months. A progress report on bycatch sampling and stock mixture analysis results will be provided during the second and third surveillance audits. **References** Balsiger, J.W. 2011. "2010 Annual Report for the Alaska Groundfish Fisheries Salmon Incidental Catch and Endangered Species Act Consultation." Memorandum for William W. Stelle, Jr., Administrator, Northwest Region. NMFS Alaska Region, P.O. Box 21688, Juneau, Alaska. Balsiger, J.W. 2007. "2007 Annual Report for the Alaska Groundfish Fisheries Salmon Incidental Catch and Endangered Species Act Consultation." Memorandum for Robert Lohn, Administrator, Northwest Region. NMFS Alaska Region, P.O. Box 21688, Juneau, Alaska. Celewycz, A.G., Thompson, L.M., Cusick, J., Fukuwaka, M. and J.M. Murphy. 2010. "High Seas Salmonid Coded-Wire Tag Recovery Data, 2010." NPAFC Document 1279. North Pacific Anadromous Fish Commission, 889 West Pender Street, Suite 502, Vancouver, B.C. Oliver, C. 2011. "Letter from Chris Oliver, NPFMC Executive Director, regarding genetic stock of origin determination for Chinook and chum salmon taken as bycatch in the Gulf of Alaska pollock fishery." April 20, 2011. North Pacific Fishery Management Council, 605 West 4th Avenue, Suite 306, Anchorage, Alaska. North Pacific Fishery Management Council. 2011. "Chinook Salmon Bycatch in the Gulf of Alaska Pollock Fishery." Initial Review Draft. Environmental Assessment/ Regulatory Impact Review/ Initial Regulatory Flexibility Analysis for Amendment 90 to the Fishery Management Plan for Groundfish of the Gulf of Alaska. North Pacific Fishery Management Council, 605 West 4th Avenue, Suite 306, Anchorage, Alaska. Templin, W.D., Seeb, J.E., Jasper, J.R., Barclay, A.W., and L.W. Seeb. 2011. Genetic differentiation of Alaska Chinook salmon: the missing link for migratory studies. Molecular Ecology Resources 11 (Suppl. 1): 226–46.
Observations	Obtaining representative samples of salmon bycatch in the Alaska pollock fisheries is challenging because of the large spatial scale of the fishery and the patchy and unpredictable distribution of salmon bycatch. The pollock industry funded a sampling design study (Pella and Geiger 2009) to design a statistically robust

	collection of samples that would be representative of the salmon bycatch,. In addition, the AFSC implemented changes in observer assignments for the 2009 and 2010 fisheries that increased sampling rates so to provide a more robust sampling effort that could support a representative analysis of salmon bycatch. In 2011, all pollock fishing vessels will be required to have at least one fishery observer on board for every fishing trip (NMFS 2010). Genetic analyses of samples taken from the bycatch are used to determine stock origin of salmon taken in the pollock fishery. The AFSC is preparing for an extensive genotyping effort during the 2011 season by analyzing about 3,200 Chinook salmon samples from 2007-2009 and a further 10,500 chum samples from 1988-2009 (DeMaster 2009, Guyon et al. 2010). It is planned that stock-of-origin analysis for both Chinook and chum salmon will be completed by AFSC within six months of the end of each BSAI pollock season, assuming 5%-of-bycatch sample size. A collaborating genetics laboratory has been contracted to provide additional capacity for genotyping, and researchers at the University of Alaska in Fairbanks (UAF) will assist with the genetic analysis of chum salmon bycatch. AFSC expects in-house analytical capacity to be sufficient for needs of the Pacific Salmon Commission, ADFG, and Alaska groundfish managers in 2011 and beyond. Nevertheless, bycatch sampling in the GOA groundfish fisheries occurs less often than in BSAI because the fraction of catches observed is lower. Due to the relatively low fraction of catch observed, estimates of salmon bycatch are not very precise, and the estimated number of incidentally caught salmon is sometimes considerably inflated (Balsiger 2008, Bonney 2009). Federal managers are now considering revisions to the GOA observer program that will improve bycatch sampling (NPFMC 2008, 2009b). Stock composition of Chinook salmon bycatch in the GOA pollock fishery can be done using DNA analysis. The APA proposes to begin a "companion" project to initiate research on the origin of Chinook salmon bycatch in the GOA pollock fishery that builds from experience and expertise in place to secure DNA analysis in the BSAI pollock fishery. A sampling effort is proposed that will cover at least the 2012 fishing year. If a new regulation mandating full retention of Chinook bycatch is in place by 2011, then it may be possible to obtain samples from both the 2011 and 2012 pollock fisheries. Hence, within a few years estimates of salmon bycatch in the GOA pollock fishery should improve considerably.
Conclusion	Although stock-of-origin research and management of the Chinook bycatch in the pollock fishery in the GOA has lagged behind that in the BSAI, actions over the last year indicate rapid progress in efforts to obtain better estimates both the magnitude and the stock origin of Chinook bycatch in the GOA. Progress is satisfactory and considered to be on target to meet the Condition.

