PACIFIC REGION
FINAL

INTEGRATED FISHERIES MANAGEMENT PLAN

JUNE 1, 2022 - MAY 31, 2023

SALMON
NORTHERN BC

Genus Oncorhynchus

Fisheries and Oceans Canada
Pêches et Océans Canada
Canada

© Her Majesty the Queen in Right of Canada, 2022.
Cat. No. Fs143-3/22-2201E-PDF ISBN: 978-0-660-44240-2 ISSN: 2564-002X

Correct citation for this publication:

Fisheries and Oceans Canada. 2022. Northern Salmon Integrated Fisheries Management Plan 2022/23. 22-2201: 441p.

TABLE OF CONTENTS

DEPARTMENT CONTACTS **14**

INDEX OF WEB-BASED INFORMATION **18**

GLOSSARY AND LIST OF ACRONYMS **24**

FOREWORD **27**

NEW FOR 2022/2023 ..... **28**

1 OVERVIEW **31**

1.1 Introduction 31

1.2 History 31

1.3 Type of Fishery and Participants 31

1.4 Location of Fishery 32

1.5 Fishery Characteristics 32

1.6 Governance 35

1.6.1 Policy Framework for the Management of Pacific Salmon Fisheries 35

1.6.2 First Nations' Fisheries 37

1.7 Consultation on 2022/2023 38

1.8 Approval Process 38

2 STOCK ASSESSMENT, SCIENCE AND TRADITIONAL ECOLOGICAL KNOWLEDGE **39**

2.1 Biological Synopsis 39

2.2 Ecosystem Interactions 42

2.2.1 Environmental Conditions Influencing 2022 Salmon Returns 44

2.3 Indigenous Knowledge Systems (IKS) 59

2.4 Stock Assessment 60

2.5 Science Information Sources 62

2.6 Precautionary Approach 63

2.7 Shared Stewardship 64

2.8 Research 64

3 STEWARDSHIP, CO-MANAGEMENT, CONSULTATION AND ADVISORY BOARDS 67

3.1 Pacific Salmon Treaty 67

3.2 Salmonid Enhancement Program 70

3.3 Fisheries Act: Fish Stocks Provisions 72

3.4 Consultation 72

3.5 Collaborative Governance Agreements 73

3.5.1 Canada and First Nation Reconciliation Agreements 73

3.6 Advisory Committees and Boards 74

3.6.1 Salmon Coordinating Committee 74

3.6.2 Integrated Harvest Planning Committee 74

3.6.3 Commercial Salmon Advisory Board 75

3.6.4 Sport Fishing Advisory Board 75

4 ECONOMIC, SOCIAL AND CULTURAL IMPORTANCE 76

4.1 Indigenous Fisheries 76

4.1.1 Economic Value 77

4.2 Recreational Fishery 78

4.3 Commercial Fishery 84

4.3.1 Harvest Sector 84

4.3.2 Processing Sector 90

4.4 Export Market 91

5 MANAGEMENT ISSUES 96

5.1 Conservation 96

5.1.1 Wild Salmon Policy 96

5.1.2 Species at Risk Act 96

5.2 Protection of Marine and Non-Tidal Habitat 98

5.2.1 Oceans Act 98

5.2.2 Canada's Marine and Coastal Areas Conservation Mandate 98

5.2.3 Pacific north coast integrated management plan 99

5.2.4 northern shelf bioregion mpa network 100
5.2.5 SGAAN KINGHLAS – BOWIE SEAMOUNT MPA 100
5.2.6 HECATE STRAIT & QUEEN CHARLOTTE SOUND GLASS SPONGE REEFS MPA 100
5.2.7 Offshore Pacific Area of Interest & Fishery Closure 101
5.2.8 Ghost Gear Initiative 101
5.3 Conservation of Species that May be affected by Salmon Fisheries 102
5.3.1 Rockfish 102
5.3.2 Glass Sponge Reefs 104
5.3.3 Marine Mammals 105
5.3.4 Turtle And Basking Shark Incident And Sightings Reports 106
5.3.5 Seabirds 107
5.3.6 Sharks 107
5.3.7 SARA Listed Species 108
5.4 Depredation 112
5.5 Resident Killer Whale 113
5.6 Southern Resident Killer Whale Management Measures to Address Reduced Prey Availability, and Physical and Acoustic Disturbance 115
5.7 U.S. Marine Mammal Protection Act Provisions 117
5.8 Marine Mammal Regulations 117
5.9 Aquaculture Management 119
5.10 Fishing Vessel Safety 120
5.11 Catch Monitoring 120
6 FISHERY MANAGEMENT OBJECTIVES FOR STOCKS OF CONCERN 123
6.1 Rivers and Smith Inlet Sockeye 123
6.2 Skeena River Sockeye 124
6.3 Nass River Sockeye 124
6.4 North Coast Chum 125
6.5 Skeena and Nass Chinook 125

6.6 Northern Coho 125
6.7 West Coast of Vancouver Island (WCVI) Chinook 126
6.8 Skeena Steelhead 127
7 GENERAL DECISION GUIDELINES, ACCESS AND ALLOCATION 128
7.1 Access and Allocation Objectives 128
7.1.1 International Objectives 128
7.1.2 Domestic Allocation Objectives 128
7.2 Allocation Guidelines 128
7.2.1 First Nations – Food, Social, and Ceremonial (FSC) and Treaty Domestic Harvest 129
7.2.2 Test Fisheries 130
7.2.3 Recreational Fisheries 131
7.2.4 Commercial Fisheries 131
7.2.5 First Nations Economic Opportunity and CSAF and Inland Demonstration Fisheries 132
7.2.6 Excess Salmon to Spawning Requirements Fisheries 132
7.3 General Decision Guidelines 133
7.3.1 Pre-season Planning 133
7.3.2 In-season Decisions 133
7.3.3 Selective Fisheries 133
7.3.4 Post-Release Mortality Rates used to access frims 134
8 COMPLIANCE PLAN 137
8.1 Compliance and Enforcement Objectives 137
8.2 Regional Compliance Program Delivery 137
8.3 Consultation 138
8.4 Compliance Strategy 139
9 PERFORMANCE/EVALUATION CRITERIA 140
9.1 2021/2022 Post Season Review for Stocks of Concern 140
9.1.1 Rivers and Smith Inlet Sockeye 140
9.1.2 Skeena River Sockeye 141

9.1.3 Nass River Sockeye 141
9.1.4 North Coast Chum 142
9.1.5 WCVI Chinook 142
9.1.6 Inshore Rockfish 142
9.2 2021/2022 Post Season Review for Access and Allocation Objectives 143
9.2.1 International Objectives 143
9.2.2 Domestic Allocation Objectives 144
9.2.3 First Nations Objectives 144
9.2.4 Recreational and Commercial Objectives 144
9.3 2021/2022 Post Season Review of Compliance Management Objectives 144
10 NORTHERN BC FIRST NATIONS FISHERIES 146
10.1 Fishery Monitoring and Catch Reporting Initiatives 146
10.1.1 Aboriginal Harvest Management System 146
10.1.2 Chinook and Coho Coded Wire Tag (CWT Sampling) 147
10.1.3 Fishery Monitoring and Catch Reporting Risk Assessment Tool 148
10.2 Communal Licence Harvest Target Amounts 149
10.3 Indigenous Commercial Fishing Opportunities 150
10.4 Treaty Fisheries 151
11 NORTHERN BC RECREATIONAL FISHERIES 152
11.1 Recreational Vision 152
11.2 Licencing 152
11.2.1 Information on Openings and Closures 152
11.3 Catch Monitoring 154
11.3.1 Creel Surveys 154
11.3.2 Internet recreational catch and EFFORT (IREC) 154
11.3.3 Internet Annual Recreational Catch (iARC) 155
11.3.4 Logbooks 155
11.3.5 Chinook and Coho Coded Wire Tag (CWT) Sampling 156
12 NORTHERN BC COMMERCIAL FISHERIES 158

