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**Report of the 2018 International Year of the Salmon
North Pacific Working Group Meeting**

by

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

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Report of the 2018 International Year of the Salmon North Pacific Working Group Meeting

Vancouver, BC, Canada

February 5 & 8, 2018

The International Year of the Salmon Working Group (IYS-WG) met on February 5 & 8, 2018, first at the Pacific Salmon Commission (February 5) and then at the Blue Horizon Hotel (February 8), both in Vancouver, BC, Canada. The purpose of the first day of the meeting (February 5) was to plan for the IYS high seas cruise that is scheduled to occur in 2019. The purpose of the second day (February 8) was to consider the progress made during the North Pacific Steering Committee (NPSC) Meeting held during the previous two days (February 6–7) and to determine the next steps of the IYS-WG with respect to the development of IYS research and outreach plans that reflect NPAFC priorities. IYS-WG participants for both days included Mark Saunders (Chairperson) and Jim Irvine from Canada, Kengo Suzuki, Shunpei Sato and Shigehiko Urawa from Japan, Ha Na Kim, Ju Kyoung Kim and Suam Kim from Korea, Igor Melnikov from Russia, and Dion Oxman from the United States. Other participants on the first day (February 5) included Dick Beamish (DFO), Ryan Flagg (ONC), Chrys Neville (DFO), Evgeny Pakhomov (UBC), Sarah Robinson (NASCO), Aleksandr Zavolokin (NPFC), Vladimir Radchenko (NPAFC), Jeongseok Park (NPAFC), Madeline Young (NPAFC), Caroline Graham (NPAFC), and Pavel Emelin (NPAFC). Additionally, Laurie Weitkamp (NMFS) and Brian Wells (NMFS) participated via a conference line on February 5. On the second day (February 8), non-IYS-WG participants included Sarah Robinson (NASCO), Vladimir Radchenko (NPAFC), Jeongseok Park (NPAFC), Madeline Young (NPAFC), Caroline Graham (NPAFC), and Pavel Emelin (NPAFC) (Table 1).

List of Acronyms

CC	International Year of the Salmon Coordinating Committee
COFI	Food and Agriculture Organization's Committee on Fisheries
CSRS	Committee on Scientific Research and Statistics
DFO	Fisheries and Oceans Canada
F&A	Committee on Finance and Administration (NPAFC)
IYS	International Year of the Salmon
IYS-WG	International Year of the Salmon Working Group
NASC	North Atlantic Steering Committee
NASCO	North Atlantic Salmon Conservation Organization
NGO	Non-governmental Organization
NMFS	National Marine Fisheries Service (USA)
NPAFC	North Pacific Anadromous Fish Commission
NPFC	North Pacific Fisheries Commission
NPSC	North Pacific Steering Committee
ONC	Ocean Networks Canada
PICES	North Pacific Marine Science Organization
UBC	University of British Columbia

February 5, 2018—Day 1 (10:00 am to 3:00 pm)

Welcome and Introductions

IYS-WG Chairperson, Mark Saunders, opened the meeting and welcomed all participants. This opening was followed by a welcome from John Field, Executive Secretary of the Pacific Salmon Commission, and roundtable introductions. The agenda was reviewed, which included the following items:

1. Welcome and introductions (15 minutes)
2. Review of the agenda (5 minutes)
3. Discussion of Japanese proposal for IYS Theme Counsel Groups (15 minutes)
4. Context for cruises within the IYS – Mark Saunders (10 minutes)
5. Presentation of the 2019 Single-vessel High-seas Expedition Cruise Plan by Dick Beamish, Evgeny Pakhomov and Vladimir Radchenko (40 minutes)
6. Overview of the March 2018 *Shimada* Cruise by Laurie Weitkamp, (NMFS) (15 minutes)
7. Discussion of different cruise configurations (30 minutes) – options include:
 - a. Russian charter cruise alone in 2019
 - b. Russian charter cruise plus other vessels in 2019
 - c. Russian charter cruise in 2019 and multiple surveys N. Pacific wide in 2020
 - d. Russian charter cruise and other vessels in 2019 and multiple surveys N. Pacific wide in 2020
8. Discussion of the role of IYS-WG members in cruise planning (10 minutes)
9. Presentation on shipboard data acquisition and integration for science and outreach by Ocean Networks Canada – Ryan Flagg (20 minutes)
10. Cruise planning for March 2019 surveys (60 minutes)
 - a. Discussion of crewing requirements from Parties
 - b. Discussion of materials needed by Parties (*e.g.* more detailed rationale with link to management objectives to accompany the cruise plan)
 - c. Research project planning process
11. Other (5 minutes)
12. Summary and next steps (15 minutes)

There was support for the agenda among participants and no suggestions for changes were brought forward. The Japanese delegation's proposal for Theme Counsel Groups was noted as an addition to the draft agenda circulated to working group participants prior to the meeting.

Discussion of Japanese proposal for IYS Theme Counsel Groups

The Japanese delegation presented a Draft Terms of Reference for Theme Counsel Groups to be established for each of the five IYS themes: status of salmon, salmon in a changing salmosphere, new frontiers, human dimension, and information systems (Appendix A). This proposal arose over concerns that there were few representatives from Asian countries involved in the planning and development of IYS signature projects to date. This concern was echoed by other IYS-WG members. There was support for the proposal of Theme Counsel Groups with some suggested modifications. It was recommended that three groups be established, instead of five, in order to streamline the development of research plans, including signature projects. It was proposed that 'status of salmon' and 'salmon in a changing salmosphere' be combined into one Theme Counsel Group, as well as 'new frontiers' and 'information systems'. Multiple members stressed the importance of moving forward as quickly as possible with the development of plans, including signature projects. The idea for proposing Theme Counsel Groups was approved to be brought to the North Pacific Steering Committee (NPSC) and discussed again on the

second day of the IYS-WG meeting.

Context for Cruises within the IYS

Mark Saunders, Chair of the IYS-WG and Director for the IYS in the North Pacific, gave a presentation on the context for cruises within the IYS. This signature project is the most developed project in the Pacific basin and has the potential to fill key gaps in the understanding of the ocean phase of the salmon life cycle. He emphasized that this research could allow scientists to better forecast salmon abundance and understand the carrying capacity of the North Pacific. Furthermore, it has the potential to be groundbreaking in its methodologies and findings. This effort would be a true international collaboration on salmon research and it could contribute significantly to achieving the goals of the NPAFC Science Plan. He highlighted Dick Beamish's successful efforts to raise funds in support of one cruise for March 2019 in the North Pacific Ocean. While the original proposal was a multi-vessel survey in the North Pacific, both in the winter and summer, it is unclear whether this will be feasible for 2019 or for 2020. However, it is highly likely that at least a portion of the original proposal will be completed.

Presentation of the 2019 Single-vessel High-seas Expedition Cruise Plan

Dick Beamish, Emeritus Scientist from Fisheries and Oceans Canada (DFO), gave an overview of his work in fundraising and planning a high seas research cruise in the North Pacific. He noted that he had commitments from private donors, NGOs, and government agencies that totaled approximately CAD \$1 million to fund the expedition cruise; however, he is hesitant to officially announce that the cruise will be happening in February–March of 2019 until he has received the funds in full. He is still hoping to raise additional funds that would allow for projects such as onboard DNA analysis and stock identification. Those that have been essential in the fundraising and planning process, such as Brian Riddell, Evgeny Pakhomov, and Vladimir Radchenko, were acknowledged. The intention is to make the data accessible to everyone, and one potential partner in this endeavor is the University of British Columbia. Finally, he noted that the draft cruise plan is very preliminary and asked that it not be widely distributed since he has an obligation to the donors to involve them in the planning process.

