

Discussion paper on cooperatives
Gulf of Alaska Chinook Salmon Bycatch
North Pacific Fishery Management Council
February 2011

At its December 2010 meeting, the Council initiated an action to address Chinook salmon bycatch in the Gulf of Alaska pollock fisheries. As a part of the development of alternatives, the Council requested staff to prepare a discussion paper concerning certain aspects of a proposed system of cooperatives that would be intended to reduce Chinook salmon prohibited species catch (PSC). Specifically, the Council requested discussion of cooperative formation, cooperative size, the need to create fishing opportunities for non-members of cooperatives, and cooperative reporting requirements. This paper addresses these issues. In addition, this paper briefly addresses the proposal that cooperatives require full retention of Chinook salmon to improve information concerning bycatch and its effects on stocks and the interaction of the cooperative system with a proposed a Chinook PSC hard cap in the fisheries.

Purpose and need statement

To frame its action, the Council adopted the following purpose and need statement

Chinook salmon bycatch taken incidentally in GOA groundfish fisheries is a concern, and no salmon bycatch control measures have been implemented to date. Current observer coverage levels and protocols in some GOA groundfish trawl fisheries raise concerns about bycatch estimates and may limit sampling opportunities. Limited information is available on the origin of Chinook salmon taken as bycatch in the GOA; it is thought that the harvests include stocks from Asia, Alaska, British Columbia, and lower-48 origin. Despite management actions by the State of Alaska to reduce Chinook salmon mortality in sport, commercial, and subsistence fisheries, minimum Chinook salmon escapement goals in some river systems have not been achieved in recent years. In addition, the level of GOA Chinook salmon bycatch in 2010 has exceeded the incidental take amount in the Biological Opinion for ESA-listed Chinook salmon stocks. The sharp increase in 2010 Chinook bycatch levels in the GOA fisheries require implementing short-term and long-term management measures to reduce salmon bycatch to the extent practicable under National Standard 9 of the Magnuson-Stevens Act. In the short term, measures focused on the GOA pollock fisheries are expected to provide the greatest savings. In the long term, comprehensive salmon bycatch management in the GOA is needed.

Alternatives

As suggested by the purpose and need statement, the Council developed two sets of alternatives for analysis. The first set of alternatives was developed for expedited review, to ensure that more accessible reductions in Chinook salmon bycatch are achieved in the near term. The alternatives for expedited analysis, which follow, include a range of Chinook salmon PSC limits with expanded observer coverage, and mandatory salmon bycatch control cooperatives. This paper addresses the bycatch control cooperative alternative.

Alternatives for expedited review and rule making:

The below alternatives apply to directed pollock trawl fisheries in the Central and Western GOA.

Alternative 1: Status quo.

Alternative 2: Chinook salmon PSC limit and increased monitoring.

Component 1: 15,000, 22,500, or 30,000 Chinook salmon PSC limit (hard cap).

Option: Apportion limit between Central and Western GOA

- a) proportional to the pollock TAC.
- b) proportional to historic average bycatch rate of Chinook salmon (5 or 10-year average).
- c) proportional to historic average bycatch number of Chinook salmon (5 or 10-year average).

Component 2: Expanded observer coverage.

Extend 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.

Alternative 3: Mandatory salmon bycatch control cooperative membership.

In order to fish in the Central or Western GOA pollock fisheries a vessel must be a member of a salmon bycatch control cooperative for the area where they are participating. Cooperative formation will be annual with a minimum threshold (number of licenses).

Cooperative contractual agreements would include a requirement for vessels to retain all salmon bycatch until vessel or plant observers have an opportunity to determine the number of salmon and collect any scientific data or biological samples. Cooperative contractual agreements would also include measures to control Chinook salmon bycatch, ensure compliance with the contractual full retention requirement, promote gear innovation, salmon hotspot reporting, and monitoring individual vessel bycatch performance.

Annual cooperative reports to the Council would include the contractual agreements and successes and failures for salmon bycatch controls by season and calendar year.

The Council requests staff explore options related to the following aspects of mandatory cooperative formation:

- Minimum number of licenses required to promote meaningful exchange of information and cooperation to avoid bycatch under the current directed fishery management structure. (Minimum threshold for cooperative formation should be set to ensure all eligible licenses have a reasonable opportunity to participate).
- Evaluate the costs and benefits of minimum thresholds of cooperative membership that would allow for no more than 1 or 2 cooperatives in each region.
- Options to ensure participants outside of a bycatch control cooperative would be subject to regulatory bycatch controls if it is determined mandatory cooperative membership is not possible.
- Appropriate contract elements and reporting requirements.

The third alternative proposes the development of a system of cooperatives that would be formed for the purpose of reducing Chinook prohibited species catch (PSC). Two structural approaches are being considered for establishing reasonable, effective incentives for Chinook avoidance. Under the first, cooperative membership would be required for participation in a directed pollock fishery in the Western Gulf of Alaska or Central Gulf of Alaska. Cooperative formation requirements (including minimum membership thresholds or limits on the number of cooperatives that could form) would be established to ensure the effective communication and cooperation needed to meet bycatch goals, while allowing all eligible persons a reasonable opportunity to participate in the fisheries. If such requiring cooperative membership of all participants is not feasible, fishing could be permitted outside of cooperatives subject to additional specific regulatory measures to ensure that Chinook PSC bycatch goals are met.

