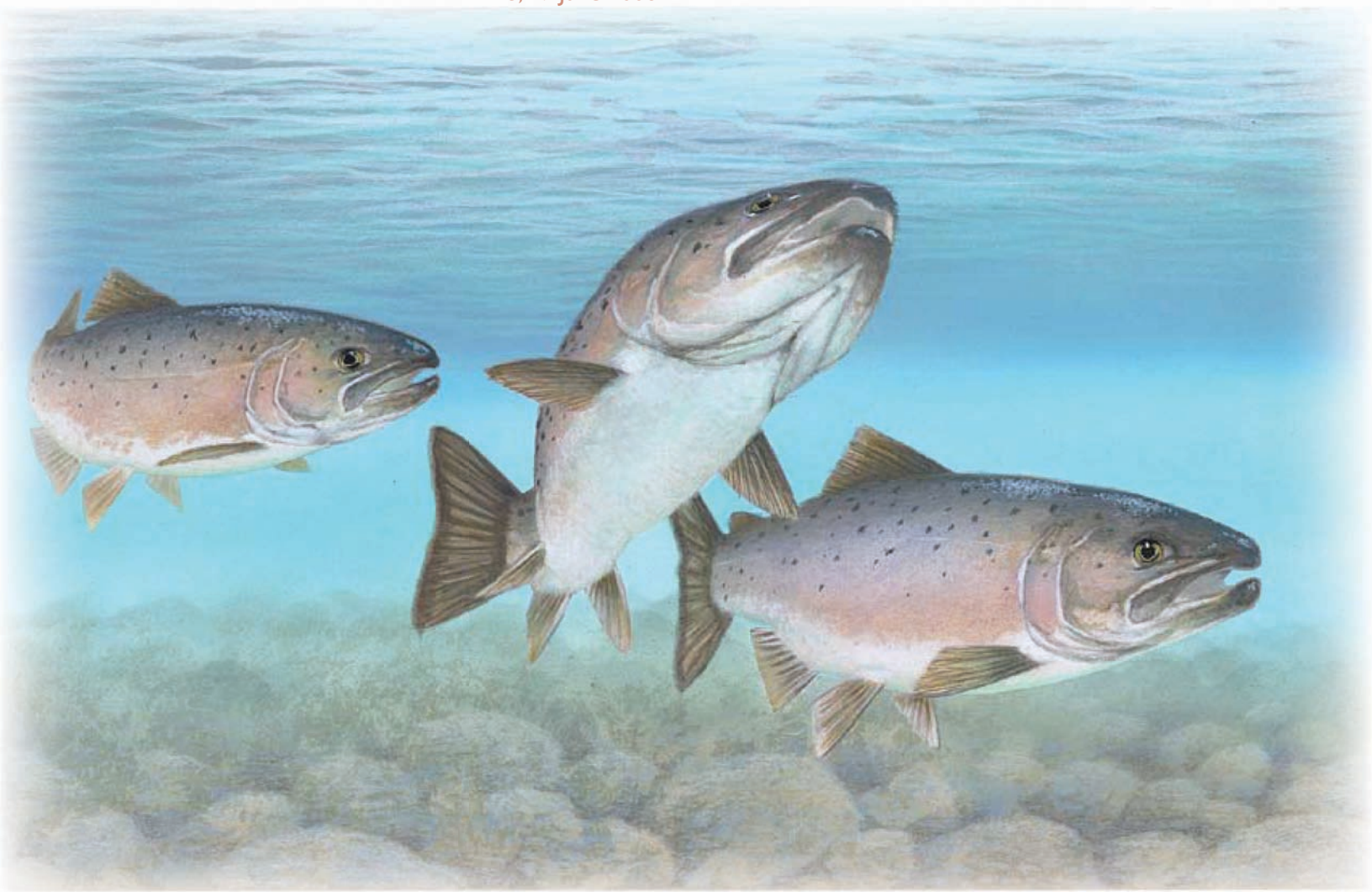
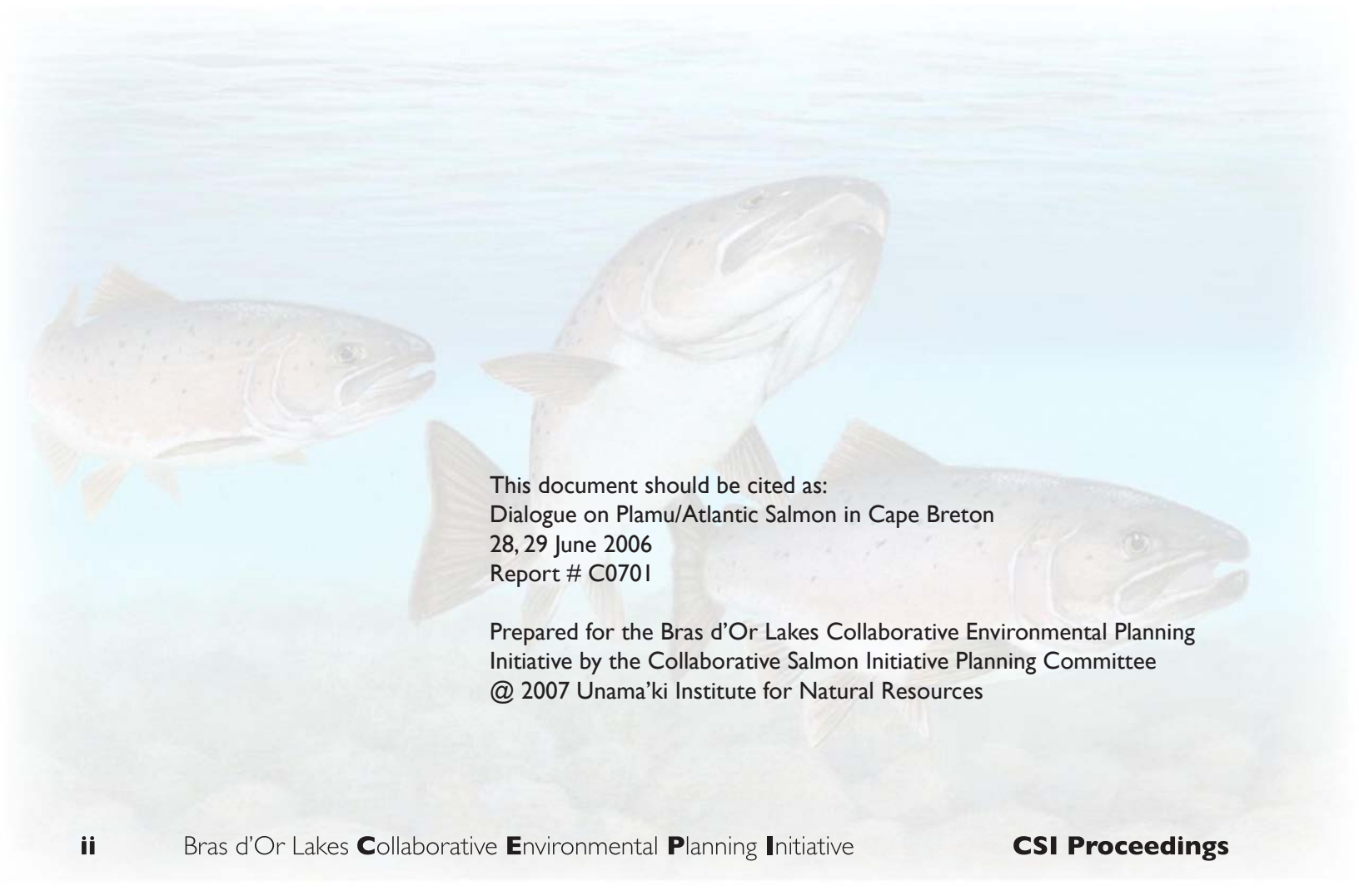
Dialogue on Plamu/Atlantic Salmon in Cape Breton

Wagmatcook Culture & Heritage Centre
Wagmatcook, Cape Breton

Organized by
Collaborative Salmon Initiative–CSI Cape Breton
Bras d'Or Lakes Collaborative Environmental Planning Initiative
Unama'ki Institute of Natural Resources

28, 29 June 2006





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Prepared for the Bras d'Or Lakes Collaborative Environmental Planning Initiative by the Collaborative Salmon Initiative Planning Committee

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Acknowledgements

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Funding Partners

Atlantic Salmon Federation
Nova Scotia Salmon Association
Indian and Northern Affairs Canada
Little Narrows Gypsum
Fisheries and Oceans Canada
Margaree Salmon Association

Kismawwi'kmumkl Wjit Nikanpukuwultijik

Msit kmitkinu sespite'tmi'tij ta'n pemtlitkle'jij sika'latijik plamu'k. Wejkwa'taqnik newiska'q jel ne'wt te'siksipnl sipu'l ta'n etl-sika'latisnik plamu'k, nike' kiskuk pasik ne'siskl weskwiaql ta'n etlsika'latijik plamu'k. Etekl wel-nenasikl koqoe'l tela'tekekl kutey nike': awsami-kwitamemk (koqwaji-kwitamemk aq kemutn-kwitamemk), kaqisika'tasikl ta'n weskowita'tij plamu'k, sa'q winamkwa'tumk samqwan, pejo'lujik se'kk tle'k mime'jk aq wasisisk, aq pemiajelkik ta'nik ketankwi'tijik. Mu weliankamkuktnuk ta'n tlitpietaq weskwia'tijik plamu'k elmi'knik, tela'tekek ne'kaw ewil-maliaptmumk maqamikew aq samqwan, wiaqiw nipuktukewey, nuji-ika'taqumkewey, mulqutimk lamqamu'kewey aq ta'n tett etli'ka'timk, aq elp mu ketlewe'ktnukl telipunqekl. Ki's sa'q kejitu'tij msit te'sijik ta'n sespite'tmi'tij kisna nujo'tmi'tij ta'n tel plamue'kemk miamuj mawuktmumk aq melkuktmumk ta'n teli apaja'luj plamu'k, nekmey pasik ta'n wji-apaja'laten wla keknue'kik mime'jk.

Klaman kisiskutasiten knekk elapimk aq mawlukwatten ilsutasik wjit Unama'kikewe'k plamu'k, ika'tasiksip Waqamatkuk tapu'kl na'kwekl telipkijiaq mawita'mk. (Nipniku's 28 aq 29 2006). Piamiw kaskimtlnaqan te'sijik skwijinu'k wikumuksisnik wla mawita'mk, pukwelkl mawkwa'tikl pejita'sni'k, msit sespite'tmi'tij ta'n telitpie'lij plamu'k Unama'kik, wiaqiw lnue'kati'l, amalkwitamtite'wk, kaplno'lk, mawkwa'timkl mu wettaqne'wasinukl kaplno'liktuk aq newtukwa'lukutijik skwijinu'k. Wla mawita'mk kisi-ika'tu'tis Unama'kikewaq "Collaborative Salmon Initiative" CSI. Mawlukutijik kisitasiktn Alsusutiey Mawio'mi wjit ta'n tl-maliaptiten eltumk aq ewe'wmumk kisite'tasik ta'n tel-lukwemk kwlaman kisi apaji'sittaq plamu'k msit tami sipu'l Unama'kik. Wla mawita'mk kisite'tasiksip kwlaman kisaknutma'titen aq mawisku'ten koqoey aq eteksipnl newkl wesku'tasikl. Amskwesewey na'kwek iloqaptasiksip ta'n ne'kaw plamu tettuji espite'tasit Lnue'kati'l aq Aklasie'wiktuk msit tami Unama'kik, kwlaman kisutten ta'n wla wutannl telpewatmi'tij tla'siktn wjit wla mime'jl. Ta'puewey wesku'tasiksip nujiankaptasik wjit ta'n koqoey kejitumk wjit ta'n te'si'tij plamu'k Unama'kik aq ketlewe'kl wsitqamue'l wjit samqwan aq kta'nukewey ta'n wla mime'jk weskowita'tij. Si'stewey wesku'tasik iloqaptasiksipnl alsusutie'l sespete'taqne'l, ilisku'tasikl ankita'suaqnn aq ta'n ki's kistl-lukutimkl maliamujik plamu'k aq ta'n tlimaliaptiten kisna apaja'ten ta'n weskowita'tij. Te's kisisku'tasik koqoey, na ika'tasiksip me' mawaknutma'timk wjit ta'n koqoey kis-kina'matimk aq ewi'tasik koqoey ta'n me nuta'q iloqaptasiktn, jiko'tasiktn aq lukwatasiktn.

