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Abstracts of Scientific Documents Submitted to the Commission for the 2020 CSRS Meeting

by

NPAFC Secretariat

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Abstracts of Scientific Documents Submitted to the Commission for the 2020 CSRS Meeting

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Keywords: Pacific salmon, status of salmon and steelhead, North Pacific Ocean, technologies, management, information systems, NPAFC Science Plan, International Year of the Salmon (IYS)

This document is a compilation of abstracts of new and revised scientific documents submitted to the Commission between adjournment of the 2019 Annual Meeting and April 30, 2020. The compilation is organized into three sections.

Section 1 lists the document number and title according to the research themes in the NPAFC Science Plan 2016–2020 (Doc. 1665) to "understand variations in Pacific salmon productivity in a changing climate."

(1) Status of Pacific Salmon and Steelhead Trout
(2) Pacific Salmon and Steelhead Trout in a Changing North Pacific Ocean
(3) New Technologies
(4) Management Systems
(5) Integrated Information Systems

For convenience, one more topic was added:

(6) Other Topics

Individual documents may pertain to more than one topic and, therefore, may be listed more than once.

Section 2 lists the document number and title according to the country that submitted the document. Documents submitted by CSRS working groups are also listed in this section.

Section 3 lists abstracts of documents in order of document number.

Documents submitted during the specified time period include 41 new documents and two revised 2019 documents for a total of 43 documents. Including all the submitted documents (n=43), 22 documents related to status of Pacific salmon and Steelhead trout, 17 documents related to Pacific salmon and Steelhead trout in a changing North Pacific Ocean, 19 documents related to new technologies, nine documents related to management system, 11 documents related to integrated information systems, and 10 related to other topics. Of the 43 documents, eight were submitted by Canada, 11 by Japan, four by Korea, seven by Russia, 10 by the United States, and three by the Working Groups.

Section 1. Documents (number, title) Listed by Research Themes of the NPAFC Science Plan 2016–2020

1. Status of Pacific Salmon and Steelhead Trout

Doc. 1824 (Rev. 1) Proposed Otolith Marks for Brood Year 2019 Salmon in Japan
Doc. 1870 Preliminary Cruise Plan for the Second Gulf of Alaska Expedition
Doc. 1876 (Rev. 1) Biostatistical Information on Salmon Catches, Escapement and Enhancement Production in Russia in 2019
Doc. 1880 Microsatellite Identification of Sockeye Salmon Rearing in the South Central Bering Sea During Summer 2019
Doc. 1881 United States Cruise Plan for the Eastern Bering Sea Surface and Pelagic Trawl Survey, August–September 2020
Doc. 1884 Preliminary Statistics for 2019 Commercial Salmon Catches in Japan
Doc. 1885 Preliminary 2019 Salmon Enhancement Production in Japan
Doc. 1887 Proposed Otolith Marks for Brood Year 2020 Salmon in Japan
Doc. 1889 Japanese Bibliography in 2019 for NPAFC Science Plan
Doc. 1896 (Rev. 1) Canadian Salmon Catch and Enhanced Salmon Production in 2017–2019
Doc. 1897 Korean Salmon Catch Statistics and Hatchery Releases in 2019–2020
Doc. 1898 Korean Research Plan for Salmon in 2020
Doc. 1903 Russian Bibliography Publications Linked to the NPAFC Science Plan in 2019
Doc. 1904 Proposed Cruise Plans of Russian Research Vessels for Pacific Salmon Marine Life Period Studies in 2020
Doc. 1906 Canadian Juvenile Salmon Surveys in 2020–2021
Doc. 1907 Proposed Thermal Marks for Salmon from Canada, Brood Year 2020
Doc. 1908 Releases of Otolith Marked Salmon from Canada in 2019
Doc. 1909 United States National Research Plan 2020
Doc. 1910 Canadian Bibliography of Recent Publications Linked to the 2016–2020 NPAFC Science Plan
Doc. 1912 2020 Update on Canadian Research Relevant to the 2016–2020 NPAFC Science Plan
Doc. 1913 (Rev.1) Report of the 2020 International Year of the Salmon North Pacific Working Group Meeting
Doc. 1914 Report of the 2020 International Year of the Salmon North Pacific Steering Committee Meeting

2. Pacific Salmon and Steelhead Trout in a Changing North Pacific Ocean

Doc. 1870 Preliminary Cruise Plan for the Second Gulf of Alaska Expedition
Doc. 1881 United States Cruise Plan for the Eastern Bering Sea Surface and Pelagic Trawl Survey, August–September 2020
Doc. 1883 Results of 2019 Salmon Research by the *Oshoro maru*
Doc. 1888 The Summer 2019 Japanese Salmon Research Cruise of the R/V *Hokko maru*
Doc. 1889 Japanese Bibliography in 2019 for NPAFC Science Plan

Doc. 1892	Northern Bering Sea Surface Trawl and Oceanographic Survey Plan, 2020
Doc. 1893	Southeast Alaska Coastal Monitoring Survey: Salmon Trophic Ecology and Bioenergetics, 2018
Doc. 1894	Southeast Alaska Coastal Monitoring Survey Cruise Report, 2018
Doc. 1895	Southeast Alaska Coastal Monitoring Survey Plan, 2020
Doc. 1896 (Rev. 1)	Canadian Salmon Catch and Enhanced Salmon Production in 2017–2019
Doc. 1898	Korean Research Plan for Salmon in 2020
Doc. 1903	Russian Bibliography Publications Linked to the NPAFC Science Plan in 2019
Doc. 1909	United States National Research Plan 2020
Doc. 1910	Canadian Bibliography of Recent Publications Linked to the 2016–2020 NPAFC Science Plan
Doc. 1912	2020 Update on Canadian Research Relevant to the 2016–2020 NPAFC Science Plan
Doc. 1913 (Rev.1)	Report of the 2020 International Year of the Salmon North Pacific Working Group Meeting
Doc. 1914	Report of the 2020 International Year of the Salmon North Pacific Steering Committee Meeting

3. New Technologies

Doc. 1833 (Rev. 1)	Proposed Otolith Marks for Brood Year 2019 Salmon in Russia
Doc. 1870	Preliminary Cruise Plan for the Second Gulf of Alaska Expedition
Doc. 1878	Proposed Thermal Marks for Brood Year 2020 Salmon in Alaska
Doc. 1879	Releases of Otolith Marked Salmon from Alaska in 2019
Doc. 1886 (Rev. 1)	Releases of Otolith Marked Salmon from Japan between Summer of 2018 and Spring of 2019
Doc. 1889	Japanese Bibliography in 2019 for NPAFC Science Plan
Doc. 1890	High Seas Salmonid Coded-Wire Tag Recovery Data, 2012, 2018
Doc. 1898	Korean Research Plan for Salmon in 2020
Doc. 1899	Otolith Thermal Mark for Brood Year 2019 and Proposed Thermal Marks for Brood Year 2020
Doc. 1900	Population Genetic Structure of Chum salmon, *Oncorhynchus keta*, in Korea
Doc. 1901	Release of Marked Salmon from Russian Hatcheries in 2019
Doc. 1902	Proposed Otolith Marks for Brood Year 2020 Salmon in Russia
Doc. 1903	Russian Bibliography Publications Linked to the NPAFC Science Plan in 2019
Doc. 1909	United States National Research Plan 2020
Doc. 1910	Canadian Bibliography of Recent Publications Linked to the 2016–2020 NPAFC Science Plan
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Doc. 1916	Recoveries of High Seas Tags and Tag Releases from High Seas Research Vessel Surveys in 2019