Mandatory cooperative membership v. alternative regulations for non-members

Mandatory cooperative membership is intended to facilitate information sharing and fleet coordination that could be important to achieving Chinook avoidance. In the absence of this communication and coordination of fishing effort, each vessel might rely on its own fishing to assess salmon bycatch at different times and locations (i.e., trial and error by each vessel). While a cooperative structure may be used to reduce bycatch, it could pose other problems. In considering mandatory cooperative membership, two related considerations should be assessed. First, any system of cooperatives must allow all eligible license holders a reasonable opportunity to participate in the fishery. Second, the Council must develop a system with enough specificity that the cooperative does not effectively receive a delegation of management authority for the fishery. In other words, the requirement that participants have membership in a cooperative should not vest in the cooperative the effective ability to define rules for the fishery (such as who is permitted to fish, when, and how much they are allowed to catch). In a liberal system that allows many cooperatives to form, management authority is not likely to arise in a cooperative, as persons unhappy with the rules of a cooperative could simply form another cooperative with its own rules. Under a system in which cooperative membership is required (and participants are constrained from creating a new cooperative), it is possible that the cooperative could use that constraint to effectively define its own management rules for the fishery. To avoid a delegation of management authority under a mandatory cooperative system that permits only a single cooperative, regulatory requirements should specifically define the rules that a cooperative would implement, rather than allow the cooperative the authority to define those rules itself. Consequently, any mandatory cooperative program should be developed to either allow eligible license holders the opportunity to form a substitute cooperative (in the event they are unable or unwilling to accept the rules of an existing cooperative) or clearly define a cooperative's discretion to define rules for cooperative members. Limiting the authority of the cooperative, together with allowing multiple cooperatives to form, strengthens arguments that the system both allows reasonable fishing opportunities and does not constitute a delegation of management authority to the cooperative.

The Council motion suggests that the Chinook bycatch benefits to be derived from a cooperative program are generated through communication and coordination of fleet. In addition, the motion suggests that these benefits may not be attained, if liberal rules lead to the formation of several cooperatives. If the

Council elects to develop a cooperative system with limited opportunities for formation of cooperatives and no fishing opportunity outside of cooperatives, care should be taken to 1) define the rules that a cooperative may develop and impose on members to avoid any delegation of management authority and 2) ensure that all eligible persons can enter the fishery (i.e., join a cooperative subject to fair and reasonable terms). If the Council elects to instead develop a cooperative system that allows a fishing opportunity outside of the cooperative structure, it would need to define the rules for vessels that fish outside of the cooperative to ensure that those vessels 1) meet the Council's bycatch goals and 2) are not unfairly disadvantaged in the fishery.

Mandatory cooperative structures

A system of mandatory cooperatives would likely be more acceptable and defensible, if the system allowed the formation of multiple cooperatives. Yet, a minimal number of relatively large cooperatives is likely to ensure that the benefits of cooperatives are achieved. In its initial consideration of this action, the Council suggested adopting a rule that directly limits the number of cooperatives that may be formed. Alternatively, the Council might consider a threshold that requires a minimum number of eligible licenses to form a cooperative, which if set appropriately would limit the number of cooperatives that might form. The fleet structure and historic participation cause some difficulties with either a direct limitation on the number of cooperatives or a minimum membership threshold of eligible licenses for cooperative formation. Currently, 118 and 98 License Limitation Program (LLP) licenses are endorsed for participation in the Central Gulf and Western Gulf trawl fisheries, respectively. Yet, since 2003 no more than 53 and 31 vessels have participated in these fisheries in any year, respectively (see Table 1). Defining cooperative formation based on the total number of eligible licenses would likely be problematic, since less than half of those eligible typically participate in the fisheries. Soliciting membership to a cooperative from persons who have no interest in the fishery could complicate negotiations surrounding the formation and may even be an obstacle to a cooperative achieving its bycatch goals.

An alternative approach to defining cooperative formation thresholds could be considered. Instead of establishing a threshold based on licenses that are eligible for the fishery, the Council could define a rule based on the past year's participation. For example, a threshold could be defined as a portion of the licenses that participated in the preceding year's fishery – i.e., licenses used for a targeted landing of pollock in the preceding year). If the Council chose a threshold requiring more than one-quarter or one-third of the participants from the preceding year, a maximum of 3 or 2 cooperatives could be formed, respectively. Although this presents a possibility that more than one cooperative would form, allowing a substantial minority to form a cooperative might be important to the acceptability of the system. In addition, a high threshold, such as one-half of the fishery's participants, might prevent cooperative formation altogether, if participants develop competing factions. Basing the threshold on the prior year's fishing would create an identifiable pool of persons for defining the threshold, all of which have some experience in the fishery. The threshold could be administered by posting a list of eligible licenses at the end of each season – comprised of licenses used for a targeted landing of pollock in the area in the

preceding year. This list would provide notice to participants of those persons whose membership would count toward attaining the threshold.

Table 1. Targeted pollock and accompanying Chinook salmon PSC catch in the Central and Western Gulf (2003-2010) .