This was followed by a presentation from Evgeny Pakhomov (UBC, Cruise Chief Scientist) and Vladimir Radchenko (NPAFC, Cruise Chief Administrator) on the technical details of the single-vessel cruise, outlined in the fourth draft of the NPAFC-IYS Cruise Plan. They acknowledged that this is an early draft and that ideas for cruise activities and research projects are still being collected. The session objectives were as follows:

- Informing the IYS Working Group on the expedition plans and objectives
- Soliciting the NPAFC member countries' support of the IYS High Seas Signature Project
- Present an early draft of the cruise plan to discuss useful /potential research directions that can be added to the at sea/post-expedition activities

This cruise is planned to occur in February–March of 2019 in the Gulf of Alaska on a chartered Russian vessel (*PROFESSOR KAGONOFSKY*), which will operate 24 hours a day. They presented the proposed research area and sampling sites, expedition objectives, research vessel details, some instruments to be used, and the draft biological sampling program.

Following the presentations, there was time for questions and feedback from IYS-WG members/participants. Several people felt that the possibility of tagging fish on the cruise should be considered, although it was acknowledged that it might be difficult. Some ideas for fish tagging included using a live box and/or doing long line fishing. There was a question to the North Pacific Fisheries Commission (NPFC) representative as to whether the data collected on this research cruise would be of

interest to the NPFC. The representative said that the data would be of interest, but it may be too late for the NPFC to get involved with the cruise.

Overview of the March 2018 *SHIMADA* Cruise

Laurie Weitkamp (NMFS) called into the meeting to give an overview of the March 2018 United States research cruise on the NOAA ship *BELL M. SHIMADA*. This two-week cruise will start and end in Newport, Oregon and will focus on studying salmon and their prey off the Washington and Oregon coasts. They will conduct a series of transects from the border between Washington and British Columbia down to Newport, Oregon, which will include 264 fish trawls during the day, with some microtrawling and plankton surveys. A group from Oregon State University will be using a system known as ISIS to automatically identify plankton using photographs and identification software. Participants of this cruise will also be studying fish diet, genetics, condition, as well as collecting scale and otolith samples for further analyses.

Following the presentation, there was a time for questions and comments from IYS-WG members. It was clarified that this particular cruise on the *SHIMADA* would only occur once. A request will be submitted by the United States to use the *SHIMADA* as part of a multi-vessel NPAFC IYS survey in the North Pacific in 2019 and/or 2020. Additionally, there was significant interest in the ISIS technology being used on the cruise to identify plankton.

Discussion of Different Cruise Configurations

The NPAFC IYS-WG discussed a series of different cruise configurations based on the progress made to date. The ideal configuration was recognized to be the original proposal of five winter cruises and five summer cruises with repetition (2+ years). However, considering the status of the planning process, the options were proposed to be the following:

- a) Russian charter cruise alone in 2019
- b) Russian charter cruise plus other vessels in 2019
- c) Russian charter cruise in 2019 and multiple surveys N. Pacific wide in 2020
- d) Russian charter cruise and other vessels in 2019 and multiple surveys N. Pacific wide in 2020
- e) Rotational surveys—different area each year

It was noted that Canada can potentially supply a vessel for March 2019, and for 2020. The United States can potentially provide the *SHIMADA* for 2019 and another vessel for 2020. Japan has annual cruises planned in the western North Pacific each May, however, it is unlikely that they will be able to conduct trawl surveys. Members from the Korean delegation noted that while there would be Korean researchers interested in the cruises it would be difficult to contribute ship time or money to these efforts. Russia is prepared to offer another ship at the full expense of the Russian government in 2019, and potentially 2020, if there is participation from all NPAFC Parties in these surveys, which would include ships and/or funding from other countries, not just the United States and Canada. It was noted that this may be negotiable. There was a question posed to Dick Beamish about whether funders of the 2019 cruise may be interested in funding a 2020 cruise as well, and Dick responded that this was the case for some donors. Multiple participants expressed the importance of these cruises not just involving international participation but rather international cooperation, since these are international problems and we are looking for international solutions. It was agreed that the NPAFC IYS-WG would focus on planning for a single cruise in 2019, to test the methodologies, and work towards a multi-vessel series of cruises for 2020 across the North Pacific. To this end, Canada and the United States will submit requests for scheduling of vessels in 2020, while Korea and Japan will investigate the possibility of providing vessels in 2020.

Discussion of the Role of IYS-WG Members in Cruise Planning

During the discussion regarding the role of IYS-WG members in the cruise planning process, several NPAFC IYS-WG members suggested that cruise activities and research are focused around a series of questions and hypotheses that are of interest to the NPAFC member countries. One suggested research question was about the carrying capacity for salmon in the North Pacific Ocean. It was agreed that Mark Saunders and a small team would compile a synthesis document from previous scoping meetings around potential research questions. This document would then be sent to a point of contact from each country who would ask for research questions and hypotheses from scientists in their country. It was agreed that this information would be requested in the next month to six weeks in order to expedite the cruise planning process.

It was noted that a smaller group would be more efficient in planning the cruise, as opposed to a larger one, and it was agreed that one representative from each country would act as a spokesperson for their country in the planning process. It was agreed that the small planning team (Dick Beamish, Jackie King, Mark Saunders, Evgeny Pakhomov, and Vladimir Radchenko) would correspond with country representatives by email prior to the NPAFC Annual Meeting in May and the CSRS meeting would then be used to make comments and suggestions on the latest version of the cruise plan.

Presentation on shipboard data acquisition and integration for science and outreach by Ocean Networks Canada

Ryan Flagg, from Ocean Networks Canada (ONC), presented potential ways that ONC could support the work of the NPAFC in the high seas expedition. ONC is based in Victoria, BC but does work all over Canada, and even internationally. They are a non-profit society that is an initiative of the University of Victoria and funded almost entirely by the Canadian government. ONC is most well-known for their ocean observatories, such as NEPTUNE and VENUS, both located off the coast of British Columbia. They have significant capabilities to host and manage data and they can produce a variety of data products. ONC is involved in lots of shipboard operations and data collection, which may be of interest to the NPAFC IYS-WG in planning for the upcoming cruise(s). Some examples of tools that may be of interest are the Community Fishers App, which can allow for efficient and organized data collection on the cruise, SeaTUBE, a video archive manager, and container mountable satellites.

Cruise Planning for March 2019 Surveys

Since previous discussions included some points that were relevant to this topic, and since a detailed cruise plan has not yet been proposed, it was determined that this agenda item would not be discussed further at this time.

Summary and Next Steps

Each participant had a chance to voice their final thoughts during a roundtable at the close of the meeting. Participants thanked those involved in the initial cruise planning process, the organizers of the meeting, and the Pacific Salmon Commission for hosting the meeting. The Japanese delegation was thanked for their proposal to create Theme Counsel Groups to expedite IYS signature project planning. It was recognized that representatives of each country needed to clarify the availability of ship time and funding moving forward into 2019 and then 2020. The urgency for detailed cruise planning with specific questions and hypotheses in mind was noted by participants. It was also agreed that over the next few months the IYS-WG needs to build common understanding of questions they are trying to answer as part of the cruise(s) and that a small planning group needs to move forward quickly with concrete plans.

February 8, 2018—Day 2 (9:00 am to 3:00 pm)

Welcome and Opening Remarks from the IYS-WG Chair and Members

IYS-WG Chairperson Mark Saunders opened the meeting and welcomed all participants. The agenda was reviewed, which included the following items:

1. Welcome and opening remarks from the IYS-WG Chair and members
2. Review of the agenda
3. Review of IYS-WG Terms of Reference
4. Consideration of progress made at the NPSC Meeting including the 2018 IYS Launch
5. Consideration of NPAFC priorities and plans by IYS Research Theme/Science theme
 - a. Status of Pacific salmon and steelhead trout (status of salmon);
 - b. Pacific salmon and steelhead trout in a changing North Pacific Ocean (salmon in the salmosphere);
 - c. New technologies (new frontiers);
 - d. Management systems (human dimension); and
 - e. Integrated information systems (information systems).
6. Update on the First NPAFC-IYS Workshop on Pacific Salmon Production in a Changing Climate
7. Consideration of planning future workshops and symposia
8. Development of IYS Workplan including budget
9. Other
10. Summary and next steps

There was general support for the agenda among participants. However, it was noted that the Japanese proposal for Theme Counsel Groups should be revisited by the IYS Working Group and it was added to the agenda after “Consideration of progress made at the NPSC Meeting including the 2018 IYS Launch”.

