

NPAFC
Doc. 1658
Rev.

**Report of the International Year of the Salmon
2016 Scoping Workshop**

by

International Year of the Salmon Working Group
Committee on Scientific Research and Statistics
(CSRS)

Submitted to the

NORTH PACIFIC ANADROMOUS FISH COMMISSION

April 2016

THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:

International Year of the Salmon Working Group. 2016. Report of the International Year of the Salmon 2016 Scoping Workshop. NPAFC Doc. 1658. 22 pp. International Year of the Salmon Working Group, Committee on Scientific Research and Statistics (Available at <http://www.npafc.org>).

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Keywords: Vancouver, future, research, planning, proposal

Abstract

Following an international scoping workshop in 2015, an International Year of the Salmon (IYS) proposal was developed by the NPAFC IYS Study Group (IYS-SG), endorsed by its Committee on Scientific Research and Statistics (CSRS) and approved by the NPAFC Commission as an intensive burst of internationally coordinated, interdisciplinary, scientific research and outreach focused on salmon and their relation to people. New technologies, observations, analytical methods and analyses will address knowledge gaps that prevent a clear understanding of the future of salmon in a rapidly changing world. The IYS proposal anticipated a broadly inclusive research program of 7 years duration, beginning in 2017 with two years (2018/19) for a period of peak research and outreach activity. The IYS-SG proposal anticipated interest and participation in the concept from beyond the Pacific Ocean so a second scoping workshop was organized in 2016 by the International Year of the Salmon Working Group (IYS-WG). It was asked to explore greater participation by potential partners and funders and to revise the IYS strategy accordingly.

The second scoping workshop was organized and convened in Vancouver, Canada on March 15 and 16, 2016. Total attendance by members of the IYS-WG-WG and invitees was 51. The workshop featured a limited number of introductory presentations followed by extensive plenary and breakout group discussions. The substantive results of the workshop described in this report underscored the support for the IYS, particularly its broad direction, milestones and research themes. Much of the discussion centred on the scope of the IYS and how its approach could be made more relevant to partners and potential donors, what components, such as communication and public outreach strategies were necessary and what governance structure best accommodated the diverse organizations who may be part of the initiative. The results were used by the IYS-WG to develop an implementation strategy and the outcome and decisions are described in a separate report.

Background

In 2012, a proposal was made to NPAFC by Canada to establish a major research initiative based on the idea of an International Year of the Salmon (Beamish 2012). Discussions ensued within the NPAFC leading to the creation of the International Year of the Salmon Study Group (IYS-SG) in 2013. The Study Group organized a scoping workshop on February 17-18, 2015 in Vancouver, Canada to develop the research themes for the IYS (IYS-SG 2015a). An IYS-SG meeting followed immediately after the workshop where the IYS-SG developed a compelling argument for the IYS. It was supported by a number of recommendations that were later endorsed by the CSRS (IYS-SG 2015b) and presented to the Commission at its Annual Meeting in Kobe, Japan, in May 2015.

The IYS proposal was well received by the Commission. It noted that external funding would be needed and that the IYS must be fiscally prudent. Concern was expressed by the Commission that given the ambitious schedule, it may not be possible to redirect current research on such short notice. The Commission identified a need to further refine the research activities that will be undertaken. In response, CSRS formed a working group (IYS-WG) to clarify the potential core IYS partners, to develop an agenda for a second scoping workshop and to report back to the Commission at its Annual Meeting in 2016.

This document is the report of the 2016 IYS Scoping Workshop. IYS-WG members are Mark Saunders (Chairperson), Shunpei Sato, Shigehiko Urawa, Ju Kyoung Kim, Do Hyun Lee, Igor Melnikov, Ed Farley, and Eric Volk. In addition to the Study Group members, others contributed to the drafting of this report including: Skip McKinnell (rapporteur), Paul Sprout (facilitator), and Nancy Davis and Vladimir Radchenko (NPAFC Secretariat).

Welcome & Introductions

IYS-WG Chairperson Mark Saunders (Canada) called the Scoping Workshop to order at 9 am on March 15, 2016, at the Metropolitan Hotel in Vancouver, BC, Canada. Welcome addresses were made by Debora Sparrow (Musqueam First Nation), Carmel Lowe (Regional Director of Science, DFO Pacific Region), and Vladimir Radchenko (Executive Director, NPAFC). The meeting was attended by a total of 51 people including the IYS-WG and invitees (Table 1). Mark Saunders described the objectives of the workshop (Table 2), followed by self-introductions of the participants.

Facilitators

The meeting was professionally facilitated by Paul Sprout (former NPAFC representative and former Regional Director-General, DFO Pacific Region) and Andrew Stegemann who began the workshop by reviewing its objectives, the principles for discussion, their roles in the process, and the meeting logistics.

Objectives

The purpose of the 2016 IYS scoping meeting (hereafter, the workshop) was to bring potential partners together who could provide advice to refine the IYS scope, to develop the IYS strategy, and the IYS business model. Results of the workshop assisted the IYS-WG in its creation of a comprehensive strategy for the IYS, including next steps. The specific goals of the workshop were to:

- develop a common understanding of the IYS initiative, scope, and purpose
- elaborate on, and further develop, the major components of the IYS strategy
- identify actions needed and next steps to create a comprehensive IYS strategy.

Determining Timeframe and Milestones

After the introductory remarks, workshop participants were asked to provide feedback and comments on the concept, timeframe, and milestones presented. There was overall agreement with the phases as they were proposed with some specific comments from participants, which included:

- whether a two-year period of intensive research activity was sufficient to achieve the goals of the program
- the need for simple, public based communications/outreach to begin sooner than 2018
- how to maintain flexibility as funding opportunities and schedules will differ among nations
- a need to include climate change explicitly and to consider our need to respond nimbly in the future

NASCO and NPAFC Perspectives

Peter Hutchinson (Secretary, North Atlantic Salmon Conservation Organization, NASCO) started the workshop with a presentation on the status Atlantic salmon and the issues facing management of this species. He noted that the decline in abundance in recent decades was striking for multi-sea-winter stocks, particularly those in southern parts of the species range and that some stocks are critically endangered. On the other hand, there have been some notable success stories where habitat has been improved, e.g. by liming acidified rivers in Norway, and in England and Wales where there are more rivers with salmon spawning than there have been for over 100 years, primarily due to water quality improvements following the decline of heavy industry. Nevertheless, in its advice to NASCO, the International Council for the Exploration of the Sea (ICES) has advised that marine

survival indices, although variable, remain low and a declining trend in adult returns has persisted despite significant fishery reductions (Figure 1). Low marine survival in the first and second years at sea are constraining the abundance of Atlantic salmon.