| Area | Year | Number of vessels | Total catch | | Catch of lowest quartile | | | | Catch of lowest tertile | | | |
|------------------------|------|-------------------|-------------|--------------------|--------------------------|-----------------------|--------------------|-----------------------|-------------------------|-----------------------|--------------------|-----------------------|
| | | | Pollock | Chinook salmon PSC | Pollock | | Chinook Salmon | | Pollock | | Chinook Salmon | |
| | | | | | Tons | As a percent of total | Chinook salmon PSC | As a percent of total | Tons | As a percent of total | Chinook salmon PSC | As a percent of total |
| Central Gulf of Alaska | 2003 | 49 | 32,416 | 3,557 | 629 | 1.9 | 60 | 1.7 | 1,343 | 4.1 | 314 | 8.8 |
| | 2004 | 53 | 40,363 | 10,655 | 1,195 | 3.0 | 303 | 2.8 | 2,378 | 5.9 | 699 | 6.6 |
| | 2005 | 47 | 50,089 | 21,429 | 2,598 | 5.2 | 641 | 3.0 | 5,122 | 10.2 | 1,544 | 7.2 |
| | 2006 | 45 | 48,335 | 11,138 | 2,194 | 4.5 | 363 | 3.3 | 4,020 | 8.3 | 676 | 6.1 |
| | 2007 | 38 | 34,973 | 31,647 | 1,646 | 4.7 | 499 | 1.6 | 3,334 | 9.5 | 1,436 | 4.5 |
| | 2008 | 44 | 33,336 | 7,971 | 1,379 | 4.1 | 514 | 6.5 | 2,217 | 6.7 | 711 | 8.9 |
| | 2009 | 40 | 24,070 | 2,123 | 1,480 | 6.1 | 287 | 13.5 | 2,395 | 9.9 | 344 | 16.2 |
| 2010 | 41 | 45,782 | 12,334 | 3,082 | 6.7 | 684 | 5.5 | 4,786 | 10.5 | 1,394 | 11.3 | |
| Western Gulf of Alaska | 2003 | 31 | 16,299 | 738 | 551 | 3.4 | 10 | 1.3 | 1,116 | 6.8 | 35 | 4.7 |
| | 2004 | 25 | 23,420 | 2,327 | 2,276 | 9.7 | 200 | 8.6 | 3,916 | 16.7 | 440 | 18.9 |
| | 2005 | 28 | 31,282 | 5,951 | 3,308 | 10.6 | 1,646 | 27.7 | 5,048 | 16.1 | 1,901 | 32.0 |
| | 2006 | 28 | 25,001 | 4,529 | 1,863 | 7.4 | 460 | 10.1 | 3,045 | 12.2 | 668 | 14.7 |
| | 2007 | 25 | 18,069 | 3,359 | 179 | 1.0 | 17 | 0.5 | 436 | 2.4 | 110 | 3.3 |
| | 2008 | 19 | 15,497 | 2,116 | 205 | 1.3 | 33 | 1.5 | 477 | 3.1 | 60 | 2.8 |
| | 2009 | 22 | 14,674 | 441 | 1,117 | 7.6 | 27 | 6.2 | 1,894 | 12.9 | 58 | 13.1 |
| 2010 | 26 | 28,593 | 31,581 | 1,673 | 5.9 | 2,849 | 9.0 | 3,040 | 10.6 | 4,684 | 14.8 | |

Source: NOAA Fisheries Catch Accounting Data.

While the threshold would allow for multiple cooperatives, it also could allow for persons who took a relatively small share of the total catch to form a cooperative. For example, in the Western Gulf in 2009, under a 25 percent threshold, it is possible that 5 licenses with near 2 percent of the total catch would meet the threshold. A one-third threshold could have been met by 7 vessels with slightly less than 3 percent of the catch. Although this circumstance is possible, whether such segment of the fleet would have reason to develop a cooperative is questionable, as the administrative and reporting costs would seem prohibitive and burdensome to a segment of the fleet with only a marginal interest in the fishery. In addition, a cooperative made up of the more active vessels in the fleet would also likely form. Although it may be preferable to develop a threshold based on catches (such as a threshold requiring licenses that accounted for in excess of 25 percent of the total catch in the fishery from the preceding year), it is questionable whether such a threshold could be effectively administered, as it would require annually releasing catch data of all vessels in the fishery. In addition, it could lead to debates concerning catch amounts and whether a certain cooperative application satisfies the threshold. The simpler approach of requiring only a threshold portion of the participating vessels from the prior year may achieve the goal of ensuring that each cooperative has a large enough membership to achieve reasonable coordination necessary to meet bycatch goals.

While this cooperative threshold rule would make cooperative formation more predictable and manageable, steps should be taken to ensure eligible licenses can enter the fishery. As an initial step, cooperatives could be required to accept any eligible person as a member, subject to the same terms and conditions that apply to other cooperative members. Requiring the cooperative to accept eligible persons

as members would serve not only new entrants, but also would ensure that a portion of past participants (able to meet the cooperative threshold) are unable to close other past participants out of the fishery. Although this rule would allow for entrance to a cooperative, care should be taken to develop additional rules to ensure that new entrants are treated fairly. For example, a cooperative that has delayed starts for persons who have not met a minimal bycatch avoidance standard in the preceding season could operate simply as a standdown for all new entrants, who have no recent history in the fishery. To avoid such a result, the rule could require that entrants be subject to rules not more restrictive than those generally applicable to the cooperative members. For example, impositions of standdowns (or early starts) based on past performances on new entrants may disadvantage these entrants in an unfair manner, or even effectively prevent an entrant from having a reasonable fishing opportunity. The cooperative system must be structured to allow reasonable entry opportunities.

Understanding the potential effectiveness of a system of cooperatives requires an understanding of the structure of the fishery and measures a cooperative might use to avoid Chinook bycatch. In addition to cooperative declared area closures and gear modifications, cooperatives are likely to use temporal fishing constraints to avoid Chinook salmon. For example, a the large majority of a cooperative's fleet may standdown, while a few vessels scout certain areas of the grounds to determine whether Chinook salmon bycatch rates are acceptably low. Using information gathered from its fleet, a cooperative may choose not to fish at certain times, either delaying or suspending fishing on certain days (or at certain times of day). For these temporal measures to be effective, a cooperative must be able to suspend fishing for a period of time, without its members sacrificing a substantial portion of their catch from the fishery. Examining data from recent years, however, show that season have been relatively short (see Table 2) and further suggests that fishing occurs over brief periods within some seasons (see Table 3). In the recent years, some seasons have been as short as a single day. Although other seasons have been substantially longer, because of fishing practices, season lengths alone may not reflect the effort level in the fisheries.

