

# **First Nation FSC Catch Monitoring and Reporting: Preliminary Considerations, Standards and Recommendations**

Prepared by

David Lightly

&

Colin Masson

November 2009

MECTS

DFO-77058[00-01]

MECTS

## Table of Contents

1.0	Introduction and Overview	1
1.1	Purpose	2
1.2	History and Development of Catch Monitoring/Reporting	3
1.3	Management Context	3
1.4	Catch Monitoring/Reporting Overview	5
1.5	Principles	5
1.6	Catch Monitoring Basics	5
1.7	Monitoring and Reporting Standards Framework	8
2.0	Catch Monitoring in First Nation FSC Fisheries	12
2.1	Introduction	12
2.2	Collaboration	13
2.3	Salmon FSC Fisheries Catch Monitoring/Reporting	13
2.4	Pelagic FSC Fisheries Catch Monitoring/Reporting	14
2.5	Groundfish FSC Fisheries Catch Monitoring/Reporting	15
2.6	Shellfish FSC Fisheries Catch Monitoring/Reporting	16
2.7	Benefits of Improved FSC Catch Monitoring/Reporting	19
3.0	Recommendations	21
List of Tables and Figures		
1.0	Table 1. Overview of Categorizing Fisheries	9
2.0	Figure 1. Generic Decision Tree to Categorize Fisheries	10
3.0	Appendix 1. Examples of Monitoring levels for FSC Salmon Fisheries	23
4.0	Appendix 2. Tables for Generic Monitoring Standards for FSC Fisheries	25

## **1 Introduction and Overview**

The Pacific fishery has changed and can be expected to continue to evolve in response to current and future circumstances. Demands on the resource have increased at a time when many stocks are declining thereby heightening the potential for conflict between among harvesters. There are other voices demanding that managers take a broader view of the place of aquatic species in the ecosystem. The demands for sustainably managed fisheries have never been more challenging.

The current situation, for example in our Pacific salmon fisheries, described by many as a crisis, has led to a new examination of what aquatic resources mean to society and how they can be sustained. All levels of government, resource users, conservation groups, consumers and concerned individuals have begun an unprecedented discourse that has the potential to redefine how aquatic resources are managed. First Nations are integral to this discussion.

Shared fishery information, of known and rigorous quality, is the foundation for the dialogue.

All parts of the fishery rely on a common resource and ecosystems; their management must be integrated to be effective. There are, however, factors which separate the First Nations Food, Social, Ceremonial (FSC) fisheries from others. Existing/future treaty rights and an evolving body of legal precedent are elements that make them unique. FSC fisheries have priority access to fish resources, second only to conservation requirements.

The current relationship between DFO and First Nations has developed over the past one and a half centuries. Neither party is satisfied with the relationship and both desire change. This change will require the development of a strong collaborative approach to fisheries management in general and catch monitoring and reporting in particular.

### **Purpose of this document**

This document examines how fisheries monitoring and catch reporting (hereafter referred to as catch monitoring/reporting) of First Nations FSC catch contributes to the current management system. It is primarily targeted at First Nations technical staff, advisors and project managers, as well as at DFO staff involved in fisheries agreements with First Nations.

Part 1 reviews the evolution of catch monitoring in Pacific fisheries, which has culminated in the development of a set of principles upon which current catch monitoring/reporting systems are built. This section of the report also includes an examination of the factors effecting the implementation of these systems.

Part 2 provides an overview of the current situation in First Nations fisheries and describes the need for effective collaboration between DFO and First Nations, with particular reference to conflict resolution and strengthening relationships. Standards for catch monitoring/reporting systems for FSC fisheries are proposed.

Part 3 provides recommendations to help move toward a collaborative, adaptive system.

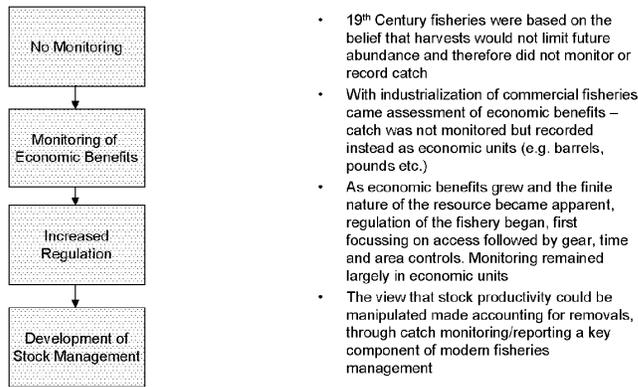
## An Overview of the History and Development of Catch Monitoring/Reporting

Catch monitoring is one of the key functions of fisheries management. The development of integrated/ecosystem management has only increased its importance. The catch of a target species can no longer be viewed in isolation from all the other effects of the fishery on the ecosystem. The monitoring requirement for a fishery may range from minimal to highly sophisticated, as determined by a broad range of management objectives.

### History

Catch monitoring in the Pacific Fishery has evolved through various phases, reflecting the values and knowledge of the times

### The evolution of catch monitoring



### Management Context

As in other jurisdictions, management of fisheries in Pacific Region is changing in response to a number of factors including:

## **Precautionary Management**

A public expectation for healthy, productive ecosystems populated with abundant fish stocks has produced the overarching principle that fisheries will be managed more cautiously, especially in the absence of rigorously collected data and information.

## **Treaties and other Agreements**

A broad range of international and domestic agreements require that fisheries be monitored at specified levels. The Pacific Salmon Treaty and existing/future First Nations treaties are particularly relevant examples where there are commitments at the federal, provincial and First Nations government levels call for higher standards of fishery monitoring and catch reporting standards.