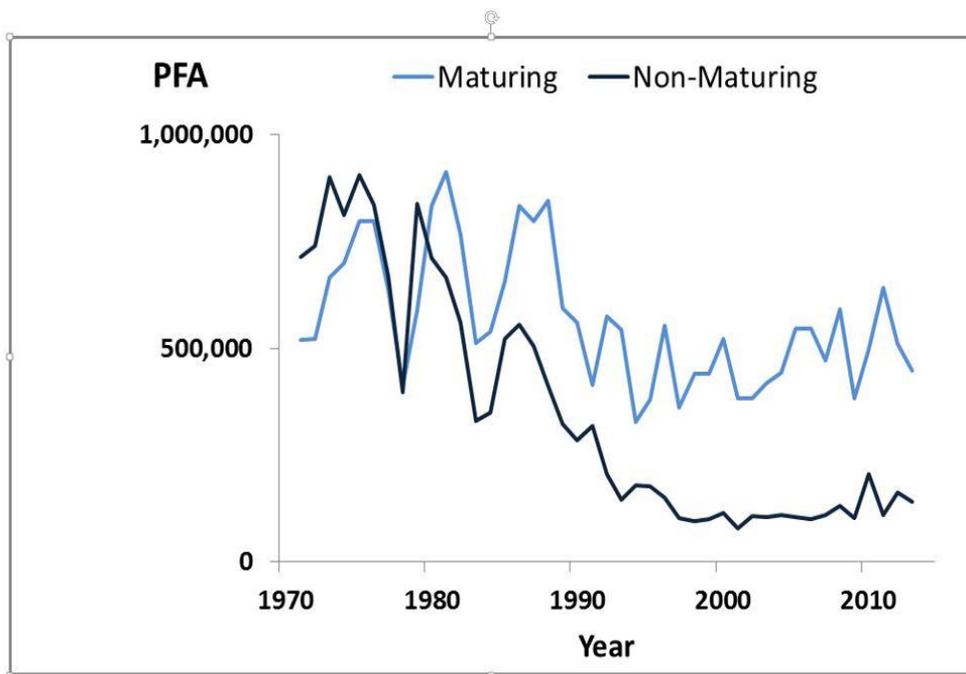


Figure 1. Prefishery abundance (numbers) of immature and maturing Atlantic salmon in the North Atlantic from 1960 to 2014. Figure provided by the NASCO Secretariat.

There was unanimous support for an IYS among NASCO Parties and its accredited NGOs. NASCO Parties favour a clearly defined, one year initiative focused on outreach to raise awareness of the challenges and opportunities facing salmon, to support fund-raising for important new research, and to include a major international symposium. The theme proposed by IYS-SG of *Salmon and People in a Changing World* captures the need for a major outreach program and further research.

Outreach initiatives that may be possible during the IYS are:

- creating exhibits e.g., at natural history museums, aquaria etc.
- liaising with international fisheries organizations to include themes and sessions relating to salmon in their annual conferences during the IYS
- developing curriculum packs for schools
- developing an IYS website or web pages
- eliciting declarations relating to commitments to salmon conservation and research by legislative bodies of Parties/jurisdictions
- producing information packs or templates to be adapted by Parties/jurisdictions on specific issues.

The list is not exhaustive and would be tailored to the situation in individual Parties/jurisdictions.

The research arm of NASCO is the International Atlantic Salmon Research Board. The Board's current research

priorities are to undertake studies to determine where mortality of Atlantic salmon occurs along their migration routes by conducting local collaborative telemetry projects and international telemetry projects.

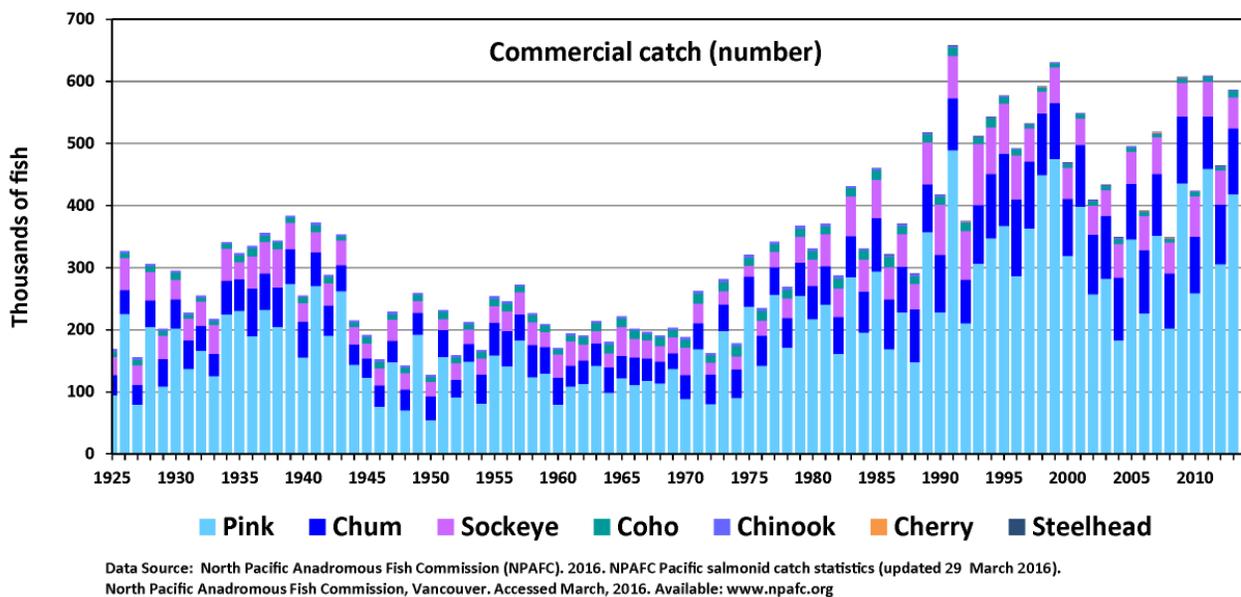


Figure 2. History of total commercial catch (number) in the North Pacific by species.

In the North Pacific, the total abundance of salmon has been higher than the long-term average in recent decades, largely because of greater abundances of pink and chum salmon in the western North Pacific (Figure 2). The total, however, does not reflect the trends in all regions. In British Columbia, Washington, Oregon, and California, for example, average abundances of coho salmon and Chinook salmon have been lower than the long-term average for several decades and many populations in the region have been designated as threatened or endangered. As the causes are poorly understood, concerns for the future of salmon populations have increased.

