

Alaska Salmon Fisheries

Surveillance Report 2001 - 2002

Prepared for: Alaska Department of Fish and Game
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General Information

Certified Fisheries	Commercial Alaska Salmon Fisheries	Alaska, United States
Fishery Agency	State of Alaska, Department of Fish and Game	
Fishery Contacts	Robert Bosworth	Doug Mecum
Species	5 species of salmon	
MSC Registration No.	SCS-MFCP-F-0004	
Certification Date	October 2000	
Certification Expiration Date	October 2005	
Certification Body	Scientific Certification Systems, Inc. (SCS)	
Surveillance Team	Chet Chaffee, Ph.D. (SCS)	Project Leader
	Dayton Lee Alverson, Ph.D. (Natural Resources Consultants)	MSC Principle 3 - Fishery Management
	Louis Botsford, Ph.D. University of California, Davis, California)	MSC Principle 1 - Stock Assessment
Surveillance Stage	Annual Surveillance 2001 - 2002	

Summary of Findings

This report describes the first full surveillance audit of the MSC certified Alaska salmon fisheries. This surveillance audit focuses on evaluating progress on the requirements for continuing certification as specified in the original MSC assessment report, along with a select number of other matters chosen at random by the evaluation team as required by the MSC certification methodology.

The surveillance found that ADF&G has made substantial additional progress toward meeting the timelines for each of the *Requirements for Continued Certification* outlined in the initial certification evaluation. Although most of the actual requirements remain to be completed, the timelines and proposed activities appear appropriate except for those under Principle 1, Indicator 1E. For Indicator 1E, SCS is modifying the requirement to provide data on stocks and escapement goals in a shorter timeframe and using specific categories of information.

Overall Finding

The overall finding of the first annual surveillance is that the Alaska salmon fisheries remain in compliance with the MSC standard and retains the MSC certification until the next surveillance visit (March - April 2003).

Background

Initial evaluations of fisheries considering certification under the MSC program include the review of information in three key areas:

1. Health of target resources (stocks),
2. Impacts on the ecosystem from fishing, and
3. The robustness and transparency of the fishery management system.

A fishery that is assessed and shown to be in compliance with the MSC Principles and Criteria is then awarded a certificate of achievement that is valid for a period of 5 years. Although the initial certification is valid for 5 years, the certified fishery is still responsible for contracting an MSC accredited certification body each year to monitor the fishery for continued compliance with the MSC standard and with any requirements for change placed upon it by the initial assessment team.

Section 17 of the MSC Certification Manual (Appendix 1) requires all certified fisheries to be subject to an annual surveillance visits to ensure ongoing compliance with the MSC Principles and Criteria. Section 17.4 of the MSC Certification Methodology provides specific guidance on what is required in an annual surveillance:

"17.4 In addition to focusing on compliance/progress with stipulated conditions and any issues raised in prior assessments, the assessor(s) will, on a random basis, select areas to inspect within the fishery of current or recent management activity for consistency with the standards of certification, including:

- Meetings with Managers, Scientists, Industry and Stakeholders to get their views

- Review any potential changes in management structure
- Review any changes or additions/deletions to regulations
- Review any personnel changes in science, management or industry to evaluate impact on the management of the fishery
- Review any potential changes to scientific base of information."

In addition to the required random audit of the fisheries' compliance with MSC standards, ADF&G must also show progress toward meeting any requirements imposed on it from deficiencies found in the original evaluation. For the Alaska salmon fisheries, several "Requirements for Continued Certification" were identified by the Evaluation Team and later agreed in a signed Memorandum of Understanding between SCS and ADF&G acknowledging that ADF&G would meet these requirements as part of receiving MSC certification for the commercial salmon fisheries in Alaska.

This surveillance report is the first in a sequence relating the results of the annual audits to determine if ADF&G continues to comply with the MSC standards and the specific requirements for maintenance of MSC certification as agreed in a formal Memorandum of Understanding signed by SCS and ADF&G in 2000. The requirements are:

Performance Indicator 1E - Target Reference Points

Within 3 years of certification the Alaska Department of Fish & Game must:

1. Determine the number of salmon spawning stocks or spawning stock aggregates in the state that are managed on the basis of (1) escapement goals determined by stock-recruitment analysis, (2) escapement goals determined by average escapements, and (3) no established escapement goals.
2. Categorize each spawning stock or spawning stock aggregate according to relevant characteristics such as: whether it is a mixed stock fishery, the number of individual stocks exploited, methods used to estimate escapement, whether escapement goals were based on data before or after the mid-1970s, and whether the monitored stocks exploited in the mixed stock fisheries are representative of unmonitored stocks exploited.
3. Present the distributions in terms of the number of spawning populations, the number of fish, and the economic value of the fishery.

Performance Indicator 1F - Limit Reference Points

1. Within 3 years after certification ADF&G must provide an explanation to the certification body about how Alaska salmon fisheries will continue to be sustainably managed even if there is an event that changes ocean survivals back to rates equivalent to those seen in the 1950s, 1960s, and 1970s. The explanation provided should at a minimum include:

- a) What type of analyses are being conducted to understand how potentially lower ocean survival rates effect population abundance and commercial catches (use stock recruitment data where available).
 - b) An assessment of the projected distribution of catches over spawning populations, the distribution of fisheries that would be shut down, and the socio-economic impact.
 - c) A description of how ADF&G would respond to these conditions and to well-reasoned arguments that most escapement goals are arbitrarily set at an average level, therefore are not based on population dynamics and should be lowered.
 - d) A description of the department's response to poor salmon survival conditions experienced historically including the 3 years in the early 1970s.
2. Within 1 year after certification ADF&G must provide evidence to the certification body that the joint stock status report for northern coho required by the Pacific Salmon Treaty is being undertaken in a timely and cooperative manner. This can take the form of presenting the certification body with ADF&G's portion of the report, or presenting copies of the correspondence from ADF&G to the appropriate PST representatives regarding progress being made.
 3. Within 2 years after certification ADF&G must present to the certification body an explanation of why ADF&G believes the stocks being co-managed under the PST are considered sustainable based on the current management paradigm.

Performance Indicator 2A - Bycatch and discards

1. Within 3 years after certification the state must implement a sampling program to identify major non-salmon fish species, birds and marine mammals taken in the salmon net fisheries of the State. The program should be designed to provide a reasonable understanding of fish, shellfish, birds and marine mammals taken incidentally in the fisheries. This requirement can be met in a number of ways. For example, one solution is that the sampling program may involve collection of bycatch information in the course of the department's test fisheries, and reference to similar data collected by the National Marine Fisheries Service. The certification body is not requiring any specific method, merely evidence that ADF&G is utilizing some process to collect the necessary information to adequately understand bycatch in the net fisheries.
2. Before 5 years pass after certification, ADF&G must provide evidence and a summary regarding its findings on bycatch of non-salmon species taken in the Alaskan salmon fisheries to an accredited certification body.

Performance Indicator 3C - Management system incentives and subsidies for sustainable fishing

1. Within 2 years of certification ADF&G must present information to the certification body reporting on progress made by the Commercial Fisheries Entry Commission on

reducing the number of permits to the numbers determined to be consistent with the limited entry law on an annual basis.

2. The Department must identify long-range research needed to assess the magnitude of the interaction of hatchery programs on the wild stock gene pool and the effect on the reproductive fitness of those stocks. The department must document the programs, policies and regulations and statutes as well as specific actions taken to assure the consistency of the hatchery program with the Genetics Policy.

Methodology

In accordance with the requirements for surveillance stated above, and in recognition of the complexity of the many issues covered under an MSC certification, SCS concluded that it was necessary to utilise at least 2 members of the initial evaluation team (Dr. D. Lee Alverson, Natural Resources Consultants, Seattle, Washington, USA and Dr. Louis Botsford, University of California, Davis, California, USA) to ensure the needed expertise was available for reviewing the information. Although these noted scientists provided expertise for the review, all conclusions and reporting requirements under the MSC program are the sole responsibility of SCS as the certification body of record.

The approach followed by the SCS surveillance team during the review is outlined below in Table 1:

Table 1. Steps in the Surveillance Audit for 2001- 2002.