12.1 Licensing 158
12.1.1 National Online Licensing System (NOLS) Client Support - Licensing Services 158
12.1.2 Licence Category 158
12.1.3 Licence Category Background 159
12.1.4 Licence Renewal 159
12.1.5 Licence Issuance 159
12.2 Openings and Closures 162
12.3 Licence Conditions 164
12.3.1 Transporting 164
12.3.2 Non-Retention Species 164
12.3.3 Retention of Lingcod by Salmon Troll 165
12.3.4 Retention of Freezer Troll Chinook and Coho Heads 166
12.3.5 Chinook and Coho Coded Wire Tag (CWT) Sampling 167
12.3.6 Commercial Harvest Logs and In-Season Reporting 168
12.4 Catch Monitoring 169
12.5 Commercial Salmon Allocation Implementation Plan 170
12.6 Conservation Measures 175
12.6.1 Selective Fishing 175
12.6.2 Robson Bight 175
12.6.3 Rockfish Conservation Measures in Salmon Troll 175
12.7 Commercial Demonstration Fisheries 176
12.7.1 Transfer Guidelines for the Temporary Transfer of Commercial Salmon Shares 177
13 SPECIES SPECIFIC SALMON FISHING PLANS 183
13.1 Northern Chinook Salmon Fishing Plan 190
13.1.1 Northern Chinook Overview 193
13.1.2 Northern AABM Chinook 196
13.1.3 Skeena-Nass ISBM Chinook 206
13.1.4 Central Coast ISBM Chinook 216
13.2 Northern Chum Salmon Fishing Plan 222

13.2.1 Northern Chum Overview 225
13.2.2 Skeena-Nass Chum 231
13.2.3 Central Coast Chum 239
13.3 Northern Coho Salmon Fishing Plan 248
13.3.1 Northern Coho Overview 250
13.3.2 Northern Coho 251
13.4 Northern Pink Salmon Fishing Plan 263
13.4.1 Northern Pink Salmon Overview 266
13.4.2 Haida Gwaii Pink Salmon 267
13.4.3 Skeena-Nass Pinks 272
13.4.4 Central Coast Pink Salmon 281
13.5 Northern Sockeye Salmon Fishing Plan 290
13.5.1 Northern Sockeye Overview 294
13.5.2 Haida Gwaii Sockeye (Areas 1, 2W and 2E) 295
13.5.3 Nass Sockeye 300
13.5.4 Skeena Sockeye 313
13.5.5 Central Coast Sockeye 330
13.5.6 Rivers & Smith Inlet Sockeye 337
APPENDIX 1: LOGBOOK SAMPLES 346
APPENDIX 2: FISHING VESSEL SAFETY 349
APPENDIX 3: COMMERCIAL SALMON LICENCE AREAS 363
APPENDIX 4: MAPS OF NORTHERN BC COMMERCIAL LICENCE AREAS 364
APPENDIX 5: ADVISORY BOARD MEMBERSHIPS 367
APPENDIX 6: UPDATES TO THE COMMERCIAL SALMON ALLOCATION FRAMEWORK 369
APPENDIX 7: NASS CHUM DRAFT REBUILDING PLAN 395
APPENDIX 8: SKEENA CHUM DRAFT REBUILDING PLAN 401
APPENDIX 9: 2022 SALMON OUTLOOK 405
1.1 Purpose 405

1.2 Changes to the outlook 405
1.3 Background 405
13.1.4 Stock Management Units 405
13.1.5 Biological and Management References 406
13.1.6 WSP Lower Biological Benchmarks and Limit Reference Points (LRPs) 406
13.1.7 Management Targets and Operational Control Points 407
1.4 Stock Outlooks 408
13.1.8 Categorical Stock Outlooks 408
13.1.9 SOUTH COAST AREA 409
13.1.10 LOWER AND INTERIOR FRASER AREA 418
13.1.11 OKANAGAN 433
13.2 CONTRIBUTORS / CONTACTS 435
1.5 References 435
1.6 Appendix - Sockeye 435
APPENDIX 10: LONGER TERM COMMERCIAL CLOSURES OR MITIGATION 438

TABLE OF FIGURES

Figure 1.4-1: Management Areas for Northern B.C. 32

Table 2.1-2: Summary of general biological and life history characteristics for five species of Pacific salmon41

Figure 2.1-1: Generalized habitat of British Columbia Pacific salmon species in the North Pacific Ocean. 42

Figure 2.2-1 Timing of common age classes of Pacific salmon returning in 2022 in each habitat they occupy. For each species, the most common life-history types are presented, using the Gilbert-Rich age designation system (in brackets); the number on the left indicates the total age at return, while the subscript shows the number of winters spent in fresh water prior to migrating to the ocean. Coloured boxes show the life stage and habitat occupied by each group of animals in every year of their life, leading up to their return to fresh water in 2022. 46

Figure 2.2-2 Global annual mean temperature difference from pre-industrial conditions (1850-1900). Canada's temperature increases are double this global rate of warming, typical of countries occupying northern latitudes. 47

Figure 2.2-3 Canadian gridded temperature and precipitation anomalies (CANGRD) from the Government of Canada: https://climate-change.canada.ca/climate-data/#/historical-gridded-data. Temperatures for 2017 to 2020 coincide with the fresh water residence period of 2022 salmon returns. These data are interpolated from adjusted and homogenized climate station data at a 50km resolution. Anomalies represent the departure from a mean reference period (1961-1990). Temperature anomalies are expressed as degree Celsius (C). 50

Figure 2.2-4 Annual average sea-surface-temperature anomalies from Fisheries & Oceans Canada lighthouse stations: https://www.dfo-mpo.gc.ca/science/data-donnees/lightstations-phares/index-eng.html. Anomalies represent the departure from a mean reference period (1948-2020). Temperature anomalies are expressed as degree Celsius (C). 53

Figure 4.2-1: Tidal Water Recreational Fishing Licences and Pacific Salmon Conservation Stamps Sold, 2000/01 to 2020/21* 80

*Note: Licence sales for the 2020/21 season are preliminary and should be treated as such 80

Figure 4.2-2: Tidal Water Recreational Fishing Direct and Package Expenditures and Investments for all species, in constant (2020) dollars 82

Figure 4.2-3: Tidal Water Recreational Fishing Direct and Package Expenditures and Investments for Salmon North Coast and South Coast, in constant (2020) dollars 83

Figure 4.3-1: Total Landed Kilograms and Value (2020$) of Pacific Salmon by Year (2013-2021*) 85

Figure 4.3-2: Total Landed Value (2020$) of Pacific Salmon by Species by Year (2013-2021*) 86

Figure 4.3-3: Total Landed Kilograms of Pacific Salmon by Licence Area by Year (2016-2021*) 87

Figure 4.3-4: Total Landed Value (2020$) of Pacific Salmon by Licence Area by Year (2016-2021*) 87

Figure 4.3-5: North Coast salmon value by species, 2013-2021* (in 2020$) 88

Figure 4.3-6: South Coast salmon value by species, 2013-2021* (in 2020$) 89

Figure 4.3-7: Share of the total value of processing sector wages in 2021* (by salmon species) 90

Figure 4.4-6 Proportions of total value of Pacific salmon exports from BC by main destination countries in 2021* (in 2020$) 94

Table 7.2-1: Allocation guidelines 129

Table 7.3-1: Post-Release Mortality Rates 135

Table 10.2-1: Communal Licence Harvest Target Amounts 150

Figure 12.3-1: Fish Head CWT Portion 166

Figure 13.1-1: Overview of Northern Chinook salmon 193

Figure 13.1-2: Overview of Northern AABM Chinook 197

Table 13.1-1: Stock management actions anticipated in Northern British Columbia AABM Chinook fisheries to limit impacts on stocks of concern 198

Table 13.1-2: Commercial Allocation Implementation Plan for the 2015–2022 period 204

Figure 13.1-3: Overview of the Skeena-Nass ISBM Chinook 208

Table 13.1-3: Commercial Allocation Implementation Plan for the 2015–2022 period 214

Figure 13.1-4: Overview of Central Coast ISBM Chinook 216

Table 13.1-4: Commercial Allocation Implementation Plan for the 2015–2021 period 220

Figure 13.2-1: Overview of Northern Chum 225

Figure 13.2-2: Overview of Haida Gwaii Chum 226

Table 13.2-1: Commercial Allocation Implementation Plan for the 2015–2022 period 230

Figure 13.2-3: Overview of Skeena-Nass Chum 231

Table 13.2-2: Commercial Allocation Implementation Plan for the 2015–2021 period 237