The IYS-WG Chairperson reviewed the IYS initiative and its history for the participants before describing the work required during the next few months and the role of the workshop in this process. The primary need is to prepare reports and recommendations for the annual meetings of NPAFC (May) and NASCO (June). Those reports must:

- outline the nature, scope, and timing of the proposed IYS initiative,
- describe the IYS Implementation Strategy including a business model,
- include recommendations on governance, funding, and capacity requirements for the planning phase.

Key Partners and Donors

Discussion leaders were identified for each breakout group (named below in parentheses). They reported to the plenary session on the results of their groups' deliberations. Without repeating points raised by previous groups, the unique responses of each group, in order of presentation at the plenary, are summarized in point form. After each presentation, any follow-up discussion points raised in plenary are noted.

Group 5 (Jim Irvine)

- two potential kinds of funding seem possible: impulse donors versus sustainable donors
- impulse funding was defined as a large sum donated once
- a Moore Foundation representative was part of the group and suggested there may be some legacy funds to support IYS
- communications industry
- fishing industry could contribute both boats and time
- donors suggested by the group included Oregon Stream, Applied Technology, Kramer Fish Sciences, Stream of Dreams, Mural Society, and BC Hydro

Group 4 (Kim Hyatt) – Major categories of donors were discussed:

- national science agencies subscribing to IYS
- obtaining funding for international collaboration on common problems is a more difficult challenge
- industry partners might include:
 - wild capture fishing industries
 - energy producers and petroleum product transportation industries; because of their extensive use of salmon and fish habitat, they will be part of the problem unless they become part of the solution
 - wild/farmed salmon producers (corporate donors and partners can also make in-kind contributions); with access to farm production data and life-history data
- International Arctic Science Council (IASC) as a partner to include Arctic salmonid ecosystems
- provincial/state agencies; their interests are served if land/freshwater habitats are included in IYS
- major foundations (Moore is moving away from wild salmon research but it has made substantial investments in wild salmon that they are unlikely to walk away from)
- outreach activities should be in parallel with science program development
- universities would likely be in-kind contributors (using NSERC or NSF, for example)
- a brief discussion of priorities concluded that different donors may be interested in different phases of the IYS.

Group 3 (Marc Trudel)

Many topics raised by Group 4 were also discussed in this group. The novel contributions of this group are:

- to develop strategies to attract funding (e.g. a high profile patron might be desirable)
- the need to identify 4 or 5 key funders to provide seed funding (sponsors might place their logos on IYS program materials)
- Schmidt Foundation (has both funding and a vessel)
- in-kind contributions may be possible (eg. ships of opportunity – shipping companies)

Group 2 (Nancy Davis)

- foundations to approach include Moore, Meyer, Tides Canada, Tides US, Tula, Crabtree, PSF
- corporate sponsors could include: oil, energy, forestry, utilities: Irving, BC Hydro
- salmon buyers/consumers (Costco, Walmart)
- governmental funding (Genomics agencies in Canada, DFO, NOAA)
- treaty (Pacific Salmon Commission endowment funds, Atlantic Salmon Conservation Fund)

Follow-up: Government science funding agencies should be the highest priority. Foundations act as individuals and what may suit one might not suit another. Each donor/partner should have an approach tailored to their perceived needs. Donors that are currently known are probably already overcommitted.

Group 1 (Mark Saunders)

- US Tribes, Alaska aquaculture associations, BC freshwater fisheries, U.S. Forests, Suzuki Foundation, (data partnerships)
- be sensitive to competition among donors so the approach needs to be coordinated
- there was a desire to stay in the northern hemisphere
- recognition that there are European analogues to the North American agencies that are being identified
- salmon fatigue needs to be recognized
- Whole Foods, Packard, MBARI (Monterey Bay Aquarium Research Institute)

Follow-up: Seeking additional millions for salmon from legislators requires a sensitive approach that recognizes existing investments.

Facilitator Synthesis

While the groups identified a number of donors, usually in categories, few partners were noted. Notwithstanding this, it was clear that when approaching donors/partners, that a customized approach was needed and that any outreach should be funnelled, streamlined, and focused. In considering the partners and donors, it was also useful to consider their interests, which are outlined broadly as follows:

Partner/Donor	Example Interests/Considerations
Major donors (e.g. Moore’s legacy fund, Schmitt Foundation, Tula, Meyer, Tides Canada, etc)	Differs depending on foundation, but some examples: <ul style="list-style-type: none"> - Education - Community outreach - Technology
Government/ National Science Agencies (e.g. NSERC, provincial agencies, DFO, NOAA, etc)	<ul style="list-style-type: none"> - Require long lead times - Land based research (provincial agencies) - Climate change
Private companies/industry	<ul style="list-style-type: none"> - Social licence - Brand alignment with conservation issues - Getting results that provide direction
International Arctic Science Committee	<ul style="list-style-type: none"> - Research
Universities	<ul style="list-style-type: none"> - Can likely provide in-kind support - Research - Brand affiliation - Recruitment
Purchasers/ consumers	<ul style="list-style-type: none"> - Want to be better informed - Want improved understanding
Food Distribution (e.g. Costco, Whole Foods, etc)	<ul style="list-style-type: none"> - Social licence - Public health
Treaty related (e.g. Pacific Salmon Treaty)	<ul style="list-style-type: none"> - Understanding salmon dynamics - Support for fisheries management
First Nations (e.g. US Tribes, Canadian First Nations)	<ul style="list-style-type: none"> - Salmon as cultural foundation - Sharing knowledge - Long-term sustainability

Research Themes

The IYS was proposed originally to include five overarching research themes. Meeting participants were split into five groups, based primarily on personal interest, and each group reviewed and discussed one theme. Considering the potential expansion of IYS to the Atlantic Ocean, and the broader interests of the participants at

the workshop, there was a need to determine whether the themes were adequate to capture their interests. The discussion leaders of each group reported back to the plenary and the highlights are reported here.

Group 1 - Status of Salmon (Jim Irvine)

The group identified topics that could be appropriate as sub-themes. They included:

- scale (spatial and temporal), which ranges from taxonomic species in the North Pacific to Conservation Units; ties into the international aspect of salmon management
- information needed, varies depending on scale sources, could add local knowledge
- data quality, western science vs. aboriginal traditional and local knowledge
- forecasting
- hatchery production is an important issue, including effects on wild salmon and uses of hatcheries

Follow-up: The outreach activities could include an update of the Atlas of Pacific Salmon that was published by the Wild Salmon Center. It is an excellent communication tool that describes the status of salmon in various watersheds around the Pacific Rim. It could be linked with similar activities that are currently underway in the Atlantic and in Alaska. It might also include reports on new, exciting research on where salmon go and how they navigate. The atlas could be an early IYS product that would feed into future work and be a legacy activity for IYS. A comprehensive data and information system could provide the basic information for the atlas. NASCO has established a web-based database of salmon rivers (approximately 2,500 rivers) with an indication of stock status, main impact factors and river characteristics and the information can be displayed on interactive maps. The intention is to develop a 'State of the Salmon' report once revised stock classification categories are agreed. This report could be a very important contribution to the IYS.