1.	Confirm MSC Requirements with ADF&G		
2.	Advise client regarding information needs and time requirements to complete the annual surveillance audit.		
2.a	Collect information from the client on progress made toward meeting all 'Requirements for Continued Certification'.		
2.a.1	Requirement 1	Principle 1, Criterion E	Target Reference Points
2.a.2	Requirement 2	Principle 1, Criterion F	Limit Reference Points
2.a.3	Requirement 3	Principle 2, Criterion A	Bycatch and Discards
2.a.4	Requirement 4	Principle 3, Criterion C	Management System Incentives and Subsidies for Sustainable Fishing
2.b	Collect information in general areas of concern or importance		
2.b.1		Escapement Goals (as related to Cook Inlet, Kodiak, Chignik areas) and Climatic Regime Shift	
2.b.2		Subsistence Fisheries	
2.b.3		Limnology and Fisheries Management	
2.b.4		Management Agency and Budget	

3	Review comments submitted by Trout Unlimited regarding management of Alaska salmon fisheries.	
4	Evaluate Information collected by the surveillance team.	
5	Analysis and recommendations of the surveillance team	
5.a		Progress re: requirements
5.b		Stability of fisheries
5.c		Modifications to schedule re: meeting requirements for continued certification.
6	Surveillance Report	

Discussions to initiate the first annual surveillance were begun at the end of the first year of certification. The certifier of record, Scientific Certification Systems Inc. (SCS), provided The State of Alaska Department of Fish & Game (ADF&G) with an overview of the surveillance requirements along with a budget for the proposed activities. A number of problems were encountered in initiating the surveillance audit, some procedural and others concerning substance. The following paragraphs describe both the problems encountered and the solutions derived to get the Alaska salmon surveillance audits back on track:

1. SCS misinterpreted the timeline requirements for the first surveillance audit. After discussions with the MSC staff, SCS discovered it had misinterpreted the requirement and that the first surveillance would be behind schedule. At that time, SCS notified the MSC of the newly proposed timeline and its intent to bring the entire surveillance audit procedures back into compliance by the end of the 2nd year of surveillance.
2. ADF&G required several internal discussions to get approval to fund the surveillance audit and to approve ADF&G staff time to respond to the SCS requests for information. As one of the first fisheries projects under the MSC program, the Alaska salmon certification project was a test bed for how to conduct both the initial evaluation and surveillance audits for a state agency and for a large number of fisheries under one project. Dealing with budgetary considerations and staff availability delayed the process. ADF&G has now recognized the need to better incorporate the MSC Surveillance audits into its annual programs and has indicated that it will be in a better position to be able to respond in the following years.
3. A large number of fisheries are covered under the certification of Alaska salmon. As a result, it took more time than first anticipated by SCS to develop and agree on a protocol with ADF&G as to how to practically handle the annual review process. Eventually, an agreement was reached with ADF&G and later confirmed with the MSC to review salmon fisheries on a regional basis within Alaska.

Starting in 2001, the annual surveillance will coincide with the schedule for Board of Fisheries Review as follows:

- Year ('01-'02) Cook Inlet, Kodiak, Chignik areas,
- Year ('02-'03) Southeast Alaska, Yakutat, Prince William Sound,
- Year ('03 - '04) Arctic/Yukon/Kuskokwim, Bristol Bay, Alaska Peninsula, Aleutians.

This agreement allows the certifier to utilize information already being prepared by ADF&G for the Board of Fisheries in Alaska. With this rotating schedule, each region will be examined every three years, unless otherwise noted due to specific concerns identified by the Board of Fisheries process or by the certifier through discussions with stakeholders. For subsequent years, ADF&G and SCS have agreed to complete the surveillance audits following the Board of Fisheries reviews in April 2003, April 2004, and April 2005. After this time, the Alaska salmon fisheries will be required to undergo a re-certification for all the fisheries in the state.

This review process will be used specifically to address questions under Audit Step 2.b.1 (see above). This process will allow the certifier to practically review the status of different stocks as well as review the development, implementation, and attainment of escapement goals in the selected fisheries.

4. To prevent the same problems from happening in subsequent audits, ADF&G in discussions with SCS agreed to shorten the timeframe for meeting the Requirement for Continued Certification under Performance Indicator 1E - Target Reference Points. ADF&G has agreed that at the very least it will provide SCS with the data required for surveillance (see Requirements for Continued Certification - Performance indicator 1E) of the fisheries covered in the first and second year surveillance audits as part of the second year surveillance. This will move the entire process for meeting the requirement ahead of schedule and facilitate a more thorough and complete review process in all subsequent years.

Using the schedule noted above, SCS requested from ADF&G the reports concerning Cook Inlet, Kodiak, and Chignik areas that address issues related to the MSC standards (see Appendix 1-List of reports). Based on the timing of the request, the schedule delays mentioned above, and the availability of the evaluation team members, SCS estimated that the first year surveillance could be completed by June 2002. However, further difficulties arose when requesting additional information on escapements, escapement goals, and on issues noted in 2.b.2 - 2.b.8 (see above) related to hatcheries, transboundary stocks, and the management agency. SCS re-advised the MSC of the additional delays.

Surveillance Results and Discussion

Section A: Requirements for Continued Certification

1. Performance Indicator 1F - Evaluation of Limit Reference Points

The only 'Requirement for Continued Certification' that was due in full during the first year surveillance audit is the requirement that:

"Within 1 year after certification ADF&G must provide evidence to the certification body that the joint stock status report for northern coho required by the Pacific Salmon Treaty is being undertaken in a timely and cooperative manner. This can take the form of presenting the certification body with ADF&G's portion of the report, or presenting copies of the correspondence from ADF&G to the appropriate PST representatives regarding progress being made."

Situation

ADF&G presented SCS with both correspondence and reports showing that it participated as required in the joint management review of Northern Coho and other transboundary stocks. Specifically, ADF&G provided:

- Status of coho salmon stocks in the northern boundary area through 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 1J98-12, Douglas, Alaska.
- Status of coho salmon stocks and fisheries in the northern boundary area. Pacific Salmon Commission Northern Boundary Technical Committee Report, Report TCNB (02)-3.
- State of Alaska, Department of Fish and Game, Office of the Commissioner. Memorandum to Rob Bosworth from Dave Gaudet and Alaskan Chinook Technical Committee Members. Review of the Pacific Fisheries Resource Conservation Council's Assessment of the PST Agreement.

The memorandum was issued in response to a request from Rob Bosworth for the technical committee to review the Pacific Fisheries Resource Conservation Council (PFRCC) report. The memorandum does not provide an exhaustive review of the PFRCC report, but highlights the strengths of the PST agreement and comments on the recommendations made by the PFRCC report to improve the management arrangements. The Alaska team confined its comments to chinook at the time of the memorandum as no specific agreement was in place for coho.

Analysis

The information reviewed indicates that ADF&G willingly and proactively participated in technical meetings and report development regarding transboundary stock management. Moreover, the evidence provided shows that ADF&G is continuing to improve its data collection on coho with mark-recapture studies. From these studies, ADF&G found using data from the Chilkat River that the salmon population was grossly underestimated. ADF&G therefore began collecting a new time series of data with an

expectation that it will be better able to estimate stock and escapements against the MSY escapement goal for that coho stock.

The ADF&G analysis of the concerns raised by the PFRCC report on the PST showed that ADF&G was in agreement with many of the recommendations. However, ADF&G also had a number of areas where there was substantial disagreement (PFRCC recommendations 8, 9, 10, 13, 14, and 15).

It is clear that the ongoing disputes between the US and Canada over transboundary stock management will continue throughout the certification period. The only real issue for the evaluation team and SCS is whether the escapements required for sustaining the impacted stocks are being properly met. The evaluation team remains concerned that the ongoing debate over who is right will continue to detract from establishing a joint conservation program that clearly reflects or demonstrates the principles of the MSC.

Evaluation Against Requirements

SCS finds that ADF&G has met the first year 'Requirement for Continued Certification' as outlined in the initial evaluation report and in the memorandum of understanding.

Because the co-management of salmon between the US and Canada will continue to involve unresolved issues, SCS will make the issue of transboundary stock management a part of all future surveillance audits. SCS will engage both ADF&G and Canada in discussions about these stocks and determine if further actions are needed on the part of Alaska to comply with the MSC standards for sustainable salmon management. Specifically, the critical issue identified in the reports and in the PFRCC review is whether there are sufficient data and understanding of the transboundary stocks. The recommendation by PFRCC to model potential scenarios to test management rules will be further examined in light of the new information becoming available on the stocks in question.

2. Performance Indicator 1E - Target Reference Points

The original 'Requirement for Continued Certification' on target reference points states:

"Within 3 years of certification the Alaska Department of Fish & Game must:

1. Determine the number of salmon spawning stocks or spawning stock aggregates in the state that are managed on the basis of (1) escapement goals determined by stock-recruitment analysis, (2) escapement goals determined by average escapements, and (3) no established escapement goals.
2. Categorize each spawning stock or spawning stock aggregate according to relevant characteristics such as: whether it is a mixed stock fishery, the number of individual stocks exploited, methods used to estimate escapement, whether escapement goals were based on data before or after the mid-1970s, and whether the monitored stocks exploited in the mixed stock fisheries are representative of unmonitored stocks exploited.

3. Present the distributions in terms of the number of spawning populations, the number of fish, and the economic value of the fishery.

Situation

ADF&G with SCS and the Evaluation Team discussed the requirement and the work involved in putting together the information. It was recognized through these discussions that these data are exceedingly important in being able to properly carry out the continued surveillance audits of Alaska salmon fisheries as it provides the basis to determine how the fisheries (and stocks) are being managed and whether the management is meeting its objectives for escapements necessary to maintain and conserve salmon populations.

SCS requested that ADF&G make a concerted effort to shorten the time frame for developing these data and making it available to SCS.

ADF&G agreed that these data could and would be compiled ahead of schedule and made available to SCS as part of the 2nd year surveillance (on or before March 2003). At the very least, the data for the areas covered under surveillance year 1 and surveillance year 2 (Yr. 1 - Cook Inlet, Kodiak, and Chignik areas; Yr. 2 - Southeast Alaska, Yakutat, and Prince William Sound) would be made available to the evaluation team.

Analysis

SCS notes that ADF&G is working to compile the information requested on salmon stock management and escapement goals. Some progress has been made as a result of the Board of Fisheries Reviews, but SCS has requested that a more formal report be prepared and submitted as part of all following surveillance audits.

ADF&G is making progress and has agreed to provide the information ahead of the 3-year schedule agreed in the Memorandum of Understanding.