	Comments
Activity assessed	**Performance Indicator 2.3.1** The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species. **Scoring Guidepost 100** There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species. There is a high degree of confidence that there are no significant detrimental effects (direct and indirect) of the fishery on ETP species. **Scoring Guidepost 80** The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species. Direct effects are highly unlikely to create unacceptable impacts to ETP species. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts. **Scoring Guidepost 60** Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species. Known direct effects are unlikely to create unacceptable impacts to ETP species. **Score** 75 **Scoring Rationale** While the effects of the BSAI pollock fishery have been well studied the assessment team concluded that it was still not possible to say that the effects on Stellar sea lion are known and so did not meet the first scoring issue of the SG80. **Condition 2a for GOA pollock** The client is required to ensure that by the second annual audit: The effects of the fishery on Steller sea lion are highly likely to be within limits of national and international requirements for protection of Endangered, Threatened and Protected (ETP) species.
APA Action Plan	**Background for Condition** The recertification report recognizes the significant commitment of fishery managers and the regional scientific community to continuing research on Steller sea lion (SSL) populations. The report includes the following findings: Over the past four years or so, a great deal has been learned about the seasonal foraging ecology, diets, and the regional and local scale distribution of Steller sea lions in the BSAI. Continuing research has also been conducted on trends in abundance and new research on vital rates has become available that sheds light on the mechanisms underlying the demography of Steller sea lions. These and other studies have been critically reviewed with respect to how the pollock fishery might

	impact sea lions in the 2006 Boyd reports, the revised Steller sea lion recovery plan (NMFS 2008b), and NRC 2003, Bowen *et al.* (2007) and SAFE reports. Available sea lion data, extensive data on fish and invertebrate predators and prey, and information on the pollock fishery have been used to model the ecosystem effects of fishing on dependent species (e.g., Aydin *et al.* 2007). Although not definitive in its conclusions, this modeling work is state-of-the-art and in many ways is on the leading edge of such research that attempts to evaluate the effects of fishing and environment change on ecosystem structure and functioning…while the effects of the BSAI pollock fishery have been well studied the assessment team concluded that it was still not possible to say that the effects on Stellar sea lions are known and so did not meet the first scoring issue of the SG80. The assessment team applied recently revised criteria in its assessment of the Alaska pollock fisheries. The new performance indicators and scoring guideposts are the result of a three year project to improve the consistency of MSC assessments across all fisheries, but with an understanding that a uniform set of performance indicators and scoring guidelines may not fit perfectly with all circumstances. As such, in considering this Action Plan, it is important to clarify two aspects of this Condition. First, the scope of this Condition should apply only to national requirements for protection of SSL populations as there is no relevant international conservation regime. In the present case, the US Endangered Species Act (ESA) controls along with other related domestic laws and regulations. Second, probabilities and possibilities are more common than certainty in the fields of marine resource science and management. As reflected in the certification report, issues related to recovery of the SSL population include the possible effects of fishing on SSL stocks. **Western Population of Steller Sea Lions** In 1990 the SSL (*Eumetopias jubatus)* was listed as a threatened species under the ESA due to substantial declines in the western portion of the range. At the time of listing, the overall abundance of SSL in the eastern portion of the range (in southeastern Alaska and Canada) was increasing at approximately three percent per year. Critical habitat was designated in 1993 based on the location of terrestrial rookery and haul-out sites, spatial extent of foraging trips, and availability of prey. In 1997, based on demographic and genetic dissimilarities, NMFS designated two distinct population segments (DPS) of SSL: a western distinct population segment (DPS) and an eastern DPS. Due to persistent declines throughout the 1990s, the western DPS was reclassified as endangered, while the increasing eastern DPS remained classified as threatened. The western population showed an increase of approximately three percent per year between 2000 and 2004, and this was the first recorded increase in the population since the 1970s. However, more recent data from non-pup surveys suggest that the population trend for the western DPS is either stable or declining slightly (NMFS 2008). The National Marine Fisheries Service (NMFS) is currently completing a revised biological opinion for the endangered western distinct population segment of SSLs. The opinion will provide a new assessment of the effects on these SSLs of the Alaska pollock fisheries as currently managed and regulated. NMFS has announced its intention to release the biological opinion during July, 2010. To be consistent with the ESA, the pollock fishery must be conducted in a manner that does not "jeopardize" the continued existence of SSLs or adversely modify their critical habitat. If the opinion includes a finding of "no jeopardy," then it is anticipated that managers will begin to consider whether it may be possible to improve the current SSL protection measures as well as remove any unnecessary fishing restrictions and so minimize impacts on coastal communities. The North Pacific Fishery

