

A Special Report on Wild Atlantic Salmon in Eastern Canada

Prepared by

Minister's Advisory Committee on Atlantic Salmon

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Executive Summary

In December of 2014, in response to declining wild salmon returns, DFO Minister Gail Shea announced the creation of a Ministerial Advisory Committee for Atlantic Salmon. The committee was established in February, 2015, and was instructed to review critical aspects of the wild salmon resource. The committee's mandate was to address conservation, enforcement, predation, science and strategies to reduce international fisheries that target salmon produced in Canadian rivers.

The committee consulted with First Nations and Aboriginal groups, as well as stakeholder groups at sessions held in Halifax, Moncton, St. John's and Quebec City. Additional meetings with scientists, researchers, government managers and other specialists were held at all locations. Over the course of its work, the committee was impressed by the many volunteers, researchers, organizations, and groups that are fully committed to improving the wild salmon resource and its habitat.

The committee generated 61 recommendations related to the mandate areas. New investment is needed to deliver many of these recommendations. Others can be accomplished by changes in practices or management approaches. There is a large network of partners ready and able to work on all fronts to address salmon conservation and recovery. The committee believes that local Aboriginal and stakeholder groups, NGOs and existing science partners will play a major role in accomplishing the objectives of the recommendations.

The committee noted that the preferred approach for DFO and the federal Government to reinvest in the salmon resource is through the creation of a Wild Atlantic Salmon Research and Innovation Fund. The fund should be accessible to the many partners who are presently doing salmon work. It should be set up to leverage other programs and resources, and build on large-scale ecosystem and oceans work that is presently underway. The fund should be established for a given period of time and should be administered by an arm's length group of partners who have interests related to wild Atlantic salmon.

Background

The health of the Atlantic salmon population has been the focus of ongoing concerns for decades. Overharvesting at sea, in estuaries and rivers, habitat damage and water quality problems caused by river damming, land use practices and acid rain were key causes of the early declines observed in many river systems. In an effort to reverse the declining trends, a number of aggressive management measures were introduced including the closure of commercial salmon fisheries, elimination of the retention of large fish in most recreational fishing areas, bag limit reductions for grilse in all recreational fisheries and complete closures to angling in some river systems.

Wild Atlantic salmon continues to support important recreational fisheries in Atlantic Canada and Quebec. In addition to the social, cultural and recreational value of salmon angling, the sport fishery for salmon generates much needed employment and economic activity in rural regions. Wild salmon is a key species for Aboriginal food, social and ceremonial fisheries in Nova Scotia, New Brunswick, Quebec and Newfoundland and Labrador. Atlantic Salmon is also important for food security, social and cultural aspects of Aboriginal communities.

While there have been highs and lows in the numbers of returning salmon, the salmon stocks in many regions have been in decline for decades. In 2014, returns in many river systems were the lowest on record. Of the 60 rivers assessed in Canada in 2014, only 30% of them reached or exceeded their minimum spawning escapement requirements. Problems were particularly severe in the Maritimes, but there are serious concerns in southern Labrador, along the south coast of Newfoundland and in regions of Quebec, including Anticosti and the Upper North Shore. The 2014 salmon stock assessments can be found in Appendix 1.

The poor returns in 2014 were experienced firsthand on the rivers by anglers and Aboriginal harvesters. One of the most important salmon rivers in Atlantic Canada, the Miramichi in New Brunswick, was particularly hard hit. This development did not go unnoticed. When visiting the Miramichi region in December of 2014, DFO Fisheries Minister Gail Shea announced that she would

create a Ministerial Advisory Committee which would be instructed to review critical aspects of the salmon resource and fisheries, and to recommend a course of action.

Process

In February, 2015, DFO selected the committee members and appointed a chairman. Members were selected based on their diverse backgrounds in salmon-related disciplines. All salmon producing provinces in eastern Canada were represented. A list of committee members and their backgrounds can be found in Appendix 2.

The mandate areas that the committee was asked to focus on included conservation, enforcement, predation, science and strategies to address international fisheries that target wild Atlantic salmon of Canadian origin. The committee was instructed to seek input from science experts, management experts, Aboriginal partners and stakeholders. To achieve this, meetings were held in Halifax, Moncton, St. John's (with a video link to Happy Valley Goose Bay) and Quebec City. Science, management and technical sessions were held in each location. The consultation sessions were launched in early March with a full-day meeting in Halifax covering background presentation related to the state of the salmon resource, fisheries management, enforcement and international issues. That meeting was followed by a stakeholder's meeting on March 10th. Stakeholders meetings were held in Moncton on March 23 and St. John's on April 23. Additional technical sessions were held at both locations. The last stakeholder meeting was held in Quebec City on May 13. To prepare for that meeting, the committee had a preliminary session with fishery managers and researchers to receive background information on the unique approaches used to manage the Quebec salmon fisheries. Lists of stakeholder presenters as well as the technical and specialist presenters can be found in Appendix 3.

Invitations were sent out to Aboriginal representatives and stakeholder groups prior to the meetings in each location. Invited guests were asked to present information on the salmon-related issues in their areas, and to provide

recommendations to the committee. Groups that could not make the meetings were asked to send written submissions to the committee. A dedicated e-mail address was set up to receive this input. Submissions from individuals were also received via written submissions. Groups that presented to the committee or submitted written materials were asked to focus on the mandate areas when they formulated their submissions and advice.

The Committee was asked to provide interim recommendations on issues that were urgent or time sensitive. Due to increasing concerns in the river systems in the Maritimes, the Committee made interim recommendations for the 2015 fishery management plans for salmon areas 15, 16 and 18. Because of the recent increases in salmon catches off western Greenland, and growing concerns about the impact this mixed-stock fishery was having on rivers in Atlantic Canada and Quebec, the committee also prepared preliminary advice on that issue. The Greenland fishery was one of the priority areas for Canada's deliberations at the 2015 NASCO meetings, so the committee members wanted to provide input prior to those sessions. Interim recommendations can be seen in Appendix 4. The committee was informed that the final report should be submitted to Minister Shea by early summer. This time frame led to focused investigations and deliberations.

Mandate Areas

Mandate area – Conservation: Conservation was the key focus area for the committee. In fact, all of the other mandate areas ultimately impact conservation. There are many factors that influence the health of the salmon resource. Over the past number of years, the potential risks to salmon have been well documented by scientists. Low marine survival has been identified as the major factor influencing salmon returns. While there are many localized issues or perceived threats, poor or lower than expected salmon returns are being experienced across wide areas throughout the salmon's range in Canada. The declines in the returns, as well as the pulses such as the better returns witnessed in 2011, have been experienced from Labrador, and in all regions south to Nova Scotia. Scientists believe there is something going on in the ocean on a global

scale that is affecting marine survival. It is not clear whether the changes are driven by environmental shifts related to temperatures and ocean current patterns, or ecosystem changes related to the species mix (predators, food, migration cover). There may be changes in the timing of when different species are present in numbers, or a combination of all of these factors may be at play. It appears that these large-scale influences are having an impact on salmon returns in pristine remote northern rivers as well as southern rivers where many different human activities can potentially impact salmon.

Sorting out the changes in the ocean involves many scientific questions, and the key questions may not even be on the radar yet. Gathering information on ocean changes and how to address them is a priority for the longer term. In the short term, there are opportunities to focus on the freshwater, estuarine and coastal risk factors, or human activities that we may be able to influence. As such, under the broad category of conservation, the committee looked at habitat, fish mortality, stock enhancement and aquaculture.

1 Habitat Improvement: Habitat improvement is one of the most important undertakings that can be done to help sustain and improve salmon stocks. While coastal and ocean fisheries can be modified, there is little that can be done at this time to reverse the declining trends in marine survivorship. However, if more healthy smolts are produced in the fresh water systems, stocks will be better able to withstand the ocean forces that are resulting in the poor returns to our rivers. Over the years, hydro dams, acid rain, forestry/agricultural/mining practices, urban development, transportation systems and other human activities have degraded salmon habitat. In recent years, impacts of climate change, including high temperatures and erratic water levels, are putting additional strains on the resource. The good news is there are many NGOs, First Nations/Aboriginal groups, river groups and community groups with members who are active volunteers intent on improving salmon habitat in Eastern Canada. At each of our stakeholder meetings, many of these groups presented to the committee. For example, at the Quebec City meeting, the committee was informed about projects delivered through a major 10 year enhancement program for the rivers on the Saint Lawrence North Shore. That \$10 million program is supported by a

fund provided by Hydro-Quebec, created as one of the conditions to develop the Romaine River hydro-electric project. Examples from the Maritimes include the Morell River habitat restoration and salmon enhancement project, and the liming project on the West River Sheet Harbour in Nova Scotia. The committee was truly impressed by the extent of the habitat work that has taken place as well as the passion, dedication and knowledge shown by these presenters. They represent a force that is extremely valuable to wild salmon populations as well as to our freshwater ecosystems. There are also many funding initiatives and partners (government, corporate and private) that contribute to habitat improvement projects. Government investments leverage other funds, outside researchers, NGOs and the many volunteers to get habitat work done. This is a great model and should be fostered.

Habitat restoration work has a proven track record. Portions of watersheds have been opened up or restored resulting in increased salmon production within freshwater systems. Many of the habitat improvement and expansion successes have been achieved through local programs that address river and riparian zone habitat restoration, and enhanced connectivity. Governments can become directly involved or can provide a supporting role for partner groups that are doing the work. Once habitat connectivity work has been completed, in cases such as fishways and effective culvert installations, it is important to set up a program or a process to observe, inspect and maintain the structures. Again, there are opportunities to partner with Aboriginal groups, river groups, local schools or community groups to facilitate timely observation to detect problems, and where possible, address the problems.

With the pressures that are mounting on Atlantic salmon in many regions, more of this work needs to be done, and new challenges must be addressed. An example of a new challenge is the warming river and stream water that is being observed in a number of our systems. It is now necessary to explore ways to maintain, enhance or create cold water habitat in rivers and tributaries. The federal government has made significant investments over the years through initiatives such as the Recreational Fisheries Conservation Partnership Program (RFCPP) and the establishment of the Atlantic Salmon Conservation Foundation

(ASCF). These programs are very helpful, but given the status of the stocks in many regions of Atlantic Canada, and the many partners and volunteers who are available and willing participants, it is both a crucial and opportune time to make additional investments directed at salmon habitat enhancement. Such an investment should be designed to leverage other funds and be delivered through Aboriginal groups, community organizations, NGOs, universities or other partner groups. This investment could be a component of the Wild Atlantic Salmon Research and Innovation Fund identified in recommendation 12.1.

1.1 - The federal government should make additional investments in habitat improvement that will increase salmon production in freshwater ecosystems. The new investment may be administered through existing administrative structures. The priority habitat initiatives would be determined at the regional level where government representatives and partners can identify priorities.

1.2 - In addition to the new investment, DFO must work with partners to explore ways to strategically utilize available funds (RFCPP, ASCF, FQSA/Hydro Quebec, Environmental damages Fund (formally HADD fund), Adopt-a-stream, provincial programs, etc.) to carry out collaborative habitat restoration work.

At the Halifax meeting, committee members heard about how acid rain has impacted over 60 salmon rivers on the outer coast of Nova Scotia. This serious problem is not limited to a small area and it cannot be addressed over a short period of time. The problem is also unique in that the source of the acid rain is not local but largely from distant industrial locations such as the Ohio Valley. Presenters in Halifax described the Nova Scotia Salmon Association's 10 year Acid Rain Mitigation Project on the West River Sheet Harbour. This demonstration liming pilot project has been supported by an extensive volunteer monitoring program to track changes in water chemistry, fish species composition and abundance, and invertebrate community structure. Committee members believe that this problem warrants ongoing attention. The federal government should provide support for the groups that are actively trying to carry out research and mitigation on acid impacted rivers, and for those who want to do similar work on other affected rivers.

1.3 - DFO should support water conditioning projects (such as the West River initiative) where NGO groups are mitigating acid effects, and review options for treating other acid-impacted river systems. Funding arrangements should be explored with other agencies and international partners who are involved in major international ecosystem initiatives.

Not all habitat needs are project related. Many problems arise from poor land use or resource use practices. These activities can lead to river bank erosion and stream habitat degradation with reduction or even elimination of fish populations. The solutions for most land use problems are well known and contained in innumerable reports. In many cases, there are regulatory tools in place that when utilized or enforced could address runoff control, transportation system impacts, mining practices, forestry practices, agricultural practices and riparian buffer zones. Government regulators must collaborate to ensure the land/resource use practices and waterway connectivity requirements (culverts) are strictly implemented by resource users. If not, enforcement action must be taken, damages should be mitigated and any offsetting damages payments (DFO's Environmental Damages Fund) should be directed to habitat restoration projects. Such work may then be carried out by watershed committees, Aboriginal groups, NGOs or other partners.