Ta'puewey na'kwek ika'tasiksip ankite'tasiktn ta'n elmi'knik tl-pilua'taqatitaq wejuowqaltultijik. Ankua'tasikl mawaknutma'timkl wesku'tasiksip ta'n tli-anko'ten aq tli-apaja'tuten ta'n weskowita'tij plamu'k aq ta'n tla'laten plamu'k te'sijik. Kisi-miawla'kwek ta'n te'sijik eymu'tijik mawita'mk ika'lusnik nankl te'sikl mawaknutma'timkl klaman kisiwi'tasiten ta'n koqoey me' nuta'q lukwatasiktn klaman kisi-apaji'sitaq plamu'k Unama'kik aq elp kisiwi'tasiten ta'n koqoey nuta'q tla'taqatinew klaman kis-tla'siktitew ta'n koqoey kisisku'tasik.

Wla etekl kisutasikl wejiaql ta'n koqoey kisi-kina'matimk aq kisi-sku'tasik wla tapu'kl na'kwekl. Kismawa'tumkl teluekl nuta'q mawta'siktn kisi-ankaptasikl aq/kisna napwi'kasiktn ta'n ki's etek kisi-ankaptasik, ta'n tel nuta'q tli-anko'tasiktn/apaja'tasiktn ta'n weskowita'tij plamu'k, sespite'tasiktn ta'n tel-pejo'luj se'kk tle'k mime'jk aq waisisk, ta'n tl-wiaqa'laten nutqo'ltijik wjit ta'n teliankweyuj plamu'k, ta'n tl-wiaqa'laten msit tami skwijinu'k wjit wla ankita'suaqnn, aji wli-nsitasiktn koqoe'l ta'n nissenkwi'tij weskwiejik plamu'k aq plamue'l sipu'l iloqaptasiktn wjit ajki'k wsitqamuey. Ta'n eymu'tipnik mawita'mk welte'tmi'tis kisite'taqn wjit Alsusutiey Mawio'mi ta'n kaqi maliaptik ta'n teli-ankweyuj aq tel-maliamuj plamu'k Unama'kik wjit msit wen weliaqmuew.

Executive Summary

The decline of populations of the Atlantic salmon – or Plamu – is a national concern. Of 41 rivers in Cape Breton that historically sustained spawning populations, only 3 currently are above or near to spawning requirements. Some contributory causes are well known: over harvesting (legal and illegal), habitat destruction, long range and local pollution, introductions of non-native species, and changes in predator populations. The future of the remaining stocks remains bleak, especially because of continuing environmental pressure from poor land and water management, including forestry, agriculture, mining, and residential development, and because of the uncertain effects of climate change. It has been evident for some time that only a fully integrated and sustained effort at rehabilitation, supported by all that have an interest in, or responsibility for salmon stocks, offers hope for the recovery of this iconic species.

Laying the foundation for a long term, collaborative action plan for the salmon populations of Cape Breton was the purpose of a two-day workshop held in Wagmatcook, Cape Breton on 28 and 29 June 2006. Over 100 people were invited to the workshop, representing a wide range of groups interested in the fate of the Plamu, including First Nations, recreational fishers, governments, non-government organizations, and individuals. The Dialogue was organized by the Collaborative Salmon Initiative (CSI) of Cape Breton. The goal of this initiative is to develop a Management Committee charged with the creation and implementation of a management strategy - to rebuild individual salmon populations in rivers all across Cape Breton/Unama'ki.

The workshop was designed to emphasize dialogue and discussion, and organized into four themes. Day 1 began with a review of the historic importance of Atlantic salmon to both Aboriginal and Non-Aboriginal communities in Cape Breton, in order to establish the expectations of the communities for this species. Theme 2 was a survey of the current state of knowledge about Atlantic salmon populations in Cape Breton, and the relevant ecological characteristics of the freshwater and marine environments in which the species completes its life cycle. The third theme focused on management issues, reviewing concepts for and efforts to manage the stocks and to maintain or rehabilitate their habitats. Following each set of presentations, time was devoted to plenary discussion of the knowledge base exhibited, and to identify needs for future research, monitoring, and action.

The second day, Theme 4, was devoted to considerations of how to achieve change in the future through local, collaborative actions. Successive sessions focused on protection and recovery of habitat, and on activities directly aimed at salmon stocks themselves. In the afternoon the participants were divided into five discussion groups whose objectives were to identify the actions needed to rebuild Cape Breton Plamu populations, and to identify the organization needed to achieve these ends.

Some of the major conclusions reached as a result of the presentations and discussions over the 2 days can be summarized as–the need for data collection and/or collation of existing data, the need for habitat protection/restoration, the introduction of exotic species, the involvement of youth in salmon conservation issues, engaging the general public in these issues, a better understanding of the factors limiting salmon survival, and looking at salmon rivers from a larger ecological perspective. The workshop attendees supported the concept of a management committee to oversee salmon conservation/management initiatives on Cape Breton Island for the good of all.

Introduction

The decline of populations of the Atlantic salmon – or Plamu – is a national concern. Of 41 rivers in Cape Breton that historically sustained spawning populations, only 3 currently are above or near to spawning requirements. Some contributory causes are well known: over harvesting (legal and illegal), habitat destruction, long range and local pollution, introductions of non-native species, and changes in predator populations. The future of the remaining stocks appears bleak, especially in the face of continuing environmental pressure from poor land and water management, including forestry, agriculture, mining, and residential development, and because of the uncertain effects of climate change. It has been evident for some time that only a fully integrated and sustained effort at rehabilitation, supported by all that have an interest in, or responsibility for salmon stocks, offers hope for the recovery of this iconic species.

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Dialogue Agenda

Wednesday **28 June** 2006

9:15 – 9:45	Welcome and introductions *Charlie Dennis* Opening prayer *Albert Marshall* Dialogue process, output *Shelley Porter*
9:45 – 10:45	Theme 1 Salmon and the human communities of Cape-Breton; Presentations & Questions
10:45 – 11:00	Break
11:00 – 11:45	Theme 1, Dialogue
11:45 – 1:00	Lunch
1:00 – 2:00	Theme 2, Atlantic salmon diversity and ecology; Presentations & Questions
2:00 – 3:00	Theme 2, Dialogue
3:00 – 3:15	Break
3:15 – 4:00	Theme 3, Sharing the mandate, sharing the responsibility; Presentations & Questions
4:00 – 5:15	Theme 3, Dialogue
5:15 – 5:30	Review of day 1, homework for day 2 *Facilitator*

Thursday **29 June** 2006

8:45 – 9:00	Review of agenda for Day 2; Questions *Facilitator*
9:00 – 9:45	Theme 4A, Affecting change – acting locally; Presentation A; Questions
9:45 – 10:15	Theme 4A, Dialogue
10:15 – 10:30	Break
10:30 – 11:00	Theme 4B, Affecting change – acting locally; Presentation B; Questions
11:00 – 11:45	Theme 4B, Dialogue
11:45 – 1:00	Lunch
1:00 – 2:30	Resolving issues for draft action plan Each break-out group will address 2 issues. • Break-out groups with facilitators • defining expectations of communities relative to salmon • habitat priorities, initiatives to solve them, and is science knowledge sufficient? • improving protection and changing public attitudes • de-centralizing management to communities • identification of champion(s) • competing interests
2:30 – 3:00	Break Rapporteurs and facilitators organize summary presentation of break-out groups
3:00 – 4:30	Break-out group summaries by issue Presentations Questions, Dialogue
4:30 – 4:50	Summary, next step *Facilitator*
4:50 – 5:00	Closing remarks *Charlie Dennis* Closing prayer *Albert Marshall*

Dialogue on Plamu/Atlantic Salmon in Cape Breton

28, 29 June **2006**
Wagmatcook Culture & Heritage Centre
Wagmatcook, Cape Breton

Day One

Theme 1: Salmon/Plamu and the human communities of Cape Breton
Rationale: In order to develop a management or action plan, the expectations of the human communities relative to salmon must be enunciated and integrated. Without the historical and present perspective, there is no common base from which to develop a management plan.

- Atlantic salmon in the Aboriginal communities: historic and present stature
  Presenters: Albert Marshall (UINR/CEPI); Fabian Francis (EFWC)

- Atlantic salmon in the non-Aboriginal communities: historic and present stature
  Presenters: Fred Whoriskey (ASF); Harry Vickers (Cape Breton Anglers)

- Challenges for the future – renewing human interest in Atlantic salmon
  Presenters: Tara Crandlemere (NSDAF); Jerrold Timmons (Margaree)

Theme 2: Atlantic salmon diversity and ecology
Rationale: Adult Atlantic salmon run size in individual rivers is a consequence of river size, exploitation, and habitat capacity. Population structure including age at maturity, size at age, and sex ratio result from an interaction of fresh water and marine survival rates. Atlantic salmon must have freshwater habitat to complete its life cycle. Differences in physical characteristics of watersheds may contribute to the differences in Atlantic salmon status and production within Cape Breton.

- River sizes and population characteristics of Cape Breton Atlantic salmon
  Presenters: Jamie Gibson, (DFO); Gerald Chaput (DFO)

- The freshwater ecosystem
  Presenters: Jim Foulds (Ecoboy.ca); Fred Baechler (ADI Ltd)

- The marine ecosystem: an island with an inland sea
  Presenters: Shelley Denny (UINR)

Theme 3: Sharing the mandate, sharing the responsibility
Rationale: An understanding of the roles and responsibilities of governments and individuals in the management and conservation of Atlantic salmon and the environment is essential in planning interventions and actions which can be delivered by the communities.

- Managing fisheries
  Presenters: Greg Stevens (DFO)/ Murray Hill (NSDAF); Joe B. Marshall, (KMK)

- Managing habitat:
  Presenters: Charles MacInnis (DFO)/Stephanie Astephen (DFO); Eric Hundert (EC); Dean Hart (NSDEL); Rick McCready (CBRM)

Day Two

Theme 4: Acting locally – affecting change
Rationale: We cannot manage all the factors which impact on Atlantic salmon. Changing our behaviour, acting locally can increase the chances that Atlantic salmon will persist and thrive in Cape Breton. Community-based and watershed-directed projects provide opportunities for affecting change.