## **Evolving Aboriginal Rights**

The present First Nation position in the fishery, emerging from a complex combination of legislation, jurisprudence and negotiation, calls for accurate and comprehensive monitoring to ensure all interests are respected. This process will continue and the fisheries management systems will respond.

## **Defined Shares and Quota Fisheries**

The domestic and global trend toward quota and allocations brings an increased requirement for precision and timelines to catch monitoring/reporting.

## **Integrated/Ecosystem based Fisheries Management**

Integrated/ecosystem based management increases the range and complexity of monitoring systems. In addition to basic catch information on the target stock, requirements could include:

- ❖ **Catch Sampling:** This can involve sampling for a wide variety of characteristics such as marks/tags, age, length/weight, sex etc.
- ❖ **By-catch:** This can include a wide variety of species, including non-targeted fish, marine mammals and birds.
- ❖ **Releases:** The requirement to release some of the catch varies. Required releases may be non-target or target species, differentiated by criteria such as size, sex or a mark. Information may also be required on the measures taken to minimize harm and an assessment of their condition at release.
- ❖ **Encounters:** Species encountered, but not captured, during the fishing operation may be impacted. Information on these encounters may be required.
- ❖ **Habitat Impacts:** The impact of the fishing operation on critical habitat may need to be reported.

## **Certification of Fisheries**

Increased global requirements for eco-certification (e.g. Marine Stewardship Certification) and traceability have placed additional requirements on catch monitoring/reporting systems.

## **Catch Monitoring and Reporting Overview**

Catch monitoring and reporting must form a part of all fisheries planning from the outset. The process will be enhanced by the development of catch monitoring/reporting standards for all fisheries in all harvest sectors. As noted above, these standards will provide a clear statement of the information required. Monitoring programs collect the information and reporting/data systems make it available.

### **Principles**

Catch monitoring/reporting in all Pacific fisheries is guided by the following principles:

#### **❖ Scope**

All fisheries must have monitoring and reporting that addresses conservation, ecosystem and management needs. This information will provide the basis for appropriate and timely control of the fisheries.

#### **❖ Obligations**

The monitoring and reporting programs must meet the provisions of domestic and international agreements, treaties, harvest shares/allocations and any established fishery certification programs.

#### **❖ Cost Effectiveness**

Fisheries monitoring and reporting programs must be cost effective.

#### **❖ Responsibility**

Harvesters are individually and collectively responsible for fishery monitoring and reporting.

#### **❖ Standards**

Each fishery will establish fishery monitoring/reporting standards. Standards will vary between fisheries, requiring a higher level of information for more complex fisheries, for those with increased risk to conservation and for those with specific sharing arrangements.

## **Catch Monitoring Basics**

### **Information Requirements**

Reduced to its basic elements, catch monitoring/reporting needs to collect and record information on fishing effort and catch that addresses the following questions:

#### *Why*

Understanding why fishing is carried out is an important first step. It is an important determinant of effort and influences the design of catch monitoring systems.

*Who*

Who fished, under what authorization?

*How*

What gear type and what gear specifications were used? This can require more than just gear type, examples being mesh size or number of traps.

*When*

When did fishing occur? This can range from unrestricted to very narrow constraints. This may be expressed as a time period or such things as number of sets or hauls.

*Where*

Where did fishing occur? This may range from as broad as a statistical area or as narrow as a traditional fishing site.

*What*

This is the crux of the matter. What animals were encountered, what was their mortality rate and were there any other effects on them?

- Catch, by species (and in some cases size, sex and marks), retained?
- Catch, by species (and in some cases size, sex and marks), released? How were they released and what was their condition?
- What animals were encountered during the fishing, but not captured? Were there any effects on them?

### **Methods of Catch Monitoring/Reporting**

A variety of catch monitoring methods have been developed in response to changing fisheries and evolving technologies. The actual design and implementation of the monitoring programs will be guided by the standards and developed in consultation with harvesters.

The two broad classes of methodology used in catch monitoring/reporting are fisher dependent and fisher independent. These two approaches are not mutually exclusive and can be combined in a variety of ways to provide the information required.

#### **Fisher Dependent**

- ❖ Fisher dependent catch monitoring/reporting relies on individuals or groups of harvesters to monitor and report their catch. This method has many positive aspects. In theory no one is in a better position to monitor catch than the harvester. Given positive engagement by fishers, adequate training and the appropriate reporting technologies, this type of monitoring can be very cost effective. There is potential for conflict of interest and lack of acceptance by resource managers and other harvest sectors. These can be reduced by the appropriate use of independent verification, while preserving most of the positive aspects of fisher dependent catch monitoring/reporting.

- ❖ It is widely recognized that fisher dependent monitoring has limitations. Independent verification can remove or reduce many sources of these limitations. This is illustrated by the recently published *Revisions to Official Commercial Pacific Salmon Catch Estimates for 1996-2004*.

#### **Fisher Independent**

- ❖ There are many situations where the conservation risk, certainty of catch sharing and a variety of other factors require the use of fisher independent methods. There is a wide and evolving range of techniques used to provide the precision and statistical rigor required.

#### **Information Management and Data Systems**

Monitoring information is only useful if it can be integrated with other data and can be accessed in a timely manner by those who need it. Data management systems must balance these needs with the protection of proprietary information.

#### **Fishery Planning, Adaptive Management and Evaluation**

The monitoring and reporting system should be considered in every step of the planning cycle. The results should be evaluated in-season so required adjustment can be made. The process should also be evaluated post-season to enable future improvements.

#### **Factors Determining Support for Catch Monitoring and Reporting**

Perceptions of modern fisheries management range from a positive system that can produce sustainability and prosperity, to an unwelcome limitation on the rights of a group or an individual. Where an individual's perception lies on this continuum influences their willingness to positively engage in a catch monitoring and reporting program. Underlying compliance with any regulatory scheme is knowledge and understanding which reaches to the reasons behind the regulation.