1.4 - Partner with relevant provincial resource departments, industrial resource users and developers to ensure that appropriate legislation and best land use practices are in place to protect fish habitat. Ensure the legislation is enforced.

During stakeholder meetings, particularly at the Quebec City event, the committee heard about impacts that hydro dams have on salmon and salmon habitat. The focus in this case was not blockages or the loss of connectivity with the upper reaches of the watershed, but instead concerns centered on flow rates (low or a major flush) and temperature impacts. Dam structures and water management programs can lead to water temperatures that are too warm or too cold relative to the seasonal temperatures that are needed by salmon. In some cases, there is little that can be done about these problems, but in other cases,

water management plans at dam facilities can be modified at little cost to the operator.

1.5 - DFO to work with hydro operators, Aboriginal groups and concerned NGOs to identify the water needs and water risks for salmon (flow rates, timing, temperatures, etc) so that whenever possible, hydro operators can factor these concepts into their water management plans.

2 Fishing Mortality: It is possible to change the mortality levels on fish that are being intentionally killed by human activities. There are opportunities to address these mortality levels in Canada and internationally. There are many concerns about international fisheries and this mandate area will be covered later in the report. The committee believes that in order to strengthen its position to influence other countries to properly manage and control their salmon fishing activities, Canada must get its house in order regarding incidental or illegal fishing mortality, and there are ways to do this.

From the time salmon eggs are deposited in the rivers and streams, they must fight to survive and grow through their fresh water and marine stages. All along the way, they must overcome predation, compete for food and deal with numerous environmental challenges. As noted above, marine survival has declined; therefore, many people believe the fish that have made it back to our rivers as spawning adults are more important than ever. Canadian fishing activities can and should be modified to protect spawning adults, particularly in regions where there are conservation concerns. The following sections and recommendations will focus on fishing mortality, with a particular goal of protecting female salmon and especially the large salmon which make such a valuable contribution to spawning escapement.

Reduce Fish Mortality - recreational fishing: Over the years, there has been progress in reducing recreational fishing mortality. In response to conservation concerns in different regions, tag (catch) limits have been reduced, the retention of large multi-sea-winter (MSW) fish have been eliminated for most areas, and many anglers have voluntarily switched to hook and release fishing. Management plans have evolved over time to address conservation and fishing effort. The

entire Atlantic coast is divided into management areas, and each has its own season, bag limit and other fishing rules. The committee believes that the smaller the management unit, the more effective the management can be. The ultimate objective should be for governments to move toward a river by river real-time management system as is in place in some areas of Quebec. This approach requires more resources for science, management and enforcement, but it provides the best opportunity to modify recreational fishing activity to quickly respond to conservation concerns.

The characteristics of salmon populations vary among regions. In some regions, including most of insular Newfoundland, migration at sea is limited in range and most fish return as 1SW (one sea winter) salmon with a small proportion of repeat spawners. In other salmon areas, the female spawning run is mainly composed of MSW salmon and the grilse are mostly male. These factors are taken into consideration when management plans are being developed for the various regions.

As noted earlier, the resource conditions and stock characteristics vary considerably throughout Atlantic Canada and Quebec. The recreational fisheries are also very different. The rivers along most of the outer coast of Nova Scotia are closed to angling. In the Gulf of Saint Lawrence Region of New Brunswick and Nova Scotia, the rivers were restricted to hook and release angling for 2015. This change is consistent with the interim advice provided by the committee in March. During meetings in Halifax and Moncton, committee members heard from many First Nations partners and angling groups who were very concerned about the declining runs, and there was wide support for strong conservation measures. There was also a message that as stocks improve, the various measures including mandatory hook and release fishing should be reviewed.

The salmon resource in Newfoundland and Labrador is much healthier than in the Maritimes but there are still areas that are of concern, particularly the South Coast of Insular Newfoundland and Southern Labrador. The various salmon zones in Newfoundland and Labrador are coded and assigned a grilse retention limit of zero fish (hook and release), two fish, four fish or six fish. There are sections in

the rivers throughout the zones that are closed to fishing or hook and release only, and one zone (Zone 5) has a one fish retention limit. In St. John's, the committee heard concerns about the status of the stocks in some areas and received advice to reduce the recreational tag limit. We also heard representations defending the grilse retention fishery and comments linking the legal angling retention with local deterrents to poaching. A number of stakeholders were in favor of a reduction in the tag limit for the zones, perhaps one fish less in all zones where the present tag limit is more than two.

The committee believes that for the rivers in Atlantic Canada, the harvest should be based as much as possible on reliable stock assessments, habitat availability and scientific advice. The present system of setting conservation levels based on spawning escapement levels and egg requirements for available habitat is being refined to conform to the precautionary approach (PA) for salmon. The objective of the PA approach will be to set a minimum spawning escapement level needed for stock conservation, known as the limit reference point (LRP) as well as an upper stock reference point (USR), which will be used to identify when the stock is healthy. When abundance of salmon before any exploitation is below the LRP, the stock is considered to be in a critical zone and losses from fishing and other human activities should be kept to the lowest level possible. When abundance before any exploitation is between the LRP and USR levels, the stock is considered to be in the cautious zone and harvests should be adjusted to prevent the stock from falling into the critical zone and to promote stock rebuilding to the healthy zone. When the stock is above the USR and in the healthy zone, managers and stakeholders have more flexibility to set fishing plans that favour social and economic objectives. The committee believes that the PA approach should be developed as soon as possible and utilized for the management of all salmon fisheries in Atlantic Canada. The committee supports in-season reviews so appropriate PA management decisions can be made in a timely manner.

2.1 - Harvest levels for salmon in Atlantic Canada should be set using the precautionary approach framework that is presently being developed for Atlantic salmon. The limit reference point (LRP) should be the benchmark to determine if there will be any directed retention in FSC and recreational fisheries. When the

abundance of salmon is above the LRP, DFO should consult with First Nations and Aboriginal partners as well as with recreational fishery interests to define the appropriate levels and sharing of directed retention salmon fisheries. DFO should network with First Nations and Aboriginal groups as well as recreational angling interests to set appropriate daily and seasonal bag limits including consideration of grilse and large salmon retention limits in accordance with the principles of the precautionary approach and status of the stocks.

In Quebec City, the committee heard about the comprehensive and largely effective management system that is in place for the recreational fishery in the province. The provincial government enforces a variety of management regimes: the river-by-river approach (40 rivers); the traditional approach - season, daily bag limit (50 rivers); and closed rivers (28) where the salmon population is equal to or less than 100 individuals. The river-by-river approach is applied to rivers readily accessible by road. Those rivers sustain 75 % of the fishing pressure and harvest. They are managed by local associations under a mandate from the province. Rivers located in remote areas and/or where the salmon run is technically difficult to assess are managed in the traditional fashion based on previous catch record, fishing pressure and catch per unit effort. Those rivers are open to all salmon licence holders, or in many cases are operated by fish and game outfitters under a lease by the government. There are a number of fishing areas and different angling licence classes. The seasonal retention limit is 7 fish, large or small. Large salmon retention is only permitted for rivers that are meeting conservation limits. The reporting of catch is mandatory, and the province operates a reporting system through the river managers and telephone call in.

Salmon from Quebec migrate to Western Greenland before returning to home rivers to spawn. Concerns were expressed about the international fisheries that capture fish, mainly large MSW females, that were produced in and will return to Quebec rivers. Stakeholders were also aware of the larger issue related to the changes in ocean survival. Although many measures are in place to address conservation in the Quebec rivers, there were opinions expressed stating that tag numbers (7 per angler) should be reduced, particularly for large fish.

The committee believes river-based management is a very good model for conservation. It is the most effective means to respond to stock conditions over time or within seasons. The committee supports efforts to reduce fishing mortalities, particularly on large fish.

The committee was informed about the new conservation management refinements that are planned to be introduced in Quebec in 2016. Under the new approach, conservation limits and reference points for salmon stock management will be revised on a river by river basis in order to adjust the system in response to the more recent data concerning the status of Quebec salmon stocks. The present operational protocol for the grilse only season and that allowing for the retention of large salmon will be modified in order to take into account the annual uncertainties about the size of the large salmon run. Mid-season salmon counts will continue to be the crucial decisional moment in the seasonal enforcement of the river-by-river fishing plan. At that time, adjustments to the possibility of retaining large salmon and/or grilse may be made in order to achieve the conservation limit or management target for the river, or in the worst case, to reduce as much as possible the magnitude of the discrepancy between the reality and the objectives.

Once the new PA management regime is in place in Atlantic Canada, DFO should invite Quebec to adopt the PA as a management principle so that Canada as a whole will be managing its salmon stock on a common conceptual basis, although the LRP and USR points may differ from region to region to account for different stock characteristics.

2.2 - In Quebec, support the proposed conservation management approach which will revise upward the conservation limits and modify the protocol for setting recreational season and harvest levels on a river by river basis. Under the new system, the retention of large salmon in the sport fisheries will be authorized in rivers that reach their conservation limit or management target, under certain conditions and within limits, and as agreed to by the Minister and the river managers. In rivers that do not meet their conservation limits or management target, the retention of large salmon will be forbidden. However those rivers may

be opened to the retention of grilse only, or be imposed total catch and release of all salmon irrespective of size, or in the worst situation be closed totally to salmon fishing.

Hook and release recreational fishing for Atlantic salmon has grown in popularity over the years and many anglers believe that it should be implemented in all rivers systems that show conservation concerns. Studies have shown that mortality levels for fish that have been hooked and released can be very low (0-5%) if conditions are right and the fish are handled properly. Best practices such as using single barbless hooks, keeping the fish in water when removing the hook and not fighting the fish for an extended period of time can impact the survival of the released fish. The water temperature is another factor that influences the success of hook and release – the colder the water with higher oxygen levels, the better. To ensure minimal mortalities, it is important that anglers know the proper techniques for hook and release fishing. Information and training should be made available for guides and anglers so that proper hook and release methods will be practiced. Angler's guide books could be used to present this information, and river or angling groups should take the lead on educating both new and experienced recreational fishermen on the benefits and proper techniques for hook and release fishing.

2.3 - There should be information, education materials and training provided on the benefits and proper techniques for hook and release angling. Anglers and river groups should take the lead on this with the support of DFO and provincial agencies.

Reduce fishing mortality, net Fisheries – non Aboriginal: There are a number of non-aboriginal net fisheries conducted throughout Atlantic Canada and Quebec that catch salmon, either incidentally or through a regulated bycatch fishery. Any net set close to shore will pose a risk to salmon, but that risk can increase dramatically if nets are set at a time and place that would intercept migrating adults. If nets are left untended for long periods of time, many salmon will be caught, the nets will sink and the fish will be rendered useless. Also, seals will quickly target nets and eat salmon that are captured. Committee members heard

concerns about net fisheries at all stakeholder meetings, particularly in St. John's and Quebec City. We heard reports about wide-spread poaching in some areas and losses that are incurred when nets are left untended for extended periods of time. Problems were identified with coastal bait net fisheries in all provinces, the trout net fishery off the Lower North Shore of Quebec and the Labrador resident trout net fishery which allows a three salmon bycatch. We were told that these nets were often set in areas and at times that indicated the obvious purpose was to intercept migrating salmon. Committee members noted that with the exception of the Labrador trout net fishery, there are no bycatches for salmon permitted in any other fisheries. The history as to why a bycatch was introduced in the Labrador resident fishery was reviewed by the committee. Given concerns about stock levels in Southern Labrador, members believe this bycatch should be eliminated. Members also believe that all coastal gillnet fisheries should be regulated in a manner that would avoid intercepting migrating adult salmon. The recommendations for non-Aboriginal net fisheries are as follows:

2.4 - Eliminate the three fish salmon bycatch in the Labrador resident trout net fishery. Modify the opening and closing dates and other conditions on these licences to minimize the impacts on the salmon runs. If salmon mortalities in this fishery continue to be a problem, a total ban of this trout net fishery should be imposed.

2.5 - Review bait fisheries in all regions to determine if they are still required by local commercial fisheries. Similarly, the Quebec commercial trout net fishery should be reviewed to see why it exists and eliminate it if there is no clear socio-economic objective to continue it. If these net fisheries are to continue, include licence conditions related to location, timing, orientation, depth, mesh size and other factors that will minimize impacts on salmon runs.