A) protecting and recovering habitat
Presenters: John Mombourquette (DNR); Amy Weston (Adopt-a-Stream)
Panel: Blair Bernard (UINR); TBA (Parks Canada); Pierre Chiasson (Heritage Rivers); Charles MacInnis (DFO); TBA (Port Morien Wildlife Association); Robert Livingstone (SRDBWS); Joel Robinson (MSA)

B) salmon centred interventions
Presenters: Al McNeill (NSAF); Keith Christmas (NRO Membertou)
Panel: David Cairns (DFO); Greg Stevens (DFO); Leonard Forsythe, (ADAM); CEPI – Shelley Porter, UINR; Murray Hill (provincial hatchery system)

Theme 1: Plamu/ Atlantic Salmon and the Human Communities of Cape Breton

This session began with welcoming remarks from Charlie Dennis and an opening prayer by Albert Marshall. Following the opening, the objectives and process of the Dialogue were outlined by Shelley Porter and the facilitator, Graham Daborn.

Plamu/Atlantic Salmon in Aboriginal Communities: Historic and Present Stature

Albert Marshall:
The Plamu was historically one of the staple foods upon which First Nations people depended. It was viewed as a gift from the Creator, and it seemed that it would last forever. That is obviously not the case: the species is becoming extinct on a daily basis. It is our responsibility to ensure that these gifts will be available for future generations. We must not compromise future generations' ability to sustain themselves. To achieve that, it is essential to adopt a 'two-eyed seeing' approach, a message that is important that we convey to our young people. We must be holistic, minimizing our footprint, and use both the tools that come from traditional knowledge and those that are provided by modern science. That requires a collaborative approach in which Mi'kmaq people and scientists come together. We need to agree on common objectives that are based upon both conservation and recognition of rights.

Fabian Francis:
Albert has pretty well said it all. Historically, Mi'kmaq fished for salmon using spears and snares; we did not use nets. Traditionally, we were conservationists; we did not fish for what we did not need. For the last 15 or 16 years in Eskasoni we have been working in the schools, bringing students out into the field, and working on habitat rehabilitation, inserting digger logs, for example.

Discussion

Q ***Gerald Chaput:*** *What was the role of the salmon in Mi'kmaq traditions, over and above its value as a food resource?*

A ***Albert Marshall:*** *The salmon was a revered species. Our people had to settle for the aquatic life that came to us. Before the 1990s, they were not allowed to take it outside of their own communities. As a food it was not necessarily more important than other species. In addition to food, it was used in spiritual celebrations as an expression of gratitude to the Creator for what he gave to us.*

John Hart: *Albert has laid down the gauntlet, and given us some goals and objectives. It is a shame that the species had to fall to such a state before we put our differences aside and came together.*

Plamu/Atlantic Salmon in Non-Aboriginal Communities: Historic and Present Stature

Fred Whoriskey:
It is important, first, to acknowledge the very important book by R.W. Dunfield , which, in its 400 pages, provides a great deal of information not only about the species, but also about the important perspectives of Europeans. In Europe, angling for fish such as salmon and trout has been important for centuries. One of the first books on angling was published in 1492, followed by a flush of works before the most famous book by Izaak Walton, published in 1653 .

Europeans came to North America for fish, including the Atlantic salmon. They came for commercial exploitation, but also with a recreational, sport fishing tradition. Dunfield described it as "an intense faith of fanatical proportions". In 1608, Samuel de Champlain made the first manipulation of the environment in North America when he constructed a trout pond on the Annapolis River for fly fishing. By 1870 , Atlantic salmon had been reduced to 52% of their original capacity; by 1970 it was down to 32%, and now (2005), it has been reduced to about 4% of the numbers that were here at the time the first Europeans came. It is a bad situation, especially in southern Nova Scotia and the Bay of Fundy, where almost all of the stocks are severely depressed, if not extirpated. It is somewhat better in the north: you still have your fish. The species has now been designated by the federal government as "Endangered".

There are numerous hypotheses to explain these declines: acid rain is one of them, and changes in the ocean are another. The uncertainty as to the cause means that there is still much research to be done. For the future, the recipe is simple:

1. *We must keep what we have–those gifts that Albert Marshall referred to–through conservation. We have to build and restore the stocks–if not to their original number, to some other number that is compatible with human needs.*

2. *We must recover the habitat that has been lost.*

3. *We must learn the lessons of the past, and never let it happen again.*

Discussion

Q

Scott Cooke: *How much does ocean change affect the stocks of salmon?*

A

That research is still being done to evaluate that problem. We are sonic tagging smolts as they leave the rivers to try to determine how many return. There is no answer yet.

Q

Scott Cooke: *Is there any laxness in the government in putting funds into habitat restoration?*

A

There is a lot of habitat restoration work going on, although the word is not getting out. That is a problem that can be fixed, at relatively low cost, with local people. The real difficulty lies in places where there are hydro dams; people depend upon the electricity they provide.

Q

Gerald Chaput: *What role did the salmon play in developing colonies? Is there an analogy here with the 'founding fish' – the shad – in the United States?*

A

Here cod was the money fish, not salmon. In fact, there was some frustration among government officials that the Acadians did not collect and salt the salmon and send it back to Europe. Salmon was more a subsistence resource.

Q

John Hart: *Was there not export of salmon back to Europe? There are anecdotal references to shiploads of salmon being sent to Liverpool.*

A

That was a later event long after the early colonization period to which we were referring. When transport shipping increased and got faster, there was mass harvesting of salmon for export.

Q

Don Burt: *Do we have a database of the healthy salmon streams to act as a basis for tracking changes and assessing restoration?*

A

There is actually a shocking amount of data available, but the problem is that it exists in a number of different databases. One of the challenges and activities that the proposed committee must address is how to collate and integrate that information.

Harry Vickers:
Traditionally, Atlantic salmon formed the basis of a viable commercial fishery as well as an extensive recreational fishery. Drift nets and trap nets lined the shores of Cape Breton and were strategically placed in the mouths of rivers. They were also taken as by-catch in other at-sea fisheries. In the 1980s, the government moved to eliminate the commercial fishery for salmon, and anglers predicted that the rivers would fill with salmon. It didn't happen: the numbers continued to decline. International fishing continued at this time. Pound for pound, anglers agree, the Atlantic salmon is the best sport fish, but at times it is hard to describe this as a sport fishery. There are examples of people catching prize fish mainly to display them and then throwing them out to the dump. Management decisions of the past have to be questioned. For a long time there were no seasonal bag limits. Now there are limits to both numbers and sizes; salmon can only be caught with an artificial fly; and licenses are required, but enforcement is almost non-existent. Restriction of fishing to daylight hours gives a measure of protection, and this is something that anglers can supervise.

The Atlantic salmon is a great tourist attraction, and millions of dollars are spent in that connection. Local guides and outfitters provide an excellent service that ensures that the money stays in the community. Two ideas that deserve greater consideration:

1. The establishment of sanctuaries on rivers, as on the North and Margaree River.

2. Creation of a one-day fishing license that would allow people to try out the fishery without purchasing a full license, and help create greater public interest in this resource.

Discussion

Q

Graham Daborn: *What is the survival probability of salmon taken and then released?*

A

Usually the fish are not harmed. There are problems when the fish are angled too long before landing.

John Hart: *The likelihood of survival increases with the conscientious angler. The ideal is for a quick catch and a quick release.*

Challenges for the Future: Renewing Human Interest in Atlantic Salmon

Tara Crandlemere:

The Nova Scotia Department of Fisheries and Aquaculture has a new program to recreate interest in sport fisheries. The Nova Scotia government issues licenses for fishing, while the federal government manages the fish. Recreational fishing is an historical activity, enjoyed by all groups, and generally introduced to children through their families. In Nova Scotia, 90% of licensed fishers began to fish before they were 13 years of age; if not introduced to the sport then, people will not likely take it up afterwards. In 2005, 2337 licenses were issued, mostly in Inverness County. There are active, government-funded programs to interest youth in sport fishing. An Urban Angling Program is in operation in the Halifax Regional Municipality. According to national statistics, an increasing proportion of people involved in fishing are women, partly because of a decline in male participation, and partly through promotional programs such as Becoming an Outdoors Woman (BOW). The aim of provincial programs is to get more people involved in sport fishing.

Discussion

Albert Marshall: *There is no such thing as sport fishing in our culture. In our culture you are only allowed to take what you need. I am surprised that the government has such a program. To my mind, it would be better to expand knowledge and awareness rather than focus on sport fishing.*

Q

Graham Daborn: *Is a component of the program habitat awareness?*

A

When we work with schoolchildren we deal with habitat and ecology, but the program is not aimed at salmon. It is to interest children in sport fishing generally; it doesn't matter whether we catch a bullhead, an eel, or a trout. We focus on ethics and respect, and on pollution in the environment. It is difficult for us to get much time into the school curriculum. We generally are responding to requests from teachers. The program 'Magic on the Rivers', from the Atlantic Salmon Federation may have a greater habitat and awareness focus.

Lewis Hinks: *There is another program called 'Fish Friends' that runs in about 100 schools in Nova Scotia and about 800 in Eastern North America. It is very popular, and it includes habitat and environmental information.*

Jerrold Timmons:
I was pleased to be invited to talk about my experience with salmon fishing. I have been trout fishing for years, but only started fishing for salmon about two years ago. I saw three salmon lying in the Fahey pool below the Margaree River bridge, and decided I wanted to fish for salmon. When I caught my first salmon I was hooked for life. I wish more kids in the area were interested in salmon fishing, and also that there was more information available in schools about habitat and ecology.