Figure 13.2-4: Overview of Central Coast Chum 239

Table 13.2-3: Commercial Allocation Implementation Plan for the 2015–2022 period 245

Figure 13.3-1: Overview of North Coast Coho 250

Figure 13.3-2: Overview of North Coast and Central Coast Coho 251

Table 13.3-1: Commercial Allocation Implementation Plan for the 2015–2022 period 260

Figure 13.4-1: Overview of Northern Pink Salmon 266

Figure 13.4-2: Conservation Units in the Haida Gwaii Pink Salmon Management Unit (1 CU) 267

Figure 13.4-3: Conservation Units in the Skeena-Nass Pink Salmon Management Unit 272

Table 13.4-1: Commercial Allocation Implementation Plan for the 2015–2022 period 278

Figure 13.4-4: Conservation Units in the Central Coast Pink Salmon Management Unit 282

Table 13.4-2: Commercial Allocation Implementation Plan for the 2015–2022 period 287

Figure 13.5-1: Overview of Northern Sockeye Salmon.....294

Figure 13.5-2: Overview of Haida Gwaii Sockeye.....296

Figure 13.5-3: Overview of Nass Sockeye Salmon 300

Figure 13.5-5: 90 Mesh Net Construction 305

Table 13.5 Recreational Sockeye Fishery Triggers for Meziadin Lake 308

Figure 13.5-6: Overview of Skeena Sockeye Salmon.....313

Figure 13.5-7: The allowable abundance based Canadian commercial harvest rate on Skeena Sockeye. This includes gillnet, seine and inland demonstration fisheries. 317

Figure 13.5-8: 90 Mesh Net Construction 320

Table 13.5-1: Guidelines for Management Actions for Recreational Sockeye Fisheries in the Skeena Watershed 322

Figure 13.5-9: Overview of Central Coast Sockeye 330

Figure 13.5-10: 90 Mesh Net Construction 333

Figure 13.5-11: Overview of Rivers and Smith Inlet Sockeye 337

Figure 13.5-12: Sockeye Salmon Catch and Escapement to Area 10 339

Figure 13.5-13: 90 Mesh Net Construction 342

Figure 13.5-14: Area 3 Chum Exploitation Rates (US and Canada) 397

Figure 13.5-15: Area 4 Chum Exploitation Rates US and Canada 402

Table 13.5-2: Longer Term Commercial Closures or Mitigation 439

DEPARTMENT CONTACTS

A more comprehensive list of contacts can be found online at:
https://www.pac.dfo-mpo.gc.ca/contact-eng.html

24 Hour Recorded Information (Commercial)
Vancouver ..... (604) 666-2828
Toll Free 1-888-431-3474

Pacific Salmon Commission (PSC) Office ..... (604) 684-8081
PSC Test Fisheries (Recorded, In-Season Information) ..... (604) 666-8200

Recreational Fishing: https://www.dfo-mpo.gc.ca/fisheries-peches/recreational-recreative/index-eng.html
Commercial Fishing: https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/index-eng.html

REGIONAL HEADQUARTERS

Regional Director, Fisheries Management
Neil Davis ..... (604) 666-0115

A/Director, Res. Management and Sustainability
Jennifer Nener ..... (604) 666 1090

A/Director, Salmon Management and Client Services
Jeff Grout ..... (604) 666-0789

PST Implementation Advisor
Dean Allan ..... (250) 851-4821

A/Regional Resource Manager – Salmon
Mike Hawkshaw ..... (604) 314-7056

Project Manager – Salmon Team
Marla Maxwell ..... (604) 666-9993

Resource Management Biologist
Matt Mortimer ..... (250) 203-1606
A/Regional Salmon Manager
Heather Owens ..... (604) 666-1274

Regional Salmon Manager

Christie Nelson ..... (604) 348-9622

A/Regional Senior FAM Officer
Ashley Dobko ..... (604) 666-1505

A/Regional Senior FAM Officer
Jeff Radford ..... (250) 627-3453

A/Regional Senior Salmon Officer
Ge Li ..... (604) 404-3296

A/Regional Senior Salmon Officer
Erika Watkins ..... (250) 895-9351

Regional Fisheries Management Officer
Mikaela Bacon ..... (236) 334-0293

A/Regional Salmon Officer
Lindsay Begemann ..... (236) 334-0654

Regional Recreational Fisheries Coordinator
Greg Hornby ..... (250) 286-5886

Regional Director, Conservation and Protection
Nicole Gallant ..... (604) 666-0604

Regional Director, Ecosystem Management
Tracey Sandgathe ..... (604) 220-3295

Director, Aquaculture Management Division
Brenda McCorquodale ..... (604) 666-0129

Pacific Fishery Licence Unit
200-401 Burrard Street
Vancouver, B.C. V6C 3S4
Toll-Free: 1-877-535-7307
Email ..... fishing-peche@dfo-mpo.gc.ca

NORTH COAST AREA

Area Director
Sandra Davies ..... (250) 627-3426

Senior Reconciliation Implementation Advisor
Stephen Watkinson ..... (604) 787-8662

Senior Reconciliation Implementation Advisor
Peter Katinic ..... (250) 407-2500

North Coast Reconciliation Implementation Coordinator
Karen Kimura-Miller ..... (250) 624-0042

Central Coast Reconciliation Implementation Coordinator
Kristen Wong ..... (250) 799-5620

A/Haida Gwaii Reconciliation Implementation Coordinator
Mark Rose ..... (250) 561-5966

A/Reconciliation Implementation Officer
Wendy Evans ..... (250) 627-3425

Aboriginal Affairs Advisor
Melanie Anthony ..... (250) 627-3426

A/Aboriginal Program Officer-
Andrea Komlos ..... (250) 615-5371

A/Aboriginal Program Officer-
Christina Cann ..... (778) 361-0164

Area Chief, Conservation and Protection
Terry Jackson ..... (250) 627-3484

Salmon Stock Assessment Section Head (Formerly Area Chief)
Shaun Davies ..... (250) 627-3472

Pacific Salmon Strategy Initiative (PSSI) Implementation Coordinator
Shannon Balfry ..... (604) 617-9744

PSSI Implementation Officer
Clarence Nelson ..... (250) 627-3477

Resource Management - A/Salmon Section Head
Bradley Koroluk ..... (778) 213-8082

Resource Manager - Haida Gwaii
Patrick Fairweather ..... (778) 361-0582

Resource Manager - Nass/Skeena (Areas 3 to 6)
Corey Martens ..... (250) 627-3404

Assistant Resource Manager, North Coast
Vacant.....

Resource Manager - Inland Demonstration Fisheries/ESSRs
Jennifer Gordon .....(250) 600-0246

A/Resource Manager - Central Coast (Areas 7-10)
Justinas Savickas..... (250) 799-5127

Resource Manager - Recreational Fisheries
Darren Chow.....(250) 627-3441

Salmon Management Biologist, North Coast
Meagan Kindree..... (250) 799-5127

AQUACULTURE MANAGEMENT

Director, Aquaculture Management Division
Brenda McCorquodale .....(250) 902-8865

Manager, Aquaculture Environmental Operations
Adrienne Paylor .....(250) 202-0400

Manager, Area-Based Aquaculture Management and Fish Health
Kerra Shaw .....(250) 703-0917

Manager, Aquaculture Resource Management
Reagan Newcomb .....(778) 268-2854

Senior Coordinator: Marine Finfish and Freshwater
Vanessa Metcalf .....(250) 754-0405

Senior Coordinator – Engagement
Michelle Manning .....(250) 740-5979

Senior Coordinators – Engagement and Indigenous Consultation

Todd Johansson.....(250) 902-2683

Chief, Conservation and Protection
Trevor Gray .....(250) 286-5811

INDEX OF WEB-BASED INFORMATION

FISHERIES AND OCEANS CANADA GENERAL INFORMATION

MAIN PAGE

http://www.dfo-mpo.gc.ca

Our Vision, Latest News, Current Topics

Twitter:
DFO Pacific: @DFO_Pacific
En Français: @MPO_Pacifique

ACTS, ORDERS, AND REGULATIONS

https://www.dfo-mpo.gc.ca/acts-lois/index-eng.htm

Atlantic Fisheries Restructuring Act, Canada Shipping Act, Coastal Fisheries Protection Act, Department of Fisheries and Oceans Act, Financial Administration Act, , Fisheries Act, Fisheries Development Act, Fisheries Improvements Loan Act, Fishing and Recreational Harbours Act, Freshwater Fish Marketing Act, Great Lakes Fisheries Convention Act, Oceans Act, Species at Risk Act