4. Management Systems

Doc. 1870	Preliminary Cruise Plan for the Second Gulf of Alaska Expedition
Doc. 1889	Japanese Bibliography in 2019 for NPAFC Science Plan
Doc. 1898	Korean Research Plan for Salmon in 2020
Doc. 1903	Russian Bibliography Publications Linked to the NPAFC Science Plan in 2019
Doc. 1909	United States National Research Plan 2020
Doc. 1910	Canadian Bibliography of Recent Publications Linked to the 2016–2020 NPAFC Science Plan
Doc. 1912	2020 Update on Canadian Research Relevant to the 2016–2020 NPAFC Science Plan
Doc. 1913 (Rev.1)	Report of the 2020 International Year of the Salmon North Pacific Working Group Meeting
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5. Integrated Information Systems

Doc. 1870	Preliminary Cruise Plan for the Second Gulf of Alaska Expedition
Doc. 1889	Japanese Bibliography in 2019 for NPAFC Science Plan
Doc. 1890	High Seas Salmonid Coded-Wire Tag Recovery Data, 2012, 2018
Doc. 1898	Korean Research Plan for Salmon in 2020
Doc. 1903	Russian Bibliography Publications Linked to the NPAFC Science Plan in 2019
Doc. 1909	United States National Research Plan 2020
Doc. 1910	Canadian Bibliography of Recent Publications Linked to the 2016–2020 NPAFC Science Plan
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Doc. 1916	Recoveries of High Seas Tags and Tag Releases from High Seas Research Vessel Surveys in 2019

6. Other Topics

Doc. 1874 (Rev. 1)	Proposed Cruise Plans of Japanese Research Vessels for Salmon in the North Pacific Ocean in 2020
Doc. 1875	Cruise Plans of Japanese Research Vessels Involving Incidental Takes of Anadromous Fish in the North Pacific Ocean in 2020
Doc. 1882	Incidental Catches of Anadromous Fishes by Japanese Research Vessels in the North Pacific Ocean in 2019
Doc. 1889	Japanese Bibliography in 2019 for NPAFC Science Plan
Doc. 1891	Incidental Catches of Salmonids by U.S. Groundfish Fisheries in the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1990–2019
Doc. 1898	Korean Research Plan for Salmon in 2020
Doc. 1903	Russian Bibliography Publications Linked to the NPAFC Science Plan in 2019

Doc. 1905	Cruise Plan of Russian Research Vessel *TINRO* Involving Incidental Takes of Anadromous Fish in the North Pacific Ocean in 2020
Doc. 1913 (Rev.1)	Report of the 2020 International Year of the Salmon North Pacific Working Group Meeting
Doc. 1914	Report of the 2020 International Year of the Salmon North Pacific Steering Committee Meeting

Section 2. Documents (number, title) Listed by Country or Other Sources

Canada

Doc. 1870	Preliminary Cruise Plan for the Second Gulf of Alaska Expedition
Doc. 1880	Microsatellite Identification of Sockeye Salmon Rearing in the South Central Bering Sea During Summer 2019
Doc. 1896 (Rev. 1)	Canadian Salmon Catch and Enhanced Salmon Production in 2017–2019
Doc. 1906	Canadian Juvenile Salmon Surveys in 2020–2021
Doc. 1907	Proposed Thermal Marks for Salmon from Canada, Brood Year 2020
Doc. 1908	Releases of Otolith Marked Salmon from Canada in 2019
Doc. 1910	Canadian Bibliography of Recent Publications Linked to the 2016–2020 NPAFC Science Plan
Doc. 1912	2020 Update on Canadian Research Relevant to the 2016–2020 NPAFC Science Plan

Japan

Doc. 1824 (Rev. 1)	Proposed Otolith Marks for Brood Year 2019 Salmon in Japan
Doc. 1874 (Rev. 1)	Proposed Cruise Plans of Japanese Research Vessels for Salmon in the North Pacific Ocean in 2020
Doc. 1875	Cruise Plans of Japanese Research Vessels Involving Incidental Takes of Anadromous Fish in the North Pacific Ocean in 2020
Doc. 1882	Incidental Catches of Anadromous Fishes by Japanese Research Vessels in the North Pacific Ocean in 2019
Doc. 1883	Results of 2019 Salmon Research by the *Oshoro maru*
Doc. 1884	Preliminary Statistics for 2019 Commercial Salmon Catches in Japan
Doc. 1885	Preliminary 2019 Salmon Enhancement Production in Japan
Doc. 1886 (Rev. 1)	Releases of Otolith Marked Salmon from Japan between Summer of 2018 and Spring of 2019
Doc. 1887	Proposed Otolith Marks for Brood Year 2020 Salmon in Japan
Doc. 1888	The Summer 2019 Japanese Salmon Research Cruise of the R/V *Hokko maru*
Doc. 1889	Japanese Bibliography in 2019 for NPAFC Science Plan

Republic of Korea

Doc. 1897	Korean Salmon Catch Statistics and Hatchery Releases in 2019–2020
Doc. 1898	Korean Research Plan for Salmon in 2020
Doc. 1899	Otolith Thermal Mark for Brood Year 2019 and Proposed Thermal Marks for Brood Year 2020
Doc. 1900	Population Genetic Structure of Chum salmon, *Oncorhynchus keta*, in Korea

Russia

Doc. 1833 (Rev. 1)	Proposed Otolith Marks for Brood Year 2019 Salmon in Russia
Doc. 1876 (Rev. 1)	Biostatistical Information on Salmon Catches, Escapement and Enhancement Production in Russia in 2019
Doc. 1901	Release of Marked Salmon from Russian Hatcheries in 2019
Doc. 1902	Proposed Otolith Marks for Brood Year 2020 Salmon in Russia
Doc. 1903	Russian Bibliography Publications Linked to the NPAFC Science Plan in 2019
Doc. 1904	Proposed Cruise Plans of Russian Research Vessels for Pacific Salmon Marine Life Period Studies in 2020
Doc. 1905	Cruise Plan of Russian Research Vessel *TINRO* Involving Incidental Takes of Anadromous Fish in the North Pacific Ocean in 2020