Dialogue on Theme 1

Graham Daborn: *One of the important foundations of any strategy for rehabilitation of the Atlantic salmon is a recognition of the historic relationships that we have had with the species. This recent session has provided information about that. The objective now is to determine what lessons we must take from that history; what are the elements that should be included in a strategy for recovery and management in the future. This dialogue should try to identify those elements.*

Gerald Chaput: *What part should salmon play, and how do others view the salmon? Should we be eating it?*

Albert Marshall: *The salmon is put there for a purpose. We only eat it when we are hungry. In the past, a barter system was in place: if someone had a surplus they would exchange with others for something else. Harvesting was not for the benefit of the individual, but for the benefit of the community. Now it is a specialty rather than a staple, but it is an important reminder of our responsibilities. We must consume it for our needs, and be thankful to the Creator for the gift, remembering always to give some back to the Creator so that this species will continue. We didn't need to worry so much about the salmon as about ourselves; salmon are resilient. We need to be sure that what we do today will ensure that the salmon will be available for future generations.*

Harry Vickers: *Conservation must come first. After that is the aboriginal food fishery. Recreational use is last. However, if we do not allow people to take fish, we will see fewer people on the river. In the past on the Margaree, there was a hook and release policy, but now there is an allowance for taking and keeping grilse. We need to allow people to take salmon.*

Don Burt: *Part of our relationship to the salmon is that it is an indicator; salmon need a certain environment – if they decline it is an indication that there is something wrong with the environment. How far are we willing to go to accommodate this species by preserving habitat? Is Cape Breton all for sale? We need to establish what we already have, and to monitor changes in the future. It is important that we put a value on this species that is not just related to money.*

Fred Whoriskey: *There has been a massive change in my living memory as people have been dissociated from their environment because they live in urban environments more and more. What I find positive and encouraging is the need and desire among people to recharge their spirit by experiencing what their ancestors had when they lived off the land. For many, the attraction of going fishing is to catch this thing that is so remarkable to them, and release it back into the environment. They do not need to take it home because their food comes from the grocery store. The angling community is breaking into two groups: one that is content to catch and release, and the other that sees it as equally respectful to take it home. These are not incompatible notions provided the primary goal is conservation.*

Fred Baechler: *Mother Nature has had a history of changing climate. Is there any historic information in European or Mi'kmaq lore over hundreds or thousands of years regarding changes in salmon stocks, such as in response to climate changes of the past?*

Albert Marshall: *In our oral traditions, there are some indications that things have changed in the past in relation to extreme conditions in the environment. What that has taught us is that some of the factors are outside our control. It also teaches us that we must be vigilant, to ensure that our own behaviour does not adversely affect these species that are already affected by natural phenomena. We need to have faith in the Creator. But we must also look on natural phenomena and changes as "messages". What is the role of the species in the integrity of the total ecosystem? Life itself is very fragile. Our teachings are based on the interconnectedness of all things. Unfortunately, the advance of science and technology has been so fast that it has not allowed Mi'kmaq to interpret what the effects are. We need to focus our efforts on the effects of the residues of modern society. What are their effects on the reproductive success of salmon? We need to develop a collaborative system to focus the energies available to us in Cape Breton to study and protect the river systems so that we can learn to undo some of the damage that has been done.*

Fred Whoriskey: *From a glacial perspective, we know that 12,000 years ago any salmon that had been here were eliminated by the ice. When the ice retreated, the salmon returned. It is a very robust and adaptable species. In Europe, there are clear indications of climatic changes (e.g. in vineyard records of monasteries); we know that salmon were there in Roman times and after these climate changes, and we must assume that they were there in between, or recovered. It is an indication of their adaptability. In western Canada, lake sediments record large changes in conditions, but always the salmon came back. The effects of urbanization on temperature far outweigh the overall changes that would appear to be happening in non-urban areas. We can expect salmon to adapt to slight natural changes, but not necessarily to the much larger and rapid changes associated with urbanization.*

Jamie Gibson: *A recent survey by Murray Rudd on the values of endangered species indicates that the Atlantic salmon is the #1 species of concern among Canadians, particularly those who live on the East and West coasts, but also among older farmers in Saskatchewan. However it is among the lowest interests of young people in central Canada. These include many of the policy-makers of the future. We have to think in terms of broader groups than those represented here. How do we get other people more interested in salmon?*

Alan McNeill: *Surveys done on the recreational fishers that have licenses and come to Cape Breton and the Margaree, many of whom are non-resident in Canada, indicate that they rate their experience in Nova Scotia as excellent – even if they don't catch anything after fishing for 5 or 6 days! What they appreciate is:*
1. the ease of access to the river;
2. the simple regulations;
3. the natural beauty of the area; and
4. the natural friendliness of Cape Breton people.
If we lose access to the fishery, we lose those people.

Larry Marshall: *In response to Jamie's question, I suggest that we do not worry so much about the bureaucrats in central Canada, but rather focus on developing the plan to conserve the salmon for the people of Cape Breton. Use what assistance and support can be obtained from governments and NGOs, but take control of the problem yourselves.*

Theme 2: Plamu/ Atlantic Salmon Diversity and Ecology

This second theme deals with our present knowledge regarding the Atlantic salmon: its ecology and life history.

River Sizes and Population Characteristics of Cape Breton

Gerald Chaput and Jamie Gibson:
Cape Breton salmon spend two to four years in freshwater after hatching, before descending to the sea as smolt. Those from the eastern rivers mostly go to sea at 3 years of age, but in the western rivers of the Margaree and the Cheticamp, and in the Grand River, stocks go to sea mostly at age two. It is believed that they travel as far as Greenland to feed, before returning to spawn. Length of time at sea is usually 1 or 2 (occasionally 3) years - those returning after 1 year being known as grilse, and those after 2 or 3 years as large salmon. There are distinct differences between the stocks of different rivers. Reliable information on adult characteristics is available for 7 rivers. Most return as large salmon, except in the Grand River, where the majority return as grilse. Male to female ratios also vary; most of the grilse are males, except, again in Grand River where the sex ratio is more even; in large salmon rivers females predominate.

Studies have been carried out on 41 river systems in Cape Breton. Each of the watersheds has been characterized from maps and aerial photographs to estimate the amount of salmon habitat available . The largest watershed is the Margaree River. We estimate that in total there are 330,000 m^2 of habitat in Cape Breton. The 'Conservation spawner requirement' is based on the number of fish required to deposit 2.8 eggs/m^2, and is used as a reference to compare the stocks. Fish data are derived from creel surveys, electrofishing, counts of adults at fish fences, and at the smolt wheel on the Margaree River. Much of the data records on abundance are intermittent; especially creel survey data, which are declining as recreational activity decreases. The western rivers (Margaree and Cheticamp) had low numbers of juveniles from the 1950s to the 1970s, but since 1985, the Margaree and Cheticamp have exceeded the conservation spawner requirement. In the eastern side of Cape Breton only, the North River meets the conservation spawner requirement, but all the others fall below that. By comparison with other Nova Scotia rivers, however, the Cape Breton rivers are still doing better, and there are some encouraging signs of increase in recent years.

Discussion

Larry Marshall: *It is important to note that the data are based on recreational and other surveys, so that for years when commercial harvesting was still going on, the commercial catches were not included. The populations would have been larger than shown.*

Q ***John Hart:*** *What was the smolt production in the Margaree in 2006?*

A *About 4 to 5 per habitat unit; i.e. roughly 100,000 individuals.*

Q

Unidentified Participant: *Has there been any water temperature monitoring done as part of these studies?*

A

There is some monitoring on the Margaree and Cheticamp, but we do not have a long time series, even for them. We expect that some data exist on some other rivers, but it has not been a part of the studies reported here.

Q

Albert Marshall: *You know there are a lot of barriers on the rivers. What degree of importance do manmade structures like bridges and other modifications that affect migration play in these results? Are there research studies into the effects of these?*

A

All projects these days are examined in the light of their effects on migratory fish, not just their upstream movement, but effects on their whole life cycle. A project like the Canso Causeway would now require a very large assessment. The examination into the effects of seismic exploration includes its effects on fish as well as crustaceans. These aspects are all being considered now, not just in fresh water habitat.

Q

Albert Marshall: *What are the pros and cons of using electrofishing to assess populations?*

A

All of our sampling techniques have some effects on fish. In electrofishing, when the current is switched on, it stuns the fish, but when switched off, the fish usually recover. We recognize that electrofishing does affect fish, but we work to minimize that.

The Freshwater Ecosystem

Fred Baechler and Jim Foulds:

There are many aspects of relevance in freshwater ecosystems, but the focus here is on three of them: climate change, the hydrologic regions, and the riparian zones. Climate data from Sydney since 1895 show that there has been a drop in precipitation over the last 15 years, and the data indicate that flows in the North East Margaree River have correspondingly declined. Streams respond quickly to changes in precipitation and other climate change effects; groundwater less so. "Hydrological regions" refers to variations in occurrence, quantity and quality of water; there are six quite different regions in Cape Breton. They affect seasonal stream flows, water quality (the chemical signature), groundwater stream interaction, and the morphology of the stream courses that affect salmon habitat. Cape Breton has a great variety of streams and salmon habitat as a result. Data presented come especially from a study of Glen Brook, near Melford, as part of the impact assessment for the Georgia-Pacific mine. The best type of salmon habitat tends to be in gravel deposits left over from the last ice age.

The riparian zone is part of the interaction between flora and fauna that affects salmon, and determines much of the habitat quality in the stream. Important features are the living vegetation, and fallen trees (etc.) that provide protective cover for fish, ameliorate temperatures, and support insect populations upon which juvenile

fish feed. Predation and competition may be limiting factors, represented by other species of fish, birds, and humans. It is necessary to focus much attention on land use patterns and the maintenance of intact riparian zones. Beavers have an important role at times: even though salmon and beaver evolved together, if the numbers are too large, the effect on salmon habitat will be negative. As more protection is provided for some of the bird predators (kingfishers, mergansers, cormorants, loons etc), we can expect greater effects on fish populations. Other fish such as rainbow and brown trout, and non-native species such as small mouth bass, act as predators. Since none of the factors act independently, any management plan must address that complexity.

Discussion

Q

Charles MacInnis: *Do you notice whether beaver dams have more serious effects in areas where land use or other human factors already have diminished riparian protection? For example, where farmland has been allowed to go back, the riparian zone is dominated by alders, and beavers are much more prevalent.*

A

Yes. It stands to reason that the effects tend to be worse where there are already other assaults on the ecosystem. Each stream has to be assessed independently as to whether a dam will have a negative effect.

Q

Charles MacInnis: *The precipitation data are based on annual totals. Do you know what the effect of declining snow pack is on stream conditions?*

A

The maximum snow falls were in the 1960s, and have been declining ever since. Forecasts by climate change experts suggest that in the future, in this region, precipitation will be more rain and less snow in winter, with more extreme events, and prolonged droughts. Disappearance of the snow pack in winter will have significant effects.

Q

Scott Cooke: *We have all heard the horror stories about the effects of clear cutting on streams. Is there any way, in your view, that we can have a viable forestry industry on the headlands of a stream and still protect the stream?*

A

I think it would be viable if we value the forest products properly, as would having more natural clear cuts (i.e. no wider than the height of the tallest tree). Things are improving, although there are still many examples of bad forestry. The problem is we undervalue forest products. We can manage the forest and preserve the ecosystem; Europeans have shown that this can be done.

Lawrence Bernard: *The migration of other people of different nations to the Americas had detrimental impact on all species of animals: fishes, humans, plants and birds - even the weather has gone crazy in the Americas. The most noticeable of all are the Tribes of Peoples who have been put in holding pens called reserves (I prefer to call them limbos). The same was done to fishes, birds, and most of the animals. No solutions of any kind are in store for them; just more of the same. Disrespect of all habitats just goes on and on.*

The Marine Ecosystem: An Island with an Inland Sea

Shelley Denny:
The Bras d'Or Lakes is a stratified system, with an upper layer from 0 to 10m of fresher water (salinity < 1 part per 1000) that flows north to the sea, and a deeper saline layer, about 22 to 25 parts per 1000 that flows south. Average depth in the lakes is 30m. There are tides of 4 to 16 cm in the lake that respond to events in Sydney Bight; average is 4 to 4.5 cm. Comparison with work done earlier in the 70s suggests that there have been some changes since that time. Flushing times vary throughout the lakes because of the different basins, from 1.5 days in the Bras d'Or Channel to 2 years elsewhere. These affect the removal rates of nutrients and pollutants. In general, the water is low in nutrients. Apart from some localized examples of lead or zinc, the waters tend to be low in metals, PAHs, and PCBs. The main pollutant of concern is sewage in a few localities only.