Factors motivating compliance include:

- ❖ *Positive Incentives*  
Positive incentives provide a means of encouraging a specific behaviour or set of behaviours by providing benefits to those who act in compliance with a set of policies. A common example is the provision of continued access to fishing opportunities with adequate catch reporting. Another example is the offering of rewards, often in the form of a lottery, for the provision of monitoring information. This is most often used to promote tag or mark returns. These incentives can be useful in specific circumstances, however recognizing the critical importance of monitoring to resource management, and using that belief as your incentive is more important in the long term.
- ❖ *Negative Incentives*  
Negative incentives can be powerful regulatory policy tools, when used correctly. One of the more common negative incentives is the use of sanctions.

Legal sanctions are well rooted in our culture and, in certain circumstances, are effective. There must be a reasonable certainty that they will be applied and they must be a deterrent.

Sanctions tend to be expensive to apply and may re-enforce an adversarial relationship. However, the use of sanctions is an important tool, especially when widely supported by stakeholders and as one of several management options.

❖ *Positive Engagement*

If a regulation is perceived to be equitable and beneficial, it will be supported and followed. The benefits may be personal, as in the case of a future opportunity in sustainable fishery, or they may be benefits to a larger community. Cultural and spiritual values are also important motivations.

### **Monitoring and Reporting Standards Framework**

Specific catch monitoring and reporting methods will be developed collaboratively by DFO and First Nations fishery managers. These will be guided by the standards to produce the required information, at the desired levels of detail, precision and timeliness.

Standards will vary with each type of fishery (e.g. shellfish vs. salmon, etc.), however, it is important that they be based on a consistent set of criteria. The criteria will consider the level of conservation risk associated with the fishery, the management actions taken in response and the various other factors (e.g. a quota vs. an open fishery). The methods used in developing monitoring standards apply across all fisheries. They consist of the following steps:

#### **Step 1 - Establish Required Level of Monitoring based on fishery characteristics**

In general, fisheries are categorized as requiring *low, moderate, or enhanced* levels of monitoring and reporting. The starting point is the moderate category, with fisheries lowered or raised, based on their specific characteristics and information requirements.

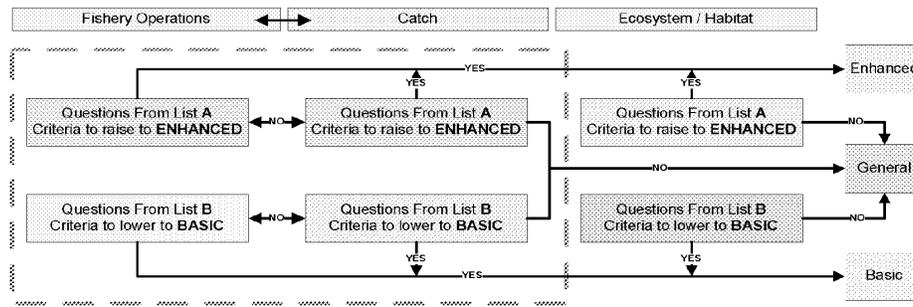
Table 1 provides an overview of the type of information needed in each of the three levels of fishery monitoring and reporting and illustrates the typical fishery characteristics of each.

Table 1: Overview of Categorizing Fisheries

INFORMATION REQUIREMENT			
<b>Starting Point:</b> Move to Low or <i>Enhanced</i> due to specific fishery characteristics			
Information Category	Low (Basic)	Moderate	Enhanced
<b>Fishery Operations</b>	Able to determine the characteristics of the fishery  Not managed by defined shares/specific allocation	Able to quantify effort levels. High consistency across years to establish reliable trends of catch per unit of effort (CPUE)  Not managed by defined shares/specific allocation	Accurate and timely (high statistical quality) records of operational details (e.g. effort/location, gear details)  Managed by defined share(s) or specific allocation
<b>Catch</b>	Able to determine magnitude of catch and catch-related mortality relative to other fisheries	Able to quantify annual catch and catch-related mortality. High consistency across years to establish reliable trends	Accurate and timely (high statistical quality) records of catch and catch-related mortality
<b>Ecosystem/Habitat</b>	Able to qualitatively identify any potential impacts  No significant ecosystem or habitat impacts anticipated	Able to quantify the magnitude of impacts (for any species/habitats that apply)  Low to moderate ecosystem or habitat impacts anticipated	Accurate and timely records of any impacts (e.g. incident reports for marine mammal/bird/reptile encounters and mortalities. Other ecosystem or habitat effects)  Moderate to significant impacts possible
<b>Statistical Quality</b>	Low +/- 50%, little if any independent verification	Moderate +/- 80%, < 20% independent verification	Enhanced +/- 95%, > 20 % independent verification

Each fishery will be evaluated to determine the level of information required. Figure 1 illustrates a decision process to make this evaluation. For each major type of fishery (e.g. salmon, groundfish etc.) the decision tree will be customized. The factors used in this evaluation will vary depending on the specifics of each fishery, but the goal is to provide consistent monitoring programs across fisheries.