United States

Doc. 1878	Proposed Thermal Marks for Brood Year 2020 Salmon in Alaska
Doc. 1879	Releases of Otolith Marked Salmon from Alaska in 2019
Doc. 1881	United States Cruise Plan for the Eastern Bering Sea Surface and Pelagic Trawl Survey, August–September 2020
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Doc. 1891	Incidental Catches of Salmonids by U.S. Groundfish Fisheries in the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1990–2019
Doc. 1892	Northern Bering Sea Surface Trawl and Oceanographic Survey Plan, 2020
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Doc. 1894	Southeast Alaska Coastal Monitoring Survey Cruise Report, 2018
Doc. 1895	Southeast Alaska Coastal Monitoring Survey Plan, 2020
Doc. 1909	United States National Research Plan 2020

CSRS Working Groups

Doc. 1913 (Rev.1)	Report of the 2020 International Year of the Salmon North Pacific Working Group Meeting
Doc. 1914	Report of the 2020 International Year of the Salmon North Pacific Steering Committee Meeting
Doc. 1916	Recoveries of High Seas Tags and Tag Releases from High Seas Research Vessel Surveys in 2019

Section 3. Document Abstracts (numerical order)

Doc. 1824 (Rev. 1) **Proposed Otolith Marks for Brood Year 2019 Salmon in Japan**
Kazuyuki Yamaya, Motoyasu Kuwaki, and Shigehiko Urawa

Japan plans to mark approximately 375 million salmon of the 2019 brood year (232 million chum, 138 million pink, 4.0 million masu, and 150 thousand sockeye salmon) using 152 discrete thermal patterns and two ALC (alizarin complexone) patterns at 54 hatcheries. Two rings in the first band are adopted as the base mark to distinguish Japanese chum and pink salmon from other stocks.

Doc. 1833 (Rev. 1) **Proposed Otolith Marks for Brood Year 2019 Salmon in Russia**
Elena Akinicheva, Vladimir Volobuev, and Maksim Myakishev

Mass marking of juvenile salmon is an important instrument that allows evaluating a rate of survivability of hatchery-raised salmon after their seaward run from the rivers into the seashore area, and studying the ways of migration and fry salmon distribution in the Sea of Okhotsk and areas of fattening in the ocean. Moreover, otolith marking allows determining the effectiveness of hatcheries' work by looking at the amount of returned hatchery fish.
Otolith marking of salmon of 2019 brood year will be conducted in five regions of the Far East: Kamchatka, Magadan, Sakhalin, Khabarovsk, Kuril and Primorsky regions.
This document reports the otolith mark patterns applied to hatchery-raised salmon stocks released in Russia during 2019.

Doc. 1870 **Preliminary Cruise Plan for the Second Gulf of Alaska Expedition**
Richard J. Beamish and Brian E. Riddell

The second Gulf of Alaska expedition is planned for March–April 2020. The ship will be the Canadian commercial trawler, the *Pacific Legacy* which is 37 m long, 10 m beam with a draft of 6.0 m and a gross tonnage of 600, with 2600 hp. It has modern accommodations for 15 researchers. It is planned to have participants from Canada, Japan, Korea, United States and Russia. The set locations will be similar to the first expedition, with more stations within the Canadian and United States EEZ. There also will be deeper sets. Sampling will be similar with limited oceanographic sampling. All data will be publicly available through arrangements with the Tula Foundation. Funding for the expedition was available through government organizations, foundations, the commercial fishing industry and private donations. The Pacific Salmon Foundation is the supporting agency and will manage the financial aspects. The expedition will be a contribution to the International Year of the Salmon and coordinated with the North Pacific Anadromous Fish Commission. We are confident that the results of both expeditions will demonstrate the value of this research and the value of continuing these surveys to monitor ocean changes and impacts of rearing Pacific salmon.

Doc. 1874 (Rev. 1) **Proposed Cruise Plans of Japanese Research Vessels for Salmon in the North Pacific Ocean in 2020**
Shunpei Sato, Kengo Suzuki, Shigehiko Urawa, and Masa-aki Fukuwaka

Two Japanese research vessels are scheduled to conduct four high-seas salmon surveys in 2020. The *Hokko maru* will carry out two salmon research survey in the western North Pacific Ocean between early June and early July. The *Hokko maru* will also carry out a summer monitoring survey for salmon and their habitat in the central Bering Sea during middle July to early August. The *Hokuho maru* will conduct salmon research in central and western North Pacific Ocean from early June to late July.

Doc. 1875 **Cruise Plans of Japanese Research Vessels Involving Incidental Takes of Anadromous Fish in the North Pacific Ocean in 2020**
Japan Fisheries Research and Education Agency

Japanese research vessels (Appendix table) are scheduled to conduct six surveys for pelagic fishes and squids in the North Pacific Ocean in 2020 (Table 1). These surveys have a possibility of incidental salmon catch during the fishing operations with driftnets or trawl net. In the case of driftnet operation, the length of driftnets will be less than 2.5 km at the sea.

Doc. 1876 (Rev. 1) **Biostatistical Information on Salmon Catches, Escapement and Enhancement Production in Russia in 2019**
N.V. Klovach, O.S. Temnykh, V.A. Shevlyakov, S.V. Naydenko, A.V. Lysenko, A.V. Bugaev, A.M. Kaev, A.V. Yamborko, V.I. Ostrovsky, and E.V. Golub.

Salmon catch (commercial, subsistence, and sport catch), average weights, hatchery releases, and escapement statistics for 2019 are provided.

Doc. 1878 **Proposed Thermal Marks for Brood Year 2020 Salmon in Alaska**
Dion S. Oxman

In Alaska, mass-marking of salmon using otolith thermal marking is an effective research and management tool applicable to a variety of situations. For brood year 2020, approximately 63 million sockeye, 1 billion pink salmon, 837 million chum, 18 million Coho, and 9 million Chinook salmon will be marked at 27 different hatcheries using 116 thermal marks, seven dry marks, one salt, and one strontium mark.

Doc. 1879 **Releases of Otolith Marked Salmon from Alaska in 2019**
Dion S. Oxman

In Alaska, mass-marking of salmon using otolith thermal marking is an effective research and management tool for a variety of situations. This document reports the otolith mark patterns applied to hatchery-raised salmon stocks released in Alaska during 2019. It includes five species of salmon from brood years 2017 and 2018. Release numbers, mark patterns, and release locations are summarized.

Doc. 1880 **Microsatellite Identification of Sockeye Salmon Rearing in the South Central Bering Sea during Summer 2019**
Terry D. Beacham, Eric B. Rondeau, and S. Sato

Stock composition of sockeye salmon (*Oncorhynchus nerka*) caught in the southern central Bering Sea during a Japanese research cruise in the summer of 2019 was estimated through an analysis of microsatellite variation. Variation at 14 microsatellites was analyzed for immature sockeye salmon, and a 415-population baseline spanning Japan, Russia, Alaska, Canada, and Washington State was used to determine the stock composition of the fish sampled. Alaskan-origin sockeye salmon were the most abundant in the catch of immature individuals, comprising 90.4% of all sockeye salmon caught, with the catch dominated by sockeye salmon of Bristol Bay origin (82.0%). Russian-origin sockeye salmon accounted for 2.9% of the catch, while Canadian-origin salmon accounted for an average of 6.6% of the catch, with 388 individuals of the catch genotyped.