Group 2 – Human Dimension (Mark Saunders)

Salmon connect ecosystems, economies, cultures, and traditions throughout the salmosphere. The original IYS proposal offered to investigate cultural, social, and economic elements that depend on sustainable salmon populations. This might be refined to the following research sub-themes:

- understanding socio-economic and cultural impacts of changing salmon distribution, abundance and productivity
- addressing the role of salmon in food security
- engaging community in research and resulting societal choices and trade-offs
- addressing root causes of social, political, technical, and management challenges, that when solved, will greatly enhance the probability of salmon sustainability
- investigating long-term challenges to salmon dependent communities
- exploring options for maintaining access to salmon resources through changes in salmon productivity

The value of considering a large geographic scale is its ability to connect people (people, educators, indigenous peoples, managers).

- there will be a need for new strategies for fisheries management, within the context of climate change.
- How do management strategies vary among countries? Perhaps by sharing experiences through existing NASCO and NPAFC organizations, we can we learn. Can we learn by comparing systems from different regions?
- challenges in maintaining salmon are generally related to decisions that affect peoples' lives.
- can we develop a tool kit for communities to make the best possible decisions in the face of change?
- how can the public be engaged in the development of the research agendas? Address the causes of declining abundance in the salmosphere.
- the IYS program needs to be relevant and focused throughout the salmosphere
- the value (social and economic) of the fishery should be considered in arguments about the need for an

- IYS. There may be a need to update the importance of fisheries to society.
- notion of a “salmon nation” at the ready to protect the resources.

Follow-up: This theme/goal needs to be reframed in terms of connectivity objectives because, for example, the word “investigate” in the IYS proposal did not capture the research need. A question was raised about how children would be engaged in the IYS.

Group 3 – Salmon in a changing salmosphere (Kim Hyatt)

- no new themes were raised by the group but there was a suggestion that biological traits be included in addition to distribution and abundance. Biological traits can provide clues to drivers that might explain the distribution and abundance.
- most bottom-up models of ecosystem function do not get to fish, whereas top-down models do not capture ecosystem variability. Entire suites of new models should be an important part of an IYS. New observations will be required to ground truth the new models. High precision data would be represented by only a small percentage of the tens of thousands of salmon populations that exist and that will not change.
- comparative studies generally lead to new insights
- support systems for an IYS need to consider data assembly, data standards, data exchange
- scaling up of regional models and downscaling of large-scale models will be required
- there were different views in the group about whether the open ocean should be the priority or whether the mission should be looking at cumulative outcomes across all stages of a salmon life history. There are varying degrees of difficulty depending on whether the scale is large or more focused.
- range expansions into the Arctic will be an issue
- Arctic charr populations may change substantially as a consequence of climate change. How can that change be accommodated? This ties into food security issues in the high Arctic.

Outcomes of IYS might include:

- improved forecasting
- improved planning given environmental uncertainties to improve the probabilities of success of hatcheries and/or spawning channels for example
- understanding of temporal and spatial risks in a changing salmosphere
- high social/cultural values of Atlantic salmon is something that IYS could inform by improving assessments of restoration possibilities. This might be an example of basin-specific differences in priorities
- different perspectives were expressed on the value of experimenting with hatchery production

Follow-up: There was a suggestion made to frame the IYS objectives within a broader ecosystem concept with the idea that there would be benefits from studying salmon and their entire ecosystems. This was countered by concern that a broad ecosystem perspective could dilute the focus of the IYS and limit fundraising opportunities by having objectives that are too diffuse.

Group 4 – Information Systems (Nancy Davis)

- A strong suggestion was NOT to develop a whole new database system but instead to integrate IYS data products with existing data systems.
- A working group could investigate which data systems would be the most appropriate places to house IYS data and, depending on the type of IYS data to be archived, this could be in several different existing data systems. The best practices established by these existing data systems would then become the best practices used for developing IYS data sets.
- The starting point would be to know stakeholders interests and then design the data to be generated,

- making this a customer-oriented process.
- Handling the data and information systems component of research generally requires more time and effort than originally estimated. Approximately 20% of the budget may be a reasonable estimate needed for this theme.

Follow-up: There may be a need to concentrate data efforts on high-value high-reward products such as the atlas.

Group 5 – New Technologies (Marc Trudel)

No new themes for the IYS were proposed but topics that were raised in the group included:

- new developments in genomics
- new types of tags
- the value of including salmon as components of ecosystem models
- new models are needed that will utilize data from ocean observing systems; satellites and gliders
- applying new technologies in novel ways to longstanding problems in salmon research
- adopting techniques currently developed for brain science to questions about salmon migration
- stop doing activities that are not generating new information

Discussion: The group felt that a targeted approach to donors/partners will be required to link their interests with the IYS. Some feasibility studies could be implemented immediately to show that the work can be done. Options included one cruise in one ocean to three cruises in three oceans with communicators on board.

Day 1 – Facilitator's Review

Paul Sprout began the second day summarizing Day 1. He reflected first on the welcome by Debora Sparrow who emphasized the importance of salmon to the Musqueam people and to others in the region. Ms. Sparrow advised that solutions to the challenges facing salmon should engage people in their local communities and be seen as meaningful to them. Mr. Sprout suggested that this perspective provided important guidance to the IYS, and resonated with its proposed research themes.

Mr. Sprout referred briefly to the presentations on setting the stage for further developing the IYS which included presentations by Peter Hutchinson on NASCO, a potential Atlantic partner in the IYS, and Mark Saunders' remarks on behalf of NPAFC on the broad IYS components, milestones and timelines. The NASCO presentation, which outlined the role and mandate of the Atlantic organization, also highlighted the challenges affecting Atlantic salmon conservation. The facilitator observed that the presentation underscored the requirement for a IYS approach to be flexible and able to accommodate the diverse organizational mandates, various regional contexts and different salmon issues and needs that may comprise the IYS. The NPAFC presentation, and the subsequent plenary discussion, confirmed that there was broad interest in the IYS and support for its structure but more discussion was required on its specific elements. Several participants, when discussing the role of salmon in the environment, expressed the view that salmon were integrators of freshwater and marine ecosystems but also integrated people and nature.