**Figure 1: Generic Decision tree to Categorize Fisheries**



**EXAMPLES OF KEY QUESTIONS:**

FISHERY OPERATIONS	CATCH	ECOSYSTEM / HABITAT
<b>A. Questions to raise to ENHANCED</b>		
1. Is the fishery quota/allocation based?	1. Is the target species/stock at or near the target reference point?	1. Is there significant potential for negative effects on marine mammals/birds/other?
2. Is it a formal assessment fishery or an indicator stock?	2. Is the target species/stock trending toward a lower limit reference point?	2. Are there significant potential negative effects on species at risk?
3. Is it a pilot or demonstration fishery?	3. Is the by-catch potential of a species/stock of concern high?	3. Does the fishery have potential significant impacts on predator/prey relationships or ecosystem productivity?
4. Is dual fishing being carried out on a groundfish or shellfish fishery?		4. Are there significant potential habitat impacts?
5. Is high capacity/high efficiency gear used?		
6. Do adjacent fisheries (shellfish) appear to limit the ability of FNs to meet FSC needs?		
<b>Questions to drop to LOW</b>		
1. Is the # of harvesters known to be low/limited and stable and fishing with low efficiency gear?	1. Is there a low conservation risk and limited catch?	1. Is the potential for interaction with other species insignificant?
	2. Is the fishery on a stock of known high abundance with minimal by-catch?	2. Is the potential to impact habitat insignificant?

The monitoring category (**Moderate, Low or Enhanced**) is determined by identifying the issues that apply to the fishery in the areas of Fishery Operations, Catch and Ecosystem/Habitat. The answers to specific questions about the issues are used to determine if the fishery monitoring category should be changed from 'Moderate'. The questions in list A are used to determine if the category is raised to 'Enhanced' and those in List B are used to determine if the category should be lowered to 'Low'. Questions used (specifics and number) will change as appropriate for each fishery type (e.g.: groundfish; shellfish, pelagics, etc). The identification of issues and determining how they will affect the categorization will form part of the planning process for each fishery.

## Step 2 - Develop Standards

Once the level of monitoring required for a fishery has been determined, a specific standard can be developed. The standards will vary depending on the unique features of the fishery. The purpose of these standards is to provide consistent guidance to the type and precision of information collected, the choice of monitoring method, the reporting frequency and the support required.

Tables are attached in the appendix (Tables 2A, 2B and 2C) to provide generic templates for developing standards for the low, moderate and enhanced monitoring levels. The use of common methods to categorize the level of monitoring and the information standards is an important tool to ensure consistent fishery monitoring and reporting programs across a broad range of fisheries.

Some aspects of the standards may vary with the unique nature of each fishery, but they share the common goal of addressing the conservation risks and the management requirements of the fishery. The standards for each fishery will guide the development of monitoring and reporting programs during the fishery planning cycle. The standards will be evaluated and refined as required.

## Summary

Modern fisheries management requires a comprehensive and integrated approach. Fisheries monitoring and catch reporting are an essential part of fisheries management. All fisheries must provide information of sufficient and known precision and accuracy. This information must be available a timely manner to allow managers to address comprehensive range of impacts on the resource.

In developing standards for catch monitoring, the level of information required is determined by categorizing fisheries according to conservation risks and other management needs. This is followed by an examination of all the information needed to meet the conservation and management goals for the fishery. Methodology is developed to provide a consistent approach across a range of fisheries, while responding to the unique features of each fishery.

Some of the information needs addressed by the standards are based on shared management objectives for sustainable fisheries; others will be based on the evolving requirements of the fishery determined collaboratively with harvesters.

## 2 Catch Monitoring in First Nation Food, Social and Ceremonial Fisheries

### Introduction

First Nations have traditionally utilized an incredibly diverse mix of marine and freshwater flora and fauna for food, social and cultural purposes. Recently however, FSC fisheries have focused primarily on species of salmon, groundfish, pelagics, (primarily herring and eulachon), and shellfish (primarily clams, oysters, crabs and prawns) available to a community in their fishing area.

Many FSC fisheries are undertaken by individuals, harvesting small numbers from an abundant resource base with no measurable impact. Others are very large and complex community-managed fisheries involving hundreds of fisherman, harvesting hundreds of thousands of fish with the real potential to impact upstream harvesters and the resource sustainability. The dramatic drop in the number of commercial fishers operating in First Nations communities has affected the ability of many individuals and communities to access FSC resources.

The mix of fish resources available for FSC fisheries also varies considerably from a diverse array of species that reflects the rich coastal ecosystems to a single salmon species available for the limited migration period typical of an upper watershed fishery.

The FSC fisheries which target on the large salmon returns of major watersheds such as the Skeena and Fraser typically operate under complex management regimes with scientifically designed sampling and monitoring programs. At the other end of the spectrum, the small-scale and remoteness of some FSC fisheries leave them essentially unmonitored. The standards for monitoring and reporting programs will reflect this diversity.

Various agreements are in place to support First Nations in the management and monitoring of their fisheries. The *Aboriginal Fisheries Strategy* (AFS) is the primary program in support First Nations fishery management. These agreements tend to vary with the nature and complexity of the fisheries. Recently aggregates of First Nations have entered into *Aboriginal Aquatic Resource and Oceans Management* (ARROM) agreements with DFO. This initiative has a goal of fostering a more collaborative relationship. *Contribution Agreements* are another vehicle occasionally used to fund specific, short term initiatives.

As with the monitoring of all fisheries, in all sectors, the results to date of FSC monitoring programs are mixed, but the lack of consistency in reporting and storage of the data make evaluation difficult. The development of standards will aid in the design, implementation and evaluation of monitoring and reporting programs. It will also allow the support provided under the various programs to be used more efficiently.

## **Collaboration**

Communication between DFO and First Nations is often difficult, yet a strong collaborative relationship in fisheries management is desired for both parties to achieve the shared goal of sustainable fisheries.

To foster the dialogue required to collectively develop and support FM&CR programs, as technical people we need to recognize and follow important collaborative practices. The fundamental characteristic of such a relationship is one of mutual respect and open communication. Typically this develops by working to ensure that each is effectively listening to the other, such that statements are acknowledged and explored leading to an understanding and acceptance of differing views.