Doc. 1881 **United States Cruise Plan for the Eastern Bering Sea Surface and Pelagic Trawl Survey, August–September 2020**
Alexander G. Andrews III and Elizabeth C. Siddon

This cruise plan outlines the dates, locations, and activities of a fisheries oceanographic survey conducted in the eastern Bering Sea during late summer and fall 2020. This survey is in part a

continuation of the Bering Aleutian Salmon International Survey (BASIS). The primary objectives are to collect biological information on important fish species and describe the physical and biological oceanographic conditions in the southeastern Bering Sea.

Doc. 1882 **Incidental Catches of Anadromous Fishes by Japanese Research Vessels in the North Pacific Ocean in 2019**

Shunpei Sato, Kengo Suzuki, and Shigehiko Urawa

Japanese research vessels conducted scientific fishing operations to assess stock status of Pacific saury, and other pelagic fishes and squids using surface and midwater trawls, and drift gillnets in the western and central North Pacific Ocean (Japan Fisheries Research and Education Agency 2019). A total of 225 salmon including 127 chum, 91 pink, three Chinook salmon, two coho, and two steelhead trout was incidentally caught during the research surveys between May and October 2019 (Table 1).

Doc. 1883 **Results of 2019 Salmon Research by the *Oshoro maru***

Taichi Sato, Keiichiro Sakaoka, Naoki Hoshi, Keiri Imai, Maki Ohwada, Kenji Oguma, Kouki Sawada, and Shogo Takagi

In order to accumulate oceanographic and biological data (including salmonids) and to clarify the oceanic structure and marine ecosystem, T/V *Oshoro maru* conducted oceanographic observations and fishing surveys in the western North Pacific (along the 155°E longitude line). The survey was conducted during the Cruise #071 in May 2019.

Oceanographic observations and a drift gillnet surveys were conducted along the 155°E during the Cruise #071.

We were able to conduct three gillnet surveys at three different stations, whereas only one survey was conducted in 2018. A total of 721 salmonids was caught by the survey, including 699 pink, 21 chum and one coho salmon. Other species such as steelhead and sockeye salmon were not caught during the cruise. The fork lengths (F.L.) of pink salmon collected by C-gear gillnet were all adult fish ranging between 308-497 mm.

To collect salmon samples including fresh salmon blood, otoliths and various tissues extensively four hook-and-line gear samplings were conducted during the Cruise #071.

Doc. 1884 **Preliminary Statistics for 2019 Commercial Salmon Catches in Japan**

Yukiharu Gohda and Toshihiko Saito

The preliminary commercial salmon catches in coastal and offshore areas of Japan in 2019 totaled 18.5 million fish (59.5 thousand metric tonnes), including 17.1 million chum (55.9 thousand metric tonnes) and 1.4 million pink (2.1 thousand metric tonnes) salmon (Tables 1, 2), which were compiled by HNFRI. The official specific statistics data may be available by the end of March 2021.

Doc. 1885 **Preliminary 2019 Salmon Enhancement Production in Japan**

Hiroaki Fukuzawa and Yukiharu Gohda

Four species of anadromous Pacific salmon (chum, pink, masu, and sockeye salmon) are currently enhanced in Japan. A total of 1,918 million fry, juveniles and smolts were released from Japanese hatcheries in 2019 (Tables 1 and 2). Number of chum salmon fry released in the spring of 2019 was approximately 1,780 million fish. Japanese hatcheries also released 130 million pink salmon fry, 7,725 thousand masu salmon fry, juveniles and smolts, and 184 thousand sockeye salmon fry and smolts in the spring and fall of 2019.

In 2019, the number of adult salmon captured in rivers along the Japanese coasts was 3,085 thousand fish (Table 3), which corresponded to 9,540 metric tonnes in weight (Table 4). The dominant and second dominant species were chum and pink salmon, contributing 92.5% and

7.2% in numbers of all salmon captured in rivers, respectively. Adult masu salmon occur in rivers of both Hokkaido and Honshu, but number of catches was not available in Honshu. The number of adult masu salmon caught in rivers of Hokkaido was approximately 9.0 thousand fish. Anadromous sockeye salmon were caught in two rivers along the Pacific coast of Hokkaido, where the number of catches was 2,192 fish.

Doc. 1886 (Rev. 1) **Releases of Otolith Marked Salmon from Japan between Summer of 2018 and Spring of 2019**

Kazuyuki Yamaya, Motoyasu Kuwaki, Shigehiko Urawa, and Shunpei Sato

This document provided information of Japanese otolith mark releases, including release site, date, number, and mark patterns with images. From July 2018 to June 2019, approximately 261 million chum, 130 million pink, 3 million masu, and 55 thousand sockeye salmon (2018 brood year) with thermal marks or ALC (alizarin complexone) patterns were released or stocked in Japan. In addition, 381 thousand masu salmon smolts and 80 thousand sockeye salmon smolts (2017 brood year) with thermal marks or ALC patterns were released in the spring of 2019. In the summer and fall of 2018, 429 thousand masu salmon juveniles and 50 thousand sockeye salmon juveniles (2017 brood year) with thermal marks were also released. Two thermal rings as base mark were adopted to distinguish Japanese chum and pink salmon from other stocks. The data are uploaded to the database on the website of NPAFC Working Group on Salmon Marking (http://wgosm.npafc.org/).

Doc. 1887 **Proposed Otolith Marks for Brood Year 2020 Salmon in Japan**

Kazuyuki Yamaya, Motoyasu Kuwaki, Shigehiko Urawa, and Shunpei Sato

Japan plans to mark approximately 364 million salmon of the 2020 brood year (222 million chum, 138 million pink, 3.5 million masu, and 110 thousand sockeye salmon) using 151 discrete thermal patterns and two ALC (alizarin complexone) patterns at 51 hatcheries. Two rings in the first band are adopted as the base mark to distinguish Japanese chum and pink salmon from other stocks.

Doc. 1888 **The Summer 2019 Japanese Salmon Research Cruise of the R/V *Hokko maru***

Kentaro Honda, Tomoki Sato, Yui Minowa, Ryosuke Ohashi, Takaaki Abe, Mitsuki Kuroda, Kenta Ueda, Kengo Suzuki, and Shunpei Sato

A summer high-seas research cruise to investigate the biology of Pacific salmon was conducted from 22 July to 1 August 2019 in the Bering Sea aboard the Japanese research vessel *Hokko maru*. Research cruise activities included the collection of data on oceanography, zooplankton, micronekton, salmonids, and other organisms. A total of 3,352 salmonids were caught by surface trawls and hook-and-lines at 17 monitoring stations. Among salmonids caught by trawls, chum salmon was the most abundant species (n = 2,548, 79.0%), followed by sockeye salmon (n = 618, 19.2%), Chinook salmon (n = 32, 0.99%), pink salmon (n = 21, 0.65%), and coho salmon (n = 6, 0.19%). Salmonids were measured with respect to fork length and body and gonad weights by sex, and the scales were removed for age determination. Isotope, genetic, otolith, stomach, and seawater (for environmental DNA analysis) samples were obtained for future study. A total of 44 chum salmon equipped with an archival tag were released in the Bering Sea. Age-specific catch per unit effort by surface trawl and annual mean body weight of each ocean age of chum salmon during 2007–2019 are documented here.