On the topic of donors and partners, Mr. Sprout noted the suggestion from several of the groups to better understand the interests of potential donors and ensure that IYS was seen as relevant and connected with the goals of these organizations. Given the concerns with donor fatigue (e.g., large number of funding proposals and little resources or capacity for donors to take on new funding requests) flagged in the discussions, the facilitator referred to the advice from several participants that the IYS donor approach needed to be carefully considered and mindful of the capacity and time required to effectively engage donors. Mr. Sprout observed that discussion on donors did not lead to specific recommendations on potential donors but tended to describe classes of donors. He noted, as well, that there was little advice on potential partners.

Regarding the five research themes reviewed in Day 1, Mr. Sprout observed that there was broad support for the themes, although refinements were suggested. He noted the advice by some that a comprehensive data policy and communications strategy should precede the IYS and should follow through the more intensive research phases. Mr. Sprout commented that demonstration projects had been proposed as a way to promote IYS and begin IYS implementation efforts early and that the results from these projects should be used to assist in encouraging broader involvement and support for IYS. Along these lines, the idea of committing to prepare a revised Salmon Atlas, advanced by several of the groups, was seen as a tangible and important product that would bring additional credibility and support for the IYS. Lastly, Mr. Sprout noted the views of several participants who encouraged IYS to be nimble and able to respond or adjust to new funding opportunities that may arise quickly.

Finally, Mr. Sprout referred to the visit by participants to the Vancouver Aquarium at the end of Day 1 and the interest of the Aquarium in supporting the IYS. He observed the importance of raising public awareness on IYS, and its connection to salmon, that had been flagged by participants and how this may be greatly aided by working with organizations, such as Aquariums and others. The facilitator noted that the Aquarium visit was a good introduction to tackling a key component of the IYS and that was to develop a public outreach and engagement strategy.

Year of Outreach

NASCO views the IYS outreach as an opportunity to raise awareness and understanding of the issues facing salmon in support of salmon conservation and restoration and of new research to partition mortality at sea. In that light, workshop participants were divided into breakout groups to discuss the following topics related to outreach:

- the main objectives and outcomes needed to ensure a successful year of outreach
- who needs to be engaged, who engages them and how
- how to effectively outreach to interested groups
- timeframe for outreach
- barriers to fundraising and how to overcome them

Group 1 (Jim Irvine)

Objectives and outcomes

- the group identified different target audiences and approaches: public, scientific community, donors and partners, First Nations.
- all need to be involved in articulating the objectives and it should occur early in the process
- donors need to be sold on the opportunities provided by an IYS
- ways of branding the initiative will be important, established early and continued through the IYS program
- convince the public that climate change is upon us with implications for salmon populations
- Terry Fox initiative is a good example of fundraising in research; examining this approach might provide some valuable lessons
- involve professional groups with expertise

Engagement

- the Pacific salmon atlas update was held up as a good example of a product that could engage the public
- a workshop or symposium is needed for scientists to articulate the scientific objectives, and ensure young scientists are involved
- some donors may want only a loose association with IYS while others may want a more hands-on

approach and wish to be actively involved in some aspect of IYS

Timeframe

- IYS has already begun. Begin with outreach aimed at donors/partners. Divide IYS into stages, e.g., planning, coordinated field programs, post-field programs, outreach, and a legacy of IYS
- A linear timeline may not be the right model because of potential loops and feedbacks

Barriers

- donor's salmon fatigue and funding shortages are hurdles
- Public is much more focused on climate change, ecosystem changes, and their potential effects on salmon. Incorporate these concepts in IYS communication materials.

Group 2 (Kim Hyatt)

Objectives and outcomes

- generate broad support for IYS
- inform the audience about the history of what was, what is now, and what their future will be. There is a great deal of interest in what science can say about a future that will be different from today

Engagement

- engage the next generation of scientists in climate change and ecosystem impacts research
- solicit dollars and build a business plan to achieve the objectives
- donors may wish to shape the nature of the IYS program
- crowdsourcing is a novel approach
- government agencies need to push forward on an outreach agenda
- an alternative is NGOs which more often than not, have a wealth of experience. NASCO, for example, has a network of 35 accredited NGOs that make a valuable contribution to all aspects of its work and that could be key partners in outreach activities around the North Atlantic.
- there is a need to decide what message is going out; it will be important to get something that will grab attention

Outreach

- international, national, and regional outreach (i.e. not local) is the appropriate scale for outreach initiatives
- essential that someone is responsible for outreach (organizations or individuals) but funding is needed
- Census of Marine Life was a successful example of a focused research program of limited duration
- tailoring the outreach activities will be needed; for example, the significance of whether salmon are produced in hatcheries or wild will differ among regions
- credibly forecasting the fate of salmon could augment a salmon atlas if it lays out likely futures in addition to the present status. The linkages between salmon and people are likely to change with new populations appearing and marginal ones disappearing

Timeframe

- this is a perpetual process needing a multiyear strategy
- efforts to have a focused single year of outreach are consistent with an ongoing need for promotion.

Barriers

- donor fatigue and competition for a limited pool of funds
- not knowing the committed individuals and organizations
- achieving proper message clarity and focus

Follow-up: The atlas was seen as a great idea. IYS should have a program that aligns with the positive things that smaller initiatives are doing and have done. Therefore, some sensitivity to existing research initiatives is required.

Group 3 (Marc Trudel)

Objectives and outcomes

- the group discussion began with calls for a focused program and the highest likelihood of success and international cooperation and collaboration is probably on the high seas. There are many initiatives in coastal waters but not so much on the high seas. Salmon as ocean integrators was seen as an attractive hook.

Engagement

- engage politicians in the cause of high seas research was seen as a desirable approach to securing funding under IYS
- convey the impacts of climate change on salmon populations
- need for new management strategies in the face of changing climate
- celebrating the innate value of salmon in the IYS by creating memorable experiences
- IYS as a call for action
- need broad base support

Outreach

- use conduits or intermediaries (journalists) to reach the public
- use social media

Timeframe

- as soon as possible!

Follow-up: There is a need for positive stories about salmon to be part of the communication strategy. Should the IYS ignore freshwater habitat? Some species will be excluded by the choice of high seas as the focus.

Group 4 (Nancy Davis)

Engagement

- buy-in by science leaders – get a clear IYS message to them (Royal societies, professional organizations). This might be done by a call for pre-proposals
- government – a working group is needed that would have a portfolio to approach organizations
- public – needs a clear message that continues throughout the IYS, with a fully developed story, by social and traditional media. Should be flexible because of variable timelines of projects. Salmon have an ecological role as an integrator (freshwater and marine); tracking can be visually displayed and easily understood.

Barriers

- need a catch phrase that inspires action (e.g. the poles are melting)

Group 5 (Mark Saunders)

Engagement

- NGOs, etc. can amplify the IYS message.
- academics – perhaps an annual science forum
- engagement of youth
- Stream of Dreams as a small example
- celebrate the successes
- community science participation

Outreach

- need a good communications strategy that is targeted to achieve success in IYS, rather than general topics about salmon. Sell the IYS, not the animals.