Respectful communication recognizes the responsibility of the parties to clearly identify issues, positions and interests to themselves and to one another. Compelling and underlying issues should be openly shared and explored together to enable a collective understanding and acknowledgement of the priorities held by each. Collaborative relationships may have issues which cannot be resolved, but have no issues which cannot be acknowledged and discussed (thus avoiding “the elephant in the room”).

Equally important is the discussion required to agree on shared objectives and priorities. DFO and First Nations should be willing to identify and commit to collaborative solutions to their common problems. Once common objectives are identified, the development of appropriate standards and monitoring programs can more readily occur. This is a classic, interest-based, approach to conflict resolution which can be very difficult to achieve in situations where distrust and intractable positions have become systemic.

A clear definition, discussion and acceptance of roles and responsibilities are also a useful foundation for the development of a constructive and respectful relationship.

## **Salmon FSC Fishery Catch Monitoring/ Reporting**

Historically First Nation salmon fisheries harvested a diverse mix of species, using an ingenious variety of methods at locations ranging from the open ocean to the headwaters of rivers. Many factors have led to a reduction in the scope and range of the fishery. The contraction of fishing capacity in the commercial salmon industry has affected the ability of many First Nations communities to access FSC salmon, and has resulted in many communities turning to communal harvest and distribution. In spite of these obstacles, salmon retains its importance. It is described by many First Nations people as “the life blood of the community”.

The management of salmon stocks on the Pacific coast ranges from relatively simple systems to highly integrated, complex systems involving a variety of harvesters operating year round, on an international scale.

This diversity of scale and complexity is reflected in current FSC salmon fisheries, which range from low impact harvesting by individuals in terminal areas to large scale

fisheries using highly efficient gear, in areas with high conservation risk or other management concerns such as allocations. Monitoring and reporting standards must reflect this diversity.

As with all fishery monitoring and reporting programs, there are two key factors that determine the specific information requirements for FSC salmon fisheries:

- The paramount consideration is conservation risk. This may range from the need to prevent over-harvesting of a single stock to the need to manage a complex mix of species and stocks. Guidance is provided in the *Wild Salmon Policy (2008)*.
- The need to meet a variety of management objectives such as allocations, assessment of indicator stocks, eco-certification or ecosystem/habitat effects.

FSC salmon fisheries can be categorized as requiring general, enhanced or low (basic) levels of monitoring using the decision tree shown in Figure 1. As noted above the default category is general, with some fisheries raised to enhanced or lowered to low, based on their information needs.

The standards required for the three levels of catch monitoring and reporting can be developed using the templates provided in Appendix 2 - Tables 2A, 2B and 2C respectively. The first priority of the monitoring standards in FSC salmon fisheries is reaching the precision of catch and by-catch reporting required to address the conservation risks. The second priority is meeting management goals such as allocations, assessment of indicator stocks or eco-certification. The issue of timeliness can be an over-arching requirement for all these areas.

Determining how these standards are achieved will vary with each fishery and will form part of the annual cycle of fishery planning and consultation.

### **Pelagic FSC Fishery Catch Monitoring/Reporting**

Pelagics are a diverse group of fish, characterised by their tendency to spend at least part of their lives in the mid or surface waters, often in offshore areas (salmon fit but are considered separately). They often exhibit wide variation in abundance. The main species of interest for FSC fisheries are herring and eulachon. While many other pelagic species are also harvested, little information is available.

#### **Herring**

Herring are harvested by seine and gillnet, with some minor harvest by jigs, rakes or dipnets. Fisheries may range from groups of First Nations using highly efficient seine or gillnet gear, with the potential for relatively large catches, to individuals using relatively low impact gear. Herring roe is harvested on branches or kelp, usually by groups or individual First Nations. Some food herring is obtained from DFO test fisheries or commercial operations.

The FSC harvest of whole herring and roe is inconsistently monitored and reported. Some information is submitted by groups (such as the First Nation Marine Society) when co-ordinated fisheries occur. Individual First Nations report catch on AFS reports and there are some hail figures collected opportunistically by DFO and First Nation fisheries staff. This data does not allow an estimate of the total harvest.

Information requirements for First Nation FSC herring fisheries can be categorized using the framework described in Section 1.6. Most requirements will probably fall into the general category with little or no conservation risk, limited ecological impact and no FSC access issues. Some larger scale fisheries with more efficient gear may fall into the enhanced category, as may FSC fisheries where community needs are not being met, thus requiring greater certainty in monitoring.

The units for reporting FSC catch of herring requires examination. In most cases scales to weight the catch will not be available; however the weight of whole herring and roe on branches or kelp could be estimated with the help of standardized containers. This is an example of the kind of issue that will be included in the collaborative development of the standards.

### **Eulachon**

The eulachon fishery occurs in several of the larger rivers along the length of the mainland. These fisheries are very important to First Nations. They are eaten fresh and smoked, but the rendered oil is most prized. As with herring there is some reporting of catch, but the total harvest is unknown.

Eulachon stocks have generally declined in recent years. It is essential that information on recent First Nation catches is gathered and a monitoring program developed to meet the needs of those fisheries still active.

### **Other Pelagic Fish**

The harvest of other pelagic fish by First Nations is relatively unknown. It is likely that sardines, surf smelt, shad, perch sp., sand lance, mackerel and albacore are harvested. Catch monitoring/reporting is an important management tool in these fisheries.

## **Groundfish FSC Catch Monitoring/Reporting**

Groundfish represent a wide array of fish species that are managed under a complex and evolving system. Many of the species are relatively long-lived and widely dispersed, and as such they can support stable, multi-year fisheries when properly managed. In response to increased fishing pressure and declining stocks, improved groundfish management has become a high priority. Part of this priority is improved catch monitoring/reporting for all sectors.