REPORTS AND PUBLICATIONS

http://www.dfo-mpo.gc.ca/reports-rapports-eng.htm

Administration and Enforcement of the Fish Habitat Protection and Pollution Prevention Provisions of the *Fisheries Act*, Audit and Evaluation Reports - Audit and Evaluation Directorate, Canadian Code of Conduct for Responsible Fishing Operations, Departmental Performance Reports, Fisheries Research Documents, Standing Committee's Reports and Government responses, Sustainable Development Strategy

WAVES

https://science-libraries.canada.ca/eng/fisheries-oceans/

Fisheries and Oceans Canada online library catalogue

PACIFIC SALMON TREATY

http://www.psc.org

Background information; full text of the treaty

PACIFIC REGION GENERAL INFORMATION

MAIN PAGE

http://www.pac.dfo-mpo.gc.ca/index-eng.html

General information, Area information, Latest news, Current topics

POLICIES, REPORTS AND AGREEMENTS

https://www.dfo-mpo.gc.ca/about-notre-sujet/publications/fisheries-peche-eng.html

Reports and Discussion Papers, New Directions Policy Series, Agreements

OCEANS PROGRAM

http://www.pac.dfo-mpo.gc.ca/oceans/index-eng.html

Integrated Coastal Management; Marine Protected Areas;

Areas of Interest; Canada's Ocean Strategy; Oceans Act

PACIFIC REGION FISHERIES MANAGEMENT

MAIN PAGE

http://www.dfo-mpo.gc.ca/fm-gp/index-eng.htm

Commercial Fisheries, Aboriginal Fisheries, Recreational Fisheries, Maps, Notices and Plans, International Management, Enforcement

ABORIGINAL FISHERIES STRATEGY

http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.html
or http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/index-eng.htm

Aboriginal Fisheries Strategy (AFS) principles and objectives; AFS agreements; Programs; Treaty Negotiations

AQUACULTURE MANAGEMENT

http://www.pac.dfo-mpo.gc.ca/aquaculture/index-eng.html

The new federal regulatory program for aquaculture in British Columbia; Program overview and administration, public reporting, and aquaculture science

RECREATIONAL FISHERIES

http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

Fishery Regulations and Notices, Fishing Information, Recreational Fishery, Policy and Management, Contacts, Current BC Tidal Waters Sport Fishing Guide and Freshwater Supplement; Rockfish Conservation Areas, Shellfish Contamination Closures; On-line Licencing

COMMERCIAL FISHERIES

http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/index-eng.htm

Links to Groundfish, Herring, Salmon, Shellfish and New and Emerging Fisheries homepages; Selective Fishing, Test Fishing Information, Fishing Areas, Canadian Tide Tables, Fishery Management Plans, Commercial Fishery Notices (openings and closures)

INITIATIVE TO UPDATE THE COMMERCIAL SALMON ALLOCATION FRAMEWORK

http://www.pac.dfo-mpo.gc.ca/consultation/smon/saf-crrs/index-eng.html

Links to the Departments' consultation website which provides an overview of the process to update the Commercial Salmon Allocation Framework (CSAF), including links to summary reports and submissions with recommendations.

FISHERIES NOTICES

http://www-ops2.pac.dfo-mpo.gc.ca/fns-sap/index-eng.cfm?

Want to receive fishery notices by e-mail? If you are a recreational sport fisher, processor, multiple boat owner or re-distribute fishery notices, register your name and/or company at the web-site address above. Openings and closures, updates, and other relevant information regarding your chosen fishery are sent directly to your registered email. It's quick, it's easy and it's free.

INTEGRATED FISHERY MANAGEMENT PLANS

http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/index-eng.htm

Current Management Plans for Groundfish, Pelagics, Shellfish (Invertebrates), Minor Finfish, Salmon; sample Licence Conditions; Archived Management Plans

SALMON TEST FISHERY - PACIFIC REGION

https://www.pac.dfo-mpo.gc.ca/pacific-smon-pacifique/science/research-recherche/testfishery-pechedessai-eng.html

Definition, description, location and target stocks

LICENCING

http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.html

Contact information; Recreational Licencing Information, Commercial Licence Types, Commercial Licence Areas, Licence Listings, Vessel Information, Vessel Directory, Licence Statistics and Application Forms

NATIONAL ON-LINE LICENSING SYSTEM (NOLS)

https://fishing-peche.dfo-mpo.gc.ca
E-mail: fishing-peche@dfo-mpo.gc.ca
(Please include your name and the DFO Region in which you are located.)
Telephone: 1-877-535-7307
Fax: 613-990-1866
TTY: 1-800-465-7735

SALMON

https://www.pac.dfo-mpo.gc.ca/fm-gp/salmon-saumon/index-eng.html

Salmon Facts; Salmon Fisheries; Enhancement and Conservation; Research and Assessment; Consultations; Policies, Reports and Agreements; Glossary of Salmon Terms

FRASER RIVER/BC INTERIOR AREA RESOURCE MANAGEMENT AND STOCK ASSESSMENT

http://www.pac.dfo-mpo.gc.ca/fm-gp/fraser/index-eng.html

Contact information; Test fishing and survey results (Albion, creel surveys, First Nations); Fraser River Sockeye and Pink escapement updates; Important notices; Recreational fishing information

NORTH COAST RESOURCE MANAGEMENT

http://www.pac.dfo-mpo.gc.ca/fm-gp/northcoast-cotenord/index-eng.html

First Nations fisheries, Recreational fisheries; Commercial salmon and herring fisheries; Skeena Tyee test fishery; Counting facilities; Post-season Review; Contacts

YUKON/TRANSBOUNDARY RIVERS AREA MAIN PAGE

http://www.pac.dfo-mpo.gc.ca/yukon/index-eng.html

Fisheries Management; Recreational fisheries; Habitat; Licencing; Contacts

PACIFIC REGION
SALMONID ENHANCEMENT PROGRAM

MAIN PAGE

http://www.pac.dfo-mpo.gc.ca/sep-pmvs/index-eng.html

Publications (legislation, policy, guidelines, educational resources, brochures, newsletters and bulletins, papers and abstracts, reports); GIS maps and Data (habitat inventories, spatial data holdings, land use planning maps); Community involvement (advisors and coordinators, educational materials, habitat conservation and Stewardship Program, projects, Stream Talk).

PACIFIC REGION
POLICY AND COMMUNICATIONS

MAIN PAGE

http://www.pac.dfo-mpo.gc.ca/index-eng.html

Media Releases; Salmon Updates, Backgrounders, Ministers Statements, Publications; Contacts

CONSULTATION SECRETARIAT

http://www.pac.dfo-mpo.gc.ca/consultation/index-eng.html

Consultation Calendar; Policies; National; Partnerships; Fisheries Management, Oceans, Science and Habitat and Enhancement Consultations; Current and Concluded Consultations

PUBLICATIONS CATALOGUE

http://www.pac.dfo-mpo.gc.ca/publications/index-eng.html

Information booklets and fact sheets available through Communications branch

SPECIES AT RISK ACT (SARA)

https://www.dfo-mpo.gc.ca/species-especes/sara-lep/index-eng.html

SARA species; SARA permits; public registry; enforcement; Stewardship projects; Consultation; Past Consultation; First Nations; Related Sites; News Releases

PACIFIC REGION
SCIENCE

MAIN PAGE

http://www.pac.dfo-mpo.gc.ca/science/index-eng.html

Science divisions; Research facilities; PSARC; International Research Initiatives

GLOSSARY AND LIST OF ACRONYMS

A comprehensive glossary is available online at:
http://dev-public.rhq.pac.dfo-mpo.gc.ca/fm-gp/salmon-saumon/gloss-eng.html

LIST OF ACRONYMS USED IN THIS PLAN:

ACRONYM	PHRASE
AABM	Aggregate Abundance-Based Management
AAROM	Aboriginal Aquatic Resource and Oceans Management
AHC	Area Harvest Committee
AFS	Aboriginal Fisheries Strategy
ATP	Allocation Transfer Program
CCTAC	Canadian Commercial Total Allowable Catch
CEDP	Community Economic Development Program
COHO ABM	Coho Abundance-Based Management
COSEWIC	Committee for the Status of Endangered Wildlife in Canada
CPUE	Catch Per Unit Effort
CSAP	The Centre for Scientific Advice Pacific
CSAS	The Canadian Science Advisory Secretariat
CSAF	Commercial Salmon Allocation Framework
CSAB	Commercial Salmon Advisory Board
CWT	Coded Wire Tag
DIDSON	Dual Frequency Identification Sonar
ER	Exploitation Rate

ESSR	Excess Salmon to Spawning Requirements
FNFC	First Nations Fishery Council
FRP	Fraser River Panel
FSC	Food, Social and Ceremonial
HG	Haida Gwaii
ITQ	Individual Transfer Quota
IHPC	Integrated Harvest Planning Committee
ISBM	Individual Stock-Based Management
LAER	Low Abundance Exploitation Rates
LRP	Lower Reference Points
MCC	Marine Conservation Caucus
MPA	Marine Protected Area
MSY	Maximum Sustainable Yield
MVI	Mid Vancouver Island
NOLS	National On-line Licensing System
PICFI	Pacific Integrated Commercial Fisheries Initiative
PFMA	Pacific Fisheries Management Areas
PSC	Pacific Salmon Commission
PST	Pacific Salmon Treaty
RCA	Rockfish Conservation Area
SARA	Species at Risk Act
SEG	Sustainable Escapement Goal

SEP	Salmonid Enhancement Program
SFAB	Sport Fishing Advisory Board
SHMF	Selective Hatchery Mark Fishery
TAC	Total Allowable Catch
TAM	Total Allowable Mortality
WCVI	West Coast Vancouver Island
WSP	Wild Salmon Policy (Canada's Policy for Conservation of Wild Pacific Salmon)

FOREWORD

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the main objectives and requirements for the Northern B.C. Pacific salmon fishery, as well as the management measures that will be used to achieve these objectives. This document also serves to communicate the basic information on the fishery and its management to Fisheries and Oceans Canada (DFO, the Department) staff, legislated co-management boards, First Nations, harvesters, and other interested parties. This IFMP provides a common understanding of the basic "rules" for the sustainable management of the fisheries resource.

This IFMP is not a legally binding instrument that can form the basis of a legal challenge. The IFMP can be modified at any time and does not fetter the Minister's discretionary powers set out in the Fisheries Act. The Minister can, for reasons of conservation or for any other valid reasons, modify any provision of the IFMP in accordance with the powers granted pursuant to the Fisheries Act.

Where DFO is responsible for implementing obligations under land claims agreements, the IFMP will be implemented in a manner consistent with these obligations. In the event that an IFMP is inconsistent with obligations under land claims agreements, the provisions of the land claims agreements will prevail to the extent of the inconsistency.

NEW FOR 2022/2023

KEY CHANGES FOR THE 2022/23 NORTHERN BC SALMON IFMP

PACIFIC SALMON STRATEGY INITIATIVE

In April 2021, the Government of Canada released Budget 2021, which includes a commitment of $647.1 million over five years to implement a transformative Pacific Salmon Strategy Initiative (PSSI). The PSSI signals a more precautionary approach to address historic declines in Pacific salmon populations and to protect and rebuild these populations to sustainable levels. Work through the PSSI will be categorized under four pillars: Conservation and Stewardship; Salmon Enhancement; Harvest Transformation, and; Integration and Collaboration. In 2021, the Minister announced significant interim commercial salmon fishing closures in areas with stocks of conservation concern.

For 2022 and beyond, the Department is continuing to take a more precautionary approach to managing fisheries that interact with stocks of conservation concern to help stabilize and support rebuilding of these depressed populations.

From February through May of 2022, the Department sought feedback on the approach for managing the identified stocks of concern which included longer term commercial closures; or implementation of additional mitigation measures. Further details on longer term commercial closures or additional mitigations beginning in 2022 can be found i**N** Appendix 10. The Pacific Salmon Commercial Licence Retirement Program and Pacific Salmon Indigenous Communal Commercial License Alternation Program will also be launched to address factors affecting the long term sustainability of the fisheries by reducing the commercial salmon fleet to better align with longer-term prospects for commercial harvest.

PACIFIC SALMON IN 2022: RECENT ENVIRONMENTAL TRENDS SUGGEST BELOW AVERAGE SALMON PRODUCTIVITY (ADULT RECRUITS PRODUCED PER ADULT PARENTAL SPAWNER)

Environmental and biological data from 2016-2021 suggest that 2022 salmon productivity, defined as the number of adult recruits produced per adult parental spawner, will generally be below average. Specifically:

- Higher than average river temperatures occurred from 2017 to 2020. Summer river temperatures are increasingly exceeding upper thermal tolerances for salmon in assessed systems.

- Snow melted earlier in snow-dominated freshwater habitats. Most BC snowpacks were anomalously low by early May in 2018 and 2019, 2020 and by early June in 2017. In general, this contributed to warmer summer river and lake temperatures in snow-dominated systems in those years.
- Record summer droughts occurred in 2017 and 2018. Lower water levels can increase temperatures, block passage to key spawning habitat, strand salmon, and increase their exposure to predators.
- Unprecedented Northeast Pacific marine heatwaves were present during late-2013-2016 and in 2019 and 2020. This has negatively affected physical and biological ocean processes relating to salmon growth and productivity.
- Ocean food webs shifted. Northeast Pacific Ocean zooplankton community composition continued to exhibit characteristics consistent with a warmer ocean from 2017 to 2020, contributing a higher proportion of lower quality species near the base of the salmon food web.

Salmon productivities are generally expected to be below average, although responses will vary by species and population.

KWINAGEESE SOCKEYE CLOSURE

The Kwinageese Sockeye closure will be implemented for 1 week in 2022 for all marine net fisheries in PFMA 3.

NORTHERN BC COHO MANAGEMENT ACTIONS

The Department is continuing a precautionary approach to Coho management in 2022 to address ongoing conservation concerns for Northern Coho stocks as a result of poor returns observed in recent years. Management actions to reduce overall exploitation are being implemented, including a longer term closure of the Area F mixed-stock Coho directed fishery, starting in 2022. For more information on Coho see Section 13.3.

SKEENA CHINOOK

Post season evaluation of Skeena Chinook returns in 2021 were weaker than expected; subsequently a continued precautious approach is warranted. For 2022, management measures will implemented in both Recreational and Commercial fisheries to support conservation and promote rebuilding of Skeena Chinook.

Beginning in 2022, the Area 4 Gillnet fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or

until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

FRASER RIVER CHINOOK – CONSERVATION MEASURES

For 2022, the Area F Chinook fishery start date will be in mid-August. This will allow for passage of Spring 4_2, Spring 5_2, and Summer 5_2 Chinook stocks to support both conservation and allocation priorities.

MEZIADIN LAKE RECREATIONAL TRIGGERS

Triggers for the recreational fishery in Meziadin Lake are being implemented again in 2022 in response to recent poor returns of Meziadin Sockeye. For more information, see Section 13.5.3.5.2.

MANAGEMENT ACTIONS DURING SKEENA SOCKEYE FSC CLOSURES

When FSC fisheries for Skeena Sockeye are closed for conservation purposes, a number of management actions will be implemented. For descriptions of these management actions, see Section 13.5.

1 OVERVIEW

1.1 INTRODUCTION

The Northern BC Salmon Integrated Fisheries Management Plan (IFMP) covers the period June 1, 2022 to May 31, 2023.

This IFMP provides a broad context to the management of the Pacific salmon fishery and the interrelationships of all fishing sectors involved in this fishery. Section 2 considers stock assessment, while Sections 3 and 4 consider the shared stewardship arrangements and the social, cultural, and economic performance of the fishery. Section 5 describes the broader management issues, and the objectives to address these issues are identified in Section 0. Sections 7 and 8 describe allocation, general decision guidelines, and compliance plans. 2018 Post-season review information is outlined in Section 9. Sections 10, 11, and 12 are sections that describe the different fisheries and Section 13 of the IFMP covers off the fishing plans for each salmon species.