Reduce net fishing mortality – First Nations/Aboriginal: Committee members fully respect the First Nations/Aboriginal rights to fish for food, social and ceremonial purposes (FSC), as well as the duty of DFO to consult with First Nations/Aboriginal partners to develop fishing plans and allocations. At the stakeholder meetings, we heard from First Nations and Aboriginal partners about

the importance of salmon for food, and also about the social and cultural importance of this species to their communities. Some First Nations representatives at the Quebec meeting stressed the importance of salmon to their community in establishing guiding and sportfishing businesses which created needed economic activities in their region. Committee members believe it is essential to have First Nations/Aboriginal partners on board if we are to successfully rebuild and manage the Atlantic salmon resource. We believe there is willingness in aboriginal communities to pursue conservation approaches, in fact, a number of First Nations Bands have voluntarily suspended their FSC harvests. However, in some cases, there is a need for education, awareness and engagement. When it comes to net fishing, committee members have the same concerns as noted above. Communal FSC licences in Labrador currently contain measures that address mesh size, seasons, fishing log requirements, weekly and 10 day take ups in some instances, and other measures that recognize the need for conservation, such as the regular tending of nets. These measures should be reviewed on an annual basis. In the case of fishing locations, and contrary to what was mentioned above, it would be best where possible to conduct fishing operations in bays and estuaries close to the entrances of salmon rivers so that local fish stocks can be targeted rather than mixed stock migratory fish that may be encountered in coastal areas. When DFO is negotiating with First Nations and Aboriginal communities about their fisheries, the committee would like to have concepts including regular net tending, avoiding larger MSW fish and the possibility of replacing gill nets with fish traps included in the discussions. Fish traps have been used successfully by the Red Bank First Nation in New Brunswick. This fishing method may provide a fishing option that will avoid unintended fish loss, and enable fish size and sex selectivity. At the Moncton meeting, First Nations speakers also raised the possibility of replacing salmon with other species such as striped bass in the FSC fisheries. This option was viewed as positive by Committee members.

2.6 - When gillnets are used for FSC fisheries, they should be tended regularly and not left out for long periods of time. Explore the possibility of establishing take-out periods in the management plan – examples would be a 24 hour period every

week and extended periods during times of high large fish migration, as is practiced in some Aboriginal fisheries in Labrador. Longer weekly takeout periods (72hrs) should be considered.

2.7 - In an effort to reduce coastal fishing in FSC fisheries, explore options to set gill nets near the entrance of salmon rivers or in bays and estuaries of salmon rivers to avoid catching migrating mixed stocks.

2.8 - Where possible, explore the use of fish traps to replace gillnets for harvesting FSC fish allocations. Work should be done by DFO, Aboriginal and other partners to find a way to make trap nets work in areas where they have been ineffective to date.

2.9 - Explore option to take small fish only in the FSC fisheries, particularly in areas where such action is needed. Potential ways to do this may include the use of fish traps, mesh sizes in gill nets and season adjustments.

2.10 - Explore options to replace salmon with other FSC species (eg striped bass in Miramichi).

3 Stock Enhancement: There are a number of ways to directly enhance salmon stocks, the most obvious being hatchery production of fry, parr or smolts. At the Halifax meeting, the committee heard about the Margaree hatchery in Cape Breton that has been operating for over 100 years. There has been a successful enhancement program on the Nepisiguit in New Brunswick. In Moncton, a stakeholder group stressed the need to rejuvenate the Mactaquac hatchery facility. The committee was provided a presentation on the semi-natural rearing program that rejuvenated the salmon fishery on the Morell River system in PEI. This presentation highlighted the challenges and expertise required to produce viable smolts capable of returning in sufficient numbers to warrant the initial grow out investments. DFO has a hatchery and holding program to maintain genetic strains from depleted rivers. There are also enhancement options that include stream-side egg incubation boxes, smolt collection and grow out, and kelt collection and grow out. At the Nova Scotia meeting, we heard from a group that is interested in pursuing a number of these enhancement approaches. In

Moncton, the committee heard from a First Nations group that is working with an aquaculture business to rejuvenate Inner Bay of Fundy kelts in sea cages and then reintroduce them into their local river. These presenters and many stakeholders believe that stock enhancement is a needed option to restore the salmon resource in areas where stocks are seriously depressed. However, there is scientific evidence expressing concern about artificial enhancement, particularly if it is not done correctly. Enhancement can alter the genetic mix in river systems, with greater impact in rivers where the natural salmon run is very low. If too many fish from a few adults end up in the population, the possibility of inbreeding or other genetic risks occur. Also, there are risks for producing infected or weak fish that could compete or cause other problems for wild stocks.

The committee believes that there is a time and a place for enhancement. There are many partner groups that are prepared to do work and in some cases fundraise. DFO and provincial governments have expertise that can help to get it right to ensure genetic risks are minimized and good husbandry practices are followed. Perhaps scientific norms could be established for Canadian waters, as well as hatchery protocols and guidance on conditions that may influence when enhancement is biologically and economically acceptable. For any existing or future enhancement program, there needs to be a process in place to measure the results.

3.1 - Stock enhancement should be considered as an option to maintain genetic stocks or improve collapsed stocks. DFO should provide advice to protect against genetic risks, but also provide advice and support (such as monitoring impacts) when programs may have a beneficial impact.

4 Aquaculture: Sea cage salmon aquaculture has been identified as a risk to wild stocks. There are risks of disease or sea lice transmission to wild salmon that are passing near aquaculture sea cages. Another problem involves escapees migrating into rivers, competing with wild fish and negatively impacting the genetic makeup of the local populations. There is also the possibility of fish farms attracting predators such as grey seals that will encounter migrating salmon as they are attracted to or pass by sea cage sites. Stakeholders expressed strong

concerns and opposition to aquaculture at the meetings in Halifax, Moncton and St. Johns. The committee was informed about the preference to use land-based salmon aquaculture options which eliminate the ocean pen disease transmission and escapee problems. As noted above, at the Moncton meeting, a presentation was made about a river enhancement partnership project between a First Nations group and an aquaculture farm.

The committee had extensive discussions about aquaculture. There are concerns about the risks to wild salmon, and it is important to conduct farming operations using best practices to avoid escapement, habitat degradation, disease outbreaks and parasite infestations. There were discussions on the need to be able to identify escaped aquaculture fish, and it was noted that in Maine, a system is in place to do that. Such a system should be developed and put in place in Canada. There is a need to do more science on the interaction between wild and aquaculture salmon; that concept will be referenced later in the science section.

4.1- DFO should work with provincial regulators and industry to address risks that open pen salmon culture pose to wild Atlantic salmon, particularly salmon escapement and disease/parasite transfer. Proper regulatory checks and balances should be put in place in all Atlantic jurisdictions, as noted in the Doelle-Lahey report that was recently released in Nova Scotia.

Mandate Area – Enforcement: All management plans, regulations and best practices will only work if there is compliance. If there is a potential benefit for groups or individuals who break the rules within a legal fishery, many will break them. Likewise, if groups or individuals who don't have legal access to a resource believe they can harvest it without getting caught, many will. There are two main ways to address these compliance problems – education and deterrence. It can be argued that there can never be enough enforcement resources. This may be true, but in the case of salmon, as with habitat improvement, there are many partners who are prepared to contribute to the task.

On the education front, river groups, community groups and First Nations/Aboriginal partners all have a major role to play. This is particularly true

for Aboriginal groups who have FSC rights to wild salmon and who are in the best position to inform their community members about the rules and the reasons why they must be followed. Community values and pressures can provide a major deterrent to illegal activity. All resource users will be more inclined to break the rules if they are unaware of them or don't believe in them. It is very important to provide information about the laws and regulations as well as the reasoning for them. Using Radio, TV or internet would help get the information out to a wide audience. Continued media attention about the struggles of the wild salmon resource will also help to inform the general public.

On the deterrence front, there is no question that risk of apprehension is the most important component. If there are no fears of being caught and charged, poaching may continue to grow until the benefits to the poacher are no longer worth the efforts that are being made. DFO enforcement officers are the main player across all Atlantic salmon regions. Even an occasional visible presence of DFO acts as a significant deterrent, and a few charges that result in meaningful penalties provide an even greater impact. Provincial enforcement partners are another major player. As with DFO officers, their presence and enforcement authority can make a huge difference. Aboriginal and Native Guardians are also extremely important, not only for enforcement within their own communities, but also to deter all poachers and to work in partnership with federal and provincial officers. Enforcement contributions from private river management groups, as occurs on some of the Quebec rivers, is also effective. In this Quebec situation, assistant protection officers are hired by the management groups using licence fees (right of access fees to rivers) paid by anglers. Having eyes on the rivers, estuaries and in the communities is also helpful. At several of the stakeholder meetings, the committee heard of how the presence of law-abiding anglers on the rivers can deter poaching activities. Many of the salmon partners, stakeholder groups and individuals would gladly work in cooperation with government enforcement personnel if there were identified procedures to provide input.

5 Strengthen enforcement activities: Committee members heard lots about enforcement and poaching – at stakeholder meetings, through written

submissions and through private conversations. Poaching is going on everywhere, but there are indications that net poaching has subsided in areas such as the outer coast of Nova Scotia where salmon returns are low – the reasons for that are obvious. However, in some areas where salmon runs are poor, there are still issues with river poaching, so enforcement or deterrence through legitimate presence on the rivers is still very important to protect those struggling populations. The committee heard reports of serious poaching in some areas including Southern Labrador, the Lower North Shore of Quebec and parts of coastal Newfoundland. Major issues were identified with net fisheries, both legal and illegal, as well as river angling activities. The problems were reported to be more severe in remote areas where enforcement is difficult and expansive fishing opportunities exist. The committee also heard about illegal buying and selling of wild Atlantic salmon. Allegedly in some cases, products are being served in restaurants. It is imperative that there is strong enforcement to stop this illegal activity, from the water through to the final destination.

As noted above, many partners are prepared to cooperate on enforcement activities, but DFO's lead in this area is critical. That leadership role includes increasing its salmon enforcement activities, contributing adequate resources for Aboriginal/First Nations Guardians, doing joint work with Aboriginal and provincial partners, and following through on enforcement actions carried out with or by partners. The need for better cooperation between the federal and provincial enforcement staff was identified for the Lower North Shore area as well as for Southern Labrador. The committee supports significant fines, loss of vehicles, equipment confiscation and loss of fishing privileges for people convicted of poaching. Significant fines should be imposed on people buying poached Atlantic salmon. Jail sentences should be applied to repeat offenders. Compliance-related recommendations are as follows.

5.1 - Increase funding levels and capacity for wild Atlantic salmon enforcement.

5.2 - DFO should explore how to get efficiencies from enforcement dollars through collaboration with provincial agencies, enhancement of Aboriginal/Native Guardian programs or other partnerships.

5.3 - DFO should continue to explore the use of technology (cameras, heat sensors, etc) and risk assessment tools to improve enforcement techniques. They should also use internal knowledge and that of local partners to select the timing when enforcement activities are most needed.

5.4 - DFO should recognise that the presence of partners such as Aboriginal/First Nations, anglers and river groups can be a deterrent to poachers on rivers and in estuaries. Develop networks with these groups, and establish collaborative means to detect and report poachers so that enforcement action can take place in a timely manner.

5.5 - Carry out education programs, in cooperation with partners, to inform the public and user groups about the state of wild salmon stocks, how poachers pose additional risks to the resource, and the options that are available to help prevent poaching. There should be educational messages aimed at persons purchasing poached salmon.

Mandate Area – Predation: There are concerns about changing species distribution in the salmon’s habitat, particularly related to potential predators that may be present in areas where salmon are concentrated at certain times in their life cycles. There is little known about predator risks in the open ocean, but in rivers and estuaries, populations of several suspect species are growing in abundance. Of particular concerns are seals, striped bass, sea birds and small mouth bass. Some of these predators may be targeting smolts when they are on their way out of the river systems; others target large salmon as they return to the estuaries and rivers. An additional factor that may be increasing this risk is the changing abundance of other prey species such as rainbow smelt, gaspereau and blueback herring. These species have traditionally been in the estuaries and rivers in large numbers, but that is no longer the case in some areas. Large numbers of other prey species would provide cover for smolts and would reduce their chances of being preyed upon as they leave the rivers and estuaries. They may also provide important forage for both migrating smolt and kelts at key times.

6 Predation – seals: Seal populations occur throughout the entire coastal range of salmon in Atlantic Canada. Some seal populations have exploded in growth in recent years. Grey seals are now found in abundance throughout the Gulf of Saint Lawrence, along the outer coast of Nova Scotia, and recently along the South Coast of Newfoundland. This species grows to a very large size (males can weigh more than 600 lbs) and they are known to target salmon captured in nets. Moving north, there is a massive and growing harp seal population, as well as hooded and ring seals. Stakeholders have reported that seals often congregate in estuaries and at the mouth of rivers during salmon runs. Committee members were told about seals actually moving well up into salmon rivers. The committee received a presentation on grey seal diets that showed an occurrence of salmon but no preference for this species. However, it was noted that seals are opportunistic feeders and it is very possible that they could target salmon when they return to the rivers and estuaries. Unless studies are conducted at the right time and place, the observed impacts on salmon would be missed. An added risk would be the presence of seals when salmon are forced to linger in the estuaries waiting for the river water to rise before moving upstream. Committee members believe that the impact of seals on salmon should be further studied in greater detail.