Management Council (NPFMC) has formed a Sea Lion Mitigation Committee for this purpose.

If on the other hand, the opinion includes a “jeopardy” finding, then fishery managers will be required to develop and implement regulations sufficient to mitigate the effects of fishing on SSLs. Depending on the time period within which new management regulations would be required to be implemented, the Sea Lion Mitigation Committee could also play an important role in developing and recommending any necessary changes in the regulations. However, it is ultimately the responsibility of the Secretary of the US Department of Commerce to approve fishery management regulations that meet ESA standards.

Multiple-Hypothesis Statistical Modeling

The assessment report includes a demand for an analysis to evaluate the relative strength of support for hypotheses indicated by the Steller sea lion recovery plan to have medium to high impact on stock recovery. These hypotheses include environmental variability, competition with fisheries, predation by killer whales, and exposure to toxic substances (NMFS 2008, Table IV-1). It is also advised that the analysis should make use of existing data and a multiple-hypothesis, statistical-modeling approach. Hypothesis tests based on statistical models provide an avenue for development of new information when direct, experimental investigations are impractical (e.g., for large, free-ranging populations such as fish or large mammals).

Multiple-hypothesis, statistical-modeling analyses of the factors likely responsible for the SSL population decline are provided by Pascual and Adkison (1994) and Wolf and Mangel (2004). The former analysis concluded that deterministic transient population behavior, historical pup harvesting, and short-term environmental variation were all unlikely to have caused the decline. As a result, the authors suspect that some long-term change in the environment, or a novel catastrophe, was responsible for the decline. In contrast, Wolf and Mangel found strong evidence for several relationships: 1) total prey available having a strong affect on SSL fecundity; 2) pollock fraction having a strong affect on pup recruitment; and 3) harbor seal density (a proxy for killer whale predation) having a moderate effect on non-pup survival.

Other analytical approaches to understanding the decline are based on graphical analysis and concepts from theoretical ecology (e.g., Springer et al., NRC 2003), or build on existing whole-ecosystem simulation models to evaluate multiple hypotheses to explain SSL population dynamics simultaneously (Guenette et al. 2006). All of these analytical approaches provide a rich source of relationships on which hypothesis tests can be based. NMFS (2008) provides a summary and interpretation of most of the evidence on those factors thought to potentially represent threats to sea lion recovery, and descriptions of many relevant analyses, in "Section IV. Threats Assessment for the Western Population."