Discussion

Q ***Charlie Dennis:*** *Where is the lead coming from?*

A *That is unknown; it might be an isolated dumping event.*

Q ***Fred Whoriskey:*** *What are the oxygen levels like?*

A *Except for Whycocomagh Bay, which is anoxic, the levels are very good.*

Q ***Harry Vickers:*** *What is the source of the zinc?*

A *That is not known. It is a metal of concern in oysters, which is why it was investigated. The high values are in the areas of oyster harvesting.*

Q ***John Hart:*** *How much monitoring is going on?*

A *Environment Canada monitors in areas of shellfish production, and the industry is required to do some monitoring. The Nova Scotia Department of Environment requires some monitoring of bacteria in areas affected by sewage treatment systems.*

Dialogue on Theme 2

This dialogue focused on the review of scientific information presented in the previous three talks. They included several recommendations for things that need to be put in place to move forward.

Fred Baechler: *We need a lot of data in order to understand and to forecast conditions in the watersheds in the future. There is a lot of data out there, but they are dispersed in different places. At present there are large data gaps in rivers and groundwater monitoring. Money needs to be made available to investigate, collate, analyze, and interpret existing data. Unfortunately, monitoring doesn't appear to be a priority.*

Graham Daborn: *Who would/should do the monitoring? There has been a steady decline in the capacity of government agencies to do monitoring. In some cases this has been taken up by non-government groups.*

Albert Marshall: *At a workshop a few years ago, there was a unanimous decision that UINR was chosen to be the champion for ecological integrity of Cape Breton. Is this being done? If we don't work together resources will dwindle and the ecosystem will suffer. When are we going to optimize on this opportunity? Other regulatory agencies are not cooperating with UINR.*

John Hart: *Right now we are working towards putting something in place, without depending upon government agencies. In the next session, focused on "Sharing the Mandate and Sharing the Responsibility", we will address that. We are working towards a collaborative effort.*

Joel Robinson: *Isn't it time to be looking for new approaches such as introducing non-native species? Our Native American or white elm have been in decline and no longer serve to stabilize banks. It is time to consider introduction of other elm species that could.*

Jim Foulds: *Short term ('band-aid') solutions are not desirable. Changes in streams are natural, but we don't allow them to move any more. We should allow our streams to follow their natural movements. I agree that new solutions such as that just proposed should be looked at, but as educated people we should steer the direction of decisions toward more natural solutions.*

Jamie Gibson: *Climate is constantly changing and we have to adapt, but what are the things that we should adapt to in the context of rivers and streams?*

Fred Baechler: *I agree. One adaptation is that we should move out of high risk areas such as floodplains, and allow the rivers to do their thing. A second point is that changes in the past have been much greater, and in this area there are examples where we have adapted.*

Graham Daborn: *Does anyone have any idea of how many Cape Breton rivers have become over-widened as a result of log runs of the past century? This is a problem in other parts of the Maritimes.*

Fred Baechler: *In the Rocky Mountains where glaciers occur, people regard the glaciers as the forecasters of climate change – the 'canary in the mine'. It occurs to me that although Cape Breton does not have glaciers, we have the snow pack in the Highlands which affects stream flow and salmon habitat. Rivers draining from the Highlands have two peaks: one in spring from the rains and a second later when the snow pack melts. We should be regarding that snow pack not just as a resource for snowmobiling but as our 'canary in the mine'.*

Graham Daborn: *Earlier, there were suggestions that significant declines in some stocks may be due to events at sea. The data presented earlier on the differences between different east and west coast stocks might be influenced by distant effects. Does anyone know whether some of these specific stocks are influenced by events at sea? That is an issue that needs to be a part of any strategy.*

Fred Whoriskey: *They are clearly related, but we don't know how. In the last presentation on the Bras d'Or, a large amount of information is being gathered. As the salmon move down through the lakes and encounter cod, does this affect their survival? Why are the data being collected? What other species or 'gifts' are being studied?*

Shelley Denny: *We are collecting data in collaboration with DFO on a variety of species, such as cod. We haven't looked at stomach contents to see whether they are preying upon salmon. Our objective is to understand the larger ecosystem to know about our fisheries resources. We need people and money to do the analyses. We have not looked so much at salmon because our focus has not been on the rivers. It has been suggested that some of the salmon stay year round in the lakes.*

Charlie Dennis: *Some years ago we tried to imprint some salmon smolts on a stream at Eskasoni but it didn't work. Some time later, people fishing in the winter encountered tagged salmon in the lakes, and it seemed that they might be staying there.*

Larry Marshall: *The fish used in that experiment were Grand River fish that run down to the Atlantic, and we don't know how they respond to being in Bras d'Or. I think the answer is that we have no evidence for any salmon staying in the Bras d'Or.*

Theme 3: Sharing the Mandate, Sharing the Responsibility.

This session addresses what had been mentioned several times by Albert Marshall and others, regarding the need for collaboration and sharing responsibility. There are two parts to this: the first addresses the management of the fisheries, and the second focuses on management of the habitat.

Managing Fisheries

Alan McNeill:

The federal government has the ultimate responsibility for management and control, whereas the province controls access through licensing for freshwater and recreational fishing. Nova Scotia is divided into 5 areas for salmon fishing. In Nova Scotia, management for recreational fishing is shared: the federal government manages migratory fish species. The objectives of the federal management strategy are: to manage fisheries and habitat; conserve and restore stocks of commercial and recreational importance; preserve biological diversity; access for Aboriginal peoples; ensure access regulations are transparent and fair. Cape Breton is divided into two management regions: the Gulf (area 18) and the Maritimes Region (area 19). Area 19, by agreement with First Nations people, is a model of collaborative management. Under this regime, surpluses have been maintained, although the reasons may be difficult to discern.

The provincial role is to protect, conserve, and enhance the quality and diversity of fisheries resources in the province. Our client base is typically the recreational fishers. Two provincial acts control activities: the Fisheries and Coastal Resources Act and the Wildlife Act. Much of the work overlaps with federal responsibilities and are covered by memoranda of agreement. For enhancement, the province operates two fish hatcheries in the province, producing 2 million fish, mostly brook trout, brown trout, and Atlantic salmon. In addition, there are two federal hatcheries in the province, one of which is the Margaree that produces salmon and brook trout. The Margaree hatchery contribution is a major support to the Margaree stock. The province stocks about 25 lakes in Cape Breton in the summer and about 35 lakes in the fall. Recently, at the request of fishers, we instituted a $5.00 levy on licenses to support habitat rehabilitation activities. The funds are funneled through the Adopt-a-Stream program.

Discussion

Q ***Harry Vickers:*** *Are the recent increases in some salmon stocks due to restriction of the at-sea fishery, or are they a result of natural causes?*

A *I think I would refer that question to federal colleagues.*

Q ***John Hart:*** *Is the success of the Margaree River stock due to the support system of hatchery enhancement and habitat protection (etc), or is that a coincidence?*

A *I think it is a mix of reasons. The management and support program are important, but it is also an aspect of location. It drains westward into the Gulf area, and the headwaters are pristine.*

Q ***Albert Marshall:*** *In the 1980s, the Bras d'Or Lakes were opened to fisheries by changing the designation from an inland fishery to a coastal one. With dragging, herring stocks changed considerably. How did the aquatic life suffer? Is anyone doing studies on the impact?*

A *I am not qualified to answer.*

Q ***Gerald Chaput:*** *How do variation orders come about?*

A *That responsibility for freshwater species is delegated to the province. For anadromous species, the recommendation comes from federal science.*

Q ***Unknown Participant:*** *Is there an inventory of salmon streams in the province?*

A ***Gerald Chaput:*** *We haven't found a river without at least juveniles yet.*

Joe B. Marshall:
I am here to talk about Kwilmuk Maw-klusuaq. For those who cannot pronounce that, it is the Mi'kmaq Rights Initiative. From the beginning, Mi'kmaq refused to participate in the federal negotiation process. We are working on an historical claim or grievance that relates to a way of life that was almost completely destroyed by the settlement of Europeans on Mi'kmaq territories. Part of that way of life had to do with salmon. Pre-Contact, Mi'kma'ki was divided into 7 districts that represented ecological zones within the territory. Within the ecological zones were watersheds feeding main streams and tributaries that were assigned to Mi'kmaq families to pursue their way of life. Their methods, their technical development were sufficient. Part of that knowledge was what led to the creation of the seven districts. It has taken Europeans 400 years to learn what Mi'kmaq knew already. We are searching for consensus on the management of resources. Start listening to us, as we have something to contribute: there is evidence that our people have been here for 12,000 years. Where is our share of these resources?

Our governments signed treaties, which the Supreme Court of Canada has declared as still valid. How do we define those aboriginal rights today? How do we implement them? Our ancestors signed those treaties with the intent to preserve our way of life. In our tradition we have a responsibility for the next seven generations; some of us are the seventh generation since those treaties were signed. Mi'kmaq people want to take up

our responsibility on these issues, especially the management of resources. Discussions began in 2001-2002. It is slow, in part because we want to involve as many of our people in the 13 communities as possible. We want meaningful involvement in the management of resources, not just as advisors. Mi'kmaq people have always had conservation in mind. Their conservation and management policy was 'Take only what you need'. The Mi'kmaq Rights Initiative is aimed at taking responsibility that Mi'kmaq had before the Europeans arrived. There is a lot of knowledge in Mi'kmaq society that you haven't heard yet. There are working groups in place, dealing with fisheries, land use, and moose, which are trying to come up with interim agreements to take place before final agreements are reached.

Q

Unidentified Participant: *How do you reconcile the Western concepts of development, which seem to be based on the idea of faster development and utilization of resources, with the Mi'kmaq policy of taking time?*

A

The Chiefs have instructed us in the beginning not to expect too much, but to take 'baby steps'. The process of negotiation may speed up as more of our people become better informed.

Managing Habitat

Stephanie Astephen and Charles MacInnis:
The Habitat Management Division controls activities that may affect aquatic habitats. Regulations that affect habitat protection are to be found in a number of acts, including the Fisheries Act, the Canadian Environmental Assessment Act (CEAA), the Species at Risk Act (SARA), and the Oceans Act. We work collaboratively with provincial agencies to ensure that all responsible groups have a voice in the assessment. Much of the regulatory activity takes place under the Fisheries Act [Section 35], which stipulates no 'harmful alteration, disruption or destruction' of fish habitat shall take place. The purpose is to achieve no net loss of fish habitat. Some other aspects of the Fisheries Act relate to the design and demand for fish passage, flow requirements, fish screens, request for information, etc. Under CEAA, the objective is to ensure that environmental effects are considered, to promote sustainable development, to prevent significant adverse effects on resources, and to promote meaningful participation in the decision-making process. Under SARA, the Minister of Fisheries and Oceans is the responsible minister for aquatic plants and fish.

Stewardship activities involve work with community groups such as those here. Activities include stream restoration, habitat design and improvement, planting for riparian zones, and research and consultation on the best remediation practices, focused on participation. A variety of local projects involving DFO and local groups in Cape Breton are listed. These provide services in design of fish habitat restoration, and deliver funds derived from court fines. If climate continues to change as rapidly as it appears to have in recent years, we may, as Joel Robinson indicated earlier, have to consider the

introduction of new species that will be more adapted to the changed temperatures, flow regimes, etc. In the Antigonish area we have planted many 'Dutch Elm-resistant' elms from the USA. They are the most successful in improving habitat. Elms are the best trees for riparian areas in terms of survival, growth rate (rapid), and potential to ensure bank stability. We need to keep an open mind on this subject. The Oceans Act was enacted in 1997. It has an integrated management mandate, looking outward from the estuaries to the coastal regions. We have a pilot project in Mabou that has many facets. The project goes from the top of the mountain to the ocean. The Oceans Act is a good instrument for that kind of project.