6.1 - Develop a grey seal harvest in the Gulf of Saint Lawrence. Partner with First Nations groups to conduct a grey seal fishery. If possible, focus on targeting grey seal populations that are congregating in estuaries or river mouths when smolts are leaving the rivers or adults are returning.

6.2 - Conduct stomach content analysis on seals that are present in estuaries during salmon migration times.

6.3 - Allow seal harvests/culls in other areas where they are clearly targeting wild Atlantic salmon.

7 Predation – striped bass: The striped bass populations in the Bay of Fundy and the Gulf of Saint Lawrence have grown significantly over the past decade. These aggressive fish are believed to prey on salmon smolts as they leave the rivers and estuaries. At the Halifax and Moncton meetings, committee members received

presentations on smolt tagging programs in the Bay of Fundy and Miramichi Bay that are attempting to gain knowledge about what is happening with the smolts, including the impacts from striped bass. The issue is a particular concern for the Miramichi River which is the only known spawning location for striped bass in the Gulf of Saint Lawrence. Science assessments have indicated that over the past three years, estimates of the bass spawning populations in the estuary of the Northwest Miramichi were in the 150,000 to 250,000 range. Diet studies were conducted, and although most stomachs were found to be empty, the presence of salmon smolts was observed in striped bass; some sampled fish had 1-6 smolts in their stomachs. Smolt tracking research conducted by the Atlantic Salmon Federation in partnership with the Miramichi Salmon Association and DFO has shown strong correlations between the presence of large numbers of striped bass and the timing of smolt exiting the Northwest Miramichi, and smolt survival through to the head of tide.

At the Moncton meeting, Committee members heard from local stakeholders who expressed concerns about the abundance of striped bass in the Miramichi region and in other areas in the Gulf of Saint Lawrence from the Gaspé to Cheticamp. Presenters feared that the high striped bass population is out of sync with the depressed salmon population in the Miramichi, and efforts must be made to reduce their numbers. Concerns were also expressed at the meeting in Quebec City, and speakers noted the need to improve cooperation between the province of Quebec and DFO to monitor and manage the striped bass fishery in the Bay of Chaleur. The committee shares these concerns and believes that efforts should be made to significantly reduce the striped bass stocks, while respecting the needed spawning requirements.

7.1 - Support expanded research programs on striped bass to get a better understanding of the impacts this species is having on wild Atlantic salmon (surveys in Miramichi Bay and Bay of Chaleur, Bay of Fundy smolt tagging work).

7.2 - Consult with local First Nations bands in the Miramichi area to explore the establishment of striped bass food fisheries that may replace some of the FSC salmon catch.

7.3 - Since striped bass population levels in the Northumberland Strait are well above conservation targets, DFO should allow an increased harvest through angling or other methods (from the Cheticamp area in Western Cape Breton through to the Gaspé Peninsula). Required spawning levels must be respected to ensure the striped bass population does not approach threatened levels, as occurred in the past.

8 Predation – seabirds: Seabird populations and breeding sites have been increasing in the Gulf of Saint Lawrence and in some areas off Newfoundland. Of concern are gannets, cormorants and mergansers. The committee heard presentations related to diet studies done on cormorants in the Gulf of Saint Lawrence as well as research done on gannets in the Southern Gulf and at Funk Island Newfoundland. Salmon was found to be in the diets of cormorants and gannets from the Funk Island location. There is no clear information on the level of the seabird threat, but expanding colonies, particularly near the entrances to salmon rivers, are cause for concern and should be further investigated.

8.1 - Support and expand the research on the impacts of seabird populations on salmon.

9 Predation – smallmouth bass: Smallmouth bass are an invasive species in the Maritimes. They have been illegally introduced in a number of the freshwater systems and pose a threat to indigenous trout and salmon populations. This species was recently introduced into Miramichi Lake and mechanical removal efforts are underway to eradicate this population. The species is being physically restricted from entering the river system, but there are concerns that the physical barrier could be breached. If smallmouth bass get into the Miramichi river system, there are concerns that they will place another major stress on depressed salmon stocks. The committee supports continued work by DFO to eradicate smallmouth bass in Miramichi Lake and recommends more aggressive approaches if the present program is not successful.

9.1 - For 2015, continue with the small mouth bass eradication program in Miramichi Lake. For 2016, explore other options such as chemical eradication under the authority of the new Aquatic Invasive Species Regulations.

Mandate Area – Science: There are numerous knowledge gaps for Atlantic salmon and many research areas that require work to fill those gaps – from basic river counts to understanding what is going on in the ocean. Developments such as ocean tracking and genetic identification pose opportunities to get a better handle on salmon migrations. Multidisciplinary and comprehensive work on ocean ecosystems will help scientists understand the large-scale changes that may be influencing salmon populations. Science challenges are huge and cannot be met by a single group or agency; however, there are many partners, from local volunteers on the rivers to ocean researchers, who can be utilized to help fill in the knowledge gaps. The committee heard from First Nations and Aboriginal groups who value traditional knowledge. They have much to offer regarding conservation and ecosystem approaches to salmon management. The committee observed that there is a distance between the scientist’s knowledge and what the layperson understands. There is a need for scientists to explain their concepts and translate them into words that can be understood by the public. DFO researchers must continue to be active members in the national and international research community, and use every network possible to acquire and share scientific information for salmon.

The committee heard from DFO, provincial, university, NGO and private researchers during our course of meetings. There are many knowledgeable and dedicated researchers working on salmon, some of the best within DFO. They must be supported going forward so that the needed work can be done to better understand the salmon resource.

10 Stock Assessments: Basic stock assessment information is lacking in many regions of Atlantic Canada and Quebec. It is the foundation of management plans, yet there are many uncertainties. There are gaps for most areas on the east coast and committee members heard concerns about this at stakeholder meetings. The best option for salmon conservation is river by river assessments and fishing plans, with population objectives for salmon throughout its life stages, from eggs to returning salmon - this should be a long term goal. In the near term, additional counting locations are needed, particularly on the South Coast of

Newfoundland, in Labrador, on Anticosti Island and on the Saint Lawrence North Shore. The committee received information on electronic counting equipment and believes there are opportunities to utilize this technology. The committee believes immediate action is needed to improve stock assessment capacity and proposed the following.

10.1 - Secure long-term funding for existing locations and increase the number of locations where counting takes place. Target/priority areas include the South Coast of Newfoundland; additional rivers in Northern Labrador, far north and Kenamu River in Lake Melville; an additional river in Southern Labrador, the Eagle River is suggested; an additional river on Anticosti; and an additional river on the Saint Lawrence North Shore, east of Moisie River.

10.2 - Do a review of the options that are available for doing counts and stock assessment to evaluate which are most cost effective, which are appropriate for science needs, and which may work best in given climates and circumstances (counting fences, swim through, smolt wheels, new technologies to do electronic counting, etc.).

10.3 - Do a review of the approaches used to determine egg requirements for river systems so that consistent principles, most appropriate methodologies, and realistic numbers can be used for minimum spawning requirements. (Note: this work may be underway with the PA approach for Atlantic Canada and the developing 2016 management plan for Quebec).

10.4 - As DFO implements the precautionary approach, science and management should develop the tradeoffs and implications associated with different harvest levels when the stock is in the cautious and healthy zones.

11 Data: There is a need to get more data about the salmon resource from the various users on the east coast. There is a requirement for anglers to report on their activity and catch, yet the only location that seems to have any reasonable level of compliance is Quebec. In the absence of river assessments, these data may be the best proxy available to get an indication of the status of the resource. To make it easier to submit data and then use them for assessment purposes,

electronic reporting systems must be set up. At the meeting in Newfoundland, the committee was told that private camps, outfitters and Aboriginal harvesters complete detailed logs and keep comprehensive records. They noted that they are on the water regularly and may be able to obtain more information. DFO should take advantage of this knowledge and opportunity. Local watershed and community groups, university undergraduate and graduate research projects, provincial government departments, NGOs and others gather information on the river systems throughout the region. It is important to foster a data network and share information collected.

11.1 - Work with provincial partners in NS, NB and NL to improve the licence return rates from the recreational fisheries. Collaborate on the development of a user-friendly electronic on-line reporting system that would be available for reporting on a daily basis. Establish a deterrent or incentive process/program to encourage reporting – there must be some consequences for not reporting.

11.2 - Work with Aboriginal groups to obtain good data and to better use the information that they are collecting or can collect from their subsistence fisheries.

11.3 - Work with anglers, professional guides, fishing camps, river groups, or others who are regularly on the rivers and in the estuaries, to collect any data that may help in pursuing science needs.

11.4 - Foster data sharing among DFO, the scientific community and other partners/user groups.

12 Partnerships: There are many government, NGO, university and private sector researchers actively working on salmon. There are also exciting research programs that utilize new technologies and address ecosystem questions that are relevant to salmon. In addition, there are many partner groups and volunteers who willingly collect data and do on-the-ground work to help with projects. DFO should utilize these partnerships, foster collaborative work and support salmon related research whenever possible. There is some scientific research that is most suited to the university system, some best done by governments and some is best delivered by NGOs or the private sector. DFO should take advantage of these

strengths and utilize federal resources to get the science work done as efficiently as possible. The key is collaboration, information sharing and partnerships across all contributors – no one should own the work, some will lead but all will share. One possible option to achieve this would be through the creation of a DFO led Atlantic Salmon Scientific Research & Development Group that would include University researchers, provinces, Aboriginal groups and NGOs working together via this one body. It would also be helpful to organize conferences, perhaps once every two or three years, to bring the partners together to discuss work and developments (locally, nationally and internationally) related to salmon science and habitat.

12.1 - DFO should support and encourage their scientists to work collaboratively with university researchers, NGOs, private researchers or local interest groups in an effort to collect information and pursue scientific knowledge on Atlantic salmon. DFO/the federal government should establish a Wild Atlantic Salmon Research and Innovation Fund to support this initiative.

12.2 - DFO should work with The Atlantic Salmon Federation and international scientists to address low marine survival and salmon migration patterns. There should be support for and collaboration with Greenland to do genetics and tagging work to gain a better understanding of the populations, migration, mortality estimates and relationships between the west Greenland fishery and river spawning populations.

12.3 - DFO should provide training to local aboriginal, river groups or school groups (or arrange for training programs) so these groups can assist in doing science work such as stock assessments, data collection, water quality sampling, etc.

13 Ocean Research, Ocean Tracking: The committee received presentations on the ocean tracking programs at the Halifax and Moncton meetings. At the Quebec meeting, we received a presentation on the ecosystem changes that are being observed in the Gulf of Saint Lawrence. These programs are needed on many fronts to better understand our ocean ecosystems and to track changes that are occurring. There is an opportunity to utilize these programs to shed light on what

is happening to salmon during their ocean migrations, particularly through the Gulf of Saint Lawrence, so we may understand and possibly mitigate what is influencing the low ocean survival rates.

13.1 - Work with national and international partners to research the larger ecosystem changes that are occurring in the Northwest Atlantic, including the Gulf of Saint Lawrence. Identify salmon as a keystone species to study as part of this research.

13.2 - Support and expand ocean tracking programs to help understand the marine components of Atlantic salmon – either through direct DFO involvement or partnerships. Programs could include smolt tagging, adult tagging in remote areas (Greenland) or increased monitoring sites/activities. Results of this important work should be peer reviewed and published.

13.3 - Support genetics work that would supplement the tagging and migration studies.

14 Water quality: There is a need to monitor water quality in the rivers for characteristics such as temperature, oxygen levels, flow rates, toxicity (aluminum) and other components. Two acute problems are presently observed – increasing water temperatures and acidification. If we know what is going on, we may be able to take measures to address salmon needs. At the Quebec meeting, committee members heard about work being done through CIRSA (Inter-university Center for Research on Atlantic Salmon). This cooperative research effort, which is focused on freshwater salmon production, is an excellent example of partnership and research focussed on specific issues important to salmon management. Programs such as this should be expanded, and volunteers should be utilized to gather water quality information so that this information can be studied and tracked over time.

14.1 - Support existing water monitoring programs and expand on them to establish time series data on water throughout salmon river systems.

14.2 - Use partnerships with river groups, universities, local schools or local community groups to collect fresh water samples and data. DFO should provide training and necessary support.