3. Remaining Portion of Performance Indicator 1F - Limit Reference Points

The original 'Requirement for Continued Certification' on limit reference points states:

- "Within 3 years after certification ADF&G must provide an explanation to the certification body about how Alaska salmon fisheries will continue to be sustainably managed even if there is an event that changes ocean survival rates back to rates equivalent to those seen in the 1950s, 1960s, and 1970s. The explanation provided should at a minimum include:
 - What types of analyses are being conducted to understand how potentially lower ocean survival rates effect population abundance and commercial catches (use stock recruitment data where available).
 - An assessment of the projected distribution of catches over spawning populations, the distribution of fisheries that would be shut down, and the socio-economic impact.

- A description of how ADF&G would respond to these conditions and to well-reasoned arguments that most escapement goals are arbitrarily set at an average level, therefore are not based on population dynamics and should be lowered.
- A description of the department's response to poor salmon survival conditions experienced historically including the 3 years in the early 1970s.
- Within 2 years after certification ADF&G must present to the certification body an explanation of why ADF&G believes the stocks being co-managed under the PST are considered sustainable based on the current management paradigm.

Situation

ADF&G has presented information to SCS showing work in progress that will help answer the requirements. In answering general questions about escapement goal policies, ADF&G has provided some information pertinent to meeting this requirement (see later section on Principle 1 review).

Analysis

ADF&G is making appropriate progress toward meeting this requirement.

4. Performance Indicator 2A - Bycatch and discards

The original 'Requirement for Continued Certification' on bycatch and discards states:

- "Within 3 years after certification the state must implement a sampling program to identify major non-salmon fish species, birds and marine mammals taken in the salmon net fisheries of the State. The program should be designed to provide a reasonable understanding of fish, shellfish, birds and marine mammals taken incidentally in the fisheries. This requirement can be met in a number of ways. For example, one solution is that the sampling program may involve collection of bycatch information in the course of the department's test fisheries, and reference to similar data collected by the National Marine Fisheries Service. The certification body is not requiring any specific method, merely evidence that ADF&G is utilizing some process to collect the necessary information to adequately understand bycatch in the net fisheries."
- "Before 5 years pass after certification, ADF&G must provide evidence and a summary regarding its findings on bycatch of non-salmon species taken in the Alaskan salmon fisheries to an accredited certification body."

Situation

In the original evaluation report it was noted that the evaluation team was concerned about the lack of information regarding levels of bycatch in all gear types employed in the Alaska salmon fisheries. Although there have been a few government studies concerned with marine mammal catches in the various Alaskan salmon fisheries, there has been very little actual documentation of the bycatch by specific gear types, e.g. purse seine, gill net, set nets, etc. The team's concern was heightened by user group reports stating that considerable bycatch of birds, pollock, and other fin fish are at times taken in these fisheries as well as porpoise, seals and sea lions. As a result of these concerns the original evaluation required that ADF&G initiate a program to document bycatch levels in the salmon fisheries.

During this surveillance we made a specific request for information on what steps are being taken to implement such a program, even though the completion of the requirement is not due at this surveillance. ADF&G advised SCS that they had required all test fisheries to collect information on bycatch species and quantities caught and a report was scheduled for early 2003.

Analysis

At this point in time it appears that ADF&G is well ahead of schedule in meeting this requirement.

5. Performance Indicator 3C - Management system incentives and subsidies for sustainable fishing

The original 'Requirement for Continued Certification' on the management system incentives and subsidies for sustainable fishing states:

- "Within 2 years of certification ADF&G must present information to the certification body reporting on progress made by the Commercial Fisheries Entry Commission on reducing the number of permits to the numbers determined to be consistent with the limited entry law on an annual basis."
- "The Department must identify long-range research needed to assess the magnitude of the interaction of hatchery programs on the wild stock gene pool and the effect on the reproductive fitness of those stocks. The department must document the programs, policies and regulations and statutes as well as specific actions taken to assure the consistency of the hatchery program with the Genetics Policy."

Situation

ADF&G noted that no specific work had yet occurred on this issue, but discussions are ongoing on how to address this requirement. ADF&G has a number of programs and

activities that deal directly with hatchery issues (see section on responses to Trout Unlimited Comments).

Analysis

Although no specific activities are being implemented to address these issues, the ongoing research on hatcheries and wild populations should make it possible for ADF&G to provide answers on schedule.

Section B: General areas of concern or importance

1. Escapement Goals (as related to Cook Inlet, Kodiak, Chignik areas)

This part of the surveillance involves issues relevant to Principle 1:

- A. A review of documents describing recent Alaska management,
- B. The formulation of a set of questions regarding concerns that arose from that review, and submission of those to ADF&G,
- C. A review of the response by ADF&G.

Situation

Here we present a brief review of relevant aspects of the original certification, briefly describe step 1 above, referring to our review of documents, then present the questions posed to ADF&G, and their answers.

Our original certification involved several exceptions to the standard, albeit evolving, MSC program. First we were dealing with several species (5) and number of separate populations (approximately 30,000), rather than a single population of a single species. These populations had varying levels of information (and uncertainty) associated with them. Second, none of the specified management procedures for any of these populations included an explicit limit reference point (LRP). A pre-agreed fixed point at which harvesting will be stopped or severely curtailed is considered to be an essential component of sustainable fishery policy. In the original certification, we noted that while Alaska did not have an LRP, because management attempts to maintain an escapement threshold for many of the populations, we treated that escapement threshold as being functionally equivalent in many ways to a LRP. Third, the management procedures were not specified in terms of a single control law (a diagram of management actions to be taken for all possible perceived states of the fishery).

In addition, it was clear that Alaska salmon had recently experienced a substantial increase in production due to an increase in ocean survivals in the 1970s. Because of this, abundance and catches of Alaska salmon were very high, which lent an initial

positive tendency to our certification. However, we also perceived a significant future threat to Alaska salmon populations that was not being addressed: the potential for a reversal of the regime shift to favorable ocean conditions in the mid-1970s. We were concerned that in response to declining catches there would be strong pressure for: (1) increasing failure to meet escapement goals, and (2) a strong pressure for reduction in escapement goals. If these occur, the escapement goal would no longer be a fixed threshold, and no longer resembles a LRP.

We noted the special characteristics of these fisheries and our concerns in our original certification. The score on Performance Indicator 1F was low, because of our concerns that escapement goals could be easily changed. We also requested as requirements for continued certification: (1) a report detailing the distribution of the basis for management of the various separate salmon populations (under Performance Indicator 1E) and (2) a report describing Alaska's plans to cope with an eventual downward shift in ocean salmon survival (under Performance Indicator 1F).

A. Initial Surveillance Review

As noted earlier, the documents we reviewed were prepared by the State of Alaska as part of their annual review of the management status of roughly one-third of their salmon fisheries. In addition, these documents also contain reports of progress in development of new approaches to salmon management. Review comments on each document are contained in Appendix 3. The general issues of most concern to us were mostly contained in two documents, which we summarize here.

The catch records in the report on "Run Forecasts and Harvest Projections..." by Eggers (appendix 3) indicate a downturn in catch in the late 1990s in coho, chinook, sockeye and possibly chum salmon. Concern for a shift in ocean conditions is expressed in the Executive Summary of the document, but there is no discussion of this in the body of the document. There is growing evidence from other species at other locations that there may have been a reversal in ocean conditions in 1999.

The document by Eggers and the document by Bue and Hasbrouck, "Escapement Goal Review of Salmon Stocks of Upper Cook Inlet," (Appendix 3) describe the facts that: (1) some escapement goals were not met in 2001, and (2) that some escapement goals are being revised, mostly in a downward direction. An example of the effects of the revision in escapement goals is shown in Table 3 of Bue and Hasbrouck. For the salmon stocks in upper Cook Inlet (Table 3), most of the lowest allowed values of escapement were lowered (27), while some remained the same (4) and some increased (5).

B. Questions Presented to ADF&G

B.1 Escapement Goals

The comprehensive report on all Alaska salmon fisheries in 2001 (Run Forecasts and Harvest Projections for 2002 Alaska Salmon Fisheries and Review of the 2001 Season),

edited by Eggers, refers to a number of instances in which escapement goals were not met. Historically, the State has depended on in-season management to insure that the appropriate escapement is achieved. In fact, the original certification rested heavily on the fact that while Alaska did not have a Limit Reference Point in any of their fisheries, it did have escapement goals to which it adhered closely (see Assessment of Performance for Performance Indicator 1F in original assessment). We recognize that the range of Sustainable Escapement Goals (SEGs) allows the regional managers and area biologists to make certain adjustments to variations in run sizes. Moreover, we appreciate the difficulties of in-season prediction and management. However, it was of some concern to the evaluation team to see a number of instances of failure to meet the prescribed escapement goals. As a result, we asked ADF&G:

1. Are the SEGs viewed by Alaska as Limit Reference Points, below which an individual fishery will be severely curtailed or are they Target Reference Points, a moving goal rather than a pre-set threshold?
2. If the SEGs are Target Reference points, are the lower bounds of the SEGs used as a limit reference point?
3. There appears to have been an attempt to establish limit reference points on AABM fisheries. Has ADF&G established limit reference points for stocks in other areas of Alaska? If so, please provide a list of all stocks where Limit Reference points have been established.
4. For fisheries where escapement goals have not been met in any of the past few seasons, please provide the full exploitation rate on the stocks in these fisheries where it is known and indicate where it is not known.