Table 2. Gulf of Alaska pollock seasons (2010).

| Area | Season | Opening | Closing | Reason |
|--|--------|--------------|--------------|--------|
| 610 (WG) | A | January 20 | February 27 | TAC |
| | B | March 20 | April 12 | |
| | C | August 20 | September 10 | |
| | D | October 1 | October 9 | |
| | | October 14 | October 17 | |
| 620 (CG) | A | January 20 | February 25 | |
| | B | March 10 | March 16 | |
| | C | August 25 | September 7 | |
| | D | October 1 | October 6 | |
| 630 (CG) | A | January 20 | February 5 | |
| | | February 28 | March 2 | |
| | B | March 10 | March 10 | |
| | | March 22 | March 25 | |
| | C | August 25 | August 27 | |
| | | September 18 | September 19 | |
| | D | October 1 | October 2 | |
| | | October 15 | October 18 | |
| Source: NMFS Inseason management reports | | | | |

Catch data in the fisheries shows that fishing takes place over more than 10 weeks each year in each management area (i.e., 610, 620, and 630). Yet, the weekly catches frequently exceed one-half of the seasonal catch. Specifically, in areas 610 and 620, more than three times a year, on average, half of a season's catch taken in a single reporting week. In area 630, slightly less than 3 times a year, on average, half of a season's catch is taken in a single reporting week. The occurrence of these high weekly catches despite the season being open substantially longer likely reflects the fleet's willingness to make arrangements to limit fishing effort. These agreements may serve a few purposes. In some cases, standdowns may be used to ensure that roe conditions are acceptable in the fishery. Management needs may also drive some agreements to limit effort. The catching power of the fleet (relative to the available total allowable catches) has complicated in-season management, as those total allowable catches could be quickly exceeded. Managers have carefully monitored catch inseason, at times, announcing brief openings of a day or two, to prevent total allowable catch overages. In some cases, the fleet has agreed to limit its effort to induce managers to open the fishery, when managers have been concerned that the amount of effort exceeds their ability to time a closure to avoid a total allowable catch overage. Managers often communicate with participants concerning the timing of their efforts. These conditions need to be considered when evaluating the operation and effects of a cooperative structure on Chinook salmon bycatch and developing a cooperative structure to achieve reductions.

Table 3. Weeks of fishing, the number of weeks when vessels catches exceeded one-half or one-third of the average seasonal catch (2003-2010).

| Area | Year | Weeks of fishing | Number of weeks | | Number of weeks with more than half of participating vessels |
|------|------|------------------|--|---|--|
| | | | one-half of the average seasonal catch | one-third of the average seasonal catch | |
| 610 | 2003 | 7 | 3 | 3 | 3 |
| | 2004 | 8 | 4 | 5 | 6 |
| | 2005 | 8 | 4 | 5 | 7 |
| | 2006 | 15 | 2 | 5 | 6 |
| | 2007 | 17 | 3 | 4 | 2 |
| | 2008 | 13 | 3 | 4 | 6 |
| | 2009 | 7 | 5 | 5 | 5 |
| | 2010 | 18 | 2 | 3 | 8 |
| 620 | 2003 | 11 | 3 | 5 | 3 |
| | 2004 | 15 | 2 | 3 | 2 |
| | 2005 | 16 | 3 | 5 | 5 |
| | 2006 | 17 | 3 | 5 | 4 |
| | 2007 | 14 | 3 | 3 | 3 |
| | 2008 | 13 | 4 | 4 | 4 |
| | 2009 | 10 | 3 | 3 | 3 |
| | 2010 | 10 | 4 | 6 | 6 |
| 630 | 2003 | 11 | 3 | 4 | 3 |
| | 2004 | 14 | 3 | 4 | 4 |
| | 2005 | 13 | 3 | 5 | 4 |
| | 2006 | 18 | 2 | 5 | 6 |
| | 2007 | 14 | 1 | 5 | 3 |
| | 2008 | 7 | 4 | 5 | 4 |
| | 2009 | 4 | 2 | 2 | 2 |
| | 2010 | 11 | 4 | 4 | 4 |

Source: NMFS Catch Accounting.

The high catch rates in the fisheries raise concerns with any multiple cooperative system that attempts to derive Chinook salmon PSC reductions through actions affecting the timing of fishing effort. For example, if two cooperatives are permitted to form and one cooperative attempts to reduce Chinook salmon bycatch by delaying fishing (while the other does not) it might be possible for early starting cooperative's efforts to substantially reduce the portion of the total allowable catch available to the cooperative that delays fishing. If a system that permits multiple cooperatives is adopted, an intercooperative agreement could be required to address these issues. An intercooperative agreement could be used to ensure that a cooperative's decision to pursue Chinook salmon avoidance through changing the timing of its fishing does not forsake a fair fishing opportunity for its members. An intercooperative agreement could be negotiated to time fishing in a manner that does not disadvantage either cooperative or provide for a compensatory mechanism, if one cooperative's choice of timing unfairly disadvantages the other.