Review of IYS-WG Terms of Reference

The IYS-WG Terms of Reference (Appendix B) were reviewed and the question was raised as to whether the NPAFC IYS-WG has some role in coordinating with the North Atlantic Salmon Conservation Organization (NASCO). Since the North Atlantic Steering Committee (NASC) and the Coordinating Committee (CC) agreed that two study groups would be formed, one for research and one for outreach, to coordinate at the hemispheric level, it was agreed that the IYS-WG Terms of Reference should be expanded to reflect these changes. There was consensus that the NPAFC IYS-WG should be connected to NASCO through the research and outreach study groups. Mark Saunders suggested that the research study group might include the Chair of the Science Sub-Committee for CSRS (currently Shigehiko Urawa), Hal Batchelder (PICES), and himself. No suggestions were made for membership of the outreach study group.

Consideration of Progress Made at the NPSC Meeting Including the 2018 IYS Launch

NPAFC IYS-WG participants discussed opening event activities for the IYS, which included a proposal for an IYS announcement at a side event of the Food and Agriculture Organization’s Committee on Fisheries (COFI) Meeting in July 2018, ministerial announcements by country, and opening events/activities across the hemisphere in the fall of 2018, including a large event in Vancouver, BC. There was general agreement that this was a good approach for the opening of the IYS, given the short time frame. There was some concern that the COFI announcement might overshadow the ministerial announcements and opening events in the fall of 2018. It was agreed that it should be clarified that the

COFI announcement is to inform higher levels of government about the IYS, while the ministerial announcements and opening events will be the main events for officially launching the IYS. IYS-WG members agreed that a circular letter will be sent to NPAFC members as soon as possible, detailing the plans to announce the IYS and asking the heads of delegation from each country to confirm when and how the ministerial announcement will take place. Several IYS-WG members suggested that the ministerial announcements could be tailored to each country, but they would all occur at the same time in their respective countries.

The circular letter will also include a request for countries to host opening events in conjunction with the event in Vancouver, BC and other events around the hemisphere that will occur in the same time frame during the fall of 2018. The Russian and Japanese delegations both acknowledged that other salmon-related annual events and festivals happening in their countries could be used to open the IYS in the fall of 2018. There was agreement that the IYS opening event in Vancouver should not just be a local event and it should include participants from all NPAFC member countries. It was suggested that there should be media presence from each country at this event, so they can distribute media materials back to their respective countries. The next step is to engage Jacques White (Long Live the Kings) and Brian Riddell (Pacific Salmon Foundation) to begin planning the Vancouver opening event.

Another topic that was briefly addressed was the integration of the IYS into conferences and symposia that are already being planned. The IYS is currently scheduled to host a session at the International Congress on the Biology of Fish in Calgary, AB in July of 2018, however, members determined that the timeline and budget were too tight for this to happen. The IYS has another option to host a session at the International Ornithological Congress in Vancouver, BC in August of 2018, but it was decided that the timeline was likely too tight for this as well. Jim Irvine suggested that a general poster for the IYS be prepared that can be presented at events like these by members of the IYS-WG.

Consideration of Japanese Proposal for Theme Counsel Groups

All parties supported the creation of four Theme Counsel Groups, instead of the proposed five groups. The Theme Counsel Groups will be as follows, according to the IYS themes:

1. Status of Salmon and Salmon in a Changing Salmosphere
2. Human Dimension
3. New Frontiers and Information Systems
4. Communication and Outreach

Some of the themes were combined into one counsel group to efficiently move forward with the research and outreach planning process. IYS-WG members also agreed that each Theme Counsel Group would have a Chair and a Vice-chair, and that these positions would be filled by one representative from the western Pacific and one from the eastern. However, there would be no requirement to have representation from all NPAFC member countries in each Theme Counsel Group. The IYS-WG Terms of Reference will be edited to reflect these changes. There was agreement that these groups needed to be formed as quickly as possible so that they could begin discussions on research and outreach planning before the 2018 NPAFC Annual Meeting.

Consideration of NPAFC Priorities and Plans by IYS Research Theme/Science Theme

Mark Saunders provided an overview of the ‘International Year of the Salmon Prospectuses by Theme’ discussion document (Appendix C), which aligns with the following 2016–2020 NPAFC Science Plan research themes:

- a. Status of Pacific salmon and steelhead trout (Status of salmon);

- b. Pacific salmon and steelhead trout in a changing North Pacific Ocean (Salmon in a changing salmosphere);
- c. New technologies (New frontiers);
- d. Management systems (Human dimension);
- e. Integrated information systems (Information systems)

There were some concerns raised about publishing this document since it contains names of people that have not yet been asked whether they would like to be involved in the IYS. It was clarified that this document, for the moment, is only for internal purposes within the NPAFC and NASCO and it will not be published in its current state. It was suggested that when listing people involved in each of the themes that the project(s) they are interested in also be noted.

Attention was then returned to the matter of advancing research and outreach planning as quickly as possible through the creation of Theme Counsel Groups. IYS-WG members agreed to ask each NPAFC member country to submit a discussion document on behalf of their country with major challenges and national research priorities for each of the Theme Counsel Groups. It was noted that these documents could be useful for the ministerial announcements in each country. Members also agreed to submit a list of candidates for the four Theme Counsel Groups from each country. Parties agreed to provide this information within one month after submission of the 2018 NPAFC IYS-WG Report so that these groups can be formed quickly and begin discussions before the 2018 NPAFC Annual Meeting. The intention would be to have a report developed by each of the Theme Counsel Groups to be presented at the NPAFC Annual Meeting in May 2018.

Update on the First NPAFC-IYS Workshop on Pacific Salmon Production in a Changing Climate

Workshop co-chair, Shigehiko Urawa, presented an update on the First NPAFC-IYS Workshop on Pacific Salmon Production in a Changing Climate, which will take place in Khabarovsk, Russia for two days following the 2018 NPAFC Annual Meeting. There are five topic sessions (status of Pacific salmon and steelhead trout, Pacific salmon and steelhead trout in a changing North Pacific Ocean, new technologies, management systems, and integrated information systems), based on the five IYS themes/NPAFC Science Plan research themes, and each will have a keynote presentation. However, there are currently no abstract submissions for the ‘New Frontiers/New Technologies’ theme. The workshop will also include a panel discussion on research priorities and international cooperation for the IYS initiative, which will be coordinated by the IYS-WG. It was agreed that each country will present their major challenges and national research priorities during a panel discussion. Members also agreed that it would be beneficial to invite some people from the Atlantic basin who are involved with the IYS to this workshop, however, the budget is too small to allow this in 2018. The second NPAFC-IYS Workshop will be scheduled in conjunction with the 2019 NPAFC Annual Meeting in Portland, Oregon. It was suggested that the IYS-WG be involved in planning this workshop.

Consideration of Planning Future Workshops and Symposia

With regards to future IYS workshops/symposia, it was noted again that the timeline and budget are too tight to hold an IYS session at the International Congress on the Biology of Fish in Calgary, AB in July of 2018. Suam Kim offered to present a general IYS poster at the PICES International Symposium on The Effects of Climate Change of the World’s Oceans in Washington, DC in June 2018.

Development of IYS Workplan

The IYS-WG reviewed the IYS Workplan for 2017/2018 and agreed that it should be updated for 2017/2018 based on the outcomes of this meeting. The 2017/2018 IYS Workplan is as follows:

- a. Participate in the North Pacific Steering Committee, including:
 - i. Development of research priorities, plans and fundraising strategies for IYS Outcomes and Signature projects.
 - ii. Provide direction to the Coordinating Committee in completion of the IYS brand, website and communications plans and use of logo/brand by partners and projects.
- b. Provide direction to and assist the Symposium Steering Committee in planning the opening Symposium/Congress.

The IYS Secretariat was tasked with updating the IYS Workplan for 2018/2019 and it will be agreed to by email correspondence.