14.3 - Use technology such as remote sensing to map rivers and identify temperature patterns in rivers.

14.4 - DFO should work with research partners to study the impacts that changes in water quality, such as increased aluminum levels in acid rivers, are having on different life stages of Atlantic salmon. Likewise, partnership research programs are needed to better understand hydrology, particularly related to climate change and impacts on freshwater habitat.

15 Aquaculture interactions: There are widespread concerns about the impacts of aquaculture escapees on wild salmon, particularly related to effects on the genetic composition of the stocks. Over long time periods, river systems have developed genetic characteristics that are suited to the local ecosystem. Escaped aquaculture fish spawning with wild salmon will alter the gene mix and have negative implications on the fitness of the offspring. Important genetic characteristics that have built up over centuries could be lost or diminished. Visually identifying aquaculture fish in rivers is often straight forward, but it can be difficult in some cases. It is necessary to have clear information/tools that can be used to identify and distinguish between wild and aquaculture fish.

15.1 - Work with provincial partners and the aquaculture industry to do genetics work in river systems adjacent to aquaculture farms to determine the presence and impacts of escaped fish on local wild stocks.

15.2 - Aquaculture fish should be marked so that escapees may be identifiable, genetically traceable and removed from river systems. There should be consequences to the aquaculture industry for not accurately reporting escapees in a timely manner.

Core Mandate – identify Strategies to Address International Fisheries:

All the work that Canada is doing to restore habitat, effectively manage our

fisheries and carry out enhancement programs will be for not if salmon do not survive ocean migrations to return to our river systems. At this time, there is little we can do to alter increasing natural mortality trends in the ocean, but fishing mortality can be addressed. Of particular concerns are international fisheries that target mixed stock MSW fish. Areas producing high percentages of large salmon - such as Quebec, Labrador and the Gulf Region - are more susceptible to suffer from international fisheries. There are general concerns given the declining numbers of MSW fish, but a specific concern is that mixed stock fisheries cannot select fish, so they may be harvesting salmon that originate from a river system that is in very bad shape and needs all potential returning adult salmon. The main international fishery that targets Canadian origin MSW fish occurs off the west coast of Greenland. The committee provided advice on that fishery already (see Appendix 4). The other international fishery of concern occurs off the French islands of Saint Pierre and Miquelon. At all stakeholder meetings, the committee members heard concerns from presenters. There is strong awareness of this problem among stakeholders and partner groups.

16 Reduce International fisheries that target Canadian fish: Canada must work through NASCO, bilateral forums and multilateral forms to reduce and control the harvest from international fisheries. All partnerships and alliances (foreign governments, NGOs and private sector) should be utilized to achieve this objective. As noted earlier, Canada must get its house in order regarding incidental or illegal fish mortality, enforcement and reporting systems to establish credibility and strengthen its international position.

16.1- Continue to work with NASCO, Greenland, Denmark and other partners to reduce the harvest and effectively manage the salmon fishery located off western Greenland.

16.2 - Work with NASCO, France and other partners to reduce and eventually eliminate the salmon net fishery conducted off Saint Pierre and Miquelon. The first target should be the elimination of the commercial fishery.

17 Other considerations outside of mandate areas: The following material may not fit into one of the committee's mandate categories, but the concepts were flagged at stakeholder sessions. Committee members discussed these issues and believe the recommendations listed below should be considered. There is some context provided for recommendations when needed, others are self explanatory.

Engagement – Public consultation:

We heard many comments from NL about the 5 year management cycle. Presenters believe this extended time frame diminishes stakeholder engagement. Interest groups say the annual management process facilitated the exchange of information, and allowed input on important decisions and priorities for salmon. DFO representatives informed the committee that an annual workshop process replaced the management plan meetings, and the 5 year management plans created stability and efficiency. Committee members recognized the benefits of multi-year management plans, but also noted the importance of keeping large numbers of stakeholder volunteers engaged. In New Brunswick, there may be support for two-year management plans, but immediate issues such as the status of stocks in key rivers and the 2015 temporary hook and release management measures should be addressed before a switch is made. Many groups from all regions (Aboriginal and stakeholder) stated they want meaningful consultations and discussions with DFO.

At other stakeholder meetings, committee members heard concerns about how hard it is to get government approval to do anything, even if the work is not costing government but helping achieve salmon objectives. Sometimes it is even difficult to know who to call, and volunteers often get the bureaucratic run around.

17.1 - Change to a two year management cycle in NL. Maintain the option to implement immediate changes for major management or conservation issues. In other regions in Atlantic Canada, once an appropriate management regime is in place for a foreseeable period, the consultations can change to a two year cycle.

17.2 - DFO should work with the provinces and NGOs to streamline the permitting and approval process for volunteers who are doing constructive work on salmon stocks or salmon habitat.

17.3 - DFO should work with representative interest groups to identify contact people (and coordinates) who can be accessed to get the various federal and provincial approvals or funding to do salmon-related work.

To address concerns about changes resulting in business losses or cancellations of sport fish client's reservations, etc., regulators should give advance notice to inform the public about changes that are coming. A good tool could be a notification to anglers in the provincial angling licence guides, provided a year in advance of proposed changes.

17.4 - Give a one year advance notice about management changes that will be introduced so that businesses can adjust and plan as necessary.

Governments must deal with the problems Quebec has whenever it wants to make management changes that are connected with the power sharing agreement between the federal government and the province. Issues include a delay in the amendment process, an extended time frame to process the amendment, and the specifics covered by the variation order capacity delegated to Quebec.

17.5 - The federal government/DFO and Quebec should address the governance process so that the province will have the authority to quickly make management changes needed for conservation.

17.6 - Governments must promptly address the harmonization of management approaches in the river systems on the border of NB and Quebec. Establish a process to immediately deal with this situation when future management changes are made.

17.7 - A review of the Wild Atlantic Salmon Policy is overdue. It should be reviewed considering recommendations in this report and the new policy should be implemented. The federal government and the province of Quebec should

collaborate and attempt to implement their respective salmon policies within the same time frame.

17.8 - Review the unscheduled salmon rivers in NL to determine whether some should be listed as scheduled waters.

At stakeholder meetings in Halifax, Moncton and St. John's, the committee heard numerous presentations that stressed the importance of having a legal angler presence on rivers to act as a deterrent to poachers. When salmon anglers are absent, fishing for other species continues on these rivers, but management and enforcement interests wanes in many cases. If those rivers were open for salmon angling, even for hook and release, there would be eyes on the river to assist in enforcement. Angler interest is also an important factor in NGO participation in salmon research and river restoration efforts. There would have to be consultations and negotiations between DFO and First Nations regarding allowing angling without a permitted FSC fishery. It is hoped that recreational fishing groups and First Nations partners can communicate and come to common agreement on when such an option may be acceptable.

17.9 - Review the status of closed rivers in the Maritimes, in consultation with First Nations partners and interest groups, and assess the possibility of reopening. Similar reviews may be considered for NL and Quebec.

Conclusions

Many people are very passionate about wild Atlantic salmon. At all four stakeholder meetings, the committee was extremely impressed by the level of interest and knowledge that was demonstrated by presenting groups. At scientific and technical meetings, we observed the same level of dedication. First Nations and Aboriginal representatives spoke of salmon not only as an important source of food, but also an important component of the cultural and social fabric of their communities. We heard many reports of the work conducted by community and river groups – volunteers who dedicate huge amounts of time and their personal resources to help restore salmon habitat and stocks. We met with researchers who spent their entire careers working on the species, some

who continued on after retirement. As the committee planned and completed the stakeholders meetings, initial suspicions about “what The Minister’s Committee on Atlantic Salmon was up to” were soon replaced by willingness to help and an appreciation that work was being done to address salmon issues. In many ways, the Committee has acted as an inter-regional forum, and this seemed to be appreciated by all groups. Committee members were impressed by the interest that groups had about salmon issues in areas other than their own, and internationally. If there was a way to follow up with inter-regional forums, perhaps through a revamped Atlantic Salmon Advisory Committee that had a meeting rotation among regions, it would be well received.

A number of themes continued to surface as the committee conducted its work. The main ones were the need for knowledge, the many partnerships that exist and can be expanded, and the strong support for conservation and proper management of the resource.

Knowledge is needed on many fronts. Additional scientific information is needed from the river systems, from estuaries, in coastal areas, in the ocean and on interactions with other resource users and industries. The general public and salmon users need better information on everything from the status of the resource, to best fishing practices, to why the conservation rules are in place. The many partners and volunteers need guidance, training and technical support.

The existing partnerships and the potential for many more is truly amazing. On the science side, there are government (provincial, national and international), university, NGO and private sector researchers who are presently conducting joint work, and much more collaboration is possible. Aboriginal groups and NGO/river groups are conducting many projects with governments and universities, and they are anxious to do more. NGO and private sector funders and researchers have contributed to initiatives led by governments, volunteers, universities or themselves, and they appear willing to continue to invest.

All stakeholder and partners may not agree on the best ways to manage salmon fishing activities, but most are strong supporters of conservation and want to get management right. There are many ideas on how to improve the resource with a

willingness to be actively involved in doing it. There is an awareness of the conservation risks to salmon on the local front, to the distant water risks that salmon face from the fisheries off Greenland. Stakeholders want proper practices followed wherever and whenever wild salmon are involved.

There are many challenges and unknowns facing the wild salmon resource. Downward stock trends observed over recent decades continue, and more areas may be showing this pattern. The low at-sea survival rates are a major concern. There are environmental and ecosystem changes that are worrisome. Warmer summers and forest clear cuts have lead to high river water temperatures. It is unknown what impacts the changes in marine ecosystems may be having on salmon.

But there are bright spots. The resource is strong in many river systems on insular Newfoundland. While there are reasons for concern in Southern Labrador, stocks are looking very strong in central and northern Labrador. There are some concerns in Quebec, but a number of the river systems still produce strong runs. Salmon habitat is relatively pristine in many areas, and improvements are being made in other areas. Habitat restoration projects have demonstrated that work and resources invested can produce positive results. A huge asset is the multitude of researchers, government workers, Aboriginal partners, stakeholders and volunteers who are ready to answer the call to help improve the salmon resource and habitat.

There are 61 recommendations in this report. Many can be implemented by changing management plans or practices. Others need investment and different approaches to carrying out activities. Much of the science and habitat initiatives identified in the recommendations have implications far beyond salmon. They touch on improvements to freshwater ecosystems for all living components, providing benefits not just for salmon and related interest groups, but for all citizens. Some of the science implications will shed light on environmental and ecosystem changes that are occurring on land and in the oceans. An added bonus is the partnership approach, which will break down barriers that sometimes

divide government, Aboriginal groups, NGOs, industry and river/community groups.

To deliver on the recommendations, the federal government must make reinvestment in the salmon resource and the salmon industry a priority. As noted by the recent Gardner Pinfold report, wild salmon supports very substantial economic and employment activities. Investments will not be just for conservation and stock enhancement, but for rebuilding and stabilizing a resource that drives a very important rural industry. There are many ways the reinvestment could take place. Existing government or privately-administered programs could be enhanced. Existing federal resources that are earmarked for environmental, ecosystem, science or climate change initiatives could be utilized.

The committee believes that an effective approach for reinvestment would be to establish a Wild Atlantic Salmon Research and Innovation Fund, to be made available for work that will focus on science, habitat, stock enhancement and initiatives that will lead to proper management of the resource. This fund should be accessible to the many partners who are presently doing salmon work, or who can quickly mobilize to carry out projects in priority areas. The fund would leverage other programs and resources, and build on large-scale ecosystem and oceans work that is presently underway. DFO could further utilize this investment by establishing and leading an Atlantic Salmon Scientific Research & Development Group that would include university researchers, provinces, Aboriginal groups and NGOs, working together via this one body. This group would be guided by the principles of financial partnership, cooperative research, information sharing and involvement of grassroots organizations. The Wild Atlantic Salmon Research and Innovations Fund should have a start and a finish period – ten years is suggested. That time frame will hopefully provide an indication as to whether the salmon resource can be improved and stabilized, or continue to be at the mercy of changing environmental and oceanic forces. Finally, the fund could be administered by an arms-length group of salmon partners who will network with government players, Aboriginal and First Nations groups, researchers and existing salmon-related organizations.

Summary List of Recommendations

The following list of recommendations is taken from the final report from the Minister's Advisory Committee on Atlantic Salmon. These recommendations cover areas related to conservation, enforcement, predation, science and international issues, in keeping with the mandate of the Minister's committee. New investment is recommended to deliver on many of these recommendations. Others can be accomplished by changes in practices or management approaches. There is a large network of partners ready and able to work on all fronts to address salmon-related initiatives. The committee believes that local Aboriginal and stakeholder groups, NGOs and existing science partners will play a major role in accomplishing the objectives of the recommendations.