Requiring all cooperatives to be part of an intercooperative agreement would be preferred to requiring all participants to be part of a single cooperative, as an intercooperative would be more limited in its terms. Rather than requiring all participants to join a single association (which could be interpreted as imposing associations on some participants), an intercooperative would allow most terms to be defined by the cooperative with the intercooperative only defining those terms that ensure that no cooperative has an

unfair advantage. This separation would allow participants more choice of associations and specific fishing terms through the cooperatives, at the same time using the intercooperative to ensure that no cooperative's internal measures to reduce Chinook salmon PSC creates an unfair advantage or disadvantage.

Although more liberal than a single cooperative structure, the cooperative formation rule suggested here would allow few cooperatives to form. Consequently, the Council should consider limiting the scope of cooperative agreements to ensure that the system is not interpreted as a delegation of management authority to cooperatives. Since the action is intended to address Chinook salmon PSC, a reasonable starting point is to limit cooperative agreements to measures intended to address Chinook salmon PSC. Additionally, cooperatives should be permitted to adopt ancillary measures to ensure that all participants in the fishery have a fair opportunity. These measures might include standdowns and other effort limits, which might be used to allow vessels to experiment with gear modification or other fishing practices that could reduce catch rates without sacrificing a fishing opportunity. A program that creates an opportunity for a few large limited purpose cooperatives to form, but includes provision for an intercooperative program allow participants to pursue Chinook PSC avoidance measures without overly limiting any participant's opportunities in the fishery.

A limited access fishery for participants outside of cooperatives

An alternative to a mandatory cooperative structure is a structure that allows participants who choose not to join a cooperative, an opportunity to fish outside of cooperative. Such a structure might be preferred to a mandatory cooperative structure, as it would avoid any complications arising from a requirement that a participant join an association to access the fishery. The complication for a structure with a limited access opportunity is the development of rules for that limited access fishing that both ensure its participants a reasonable fishing opportunity and creates incentives to reduce Chinook salmon PSC without disproportionately reducing the incentive for cooperatives to pursue Chinook PSC avoidance measures.

Any limited access structure would be intended to allow limited access participants to fish, but not gain a competitive advantage over the cooperative participants. Cooperatives, however, are likely to attempt to use time constraints on effort (e.g., delaying fishing while members monitor Chinook PSC rates) to reduce Chinook bycatch. Developing a management system for a limited access fishery that allows flexibility to delay starts or suspend fishing is likely unworkable for the agency. The agency would likely have limited ability to time limited access openings to correspond with cooperative decisions or to limit the catch of limited access participants to ensure that cooperatives had access to some proportional share of the total allowable catch.

A further complication would likely arise from any management measures intended to reduce Chinook PSC in the limited access fishery. These measures would need to be static, modified only through Council actions. The need to resort to Council action for their modification presents challenges. In the event cooperatives develop effective means of addressing Chinook PSC, applying those measures in the limited access fishery would be delayed by the process of completing the required regulatory analysis and

Council action. While it is possible that some participants in the limited access fishery may voluntarily adopt measures, no participants could be compelled to adopt the measures in the absence of Council action. It is possible that some limited access participants may see the inapplicability of cooperative Chinook avoidance measures (particularly those that reduce pollock catch rates) as creating an opportunity to increase their catch from the fishery. This opportunity could not only increase the incentive for fishery participants to remain in a limited access fishery with higher Chinook PSC rates, but could also reduce the incentive for cooperatives to develop or adopt effective Chinook avoidance measures. Although the initial response to this circumstance might be to impose relatively stringent restrictions on a limited access fishery (thereby creating a substantial incentive for cooperative membership), the limited access fishery must provide reasonable access to the fishery.

A starting point for defining the limited access fishery should be the development of management measures, the combination of which effectively limit Chinook PSC, while providing a fishing opportunity for participants comparable to the opportunity available in a cooperative. Yet, information concerning effective means of avoiding Chinook PSC is expected to evolve as cooperatives experiment with new measures and adapt behaviors in response to their findings. Consequently, a measure that might currently seem altogether reasonable could be obsolete in the near future (as being proven ineffective relative to other measures). Such a circumstance does not lend itself to the development of rigid measures of the type likely to be needed for management of the limited access fishery. For example, it might be reasonable to limit catches during a particular time period due to high Chinook salmon PSC rates during that period. Over time, the timing of high Chinook salmon PSC rates may change. While a cooperative may be able to quickly respond to these changes, it is unlikely that a similar regulatory response would be possible for the limited access fishery. The rigidity of regulatory management might prevent the development of an effective limited access management structure that provides both a fishing opportunity comparable to that of cooperative members and effective Chinook PSC avoidance.

The difficulty of defining an effective suite of measures for addressing Chinook PSC, while maintain a reasonable fishing opportunity relative to cooperatives whose Chinook avoidance measures are likely to change over time suggest that creating a limited access fishery may not effectively address Chinook bycatch and provide a reasonable opportunity in the fishery.

Cooperative management and reporting requirements

The Council's objective for this action is to adopt a management system that achieves practicable reductions in Chinook salmon PSC rates. While a variety of measures could be considered to achieve this end, the reasons for recent relatively high Chinook salmon PSC are not known with certainty. Consequently, specific management requirements (such as specific gear requirements) may not reliably achieve the Council's objective. As a result, the Council's motion suggests a variety of measures should be considered.

The motion first suggests that cooperatives agreements include a full retention requirement under which members would retain all salmon bycatch to facilitate counting and sampling for biological purposes.¹ **In order to implement a full retention requirement, regulations will need to be modified (as a part of this action) to allow salmon retention.** Currently, regulations in the Gulf of Alaska prohibit vessels from retaining Chinook salmon (see 50 CFR 679.21). Assuming that regulation is modified, the full retention requirement could be implemented and overseen by cooperatives. Plant observers could then collect samples and count salmon, increasing biological information from the fishery. The cooperative would not only establish this full retention requirement, but would also be required to establish a system for ensuring compliance. In addition to providing scientific information concerning the fishery, cooperatives might also use this information to assess the success of its Chinook salmon avoidance measures and to internally manage its fishing effort.