Budget Discussion

A draft budget for 2018/2019 was presented to the IYS-WG (Appendix D), which totaled \$438,000 CAD. This proposed budget only included funding to plan and implement the IYS, including IYS Secretariat staff salaries. The proposal included the salary for an additional part-time Communications Officer. This budget did not include any funding for signature projects. It was noted that a budget of \$250,000 would allow the IYS Secretariat to maintain its basic function but the full \$438,000 would allow the IYS to move forward with planning for signature projects as the focal year approaches in 2019.

Participants commented that the 2019 NPSC meeting was missing from the budget, which would need to be more than \$17,000. The Salmon Ocean Ecology Meeting was one budget item that members suggested could be removed. It was agreed that logistical costs for the second NPAFC-IYS Workshop, in conjunction with the 2019 NPAFC Annual Meeting in Portland, Oregon, USA, should be included in the budget, in addition to travel funds for three keynote presenters. Overall, the total budget should not change, but the individual items should be adjusted to incorporate these changes.

A question was raised about how much money would be requested from F&A based on this budget, and the answer was unclear. It was agreed that this budget should be discussed among heads of delegation prior to the annual meeting. IYS-WG members agreed that the budget seemed like a reasonable approach, but it was unclear where this money would come from.

Other

Some final comments were made about the communication and outreach part of the IYS and the upcoming outreach workshop hosted by NASCO. It was noted that the statement of work for the key messages contract would be finalized by the week following the WG and NPSC meetings. Mark Saunders said he would like to engage both Rae Hull and Mark Glyde in future IYS communications discussions. A call for countries to identify potential participants in the upcoming outreach scoping workshop was made. Countries were also asked to identify whether they would be able to support travel, but NASCO also may be able to provide some funds. The Terms of Reference will be forwarded to all WG and NPSC members as soon as they are finalized.

Summary and Next Steps

In summary, the WG and NPSC meetings this week give the IYS momentum moving forward into the opening events in the summer/fall of 2018 and the focal year in 2019. IYS-WG members were reminded of the tasks to bring forward hypotheses for the cruise(s) and to take steps to plan for a multi-vessel survey in 2020. The Japanese delegation was acknowledged and thanked for their Theme Counsel Group Proposal, which will allow the IYS to move forward collaboratively and engage all countries in the NPAFC. The budget was acknowledged as a concern and something that needs to be addressed moving

forward. The IYS Secretariat will make progress as quickly as possible on the tasks at hand, including the outreach piece, with the website and social media development.

The meeting was concluded with members/participants sharing their final thoughts during a roundtable. The IYS and NPAFC Secretariat staff were acknowledged for their hard work leading up to and throughout the WG and NPSC meetings. Members/participants noted that there was lots of work to be done and still some significant concerns, such as the budget, but many were optimistic about the progress and the IYS moving forward.

Table 1. Participants of the International Year of the Salmon North Pacific Working Group Meeting Agenda (February 5 & 8, 2018, Vancouver, BC, Canada), listed in alphabetical order by last name.

	Name	Role	Organization	Country
1	Dick Beamish	Participant	DFO	Canada
2	Ryan Flagg	Participant	Ocean Networks Canada	Canada
3	Pavel Emelin	NPAFC Intern	NPAFC	Secretariat
4	Caroline Graham	NPAFC Intern/Rapporteur	NPAFC	Secretariat
5	Jim Irvine	IYS-WG & NPSC Member	DFO	Canada
6	Ha Na Kim	IYS-WG Member	Korea Fisheries Resources Agency	Korea
7	Ju Kyong Kim	IYS-WG & NPSC Member	Korea Fisheries Resources Agency	Korea
8	Suam Kim	IYS-WG Member	Pukyong National University Korea	Korea
9	Igor Melnikov	IYS-WG & NPSC Member	TINRO-Center	Russia
10	Chrys Neville	Participant	DFO	Canada
11	Dion Oxman	IYS-WG & NPSC Member	Alaska Department of Fish and Game	USA
12	Evgeny Pakhomov	Participant	University of British Columbia	Canada
13	Jeongseok Park	NPAFC Secretariat; NPSC Member	NPAFC	Secretariat
14	Vladimir Radchenko	NPAFC Secretariat; IYS Coordinating Committee Member	NPAFC	Secretariat
15	Sarah Robinson	NASCO Secretariat	NASCO	UK

16	Shunpei Sato	IYS-WG Member	Japan Fisheries Research and Education Agency	Japan
17	Mark Saunders	NPAFC Secretariat; IYS-WG Chair; NPSC Chair; IYS Coordinating Committee Co-Chair	NPAFC	Secretariat
18	Kengo Suzuki	IYS-WG & NPSC Member	Japan Fisheries Research and Education Agency	Japan
19	Shigehiko Urawa	IYS-WG Member; CSRS SSC Chair; 1 st NPAFC-IYS Workshop Co-chair	Japan Fisheries Research and Education Agency	Japan
20	Laurie Weitkamp	Participant (called in)	National Marine Fisheries Service	USA
21	Brian Wells	Participant (called in)	National Marine Fisheries Service	USA
22	Madeline Young	NPAFC Secretariat; IYS Coordinator	NPAFC	Secretariat
23	Aleksandr Zavolokin	Participant	NPFC	Japan

Appendix A

Draft Terms of Reference for Theme Counsel Groups

1. Under the Terms of Reference 2 (c) for the North Pacific Steering Committee (NPSC), Theme Counsel Groups (TCGs) are established for each of IYS themes:
 - Status of Salmon (TCG-1)
 - Salmon in a Changing Salmosphere (TCG-2)
 - New Frontiers (TCG-3)
 - Human Dimension (TCG-4)
 - Information Systems (TCG-5)

2. Each Theme Counsel Group shall consist of experts appointed from five member countries (Canada, Japan, Korea, Russia, and USA). The NPSC will designate a leader for each TCG. TCG leaders shall be a member of the NPSC, and facilitate communications among members and with the NPSC to satisfy the mandate.

3. Theme Counsel Group's mandate is to support the NPSC by:
 - Recommending research and outreach priorities, and outcomes for theme
 - Proposing/assembling research and outreach plans/projects for theme activities
 - Reporting status of research and outreach activities for theme
 - Maybe others.....

Appendix B

International Year of the Salmon Working Group (IYS WG) Terms of Reference

The working group is composed of one or more members from each Party, and subject to approval by the CSRS. The CSRS designates one official chairperson who shall preside over the working group and act as the primary representative for the working group. The working group will report annually to CSRS on progress of its work that will include proposed changes in membership.

The primary goal of the IYS WG is to coordinate the planning and implementation of the North Pacific elements of the International Year of the Salmon initiative.

Subject to approval by CSRS:

The IYS WG shall:

- Participate in the IYS Coordinating Committee and Symposium Steering Committee;
- With assistance from the NPAFC Secretariat, develop and coordinate the North Pacific Steering Committee for the IYS including the following: Develop outreach activities, engage core partners, review progress, identify research priorities, support fund-raising for research, and establish reporting procedures;
- Draft an annual work plan for planning, outreach and research activities including IYS activities of CSRS Working Groups;
- In the final year of the IYS initiative prepare a synthesis and review of all aspects of the IYS initiative.

Appendix C

International Year of the Salmon Prospectuses by Theme Discussion Document

List of Abbreviations

ADFG – Alaska Department of Fish and Game
AST – Atlantic Salmon Trust
CIMRS – Cooperative Institute for Marine Resource Studies
DFO – Fisheries and Oceans Canada
FIRA – Korea Fisheries Resources Agency
FNFC – First Nations Fisheries Council
FREA – Japan Fisheries Research and Education Agency
IASRB – International Atlantic Salmon Research Board
ICES – International Council for the Exploration of the Sea
INRA – French National Institute for Agricultural Research
IOF – Institute for oceans and Fisheries at the University of British Columbia
IOS – Institute of Ocean Sciences
IYS – International Year of the Salmon
LLTK – Long Live the Kings
NASCO – North Atlantic Salmon Conservation Organization
NIFS – National Institute of Fisheries Science in Korea
NGO – Non-governmental organization
NOAA – National Oceanic and Atmospheric Administration
NPAFC – North Pacific Anadromous Fish Commission
NWFSC – Northwest Fisheries Science Center
OSU – Oregon State University
PBS – Pacific Biological Station
PICES – North Pacific Marine Science Organization
PSC – Pacific Salmon Council
PSF – Pacific Salmon Foundation
ROAM – RAFOS Ocean Acoustic Monitoring
RPI – Rensselaer Polytechnic Institute
SFU – Simon Fraser University
TINRO – Pacific Scientific Research Fisheries Center in Russia
UAA – University of Alaska Anchorage
UAF – University of Alaska Fairbanks
UBC – University of British Columbia
UFFCA – Upper Fraser Fisheries Conservation Alliance
UINR – Unama’ki Institute of Natural Resources
UNB – University of New Brunswick
USGS – United States Geological Survey
UVic – University of Victoria
UW – University of Washington

STATUS OF SALMON

Theme/Outcome:

From Outline Proposal: To understand the present status of salmon and their environments.