B.2 Climatic Regime Shift

There is a growing body of information indicating an oceanographic regime shift during the mid 1990's. Catch figures in the report by Eggers (2001) indicate that the dramatic increase in abundance and catch that began in the mid-1970s is changing, at least for chinook, sockeye, coho and possibly chum salmon (Figs. 2-6). That is cause for concern by the Evaluation Team. In the original certification, we expressed concern for how the state of Alaska would respond if ocean conditions returned to their pre-1975 state (see original certification 1.5.1.2). We noted that if and when ocean conditions did return to their earlier state, there would be considerable pressure on ADF&G to maintain high catches by decreasing escapements. The report by Eggers expresses some nervousness about this possibility in the Executive Summary, referring to "news stories about unusual climatic and oceanographic conditions." However, we found no mention in the rest of the report. In addition, information provided on newly set SEGs suggests that escapement goals have been reduced in a number of fisheries without clearly explaining in every case what biological characteristics of the system led to the reductions.

The specific questions we posed to ADF&G:

1. What is ADF&G doing in response to their concerns expressed in the last paragraph of the Executive Summary of the report edited by Eggers, which reads:

"In recent years, news stories about unusual climatic conditions and oceanographic conditions have become increasingly common. Because our forecasts are based on statistical relationships that have been observed in the recent past, we are always nervously looking for reasons to think the past conditions have changed. Global warming, strong El Nino events followed by ocean cooling, exceptional temperatures in the Bering Sea, large forecast errors in the Bristol Bay sockeye returns, and an unexplained spectacular drop in Western Alaska chum and Chinook salmon production are just some of the things that worry salmon fisheries managers."

2. Has the regime shift and declining run size in some areas made it difficult for ADF&G to maintain SEGs? What basis was used to make SEG adjustments (and be specific by showing where adjustments have been made on a fishery by fishery basis and providing the basis for the adjustment)?

C. ADF&G Response to Questions

The response of ADF&G to these questions was as follows:

C.1 Escapement Goals.

General Comment:

It is the Department of Fish and Game's intent in implementation of the Sustainable Salmon Fisheries Policy (SSFP) and the escapement goal policy (EGP) to establish scientifically defensible target (Biological Escapement Goals (BEGs) and SEGs) and limit reference points (Sustainable Escapement Thresholds) for Alaska Salmon fisheries. To this end, the department has established an Escapement Goal Implementation Team (EGPIT) which has been tasked with the following: 1. Develop general methods and procedures for establishing BEGs, SETs, and SEGs (a manual); 2. Document existing escapement goals; Review existing goals for consistency with EGP and SSFP; 3. Develop a plan (schedule) for developing goals consistent with these policies for stocks with no goals or with inconsistent goals; and 4. Review BEGs, SEGs, and SETs for all salmon stocks in Alaska

1. Are SEGs viewed by Alaska as Limit Reference Points, below which an individual fishery will be severely curtailed or are they Target Reference Points, a moving goal rather than a pre-set threshold?

2. If the SEGs are Target Reference points, are the lower bounds of the SEGs used as a limit reference point?

ADF&G Response:

Biological Escapement Goals (BEGs) and sustainable escapement goals (SEGs) are viewed as target reference points. BEGs are management target escapement goals consistent with maximum sustained yield and are estimated for stocks where stock specific catches can be assessed. BEGs are based on analysis of stock and recruitment data, although assessment of rearing habitat may be used for certain sockeye stocks where habitat assessments are available. In situations where estimates of stock specific catch is not available, it is not possible to estimate total return and therefore recruits from parent escapement. For these stocks, and where management targets are necessary to control fishing, SEGs will be set. SEGs are target escapement goals consistent with sustained yield and estimated based on analysis of historical escapement data. Lower bounds on BEGs or SEGs should not be considered as limit reference points. The limit reference point for salmon is the Sustainable Escapement Threshold (SET).

Without information on the stock recruitment relationship it is problematic to determine defensible target escapement goals. For many of these SEG candidate stocks, escapement data is of poor quality, exploitation occurs mainly as bycatch in fisheries directed at other salmon species or if directed fishing occurs it is generally at low levels and fisheries are managed passively. Escapement goals in these situations have been based on average escapement levels. However, for situations where stocks are lightly exploited or have relatively short escapement time series during a period of high stock productivity, past escapements may not be sustainable. Establishing escapement goals and particularly limit escapement goals on average escapement levels will likely result in overly cautious harvest policies, particularly as fisheries develop or there occurs a climate change induced reversion to a regime of lower ocean survival.

BEGs are the preferred target reference point for Alaska salmon fisheries. For salmon, meaningful biological reference points must be determined based on the stock and recruitment (SR). Since salmon are semelparous and harvested at the end of their life, alternative methods of determining biological reference points based on yield per recruit or spawning biomass per recruit are not relevant. With a good estimate of the stock recruitment relationship it is straightforward to establish BEGs (Figure 2). We use two methods to set BEGs: (1) the range of escapements where sustainable yield is above 90 percent of MSY, and (2) a more cautious range of 0.8 MSY escapement to 1.8 MSY escapement (Eggers 1992).

3. There appears to have been an attempt to establish limit reference points on AABM fisheries. Has ADF&G established limit reference points for stocks in other areas of Alaska?

ADF&G Response:

ADF&G has not established SETs for Alaska salmon stocks. The EGPIT has not settled on a method to estimate the SET but is analyzing several alternatives including: (1) 50% of MSY escapement, (2) Escapement that produces 50% of maximum recruitment (Myers et al 1994), and 3. using computer simulations to examine risk (defined as probability of having an apparent conservation concern when none exists) of alternative SETs. Please note that the SETs being considered are well below the target reference points, and well above the American Fisheries Society threshold for listing DPS as vulnerable and subject to close scrutiny for further listing under ESA (c.f. Figure 2).

Please also note that SETs are not necessary for stocks with BEGs.

4. For fisheries where escapement goals have not been met in any of the past few seasons, please provide the full exploitation rate on the stocks in these fisheries where it is known and indicate where it is not known.

ADF&G Response:

Table 2 provides a quick summary of the performance of Alaska salmon fisheries management in meeting established escapement goals in 2001. Actual escapements in 2001 were within or above the escapement goal for 78% of the 257 total escapement goals that are currently on the books. Exploitation rates cannot be determined for many of the stocks because stock specific catch is not available. However, in 2001 several salmon fisheries were severely restricted in face of anticipated or observed weak runs. These restrictions include: fishing restricted within the Naknek/Kvichak fishing district to the Naknek River special harvest area to protect Kvichak sockeye; closure of the June-July commercial fishery in the Kuskokwim River to protect chum and chinook; closure of the entire season commercial fishery in Yukon River was closed to protect summer chum, fall chum, and Chinook; and closure of the commercial fishery in District 1 - Norton Sound was closed to protect chum salmon. The number of systems for which escapements were below goals may appear excessively large. Many of the published escapement goals are point goals for stocks that are harvested as a complex. Management will always result in escapements for some stocks being below and some stocks being above the point goal. Escapement being below the escapement for a single year is not cause for management concern, as the entire spawning stock is not subject to exploitation. Concerns are triggered when escapement goals failed to be met on a chronic basis usually for several years.

Table 2. 2001 Division of Commercial Fisheries achievement of escapement goal objectives

Area		Species	Number of Systems within goal range	Under range	Over range	Percent within or above goal range:	Notes
Region 1							
Southeast Alaska	Yakutat	sockeye	3	4	4		
		pink	1		15		1
		coho	3		7		
		chinook	3	1	5		
		sockeye	4	2			
chinook	2						
			16	7	31	87%	
Region 2							
Upper Cook Inlet		sockeye	3	2	2		
		chinook	3	5	18		2
		coho	2		5		3
Lower Cook Inlet		pink	3	10	9		4
		chum	2	4	6		5
		sockeye	2	2	4		5
Bristol Bay		sockeye	3	1	4		6
		coho	1				
Prince William Sound		chinook			1		
		sockeye			2		1
		pink	1	2	5		1
Copper/Bering River		chum		3	4		1
		sockeye	1	2			1
		chinook	1				1
coho	2				1		
			24	31	60	73%	
Region 3							
Yukon- fall		chum	3	2			7
		coho	1				7
Yukon-summer		chinook	4	2	2		7
		chum		1			7
Kuskokwim		sockeye	2	1			7
		chinook	5	3			7
		coho		1			
Norton Sound		chum	4	1			8
		chum	5	3			9
Kotzebue		chum	1				
			25	14	2	66%	
Region 4							
Kodiak		pink	1		6		1
		chum	4	1	1		1
		sockeye	3	3	1		1
		chinook	1		1		1
		coho	2		4		1
Chignik		sockeye			2		10
		pink	1				11
South Alaska Peninsula		chum			1		11
		sockeye			1		11
		chum	1				11
North Alaska Peninsula		sockeye			2		
		chum	1				
		sockeye	2		2		
		chinook	2	1	1		
coho			5		12		
			17	5	25	89%	
STATEWIDE OVERALL			82	57	118	78%	

1Systems aggregated by District

22 of the systems below and 18 of the systems above were for systems with point estimates

35 of the systems above were for systems with point estimates

45 of the systems below and 4 of the systems above were for systems with point estimates

52 of the systems below and 4 of the systems above were for systems with point estimates

6Fishing in Naknek/Kvichak District limited to Naknek River

7Commercial Fishery Closed

8Kuskokwim River, June - July Commercial Fishery Closed

9District 1 Commercial Fishery Closed

10Fleet was on strike

11Total Area Index

12Little fishing due to limited markets

C.2 Climatic Regime Shift.

1. What is ADF&G doing in response to the concerns expressed in the last paragraph of the Executive Summary of the report edited by Eggers?
2. Has the regime shift and declining run size in some areas made it difficult for ADF&G to maintain SEGs? What basis was used to make SEG adjustments?