The Appendices in the IFMP provide information such as the fishing vessel safety, advisory board members, and maps of commercial licence areas.

1.2 HISTORY

For thousands of years, the history, economy, and culture of Canada's west coast have been inextricably linked to Pacific salmon. These magnificent fish are an important part of the diet, culture, and economy of First Nations people. Since the late 1800s, salmon have supported a vibrant commercial fishing industry, vital to the establishment and well-being of many coastal communities. Salmon, particularly Chinook and Coho, also play a key role in the west coast recreational fishery.

1.3 TYPE OF FISHERY AND PARTICIPANTS

This plan describes the management of First Nations, recreational, and commercial fisheries for Pacific salmon in northern BC and the factors that influence decision-making. Salmon fisheries are coordinated regionally with many management decisions occurring in area and field offices. Key to salmon management is the development and implementation of integrated fisheries management plans that meet specified objectives focusing on conservation, allocation, and obligations to First Nations and international treaties.

1.4 Location of Fishery

This IFMP is designed to describe the approach to fisheries in tidal and non-tidal waters from Cape Caution north to the B.C./Alaska border, including the Skeena River watershed.

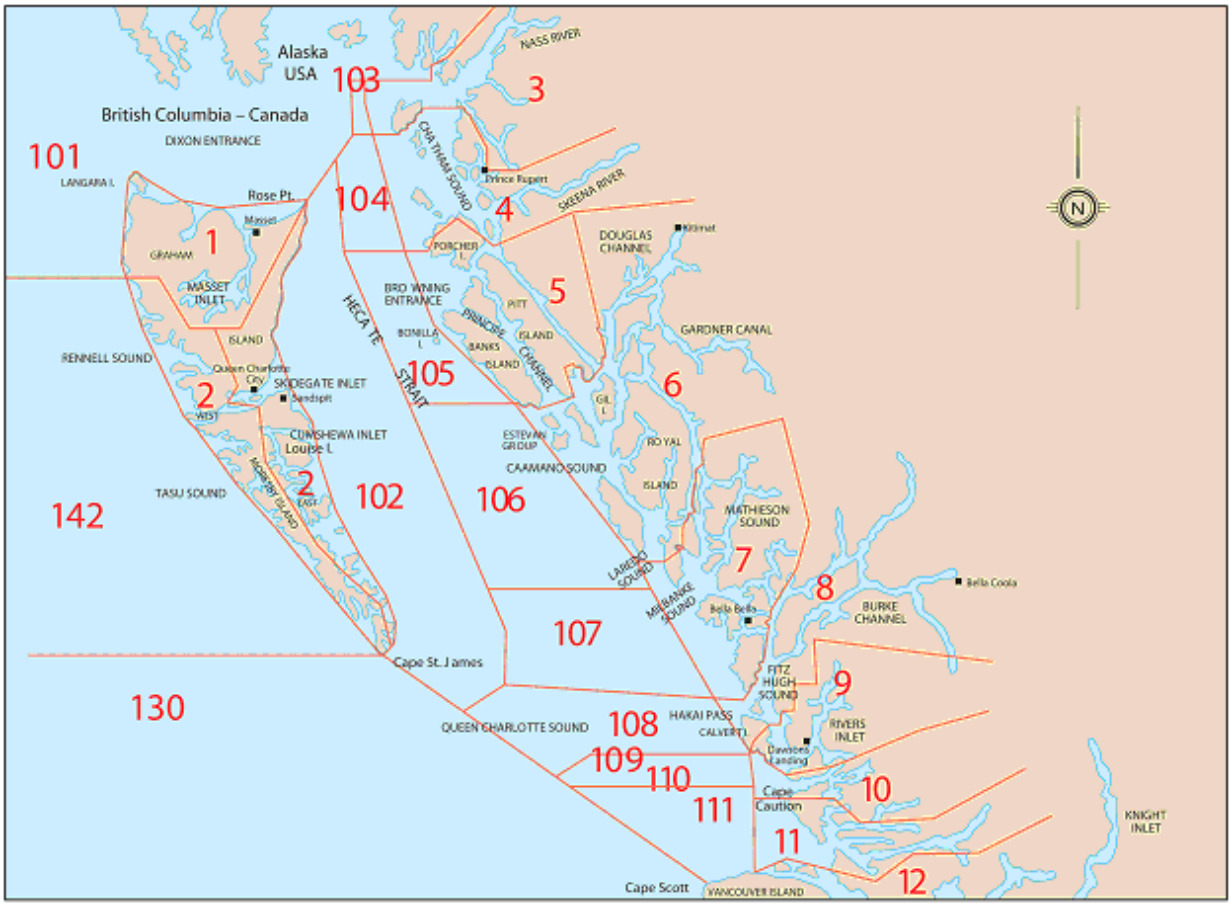


Figure 1.4-1: Management Areas for Northern B.C.

1.5 Fishery Characteristics

Pacific salmon species covered in the plan include Sockeye, Coho, Pink, Chum, and Chinook. Fisheries include those undertaken by First Nations as well as recreational and commercial fisheries.

In the 1990 Sparrow decision, the Supreme Court of Canada found that where an Indigenous group has an Aboriginal right to fish for food, social, and ceremonial (FSC) purposes, it takes priority — after conservation — over other uses of the resource.

There are four modern treaties in British Columbia, which all have fisheries chapters: Nisga'a Final Agreement, Tsawwassen First Nation Final Agreement, Maa-nulth First Nations Final Agreement, and Tla'amin (Sliammon) Nation Final Agreement. Through these treaties, Nations work with DFO to manage treaty fisheries on an annual basis. There are also historic treaties in British Columbia (Douglas Treaties and Treaty 8). For a detailed list of long-term fisheries arrangements in BC and Yukon, please see the internet at https://www.pac.dfo-mpo.gc.ca/abor-autoc/treaty-traites-eng.html. For information on Tsawwassen First Nation, Maa-nulth First Nations and Tla'amin Nation fisheries please see Section **Error! Reference source not found.**.

Pre-season, DFO engages in a variety of consultation and collaborative harvest planning processes with First Nations at the community level, broader tribal, or watershed levels. Fisheries are then authorized via a Communal Licence issued by the Department under the *Aboriginal Communal Fishing Licences Regulations*. These licences are typically issued to individual bands or tribal groupings, and describe the details of authorized fisheries including dates, times, methods, and locations of fishing. Licences and Aboriginal Fisheries Strategy (AFS) agreements (where applicable) include provisions that allow First Nations' designation of individuals to fish for the group and in some cases, vessels that will participate in fisheries.

Fishing techniques used in FSC fisheries are quite varied, ranging from traditional methods such as dip nets to modern commercial methods such as seine nets, fished from specialized vessels.

Separate from FSC fisheries, some First Nations have communal access to commercial opportunities as follows:

Harvest Agreements

Right-based commercial access for five Nuu-chah-nulth First Nations located on the West Coast of Vancouver Island (Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht). DFO has developed a Fishery Management Plan for the 2021/2022 season.

Negotiated through a side agreement, some modern treaty First Nations have communal commercial access through a Harvest Agreement outside of the constitutionally protected treaty. More information is provided in Section **Error! R eference source not found.**.

Commercial fisheries access through communal commercial licences obtained via voluntary licence relinquishments through DFO programs (e.g. Pacific Integrated Commercial Fisheries Initiative — PICFI, or Allocation Transfer

Program —ATP). These licences are fished in a manner that is comparable to the general commercial fishery.

Negotiated economic opportunity fisheries (Lower Fraser and West Coast of Vancouver Island only), or demonstration fisheries (select locations, to date supported through licences relinquished from the commercial salmon fleet, primarily from the ATP and PICFI programs).

Excess Salmon to Spawning Requirements (ESSR) fisheries may also be provided that permit the sale of fish in some highly terminal areas where spawner abundance is in excess of spawning requirements.