Discussion

Q **Harry Vickers:** *Do you deal with the environmental impact of off-road vehicles?*

A *Yes, the use of ATVs is a huge problem in some areas, that we are dealing with in the context of working on forestry and land management plans. In some areas the water quality has decreased entirely as a result of ATV use. DNR has a new policy in place to deal with it, but there are still daily complaints about this.*

Dean Hart:

The general mandate of the Department of Environment and Labour is very broad: to protect the environment and to promote safety. The goal is to promote the safety of people and property. The ultimate goal is to achieve compliance with the Environment Act (1995), which was an amalgamation of several pre-existing acts. Assessing the meaning of 'adverse effect' is often very difficult. Water-related actions that require approval include: withdrawal of more than 23,000 litres per day, construction of dams, storage of more than 23,000 litres, construction or installation of culverts and bridges, wharves, weirs and other in-stream materials, diversion structures, etc. The public perception might be that we have unlimited authority, but in reality the department is limited in what it can do. The emphasis is on shared responsibility.

Rick McCready:

Development can negatively impact water quality in various ways. The municipalities are empowered by the provincial government to pursue planning activities, which are largely achieved through the preparation of municipal planning strategies. These involve extensive consultation with other agencies, and community/public input. We do not have any authority over First Nations land. The Municipal Government Act provides considerable power for regulating land use in order to protect the environment. The municipality is attempting to develop watershed-based planning, such as for the Bras d'Or Lakes, although it is difficult. Watershed boundaries do not always coincide with political boundaries. Getting people together and getting consensus is a challenge. Lack of information is a major impediment, and obtaining community buy-in is another. Finally, we do not always have the resources and expertise to formulate and implement plans.

Graham Daborn:
Today's sessions were aimed at trying to get information out there: where is it held, who holds it, etc., so that when we come together tomorrow to formulate a plan, everybody begins from the same basis. This evening it would be beneficial for people to think about the elements and organization that should be incorporated into a strategy for the management of the Plamu/Atlantic salmon. One additional thought to bear in mind: about the earliest piece of legislation/agreement signed in the English speaking world, that included specific regulations regarding fish movements, was the Magna Carta, signed in 1215. This was a very small document which had specific requirements for control on human actions that affected the movement of fish between the ocean and freshwater and back again. That was 800 years ago, and we are still struggling to address that issue.

Theme 4: Acting Locally – Affecting Change

Graham Daborn:
The first day of this Dialogue on Plamu/Atlantic salmon was an information exchange, trying to identify what information is available, who has it, what activities are currently under way, and also what the gaps in our knowledge are. In addition, we heard about some of the players who need to be involved in any strategy to move forward. This next session focuses upon the kinds of local action that are taking place, and how these local actions should feed into a future strategy. The first presentations deal with protection of habitat, and the second with activities focused on Atlantic salmon specifically.

Protecting and Recovering Habitat

Amy Weston:
The Adopt-a-Stream Program is administered by the Nova Scotia Salmon Association on behalf of a number of angling and conservation groups. During the first five years of the program 100 projects were carried out in partnership with 30 local groups and responsible agencies. There was a two-year hiatus because of funding shortages, but the program was re-established in 2005. Currently, the main funding is from the recently established NS Sport Fish Habitat Fund, derived from license fees to ensure sustained funding. Adopt-a-Stream provides technical training, design support and project funding. Last year 17 projects were completed, involving 32 watercourses. Instream structures were installed, riparian zones rehabilitated, and some bank stabilization work completed. This year there are 20 projects underway. The goal is to increase the productive capacity of the river system. When well planned and implemented, fish habitat restoration techniques are very effective. Community groups offer long term commitment to monitor and maintain habitat improvements. Although local people may become involved initially to enhance salmon or trout stocks, they become more effective stewards of the environment and the watershed in a broader sense.

Discussion

Q ***John Hart:*** *How does it work in areas with agriculture? How do you persuade farmers not to mow to the water's edge, and to keep their animals out of the water?*

A *It is an education process, involving continuing dialogue. The Clean Annapolis River Project has taken the route of developing pilot projects, working with individual land-owners, and providing assistance to make land-use changes in the belief that neighbours will follow suit.*

Q ***Fred Baechler:*** *Nova Scotia has a strategy aimed at source water protection. Does DFO have a specific plan for watershed protection?*

A *DFO could answer this better. Everyone seems to want watershed-scale protections and plans, but no one seems entirely sure how to achieve it. There are habitat specific programs.*

Q ***Graham Daborn:*** *Has there been a comprehensive survey of potential sites in Cape Breton that would be suitable for restoration?*

A *There hasn't been an overall survey. Adopt-a-Stream works because there are local people who come with their concerns about their stream. It doesn't work where there is no local group.*

Robert Livingstone:
There are ten streams that enter River Denys Basin, which covers an area of 300 km^2 in the Bras d'Or Lakes, one of the most productive oyster growing areas in the Lakes. Glenn Brook provided a natural spawning area for salmon, and a large wetland – Big Marsh – occurs below the gypsum mine. Mining began in the 1950s when Georgia-Pacific opened an open pit mine around Big Brook. Forestry has been active in the watershed, like many other areas, and much of the area is now into second growth. Other factors include an old landfill site, and shoreline developments with summer homes. There is very little farming any more. The Stewards of the River Denys Watershed Association is a not-for-profit group established in 1999 with the objective of restoring the streams, the fish populations, and the oyster resource to healthy levels. Major blockages have been removed, in-stream structures installed and riparian vegetation replanted in MacIntyre Brook and fish have returned to those areas. Current focus is on Big Brook, which runs through the quarry site. Georgia-Pacific has provided a lot of help, equipment, and time, although fish have not yet returned to Big Brook. And so the plan is to examine water quality to see if that is the reason. A draft Integrated Management Plan for the area has been prepared, with 4 more brooks to be examined.

Discussion

Q ***John Hart:*** *Was there any historical data on water quality prior to the opening of the mine?*

A *No. We did some baseline measurements when we started the restoration projects.*

Q ***Fabian Francis:*** *Have any fish been planted in the river?*

A *No – we need to know if the habitat is forming where it should be before we begin stocking.*

Charlie Dennis: *We congratulate the Stewards for all that they have done. In Eskasoni we tried, but dropped the ball. This is a good example of what can be done in a watershed by an interested group.*

Panel Discussion

Panelists: Charles MacInnis (DFO), Richard McCurdy (DNR), Joel Robinson (MSA), Blair Bernard (UINR), John Kennedy (PMWC).

Charles MacInnis: *In addition to the work described earlier, we are heavily involved in the removal of barriers on rivers and estuaries. If people see examples of barriers on streams, they should bring this to the attention of local authorities so that they can be addressed.*

Richard McCurdy: *New Wildlife Habitat and Watercourse Protection regulations were introduced in 2002 to guide the protection of habitat on private land in Nova Scotia. Under these regulations DNR works actively with landowners and their contractors, initially on an educational basis; this is usually sufficient. Enforcement can be brought in if situations cannot be resolved. We also work in conjunction with DFO and the Department of the Environment where necessary to assess a problem and its solutions.*

Q ***Amy Weston:*** *When companies have been on the land for a long time, and water crossings were established before the new regulations were enacted, does DNR get involved in addressing those historic problems?*

A *All the examples that I have worked on have been current or continuing problems; I am not aware of any case that dealt with old ones. However, if any of you know of such examples, they could be brought forward to the regional office for consideration.*

Joel Robinson:
The Margaree Salmon Association has been involved in several projects, both on the main river and in some of its tributaries. Some important work has been achieved on the North West Margaree. Where the rivers have been armoured with rock in the past to protect farmland, there is often an absence of vegetation and the river system has been simplified and its morphology changed. One has to go back and reassess whether past actions should be continued, or should we be finding other directions. We must also focus on conservation, and assess the cost-effectiveness of restoration. These enhancement programs require a lot of education. Many of us are amateurs, but with the support of agencies such as DFO, we can find the right solutions, not just band-aid actions.

Blair Bernard:
At UINR we are looking at diversifying the Guardian program into a natural resources and environment focus in order to bring more corrective action for the benefit of the whole Bras d'Or. We are increasing patrols on the Bras d'Or.

John Kennedy:
Port Morien Wildlife is once again getting involved in the Adopt-a-Stream Program. Although we cannot get people out to the meetings, they will come out into the field. The Federation of Anglers and Hunters needs more people to join the effort.

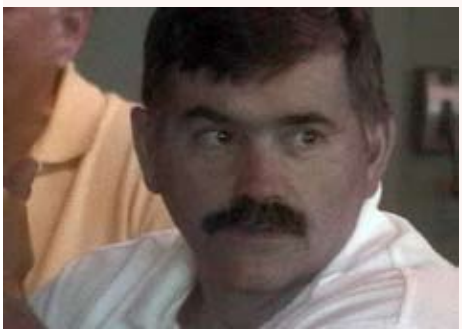
Discussion.
John Hart: *One of the biggest problems facing organizations is getting volunteers. If you are still getting them, don't sell yourself short.*

Q

Fred Baechler: *There doesn't seem to be a lot of information about water quality. Everyone seems to be focused on the physical habitat. Have the Margaree system groups started looking at water quality?*

A

Joel Robinson: *We have no documentation or reports about water quality information, although a previous person in the organization did look at that. We know that pH levels are stable, and that temperatures are good even in the low flows of summer. Because of that our focus has been on the physical conditions. We are concerned about the rivers becoming shallower - the causes and effects. Given our small budgets, we are trying to figure out what is the best 'bang for the buck'.*



Sean Neary: *We do have water quality information [on the Margaree]; in general, both quality and quantity are excellent.*

John Hart: *I think we should thank Amy Weston and Charles MacInnis for all of their work.*

Larry Marshall: *We have mostly talked about specific successes, but there are also failures in habitat restoration. When groups get involved in these projects they need to take a long term view. We need to focus on real, long term problems. In planning, think about future implications. What we are after here is creating or leaving a heritage. Recently there was an excellent report from Eskasoni that assessed the performance and effectiveness of in-stream structures.*

Q ***Unidentified Participant:*** *There are about 200 cabins along the shore of the Bras d'Or. What kind of regulations do they face? There are concerns about sewage going into the lakes. Is anyone enforcing permits? In 3 years, I have never seen a warden there.*

A ***Dean Hart:*** *That is a tough question to answer. The Department of Environment and Labour has a stewardship agreement with the Bras d'Or Lakes Association to look at water conditions, pollution sources, etc; they are working with the communities.*

A ***Shelley Denny:*** *There is someone employed to investigate and report back to the Department and to Environment Canada. So far there is not a formal report.*

Q ***Fred Baechler:*** *I have been in this field for 30 years, and when we look on a short term of 1 to 2 year, it seems that we have not made much progress. But when I look back over a longer term, we are in a very different state now. I would like each one of the panel to identify one change or action that they have seen during their careers that has made a difference to conditions.*