ADF&G Response:

It is generally believed that changing ocean conditions affect marine survival and is density independent. Certainly the magnitude of MSY would be sensitive to ocean conditions; however, the magnitude of MSY escapement levels is more determined by the size of the rearing and habitat of the stock and is relatively insensitive to ocean conditions. In theory, this may result in slight depression of MSY escapement levels as productivity decreases. There is little basis in theory for adjusting BEGs in response to suspected or realized changes in climatic conditions. ADF&G has generally increased escapement goals in response to large increases in salmon runs following the 1979 regime shift. However, this result was due to rebuilding of depressed salmon runs and the increasing contrast in escapement levels and improved resolution of MSY escapement levels from the emerging stock recruit data. The ADF&G response to declining runs, presumably due to changing ocean conditions, is to reduce exploitation and not to reduce escapement goals.

Analysis

Our initial surveillance raised the questions in our mind of whether we had been correct in viewing escapement goals as approximating the function of LRPs. We had asked ADF&G whether the SEGs or the lower limits on SEGs could be viewed as LRPs, and, if not, whether LRPs had been established for Alaska salmon. The situation as we now understand it can be summarized as follows:

- Both BEGs and SEGs are viewed as Target Reference Points,
- The lower bounds on BEGs or SEGs are not absolute limit reference points but can be seen as useful proxies for the purposes of in-season management since it is the goal of the area biologists to reach at least the bottom range of the BEGs or SEGs,
- The true limit reference points are the Sustainable Escapement Thresholds, or SETs, and the ones being considered appear to be much lower than the lowest level of the BEGs or SEGs and well above the American Fisheries Society threshold for listing DPS as vulnerable and subject to close scrutiny for further listing under ESA (c.f. Figure 2),
- ADF&G has not established exact SETs for Alaska salmon stocks,
- SETs are not necessary for stocks with BEGs.

The result of this information is that the Evaluation Team is now concerned that the escapement goals may be too flexible and is seeking further clarification from ADF&G on how implementation of the new escapement goal policy is working to address the issues of BEG, SEG, and SET determination and implementation.

We had also asked for further details regarding the concern mentioned in the Executive Summary of the document by Eggers. Specifically, we asked what ADF&G is doing in response to the described concerns. ADF&G noted that while it generally increased escapement goals following the 1979 regime shift, the standard ADF&G response to declining runs is to reduce exploitation, not to reduce escapement goals. The fact that some escapement goals have been reduced raises concerns and requires further explanation.

Alaska salmon populations are for the most part at high abundance, and management appears to be maintaining these using the standard management practices reviewed during the initial evaluation. As a result, the certifier believes that the Alaska salmon certification should still stay in effect.

However, it is not clear that Alaska salmon management is adequately dealing with issues of low abundance. Without absolute Limit Reference Points and no fixed control law, the Evaluation Team is concerned about whether ADF&G will be able to avoid unsustainable fishing in the future, especially in light of potential changes in productivity.

We have been presented with a broad overview of the management intentions (the SSFP), and documentation of how each of several hundred fisheries has been managed in the past. However, the review of these is very time consuming, and we feel there is a better way to directly address the issue of sustainability in the context of MSC criteria.

We are requiring instead that ADF&G provide a specific description of how and why the State of Alaska believes that each salmon stock meets the population criteria for sustainability reflected in the Performance Indicators for the certification of Alaska Salmon. This should be accomplished as part of the annual review of one-third of the Alaska stocks, and would also help fulfil the Specific Requirement for continued Certification associated with Performance Indicators 1E.

In specific, we are revising the Requirement for Continued Certification - Principle 1, Indicator 1E. Each year for the next 3 years, ADF&G will provide the following information for the one-third of the salmon stocks under review by the Board of Fisheries that year.

For each stock under review:

- A. Indicate whether it is managed using a Target Reference Point (TRP) that is (1) an escapement goal determined from stock-recruitment analysis, or (2) an escapement goal determined by average escapements, or (3) some other TRP.

- B. Indicate whether it is a mixed stock fishery, and if so the number of individual stocks exploited.
- C. Indicate the methods used to estimate escapement, and the data used to estimate escapement.
- D. Present the Limit Reference Point, and the derivation of its value.
- E. Specify the control law, which includes responses in terms of the TRP, the LRP and indicators of population status.

2. Subsistence Fisheries

As part of the initial evaluation, the team was provided with information that the management of subsistence fisheries was being disputed and there was a discussion about what part, if any, of the subsistence fisheries might be transferred to Federal control. During this surveillance audit, the Evaluation Team followed up this issue.

Situation

The Evaluation Team asked ADF&G the following questions:

- What changes have occurred in the management of subsistence fisheries?
- If some or all of the management of subsistence fisheries has been transferred to federal authorities, what is the working agreement between state and the federal agencies to manage salmon fisheries?
- If a change in jurisdiction has occurred, has it had a negative impact on the achievement of SEGs?

Analysis

ADF&G provided information that showed no changes occurring in the management of subsistence fisheries since the MSC Certification was issued. At that time, and at the time information was being gathered for this surveillance audit, the federal government manages subsistence fisheries on federal reserved waters. Federal court decisions established the legal framework for federal subsistence management of fisheries in 1995. Various legal challenges to this federal authority have been tried and failed; the most notable of these, Katy John, was settled in 1996 when the Supreme Court refused to reconsider the Circuit Court decision. Attempts at political reconciliation of state and federal management structures have also been unsuccessful. In January of 1999 the Secretaries of Interior and Agriculture issued a final rule implementing the Katy John

Decision. Further action by the Circuit Court in 2000 affirmed Katy John's applicability to navigable waters.

Apart from the legal framework for subsistence management, some on-the-ground changes have occurred. Federal agencies have hired fisheries staff, or given fisheries assignments to existing staff, the Office of Subsistence Management has developed a Fisheries Information Service that funds research related to subsistence fisheries (and has funded many ADF&G projects) and on-site managers in many cases have developed routines and working arrangements that ensure in-season consultation among fishery managers. ADF&G staff has better access to the federal staff committee that advises the Federal Subsistence Board and are developing working relationships and agreements with the federal Regional Advisory Committees, so as to be more effective in the RAC process for developing regulatory proposals.

The Evaluation Team concluded that no significant adverse impacts have resulted from the increased participation by the federal authorities in the management of the subsistence fisheries in Alaska.

3. Limnology and Fisheries Management

The Evaluation Team requested information on the use of limnological data to help set BEGs and SEGs. In the past, the Limnology Division of ADF&G provided useful data on the carrying capacity of certain freshwater systems, allowing ADF&G to adjust escapement goals. As a result, the Evaluation Team wanted to determine if that capacity still exists and how it is used.

Situation

ADF&G has greatly curtailed the limnology program due to budget cuts. Some minimal efforts still remain in Southeast Alaska and Central Regions. Also, some limnological data has been used to estimate escapement goals for some sockeye systems in Southeast Alaska and Cook Inlet.

Analysis

The capacity of ADF&G to develop limnological data in support of altering escapement goals is severely limited. This is not necessarily a crucial aspect of maintaining sustainable salmon populations, however it does restrict the tools available to ADF&G.

4. Management Agency and Budget

To maintain good management, the management agency must be able to retain competent staff and a consistent budget. The Evaluation Team therefore felt it worthwhile to inquire as to these factors.

Situation

ADF&G was asked two (2) specific questions:

- Has the staffing of ADF&G changed significantly over the past year?
- Has the budget changed (either increased and decreased) for ADF&G from 2000 to 2002?

ADF&G provided information that staffing in the Commercial Fisheries Division (including permanent full time, permanent part time, and temporary) has increased steadily in recent years from 836 people in FY 99 to 868 people in FY '03 (projected). While a breakout of staff dedicated to management functions was not available (and one would need a definition of management functions), the information provided suggests there has been no decrease in funded positions for any of the job categories related to salmon management. Management of salmon remains a core function of the division.

The budget of the Commercial Fisheries Division can be shown to have increased steadily from approximately \$41 million in FY 1999 to \$49 million for FY '03. The budget in FY 2000 was \$42,014,700 and the budget in FY 2002 is \$48,024,800.

Federal funds alone increased from \$7.7 million in FY 99 to \$12.2 million in FY '03 (projected).

Analysis

There are no significant changes to personnel or budget that would preclude ADF&G from maintaining the quality of its salmon management program.

5. Comments from Trout Unlimited

Situation

SCS received comments of concern from Trout Unlimited (TU) in June 2002. The comments followed a TU report on salmon hatcheries that called into question the hatchery programs in Alaska and their effects on wild salmon populations.

The Evaluation Team was not able to provide a thorough response to TU's comments or the TU report on hatcheries during this surveillance. However, SCS wants to thank TU for its comments and report. The comments received directly from TU cover a number of areas and can be summarized as:

- Managing for Sustainability - TU agrees that AK salmon deserve a passing grade, especially as compared to other salmon management. However, TU is still concerned

that AK salmon management does not embody a comprehensive coverage of all issue related to healthy salmon fisheries. TU believes the single most important issue is salmon biodiversity, and that this is not given enough credence. TU also states that it thinks Alaska's Department of Fish and Game is overconfident and needs to be careful not to repeat the mistakes made in other salmon management jurisdictions.

- Fishery Management - TU expresses concern over single stock versus mixed stock management.
- Hatcheries - TU restates the concerns it issued in its report on hatcheries acknowledging that it is very concerned that hatcheries are negatively impacting wild populations.
- Habitat Management - TU contends that not enough is being done by the State of Alaska (above and beyond the measures taken by the Department of Fish and Game) to monitor salmon habitat and mitigate or stop practices that are destroying crucial habitat.