Doc. 1889 **Japanese Bibliography in 2019 for NPAFC Science Plan**

Shunpei Sato, Masa-aki Fukuwaka, and Shigehiko Urawa

This bibliography listed original papers and documents published in 2019 by Japanese scientists and/or their collaborators to review Japanese national researches for the 2016-2020 NPAFC Science Plan. The bibliography includes 62 articles with abstracts, corresponding to five research themes of the NPAFC Science Plan.

Doc. 1890 **High Seas Salmonid Coded-Wire Tag Recovery Data, 2012, 2018**

Michele M. Masuda, Vanessa J. Tuttle, and Thomas Holland

Information on high seas recoveries of salmonids (*Oncorhynchus* spp.) tagged with coded-wire tags (CWTs) has been reported annually to the International North Pacific Fisheries Commission (1981–1992) and to the North Pacific Anadromous Fish Commission (1993–present). Data from these CWT recoveries are also reported to the Regional Mark Processing Center (RMPC, http://www.rmpc.org) of the Pacific States Marine Fisheries Commission (PSMFC) for inclusion in their Regional Mark Information System (RMIS) database. This document lists recovery data for 325 coded-wire tagged salmonids not previously reported to the PSMFC/RMPC RMIS database. These CWTs were recovered from 1) the U.S. groundfish trawl fisheries in the Gulf of Alaska (GOA) as sampled by observers from the North Pacific Observer Program (NPOP) (68 Chinook salmon [*O. tshawytscha*] in 2018 and 1 previously unreported Chinook salmon from 2012), 2) the U.S. rockfish trawl fishery in the central GOA in 2018 (27 Chinook salmon), 3) the U.S. groundfish trawl fisheries in the eastern Bering Sea-Aleutian Islands as sampled by NPOP observers in 2018 (17 Chinook salmon), and 4) the U.S. at-sea Pacific hake (*Merluccius productus*) trawl fishery in the North Pacific Ocean off Washington and Oregon in 2018 (212 Chinook salmon) as sampled by observers from the At-Sea Hake Observer Program.

Doc. 1891 **Incidental Catches of Salmonids by U.S. Groundfish Fisheries in the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1990–2019**

Gwynne M. Schnaittacher and Renold E. Narita

This report presents the estimated incidental catches and average weights of Pacific salmonids in U.S. groundfish fisheries off Alaska from 1977 through 2019. Estimated annual incidental salmon catches (all species combined) in 2019, were 390,126 salmon in the Bering Sea/Aleutian Islands (BSAI) and 30,300 salmon in the Gulf of Alaska (GOA).

Annual estimated numbers of Chinook salmon (*Oncorhynchus tshawytscha*) incidentally caught in the U.S. groundfish fisheries in the BSAI, have ranged from 8,222 individuals in 2000 to 130,000 individuals in 2007 and the annual average weight has ranged from 2.44 kg in 2016 to 5.21 kg in 1995. Annual estimated numbers of non-Chinook salmon have ranged from 14,417 individuals in 2010 to 715,628 individuals in 2005. Chum salmon (*O. keta*) typically account for over 95% of the non-Chinook salmon catch with an annual average chum salmon weight ranging from 1.82 kg in 2019 to 3.43 kg in 1995.

In the U.S. groundfish fisheries in the GOA, annual estimated numbers of Chinook salmon incidentally caught have ranged from 8,475 individuals in 2009 to 54,696 in 2010 and the annual average weight has ranged from 1.77 kg in 2019 to 4.60 kg in 1991. Annual estimated numbers of non-Chinook salmon have ranged from 1,274 individuals in 2012 to 64,792 in 1995. Chum salmon typically account for over 95% of the non-Chinook salmon catch where the annual average chum salmon weight has ranged from 2.16 kg in 1993 to 4.87 kg in 1999.

Incidental catches of Pacific salmonids in foreign and joint venture groundfish fisheries off Alaska are presented for 1977–1990. The last joint venture operation took place in 1990 in the BSAI, with an incidental catch of 152 salmon.

Doc. 1892 **Northern Bering Sea Surface Trawl and Oceanographic Survey Plan, 2020**

James M. Murphy, Jamal Moss, Fletcher Sewall, Sabrina Garcia, and Andrew K. Gray

The 2020 northern Bering Sea surface trawl and oceanographic survey operations are contingent on health and safety concerns related to COVID-19. The survey is a multi-disciplinary research project conducted aboard a chartered fishing vessel, the F/V *Northwest Explorer,* scheduled to begin and end in Dutch Harbor, AK from August 27 and September 20, 2020 with a port call in Nome, AK on Sep 8, 2020. The survey will support Alaska Sustainable Salmon Fund research objectives on juvenile salmon and the Alaska Fisheries Science Center's Bering-Arctic-Subarctic Integrated Surveys and Recruitment Process Alliance ecosystem research programs. Additional objectives by Alaska Department of Fish and Game and U.S. Fish and Wildlife Service will also be supported during the survey.

Doc. 1893 **Southeast Alaska Coastal Monitoring Survey: Salmon Trophic Ecology and Bioenergetics, 2018**

Emily A. Fergusson, James M. Murphy, and Andrew K. Gray

Juvenile Pacific salmon (*Oncorhynchus* spp.), ecologically-related species, and associated biophysical data were collected from the marine waters of the northern region of southeastern Alaska (SEAK) in 2018. This annual survey, conducted by the Southeast Coastal Monitoring (SECM) project, marks 22 consecutive years of systematically monitoring how juvenile salmon utilize marine ecosystems during a period of climate change. The survey was implemented to identify the relationships between year-class strength of juvenile salmon and biophysical parameters that influence their habitat use, marine growth, prey fields, predation, and stock interactions. Up to 13 stations were sampled monthly in epipelagic waters from May to August. Fish, zooplankton, surface water samples, and physical profile data were collected during daylight at each station using a surface rope trawl, bongo nets, a water sampler, and a conductivity-temperature-depth profiler. Coded-wire tags were recovered from two juvenile coho and eight immature Chinook salmon, that all originated from hatchery and wild stocks in SEAK. Of the juvenile salmon examined for otolith marks, Alaska enhanced stocks comprised 68% of the juvenile chum and 24% of the juvenile sockeye salmon. Of the 14 potential predators of juvenile salmon, no predation on juvenile salmon was observed. The long-term seasonal time series of SECM juvenile salmon stock assessment and biophysical data is used in conjunction with basin-scale ecosystem metrics to annually forecast pink salmon harvest in SEAK. Long term seasonal monitoring of key stocks of juvenile salmon and associated ecologically-related species, including fish predators and prey, permits researchers to understand how growth, abundance, and interactions affect year-class strength of salmon in marine ecosystems during a period of rapid climate change.