A ***Charles MacInnis:*** *I think there are two things: the change in forestry regulations regarding riparian zones, and the response from the agriculture sector regarding keeping their stock out of the streams. In the Antigonish area, I think that we have something like 90% of the areas fenced off from West River. In terms of restoration, what we are doing now is mostly cleaning up very old mistakes; we aren't making as many mistakes now. The active small woodlot owners have shown a big improvement in their management of the riparian zone. We are seeing improvements, although we still have a way to go.*

A ***Richard McCurdy:*** *I echo the comment as far as forestry regulations go. With regard to fishing, the changes in attitudes regarding catch and release, bait restrictions, changes in bag limits, have helped. There are fewer food fishers these days; people get the pleasure from being out in the environment.*

A ***Joel Robinson:*** *I fished the Margaree River since 1977. Apart from the enhancement and habitat restoration we have mentioned, I think of the small incremental changes imposed regarding hard vs. soft structures. Many of the successes seem to be associated with small incremental changes that 'tweak' the flow, rather than invest in large scale heavy 'hard' structures.*

A

Blair Bernard: *Fifteen years ago we were not able to find adult salmon at all in Indian Brook. As far as I know, there are no salmon nets in the lakes; that is down from a very large number 20 years ago.*

A

John Kennedy: *I see many good things being done, but then I hear Ministers talking about stripping the land of Cape Breton and leaving it better than before. The Ministers have to realize that we are not dummies.*

Salmon-centred Interventions

Alan McNeill:

The Management of the Department of Agriculture and Fisheries made a presentation to Cabinet regarding the concerns about the decline in interest in sport fishing, especially for salmon. The program addressed fishing opportunities, not conservation. It was successful, resulting in a $500K increase in the Departmental budget. The strategy identified three requirements: focusing only on where a sport fishery exists, or where small enhancements might generate a new one; working with local groups and volunteers, and focusing on smaller watersheds where we can make an impact. We have committed to fund the operation of the Adopt-a-Stream program. Other support is for enhanced production at the hatcheries, such as ADAM. We have produced a list of candidate rivers, and prepared a production plan for each one. It is not our role to assess salmon stocks, but a limited focus on assessment is necessary. For each candidate river we identify the limiting factors – perhaps a tendency to go dry in summer, pH levels, the presence of introduced species such as smallmouth bass or chain pickerel (not an issue in Cape Breton), and quantify the freshwater habitat. Then we are looking at various stocking options: juveniles, parr, put-and-take – especially by working with small groups raising fish alongside the river.

Discussion

Q ***Fred Baechler:*** *Do you examine the full water chemistry for candidate rivers?*

A *We usually choose rivers that were formally productive. There are data in older databases that we look at first. We look at the basic parameters: pH, temperature, oxygen, etc.*

Q ***Adrian Vautour:*** *Are any of the candidate rivers adjacent to First Nations land?*

A *Most of the rivers are ones where we have been approached by local groups. We haven't worked specifically with any First Nations under this program, but would certainly consider any proposals.*

Q ***Albert Marshall:*** *Are there any concerns about parasites from these reared and stocked fish?*

A *They are subject to the same procedures as in any hatchery. All are screened.*

Q ***Albert Marshall:*** *Are these fish fed artificially?*

A *Some of them are. In some cases, the spawned larvae are released as soon as the yolk sac has been absorbed – called 'un-fed fry'. Fish that are stocked out as parr or smolt are fed artificially in the hatchery. It is a commercial diet formulated to nutritional requirements.*

Q ***John Hart:*** *The Margaree Hatchery has been disease-free for ten years, but is still operating under restrictions. Can the restrictions be lifted? Will the Province lobby to have the restrictions lifted?*

A *All hatcheries, private or public, are operated under the same set of rules regarding fish health protection. If the professionals agree that the stock should be restricted to the watershed, we will respect that. It is in everybody's best interests to protect the watercourses.*

Sean Neary: *We would like a meeting to look at changing the status of the Margaree Hatchery.*

Keith Christmas:
The Sydney River Dam Project has not received much attention. The dam has a fish way, and some salmon do pass through it. We have been monitoring salmon passing through since 1994, counting, measuring, and taking scale samples that are sent to DFO for analysis every year. In the beginning, we estimated 100-140 fish moved through, but in recent years we have seen a considerable decline. In 2000, a number of large rocks were placed in front of the dam, possibly to address erosion of the dam. People have seen large fish coming down at high waters, passing over the dam and landing on the rocks. It is a problem for other species such as Gaspereau as well as salmon. Salmon returns have dropped to 16 in 2000, 19 in 2001, 15 in 2002, 21 in 2003, 5 in 2004, and possibly 15 in 2005.

Discussion

Q ***Gerald Chaput:*** *What was the original purpose of the dam?*

A *It was part of the Sydney River Water Supply, providing water for the Sysco Steel Plant.*

Q ***Alan McNeill:*** *Was there an assessment of the fish ladder made? The rocks may have been introduced because the floor of the river seems to have dropped.*

A *There was one in 1996 which suggested some dredging be done.*

Q ***Fred Baechler:*** *The watershed upstream is heavily urbanized, with lots of nutrients going in. Are you monitoring water quality in that area?*

A *It is something we plan to do. We will look at temperature, oxygen, and pH.*

Panel Discussion

Panelists: Alan McNeill (NSDFA), Shelley Porter (UINR), Gary MacDonald (DFO), Sean Neary (ADAM).

Alan McNeill:
(No additional statement.)

Shelley Porter:
I work for UINR as the Collaborative Environmental Planning Initiative Coordinator. One of our activities is the holding of this information seminar.

Gary MacDonald:
We are the enforcement branch for the Department of Fisheries and Oceans. We are involved in salmon, for which fisheries officers are tasked to enforce regulations; habitat, bag limits, etc. This year we are trying to get the proceeds of fines turned over to river initiative groups, to help them promote conservation in these groups.

Sean Neary:
I manage the Fish Hatchery which ADAM (Aquatic Development Association of Margaree) has been operating since 1997. Since that time we have released over a million Atlantic salmon and over a million brook trout into the Margaree River system. Now we are seeing these salmon, most of which have been fin-clipped, return to the hatchery pool. This year we have both grilse and multiple sea year salmon.

Q ***Harry Vickers:*** *Gary: Would greater publicity on the convictions and fines help to increase public awareness of regulations and problems?*

A *Yes. Our Communications branch in Halifax has contacts with the press, particularly the newspapers. Publicity does act as a deterrent and it shows that work is being done regarding fisheries and habitat. We tend to emphasize the higher profile crimes, and the media also tend to focus on the more dramatic cases.*

Q

Albert Marshall: *To what degree must a stock decline before it is declared endangered?*

A

Jamie Gibson: *Determination of the status of wildlife species is determined by the Committee on the Status of Wildlife in Canada (COSEWIC), which, like other units, is limited by resources. Decline is only one criterion. Other criteria include the cause of the decline, the size of the population, its uniqueness, etc. There are several possible outcomes from their assessment: they may decide they have insufficient information to decide; they may designate the species as Threatened, of Special Concern, or Endangered. According to the designation, a number of steps are put in place.*

Q

Albert Marshall: *Are fines set in the legislation, or is it up to the Judge?*

A

Gary MacDonald: *For 90% of the acts there are not set fines, only maximum limits set by the Fisheries Act of $100,000. There are a few things in which we can issue tickets, but in the majority of cases it is up to the judge what the fine will be.*

Q

Adrian Vautour: *What fraction of the returning fin-clipped fish are taken for brood stock?*

A

Sean Neary: *Every August we collect 23-25 each of males and females for the brood stock. That represents about 14-20%.*

Q

Fred Whoriskey: *Are fish that come from hatcheries regarded with the same spiritual value by First Nations people as wild fish?*

A

Charlie Dennis: *Yes. We are very supportive of the hatchery projects.*

Larry Marshall: *At the risk of sounding like a broken record, I would like to remind people that all of our actions have, in the past, resulted in some mistakes. Mistakes do happen, but we have certainly learned a good deal about enhancement in recent years. It is important for everyone to remember that and to think carefully about the long-term consequences.*

Breakout Groups: Resolving Issues for a Draft Action Plan

Graham Daborn:

Over the last day and a half we have had presentations providing information about what is known about the Atlantic salmon in Cape Breton. Projects of this kind have three components: reviewing and building the knowledge base; building public awareness; and building commitment among the various individuals and groups who must be involved in future work.

In terms of building the knowledge base, there is always a need for new information to complement or complete that which already exists. In addition, there is an important need, as has been mentioned several times, to ensure that we are getting the best value out of the information that already exists. This includes 'data mining', which involves examining data that are held in different databases, but which may not have been collated before, and determining if there is new valued information to be derived from it. In terms of increasing public awareness, there are three groups that have been identified as of special interest: young people; new people becoming interested in sport or recreational fishing; and the general public. As part of building commitment, we must identify what the priorities are, because we do not have the capacity to do everything at once. Secondly, we need to identify who the important partners or stakeholders are who must be involved in future actions, and establish a partnership arrangement that is effective. Finally, we need to produce a statement of procedures – a charter – that clearly outlines the process and protocols that participants accept as the way in which that project will be organized. If this workshop is to achieve its aim of preparing a good plan for the conservation and enhancement of Plamu/Atlantic salmon populations in Cape Breton, these are the things that we must consider as necessary.

In considering any question, there are four things that need to be determined and agreed upon: What is to be done? How is it to be done? Who is to do it? and, What is the time frame? In the latter case, that may be refined into objectives for one year, ten years, or a hundred years. In view of the size of the group, we organized 5 discussion groups. Each one has a facilitator, who will have a set of questions that we would like to address:

1. What are the long term goals and objectives of a management plan?
2. What information and data are required?
3. What are the priorities?
4. What are the factors controlling salmon abundance?
5. What are the barriers to effective habitat protection?
6. How should the public be engaged in this program?
7. What kind of organization should be put in place?

Reports from Discussion Groups

Clifford Paul:

The Elders decided to discuss all of the questions at once, since they are all related. The particular points that they wished to stress were as follows:

- There is a need to enforce regulations to prevent overfishing, to prevent the introduction of new species, and to end clear-cutting of the forests.
- There is a need to recreate buffer zones to protect the brooks. Streams and fish need the shade that trees provide. Elms used to do this, and should be replanted. Also black ash.
- There is a need for protection of streams from nutrients and sediments from agricultural activities; some farms should have dykes to slow the run-off.
- Any research that is done should be shared with the Mi'kmaq people. We need to assess the survival rates in catch-and-release practices, and provide adequate training for anglers in the proper ways to handle fish, both during landing and when released.
- There is a need for Mi'kmaq to reconnect with Mother Earth.
- There is a need for a holistic approach to dealing with environmental problems, an approach that recognizes the importance of indigenous knowledge.
- Young people need to learn more respect for the environment. The sense of sacredness needs to be brought back. Destruction is an effect of the loss of spiritual connections with the environment; breaking the connections is the cause of many of the problems.
- Traditional belief systems need to be brought back. No one person owns the salmon or other parts of the environment. It is a resource that is communal. In tradition, fish caught by young people was given first to the elders, and then to others in need. Everyone should recognize the responsibility to preserve resources for the seventh generation.
- Mi'kmaq Ancestors were very knowledgeable about the environment, but recently that knowledge has been taken away and replaced with books. Traditionally, 29th June was the day for renewal for Mi'kmaq people. The celebrations were important in preserving resources.
- It is now necessary to work with modern science, to combine knowledge and effort in a holistic way. Mi'kmaq are proud of the monitoring that their people are doing, but the present focus is only on monitoring and damage control, not correction. All decisions need to be ecology-based.
- There are significant questions that need to be answered. Mining affects all of Unama'ki, not just the area of the mine. What are the causes of the high concentrations of metals like mercury and zinc in the rivers? What effects did 100 years of steel-making have on Plamu? What has happened to all of the waste from steel-making and pulp-making activities? What is the relationship between Plamu and the peppermint plant? (i.e. why was the plant provided with a name that is closely similar to Plamu by Mi'kmaq?).
- Mi'kmaq need to have some jurisdiction over foreign vessels that catch salmon.