A variety of other measures would (or could) be required of cooperatives to aid in Chinook salmon avoidance. The cooperatives would also be required to establish a hotspot reporting system, under which cooperative members collect information concerning bycatch rates that can then be used to redirect effort from areas of unacceptably high Chinook salmon PSC. The information benefits arising from such a reporting system could be important to achieving acceptably low rates of Chinook salmon PSC. Time and area limitations on fishing could be incorporated into the cooperative agreement. These limits might be either fixed prior to the season (if certain times and areas can be firmly determined to be prone to high Chinook bycatch) or may be announced in season using the information gathered through the hotspot reporting system. In either case, the basis for limitations should be clearly articulated in the cooperative agreement. Cooperatives could also be required to promoting gear modifications for the purpose of reducing Chinook salmon PSC. A cooperative would also be required to monitor individual vessel performance, as a means to facilitate development and implementation of individual incentives for Chinook salmon avoidance. The provisions used to establish individual incentives should be clearly set out in the cooperative's agreement.² In addition, the system of monitoring should create a reliable basis for cooperative administration of incentives (including the imposition of penalties and granting of rewards).

Cooperatives would also be required to annually report on both the contents of cooperative agreements and the performance of the cooperative. Reporting requirements should provide information verifying the

¹ It should be noted that **salmon counts arrived at through the cooperative's full retention measure would not be used for fishery management under observer coverage of the Council's recently adopted observer program amendment.** Salmon bycatch for fishery management would be based on estimates generated by the observer program sampling. In the past, counts generated by full retention, in the absence of comprehensive observer coverage, were rejected as unreliable and potentially biased. More comprehensive monitoring (possibly through video monitoring) could be developed to substantiate census based counts in the future, but would not be timely for this action. While managers may choose not to rely on census counts for management without more extensive monitoring, cooperatives could choose to use those counts in their internal oversight, if they are satisfied with their reliability.

² It should be noted that the incentives must be carefully devised to ensure entry opportunities in the fishery. Consequently, an eligible vessel entering the fishery must not be unfairly disadvantaged for not having a bycatch record in the fishery.

cooperative's adherence to each of the cooperative requirements established by the Council. In addition, cooperative reports should provide the Council with a general description of the cooperative's Chinook bycatch avoidance during the year with specific information concerning the efficacy of the various measures required by the Council and any other measures adopted. The annual reports should describe the cooperative's agreement in a manner that enables the Council to determine whether the various measures achieve the Chinook salmon avoidance objectives.

Cooperatives could also be required to include in their reports a description of the rationale behind each cooperative measure to establish that the measure is within the scope of the cooperative's authority. Assuming an intention to limit the scope cooperative measures to those intended to address Chinook salmon PSC, cooperative reports could be required to describe the rationale behind each cooperative measure and how that measure addresses Chinook salmon PSC. Since additional measures may be included in an agreement to ensure fair fishing opportunities within and among cooperatives, the need for and rationale behind those rules should also be incorporated in a cooperative's annual report. Requiring cooperatives to establish the nexus between the measures adopted and the cooperative's objective of addressing Chinook salmon PSC while maintaining fair fishing opportunities can be used to ensure that cooperative do not effectively assume management authority for the fishery.

The Council should also consider whether intercooperative reports should be required, should an intercooperative agreement be reached. Such a report could describe any terms of the intercooperative agreement, any measures implemented under those terms and their effects. As with cooperative reports, the intercooperative report could also be required to describe how each measure served the objective of addressing Chinook salmon PSC, while ensuring participants have a fair fishing opportunity.

The Council's December motion provides a reasonable framework for the development of a more specific motion defining the cooperative alternative. Using the Council's motion, the following cooperative requirements could be used as a starting point for specifically defining this alternative:

To be eligible to participate in the Central Gulf of Alaska or Western Gulf of Alaska pollock fishery, the holder of an appropriately endorsed License Limitation Program license would be required to join a Chinook salmon bycatch control cooperative.

Each cooperative would be formed for participation in a single regulatory area (e.g., Central Gulf of Alaska or Western Gulf of Alaska).

To form, a cooperative is required to have more than:

- a) 25 percent; or
- b) 33 percent;

of the licenses that participated in the applicable regulatory area in the preceding year.

Any cooperative is required to accept as a member any eligible person, subject to the same terms and conditions that apply to all other cooperative members. In addition, the cooperative agreement shall not

disadvantage any eligible person entering the fishery for not having an established Chinook salmon bycatch history in the fishery.

Each cooperative agreement shall contain:

A requirement that all vessels retain all salmon bycatch until the plant observers have an opportunity to determine the number of salmon and collect scientific data and biological samples.

Measures to promote gear innovations and the use of gear and fishing practices that contribute to Chinook salmon avoidance.

Vessel reporting requirements to be used to identify salmon hotspots and an appropriate set of measures to limit fishing in identified hotspots.

A system of vessel performance standards that creates individual incentives for Chinook salmon avoidance, which could include rewards or penalties based on Chinook salmon bycatch.

A system of information sharing intended to provide vessels with timely information concerning Chinook salmon bycatch rates.