Doc. 1894 **Southeast Alaska Coastal Monitoring Survey Cruise Report, 2018**

James M. Murphy, Emily A. Fergusson, Andrew Piston, Steve Heinl, and Andrew K. Gray

Surface trawl and oceanographic data were collected within the northern region of Southeast Alaska (SEAK) as part of the 2018 Southeast Alaska Coastal Monitoring (SECM) survey. SECM surveys have been conducted annually since 1997 to monitor the status of juvenile salmon and ocean conditions in SEAK. Eight stations were sampled in the strait habitat at monthly intervals along two transects (Icy Strait and Upper Chatham Strait) during 2018. Four stations were added in Stephens Passage (inshore habitat) in 2018 to provide additional insight into the early marine ecology of Chinook salmon. Fish, zooplankton, water, and temperature and salinity data were collected at each station using a surface rope trawl, bongo nets, and a conductivity-temperature-depth (CTD) sensor. Surface temperatures increased and salinities decreased over the summer

growing season in both inshore and strait habitats; however, salinities were consistently lower in Stephens Passage due to the freshwater discharge of the Taku River. Average temperature in the strait habitat (May–August, upper 20m) was 9.22°C, just below the long-term average of 9.33°C. A total of 1,026 salmon and 29,612 non-salmon fish species (primarily Pacific herring) were captured during 76 rope trawl hauls. Average catch rates and sizes of juvenile salmon were below average in strait habitats during 2018. Peak catch rates of juvenile Chinook and coho salmon occurred in Stephens Passage during June. Juvenile sockeye salmon also had their peak catch rates in Stephens Passage, but their peak catch rates occurred in August. The low average size of sockeye salmon within Stephens Passage during August likely reflects the presence of the late out-migrating sub-yearling migratory phenotype. Peak catch rates for juvenile pink and chum salmon both occurred in strait habitats during July. Five coded-wire-tags (CWTs) were recovered from juvenile Chinook salmon in the inshore habitat (Stephens Passage) and three of the tags were from the Douglas Island Pink and Chum, Inc. (DIPAC) hatchery. Two CWTs were recovered from coho salmon and both were from the DIPAC hatchery. DIPAC chum salmon were the most abundant stock group in the strait habitat during June. The proportion of unmarked (wild) chum salmon (40%) and Northern Southeast Regional Aquaculture Association (37%) were highest in July. We plan to continue sampling the new stations that were added in Stephens Passage during 2018. We believe these stations hold significant promise for improving our understanding of the survival and early marine ecology of local Chinook salmon stocks. Both the size and abundance of juvenile salmon were below average in 2018. Pink salmon forecast models clearly indicate that low juvenile pink salmon abundance will contribute to poor harvests the following year. Models for the other species of salmon have either not been developed or do not provide a clear direction for how to interpret juvenile status. Developing meaningful models for other salmon species will be a priority for the SECM survey over the next several years.

Doc. 1895 **Southeast Alaska Coastal Monitoring Survey Plan, 2020**
James M. Murphy, Andrew Piston, Emily A. Fergusson, Steven Heinl, and Andrew K. Gray

This document outlines the survey plan for the Southeast Coastal Monitoring (SECM) survey during 2020. SECM surveys support harvest forecast models for SEAK pink salmon (*O. gorbuscha*), and research on the marine ecology of salmon and the pelagic ecosystem in the northern region of Southeast Alaska. SECM surveys will occur during monthly intervals from May to August, 2020 at 12 principal stations, and include surface trawl (Nordic 264) sampling for salmon and other pelagic fish species, bongo net sampling for zooplankton, and CTD data collection of temperature and salinity data (Figure 1; Tables 1 and 2). Principal funding support for the 2020 survey is provided by the Pink Salmon Disaster Relief Fund and the Northern Fund of the Pacific Salmon Commission. Support for the participation of scientific staff from the Alaska Fisheries Science Center (AFSC), Alaska Department of Fish and Game (ADFG), and the Southern Southeast Regional Aquaculture Association (SSRAA) is provided by respective agencies (Table 3).

Doc. 1896 (Rev. 1) **Canadian Salmon Catch and Enhanced Salmon Production in 2017–2019**
Antonio Velez-Espino, Mary E. Thiess, Brock Ramshaw, and Shelee Hamilton

This document reports final catch estimates for 2017–2018 and preliminary catch estimates for 2019 for the six major salmon species in British Columbia (B.C.) and Yukon fisheries. Catch is reported for commercial fisheries (numbers and total weight) in tidal waters, and recreational (numbers only) and aboriginal fisheries (numbers only) in tidal and non-tidal waters. Catches include non-Canadian origin fish caught in B.C. and exclude Canadian origin fish caught in fisheries outside B.C. This document also summarizes release information for salmon including

steelhead trout from Fisheries and Oceans Canada (DFO) and Freshwater Fisheries Society of B.C. enhancement facilities in B.C.

Doc. 1897 **Korean Salmon Catch Statistics and Hatchery Releases in 2019–2020**

Ha Na Kim, Sang-Woo Lee, Chung Il Lee, and Na Ri Kim

Total catch of chum salmon was 50,048 fish or 129.72 metric tons in 2019. The total fries of chum salmon released was 8,060 thousand fish in 2020 (2019 brood year).

Doc. 1898 **Korean Research Plan for Salmon in 2020**

Ju Kyoung Kim

Salmon are very important resources in biological, social, economic, and political aspects with characteristics of transboundary distribution and economic importance. The interest in chum salmon biology in Korea was much increased since the establishment of the Inland Living Resources Center (formerly Yangyang Salmon Station) of Korea Fisheries Resources Agency in 1980s. The enhancement program for chum salmon has been expanded thereafter, so that chum salmon were transplanted to 18 streams on the coast of the Korean Peninsula. More than 10 million fry salmon have been released every year since the 2000s. On the other hand, however, the ecological research on salmon species was very limited until recently due to the lack of research programs. Although the North Pacific Anadromous Fisheries Commission (NPAFC) emphasizes the need for salmon research, the conspicuous increase in research funding was not achieved. Oceanic environments have been rapidly altered by climate change during the last few decades and ocean ecosystems, including salmon populations, will be modified under the global warming situation. Especially, Korea is located at the southern limit of chum salmon distribution, and special attention and support for salmon ecology research is needed.

Doc. 1899 **Otolith Thermal Mark for Brood Year 2019 and Proposed Thermal Marks for Brood Year 2020**

Ju Kyoung Kim, Jong Kuk Choi, and Seong Min Yoon

Korea released 2.7 million and 1.5 million thermal marked chum salmon in March 2019 and 2020, respectively. The marks were 3,1,2H (2.5million) and 4n,2,3H (0.2million) for 2019(2018BY) and 3,3,4H (1.3million), 4n,4,2H (0.1million) and 5,3,2H (0.1million) for 2020 (2019BY). We marked approximately 1.5 million chum salmon in BY 2020, which covers about 10–20% of release of BY 2019 chum salmon at Namdae-cheon, Wangpi-cheon and Taewa-river (river). Chum salmon is marked at 3 different hatcheries (Yangyang Hatchery, Uljin Hatchery and Ulju Hatchery) using 3 thermal marks.