From Planning Primer: The present status of salmon and their environments is understood.

Rationale:

Salmon are a keystone species and iconic indicators of ecological health. However, there is no centralized source of information on the status of salmon and their environment, or any consistent methodology for reporting and understanding these population and environmental variables. To effectively manage salmon, we must first be able to share the status of salmon and their environments in a consistent manner on an accessible platform. Then we can consider how this differs across watersheds, regions, countries, and the hemisphere, and we can begin to understand how to sustainably manage salmon at different scales and work towards the resiliency of both salmon and people.

Detailed Outcome:

The International Year of the Salmon (IYS) intends to bring together interested partners from across the salmosphere to create a platform for sharing data regarding the status of salmon and their environments that can be used to inform research, outreach, policy development, and management actions. This platform would be an open-access tool that utilizes different types of knowledge (local, scientific, traditional) to assess the overall status of salmon and their environments across the salmosphere. Furthermore, the IYS seeks to review approaches to assessing the status of salmon and their environments and promote a consistent methodology for measuring and reporting these variables. This would facilitate greater overall understanding of salmon and would allow the status of these species to be more easily tracked into the uncertain future.

Example Impact Measures Associated with Outcome:

- Percent of salmon populations whose status is reported using a consistent convention
- Percent of environmental and salmon data holdings available on an open common platform
- Percent of fisheries management plans informed by information on environmental variability
- Percent of data sets that use consistently collected and reported data on salmon status and environmental variables
- Number of annual reports on the status of salmon and their environments

Signature Projects:

1. Status of Salmon Information System – Standardization, collation, and visualization of salmon abundance, distribution, and productivity data in a thoughtfully-designed framework and interactive toolset. This will allow data exploration to generate and critically examine hypotheses about salmon population trends and features. Comparative studies across species, populations, life history types and stages will be the engine that drives deep understanding of linkages to climate and salmon productivity. **Hemisphere:** There is power in the common presentation of status across the hemisphere as a communication tool and scientific value in comparative data sets to increase the capacity to understand factors behind change. ICES has indicated a willingness to participate in the development of a workshop/symposium on the Status of Salmon.

STATUS: Requires project team to convene and scope project. Sue Grant with DFO prepared to

assist in the coordination. Pacific Salmon Foundation and DFO collaborating on Salmon Explorer tool. Interest from First Nations. Waiting on process to engage ICES and the International Atlantic Salmon Research Board.

2. Salmon Atlas – A new version of the Atlas of Pacific Salmon originally produced by the Wild Salmon Center has been proposed. This would be an expanded, web-based, and interactive version similar to the Salmon Explorer web tool, developed by the Pacific Salmon Foundation, that allows you to look at maps and graphs depicting salmon and habitat statuses in British Columbia. **Hemisphere:** There is a consensus for the need for this project in the Pacific and there is a similar project underway in the Atlantic. The new Salmon Atlas could be expanded to cover the entire salmosphere.

STATUS: General interest from the NP Steering Committee. Requires a project team to scope and look for funding. Could be visualization tool linked to Status of Salmon Information System.

3. Riverscape – A collective review of approaches to assessing the status of river basins and watersheds. There are a wide variety of approaches to assessing the status of watersheds across the salmosphere. New and emerging ideas utilize technology and engage Indigenous Peoples and citizen science. **Hemisphere:** Sharing and documenting best practices can better inform scientists and regulators.

STATUS: Project scoping meeting required to bring together DFO-Luedke/Hyatt, West Coast Aquatic- Tawney Lim, Pacific Salmon Foundation, NCEAS-State of Alaska Salmon and People (SASAP), US and Canadian Ocean Observing System organizations, ONC-interest in data systems to engage citizen science/Streamkeepers, USGS- Christian Torgersen (has EU contacts), NMFS Rich Zabel and potentially NASCO scientists.

Previous and Future Events:

Event	Date	Location	Notes
Workshop on Standardizing Methods for Assessing Salmon and Environmental Data	TBD	TBD	
Initial Meeting of Working Group for the Pacific Salmon Atlas	TBD	TBD	

Priorities Moving Forward:

1) DFO has indicated a willingness to lead this initiative and ICES has indicated a willingness to assist in the development of a State of Salmon workshop. There is the potential for a State of the Salmon component of the IYS opening events.

Funding Opportunities:

- Nippon Foundation: Status of Salmon Information System, Salmon Atlas
- Wall Foundation: Scoping Workshop for Standardizing Methods for Assessing Salmon and Environmental Data

SALMON IN A CHANGING SALMOSPHERE

Theme/Outcome:

From Outline Proposal: To understand and quantify the effects of natural environmental variability and anthropogenic factors affecting salmon distribution and abundance and to make projections of their future changes.

From Planning Primer: The effects of natural environmental variability and human factors affecting salmon distribution and abundance are understood and quantified.

Rationale:

As natural environmental variability, climate change and human actions continue to alter ecosystems, salmon face an uncertain future. In this time of rapid change, new insights are needed on how these changes will affect salmon to effectively manage what can be controlled and mitigate what cannot. Developing this understanding will be strengthened by communication and collaboration at a salmosphere level, because while some effects may be localized, very likely there are similar processes occurring across the salmosphere. If we can learn how the salmosphere is evolving to better predict changes, we can be adaptive and effective in managing these challenges to improve the resiliency of salmon and the people that depend on them.

Detailed Outcome:

The IYS seeks to bring together researchers across the salmosphere to share findings regarding the effects of the changing environment on salmon, due to both natural variability and human impacts. Through a series of high impact projects, the IYS aims to better understand what challenges salmon will face in the future in order to prepare people, such as Indigenous Peoples, policymakers, and managers, to meet those challenges. Projects such as a series of high seas research cruises in the North Pacific, a framework for identifying bottlenecks across salmon life history stages, and an examination of climate change and future projections in relation to salmon, will allow all concerned stakeholders to be more prepared for the future. By bringing people across the hemisphere together to work on understanding the changing salmosphere, the IYS aims to build partnerships and collaborations that will strengthen our overall understanding and ability to manage salmon into the future.

Example Impact Measures Associated with Outcome:

- Percent of management plans informed by future climate change projections
- Number of articles published from research done on high seas cruises associated with the IYS
- Number of salmosphere-level collaborative projects that results from planning workshops around the theme ‘Salmon in a Changing Salmosphere’
- Number of publications that incorporate/quantify uncertainty
- Percent of stock assessments that include ecosystem level information

Signature Projects:

1. Likely Suspects Framework – An accounting approach to identify likely bottlenecks across life history stages of salmon. The Likely Suspects is a framework under development by the Atlantic Salmon Trust that places candidate mortality factors within an overall spatio/temporal framework of Atlantic salmon throughout the smolt migration phase, both freshwater and marine, with a view to quantifying the potential of each factor to influence survival. The principle objective is to quantify the number of salmon that are dying on their initial migration and at sea, in comparison to earlier periods of higher marine survival, and to allocate these “lost” fish to the various known or hypothesised sources of mortality. A workshop was conducted in November 2017 to discuss

further development and refinement of the Likely Suspects concept, taking account of previous and on-going related research in the North Atlantic and the wider salmosphere, including the Pacific Basin. **Hemisphere:** Convergent development of this idea in both basins has resulted in a joint scoping workshop.