A monitoring program to:

ensure compliance with the full retention requirement,

catalogue gear use and fishing practices and their effects on Chinook bycatch rates,

ensure compliance with vessel reporting requirements and limits on fishing under the system of salmon hotspots,

determine compliance with measures that require use of fishing gear or practices to avoid Chinook salmon PSC, and

verify vessel performance and implement any system of rewards and penalties related to vessel performance.

A set of contractual penalties for failure to comply with any cooperative requirements.

Each cooperative shall annually provide a report to the Council that includes the cooperative agreement and describes the cooperative's compliance with the specific requirements for cooperatives and the cooperative's performance with respect to those requirements (including salmon retention, gear innovations and fishing practices, vessel reporting requirements and hotspot identification and fishing limitations, vessel performance standards, information sharing, and monitoring). Cooperative reports shall also document any rewards or penalties related to vessel performance and any penalties for failure to comply with the cooperative agreement. The cooperative report should also describe the Chinook salmon bycatch seasonally, identifying any notable Chinook salmon bycatch occurrences or circumstances in the fishery. As a part of its report, a cooperative shall describe each measure adopted by the cooperative, the rationale for the measure (specifically describing how a measure is intended to serve the objective of addressing Chinook salmon PSC, while ensuring a fair opportunity to all participants in the fishery), and the effects of the measure.

In the event more than one cooperative is created, those cooperatives will be required to enter an intercooperative agreement prior to beginning fishing. The intercooperative agreement will establish rules to ensure that no cooperative (or its members) are disadvantaged in the fishery by its efforts to avoid Chinook salmon.

The parties to any intercooperative agreement shall annually provide report to the Council including the intercooperative agreement and describing each measure in the agreement, the rationale for the measure (specifically describing how a measure is intended to serve the objective of addressing Chinook salmon PSC, while ensuring a fair opportunity to all participants in the fishery), and the effect of the measure.

Hard caps and cooperatives

As the Council continues to develop this action, it will need to consider the interactive effects of the different alternatives. If the Council elects to include management of a hard cap (to create a fixed limit on Chinook salmon PSC) and a cooperative program (to create incentives for coordinated efforts to reduce Chinook salmon PSC), the interaction of the measures will need to be considered. The Council could follow one of two courses of action to implement any hard cap along with a cooperative program. It could either develop a system that divides the hard cap among participants (or cooperatives) or allow the participants to decide on any division of the hard cap, subject to certain limitations defined by the Council.

Division of any hard cap among cooperatives by the Council is likely to add substantially to the time needed to develop this action. Such a distribution of interests is analogous to a catch share system (or further definition of the limited entry system for the pollock fishery). The distribution of the hard cap is also likely to be complicated by the consideration of a variety of methods of determining the overall cap level and its division between the two regulatory areas. These sorts of distributions typically require expansive analysis, stakeholder and public comment, and Council deliberations.

If the Council elects to set a hard cap without defining a distribution of that cap among cooperatives within a regulatory area, cooperatives will be left to manage their fleets to comply with the cap. Cooperatives may choose either to attempt to manage to the cap or reach overall cap compliance through bycatch avoidance measures.

Allocation of the cap within a cooperative presents a particular dilemma for cooperative structuring. Specifically, if a cooperative has both established Gulf of Alaska pollock fishery participants with established fishing and bycatch histories and entrants with no (or very limited or dated) histories the division of the cap among participants is likely to be both controversial and sensitive, given the need to provide these entrants with a reasonable fishing opportunity and the need for the management to remain with the Council (rather than to be effectively deferred to the participants). Although precedents exist for the division of allocations among participants (such as the scallop cooperative and freezer longline cooperatives) those arrangements have occurred after extended negotiation among a well-defined, limited number of participants. This action will maintain the current number of eligible license holders, which is likely an unmanageable number for the type of negotiation needed to establish a cooperative arrangement to divide the any bycatch cap among participants. In addition, by allowing a structure that accommodates multiple cooperatives (which may be needed to ensure some choice among associations), an agreement concerning the division of the cap is even less probable. For example, it is possible that one cooperative

may agree to an internal division of the cap that applies a particular weight to historic bycatch usage, while a second cooperative may weight that history in an entirely different manner. These settlements would likely be based on an assumption concerning the amount of the total cap available to the cooperative, which may be entirely inconsistent with the assumed distribution of the other cooperative.

The recent experience in agreeing to the development of a Chinook salmon bycatch cap in the Bering Sea pollock fishery provides some insight into the process that could be used by cooperative members to negotiate division of a cap. That fishery is made up of a specifically-defined group of participants, each with an established pollock allocation. Yet, the introduction of the cap on Chinook bycatch led to an extended negotiation (over the course of a few years) concerning the division of that cap among cooperative members. In addition, the Bering Sea pollock fishery participants had several years of experience working with each other in a cooperative structure that likely proved useful in negotiations. Although the Gulf of Alaska fisheries have historically had fewer participants than the Bering Sea pollock fishery, several licenses eligible for the fisheries could enter the fishery. This potential entry creates uncertainty concerning the persons that must be included in a negotiation and could prevent the development of stability, as the participants in negotiations could change annually. This absence of a well-defined, consistent cooperative membership could prevent the development of a stable agreement on the division of a cap. Such a negotiating environment is particularly problematic for long term participants who have the most at stake in the fishery and are likely to be asked to make additional concessions annually by new entrants who may use the preceding year's agreement as the starting point for their negotiations. A further barrier to the development of a cooperative agreement that divides the cap among cooperative members is the uncertainties surrounding Chinook salmon bycatch. Bycatch rates have fluctuated greatly within and across years, seasons, and areas. These uncertainties are likely to make some participants reluctant to enter agreements that fully define the distribution of Chinook salmon bycatch (and could result in any fully defined annual distribution being perceived as unfair). For example, if Chinook bycatch is distributed randomly such that one in thirty vessels each year is likely to unavoidably catch a large number of Chinook salmon (say one-fifth of a cooperative's allocation), any complete annual distribution of the hard cap within the cooperative could be perceived as unfair, as the unfortunate vessel with the high Chinook salmon bycatch would likely be required to acquire others' distributions to cover an overage. Clearly, other cooperative measures may be available to address these circumstances, but a complete distribution of the cap is likely to be unsatisfactory to a substantial share of the fishery's participants. These factors, together, make it unlikely that cooperatives will desire to or reach an agreement to distribute a Chinook salmon bycatch cap among participants in the near future. In the long run, cooperatives and fishery participation may stabilize to a point that participants are able to negotiate a distribution of the hard cap among members, but such an agreement would likely take years to develop.