In addition to the TU comments and report, SCS received some informal comments, but most of such a vague nature as to be difficult to address. TU's comments and report provide a better forum for discussing the issues as they relate to the MSC certification of Alaska salmon and will be addressed during the 2nd year surveillance.

Analysis

Although SCS was not able to include a full review and comment during this surveillance, we did ask ADF&G for its response to the TU report on hatcheries. ADF&G had numerous comments concerning inaccuracies in the TU report. However, ADF&G also acknowledged that there were some recommendations with which it could agree, as well as some it could not. Appendix 4 provides a copy of the letter from ADF&G to SCS detailing its concerns about the recommendations made by TU regarding salmon hatcheries.

As noted above, SCS will take up this issue more thoroughly during the next surveillance audit.

Summary of the Surveillance Findings

It is the overall assessment of the surveillance team that the Alaska salmon fisheries should maintain the MSC certification until the completion of the next surveillance visit. However, the Evaluation Team notes there are several areas of concern regarding the ability of ADF&G to properly document compliance with MSC requirements for management measures related to lower productivity and falling salmon populations. In

addition, the Evaluation Team notes the continuing concern over the salmon enhancement programs and will deal with this during the next surveillance.

All other areas of inquiry addressed by the Evaluation Team remain in compliance with the MSC standard and warrant continued certification until the next surveillance visit. Additionally, the Evaluation Team finds that ADF&G has made significant progress on a number of the Requirements for Continued Certification that are not yet due.

The Evaluation Team is changing the 'Requirement for Continued Certification' under Principle 1, Indicator 1E by requiring ADF&G to provide the following information for the one-third of the salmon stocks under review by the Board of Fisheries for this year and next (Surveillance Audits 1 and 2).

For each stock under review:

- F. Indicate whether it is managed using a Target Reference Point (TRP) that is (1) an escapement goal determined from stock-recruitment analysis, or (2) an escapement goal determined by average escapements, or (3) some other TRP.
- G. Indicate whether it is a mixed stock fishery, and if so the number of individual stocks exploited.
- H. Indicate the methods used to estimate escapement, and the data used to estimate escapement.
- I. Present the Limit Reference Point, and the derivation of its value.
- J. Specify the control law, which includes responses in terms of the TRP, the LRP and indicators of population status.

Appendix 1

MSC Requirements For Maintenance of Certification

(Extract from MSC Certification Methodology; issue 3 of March 2001)

Section 17 On-going Maintenance Of Certification

17.1 It is not sufficient to simply certify a fishery at one point in time and then allow a MSC Label to appear on fish containers or fish products thereafter. It is important to know that the claim made by the MSC Label is still accurate and can be substantiated on an ongoing basis. As a result, it is necessary as part of the overall certification process to establish a monitoring program that keeps the substantiation of the claim in the marketplace up-to-date and accurate. The monitoring period may be different for different fisheries, and will be established by the certification team and the client before final certification is awarded.

17.2 Certified fisheries are required to have, as a minimum, an annual on-site visit by the certification body in order to maintain their certified status. Members from the original Assessment team shall conduct the annual maintenance assessments. Annual on-site visits are an important follow-up to an initial assessment for two reasons:

- 1) They enable the certification body to monitor a fisheries continued compliance with stated goals and,
- 2) Any conditions in place at the time of the original assessment.

They establish an ongoing framework by which the certification body may track any specific issues or concerns raised in the initial evaluation by the Assessment team and/or the peer review committee.

17.3 Prior to conducting an annual assessment, the assessors designated by the certification body shall have reviewed the original certification report and any prior annual assessment reports as well as receive written and/or oral direction from the Certifiers designated “MSC Program Manager” and, as appropriate, the Assessment team Leader.

17.4 In addition to focusing on compliance/progress with stipulated conditions and any issues raised in prior assessments, the assessor(s) will, on a random basis, select areas to inspect within the fishery of current or recent management activity for consistency with the standards of certification, including:

- Meetings with Managers, Scientists, Industry and Stakeholders to get their views
- Review any potential changes in management structure
- Review any changes or additions/deletions to regulations
- Review any personnel changes in science, management or industry to evaluate impact on the management of the fishery
- Review any potential changes to scientific base of information

The findings of the assessor will be presented in a written report. The certification body's MSC Program Manager will transmit the assessment report to the fisheries along with any requests, conditions, or recommendations that may arise from the assessor's findings.

17.5 A Public Summary Report shall also be generated and forwarded to the MSC within a month of completing the on-site visit for publication on the MSC website. The content of the Surveillance Visit Public Summary shall include the following:

1. TITLE & HEADING INFORMATION

Title ("Surveillance Visit - Public Summary for XYZ Hake Fishery")

Certificate Number

Name and Address of Certification Body

Date of Summary

2. GENERAL INFORMATION

Name and contact information for the certified fishery: Source name, contact person, address, tel/fax/email.

General background about the fishery

3. THE CERTIFICATION ASSESSMENT PROCESS

Date(s) of the Surveillance Visit

Member(s) of the Assessment team.

Assessment process: describe general context, scope and history of assessment(s), if applicable; generally outline activities, e.g., what was inspected.

Guidelines: Reference the guidelines and methodologies used.

4. RESULTS, CONCLUSIONS AND RECOMMENDATIONS

General discussion of findings and statement confirming the status of the Certification.

Status of previously raised conditions:

The progress being made by the Fishery to address any conditions that were placed on the certification from previous assessment visit(s) shall be detailed.

Any conditions that have not been closed out within previously agreed timescales shall be detailed together with the reasons (if any). The report shall detail what actions are required by the fishery, including revised timescales, and what the implications are for continued certification.

Any conditions that have been closed out to the satisfaction of the Certifier shall be detailed.

Surveillance visit results: Specifically or generally describe any new conditions and recommendations and agreed timescales for implementation and timeframes for achievement. Quote the actual conditions raised.

- 17.6 In addition to annual assessments, the certification body shall ensure that its contractual documentation with the client reserves the right to conduct irregularly timed short-notice inspections

17.7 Ongoing Chain-of-Custody Compliance

17.7.1 Each certification body shall ensure that all chain-of-custody participants undergo annual on-site assessments related to the segregation of, processing and distribution of

certified fish products. In addition to annual assessments, the certification body shall ensure that in its contractual documentation with a chain of custody client, that it reserves the right to conduct irregularly-timed short-notice inspections, and/or to request and examine documentation related to the processed product's chain-of-custody (i.e. bills of lading).

Appendix 2

List of ADF&G Documents for Board of Fisheries 2001-2002 Review Cycle

(Reports in red were reviewed for this surveillance audit)

Commercial Fish Division: Area Management and Stock Status Reports

Statewide Overview:

<http://www.cf.adfg.state.ak.us/geninfo/pubs/rir/5j02-01.pdf>

- Run Forecasts and Harvest Projections for 2002 Alaska Salmon Fisheries and Review of the 2001 Season

Cook Inlet

<http://www.cf.adfg.state.ak.us/region2/cf2bof.htm>

- 2001 Upper Cook Inlet Annual Management Report
- 2001 Central Region Limnology Annual Progress Report
- Fish Creek Sockeye Salmon - Technical Review Report
- Escapement Goal Review of Salmon Stocks of Upper Cook Inlet
- Review of the 2001 Lower Cook Inlet Area Commercial Fishery, Personal Use Coho Salmon Gillnet Fishery, and Salmon Enhancement Programs
- Sustainable Escapement Goals for Chum, Pink and Sockeye Salmon in Lower Cook Inlet

Kodiak / Chignik

<http://www.cf.adfg.state.ak.us/region4/pubs/rgn4bof.htm>

- Kodiak Management Area Commercial Salmon Annual Management Report, Cape Igvak Salmon Management Plan
- The Alitak Bay District Commercial Salmon Fishery, 2001
- The Perenosa Bay Section Commercial & Sport Salmon Fishery
- A Summary of Salmon Enhancement and Restoration in the Kodiak Management Area Through 2001
- Chignik Management Area Commercial Salmon Fishery

Sport Fish Division: Area Management and Stock Status Reports

Cook Inlet

http://www.sf.adfg.state.ak.us/Region2/html/bof_11_8_12.stm

- Stock Status of Coho Salmon in Upper Cook Inlet
- Kenai River Riparian Habitat Studies
- Season Overview for Recreational, Subsistence, Personal Use and Educational Fisheries, Northern Cook Inlet Management Area, 2001
- Escapement Goal Review of Salmon Stocks of Upper Cook Inlet
- ERRATA - Escapement Goal Review of Salmon Stocks of Upper Cook Inlet
- Area Management Report for the Recreational Fisheries of the Northern Kenai Peninsula, 2000-2001

- Area Management Report for the Recreational Fisheries of Northern Cook Inlet, 2000
- Recreational Fisheries in the Lower Cook Inlet Management Area, 1995-2000
- Area Management Report for the Recreational Fisheries in Resurrection Bay, 1998-2000

Appendix 3

A Brief Summary of Documents Reviewed During the Surveillance Audit

1. Run Forecasts and Harvest Projections for 2002 Alaska Salmon Fisheries and Review of the 2001 Season

Edited by D.M. Eggers

This is a qualitative overview of how the 2001 fisheries for various salmon species fared in the each district. It reports and compares catches, value of the catches, and some escapements. Overall, catch figures indicate that the dramatic increase in abundance and catch that began in the mid-1970s is over, at least for chinook, sockeye, coho and possibly chum salmon (Figs. 2-6). This report expresses some nervousness about this possibility in the Executive Summary, referring to "news stories about unusual climatic and oceanographic conditions." However, we found no mention in the rest of the report. Since scientists in Alaska and elsewhere generally accept the fact that there was a regime shift in ocean conditions in the mid-1970s, which improved conditions for Alaska salmon, it would be prudent for ADF&G to be paying greater attention to the potential for a return to earlier conditions, and developing an agreed upon plan to have in place when it occurs.