1.1 - The federal government should make additional investments in habitat improvement that will increase salmon production in freshwater ecosystems. The new investment may be administered through existing administrative structures. The priority habitat initiatives would be determined at the regional level where government representatives and partners can identify priorities.

1.2 - In addition to the new investment, DFO must work with partners to explore ways to strategically utilize available funds (RFCPP, ASCF, FQSA/Hydro Quebec, Environmental damages Fund (formally HADD fund), Adopt-a-stream, provincial programs, etc.) to carry out collaborative habitat restoration work.

1.3 - DFO should support water conditioning projects (such as the West River initiative) where NGO groups are mitigating acid effects, and review options for treating other acid-impacted river systems. Funding arrangements should be explored with other agencies and international partners who are involved in major international ecosystem initiatives.

1.4 - Partner with relevant provincial resource departments, industrial resource users and developers to ensure that appropriate legislation and best land use practices are in place to protect fish habitat. Ensure the legislation is enforced.

1.5 - DFO to work with hydro operators, Aboriginal groups and concerned NGOs to identify the water needs and water risks for salmon (flow rates, timing, temperatures, etc) so that whenever possible, hydro operators can factor these concepts into their water management plans.

2.1 - Harvest levels for salmon in Atlantic Canada should be set using the precautionary approach framework that is presently being developed for Atlantic salmon. The limit reference point (LRP) should be the benchmark to determine if there will be any directed retention in FSC and recreational fisheries. When the abundance of salmon is above the LRP, DFO should consult with First Nations and Aboriginal partners as well as with recreational fishery interests to define the appropriate levels and sharing of directed retention salmon fisheries. DFO should network with First Nations and Aboriginal groups as well as recreational angling interests to set appropriate daily and seasonal bag limits including consideration of grilse and large salmon retention limits in accordance with the principles of the precautionary approach and status of the stocks.

2.2 - In Quebec, support the proposed conservation management approach which will revise upward the conservation limits and modify the protocol for setting recreational season and harvest levels on a river by river basis. Under the new system, the retention of large salmon in the sport fisheries will be authorized in rivers that reach their conservation limit or management target, under certain conditions and within limits, and as agreed to by the Minister and the river managers. In rivers that do not meet their conservation limits or management target, the retention of large salmon will be forbidden. However those rivers may be opened to the retention of grilse only, or be imposed total catch and release of all salmon irrespective of size, or in the worst situation be closed totally to salmon fishing.

2.3 - There should be information, education materials and training provided on the benefits and proper techniques for hook and release angling. Anglers and river groups should take the lead on this with the support of DFO and provincial agencies.

2.4 - Eliminate the three fish salmon bycatch in the Labrador resident trout net fishery. Modify the opening and closing dates and other conditions on these licences to minimize the impacts on the salmon runs. If salmon mortalities in this fishery continue to be a problem, a total ban of this trout net fishery should be imposed.

2.5 - Review bait fisheries in all regions to determine if they are still required by local commercial fisheries. Similarly, the Quebec commercial trout net fishery should be reviewed to see why it exists and eliminate it if there is no clear socio-economic objective to continue it. If these net fisheries are to continue, include licence conditions related to location, timing, orientation, depth, mesh size and other factors that will minimize impacts on salmon runs.

2.6 - When gillnets are used for FSC fisheries, they should be tended regularly and not left out for long periods of time. Explore the possibility of establishing take-out periods in the management plan – examples would be a 24 hour period every week and extended periods during times of high large fish migration, as is practiced in some Aboriginal fisheries in Labrador. Longer weekly takeout periods (72hrs) should be considered.

2.7 - In an effort to reduce coastal fishing in FSC fisheries, explore options to set gill nets near the entrance of salmon rivers or in bays and estuaries of salmon rivers to avoid catching migrating mixed stocks.

2.8 - Where possible, explore the use of fish traps to replace gillnets for harvesting FSC fish allocations. Work should be done by DFO, Aboriginal and other partners to find a way to make trap nets work in areas where they have been ineffective to date.

2.9 - Explore option to take small fish only in the FSC fisheries, particularly in areas where such action is needed. Potential ways to do this may include the use of fish traps, mesh sizes in gill nets and season adjustments.

2.10 - Explore options to replace salmon with other FSC species (eg striped bass in Miramichi).

3.1 - Stock enhancement should be considered as an option to maintain genetic stocks or improve collapsed stocks. DFO should provide advice to protect against genetic risks, but also provide advice and support (such as monitoring impacts) when programs may have a beneficial impact.

4.1- DFO should work with provincial regulators and industry to address risks that open pen salmon culture pose to wild Atlantic salmon, particularly salmon escapement and disease/parasite transfer. Proper regulatory checks and balances should be put in place in all Atlantic jurisdictions, as noted in the Doelle-Lahey report that was recently released in Nova Scotia.

5.1 - Increase funding levels and capacity for wild Atlantic salmon enforcement.

5.2 - DFO should explore how to get efficiencies from enforcement dollars through collaboration with provincial agencies, enhancement of Aboriginal/Native Guardian programs or other partnerships.

5.3 - DFO should continue to explore the use of technology (cameras, heat sensors, etc) and risk assessment tools to improve enforcement techniques. They should also use internal knowledge and that of local partners to select the timing when enforcement activities are most needed.

5.4 - DFO should recognise that the presence of partners such as Aboriginal/First Nations, anglers and river groups can be a deterrent to poachers on rivers and in estuaries. Develop networks with these groups, and establish collaborative means to detect and report poachers so that enforcement action can take place in a timely manner.

5.5 - Carry out education programs, in cooperation with partners, to inform the public and user groups about the state of wild salmon stocks, how poachers pose additional risks to the resource, and the options that are available to help prevent poaching. There should be educational messages aimed at persons purchasing poached salmon.

6.1 - Develop a grey seal harvest in the Gulf of Saint Lawrence. Partner with First Nations groups to conduct a grey seal fishery. If possible, focus on targeting grey

seal populations that are congregating in estuaries or river mouths when smolts are leaving the rivers or adults are returning.

6.2 - Conduct stomach content analysis on seals that are present in estuaries during salmon migration times.

6.3 - Allow seal harvests/culls in other areas where they are clearly targeting wild Atlantic salmon.

7.1 - Support expanded research programs on striped bass to get a better understanding of the impacts this species is having on wild Atlantic salmon (surveys in Miramichi Bay and Bay of Chaleur, Bay of Fundy smolt tagging work).

7.2 - Consult with local First Nations bands in the Miramichi area to explore the establishment of striped bass food fisheries that may replace some of the FSC salmon catch.

7.3 - Since striped bass population levels in the Northumberland Strait are well above conservation targets, DFO should allow an increased harvest through angling or other methods (from the Cheticamp area in Western Cape Breton through to the Gaspé Peninsula). Required spawning levels must be respected to ensure the striped bass population does not approach threatened levels, as occurred in the past.

8.1 - Support and expand the research on the impacts of seabird populations on salmon.

9.1 - For 2015, continue with the small mouth bass eradication program in Miramichi Lake. For 2016, explore other options such as chemical eradication under the authority of the new Aquatic Invasive Species Regulations.

10.1 - Secure long-term funding for existing locations and increase the number of locations where counting takes place. Target/priority areas include the South Coast of Newfoundland; additional rivers in Northern Labrador, far north and Kenamu River in Lake Melville; an additional river in Southern Labrador, the Eagle River is suggested; an additional river on Anticosti; and an additional river on the Saint Lawrence North Shore, east of Moisie River.

10.2 - Do a review of the options that are available for doing counts and stock assessment to evaluate which are most cost effective, which are appropriate for science needs, and which may work best in given climates and circumstances (counting fences, swim through, smolt wheels, new technologies to do electronic counting, etc.).

10.3 - Do a review of the approaches used to determine egg requirements for river systems so that consistent principles, most appropriate methodologies, and realistic numbers can be used for minimum spawning requirements. (Note: this work may be underway with the PA approach for Atlantic Canada and the developing 2016 management plan for Quebec).

10.4 - As DFO implements the precautionary approach, science and management should develop the tradeoffs and implications associated with different harvest levels when the stock is in the cautious and healthy zones.

11.1 - Work with provincial partners in NS, NB and NL to improve the licence return rates from the recreational fisheries. Collaborate on the development of a user-friendly electronic on-line reporting system that would be available for reporting on a daily basis. Establish a deterrent or incentive process/program to encourage reporting – there must be some consequences for not reporting.

11.2 - Work with Aboriginal groups to obtain good data and to better use the information that they are collecting or can collect from their subsistence fisheries.

11.3 - Work with anglers, professional guides, fishing camps, river groups, or others who are regularly on the rivers and in the estuaries, to collect any data that may help in pursuing science needs.

11.4 - Foster data sharing among DFO, the scientific community and other partners/user groups.

12.1 - DFO should support and encourage their scientists to work collaboratively with university researchers, NGOs, private researchers or local interest groups in an effort to collect information and pursue scientific knowledge on Atlantic

salmon. DFO/the federal government should establish a Wild Atlantic Salmon Research and Innovation Fund to support this initiative.

12.2 - DFO should work with The Atlantic Salmon Federation and international scientists to address low marine survival and salmon migration patterns. There should be support for and collaboration with Greenland to do genetics and tagging work to gain a better understanding of the populations, migration, mortality estimates and relationships between the west Greenland fishery and river spawning populations.

12.3 - DFO should provide training to local aboriginal, river groups or school groups (or arrange for training programs) so these groups can assist in doing science work such as stock assessments, data collection, water quality sampling, etc.

13.1 - Work with national and international partners to research the larger ecosystem changes that are occurring in the Northwest Atlantic, including the Gulf of Saint Lawrence. Identify salmon as a keystone species to study as part of this research.

13.2 - Support and expand ocean tracking programs to help understand the marine components of Atlantic salmon – either through direct DFO involvement or partnerships. Programs could include smolt tagging, adult tagging in remote areas (Greenland) or increased monitoring sites/activities. Results of this important work should be peer reviewed and published.

13.3 - Support genetics work that would supplement the tagging and migration studies.

14.1 - Support existing water monitoring programs and expand on them to establish time series data on water throughout salmon river systems.

14.2 - Use partnerships with river groups, universities, local schools or local community groups to collect fresh water samples and data. DFO should provide training and necessary support.

14.3 - Use technology such as remote sensing to map rivers and identify temperature patterns in rivers.

14.4 - DFO should work with research partners to study the impacts that changes in water quality, such as increased aluminum levels in acid rivers, are having on different life stages of Atlantic salmon. Likewise, partnership research programs are needed to better understand hydrology, particularly related to climate change and impacts on freshwater habitat.

15.1 - Work with provincial partners and the aquaculture industry to do genetics work in river systems adjacent to aquaculture farms to determine the presence and impacts of escaped fish on local wild stocks.

15.2 - Aquaculture fish should be marked so that escapees may be identifiable, genetically traceable and removed from river systems. There should be consequences to the aquaculture industry for not accurately reporting escapees in a timely manner.

16.1- Continue to work with NASCO, Greenland, Denmark and other partners to reduce the harvest and effectively manage the salmon fishery located off western Greenland.

16.2 - Work with NASCO, France and other partners to reduce and eventually eliminate the salmon net fishery conducted off Saint Pierre and Miquelon. The first target should be the elimination of the commercial fishery.

17.1 - Change to a two year management cycle in NL. Maintain the option to implement immediate changes for major management or conservation issues. In other regions in Atlantic Canada, once an appropriate management regime is in place for a foreseeable period, the consultations can change to a two year cycle.

17.2 - DFO should work with the provinces and NGOs to streamline the permitting and approval process for volunteers who are doing constructive work on salmon stocks or salmon habitat.

17.3 - DFO should work with representative interest groups to identify contact people (and coordinates) who can be accessed to get the various federal and provincial approvals or funding to do salmon-related work.

17.4 - Give a one year advance notice about management changes that will be introduced so that businesses can adjust and plan as necessary.

17.5 - The federal government/DFO and Quebec should address the governance process so that the province will have the authority to quickly make management changes needed for conservation.

17.6 - Governments must promptly address the harmonization of management approaches in the river systems on the border of NB and Quebec. Establish a process to immediately deal with this situation when future management changes are made.

17.7 - A review of the Wild Atlantic Salmon Policy is overdue. It should be reviewed considering recommendations in this report and the new policy should be implemented. The federal government and the province of Quebec should collaborate and attempt to implement their respective salmon policies within the same time frame.

17.8 - Review the unscheduled salmon rivers in NL to determine whether some should be listed as scheduled waters.