Fred Baechler:

The objectives of salmon management are:

- To sustain research on stocks and their status;
- To establish what is a healthy population;
- To enhance community awareness and advising people on how they can get involved;
- To regard the salmon as an indicator of environmental health;
- To maintain the aesthetic experience of streams;
- To enhance ecotourism built around the salmon;
- To maintain long-term monitoring.

The information and data requirements are:

- To collate all existing data together, including traditional knowledge and western science, and analyze it so that it can be most useful. It would be extremely valuable to have a central data storage facility that everyone can access;
- To maintain long-term monitoring, but focused effectively on the issue or the question being addressed;
- To establish some index watersheds for monitoring so that we can document the effects of environmental change without the results being confounded by local activities or pollution.

The organization needed:

- It is critical to determine first who will fund it, or who can obtain funding. Perhaps the CEPI unit of UINR could be a model upon whatever is established could be designed for other areas not currently addressed by the CEPI.

For engaging the public at large:

- We need a good positive approach, advising and celebrating best practices, giving awards for achievements, etc.
- We need to focus efforts on youth in the public schools;
- There needs to be regular and effective use of all media, including attention-getting events such as live streaming video of salmon during the spawning season, etc.

Factors affecting salmon populations:

- Decline in resources for monitoring and enhancement;
- Lack of knowledge about salmon population dynamics;
- Lack of understanding about many human activities on habitat;
- Need to establish priorities for habitat rehabilitation.
- We should not, however, use the lack of complete knowledge as an excuse for inaction.

Barriers:
- Lack of habitat protection;
- Lack of adequate monitoring.

Charlie Dennis:

Goals and Objectives:
- To build sustainability of the salmon populations of Cape Breton so that food and recreation goals can be met.

Information and data needed:
- There is a lack of information on most of the rivers in the region. We should conduct a TEK survey of all of those;
- There are uncertainties about ocean survival;
- We need to build local capacity for compilation of data and its analysis;
- Need to establish benchmark assessments of fish populations soon so that changes can be recognized.

Priorities for Habitat:
- We need to ensure protection of the headwaters;
- We need also to provide more floodplain protection.

Factors limiting salmon in Unama'ki:
- They are being traded away for other economic benefits;
- There is a lack of appreciation of the species, leading to it being undervalued as an environmental indicator;
- Climate change;
- Poor survival while at sea;
- Limitations of hatchery production (e.g. restrictions on distribution of stocking material);
- The regulatory framework and negligence of responsible authorities;
- Lack of funds.

Barriers:
- Lack of enforcement;
- Lack of meaningful public input;
- Lack of involvement of youth.

Engaging the public:
- Public education;
- Specific target of youth in schools;
- Landowners;
- Effective use of media;
- Increasing the profile of the salmon and the efforts being undertaken.

The Organization:
- Continue UINR and CSI; this has been a successful collaboration, involving governments, non-government people, youth, etc., with very good people.

Joel Robinson:

Goals and objectives:
- Maintain the existing healthy stocks and restore those that have been largely lost;
- Establish a system of index sites;
- Assess other species types regarding health of rivers;
- More effective recording of the interests of all user groups;
- Create a network of user groups, including those not user groups.

Information/data needed:
- Complete stock assessments;
- Identify foreign species and their impacts;
- Establish criteria/parameters for good habitat;
- Initiate regular annual surveys (as in Christmas Bird Count model).

Priorities for Habitat Preservation:
- Establish maintenance of good habitat;
- Enhance education especially with a focus on youth; there is a need to get more youth out into the field;
- Provide incentives and awards for best practices and improvements in land or water use;
- Reward volunteers.

Engaging the public:
- Maintain traditional knowledge;
- Share information more readily;
- Develop more numerous relationships with media outlets, so that more information can be made available;
- Establish a list of stakeholders, not just those involved in the fisheries, and advertise their interests.

Organization:
- CEPI and UINR seem good models, although the primary focus is on environmental aspects; there is a need for consideration of social and economic elements of salmon;
- Create an Advisory Board that would report regularly to the larger stakeholder groups.

Alan McNeill:

Goals & Objectives:
- Ensure that every river meets potential production, including the enjoyment and benefit of people in perpetuity;
- Raise the awareness of the public and end-users of salmon regarding the importance of salmon;
- Maintain the integrity of the ecosystem.

Information & Data:
- Carry out data mining activities;
- Build more adequate historical accounts of the river systems and the ecosystems (including the relevant ocean ecosystem);
- Evaluate the economic potential and value of salmon;
- Assess the important predator-prey relationships of salmon in rivers;
- Assess the causes and amounts of at-sea mortality;
- Examine the genetic identities of different stocks;
- Assess and document illegal removals of salmon;
- Investigate and promote methods to reduce by-catch of salmon from fishing activities.

Habitat:
- We need more complete inventories of fish habitats on many rivers;
- Ensure more effective implementation of the Fisheries Act, such as by creating and enforcing sanctuaries for salmon on all rivers;
- Create a GIS database on habitat and share data;
- Increase public awareness regarding habitat issues.

Limiting factors:
- Human development in the watersheds;
- Habitat destruction;
- Poaching;
- Climate changes;
- Invasive species;
- At-sea mortality.

Resolution through: enforcement, education and research.

Barriers to habitat protection:

- Money; many programs have been eliminated, especially those with incentives for land owners etc.;
- Over-reliance on volunteers;
- Lack of open dialogue between government agencies;
- Lack of appropriate regulations and policies regarding long-distance transfers of pollutants;
- Lack of commitment to international goals.

Engaging the public:

- Focus on youth and schools;
- Improve consultation of the public by governments;
- Increase the effective use of the media;
- Use international events such as Earth Day and Oceans Day to focus on salmon;
- Celebrate successes (e.g. having an annual salmon day).

Organization:

- We need an effective champion;
- There has to be strong leadership, based on a good knowledge of salmon resources and issues;
- The organization must have time and influence;
- The organization must be financially capable of managing the project;
- UINR may be the most effective champion available.

Looking Forward

Our discussion groups agreed that the Unama'ki Institute, because of its credibility with all communities and interest groups, will be the lead organization in the creation of a management plan for Plamu/Atlantic salmon in Cape Breton. Our management planning team will consist of representatives of all interest groups, plus bring in experts in biology, hydrology, traditional ecological knowledge, etc., as required. The management plan will take into account the needs and expectations of all groups, but the survival of the species will be paramount. The plan will include the engagement of youth, and the integration of elders' knowledge and experience. It was agreed that a more holistic approach to management was needed, with the social and economic value as well as the ecological value of salmon taken into account.

A management planning team will be assembled by UINR, and work on the plan will begin right away. We will be looking to the regulators, the communities, and experts from the academic and traditional knowledge fields to assist in creating a plan to ensure the Atlantic salmon thrives on Cape Breton island for many generations to come.

Appendix
I

Collaborative Salmon Initiative, Cape Breton. Concept:

Partnering to Rebuild the Plamu/Atlantic Salmon Populations of Cape Breton/Unama'ki

The Plamu/Atlantic salmon holds a position of significance in the history and culture of both First Nations and Non-First Nations people. Historically, the salmon was a food source for both Mi'kmaq and European settlers. In modern times, Atlantic salmon has developed an economic significance beyond its use for food, first through a commercial fishery, and most recently through the development of a recreational sport fishery on a number of Cape Breton rivers.

People from First Nations and Non-First Nations communities across Unama'ki/Cape Breton have expressed concern regarding the state of the Plamu/Atlantic salmon stock in this region. Scientific and anecdotal reports indicate Plamu/Atlantic salmon populations are in decline and/or not recovering to historic levels. Given that healthy Plamu/Atlantic salmon populations are of vital importance to all communities and cultures of Unama'ki/Cape Breton, First Nations and Non-First Nations groups intend to (in cooperation with appropriate provincial and federal agencies) develop a plan to revitalize and rebuild the Plamu/Atlantic salmon stock for the benefit of current and future generations.

Issues:
A number of factors affect Plamu/Atlantic salmon populations, and the interaction between user groups, as follows:

1. environmental threats and concerns;
2. sport fisheries and First Nations food fisheries;
3. communication between government and user groups;
4. habitat;
5. overall stock status;
6. the need to improve education, understanding, and communication between and among user groups.

Goals and Objectives of the CSI:
The goal of this initiative is to develop a Management Committee/Body charged with the development and implementation of a management strategy to rebuild individual salmon populations in rivers all across Unama'ki/Cape Breton. The body will include First Nations and Non-First Nations users, and will be assisted and supported by the appropriate provincial and federal government agencies and departments. With the health of the Plamu/Atlantic salmon stock as its main concern, the Management Committee will examine issues relating to the species and its habitat, and make recommendations for study, protection, etc.

Guiding Principles of the CSI:

It is recommended that the Management Committee should be guided by, and include the following as mandated responsibilities:

- To impress upon all concerned that the Atlantic salmon be enhanced, harvested, and protected in a spirit of cooperation, while recognizing the need for conservation measures.
- To develop a comprehensive management plan to protect, enhance, and recommend management procedures for the Unama'ki/Cape Breton salmon natural resource.
- To broaden the knowledge of the public to all issues surrounding the Cape Breton/Unama'ki salmon resource.
- To further in all ways possible, the conservation, protection, propagation, and perpetuation of the Unama'ki/Cape Breton salmon resource.
- To support and assist the efforts of the federal Department of Fisheries, the Nova Scotia Department of Fisheries, and other organizations in any program to conserve and improve the Unama'ki/Cape Breton salmon resource and fishery.
- To encourage and promote courtesy, sportsmanship, communication, and an attitude of co-operation between user groups in the restoration of the Unama'ki/Cape Breton salmon resource and fishery for the benefit of all.

The restoration/management plan shall recognize the rights of First Nations peoples and the economic importance of the recreational fishery to Cape Breton Island. The Management Committee shall consider the conservation and well-being of the salmon resource as its primary objective, while developing and implementing its recovery strategy. The Committee should strive to foster an atmosphere of amity, partnership, and cooperation in addressing all issues surrounding the Cape Breton/Unama'ki salmon resource.

Participants

Stephanie Astephen, DFO Habitat, Sydney

Dan Banks

Shauna Barrington, Mabou District Development Association

Fred Baechler, ADI Ltd., Sydney

Blair Bernard, NRO Coordinator, Unama'ki Institute of Natural Resources, Eskasoni

Lawrence Bernard, Elder, Waycobah First Nation, & Waycobah Fisheries

Lena Bernard, Elder, Waycobah First Nation

Nadine Bernard, Director of Natural Resources & Commercial Fisheries

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