The alternative is for a cooperative to manage its fleet's behavior to avoid Chinook PSC in a manner that reduces any potential of reaching the hard cap. Measures that a cooperative might employ are those described above for general cooperative management (e.g., monitoring and hotspot time and area closures, gear modification incentives, and reward and penalty structures). Using these measures a

cooperative may attempt to control Chinook salmon bycatch and create incentives for Chinook salmon avoidance, which together might maintain bycatch within the cap level. These more general measures are likely to be more acceptable to the fleet, particularly until more participants develop better confidence in their individual abilities to affect (and control) Chinook PSC levels.

In a single cooperative fishery, that cooperative's members will be positioned to develop a set of rules that all of participants accept as a condition of their participation in the fishery. In a multiple cooperative fishery, the different cooperatives will be compelled to negotiate their own internal agreements, as well as an intercooperative agreement to ensure that no cooperative gains an unfair advantage over other cooperatives, as a result of the differences in the Chinook salmon bycatch avoidance measures across cooperatives. The potential for different cooperative's to have different preferences for different Chinook bycatch avoidance measures will complicate any negotiation of the terms of an intercooperative agreement, as the parties are likely to attempt to ensure that their positions in the fishery are not sacrificed by the differences. The existence of a binding hard cap could further complicate these negotiations, particularly as cooperatives perceive the potential for their pollock catch to be constrained by not only the pollock total allowable catch, but also by the Chinook salmon cap. A cooperative would need to balance its own measures against those of any competing cooperative to ensure that it has a fair opportunity in the fishery relative to the other cooperative, given the potential to reach either the pollock total allowable catch or the Chinook salmon PSC cap. One may be inclined to suggest that the intercooperative agreement could specify a division the cap between cooperatives, subjecting each cooperative to its own cap. Yet, in the absence of a Council specified division of the cap, the cooperatives would all continue to be bound by the overall cap. Consequently, for any such agreement to be reached either the cooperatives would need to have full confidence that the other cooperatives would effectively be able to avoid an overage of their shares of the cap or the agreement would need to include enforceable penalties for overages.³

While these factors may complicate negotiations of cooperative and intercooperative agreements under a system that includes both a cooperative structure and a Chinook salmon PSC cap, the cap would serve as an upper limit on Chinook PSC. In addition, the cooperative structure and the incentive for Chinook PSC reductions might complement the cap by creating an incentive for Chinook PSC reductions in periods when the cap is not (or is not likely to be) binding. In assessing the interactions of a hard cap with a cooperative alternative, the relatively brief seasons in the fishery should also be considered. The rate at which the fishery is prosecuted has presented a challenge to inseason managers for the last several years. The need to also manage the fishery to a Chinook PSC cap (particularly one based on extrapolated rates

³ It should be noted that the effects of a single cap governing multiple cooperatives would be compounded, if the Council were to develop an alternative that established a single Gulf-wide cap. As under a regulatory area cap, each cooperative would need to assess its own measures against those of other cooperatives. This assessment must consider the effectiveness of the measures on Chinook PSC rates. If a cap is applied Gulf-wide, a cooperative in one regulatory area must have confidence in its ability to assess the effects of measures on Chinook PSC rates adopted by cooperatives that fish only in other regulatory areas. The ability of a cooperative (through its members) to make such an assessment is not known, but is likely to be dependent on the overlap in participation across the two areas (and membership in cooperatives in the two areas).

within a partially observed fleet) could present even greater challenges. To the extent that cooperatives slow the rate of prosecution of the fishery, they may also facilitate more precise management of the fishery. Similarly, cooperative management provides an avenue for improved communication between the fleet and managers. This additional communication concerning the timing of effort in the fishery, pollock catch rates, and Chinook PSC rates could also benefit inseason managers' efforts to manager the fleet to the pollock total allowable catch and any Chinook PSC cap.

Conclusion

As the Council considers the development of a cooperative system for addressing Chinook salmon PSC avoidance, certain considerations should be kept in mind. Any cooperative system must afford all eligible license holders a reasonable fishing opportunity. To accommodate those opportunities, the Council should consider a structure that either allows multiple cooperatives to form or allows for fishing outside of a cooperative. In addition, if fishing outside of a cooperative is not permitted, cooperatives should be required accept any eligible license holder as a member and must not disadvantage persons without history in the fishery. A cooperative system could prove useful in developing Chinook salmon avoidance measures, as cooperatives may not only facilitate improved information concerning Chinook salmon bycatch in the fishery, but also may be able to quickly respond to that information to reduce Chinook salmon bycatch. A Chinook PSC hard cap is likely to complicate the development of cooperative (and intercooperative) agreements; yet, a hard cap does serve a fundamentally different purpose, which may complement the cooperative structure.