17.9 - Review the status of closed rivers in the Maritimes, in consultation with First Nations partners and interest groups, and assess the possibility of reopening. Similar reviews may be considered for NL and Quebec.

Appendices

Appendix 1: Links to stock status and science reports for Atlantic salmon.

Maritimes Region SFAs 19-21 & 23: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2015/2015_021-eng.pdf

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2015/2015_021-fra.pdf

Gulf Region SFAs 15 & 16: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2015/2015_008-eng.pdf

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2015/2015_008-fra.pdf

Gulf Region SFAs 17 & 18: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2015/2015_016-eng.pdf

Newfoundland and Labrador: http://www.dfo-mpo.gc.ca/csas-sccs/publications/scr-rs/2015/2015_023-eng.pdf

http://www.dfo-mpo.gc.ca/csas-sccs/publications/scr-rs/2015/2015_023-fra.pdf

Quebec: <http://www.mffp.gouv.qc.ca/publications/faune/bilan-saumon-2014.pdf>

<http://www.mffp.gouv.qc.ca/publications/faune/riv-st-jean-trinite-2014.pdf>

Appendix 2

Members of the Ministerial Advisory Committee on Atlantic Salmon

Greg Roach (Chair)

After retiring from the Nova Scotia Department of Fisheries and Aquaculture in 2012, Mr. Roach set up a company that offers services in project management, training and advice related to the commercial fisheries, aquaculture and recreational fisheries in Atlantic Canada. Mr. Roach first joined the Nova Scotia Fisheries Department in 1976 as a Marine Biologist and retired as the Associate Deputy Minister of Fisheries and Aquaculture. He has extensive expertise in resource science, resource management, project management and government operations, and a strong working relationship with industry groups addressing applied development, regulation and government services. Likewise, Mr. Roach has a long-term working relationship with the federal government addressing local, provincial, national and international issues related to fisheries, aquaculture, coastal community development, oceans and other resource management issues. Mr. Roach received a Bachelor of Science, Honors Biology from St Francis Xavier University and a Master of Science in Marine Biology from Dalhousie University.

Bill Taylor (Vice-Chair)

Mr. Taylor lives in St. Andrews, New Brunswick and is President and Chief Executive Officer of the Atlantic Salmon Federation (ASF). He joined the staff of ASF in 1988 and served as Manager of Regional Programs, Director of Communications, Executive Director of Public Policy and in 1995 was appointed President and Chief Executive Officer. Mr. Taylor serves on several regional, national, and international conservation boards and committees, including Canada's Hunting and Angling Advisory Panel, the Atlantic Salmon Advisory Committee, and is a member of Canada's delegation to the North Atlantic Salmon Conservation Organization (NASCO). In recognition of his work in Atlantic salmon conservation, Mr. Taylor has received several awards, among them the Queen's Silver Jubilee Medal and the Roland Michener Award which recognizes outstanding achievements and contributions to conserving Canada's natural resources.

Rene Aucoin (Advisor)

President of the Nova Scotia Salmon Association (NSSA) since March 2014, Mr. Aucoin has been on the NSSA board since 2006. He also sits on the Atlantic Salmon Federation board of directors as the Nova Scotia representative. As the founder and president of the Cheticamp River Salmon Association (CRSA), Mr. Aucoin has been involved, on a volunteer basis, with Atlantic salmon research and stream restoration projects since the creation of the CRSA in the early 1980s. His

latest project goals include the restoration of historic stream width on the Cheticamp River and the continuation of NSSA's West River Sheet Harbour Acid Mitigation project. Mr. Aucoin has been a board member for numerous non-profit organizations, both at the local and provincial levels, and was instrumental in the creation of one of Canada's first National Park Cooperating Associations, Les amis du Plein air, based in Cheticamp, Nova Scotia. Mr. Aucoin has had a varied career as a Professor at both school and college levels, as a guide and outfitter in small business and as a Business Development officer. He is presently director of Université Sainte-Anne's satellite campus located near Cheticamp, Nova Scotia.

Francois Caron (Advisor)

Based in Quebec, Mr. Caron has been a volunteer member of the Central Advisory Committee of the Atlantic Salmon Conservation Foundation since 2011. Now retired, Mr. Caron spent most of his career as a biologist doing research on migratory fish — mainly salmon, sturgeon and eel — for the Quebec Fish and Wildlife Department. He worked closely alongside scientists from the Department of Fisheries and Oceans Canada, and was also a member of the Canadian delegation on the International Council for the Exploration of the Sea (ICES) North Atlantic Salmon Working Group. Mr. Caron has conducted extensive research in Quebec on the salmon population dynamic. In addition to his continued involvement in local and regional conservation groups, Mr. Caron participates in CIRSA (Centre interuniversitaire de recherche sur le saumon atlantique) which is a multidisciplinary group from six universities focusing on Atlantic salmon research.

Yvon Côté (Advisor)

Yvon Côté lives in Québec City and is a graduate from Montreal University (B. A. and B. Sc.) and Mc Gill University (M. Sc.). He served as President of the Fédération québécoise pour le saumon atlantique (FQSA) from 2000 to 2013. Prior to that, Mr. Côté held various positions within the Québec Ministry of Recreation, Fish and Game, and Ministry of Environment and Wildlife. During his more than 25 year tenure, he completed many field research projects and was the director of the Fishery service from 1987 to 1992. Before retiring from the public service in 1996, Mr. Côté led the way for the creation of a federal-provincially funded Salmon Economic Development Program, which provides funds to local organizations to facilitate development and conservation initiatives in Quebec rivers. In recognition of his long-standing commitment to the conservation of salmon and their habitat, Mr. Côté was awarded the T.B. (Happy) Fraser Award, the Atlantic Salmon Federation's top Canadian conservation award, in 2011.

Richard DeBow (Advisor)

Richard E. DeBow acts as counsel in the Moncton office of Cox & Palmer. After completing his education at Dalhousie University, Mr. DeBow was called to the New Brunswick Bar in 1970. He joined Cox & Palmer following a number of years with Barry Spalding. A native of Riverview,

Mr. DeBow practices corporate, commercial, real property and construction law and also represents insurers on errors and omission claims. Being involved with wildlife organizations is a passion of Mr. DeBow's. He has been affiliated with a number of them which administer trust funds for wildlife, habitat conservation and related education activities. Mr. DeBow is a past-President of the Canadian Wildlife Foundation, the New Brunswick Wildlife Federation and the Moncton Fish and Game Association. He was also a member of the New Brunswick Wildlife Trust Fund and the New Brunswick Environment Council.

Jacqueline Girouard (Advisor)

As president and owner of Girouard Consultant, Ms. Girouard provides project management services to companies requiring assistance in their production facilities, and research and development projects. With more than 10 years of experience in the public service, Ms. Girouard held various positions at both the federal and provincial government levels where she acquired extensive experience in service contract management and report development. In her passion to promote salmon conservation through public awareness and education, Ms. Girouard held various volunteer positions since 2012 with the Miramichi Salmon Association and is currently an Executive Board Member. Ms. Girouard has 15 years of experience with recreational salmon fishing on the Gander River in Newfoundland where she once managed and co-owned a salmon fishing lodge. She graduated in 1987 with a Bachelor of Science in Industrial Engineering from the Université de Moncton in New Brunswick and now lives in Ste-Marie-de-Kent, New Brunswick.

Daryl Guignon (Advisor)

As a wildlife biologist, researcher and teacher, Daryl Guignon has spent a lifetime working with educators, policy-makers, and community organizations to encourage greater respect and protection for the natural environment. Formerly an associate professor of biology at the University of Prince Edward Island, Mr. Guignon spent his career researching wildlife and their ecosystems and investigating factors limiting wild salmon production on PEI. He was a founding member of the Island Nature Trust, an NGO dedicated to protecting PEI wildlife habitat, and was instrumental in rebuilding salmon stocks in the Morell River. Mr. Guignon also developed a conservation strategy for Atlantic salmon on PEI and recently co-authored the Technical Manual for Watershed Management on PEI. In his current role as Community Environmental Liaison for the university, Mr. Guignon continues to work with environmental groups to develop and implement watershed plans, which play a critical role in salmon recovery.

Carl McLean (Advisor)

Based in Happy Valley Goose Bay, Labrador, Carl McLean is a beneficiary of the Labrador Inuit Land Claim Agreement and the current Deputy Minister with the Department of Lands and Natural Resources with the Nunatsiavut Government. His current role includes the administration of the domestic food fishery, which includes Atlantic salmon for Labrador Inuit

and the commercial inshore fishery including snow crab, Greenland halibut, shrimp and scallop. In April 2014, Mr. McLean was appointed Commissioner to the North Atlantic Salmon Conservation Organization (NASCO). Prior to coming to work with the Nunatsiavut Government in 2008, Mr. McLean spent some 20 years in the Northwest Territories and Nunavut working for various levels of government, including Senior Land Officer with the Governments of the Northwest Territories and Nunavut, Land Administrator with the City of Iqaluit and Manager of Lands and Director of Operations with Indian and Northern Affairs Canada, Nunavut Region.

Chief Terrance Paul (Advisor)

Terrance Paul is the Chief of Membertou, a position he has held for the past 31 years. Chief Paul started his career with the Boston Indian Council where he held positions such as job placement officer, director of finance and then finally, president. Returning home to Membertou, Chief Paul joined the Membertou Band Council in the role of economic development officer and progressed to the position of band manager before he was elected as Chief in 1984. Chief Paul has achieved many notable accomplishments in his current role including doubling the land base for the Membertou Reserve and increasing the employment rate within Membertou to nearly 80 per cent in the community. The Membertou logo of “Welcoming the World” is undoubtedly the most accurate representation of the open and progressive First Nation community that Membertou has become under the leadership of Chief Terry Paul. **Note: Conflicts with Chief Paul’s schedule prevented him from participating in early committee meetings. Ongoing time pressures resulted in Chief Paul withdrawing from active participation in the committee.**

Graham Roome (Advisor)

A resident of St. John’s, Newfoundland and Labrador, Mr. Roome is currently self-employed as a consultant in the fishing industry. With 35 years of experience in the seafood sector, Mr. Roome held various senior executive positions in large public and private seafood companies, Clearwater Seafoods in Halifax, Nova Scotia and Fishery Products International in St. John’s, Newfoundland. Mr. Roome graduated in 1978 with a Bachelor of Science in Biology from Memorial University of Newfoundland. During his student years, Mr. Roome spent three summers working with Fisheries and Oceans Canada on the Exploits River Salmon Enhancement program. As an active member of his community, Mr. Roome is a member of the Atlantic Salmon Federation and the Salmon Preservation Association for the Waters of Newfoundland and Labrador.

Appendix 3: Lists of meeting participants

Stakeholder Meetings - (Note: a number of First Nations and Aboriginal Partners, as well as stakeholder groups could not attend the meetings but submitted in writing)

Stakeholders – Halifax, March 10

NS Dept. of Fisheries and Aquaculture
Nova Scotia Salmon Association
Atlantic Salmon Federation
NS Federation of Anglers and Hunters
Wild Salmon Unlimited
Margaree Salmon Association
Medway River Salmon Association
Antigonish Rivers Association
Cape Breton Anglers
Cheticamp River Association
Middle River Watershed Group
North Colchester River Restoration Assoc.
Sackville River Association
Eastern Shore Wildlife Assoc.
Ecology Action Center

Stakeholders – Moncton, March 23

New Brunswick Wildlife Federation
Miramichi Salmon Association
New Brunswick Salmon Council
Miramichi Watershed Mgmt Committee
St. John Basin Salmon Recovery Inc
Nashwak Watershed Association Inc.
Restigouche River Watershed Mgt Council
Assembly of FN Chiefs - NB
PEI Wildlife Federation
NB Dept of Natural Resources
PEI Dept of Agriculture and Forestry

Central Queens (PEI) Wildlife Federation
Fort Folly First Nation
Nepisquit Salmon Association
Metepenagiag First Nation
Atlantic Policy Congress of FN Chiefs
NB Aboriginal Peoples Council
Tabusintac River Watershed Assoc
North Shore Micmac District Council
South Eastern Anglers Association
NB Professional Outfitter Gide Assoc
Atlantic Salmon Federation
Maliseet Nation Conservation Council
Atlantic Salmon Conservation Foundation
Hammond River Anglers Association
Burnt Church First Nation
Kent County Fly Tying Club

Stakeholders – St. John’s & video link from Goose Bay, April 23

Salmonid Council of NL
Atlantic Salmon Federation
NL Wildlife Federation
Qalipu Mi’kmaq FN Band
Miawpukek First Nation
NL Outfitters Association
NL Provincial Dept Environment & Conservation
Bay St. George Salmon Stewardship Group
Freshwater-Alexander Bays Ecosystem Corporation
Environmental Resources Management Assoc
Gander River Ecosystem Corporation
Salmon Association of Eastern Newfoundland
Salmon Preservation Assoc. Waters of Newfoundland (SPAWN)
Atlantic Salmon Conservation Foundation
Marine Institute
Torngat Secretariat
Innu Nation
Labrador Hunting and Fishing Association