Groundfish species are very important to First Nations. In some areas of the outer coast they are as, or more important, than salmon. In many inner coastal areas the reduction in access to salmon has caused a shift to groundfish to meet some of the communities' FSC needs. This harvest may occur during a commercial fishery, raising the potential of

bringing First Nations into conflict with DFO over its *Fishing Area Policy* and/or with each other over territorial protocols.

Although First Nations FSC harvest probably included most of the inshore and shelf dwelling groundfish at one time or other, the main species targeted today are halibut, lingcod, sablefish and a variety of rockfish. Harvest methods range from individuals using hook and line gear from small vessels to highly efficient commercial longline vessels, either owned or designated by First Nations. There is no indication that commercial trawl vessels are used to harvest FSC groundfish.

An important issue for First Nations and DFO is providing access to FSC harvest opportunities in areas with depleted stocks. Effective catch monitoring/reporting is an important tool to identify these issues and to assess any adjustments made.

Another important issue for DFO groundfish managers is “dual” fishing. This occurs when a licensed vessel harvests from a commercial TAC and retains FSC fish on the same trip. This practice complicates effective monitoring of catch. The 2009-2010 Groundfish IFMP sets out requirements for a designation certificate from a First Nation and a hail-out prior to fishing. This makes it more difficult to “launder” by-catch after the fact.

In general, the monitoring of the FSC groundfish fisheries is highly variable. Catches are intermittently monitored by some First Nation fisheries staff and reported in AFS reports. There is no clear picture of the total effort or catches for any of the groundfish species.

FSC groundfish fisheries will be categorised and standards developed based on the methods presented above.

### **Shellfish FSC Catch Monitoring/Reporting**

The monitoring and reporting of shellfish utilizes some unique methods to ensure sustainability which often do not rely on catch monitoring and reporting as the basis of the management system. However, questions of catch sharing between harvesting sectors and treaty/international obligations require improved monitoring and reporting.

Meeting First Nation FSC needs is an important factor in managing shellfish, as evidenced by the crab fishery example, wherein areas have been excluded from the commercial fishery to ensure FSC access. The effectiveness of these area closures is usually assessed not by total catch, but by an index of abundance.

The principle FSC shellfish fisheries are:

#### **Crab**

The crab fishery is managed by a size limit that ensures males spawn at least once before they are removed, combined with the total protection of females. There are trap limits in the commercial and recreational fisheries. There are regulations to limit bycatch and the

commercial fishery has regulations (soft shell closures) designed to minimize physical damage to the stock during fishing. This approach (often referred to as three "S" - size, sex and season), has created a sustainable fishery, albeit one that shows considerable cyclical variation.

The commercial fishery catch is monitored through landing information and/or the sales slip system, combined with electronic monitoring and logbooks. The recreational fishery is opportunistically monitored. Salmon creel survey collects some data. Total catch estimates are not generated for the recreational fishery as a whole, however targeted monitoring of specific fisheries does occur. The First Nation FSC catch monitoring is similar. There is some reporting in AFS reports and some FN fishery programs monitor catch, but the data is insufficient to estimate overall FSC catch.

First Nations have begun survey programs in key high use areas to assess the strength of stocks and their opportunity to meet their needs.

DFO has engaged all sectors of the crab fishery in a process of Crab Reform. One goal of this process is to improve FSC access to crab. This may encourage some First Nations to become active in monitoring their crab fisheries.

FSC crab fisheries will be categorised and standards developed based on the methods presented above.

### **Prawns**

The situation in the prawn fishery is similar to the crab fishery, with some important differences dictated by prawn life history. The fishery is successfully managed based on a spawner abundance index, which is established in standardized test fisheries carried out coast wide at set intervals. While prawn abundance and catch vary, the fishery opens and closes on the index. The index is applied in different ways in different areas.

First Nations FSC catch for prawn is unmonitored except for a few reports which are not indicative of the actual overall catch. The level of participation of First Nations in the prawn fishery is relatively unknown, and establishing the level of participation is an important first step in designing a monitoring program.

FSC prawn fisheries will be categorised and standards developed based on the methods presented above.

### **Intertidal Clams**

Clam fisheries are managed under a variety of regimes. The presence or the threat of various bio-toxins and other contaminants can close large areas to all harvesting by all sectors, and beaches leased for aquaculture are closed to all sectors. Outside of these closures, FSC fisheries operate with no time or area closures and have no size limits. Clams are highly valued by First Nations, but access to this resource has previously been limited in many areas through alienation and contamination of many traditional sites.

The commercial fisheries are monitored through landings and/or sales slips. In addition they have stringent requirements for traceability. The recreational fishery is unmonitored. The First Nation FSC fisheries are essentially unmonitored, aside from periodic AFS reports and other reports from First Nation fisheries programs which give no indication of the overall harvest. This harvest is known to be extensive in some areas.

FSC clam fisheries will be categorised and standards developed based on the methods presented above.

### **Other Invertebrates**

There are a variety of other invertebrates harvested by First Nations, but no comprehensive list exists.

Improved monitoring of these harvests will require:

- A comprehensive list of the species used by each First Nation;
- Preliminary estimates of harvest levels and effort;
- Consultation with First Nation on the factors affecting the harvest; and
- Development of standards and methods to monitor the harvest.

The overall goals of monitoring and reporting of FSC harvest are the same. Risks to conservation are the primary concern, followed by ecosystem effect and the fulfillment of obligations, in this case primarily the provision of FSC access.

The introduction of monitoring of these species is a valuable tool in ensuring continued access to these species. If it is consistently approached from that point of view, it has the potential for improving relationships.