- difficult to discuss outreach when the scope of IYS has not been finalized.
- not enough detail to sell the program.
- how does understanding salmon improve lives?
- Clearly spell out how IYS will make things different in 5 years for people, industries, First Nation etc.
- use a “Day in the Life” model to tell stories about salmon
- the written word is becoming less important

Timeframe

- need people paid who can move the program forward

Follow-up: The broad scope of an IYS can be overwhelming. Perhaps some demonstration projects could be used to demonstrate an integrated view to the world.

Facilitators Review

Common themes emerged among the groups including:

- the idea of framing the joint future of salmon and people in light of climate change
- a need to articulate a realistic, yet optimistic message
- how to measure whether the IYS was successful
- nuanced communication strategies for different audiences will likely be needed.
- a need for a logo/theme to be attached to something concrete
- there was unanimity that some dedicated communications support will be required
- finally, IYS scope was flagged as an issue (thematic, geographic, etc.) that will require more attention from the architects of the IYS. It can be quite narrow if focused on something like high seas research, or it can be something more universal about research in the salmosphere. At present there is no convergence of views in the room on whether to adopt the broad or narrow views.
- IYS needs a balance of projects and activities that is international and inclusive on one end of the spectrum and programs with a more narrow focus on the other.

Governance/Capacity

The IYS-WG Chairperson made a presentation on the issues surrounding governance and capacity to undertake an IYS. The context for the discussion was:

- the major components of IYS have been identified, including its purpose, themes, duration, need for donor and public outreach strategies, and a need for partners and roles to be confirmed
- what remains is how best to organize partners to finalize the IYS strategy and begin its implementation
- governance must insure effective coordination and continuity over the IYS time frame and bring coherence to an international endeavour
- the governance structure should define who is involved, their roles and responsibilities and what process will be used to interact, identify actions, make decisions (as necessary) and communicate effectively.

Considerations for discussion among workshop participants included:

- the makeup of IYS Partners and their roles in IYS
- respecting the interests and needs of the diversity of organizations that may be involved in IYS
- potential differences in IYS approach and scope between oceans
- what level of (in)flexibility is appropriate during the research phase, deviations from themes, IYS approvals process
- centralized or distributed coordination
- ensuring that capacity and resources are available for IYS oversight and coordination

One possible direction proposed was to establish an IYS Steering Committee to decide on the final strategy and make decisions as necessary. Issues included:

- who should part of this?
- what is its role?
- how and when does it interact and communicate its decisions and actions?
- identify working committees where further work is required to prepare strategy and seek endorsement by the IYS Steering Committee and potentially to set up working groups to complete work required
- tracking progress and reporting regularly to partners.

David Carlson (Director of World Climate Research Program) described governance during the International Polar Year. IPY did not have a detailed science plan. Backed by the support of the World Meteorological Organization and the International Council of Scientific Unions, the IPY was developed to make major advances, leave a legacy of capacity, inspire a new generation, and to engage the public. These are very similar to what the IYS imagines it will be. There were existing international polar research organizations in the northern and southern hemisphere that did not communicate well, if at all, and there was no mandate or capacity for this to occur. An initial decision of the IPY planning group was not to map existing research activities under an IPY umbrella. “Projects” were used as the mechanism to get new science done and to develop new associations. The planning group decided on 11 criteria for branding an activity as an IPY project:

- address one or both polar regions and its global relevance
- had the potential to make significant advances within one or more of the IPY themes
- represented an intensive, time-limited burst of activities that occurred within the period of the IPY
- contributed to international cooperation and collaboration
- logistically and technically feasible within the IPY timeframe
- avoided duplication or disruption of established activities (established IPY as something new)
- open and timely access to data
- ethically and environmentally sensitive
- logistically efficient
- explicitly includes young scientists
- engages in outreach activities

IPY Outcome: After this set of criteria was agreed by the IPY planners, a call for 2 page pre-proposals was sent out and over 1200 were received, many of which had overlapping goals. An IPO was created to organize these into fewer projects by merging like-minded initiatives. Once all of the matches had been identified, fund-raising for a project was undertaken independently by the proponents. Eventually, 170 projects got funded through national science agencies. The IPO did not fund any activities; all were funded nationally, primarily by governmental agencies. The IPY became the 170 projects that were funded by agencies. About 80-85% were funded. Each project had two leaders, a data function, and outreach activities. The IPO simply coordinated things through communication with the project leaders. The IPY logo was not licensed, it was open access for use by organizations (NGOs, museums, schools) that supported the goals of the IYS. The IPY would not have worked without a central coordinating office. IPY was a very flat structure with a coordinating function at the centre. Most of IPY research played out in the 2007-09 period. Some projects were early (some already underway before IPY) and some were late. It is almost impossible to get international projects to start and end on the same dates.

Follow-up: How did the IPO get its funds to run the coordinating office? Did NGOs engage in IPY? There was a huge influx of organizations to the program.

What structure makes sense for an IYS?

In plenary, the participants were asked to provide their views on an appropriate structure for IYS.

Suggestion 1: Establish an overarching committee with science/non-science expertise. Under this might be regional sub-committees for the three nodes representing different regions.

Suggestion 2: The precursor of what became Ocean Networks Canada recognized that oceanographic research was expensive because of the need for ship time. The original participants met to discuss their interests in monitoring and research without ships. A key feature in running these projects is cooperation; quasi-independent groups were established in the Atlantic and Pacific. There was a need to have a substantial communications budget to allow scientists in both oceans to exchange information.

Suggestion 3: There is a need to consider the nature of the governance objectives and what will be gained from governance. We certainly need rigorous science programs, but the specifics are likely place dependent. It would be useful to bin the objectives into three scales: International/overarching, basin specific and then party specific. Under 'international' would fall things like a steering committee to provide a cohesive message and to be a hub for compiling and sharing information and to create inclusive (not stifling) objectives such as brand, messaging and outreach along with the coordination of science. Under 'basin' would fall the basin NGO's, the status of salmon by basin, and the more basin specific research objectives and projects. Under 'party specific' would fall the regional examples such as recognizing that, e.g. NE USA is very different from other areas. Here you would determine what other species you may include like trout. Here would also fall local outreach and first nations engagement, and other very place specific items.

Suggestion 4: The basic model of IPY relied on national science foundations, whereas IYS is anticipating donors. NPAFC and PICES have secretariats with the capacity to act for the benefit of IYS whereas a Steering Committee is a different species with responsibilities in many places. There is a need for dedicated capacity to implement the IYS.