Fisheries and Oceans Canada regulates recreational fishing for Pacific salmon in both tidal and non-tidal waters. All recreational fishers must possess a valid sport fishing licence. Tidal licences are issued by DFO, and non-tidal licences are issued by the province. Anglers wishing to retain salmon taken from either tidal or non-tidal waters must have a valid salmon conservation stamp affixed to their licence. The proceeds from the sale of tidal Pacific Salmon Conservation stamps are used to fund salmon restoration projects supported by the non-profit Pacific Salmon Foundation. The proceeds from the sale of non-tidal Conservation Surcharge stamps directly benefit fish conservation through the Habitat Conservation Trust Foundation.

Fishing techniques used in the recreational fishery include trolling, mooching, and casting with bait, lures, and artificial flies. Boats are most commonly used, but anglers also fish from piers, shores, or beaches. Only barbless hooks may be used when fishing for salmon in British Columbia.

Commercial salmon licences are issued for three gear types: troll, seine, and gill net. Trollers employ hooks and lines, which are suspended from large poles extending from the fishing vessel. Altering the type and arrangement of lures used on lines allows various species to be targeted. Seine nets are set from fishing boats with the assistance of a small skiff. Nets are set in a circle around schools of fish. The bottom edges of the net are then drawn together into a "purse" to prevent escape of the fish. Salmon gill nets are rectangular nets that hang in the water and are set from either the stern or bow of the vessel. Fish swim headfirst into the net, entangling their gills in the mesh. Altering the mesh size and the way in which nets are suspended in the water allows nets to target certain sizes of fish. Gill-netters generally fish near coastal rivers and inlets.

Licence conditions and commercial fishing plans lay out allowable gear characteristics such as hook styles, mesh size, net dimensions, and the methods by which gear may be used.

1.6 GOVERNANCE

Departmental policy development related to the management of fisheries is guided by a range of considerations that include legislated mandates, judicial guidance, and international and domestic commitments that promote biodiversity and a precautionary, ecosystem-based approach to the management of marine resources. Policies were developed with consultation from those with an interest in salmon management. While the policies themselves are not subject to annual changes, implementation details are continually refined where appropriate.

1.6.1 POLICY FRAMEWORK FOR THE MANAGEMENT OF PACIFIC SALMON FISHERIES

Salmon management programs continue to be guided by the following policies: *Canada's Policy for Conservation of Wild Pacific Salmon* (WSP), *An Allocation Policy for Pacific Salmon, A Policy for Selective Fishing, A Framework for Improved Decision Making in the Pacific Salmon Fishery*, and the Strategic Framework for Fishery Monitoring and Catch Reporting in the Pacific Fisheries. These policies are available at:
https://www.pac.dfo-mpo.gc.ca/fm-gp/salmon-saumon/wsp-pss/index-eng.html

Canada's Policy for Conservation of Wild Pacific Salmon (the Wild Salmon Policy) sets out the vision regarding the importance and role of Pacific wild salmon as well as a strategy for their protection. More information on this can be found in Section 0 of this plan or at:
https://www.pac.dfo-mpo.gc.ca/fm-gp/salmon-saumon/wsp-pss/index-eng.html

The 1999 *An Allocation Policy for Pacific Salmon*, announced in 1999, sets out principles for allocating salmon in BC among the three harvest groups (First Nations food, social and ceremonial; commercial; and recreational) and within the commercial fishery among gear types (gillnet, seine and troll). It forms the basis for general decision guidelines outlined in Section 0 of this plan.

Since the Salmon Allocation Policy was first adopted twenty years ago, there have been significant changes to fisheries management, policy, and Aboriginal rights. Most recently, within the 2018 BC Supreme Court *Ahousaht* decision (Ahousaht Indian Band and Nation et al v. Canada (Attorney General) 2018 BCSC 633), the application of the SAP (1999) was found to be an unjustified infringement of the five Nuu-chah-nulth Nations' (Ahousaht, Ehattesaht/ Chinehkint, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht) Aboriginal rights to fish and sell fish insofar as the SAP accords priority to the recreational fishery over the Five Nations' right-based sale fishery for Chinook and Coho salmon. To the extent that the SAP applies to the Five Nations in the manner declared an unjustifiable infringement by the Court, the SAP is of no force and effect in its application to the Five Nations' exercise of their Aboriginal right to fish

and sell fish. DFO has responded to the court decision through the development of a Fisheries Management Plan for the Five Nations, which addresses the right to sell fish. Rather than designing a process solely to address the Court's findings in Ahousaht, DFO has also initiated a process to review and replace the SAP (1999).

The Department has embarked on a collaborative, phased process with First Nations and stakeholders to review and update the policy. This process of updating the Salmon Allocation Policy is being conducted in a manner that is intended to respect Canada's nation-to-nation relationship with Indigenous peoples and engage stakeholders. For more information on the SAP Review process, please visit our website (http://www.pac.dfo-mpo.gc.ca/consultation/smon/sap-prs/index-eng.html).

Pacific Fisheries Reform, announced by the Department in April of 2005, provides a vision of a sustainable fishery where the full potential of the resource is realized, Aboriginal rights and title are respected, there is certainty and stability for all, and fishery participants share in the responsibility of management. Future treaties with First Nations are contemplated, as is the need to be adaptive and responsive to change. This policy direction provides a framework for improving the economic viability of commercial fisheries, to addressing First Nations aspirations with respect to FSC and commercial access and involvement in management.

The 'Vision for Recreational Fisheries in BC' was approved in January 2010 by DFO, the Sport Fishing Advisory Board (SFAB), and the Province of BC. Guided by this Vision, an action and implementation plan are being developed to build upon the collaborative process established by the Federal and Provincial Governments and the SFAB.

In May 1999, the Department released *A Policy for Selective Fishing in Canada's Pacific Fisheries*. Under the Department's selective fishing initiative, harvester groups have experimented with a variety of methods to reduce the impact of fisheries on non-target species, with a number of measures reaching implementation in fisheries.

The Sustainable Fisheries Framework is a toolbox of existing and new policies for DFO to sustainably manage Canadian fisheries by conserving fish stocks while supporting the industries that rely on healthy fish populations. The Sustainable Fisheries Framework provides planning and operational tools that allow these goals to be achieved in a clear, predictable, transparent, and inclusive manner, and provides the foundation for new conservation policies to implement the ecosystem and precautionary approaches to fisheries management. These policies include:

- Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas;
- Policy on New Fisheries for Forage Species;
- A Fishery Decision-Making Framework Incorporating the Precautionary Approach;

- Guidance for the Development of Rebuilding Plans under the Precautionary Approach Framework: Growing Stocks out of the Critical Zone;
- Policy on Managing Bycatch; and
- Ecological Risk Assessment Framework (ERAF) for Coldwater Corals and Sponge Dominated Communities.
- Fishery Monitoring Policy

For more information on the Sustainable Fisheries Framework and its policies, please visit: https://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/overview-cadre-eng.htm

Work is progressing on aligning the management of Pacific Herring with the Sustainable Fisheries Framework.

1.6.2 FIRST NATIONS' FISHERIES

Section 35(1) of the *Constitution Act, 1982* recognizes and affirms the existing Aboriginal and treaty rights of the Aboriginal peoples in Canada. The Government of Canada's legal and policy frameworks identify a special obligation to provide First Nations the opportunity to harvest fish for food, social and ceremonial purposes. Treaty Agreements signed between Nations and the Government of Canada also obligate Canada to provide these opportunities.

DFO is committed to the recognition and implementation of Aboriginal and treaty rights related to fisheries, oceans, aquatic habitat, and marine waterways in a manner consistent with section 35 of the *Constitution Act, 1982*, the United Nations Declaration on the Rights of Indigenous Peoples Act, and the federal Principles Respecting the Government of Canada's Relationship with Indigenous peoples. The DFO-CCG Reconciliation Strategy provides a guidance document to better understand why and how reconciliation informs the work of the Department.