### **Shellfish Summary**

These fisheries tend to be pursued by individuals at diverse locations, at any time of the year depending on time and weather. The trap fisheries are often done in conjunction with other fishing or travel. This makes landing times unpredictable. First Nation fisheries staff has some ability to monitor catch independent of the fishers, but the best ones to effectively monitor catch are the fishers themselves. However, units of measurement require consideration.

Logbooks and catch calendars are the common tools used to achieve general levels of information required.

Engagement of the fishers and long term, collaborative relationships are keys to success.

High volume crab and prawn FSC fisheries using commercial gear are unique. These may need on the water independent verification of catch by independent observers, including DFO staff.

## **Benefits of Improved FSC Catch Monitoring**

There are tangible benefits to the development of a functional catch monitoring and reporting system. The mutual recognition and acknowledgment of these benefits is an important part of the development of a collaborative approach. The benefits are:

### **Sustainability of Fisheries**

This is the primary goal of our fisheries management system. There are too many natural variables affecting the fishery to allow a lack of clarity about harvest levels to lessen our ability to protect the resource. First Nations FSC harvests should be the first to benefit from healthy stocks.

### **Improved Access**

First Nation's improve their access to fisheries in two ways - by using tools they have now and by forging new ones. Improved catch monitoring/reporting is required in both.

#### *❖ Existing tools*

The constitutionally protected priority of FSC fisheries is a powerful tool that First Nations and DFO can use to ensure access to FSC harvest is maintained. If First Nations can demonstrate, through credible catch monitoring/reporting systems, a lack of opportunity for FSC harvest, they will be in a strong position to obtain better access.

Two good examples are *Crab Reform* and *Rockfish Conservation*. Both initiatives have a strong element of protection of FSC access.

#### *❖ New tools*

New treaties are being negotiated, signed and implemented. New cases are before the courts. Each of these areas relies on robust information provided by reliable catch monitoring/reporting.

### **Strengthening First Nations' Role in Fisheries Management.**

The oft heard line "If we give you catch information, you will only use it against us", speaks to the distrust many First Nations have toward fisheries management. In fact, accurate and reliable catch monitoring information positions First Nations to participate in and influence key decisions regarding sustainability and allocations. This approach to active participation in fisheries monitoring and catch reporting enables greater success in resolving various issues associated with resource access and determination of harvester shares.

### **Integrating FSC Fisheries**

Modern fisheries are integrated. They are integrated internationally, regionally and locally. What happens in a First Nations fishery is no longer an isolated, unimportant event.

A First Nations person can now participate in an FSC, a commercial and a recreational fishery in one week- all based on the same stock of fish. Our attitudes, planning and management need to catch up to this reality. Monitoring and reporting of catch will seem like second nature if that happens.

20

MECTS

MECTS

### **3 Recommendations**

#### **Communicate that catch monitoring is a priority**

The importance of catch monitoring and reporting must be made clear throughout the planning and implementation of fisheries. Both DFO and First Nations must place a high priority on effective monitoring. Early in the consultation process, DFO and First Nations need to establish all the elements of the monitoring system proposed for the fishery.

The consequences to the sustainability of the resource are the key reason to establish effective monitoring. This shared interest is the starting point of discussions about catch monitoring and reporting. In the rare cases where this interest is not shared, it should also be the starting point for discussion.

#### **Establish an effective collaborative approach**

Both DFO and First Nations must agree on a common understanding of collaboration. Both must identify their requirements within this relationship and be willing to seek and commit to collaborative solutions to common problems. Once shared objectives are identified, the development of appropriate standards and monitoring programs can occur.

#### **Planning and support for First Nation catch monitoring**

Effective monitoring requires planning, followed by appropriate support. The subject should not be tacked on the end of the negotiations of fisheries agreements, but should be identified as an integral part of the process.

This document provides the basis for DFO staff to collaborate with First Nations on the development of monitoring programs sufficient to meet the identified requirements. Once the requirements are clear, effective and efficient monitoring programs can be planned to meet them. Understanding gaps between existing and required programs is useful in identifying the specific resources (financial and human) and operational capacity needed.

Careful multi-year planning and documentation of results are key to achieving the desired level of fisheries monitoring and to developing a sound basis for effective participation in fisheries management processes.

The coordination and integration of monitoring (and other management) programs with other First Nations and harvesters will be essential to successful and efficient fisheries management.

It is important to have on-going consultations and feedback between DFO and First Nations so each understands the issues and requirements of the other. Specific feedback on the quality and use of monitoring information is required.

### **Establish Data Management Advisors**

Support for roles and positions that actively foster enhanced catch monitoring/reporting in First Nation communities is provided in both AFS and AAROM agreements. A role which specifically focuses on developing greater FN capacity in fisheries data management and technical aspects of fisheries monitoring has been successfully piloted within an ARROM agreement in the Central Coast area. It is proposed that this role, (called “Data Management Advisor”), be considered during the planning of agreements elsewhere, either by redirecting existing responsibilities or by shaping new ones when possible. Further training and technical orientation can be provided by DFO for these individuals.

This position, ideally located in an appropriate First Nations organization, could provide the following:

- Assist with the collaborative process of determining information requirements and planning monitoring programs;
- Provision of the support required by local First Nations;
- Development of local catch monitoring and data management capacity and tools;
- Feedback to First Nations on the quality and use of catch monitoring information.

### **Implement a consistent FSC catch monitoring data system**

Aside from a few high priority fisheries, the inconsistencies in collecting, recording and distributing FSC catch data limit its utility. The development of a comprehensive system for all FSC catch data, integrated with regional data systems, is required.