Suggestion 5: Early career scientists should be included in governance. It also needs to include the Arctic.

Suggestion 6: IPY had 3 subcommittees:

- education and outreach subcommittee
- data subcommittees
- satellites observations subcommittee

Suggestion 7: The IPY model is good model but so was the Census of Marine Life. It had a secretariat, a steering committee, and a data committee.

Suggestion 8: The IPY model seems good but it contrasts with an alternative that might have more government involvement. Is IYS to be an NPAFC initiative or a broad international program?

Suggestion 9: If we followed the IPY model with the existing research themes, it would have to begin immediately to meet the timeline.

Suggestion 10: Governance in the Pacific should be more like the Salish Sea Project. There would be no need for a request for proposals because the leaders would identify the research gaps. That requires a steering committee, perhaps without an administrative function, that determines where and what research needs to be done.

Suggestion 11: There is no inherent conflict between the approach of the IPY and the Salish Sea project. The latter designed a program and sought funds to implement it. A program would be designed in the North Pacific that the countries would fund.

Suggestion 12: If someone is going to receive money from donors for a research program, there will be a need for a responsible financial board.

Discussion: Define scales of activities that are appropriate at different levels.

Next Steps

A topic that arose repeatedly during the workshop was that of capacity. Who is to do the work that is needed to implement the IYS? While the broader issues of governance and staffing were to be a subject of further discussion by the IYS-WG and partners, there were some immediate tasks to undertake:

- revise the Research Themes
- develop public engagement strategies that are sensitive to different organizations and timelines
- develop a donor strategy that respects differences in organizations / partners
- identify partners

Following a period of pairwise discussions among participants, suggestions were made by each pair about the work required to ensure a successful IYS? Responses are listed below:

Suggestion 1: The first WG must define the scope of IYS in broad terms, identify the knowledge gaps. In the Pacific, the NPAFC office should have a new person hired; there needs to be a program champion (someone excited and committed and young enough to follow through), a steering committee is needed that is international covering all oceans, there should be a science oversight committee to participate in review of science programs, coordinate vessel activity, each country reports to the steering committee and national implementation teams.

Suggestion 2: Ensure that IYS is linked with international research on climate change

Suggestion 3: Highest order decision needs to demonstrate that the whole is greater than the sum of the parts that would not occur without IYS. Governance follows from the mission. All major aspects of the IYS program require working groups (among nations).

Suggestion 4: A group will be needed to identify where to focus, to identify where the information gaps are currently. An overall scientific committee will be critical to this.

Suggestion 5: The initial next steps require a champion. NPAFC has been the champion and it needs to continue with increasing energy. An expression of concept is required to allow people to sign onto the IYS. Could be NGOs, governments, individuals, etc. What does it cost? Initially, there is a need for basic startup that may not be so pricey.

Suggestion 6: Bottom-up versus top-down approaches have been described by participants. If IYS has a clear mission then top-down approach is preferred. IYS must find its own funds. NPAFC office has no capacity to take on a coordinating role so an International Project Office should be established.

Suggestion 7: Identifying potentials for ship time should be a priority for a group. Canvas the broader research community. There is a need to coordinate with ICES and PICES at the higher level. Data gathering strategies need to be established early.

Suggestion 8: The IPY success was impressive. A steering committee would be the next step after NPAFC and NASCO endorse the IYS in the spring. A steering committee should identify costs of an IPO. A working group could look at outreach activities. A working group might define project criteria that builds on the research themes.

Suggestion 9: At least three working groups could be established: one to frame the IYS package, one to work on scientific knowns and unknowns, and one to focus on international collaboration.

Suggestion 10: Every component of IYS could use a working group. They need to be directed at specific questions. There is a need to have an easy answer when someone asks what the IYS hopes to accomplish.

Suggestion 11: Start with national members of a working group. A technical secretariat will be needed to take care of business.

Facilitators review

Paul Sprout briefly provided some concluding comments observing the key questions on scope, governance and capacity that had been flagged in the preceding discussions. He underscored the need for the architects of the IYS to reflect on how a governance structure could be flexible and able to address the differing mandates and roles of organizations that may be part of the IYS while still providing sufficient common direction to ensure that the IYS approach was coherent

Final remarks (Chairperson)

The NPAFC Working Group was thanked for their hard work in preparing for the workshop, NASCO and Peter Hutchinson have engaged in the development, the Secretariat of the NPAFC, facilitators were skillful in getting ideas out of the participants, the rapporteur who will assemble the record of the meeting, David Carlson for sharing the IPY experience, the Aquarium staff for hosting the reception and supporting the IYS. This workshop was a major leap forward in developing the for the Working Group meeting. All of the participants were thanked and the meeting concluded.

References

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- International Year of the Salmon Study Group (IYS-SG). 2015a. Report of the International Year of the Salmon Study Group Scoping Workshop. NPAFC Doc. 1602. 16 pp. International Year of the Salmon Study Group, Committee on Scientific Research and Statistics (Available at <http://www.npafc.org>)
- International Year of the Salmon Study Group (IYS-SG). 2015b. Proposal for an International Year of the Salmon (IYS). Report of the Committee on Scientific Research and Statistics (CSRS). NPAFC Doc. 1609 Appendix 7. (http://www.npafc.org/new/science_IYS.html)

Table 1. Participants at the International Year of the Salmon Scoping Workshop March 15-16, 2016, listed in alphabetical order of the last name.

	Name	Role	Organization	Country
1	Dick Beamish	Participant	Pacific Biological Station, Fisheries and Oceans Canada	Canada
2	David Carlson	Participant	World Climate Research Programme (WCRP)	Switzerland
3	Villy Christensen	Participant	Institute for the Oceans and Fisheries, University of British Columbia	Canada
4	Nancy Davis	Organizer	North Pacific Anadromous Fish Commission (NPAFC)	Canada
5	Andrew Day	Participant	Coastal Ocean Research Institute, Vancouver Aquarium Marine Science Centre	Canada
6	Karen Dunmall	Participant	Fisheries and Oceans Canada, University of Manitoba, Salmon in the Canadian Arctic	Canada
7	John Field	Participant	Pacific Salmon Commission (PSC)	Canada
8	Randy Fisher	Participant	Pacific States Marine Fisheries Commission (PSMFC)	USA
9	Rupert Gale	Participant	The Ritchie Foundation	Canada
10	Joel Harding	Participant	InStream Fisheries Research	Canada
11	Brian Hunt	Participant	Hakai Institute/University of British Columbia, Department of Earth, Ocean, and Atmospheric Sciences	Canada
12	Peter Hutchinson	Participant	North Atlantic Salmon Conservation Organization (NASCO)	United Kingdom
13	Kim Hyatt	Participant	Pacific Biological Station, Fisheries and Oceans Canada	Canada
14	Jim Irvine	Participant	Pacific Biological Station, Fisheries and Oceans Canada	Canada
15	Minho Kang	Organizer	North Pacific Anadromous Fish Commission (NPAFC)	Canada
16	Gennady Kantakov	Participant	Far Eastern Ecological Center, Ltd.	Russia
17	Sara LaBorde	Participant	Wild Salmon Center	USA
18	Do Hyun Lee	IYS WG Member	Inland Life Resources Center, Korea Fisheries Resources Agency (FIRA)	Korea
19	Carmel Lowe	Participant	Fisheries and Oceans Canada	Canada
20	Deana Machin	Participant	First Nations Fisheries Council of British Columbia	Canada
21	John Madden	Participant		Canada
22	Mike Matylewich	Participant	Columbia River Inter-Tribal Fish Commission	USA
23	Skip McKinnell	IYS Rapporteur	Salmoforsk International Environmental Consulting	Canada