Proposed Actions for Condition

During 2008 and 2009 the Pollock Conservation Cooperative Research Center advertised the availability of financial support for "an investigation of the 'fishery competition hypothesis' by exploiting a diverse range of evidence using statistical, maximum-likelihood, modeling experiments." APA agrees that a multiple-hypothesis, statistical modeling approach may be more effective, and may align better, with the risk assessment framework now being used to assess the potential threats to the SSL, albeit implicitly and informally, by NMFS Protected Resources

(UAF 2008). Unfortunately, no research proposals were received. Perhaps one reason for the lack of response is that PCC RC research funding must be linked to investigators at the University of Alaska, and it may be that a researcher with appropriate experience is not now available at the university.

To move forward, the APA proposes to make known during 2010 (and continuing into 2011 if required) the availability of financial support for an analysis of existing data using a multiple-hypothesis, statistical modeling approach designed to test the relative strength of support for environmental variability, competition with fisheries, predation by killer whales, and exposure to toxic substances as factors impeding the recovery of the western distinct population segment of SSLs. However, in contrast to prior PCC RC efforts, the APA will seek to make known an intention to fund such an analysis to a larger community of researchers.

The assessment report specifies that the effects of the fishery are (should be) known and are highly likely to be within the limits required to protect endangered, threatened, and protected species, by the second annual audit. However, leaving aside the possibility that additional scientific analysis may not provide completely convincing evidence, as a practical matter, obtaining the services of a capable team of researchers could well require 6-12 months, and then conducting such an analysis could require an additional 6-12 months. To accommodate these possibilities, the APA proposes to complete the process of securing the commitment of a research team to provide the required analysis by the second annual audit, and then to require the research to be completed prior to the third annual audit. A project progress report will be provided at the 2010 annual surveillance audit.

References for Condition

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	Steller Sea Lion: Assessing the Evidence Concerning Multiple Hypothesis. Contract Report #AB133F-02-CN-0085, MRAG Americas, Inc. AFSC, Seattle, Washington.
APA Progress Report	**Recent Measurements of SSL Populations in Alaska** AFSC scientists conducted surveys in summer 2010 to assess abundance, trends, and distribution of adult and juvenile (non-pup) SSL in Alaska. The survey was conducted from southeast Alaska through Amchitka Pass in the Aleutian Islands during June using an aircraft. Pups and non-pup counts (on-site) were also made at five rookeries and haulouts in the western Aleutian Islands during June and pups were counted at the Walrus Island rookery (near the Pribilof Islands in the Bering Sea) during July from a research vessel (Fritz and Gelatt 2011). It was not possible to provide an updated estimate of non-pup population trends for the entire western DPS in Alaska using the 2010 survey results due to the large number of trend sites missed because of weather and the closure of the runway at Eareckson Air Force Base on Shemya Island. There continues to be considerable regional variability in non-pup abundance and pup production trends throughout the range of the western DPS of SSL in Alaska. This is particularly evident in the Aleutian Islands. Pup and non-pup counts are both declining in all regions west of 177° W, with trend declines greater to the west. In contrast, near the center of the AI non-pup abundance has been variable but the trend has been stable since the early 1990s, while pup production at Kanaga, Adak, and Kasatochi rookeries has almost tripled. This is the only group of rookeries in west of Samalga Pass that has had a statistically significant increase in pup production in the last two decades (Fritz and Gelatt 2011). While only three sites were surveyed in the Bering Sea in 2010 (Amok, Sea Lion Rock, and Walrus Island), sea lion population trends are either stable or declining there. This contrasts with the rest of the eastern AI area west of Unimak Pass and the western GOA area, which have had significantly increasing trends since 2000. In the central GOA, the sea lion population is stable and the area is bordered by the eastern and western GOA areas where populations are increasing. This variable pattern of regional population trends has led AFSC scientists to believe that sea lions may be responding less to ecosystem-wide environmental or anthropogenic forces, and more to forces that vary longitudinally and at meso-scales of about 100-150 nautical miles (Fritz and Gelatt 2011). **Process to Secure the Commitment of a Research Team** The APA strategy to obtain research services to develop a multiple-hypothesis, statistical modeling approach to test the relative strength of support for alternative hypotheses about factors that may be impeding the recovery of SSL has changed since 2010. The current strategy is as follows. Instead of openly advertising the opportunity to the greater community of marine mammal scientists and statisticians, the initial effort will attempt to secure the services of a post-doctoral researcher and an auxiliary "expert advisor" to carry out the modeling analysis and the generation of results. It is thought that this modeling and statistical analysis function would be supported by a small group of marine mammal scientists that will assume responsibility for the development of the hypotheses to be tested. The group of marine-mammal scientist advisors will be assembled to capture a range of experience, interests, and abilities. The group will include a scientist-coordinator and three additional scientists with significant field research and observation