This report also refers to several instances in which escapement goals were not met (see Table 2).

2. Escapement Goal Review of Salmon Stocks of Upper Cook Inlet

B.G. Bue and J.J. Hasbrouck

This document contains a review of the escapement goals for stocks in upper Cook Inlet as indicated in the title, but, more importantly, it is the description of the development of the method for computing the new "Sustainable Escapement Goal", created in the SSFP and the EGP. The sustainable escapement goal (SEG) is "a level of escapement that is known to provide for sustained yield over a 5 to 10 year period, used in situations where a BEG cannot be estimated due to the absence of stock specific catch estimate." Its functional implications differ from those of a BEG in that "the department will seek to maintain escapements within the bounds of the SEG", whereas "the department will seek to maintain evenly distributed salmon escapements within the bounds of a BEG."

The algorithm chosen is that the SEG be the range between the 15th and the 85th percentile of the existing escapement data. This algorithm is modified to include the 25th percentile and the 75th percentile under various conditions involving the amount of contrast in the escapement data (Table 3). The range of the SEG is made narrower under conditions of high contrast (see the table on p. 3 of Otis 2001). These ranges were apparently chosen so that they would come close to the BEG for stocks for which there was enough data to compute a BEG. Comparisons are given for 11 stocks.

Other than the fact that they apparently are the values that happen to match most closely the 11 BEGs, there is no further technical justification for the chosen percentiles. However, we can examine the way in which they change management . In some cases the escapement goal changes from a point to a range, while in others a new range is adopted. The lowest allowable escapement (the point or the lower end of the range of the SEG) appears to be lowered in most cases. For the salmon stocks in upper Cook Inlet (Table 3), most of the lowest allowed values of escapement were lowered (27), while some remained the same (4) and some increased (5). Also, there may be a tendency to use the newly developed SEG and abandon other means of determining allowable escapement such as direct assessment of the habitat and ocean conditions. Further investigation of how low the escapements actually are and the years in which those escapements were seen is warranted.

3. Sustainable Escapement Goals for Chum, Pink, and Sockeye Salmon in Lower Cook Inlet

T. Otis

This document reports the newly computed SEGs for lower Cook Inlet using the methods described in Bue and Hasbrouck above. For chum salmon, 10 of 12 of the lowest allowed values are lowered, for pink salmon 23 of 24 are lowered, and for sockeye salmon, 5 of 8 are lowered.

4. Upper Cook Inlet Commercial Fisheries Annual Management Report, 2001

J. Fox and P. Shields

This report describes the salmon fisheries in upper Cook Inlet, and how they were operated in 2001. The salmon harvest in upper Cook Inlet was generally low (fourth lowest since 1974), but in general most escapements appeared to have been met. The catch was low in part because fisheries for some species were closed to prevent by-catch of other salmon species. There is mention of some marine survivals being low (p. 13).

5. Kodiak Management Area Commercial Salmon Annual Management Report, 2001

K. Brennan

This report describes the status of salmon in the Kodiak Management Area, and how they were managed in 2001. Escapement goals were met with the exception of Upper Station late-run sockeye salmon. It is also interesting that one of the two chinook runs was lower than usual, while the other was high.

6. The Cape Igvak Commercial Salmon Fishery

K. Brennan

The management described in this report is mainly to control interception of stocks from other areas in Alaska.

7. The Alitak Bay District Commercial Salmon Fishery

J. Wadle and K. Brennan

This report describes current management in the Alitak Bay district, and provides considerable historical background on the stocks and management. Their discussion of the sockeye stocks on Frazer Lake and Upper Station (pp. 4-6) is a good example of how escapement goals change from year to year, primarily in response to changes in abundance. Plots of historical escapements are given (in most cases aggregates of several streams).

8. Perenosa Bay Salmon Fisheries

K. Brennan, D. Tracy, D.Gretsch, and J. Wadle

This report gives a historical overview of management of sockeye, pink and coho salmon in the Perenosa Bay part of the KMA. Escapement time series for sockeye into Pauls Lake indicate they met the lower goal only twice between 1984 and 1995, but have met them more frequently recently (1996, 1997, and 1999 to 2001). Pink salmon met escapement goals in 7 of 10 years from 1991 to 2000, but not in 2001. Coho salmon escapements have increased in recent years, and they have met escapement goals each year since 1992.

9. Chignik Management Area Commercial Salmon Fishery and Stock Status

G. Pappas

This report describes management and performance for all five salmon species in the Chignik management area for the years 1999 to 2000. Escapement goals were met for all species in the 3 years. Coho abundance has been weak over the past 10 years, but improved in 2001.

Appendix 4

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME DIVISION OF COMMERCIAL FISHERIES

TONY KNOWLES, GOVERNOR

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Chet Chafee
Scientific Certification Systems, Inc.

September 13, 2002

Dear Chet,

Trout Unlimited came up with a set of recommendations for reforming Alaska's ocean-ranching hatchery program, supposedly based on a report by the University of Alaska Environment and Natural Resources Institute (ENRI). I say supposedly because many of the recommendations are nowhere to be found in the actual ENRI report. In addition, the person who wrote the report has stated publicly that the recommendations were written by Trout Unlimited (namely Jan Konigsberg and Ben Greene) and that he was only responsible for compiling information used in the report.

Regardless, I have stated that I do agree with some of the recommendations made by Trout Unlimited. Because of that you have asked me to describe what we are doing relative to those recommendations. I will also identify the recommendations made by TU that I don't agree with:

2. No public funding of industrial-scale hatchery production.

I don't know what this has to do with hatchery practices or sustainability of salmon populations. This is a ridiculous idea that has no scientific relevance. Furthermore, the vast majority of funding for Alaska's private non-profit hatcheries comes from loans that are paid back through cost recovery operations and self imposed fisheries landing takes. The State of Alaska only operates three

hatcheries and these are sport fish hatcheries financed with federal aid dollars (Wallop-Breaux and Dingell-Johnson).

Trout Unlimited specifically opposes the use of federal funds we received under the Pacific Salmon Coastal Recovery Fund for enhancement activities. Although we disagree with their position, we do concur that new enhancement programs financed with these funds should be consistent with the principles and criteria of the Sustainable Salmon Fisheries Policy and consistent with the protection of wild stocks. As a result, all proposals to use of these funds are evaluated against the criteria listed in the attached document "Review Criteria for Salmon Enhancement Project Proposals".

3. Publicly-funded salmon marketing programs must distinguish hatchery-produced and wild fish.

Again, this has nothing to do with sustainable salmon fishery management and is simply a mean-spirited attack on Alaska's commercial fisheries.

4. No "eco-labeling" of either hatchery-produced or wild salmon harvested in mixed hatchery/wild stock fisheries, including claims of both "sustainable" and "organic."

The MSC certification team reviewed the Alaska hatchery program and concluded that the existing laws, policies, and regulations were consistent with the MSC principles and criteria. Organic certification is a different issue but there is no doubt that Alaska hatchery fish would meet all organic certification standards with the possible exception of the "positive control" standard favored by the National Organic Standards Board.

5. Shut-down Prince William Sound (PWS) pink salmon hatcheries, which have unacceptably high straying rates.

We are not going to shut down hatcheries just because some straying has occurred. Certainly we need to make sure that hatchery management plans and practices minimize the potential for straying. We do that by reviewing hatchery

operating plans every year, by managing fisheries targeting hatchery stocks to achieve full utilization, and requiring adequate hatchery salmon marking and recovery programs. In fact, the vast majority of hatchery pink salmon in Prince William Sound are thermally marked so that we can monitor straying rates and fishery contributions. I think our review of Dr. Ben Greene's paper on the Prince William Sound hatchery program said it best:

“How does the precautionary principle direct ADF&G to proceed in the face of uncertainty? The SSFP state “ A precautionary approach, involving the application of prudent foresight, taking account of the uncertainties in fisheries and habitat management; the biological, social, and economic risks; and the need to take action with incomplete knowledge, should be applied to the regulation and control of harvest and other human-induced sources of salmon mortality.” Again, hatchery closures pose the risk of large and potentially permanent social and economic damage to the salmon fisheries in PWS. If Wertheimer et al. (2001) are right, that Hilborn and Eggers (2000) have far overstated impacts to wild productivity, then catch levels will immediately decrease and remain on average far below their current levels.

Dr. Greene obviously thinks the biological risks of hatchery programs are so great that it overrides the social and economic impact of his proposed management action. Does the current status of the wild resource indicate a resource crisis that would warrant such extreme action as terminating the hatchery program? As we pointed out earlier, the annual wild stock run in PWS from 1990-2000 has been on average 50% GREATER than prior to the initiation of the hatchery production. Productivity (returns per spawner) has probably been higher in PWS during the 1990s than for other pink salmon producing regions of Alaska (data from Hilborn and Eggers (2000); see also Wertheimer et al. (2001)). Because of improvements in management, escapements in PWS in the 1990's have been within the management range more frequently than in any decade since the state took over management authority for salmon. These facts are consistent with

the SSFP criterion that “wild stocks be maintained at levels of resource productivity that insure sustained yields”. Dr. Greene has raised some valid points; we should continue to examine the scope and mechanisms of interactions of wild and hatchery fish, to refine management and policy and to minimize negative impacts of enhancement programs on wild stocks. However, his conclusion, that these concerns require radical changes in management under the auspices of the SSFP, is not consistent with the status of the resource or the goals of the SSFP.”