## Appendix 1

### Examples of Monitoring Levels for FSC Salmon Fisheries

#### Low (or Basic)

In general these fisheries will be carried on by individuals using relatively low impact gear, on single stocks or mixed stocks of equal strength. They will tend to occur in terminal areas and have relatively low effort and exploitation rate. Reporting will be largely fisher dependent. Reports will be collected and submitted monthly or annually by First Nation staff, who will also provide support and verification as required.

Examples are:

- In-river dip or set nets in terminal areas
- Marine or estuary harvest with gillnets or troll gear
- Occasional marine or freshwater fisheries using sports gear

#### Moderate

These fisheries are carried out by individuals or groups on stocks with low or moderate conservation risks. While regular reporting is likely required, effort and exploitation rates are relatively predictable and the target stock has stable abundance. By-catch is also predictable and manageable and reliable catch reporting has been demonstrated in recent years. Sampling goals are achievable. The catch monitoring levels will not adversely affect the management of quotas/defined shares or eco-certification requirements

Examples are:

- In-river dip net or set nets on stocks with moderate and manageable conservation risks
- Marine or estuary harvest with gillnets or troll gear on stocks with moderate and manageable conservation risks
- Seine fisheries (purse or beach) on abundant stocks in terminal areas, with manageable by-catch issues

#### Enhanced

These fisheries have high or unknown conservation risks. The target stock may be trending toward a minimum reference point or there may be significant by-catch issues or the fishery may occur on an indicator stock. The expected effort and/or exploitation rate may be high. Future fishing opportunities may be dependent on high precision and

timely monitoring/reporting, and the fishery may require tracking of allocations/shares or may require eco-certification.

Examples are:

- Fraser sockeye fisheries with significant conservation concerns for by-catch of Cultus/Early Stuart sockeye or Thompson coho
- Skeena river major community based fisheries
- Marine 'coordinated' seine fisheries in Juan de Fuca, Johnstone or Georgia Straits
- Defined-share/demonstration fisheries
- Terminal seine or gillnet fisheries targeting indicator stocks

**Appendix 2: Tables for Generic Monitoring Standards.**

Table 2-A: Generic Monitoring Standards for *Low* Category of FSC Fisheries

INFORMATION TYPE	DATA REQUIRED	PRECISION	INDEPENDENT VERIFICATION
<b>FISHERY OPERATIONS</b>			
Number of harvesters and/or units of gear (Who & How)	Yes	Low to moderate	No
Time/ Date/ Duration (When)	Days Fished	Low to moderate	No
Location (Where)	Stat Area or specific location if available	Low to moderate	No
<b>CATCH</b>			
Retained	Number by species	Low to moderate	
Released	Number by species	Low to moderate	
<b>BIOLOGICAL DATA</b>			
Marks/Tags, Sex, Age, Tissue and/or Meristic	None or periodic – with standard programs, e.g. head recovery		
<b>ECOSYSTEM EFFECTS</b>			
Encounters/mortalities – birds, mammals, others	None		
Habitat effects	None		
<b>DATA</b>			
Format	E-format (preferred)		
Timeliness	Annually or end of season		

Table 2-B: Generic Monitoring Standards for *Moderate* Category of FSC Fisheries

INFORMATION TYPE	DATA REQUIRED	PRECISION	INDEPENDENT VERIFICATION
<b>FISHERY OPERATIONS</b>			
Number of harvesters and/or units of gear (Who & How)	Yes	Moderate - $\pm$ 20%, 9 times out of 10	Possible
Time/ Date/ Duration (When)	Days fished – finer resolution if required	Moderate - $\pm$ 20%, 9 times out of 10	Possible
Location (Where)	Stat area/sub area or specific location if required	Moderate - $\pm$ 20%, 9 times out of 10	Possible
<b>CATCH</b>			
Retained	Number by species	Moderate - $\pm$ 20%, 9 times out of 10	Possible
Released	Number by species	Moderate - $\pm$ 20%, 9 times out of 10	Possible
<b>BIOLOGICAL DATA</b>			
Marks/Tags, Sex, Age, Tissue and/or Meristic	Periodic – with standard programs or others as required		Possible
<b>ECOSYSTEM EFFECTS</b>			
Encounters/mortalities – birds, mammals, others	As required	As required	Possible
Habitat effects	As required	As required	Possible
<b>DATA</b>			
Format	E-format		
Timeliness	Weekly or monthly		

Table 2-C: Generic Monitoring Standards for *Enhanced* Category of FSC Fisheries

INFORMATION TYPE	DATA REQUIRED	PRECISION	INDEPENDENT VERIFICATION
<b>FISHERY OPERATIONS</b>			
Number of harvesters and/or units of gear (Who & How)	Yes	High – gear counts, hail out/in, observers or electronic monitoring (EM)	Yes – fisheries staff, observers or EM
Time/ Date/ Duration (When)	Duration of fishing required	High – hail out/in, observers or EM	Yes – fisheries staff, observers or EM
Location (Where)	Specific location required	High – observers or EM	Yes – fisheries staff, observers or EM
<b>CATCH</b>			
Retained	Number by species	High - $\pm$ 5%, 9 times out of 10	Yes – fisheries staff, observers, EM or dockside validation
Released	Number by species	High - $\pm$ 5%, 9 times out of 10	Yes – fisheries staff, observers, EM
<b>BIOLOGICAL DATA</b>			
Marks/Tags, Sex, Age, Tissue and/or Meristic	Extensive – sampling design rigorous		Yes
<b>ECOSYSTEM EFFECTS</b>			
Encounters/mortalities – birds, mammals, others	Yes – detailed documentation	As required	Yes
Habitat effects	Yes – detailed documentation	As required	Yes
<b>DATA</b>			
Format	E-format		
Timeliness	Weekly or monthly		

28

MECTS

MECTS