Nunatukavut
Salmon Camps (Labrador)

Stakeholders – Quebec City, May 13

Agence Mamu Innu Kaikusseht (AMIK)
Conseil de bande de Natashquan
Société des établissements de plein air du Québec (SEPAQ)
Fédération québécoise pour le saumon atlantique (FQSA)
Fédération du saumon atlantique (ASF)
Conseil des Innus de Pessamit
Ristigouche Salmon Club
Fédération des pourvoiries du Québec (FPQ)
Pourvoirie Mécatina
Corporation de gestion des rivières Matapédia et Patapédia (CGRMP)
Société de gestion de la rivière Matane (SOGERM)
La Fondation de la Faune du Québec (FFQ)
Association des pêcheurs sportifs de la Bonaventure (APSB)
Conseil de bande de Listuguj
Pourvoirie de la rivière Corneille
Recreational Fishers of the North Shore

Management, Science and Technical Meetings

Halifax, DFO Salmon background meeting, March 9

- Overview of stock status and science issues (all regions)
- Resource Management and Aboriginal Fisheries, NL
- Resource Management, Maritimes Region
- Resource management, Gulf Region
- Conservation and Protection
- International Fisheries Management

Halifax, March 10

- Ocean Tracking (Fred Whoriskey Dalhousie University)

Moncton, March 23

- NB salmon recovery groups (John Gilbert, Biologist)
- Canadian Rivers Institute, UNB (Rick Cunjack and Dr. Allen Curry)
- Smolt and kelt tracking, wild - aquaculture salmon interactions (Jonathan Carr, ASF)

St. John's, background on NL rivers and management, April 22

- DFO

St. John's, April 23

- Labrador Genetics (Dave Meerburg)
- NL stock assessment (Marta Robertson DFO)

Quebec City, DFO background on issues and NASCO, May 12

- DFO

Quebec, Background on management system and science, May 13

- Biological aspects of Atlantic salmon management in Québec (Julien April MFFP)
- Organizational aspects of Atlantic salmon management in Québec (Hugo Canuel MFPP)
- CIRSA (inter university research center on Atlantic salmon) (Normand Bergeron)
- North Shore salmon rivers enhancement program, (Normand Traversy, FQSA)
- The seal population of the Gulf of St-Lawrence, (Mike Hammill – DFO)
- Oceanographic and biological changes in Gulf of St-Lawrence (Hughes Benoit, DFO)

Appendix 4: Preliminary Recommendations

2015 Management Plan for SFAs 15, 16 & 18.

March 24, 2015.

To: Minister Gail Shea, Minister of Fisheries and Oceans,

CC: DFO Officials

From: Greg Roach, Chair of the Minister's Advisory Committee on Atlantic Salmon

Re: Interim Recommendations for the Management of the 2015 Atlantic Salmon Season in the Southern Gulf of Saint Lawrence (New Brunswick Management Areas 15 & 16, Nova Scotia Management Area 18)

The Minister's Advisory Committee on Atlantic Salmon met with First Nations groups and stakeholders at meetings in Halifax on March 10th and Moncton on March 23rd. The committee also met with DFO salmon science and management specialists, ocean tracking researchers, and other researchers affiliated with universities, industry and NGOs. To date, we have received over 45 written or verbal submissions, many containing detailed recommendations. We have also reviewed the preliminary science reports which addressed the stock status/returns for salmon in Fishing Areas 15, 16, 17 and 18 for 2014.

The committee held an in camera meeting on March 24th to focus on possible measures that may be recommended for the Southern Gulf Region. We are aware that the management plan for the Gulf Rivers (Areas 15, 16 and 18) will be announced soon. Also, we have been informed that preliminary recommendations for the 2015 salmon season would be welcomed if it was possible to provide them at an early date. Given the many concerns that were expressed by groups that have made submissions, and given the continuing downward trends that we noted in the preliminary science reports for the 2014 returns, the committee believed that interim recommendations should be made so that action can be taken for the 2015 management year. The following recommendations will reduce salmon mortality and can be implemented immediately.

Recommendations:

- **Hook and release only for all recreational fisheries in 2015.**
- **Fishing should only be conducted with barbless or pinched-barbed hooks.**
- **Fishing should only be conducted with single hooks.**

It is understood that these recommendations will be in addition to the existing regulations or conditions of licence for Areas 15, 16 and 18. If the single hook recommendation (which will replace the option to use a double-hook fly) requires a change in regulation, the committee recommends that the process to change that regulation commence as soon as possible. The committee explored an in-season assessment option to go along with the hook and release recommendation where counts from the early runs could be used to open a recreational harvest fishery for grilse once conservation limits are exceeded. We did not include this option because of concerns about obtaining the early count information for the many rivers that would be involved throughout the management areas. We also considered the possibility of First Nations and DFO working out changes for the 2015 FSC fisheries. We suspected that any in-season adjustment arrangements would have to be included on that front as well. If FSC change agreements can be reached, we did not want to propose an undeliverable condition that may jeopardize the larger objective of reducing salmon mortality. As our work proceeds, the committee will be exploring river-based management and in-season adjustments options.

Predation/reduced salmon mortality

The committee heard many comments on the abundance of striped bass throughout the Gulf of Saint Lawrence waters, particularly in the Miramichi system. The preliminary 2015 DFO science report indicated that 2014 spawner abundance numbers for striped bass continued to be much higher than levels observed in the late 1990s and early 2000s, and well above stock recovery spawning targets. Preliminary salmon predation studies (2013) found salmon smolts in the stomachs of some captured bass. The majority of the sampled bass had empty stomachs. It was noted that striped bass have aggressive behavior patterns, and although they may not eat when spawning or preparing to spawn, they hit hard at different types of fishing tackle, raising concerns that bass may injure and kill salmon smolt while not taking them as food. Committee members believe that given the present size of the striped bass population, there are no risks for that resource, but there are serious risks of striped bass predation on salmon smolts. The committee recommends that changes be made to the 2015 striped bass fishery management plan so the imbalances between these two fish stocks can be addressed immediately.

Recommendations:

- **Expand/extend the recreational fishing seasons.**
- **Increase the daily and procession harvest limits for recreational fishermen.**
- **Increase the parameters of the bass predation study to include additional sampling areas in Miramichi Bay, additional sample times and additional sampling options such as using fish caught by recreational anglers.**

Engaging First Nations

The Atlantic salmon resource is very important to First Nations communities on many levels, not the least of which are their Food, Social and Ceremonial fishing rights. The Committee fully recognizes and respects the FSC rights of First Nations as well as the requirement of DFO to consult on matters relating to their FSC rights. At the Moncton meeting, many comments and suggestions were made by both First Nations and recreational anglers about the FSC fish allocations and how they were harvested. Committee members were particularly impressed by some of the proactive recommendations that came from First Nations representatives. It is not within the mandate or powers of the Committee to in any way replace the FN-DFO consultative process; however, since First Nations have such a vital role to play in the management and recovery of the salmon resource, the following recommendation is offered.

Recommendation:

- **DFO should reach out to First Nations that are actively harvesting salmon on the Miramichi and other river systems in an effort to consult on options that may reduce salmon mortality rates.**

Concepts that may be considered in the consultations/negotiations include replacing gillnets with selective gear such as fish traps and focusing on harvesting grilse rather than large multi sea winter fish. First Nations speakers commented on the requirement to replace their needed salmon food supply with other sources or resource options. Two possibilities that were mentioned relate to suspected predators (striped bass and grey seals) that can directly impact salmon mortality rates. The first option is establishing a FSC fishery for striped bass. The second option is establishing a grey seal industry for First Nations. It was noted by First Nations speakers that a proposal for a grey seal harvest has already been submitted by Eel Ground First Nation. A FSC fishery for striped bass may be set up on a trial basis for 2015, and development can begin for a future First Nation seal industry.

2015 West Greenland Fishery – for NASCO meeting

May 19, 2015.

To: Minister Gail Shea, Minister of Fisheries and Oceans,

CC: DFO Officials

From: Greg Roach, Chair of the Minister’s Advisory Committee on Atlantic Salmon

Re: Interim Recommendations on international fisheries for Atlantic salmon - approaches to negotiate with Greenland on issues pertaining to their salmon fisheries

Background

The committee completed its round of stakeholder consultations on May 13. Many of the First Nations partners and stakeholder groups identified international fisheries, particularly the increasing activity in Greenland, as a major concern. Knowing that NASCO meetings will be held during the first week in June, and that preliminary committee recommendations would be welcomed by DFO, the committee held an in-camera meeting on May 13 to discuss possible strategies to address international fisheries. Committee members realize that DFO officials have been working with Greenland for some time and many of the concepts noted below are already in the works; however, the details were included to complete the approach.

Restate the Problem

Present Greenland with the 2014 salmon returns data for Quebec and Atlantic Canada. Note that the resource is at record low levels in many of our rivers. There are particular concerns about the declining numbers of large MSW fish. Research has confirmed that the Greenland fisheries catch MSW fish from mixed stocks, the majority originating from the Canadian river systems. The Greenland fisheries have been increasing in recent years, a trend that will cause further stress on the Atlantic salmon resource.

Work Canada is doing to strengthen the salmon resource

Identify the many programs that are occurring in Canada to improve/restore salmon habitat, open up blocked waterways and rebuild stocks. List the programs and their values (ASCF projects, FQSA/Hydro Quebec habitat program, DFO programs, provincial programs and NGO programs). Note that some First Nations groups, with support of government, are reducing,

modifying (trap nets) or eliminating harvests in their local river systems in an effort to improve stocks. Report that changes have been made in the recreational fisheries in 2015 (Quebec, Gulf Region) to reduce salmon mortalities, and that additional changes are expected through the work of the Ministerial Advisory Committee on Atlantic Salmon. These investments and efforts show that Canada is very serious about protecting and rebuilding the salmon resource. This work will help Greenland as well as Canada in the long run, but we need cooperation from Greenland now.

Recommendations:

- **1) Restate that Canada's position is there should be no mixed stock commercial fisheries on the North American salmon stocks (anywhere). Fisheries of concern include activities in Greenland, the St Pierre fishery and risks of fisheries restarting in the Faroe Islands.**
- **2) No international trade in Atlantic salmon from North American stocks. Number 1 above would imply this, but restate it.**
- **3) Eliminate the commercial factory fishery in Greenland.**
 - o **Explore private sector-Greenland industry arrangements to establish a development fund to replace lost opportunity from the closure of the factory fishery.**
 - o **Explore cooperative opportunities between the Canadian government & industry sectors and the Greenland government & industry sectors to address shrimp and turbot interests to complement salmon cooperation (eg – area 0 ab shrimp for MSC for Greenland producers).**
- **4) Continue to encourage Greenland and support them in establishing salmon management and monitoring programs for their indigenous fisheries.**
- **5) Once monitoring programs are in place, support Greenland (through sharing our experiences) to establish an accurate report of the catches of salmon caught in their indigenous fisheries.**
- **6) Explore any opportunities to do collaborative Canada-Greenland science work on salmon stocks feeding off the coasts of Greenland.**
- **7) Use all forums for negotiations and collaboration with Greenland including: Canada-Greenland bilateral, NASCO, Arctic Council, multilateral negotiations (Canada/Greenland/USA/Denmark/NGOs/industry), and any others that could help .**

We hope these recommendations are helpful. Please advise if clarification is necessary.

Appendix 5 - List of Acronyms

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| 1SW | One Sea Winter |
| 2SW | Two Sea Winter |
| ASCF | Atlantic Salmon Conservation Foundation |
| ASF | Atlantic Salmon Federation |
| CIRCA | Inter-university Center for Research on Atlantic Salmon (English translation) |
| DFO | Department of Fisheries and Oceans Canada |
| FN | First Nations |
| FQSA | Quebec Federation for Atlantic Salmon (English Translation) |
| FSC | Food, Social and Ceremonial |
| HADD | Habitat Alteration Disruption or Destruction |
| LRP | Limit Reference Point |
| MSW | Multi Sea Winter |
| NASCO | North Atlantic Salmon Conservation Organization |
| NB | New Brunswick |
| NGO | Non-governmental Organization |
| NL | Newfoundland and Labrador |
| NS | Nova Scotia |
| PA | Precautionary Approach |
| PEI | Prince Edward Island |
| RFCPP | Recreational Fisheries Conservation Partnership Program |
| SFA | Salmon Fishing Area |
| USR | Upper Stock Reference Point |