Table 1. Continued.

	Name	Role	Organization	Country
24	Megan McPhee	Participant	School of Fisheries and Ocean Sciences, University of Alaska Fairbanks	USA
25	Doug Mecum	IYS WG Member from F&A	Alaska Region (F/AK), National Marine Fisheries Service	USA
26	Igor Melnikov	IYS WG Member	Pacific Scientific Research Fisheries Center (TINRO-Center)	Russia
27	Kristi Miller- Saunders	Participant	Pacific Biological Station, Fisheries and Oceans Canada	Canada
28	Yasuyuki Miyakoshi	Participant	Salmon and Freshwater Fisheries Research Institute, Hokkaido Research Organization	Japan
29	Kate Moran	Participant	Ocean Networks Canada	Canada
30	Dan Morris	Participant	(GARFO) National Marine Fisheries Service	USA
31	Evgeny Pakhomov	Participant	University of British Columbia, Institute for the Oceans and Fisheries/Dept. of Earth, Ocean and Atmospheric Sciences	Canada
32	Eric Peterson	Participant	Tula Foundation	Canada
33	Vladimir Radchenko	Organizer	North Pacific Anadromous Fish Commission (NPAFC)	Canada
34	Laura Richards	Participant	North Pacific Marine Science Organization (PICES)	Canada
35	Brian Riddell	Participant	Pacific Salmon Foundation	Canada
36	Rachael Ritchie	Participant	Genome British Columbia	Canada
37	Akash Sastri	Participant	Ocean Networks Canada	Canada
38	Shunpei Sato	IYS WG Member	Hokkaido National Fisheries Research Institute, Fisheries Research Agency	Japan
39	Mark Saunders	IYS WG Chairperson	Pacific Biological Station, Fisheries and Oceans Canada	Canada
40	Sue Scott	Participant	Atlantic Salmon Federation	Canada
41	Matthew Sloat	Participant	Wild Salmon Center	USA
42	Gary Smith	Participant	Smith and Stark LLC	USA
43	Paul Sprout	IYS Business Consultant		Canada
44	Andrew Stegemann	IYS Meeting Facilitator		Canada
45	Greg Taylor	Participant	Fish First Consulting	Canada
46	Terry Tebb	Participant	Pacific Salmon Foundation	Canada
47	Marc Trudel	Participant	Pacific Biological Station, Fisheries and Oceans Canada	Canada
48	Hiroshi Ueda	Participant	Graduate School of Environmental Science, Hokkaido University	Japan
49	Shigehiko Urawa	IYS WG Member	Hokkaido National Fisheries Research Institute, Fisheries Research Agency	Japan

Table 1. Continued.

	Name	Role	Organization	Country
50	Eric Volk	IYS WG Member	Commercial Fisheries Division, Alaska Department of Fish and Game	USA
51	Fred Whoriskey	Participant	Ocean Tracking Network, Dalhousie University	Canada

Table 2. Agenda of the International Year of the Salmon Scoping Workshop 2016 (March 15-16, 2016, Vancouver).

DAY ONE

9:00 – 9:45 Agenda Review & Introductions

- NPAFC welcome: Mark Saunders
- First Nations welcome: Debora Sparrow
- Welcome from Fisheries and Oceans Canada: Carmel Lowe
- Role of the facilitators
- Review of meeting logistics, objectives, day one agenda, scope of discussion, ground rules

9:45 – 10:25 Setting the Stage

- NASCO presentation: introduction to NASCO and their interests in the IYS
- NPAFC presentation on the proposed concept of the IYS initiative

10:25 – 10:45 Determining timeframe and milestones

- Participant feedback on the proposed concept of the IYS initiative

11:00 – 12:15 Key partners and Donors

- Breakout groups: Group work to create a list of key partners and donors, and to identify each partner/donor's interest as it relates to salmon
-

1:15 – 3:15 Research themes

- Breakout groups: Group work (one group for each of the five research themes) to answer the following questions:

1. Consider the current theme and its subthemes: are there any missing subthemes?
2. Is there a different way we want to frame this research theme to better resonate with donors and partners and their interests?
3. In implementing this theme, what are the results or outcomes that will be important for decision-makers?
4. Considering the five themes identified, are we missing any themes?

3:15 – 4:00 Research theme report back to the plenary

- Plenary: presentation of findings

DAY TWO

9:00 – 9:30 Agenda Review & Day One Overview

- NPAFC welcome: Mark Saunders
- Overview of day one and review of day two agenda

9:30 – 11:00 Year of Outreach

- Breakout groups answer the following questions:
 1. What are the main objectives and outcomes needed to ensure a successful year of outreach?
 2. Who needs to be engaged and who engages them? (That is, who does the engaging, and who do they engage?)
 3. How do we effectively outreach to interested groups? (Considering the practicalities, what are some of the key messages? What are some of the media vehicles?)
 4. What is the ideal timeframe for the outreach, and when should it begin? Why?

Table 2. Continued.

5. What are the main barriers that we will likely face in raising funds for the International Year of the Salmon? How can we adjust to overcome these barriers?

11:15 – 12:00 Year of Outreach Summaries

- Breakout facilitators recount their group's notes.

1:00 – 1:30 Proposed Capacity/ Governance Arrangements

- Presentation on the proposed governance arrangement for the IYS and the needed capacity for a successful IYS initiative: Mark Saunders

1:30 – 2:00 Capacity/ Governance feedback

- Participant feedback on the proposed capacity/ governance arrangements

2:00 – 2:45 Working Group Identification

- Participants answer: What work is needed to ensure a successful IYS initiative and will require a working group to ensure it's completed?

2:45 – 3:00 Wrap up & Next Steps