6. Within one year, conduct a comprehensive scientific and management audit by an independent, interdisciplinary scientific team to ascertain whether hatchery operations are in accordance with current biologic, genetic and ecologic understanding for maintaining salmon biodiversity and with the Sustainable Salmon Fisheries Policy.

I generally agree with this recommendation and I am moving forward on a \$250K, two-year effort to review and update the Comprehensive Salmon Plan for Southeast Alaska. A copy of the proposal, funded with Sustainable Salmon Fisheries funds is attached, and as you can see, the process incorporates independent review. I will also be moving forward as funding becomes available on a similar review and update for the Regional Comprehensive Plan for Prince William Sound. Nearly all of the hatchery production in Alaska occurs in Southeast and Prince William Sound.

7. Revise the Genetics Policy to incorporate the best available science.

I strongly concur with this recommendation and I have directed my genetics as well as pathology staff to begin a scientific, technical, and public review of the existing genetics and pathology policies with the goal of placing the revised policies in state regulation.

8. Establish wild stock genetic preserves.

Most of Alaska already is a wild stock genetic preserve. Quoting Dr. Greene directly:

"Because Alaska is the greatest remaining reservoir of salmon genetic diversity, the state has a special obligation to protect its wild salmon populations," urged Ben Greene, PhD, TU-Alaska Associate Director.

Project Title: Phase III Southeast Regional Comprehensive Salmon Plan Development

2. Project Manager: Steve McGee, Fishery Biologist IV
Alaska Department of Fish and Game
Commercial Fisheries Division
P.O. Box 25526
Juneau, AK 99802-5526

3. Project Description:

The Alaska State Legislature approved a statute in 1976 that directed the Commissioner of the Alaska Department of Fish and Game to "... have developed and amend as necessary a comprehensive salmon plan for each region, including provisions for both public and private nonprofit hatchery systems." This law (AS 16.10.375) requires such plans to "be developed by regional planning teams consisting of departmental personnel and representatives of the appropriate qualified regional associations..." The current Comprehensive Salmon Plan for Southeast Alaska was developed and approved in two phases. The Phase I plan was approved in 1981. The Phase II plans, one for each of the two recognized regions in Southeast, were approved in 1982. The goals and objectives of these plans were to be reached in 20 years. That period of time has now passed and much has changed in Alaska salmon production and harvesting operations. The Southeast Regional Comprehensive Salmon Plan needs to be updated and revised to meet the current and future needs of the Southeast salmon industry. Necessary amendments to the plan are required by the statute.

This project will result in a revised and updated Regional Comprehensive Salmon Plan for Southeast Alaska. The planning process, by law, must consider the needs of all user groups and ensure that the public has an opportunity to participate in the development of the plan. Revision of the Southeast Salmon Plan, including an assessment of the current status of salmon fisheries and the success of hatchery production, is needed for further advances in salmon enhancement. Updated goals and objectives are needed to determine the direction for future fisheries enhancement efforts. The funding requested for this project will pay salaries for a planner and a biologist to research historical fish harvest and production, prepare the third phase of the Comprehensive Salmon Plan, work with the two Regional Aquaculture Associations and the Regional Planning Teams to coordinate development, and conduct an extensive series of public hearings throughout Southeast Alaska to obtain public input for the new plan.

4. Objectives:

- a. Produce a draft Phase III Regional Comprehensive Salmon Plan to rehabilitate natural stocks and supplement natural production, with provisions for both public and private nonprofit hatcheries, that defines regional production goals by species, area and time, and considers the needs of all user groups.
- b. Conduct a comprehensive public review process that provides an opportunity for fishermen, Southeast communities and other members of the public to participate in development of the Phase III Plan. This review will also include review of the draft plan by experts in the field.
- c. Following the public review, produce a final document for submission to the Commissioner of Fish and Game for approval.

Methodology: The approach proposed for development of a new Phase III Regional Comprehensive Salmon Plan for Southeast Alaska is the same as that used to produce the existing Phase I and Phase II plans in Southeast and other Regional Comprehensive Salmon Plans in other areas of Alaska. A team of 2-3 individuals will conduct background research and develop a first draft of the plan for review by department staff and the Joint Southeast Regional Planning Team. After any necessary revisions, the plan will be distributed to a panel of experts for review prior to scheduling a series of public meetings to obtain input from the public in Southeast as well as from other areas of Alaska. The expert panel will be made up of individuals who are knowledgeable about salmon enhancement so they can critically review and suggest changes or additions to the draft plan. The draft plan will also be distributed to other interested individuals and organizations for review. Following the public review and appropriate revisions to the plan, it will be forwarded to the Commissioner for approval. The final plan will then be printed and distributed.

5. Results:

The deliverable products from this project will include: (1) an initial outline for the plan; (2) a first draft plan for departmental and Regional Planning Team review; (3) a final draft plan for expert panel and public review; and (4) the final approved plan.

6. Benefits to Salmon fisheries/fishers:

Development of a new, updated Regional Comprehensive Salmon Plan will allow uninterrupted continuation of the salmon enhancement program in Southeast Alaska. The new Phase III plan will better delineate requirements for hatchery and other salmon enhancement projects necessary to demonstrate continued protection of wild salmon stocks. It will address processes and procedures for implementation of new projects. The plan will provide direction for maintaining and strengthening the economic health of the Southeast region.

7. Project Timelines:

Project Initiation	7/01/02
Outline for Phase III Plan	8/01/02
1 st Draft of Phase III Plan	1/01/03
ADF&G and RPT Review	7/01/03
Public/Expert Panel Review	8/01/03
Public Review and Hearings	3/31/04
Final Draft of Phase III Plan	4/30/04
Second Expert Panel Review	5/31/04
Final Phase III Plan approved	6/30/04

8. Stakeholder Support:

In May 2002, both the Stakeholder and Science Panels recommended funding of this project. The Stakeholders recommended \$100K be directed toward this project from the funds earmarked for salmon enhancement.

9. Partners:

All the organizations and/or agencies represented on the Northern and Southern Southeast Regional Planning Teams are cooperators in the development of a new Regional Comprehensive Salmon Plan. These include: the Southern Southeast Regional Aquaculture Association, the Northern Southeast Regional Aquaculture Association, Douglas Island Pink and Chum, Inc., and the United States Forest Service.

10. Budget:

<i>Budget Category</i>	<i>FY03</i>	<i>FY04</i>
100 Personnel	75.0	75.0
200 Travel	20.0	50.0
300 Contractual	15.0	15.0
400 Commodities		
500 Equipment		
Subtotal	110.0	140.0
3% administration	3.3	4.2
Total	113.3	144.2

Alaska Department of Fish and Game
Review Criteria for Salmon Enhancement Project Proposals
Using Pacific Salmon Recovery Funds

Departmental reviews of enhancement projects funded using Pacific Salmon Recovery Funds should consider the potential benefits of a proposed enhancement activity as well as potential impacts to wild stocks, and should include proposed measures necessary to help the department ensure wild stocks of salmon are protected. Project proposals must fully and clearly describe the enhancement activity. Applicants should include in their proposals assessments of how their projects will benefit fishermen and others in the region, as well as how it could affect the management, genetics, health, and ecological relationships of wild salmon. If tagging studies are included, the proposal should contain a complete discussion of marking, mark recovery, analysis, reporting of data and conclusions, and corrective actions that will be taken if a problem is identified.

Departmental reviewers are directed to consider the following when reviewing enhancement projects funded under the Pacific Salmon Recovery program:

1. *Are the project's objectives clearly stated and achievable?*
2. *Could the proposed project significantly affect wild salmon stocks or existing fisheries?* The reviewers should consider the issues of pathology, genetics (straying, introgression, reduction in wild-stock fitness, etc.), the likelihood that harvest of fish produced by the project will result in excessive harvest rates on wild stocks, other management concerns, and issues of competitive interactions with wild stocks.
3. *Are there potential benefits to fisheries or wild stocks from the proposed project?* Reviewers should consider the potential of an enhancement project to reduce fishing pressure on wild stocks, alleviate crowding on the fishing grounds, etc.
4. *Does the proposal demonstrate how the potential effects and interactions of introduced or enhanced stocks on wild stocks will be assessed? How will wild stocks, and fisheries on those stocks, be protected from adverse impacts from artificial propagation and enhancement efforts?* Have the proposers identified which wild stocks could be affected and the degree of risk to them, and have the proposers described the importance and any unique characteristics of any potentially affected stocks? Are the objectives of these studies clearly described and achievable and will these studies identify significant problems while they can still be corrected? Have responsibilities, funding, and reporting timelines been clearly described for all studies?
5. *Has the issue of "marking and recovery" been completely addressed within the proposal?* The reviewers should consider the following questions when deciding whether marking and recovery has been adequately addressed. Are proposed marking and recovery studies adequate to evaluate the project in relation to its objectives? Will the marking and recovery plan ensure adequate precision in estimating wild stock

harvest-rates for fishery management needs, in view of existing fisheries management practices? Are enhanced fish marked in ways that are adequate to identify them as potential strays and to identify them in studies of ocean carrying capacity and hatchery-wild stock interactions? Is there an adequate escapement-sampling plan to evaluate straying rates of marked fish into wild systems? Have the responsibilities for marking, fishery and escapement sampling, and reporting been clearly described?