Doc. 1900 **Population Genetic Structure of Chum salmon, *Oncorhynchus keta*, in Korea**

Tae-Ho Yoon, Hae Sol Kim, Eun Ah Kim, Hee Jin Kim, Su-Jeong Yang, Sang Gyu Kim, and Kyoung Hyun Park

Analysis of population genetic structure has been carried out for chum salmon (*Oncorhynchus keta*). In this study, we used ten microsatellite DNA markers to examine genetic diversity and population structure in a total 1,042 samples including seven returning populations in 2018 and four releasing populations in 2019 collected in Korea. The results of genetic diversity analysis are shown in Table 1. The mean Na (number of alleles) ranged from 16.20 (Taehwa River-releasing) to 22.30 (Taehwa River). The H_O (observed heterozygosity) ranged from 0.7017 (Maup&Osip Stream-releasing) to 0.7795 (Myeongpa Stream). The H_E (expected heterozygosity) ranged from 0.7849 (Taehwa River-releasing) to 0.8263 (Wangpi Stream). Among the four releasing populations, the highest genetic diversity values of Na (20.60), H_O (0.7250) and H_E (0.8081) were observed from Namdae Stream-releasing population genetically managed by Korea Fisheries Resources Agency (FIRA) than other three releasing populations. The results of genetic

differentiations (F_{ST}) and PCoA analysis showed that the seven returning populations were not significantly different (Table 2 and Figure 1). On the other hand, the results of genetic distance of three releasing population: Maup&Osip Stream-releasing, Wangpi Stream-releasing and Taehwa River-releasing managed by local government were significantly different between every populations (Table 2 and Figure 1). In conclusion, among the releasing populations, the highest values of genetic diversity were observed from the Namdae Stream-releasing population which of genetic diversity was managed. In addition, result suggests genetic management of releasing salmon fry should be expanded.

Doc. 1901 **Release of Marked Salmon from Russian Hatcheries in 2019**

Elena Akinicheva, Vladimir Volobuev, Aleksey Yamborko, and Maksim Myakishev

The main aim of salmon marking in Russian hatcheries is to evaluate numbers of hatchery-reared salmon returns. In 2019, juvenile Pacific salmon was marked in four regions of the Russian Far East. The release number of marked juveniles was 390.02 million. This document presents data regarding otolith unique marks used in marking salmon juveniles released from Russian hatcheries in 2019.

Doc. 1902 **Proposed Otolith Marks for Brood Year 2020 Salmon in Russia**

Elena Akinicheva, Vladimir Volobuev, Aleksey Yamborko, and Maksim Myakishev

Mass-marking of juvenile pacific salmon is an effective instrument of salmon origin identification at every stage of their life cycle. In Russia, otolith marking is being used to obtain data on the proportion of fish raised in hatcheries in their return to rivers. The presence of marks on otoliths allows an identification of salmon raised in different hatcheries, which is important information for fish farming. Moreover, research in Russia into the differentiation between hatchery-raised and wild stock at the early stages of their sea life allows to understand distribution, movement and abundance of juvenile salmon at sea, along with the identification of salmon from different reproductive zones. The finding of marked salmon during their ocean feeding period allows us to determine their area of distribution and learn more about migration of wild salmon.

Doc. 1903 **Russian Bibliography Publications Linked to the NPAFC Science Plan in 2019**

N.V. Klovach, O.S. Temnykh, V.A. Shevlyakov, S.V. Naydenko, A.V. Bugaev, V.Yu. Zharikova, A.V. Yamborko, V.I. Ostrovsky, and E.V. Golub

The current bibliography lists original papers published in 2018 by Russian scientists and their collaborators relevant to the 2016–2020 NPAFC Science Plan as well as other salmon studies. The bibliography lists 61 papers, corresponding mainly to the 3 key research components of the NPAFC Science Plan: 1) Status of Pacific Salmon and Steelhead Trout; 2) Pacific Salmon and Steelhead Trout in a Changing North Pacific Ocean; 3) New Technologies; 4) Management Systems. Each publication is listed under one research component, although some of them are relevant to several components. The references are given with abstracts if papers included abstracts in English.

Doc. 1904 **Proposed Cruise Plans of Russian Research Vessels for Pacific Salmon Marine Life Period Studies in 2020**

Olga S. Temnykh and Alexander N. Starovoytov

Two Russian research vessels are scheduled to conduct salmon surveys in summer and fall 2020. R/V "*Professor Kaganovsky*" will carry out a summer monitoring survey in the Pacific waters off Kuril Islands in June–July. The primary objectives are to collect biological information on

plankton and nekton communities, and describe the physical and biological oceanographic conditions in this region. The major purpose of these studies is the estimation of anadromous Pacific salmon abundance and biomass for short-term forecasting of their returns and possible catches on the coasts of the Sea of Okhotsk. R/V "*TINRO*" and R/V "*Professor Kaganovsky*" will operate in the western Bering Sea and then in the southern Okhotsk Sea. The major purpose of these studies is the estimation of postcatadromous Pacific salmon abundance for forecasting of their returns and possible catch in the next years.

Doc. 1905 **Cruise Plan of Russian Research Vessel *TINRO* Involving Incidental Takes of Anadromous Fish in the North Pacific Ocean in 2020**
Alexander N. Starovoytov

One Russian research vessel is scheduled to conduct epipelagic trawl surveys in summer and fall 2020. R/V "*TINRO*" will carry out a summer monitoring survey in the Pacific waters off Kuril Islands in August–September. The primary objectives are to collect biological information on plankton and nekton communities, and describe the physical and biological oceanographic conditions in this region. The major purpose of these studies is the estimation of Pacific mackerel, Japanese pilchard, mature and immature Pacific salmon and other nekton species abundance and biomass.

Doc. 1906 **Canadian Juvenile Salmon Surveys in 2020–2021**
Chrys-Ellen M. Neville and Jackie R. King

This document provides information on the juvenile salmon research surveys planned in both offshore and inshore areas of the North Pacific Ocean by Canada for fiscal year 2020–2021. The plan presented is the scheduled fishing for this period of time. However, due to the limitations and personal distancing required as a result of the Covid19 pandemic, it is anticipated that several of these surveys may be modified or cancelled.

Doc. 1907 **Proposed Thermal Marks for Salmon from Canada, Brood Year 2020**
Jeff Till

Thermal marking continues to play an important role for stock, hatchery, and fisheries management and research in Canada. Canada plans to thermally mark approximately 67 million Pacific salmon from the 2020 brood year for release in 2021/22. Thermal marking will include 67 different thermal marks applied at 19 hatcheries with marked salmon released at over 50 locations. The plan is similar to the 2019 brood year marking plan, fish planned for release in 2020/21 (Till 2019).