	experience. The primary task of the advisory group will be to evaluate all of the existing observations and data such that the best data and the most appropriate test specification can be brought forward for evaluation. This first-best set of tests will be evaluated by the modeling analysts and the results provided to the advisory group for discussion and modification if necessary. It is anticipated that contracts for implementing the approach will be in place before the end of 2011. **References** Fritz, L. and T. Gelatt. "Surveys of Steller Sea Lions in Alaska, June-July 2010." Memorandum for the Record. National Marine Mammal Laboratory, Alaska Fishery Science Center, 7600 Sand Point Way N.E., Seattle, Washington.
Observations	The central issue of this Condition has a long history, as it concerns the need to understand the potential role of the pollock fishery on the dynamics of the western stock of Steller sea lions. Although fur seal numbers are still relatively large, the continued decline in pup production at the Pribilof Island has increased concern about fishery impacts on this component of the population. The proposed actions by the client, in collaboration with NMFS and academics, is welcome and casting a wider net on the one hand and approaching researchers with previous experience with this type of modelling, on the other, will hopefully prove successful. The increased contrast between areas that continue to decline with those that have either stabilized or are increasing should help distinguish among multiple alternative hypotheses about the factors impacting sea lion and fur seal dynamics.
Conclusion	The team concluded that every effort was being undertaken to move forward on this Condition and therefore progress, although slow, is nonetheless satisfactory and on target.

Any complaints against the certified operation; recorded, reviewed and actioned
The certified operation considered here is the following signatories to the APA MSC certification programme: Alyeska Seafoods Co. Icicle Seafoods North Pacific Seafoods Ocean Beauty Seafoods Pacific Seafood Group Peter Pan Seafoods Trident Seafoods Unisea Westward Seafoods There were no reported incidents of any complaints against the APA member companies or the non-APA Alaska pollock producers relating to the scope of MSC certification.

Any relevant changes to legislation or regulation
At the October 2010 meeting the NPFMC took final action to restructure the North Pacific Groundfish Observer Program. The restructured program has two coverage categories - 100 percent and less than 100 percent. Virtually all of the vessels in the GOA pollock fishery will fall into the less than 100 percent coverage category.

The selection of vessels and processors that must carry an observer under the restructured program would be determined by the NMFS through a sampling and deployment plan (i.e., observer coverage rates [trips or vessels] would not be in regulation). NMFS will release an observer report by the first of September each year. The report will contain the proposed stratum and coverage rates for the deployment of observers in the following calendar year, as well as a detailed accounting of the financial aspects of the program.

Any relevant changes to management regime
New management measures were adopted for the GOA pollock fishery at the June 2011 meeting of the NPFMC. At this meeting the Council voted to implement initial Chinook salmon PSC management measures for the Western and Central GOA pollock fishery, including a hard cap and full retention requirement with improved monitoring and sampling opportunities to limit Chinook salmon PSC and support development of a sampling protocol to determine the stock of origin of Chinook taken by the GOA pollock fleet. The Council also voted to extend the existing 30% observer coverage requirements for vessels 60'-125' to trawl vessels less than 60' directed fishing for pollock in the Central or Western GOA no later than January 1, 2013. Observer deployment under the restructured North Pacific Groundfish Observer Program will supersede expansion of coverage under this action. Full retention of all salmon in pollock trawl fisheries is required.