STATUS: Concluded scoping workshop, final report with recommendations for next steps are being written. The recommendations will include research project concepts for both NASCO and NPAFC and partners to consider.

2. Winter and summer high seas expeditions in the Pacific basin – There is an opportunity to make significant progress in understanding the marine life history period of Pacific salmon through an intensive coordinated research program in the North Pacific. Large scale winter and summer expeditions utilizing up to five research vessels deployed simultaneously across the North Pacific Ocean has been proposed to NPAFC as an IYS Signature Project. Information, including biological materials for salmon stock identification, data for abundance estimates, and structure of nektonic communities will be collected through the trawl surveys and supplemented by oceanographic, hydrobiological, and trophological studies in the summer-autumn season as well as the wintering period. The objective of these expeditions is to provide estimates of salmon spawning stock recruitment for 3–4 age cohorts of chum and sockeye salmon. These data can then be utilized for fishery forecasting in subsequent years. High seas cruises also represent a tremendous opportunity for outreach (e.g. live streaming). **Hemisphere:** Potential to collaborate on methods related to study of salmon on the high seas including methods and collections.

STATUS: Planning of high seas cruise(s) is underway and will be discussed at upcoming IYS Working Group meeting on February 5. Involve Oceans Networks Canada - integrated data system and outreach.

3. Salmon in the Future: Coupling climate and salmon – A small scoping workshop will be convened in April/May 2018 to bring 15–20 climate and salmon experts together to review the current state of knowledge with respect to the changes in climate driving factors and the underlying mechanisms in the salmosphere and consider the coupling mechanism between these drivers and salmon survival. At this workshop, research topics/projects which would be most likely to make significant improvements in the understanding of climate/salmon interactions and their consequences for salmon management. **Hemisphere:** Salmon populations particularly in the southern regions of their range in the Atlantic and Pacific basins have undergone comparable declines in productivity since the mid-1990s. Collaborative examination of the climate drivers affecting salmon in the past and the future will benefit from joint efforts. ICES and PICES strategic initiative on understanding climate impacts on ecosystems can be a potential mechanism.

STATUS: A short prospectus for scoping workshop has just been completed. Considering an informal meeting with Climate Sciences meeting participants (middle of Feb) may be an opportunity to obtain informal feedback from climate scientists on the idea.

4. Salmon in the Future: Other topics – A number of other topics are being explored by IYS partners in the North Pacific that could benefit from hemispheric collaboration, including: 1) the

impact of rising sea levels on salmon in coastal and estuarine ecosystems (J. Moore – SFU and Daniel Schindler UW and others with Moore Foundation Funding), 2) (J. Moore – SFU and Daniel Schindler UW and others with Moore Foundation Funding), the impact of glacier retreat on salmon, 3) the impact of changing estuarine habitats on salmon- this has some interesting linkages to dramatic changes in migrating shorebirds. Interest from Ornithological Congress in summer 2018 in convening a joint session, and 4) development of projections of salmon distribution and productivity – DFO Central and Arctic Scientist has been using Facebook to track movement of Atlantic Salmon into the Arctic (Karen Dunwall). NMFS surveying movement into the western Arctic (Ed Farley).

STATUS: As above

5. Aquaculture/wild interactions – Considerable research is being conducted in both the Atlantic (Licetrack ~Can\$1M) and Pacific basins examining the interaction of wild and open-net pen raised salmon with respect to pathogen transfer and the effect of sea lice. **Hemisphere:** Collaboration on this research could expedite increased understanding and implementation of solutions.

STATUS: The research programs in the two basins need to be compared and joint work scoped.

Previous and Future Events:

Event	Date	Location	Notes
Likely Suspects Workshop	November 7-9, 2017	Edinburgh, Scotland	
NPAFC-IYS Workshop on Pacific Salmon Production in a Changing Climate	May 26-27, 2018	Khabarovsk, Russia	In conjunction with NPAFC Annual Meeting; Objectives are to: (1) improve knowledge of the distribution, growth and survival of Pacific salmon in the ocean (current status); (2) increase understanding of the causes of variations in Pacific salmon production (mechanisms); (3) anticipate future changes in the production of Pacific salmon and the marine ecosystems producing them (e.g. modelling); and (4) promote IYS activities

Priorities Moving Forward:

- 1) Securing research vessels from 5 NPAFC member countries for Pacific high seas cruises in 2019.
- 2) Detailed planning and convening Salmon in the Future Scoping Workshop.

Funding Opportunities:

- Nippon Foundation: high seas research cruises
- Wall Foundation: Salmon in the Future Scoping Workshop

NEW FRONTIERS

Theme/Outcome:

From Outline Proposal: To develop new technologies and analytical methods to advance salmon science and to explore the uncharted regions of the salmosphere.

From Planning Primer: New technologies and analytical methods are advanced and applied to salmon research. Research is carried out to fill gaps in poorly studied regions of the salmosphere.

Rationale:

With so many recent advancements in technology and analytical methods, it is now possible to use these tools to make major advancements in understanding salmon and how the changing salmosphere is impacting them. From new telemetric methods of tracking salmon, to the use of environmental DNA, to isotope and otolith studies, there are groups of people across the salmosphere already doing this groundbreaking work. Their efforts can be linked and amplified through the IYS to more rapidly and efficiently realize their development and application to gaps in our understanding.

Detailed Outcome:

The IYS aims to further advances in new/emerging technologies and analytical methods that are immediately available to study salmon and understand their life history patterns and to better manage these species. The IYS seeks to facilitate collaboration between groups across the salmosphere who have similar research objectives and could benefit from developing and sharing new/emerging technology. These collaborations and advancements will enhance the ability, from a local to a salmosphere level, to effectively manage salmon for the resiliency of salmon and people into the future.

Example Impact Measures Associated with Outcome:

- Number of salmosphere-scale collaborative projects focusing on new/emerging technologies
- Number of novel analytical methods for studying salmon published under the umbrella of the IYS
- Number of collections of salmon scales and otoliths that are identified
- Percent of salmon researchers who understand and have access to otolith microchemistry laboratories
- Percent of salmon managers and researchers who understand the potential uses for genomics technologies to conduct genetic stock identification and have access to genomics tools and expertise to assess salmon condition

Signature Projects:

1. ROAM – ROAM is an example of a new telemetric tagging method to delineate migratory pathways of salmon at sea and explore causes of marine mortality. The concept is currently being explored by Atlantic researchers out of NOAA Fisheries, Woods Hole Oceanographic Institution, and the Atlantic Salmon Federation. Discussions are on going to determine the feasibility of implementing the method in the Pacific. **Hemisphere:** A small workshop will be hosted by Tim Sheehan (NMFS) in March of 2018 (Woods Hole, MA, U.S.A) to further explore this concept. He is interested in having several people from the Pacific attend to assist in developing the concept including its applicability to all salmon across the salmosphere.

STATUS: NPAFC hosted a webinar in the fall that was well attended by North Pacific researchers. There is a follow up meeting during January to consider questions about the feasibility of application from the north Pacific perspective and to ensure we have good

attendance from the N. Pacific at the workshop.

2. Salmon Genome Map Applied – Mapping the Atlantic salmon genome is as significant for salmon as mapping the human genome is for humans. We are all familiar with genetic stock ID tools that while available have been very expensive to apply. New microfluidic (tiny amounts of chemicals) high-throughput sequencers and robots allow us to cost-effectively determine stocks of origin in near-real time to inform research and new approaches to in-season management. Sequencing hatchery brood stock can effectively tag an entire release brood. eDNA has the potential to allow us to map the distribution and abundance of salmon from simple water samples collected in freshwater and marine environments. New chip technology can tell us what genes are turned on in fish to assess its physiological condition which will inform salmon management and forecasting. **Hemisphere:** Collaboration among government, academic, and private labs will expedite the development and application of these tools. There is potential for funding for hemispheric-scale research.