Doc. 1908 **Releases of Otolith Marked Salmon from Canada in 2019**
Jeff Till

Thermal mass marking of salmon has, for a number of years, played an important role in stock, hatchery, and both fisheries and research management within Canada. This document follows up on previous documents outlining Canada's thermal marking proposals including those for brood year 2018 (Till 2019). It summarizes all thermally marked salmonids released from BC hatcheries in 2019 by species, hatch mark, facility, release location and release number.

Doc. 1909 **United States National Research Plan 2020**
National Oceanic and Atmospheric Administration

The United States identified the following research plans that reflect the five research components identified under the NPAFC Science Plan for 2016–2020 (NPAFC Doc. 1665): 1) Status of Pacific salmon and steelhead trout; 2) Pacific salmon and steelhead trout in a changing North Pacific Ocean; 3) New technologies; 4) Management systems; 5) Integrated information systems.

The US refers to the Bering Arctic Subarctic Integrated Surveys (BASIS) throughout the document.

Doc. 1910 **Canadian Bibliography of Recent Publications Linked to the 2016–2020 NPAFC Science Plan**

S.C.H Grant, J.R. Irvine, T. Beacham, C. Freshwater, C. Holt, S.G. Hinch, A.M. Huang, B. Hunt, J. Pendray, J. Reynolds, and L.A. Vélez-Espino

The current bibliography lists publications in primary scientific journals and other documents published primarily during 2019 by Fisheries and Oceans Canada scientists and their collaborators relevant to the 2016–2020 NPAFC Science Plan. The bibliography lists 112 publications, many with abstracts, corresponding to the key research components of the NPAFC Science Plan.

Doc. 1912 **2020 Update on Canadian Research Relevant to the 2016–2020 NPAFC Science Plan**

J.R. Irvine, T. Beacham, C. Freshwater, S.C.H. Grant, S.G. Hinch, C. Holt, B.P.V. Hunt, B. Johnson, M. MacDuffee, V. Minke-Martin, J. Pendray, and J. Reynolds

This document summarizes major scientific research activities in relation to the 2016–2020 NPAFC Science Plan. The report focuses on research activities planned by Fisheries and Oceans Canada scientists and colleagues during 2020/21 and results from recent studies not documented in previous Canadian research summaries.

Doc. 1913 (Rev.1) **Report of the 2020 International Year of the Salmon North Pacific Working Group Meeting**

International Year of the Salmon Working Group

The International Year of the Salmon Working Group (IYS-WG) met on February 25, 27 & 28, 2020 at the Blue Horizon Hotel in Vancouver, BC, Canada. The purpose of the meeting was to review progress made on the IYS to date, including updates on Signature Projects including reviewing the 2020 and 2021 High Seas Expedition plans, discussing the implementation of the Theme Counsel Groups (TCG), effectiveness of IYS communications and outreach, and determining the next steps of the IYS Working Group with respect to the development of research and outreach plans that reflect NPAFC priorities. The IYS-WG members are a subset of the North Pacific Steering Committee (NPSC) members, whose meeting also occurred during this week (February 26 & 27, 2020). The two meetings are separate from each other, but they are linked as the NPSC advises the IYS-WG and provides recommendations for some IYS-related decisions, and the IYS-WG informs the NPSC of what decisions they have made. The NPSC Report (NPAFC Doc. 1914) includes some overlapping information from this report. The following report documents a description of the IYS-WG meeting, including participants, discussions and outcomes.

Doc. 1914 **Report of the 2020 International Year of the Salmon North Pacific Steering Committee Meeting**

International Year of the Salmon Working Group

This report documents the proceedings of the 2020 meeting of the North Pacific Steering Committee (NPSC) that took place from February 26–27th in Vancouver, Canada, to provide direction to the IYS-Working Group (IYS-WG) regarding the implementation of the International Year of the Salmon (IYS). The NPSC is one of two basin-scale Steering Committees that provide direction to an IYS Coordinating Committee (CC) that in turn considers issues related to overall implementation of the IYS at the hemispheric scale. The agenda was supported by detailed

discussion documents on overarching issues of concern to be considered at meetings of all three committees. The North Atlantic Salmon Conservation Organization (NASCO) has expressed an interest in participating in the IYS wrap-up symposium but will not be moving forward with an International Year of the Salmon Coordinating Committee (CC). This was the fourth meeting of the NPSC, and it was held during the same week as the IYS-WG meeting (February 25, 27 & 28, 2020). Due to the linkages between these two meetings, some information from the IYS-WG report can be found in this document. The NPSC will continue to meet and provide advice on the implementation of the IYS in the Pacific.

The meeting highlighted continued support for the IYS. The increase in engagement during the IYS 2019 focal year was reflected by the increased registration of events and projects on the IYS website, along with the growth of the IYS social media accounts, which NPSC members found to be a reflection of the exciting momentum of the IYS. Participants provided direction on ways to improve IYS communication and outreach, including the website and social medias, and provided feedback on Signature projects. The report on preliminary results from the 2019 High Seas Expedition was well received and provided new and potentially important information on salmon populations in the eastern North Pacific coming out of winter. There were presentations on planned and proposed IYS signature projects and very productive discussions on communications regarding the 2021 Pan Pacific High Seas Expedition planned to survey the breadth of the North Pacific. The NPSC reviewed the effectiveness and membership of the Theme Counsel Groups (TCG), which consist of up to 15 experts from the five member nations of the North Pacific Anadromous Fish Commission. The Terms of Reference (TOR) were reviewed and updated with the intentions of increasing the capacity of the TCG to assist with the IYS Signature Projects. To increase the effectiveness of the TCG, the IYS WG and NPSC agreed to amend the TOR so that there would be two Co-Chairs per TCG as opposed to a Chair and Vice-Chair. There was also discussion about the current workplan and budget, and participants suggested alternative fundraising opportunities and strategies.

Doc. 1916 **Recoveries of High Seas Tags and Tag Releases from High Seas Research Vessel Surveys in 2019**

Working Group on Salmon Marking

In late July and early August 2019, tagging operations were conducted in the central Bering Sea by the Japanese R/V *Hokko maru*, and 44 chum salmon were released with FAJ /NPAFC disk tags and archival tags (ARCGEO, DST-magnetic, and AZBL tags). Furthermore, 37 sockeye, eight chum, and three coho salmon were tagged with FAJ/NPAFC disk tags and released into the central Bering Sea. In 2019, one tagged recovery was reported from a chum salmon caught in Okhotsk Sea coast, Hokkaido, Japan on October 7, 2019. In addition, one coho salmon which originally tagged in the North Pacific Ocean (46º 00'N, 180º 00') and released on June 23, 2010, was recovered in the Krutogorova River (55º 01'N, 155º 34' E) in western Kamchatka coast, Russia, on September 22, 2010.