Overall Conclusions
The overall management of the fishery continues to at least the level as during the full assessment. APA and/or NMFS have taken action toward addressing the Conditions of Certification raised during the MSC certification assessment and all Conditions are presently expected to be closed out within the agreed timescales. MSC Certification should therefore continue and surveillance audits continue to the same schedule.

Information Sources:

Meetings

- Monday 9th May was left open to stakeholders to meet and/or speak via conference call to the assessment team. No stakeholders met with or submitted information to the assessment team.
- Tuesday 10th May an all day meeting was held at the Alaska Fisheries Science Centre. The meeting was attended by the surveillance team and, in the course of the day, the following people participated in the meeting:
  Steve Barbeaux, Pat Livingston, Jason Anderson, Ed Richardson, Sandra Lowe, Ingrid Spies, Anne Hollowed, Mark Wilkins, Bob Lauth, Thom Wilderbuer, Buck Stockhausen, Jim Browning, Jim Ianelli, Stephanie Zador, Craig Rose, Paul Spencer, Doug DeMaster.
- Wednesday 11th May an all day meeting was held at the Alaska Fisheries Science Centre. The meeting was attended by the surveillance team and, in the course of the day the following people participated in the meeting:
  Jim Ianelli, Stephanie Zador, Mark Wilkins, Martin Dorn, Grant Thompson (by phone and webex), Tersea A'mar, Tom Wilderbruer, Buck Stockhausen, Sarah Gaichas, Ingrid Spies, Sandra Lowe, Jim Browning, Jason Anderson, Ed Richardson.
- Thursday 12th May an all day meeting was held at the Alaska Fisheries Science Centre. The meeting was attended by the surveillance team and, in the course of the day the following people participated in the meeting:
  Jim Ianelli, Tom Gelatt, Ed Melvin, Doug DeMaster, Anne Hollowed, Ingrid Spies, Sandra Lowe, Jim Browning, Jason Anderson, Ed Richardson, Shannon Fitzgerald.

NB. The site visit combined the pollock, Pacific cod and flatfish fisheries, in the BSAI and GOA hence, the meetings included specialists that cover all three fisheries and their associated species as well as other components of the BSAI and GOA ecosystem.

Reports etc. provided and reviewed in the course of the surveillance audit

Anon. 2004. "Chapter 1a Stock Assessment of Aleutian Islands Region Pollock." Appendix A. Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Bering Sea/Aleutian Islands Region. North Pacific Fishery Management Council, 605 West 4th Avenue, Suite 306, Anchorage, Alaska.

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Standards and Guidelines used:

1. MSC Principles and Criteria for Sustainable Fishing
2. MSC Fishery Certification Methodology Version 6. September 2006
3. TAB Directives - all

APPENDIX A

At-Sea Processors Association
Bering Sea and Aleutian Islands Pollock Fishery
Gulf of Alaska Pollock Fishery

Best use Cooperative
Bering Sea and Aleutian Islands Flatfish Fishery
Gulf of Alaska Flatfish Fishery

Alaska Fisheries Development Foundation
Bering Sea and Aleutian Islands Pacific Cod Fishery
Gulf of Alaska Pacific Cod Fishery

MSC Certification
Certification Body: Moody Marine Ltd

Combined Annual Surveillance Audits

Moody Marine Ltd, will be making their surveillance team – Jake Rice, Don Bowen, Susan Hanna, Paul Knapman - available to meet with stakeholders between 9th and 13th May 2011 in Seattle.

MSC certification requires annual surveillance audits of all certified fisheries. These audits have two principal functions:

1. To review any changes in the management of the fishery, including regulations, key management or scientific staff or stock evaluation
2. To evaluate the progress of the fishery against any Conditions of Certification

Should you have any information on this fishery that you feel should be considered in the audit and/or if you would like to arrange a meeting with the surveillance team, please advise us of:

a) your name and contact details
b) your association with the fishery; and,
c) the issues you would like to discuss

Please email or fax these details to Paul Knapman – p.knapman@moodyint.com Fax No. 1 902 422 9780

April 2011