STATUS: Had initial discussions with Anita Mueller (Genome BC) and Nathan Taylor (DFO/PBS) – need to convene a small scoping workshop – ICES is holding a special session along a similar line that Nathan is participating in)

3. Advanced methods in telemetry. New tags and sensor arrays – In addition to the ROAM technology there are many possible modifications to existing telemetry arrays applied through SalSeaTrack and other initiatives on both coasts such as the Ocean Tracking network. Could gliders and buoys be effectively fitted with sensors? East coast just had a regional telemetry workshop but we did not connect in time to get Pacific folks out to the meeting. **Hemisphere:** A coordinated hemispheric push could address current limitations.

STATUS: Discussions with IASRB/SAG and IYS Steering Committee to strike a telemetry group.

4. CSI Salmon - Retrospective analyses of scale and otolith collections – Studies could link oceanographic data to growth patterns in the North Pacific as well as determine the past distribution of salmon in coastal and high seas using isotope ratios determined using microchemistry. Bone microchemistry to differentiate between stocks, characterize movement, and determine natal origin can be performed on expeditions as well as with historic collections. **Hemisphere:** The laboratory and intellectual capacity required to conduct this work is not universally available. Collaboration among pockets of expertise to refine methods and apply it to collections from both basins is an expedient use of resources. The project could be framed as a “forensics” project to gain the attention of the public and decision-makers.

STATUS: Dion Oxman (ADFG) prepared to assist in convening a workshop prospectus. Evgeny Pakhomov (UBC) very active in the field and chief scientist for the expedition.

Previous and Future Events:

Event	Date	Location	Notes
ROAM Webinar-Pacific Region	October 3, 2017	Online	Video available from NPAFC Secretariat
ROAM Workshop	March 13-15, 2018	Woods Hole, USA	Interested in attendance from Pacific region

Priorities Moving Forward:

1) Follow-up meeting on ROAM with Pacific researchers.

Potential Funding:

- Nippon Foundation: ROAM, other telemetry methods, CSI salmon
- Wall Foundation: Scoping for the Salmon Genome Map

HUMAN DIMENSION

Outcome:

Original (from Outline Proposal): To improve the resilience of people and salmon through the connection and collaboration of salmon-dependent communities, Indigenous Peoples, youth, harvesters and resource managers across the salmosphere.

Another Option: To improve the resilience of people and salmon by connecting salmon-dependent communities, Indigenous Peoples, youth, harvesters, and resource managers across the salmosphere to collaboratively find innovative and adaptive solutions to sustain salmon.

Rationale:

Since the wellbeing of salmon and people are inextricably linked, it is important that the IYS considers the human dimensions of our associations with salmon. Salmon are not only an important source of food to many people, they are also culturally significant and an important aspect of many coastal economies. As the global population and demand for salmon rises, while climate change alters ecosystems, there is increased uncertainty around the fate of salmon. Looking to the future, it will be imperative to create tools and frameworks for acting quickly and effectively to manage salmon on multiple levels, from local to hemispheric, so as to increase the resilience of both salmon and people.

Detailed Outcome:

The human dimension of the IYS seeks to involve all interested parties—researchers, managers, policymakers, Indigenous Peoples, harvesters, and the public—in collaborating to increase the resiliency of both salmon and people. The IYS strives to increase resiliency by developing innovative decision-making tools that incorporate multiple types of knowledge (scientific, local, traditional) and input from all stakeholders. Furthermore, by generating new and adaptive solutions to management, through strategies that incorporate multiple scales of governance and adaptive mechanisms that allow for fast action, the IYS seeks to leave a legacy of well-informed decision-makers that can effectively sustain, restore, and manage salmon. By facilitating conversations and collaboration across the salmosphere, people can work together to successfully manage salmon across all levels, from local to hemispheric.

Example Impact Measures Associated with Outcome:

- Percent of fisheries management plans informed by information on environmental variability
- Percent of fisheries management plans informed by roundtable discussions
- Percent of fisheries management plans that incorporate multiple types of knowledge

Signature Projects:

1. Deciding to Sustain Salmon (aka Watershed Governance) – The life history of salmon plays out across a spatial continuum of ecosystems from headwaters of river basins to the high seas. Their persistence demands that humans collectively manage the cumulative impacts of their interactions on salmon and their ecosystems along this same continuum. Collaborative processes to bring diverse interests together to plan activities in watersheds and coastal environments in a holistic manner are in place or being considered throughout the world. **Hemisphere:** There is an opportunity to compare processes throughout the hemisphere and draw attention to best practices. The European Union has a watershed governance pilot in four countries and we will be connecting with several pilot processes on Canada's west coast (i.e. West Coast Aquatic).

STATUS: Caroline developing prospectus for this project and scoping workshop. Mark engaging European Union and BC watershed governance processes.

2. Development of salmon fishery management systems for a changing world – Designing a modern salmon management system that draws on multiple types of knowledge (scientific, local, traditional), is prepared for high levels of uncertainty, and respects the needs and rights of Indigenous Peoples. Two symposia are already planned on managing salmon in a changing world, one for Atlantic salmon and a second for chum salmon in Japan.

Previous and Future Events:

Event	Date	Location	Notes
Sustainable Management of Chum in Changing Environments Symposium	March 26, 2018	Tokyo, Japan	Spring Annual Meeting of the Japanese Society of Fisheries Science; In order to endorse effective IYS projects, the present symposium will encourage to: (1) comprehend the vision of IYS program; (2) understand the present status of chum salmon populations and their habitats; (3) assess effects of environmental variability on chum salmon distribution and survival; (4) evaluate new research technologies to advance salmon science; and (5) identify future research topics associated with IYS for the forecast of chum salmon distribution and production, and their sustainable management.
Workshop on Managing the Atlantic salmon in a rapidly changing environment – management challenges and possible responses	June 2019	Norway	In conjunction with NASCO Annual Meeting; a half-day or two-day symposium to allow for identification of challenges specific to the North Atlantic salmon, to assist in clarifying the role NASCO can play in addressing them in the future and to provide a basis for a major outreach initiative to increase public and political awareness of these challenges
Strategies for Watershed Governance Workshop	March/April 2018	TBD	

Priorities Moving Forward:

- 1) Scoping a workshop on strategies for watershed governance in 2018 – including Nathan Young (UOttawa), FNFC, PSF – Brian Riddell, EU Water Initiative, POLIS- Oliver Brandes at UVic, and Tawney Lem
- 2) Working with Nathan Young, FNFC, Yukon Panel, Jaime Snook (Goose Bay, Labrador), Gord Sterritt (PSC FN Caucus), Shelley Denny, and Carl McLean (NASCO Commissioner) to connect Indigenous groups in order to document the cultural importance of salmon across the salmosphere
- 3) Scoping a strategy to define a modern management system—include Jennifer Nener (DFO) and First Nations connections identified in #2; Raoul and Urawa-san as conveners of management workshops

Potential Funding:

- Wall Foundation: Scoping Workshop for Watershed Governance

INFORMATION SYSTEMS

Theme/Outcome:

From Outline Proposal: To develop an integrated archive of accessible electronic data collected during the IYS and tools to support future research.

From Planning Primer: Freely available information systems that house and mobilize historic and current data about salmon and their environment

Rationale:

Currently, there is little information sharing and collaboration at the salmosphere level, despite the fact that there are hundreds of people and groups with similar goals working to conserve salmon. Even on smaller scales, such as national and regional, there can be minimal communication among people working towards the same goal. This can be partially attributed to the lack of centralized information systems which make data on science and management accessible to not only scientists and managers, but also the interested public. These kinds of systems can support collaborative efforts on a hemispheric scale to address common issues and face current and future challenges.

Detailed Outcome:

The IYS seeks to create an open-access information system(s) that will house and mobilize historic, current, and future data on salmon research and management for the entire salmosphere. This system(s) will incorporate multiple types of knowledge (scientific, local, traditional) and will integrate the management side as well. It will facilitate collaboration and data sharing around the salmosphere to enhance our capacity to understand and effectively conserve salmon. This will be one of the most important legacies of the IYS and leverage the collective capacity of the salmosphere to build a resilient future for salmon and people.

Example Impact Measures Associated with Outcome:

- Percent of environmental and salmon data holdings available on open-access information system(s)
- Number of individuals/organizations contributing to the information system
- Investment of time and funds in achieving 'Information Systems' objectives
- Number of publications using data that was downloaded from an open access platform
- Number of databases that have international standards applied

Signature Projects:

1. SalmosphereNet – Similar issues are faced by salmon across the salmosphere but there is minimal communication between Pacific and Atlantic researchers and managers. A project is currently underway by Fisheries and Oceans Canada to build an online network to connect people working on salmon-related issues across the country. DFO is also testing cloud-based software tools based on social media platforms that use artificial intelligence to link people, organizations and activities. Static networks tend to fail given the high investment in time and resources required with often limited utility for the user. **Hemisphere:** There is interest to expand this network to the salmosphere. It would facilitate rapid connection of researchers and managers with common interests.

STATUS: DFO is continuing scoping this project and will report out at the North Pacific Steering Committee.

2. Salmon Project Inventory – NASCO and its International Atlantic Salmon Research Board (IASRB) maintain an inventory of marine salmon projects. **Hemisphere:** A hemispheric inventory of salmon research, management and outreach projects would assist to connect researchers and result in faster transfer of new technologies and methods. NPAFC has been in discussion with a US company based in Portland, Oregon (<http://www.sitkatech.com/>) that specializes in high level tracking of projects using cloud-based systems.

STATUS: Need to have follow up conversation about how to move forward and who to consult.

Previous and Future Events:

Event	Date	Location	Notes

Priorities Moving Forward:

- 1) Convene scoping team for integrated information systems – State of Salmon and the expedition(s) might be a good place to focus – Kate Moran, Evgeny Pakhamov, Sue Grant, Genome Canada rep, Hal Batchelder PICES
- 2) Develop a scoping team for SalmosphereNet—Scott Akenhead, Jim Irvine, Rory Saunders, Kate Moran

Potential Funding:

- Nippon Foundation: SalmosphereNet, Salmon Project Inventory
- Wall Foundation: Scoping for the Salmosphere Net or Salmon Project Inventory

OUTREACH AND COMMUNICATION

Outcome:

From both Planning Primer: People understand the value of healthy salmon populations and engage to ensure salmon and their varied habitats are conserved and restored against the backdrop of increasing environmental change.

Rationale:

Salmon are very important ecologically, economically, and culturally, yet many people are unaware of the challenges they face and will continue to face into the future. An integral part of conserving salmon includes communicating the value of healthy salmon and healthy ecosystems to the wider public to motivate conservation and management efforts that will ensure the persistence of these keystone species far into the future. With a rapidly changing salmosphere and an uncertain future for these fish, the outreach and communications piece is vital to ensure that we are building resilient futures for salmon and people.

Detailed Outcome:

To disseminate important information on salmon and their environment, the IYS intends to facilitate an international outreach campaign regarding the status and future of salmon in a changing salmosphere. This outreach campaign will reach across the hemisphere to bring important information to not only scientists, policy-makers, managers, and harvesters, but also the public, regarding salmon and the challenges they face. This will be facilitated in multiple and innovative ways, such as through a website, social media, and videos/films, and will be facilitated in part by NGOs across the salmosphere committed to salmon conservation and sustainable management.

Example Impact Measures Associated with Outcome:

- Number of followers on social media sites: Facebook, Twitter, Instagram
- Number of people who visit the IYS website
- Number of NGO partners involved in the outreach campaign
- Increase in citizen science involvement
- Number of media outlets reporting on salmon and their habitat
- Number of news stories about the IYS and IYS projects

Signature Projects:

1. Coordinated international awareness campaign to be considered by Pacific and Atlantic NGO's – NASCO NGO's are prepared to be engaged in the IYS outreach and have requested that they be consulted in advance. Long Live the Kings in Seattle, Washington, has volunteered to lead coordination between Pacific NGOs.

STATUS: Proposal to the committees – NASCO will consider funding a workshop in March to develop an awareness campaign at the hemispheric level.

2. Media Campaign – Multiple production companies have expressed interest in collaborating with the IYS to produce various salmon-related media projects. One interested collaborator is the production company behind UNINTERRUPTED (<http://uninterrupted.ca/>), a cinematic spectacle on Pacific salmon that was projected onto Vancouver's Cambie Bridge nightly throughout the 2017 summer, reaching a total of 30,000 people. Another example is the National Film Board of Canada, with whom there have been initial discussions regarding a short film to be distributed

over social media. This short video is currently in the planning phase and will revolve around the “discovery” of salmon by local Vancouverites as they pass through an urban stream after a disappearance that lasted for decades. **Hemisphere:** The production groups are interested in international scope projects. Uninterrupted producers have been approached by cities such as London, England that are interested in hosting the production in some form. The NFB of Canada is interested in features on salmon that go beyond Canada and are willing to work with us on projects that include the Atlantic. They also have international partners.

STATUS: Follow-up scoping meeting required – potentially the March workshop noted in 1 above.

3. Social Media Campaign – Facebook, Twitter, and Instagram pages will enable the IYS to spread outreach messages and information about the IYS to a wide audience, and specifically targets a younger generation, who are the future scientists, managers, policy-makers, and harvesters. This campaign will be facilitated through the NPAFC and NASCO Secretariats.

STATUS: Facebook pages are ready to implement for IYS awareness; awaiting approval from committees.

Previous and Future Events:

Event	Date	Location	Notes
Website Launch	TBD	Online	http://yearofthesalmon.org

Priorities Moving Forward:

- 1) Launch the IYS website and social media pages (Facebook, Twitter, Instagram) to initiate the first phase of the IYS outreach campaign strategy
- 2) Convene follow-up meeting with Bill Wareham from the David Suzuki Foundation
- 3) Work with Brian Riddell and Jacques White on convening a meeting of NGOs to consider Pacific Basin and hemispheric collaboration on an awareness campaign, including an opening event linked to fundraising.

Potential Funding:

To be determined.

Appendix D

International Year of the Salmon Proposed Budget for 2018/2019

IYS Budget 2018/2019	FY 2018/19
Wages	
NP Director	\$101,088
NP Coordinator	\$63,479
NP Communications Officer (part-time)	\$27,560
Rounding	\$373
Total:	<u>\$192,500</u>
Travel to support IYS development	
Domestic travel	\$15,000
2019 NPAFC Annual Meeting and 2nd IYS Workshop Portland, Oregon (May) – Saunders/Young	\$6,000
2019 Face-to-Face IYS Coordinating Committee Meeting (date? Location?) – Radchenko/Saunders	\$8,000
2019 Salmon Ocean Ecology Meeting (March) – one person	\$ 3,000
Unanticipated travel based on partnership opportunities	\$20,000
Total:	<u>\$52,000</u>
IYS Planning	
Opening event(s) and IYS Symposia planning (5 year) – committee travel to face-to-face meeting (date?) (3 people)	\$10,000
Opening event(s) planning contract	\$10,000
“Status of salmon” planning	\$10,000
“Salmon in a changing salmosphere” planning (15K travel, 5K facilitation) (1) Salmon connections follow-up (2) Likely suspects follow-up	\$20,000
New Frontiers planning (some elements may be in workshop form) (July – September 2019; location?) (1) ROAM follow-up (10K) (2) Genomics project (25K) (3) Otolith microchemistry (25K)	\$60,000
“Information Systems” planning – development of a salmon intelligence network. (location? date?) (Facilitation \$5K, travel \$15K)	\$20,000

“Human Dimension” planning – small group meeting including Indigenous Peoples, managers, academics. (location? date?) (Facilitation \$5K, travel \$15K)	\$20,000
<u>Total</u>	<u>\$150,000</u>
IYS Administration and Operations	
NPAFC Communications: communication materials—brochures, posters, promotional items, advertising	\$15,000
IYS Website – additional items to add to contract	\$5,000
Supplies (\$10K), computers (\$4K), Office 365 (\$5K), phone bills (\$2K), misc. (\$2.5K)	\$23,500
<u>Total:</u>	<u>\$43,500</u>
<u>Grand Total</u>	<u>\$438,000</u>