For further details on the United Nations Declaration on the Rights of Indigenous Peoples Act see https://laws-lois.justice.gc.ca/eng/acts/u-2.2/

For further details on the Principles Respecting the Government of Canada's Relationship with Indigenous peoples see https://www.justice.gc.ca/eng/csj-sjc/principles-principes.html

DFO's Reconciliation Strategy can be found at https://www.dfo-mpo.gc.ca/fisheries-peches/aboriginal-autochtones/reconciliation-eng.html

For further details on reconciliation in British Columbia and Yukon, refer to https://www.pac.dfo-mpo.gc.ca/abor-autoc/reconciliation-pacific-pacifique-eng.html

Information on Indigenous fisheries and reconciliation is available at: http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.html

Information on the Government of Canada work to advance reconciliation can be found here: https://www.rcaanc-cirnac.gc.ca/eng/1400782178444/1529183710887

1.7 Consultation on 2022/2023

This plan considers the results of consultations and input from First Nations, recreational and commercial harvesters and conservation organizations. Input was received directly through bilateral meetings and submissions to DFO on the proposed plan. Meetings with First Nations, Indigenous organizations and the Integrated Harvest Planning Committee (IHPC) provided opportunities for various parties to come together to discuss issues and concerns related to the management of salmon.

Any further significant changes to provisions in the IFMP will be identified to the parties prior to implementation, unless if circumstances require changes to be made without prior notification, such as the case of in season forecast updates.

Fisheries and Oceans Canada is committed to working with First Nations on planning and management of the salmon fisheries through existing and emerging bilateral and regional processes and relationships, and to achieving reconciliation with Indigenous peoples by working towards renewed nation-to-nation relationships and partnerships that contribute to reconciliation, the recognition of rights and mutual understanding, trust and respect. Fisheries and Oceans Canada also continues to consult with recreational and commercial harvesters, and conservation organizations to seek input on the IFMP and to further plan and co-ordinate fishing activities.

Further information on salmon consultations, including IHPC terms of reference, membership, and meeting dates can be found on the Salmon Consultation website at: http://www.pac.dfo-mpo.gc.ca/consultation/smon/index-eng.html.

1.8 Approval Process

This plan is approved by the Regional Director General – Pacific Region on behalf of the Minister of Fisheries and Oceans Canada.

2 STOCK ASSESSMENT, SCIENCE AND TRADITIONAL ECOLOGICAL KNOWLEDGE

2.1 BIOLOGICAL SYNOPSIS

Pacific salmon managed by DFO include five species belonging to the genus *Oncorhynchus*: Pink *(O. gorbuscha)*, Chum *(O. keta)*, Sockeye *(O. nerka)*, Coho *(O. kisutch)* and Chinook *(O. tshawytscha)*. The native range of Pacific salmon includes the North Pacific Ocean, Bering Strait, south-western Beaufort Sea and surrounding fresh waters. They occur in an estimated 1300 - 1500 rivers and streams in BC and Yukon; notably, the Skeena River and Nass River in the north and the Fraser River in the south, collectively accounting for roughly 75% of the total salmon production in Canada.

Each Pacific salmon species has unique physical characteristics, life histories and spawning habits, with further variation observed among populations of each species. Table 2.1-1 provides a brief summary of the contrasts in life history characteristics among species of Pacific salmon (from Haig-Brown Kingfisher Creek Restoration Project, 1998-99).

Chinook salmon produce the largest adults of all the Pacific salmon species and typically live the longest (six or more years). Chinook salmon fry may go to sea soon after hatching or, after one to two years in fresh water. Chinook salmon generally mature at age three to seven years, but "jacks" and occasionally "jills", defined as two-year-old sexually mature males and females that return to spawn, are also common among some Chinook salmon populations (as well as some Coho and Sockeye salmon populations).

Adult Coho generally return from late summer and early fall. Most populations originate from streams close to the ocean, although some journey as far as 1,500 kilometers inland. In contrast to other Pacific salmon, most Coho fry remain in freshwater for a full year after emerging from the gravel. Their age at maturity is normally three years, though a number of northern stocks may spend two years in freshwater before returning to spawn as four year old. Similarly, approximately ten percent of Interior Fraser Coho mature as four year old due to a two-year juvenile freshwater residency period.

Sockeye salmon generally spawn in streams with lake outlets. Young Sockeye typically spend between one and three years in their "nursery lake" before migrating to sea, although there are populations which do not require nursery lakes as part of their life history. Upon entering the ocean, Sockeye salmon move rapidly out of the estuaries and travel thousands of miles into the Gulf of Alaska and the North Pacific to feed. They generally return to their natal spawning stream at ages three to six years.

Chum salmon generally spawn in early winter in lower tributaries along the coast, rarely more than 150 kilometers inland. Fry emerge in the spring and go directly to sea. Chum generally mature in their third, fourth, or fifth year.

Pink salmon live only two years, spending the majority of their life in ocean feeding areas. Pink salmon fry migrate to the sea as soon as they emerge from the gravel. Once mature, adults leave the ocean in the late summer and early fall and usually spawn in streams not fed by lakes, short distances from their ocean-entry point.

The numbers of Pacific salmon returning to BC waters varies greatly from year to year and decade to decade, often with pronounced population cycles. For example, populations of Pink salmon usually have a dominant odd-year or even-year cycle, and a number of Sockeye salmon populations are very abundant every fourth year. This is seen most dramatically in the Fraser River, where the abundance of some populations in abundant years is many times larger than that of other years. Longer term cycles are also apparent but less regular and seem to be associated with changes in ocean conditions that affect survival during the feeding migration period.

All five Pacific salmon species are harvested in First Nations fisheries in coastal and inland areas. Coho and Chinook are the preferred species in the BC coastal mixed-stock recreational and commercial hook-and-line fisheries, and to a lesser extent, are caught by gill and seine nets. Sockeye, Pink and Chum are harvested primarily in First Nations and commercial net fisheries, but are also caught in recreational fisheries.

For more information, refer to the Fisheries and Oceans Canada Pacific Salmon Facts website at https://www.pac.dfo-mpo.gc.ca/fm-gp/salmon-saumon/facts-infos-eng.html.

Table 2.1-2: Summary of general biological and life history characteristics for five species of Pacific salmon

Life History Characteristic	Coho *O. kisutch*	Sockeye *O. nerka*	Pink *O. gorbuscha*	Chum *O. keta*	Chinook *O. tsawytscha*
Season when eggs hatch	Spring	Spring	Spring	Spring	Spring
Length of stay in freshwater	1–2 years; 1 year is common.	1 month to 2 years	Virtually none; often straight to ocean.	Virtually none; often straight to ocean.	Ocean-type: 60-150 days Stream-type: 1-2 years
Primary rearing habitat	Stream	Lake/stream	Estuary	Estuary	Stream/Ocean
Size at ocean migration	10cm or more	Variable, 6.5 to 12cm	About 3.3cm	2.8 to 5.5cm	5 to 15cm
Ocean voyage	4–18 months	16 months to 4 years	18 months	2 to 5 years	4 months to 5 years
Age at return to freshwater	During 2nd to 4th year	During 3rd to 5th years	During 2nd year	During 3rd to 5th years	During 2nd to 6th years
Season/month of return	Late summer to January	Mid-summer to late autumn	July to September	July to October	Spring to fall; some rivers support more than one run.
Number of eggs/female	2,000–3,000	2,000–4,500	1,200–2,000	2,000–3,000	2,000-17,000 (generally 5,000-6,000)
Preferred spawning area	Small streams	Near and in lake systems.	Close to ocean	Above turbulent areas or upwellings	Very broad tolerances

SALMON LIFE CYCLE

The Pacific salmon life-cycle includes periods in fresh water and the marine environment, with varying durations across species and populations. For all species, life begins in freshwater, when eggs deposited into gravel beds (called *redds*) the fall prior hatch as *alevins* by mid-winter. After surviving the rest of winter living in the gravel, young *fry* emerge in spring to reside in freshwater streams and lakes from a few hours (Pink and some Chum salmon populations) up to two years (some Coho and Chinook populations). Most fry then migrate to the sea to become *smolts* (transitioning to the salt water environment) and spend one to five years in the ocean, often undertaking prolonged (and sometimes distant) ocean-feeding migrations which are thought to be population-specific (Figure 2.1-1). (Notable exceptions include some Sockeye salmon that have developed a land-locked form—called kokanee–that do not go to sea). In the ocean, Sockeye, Pink and Chum feed primarily on plankton and crustaceans such as tiny

shrimp. Chinook and Coho also eat smaller fish, such as herring. At sea, Pacific salmon species attain the following average adult weights: 1 to 3 kg for Pink; 5 to 7 kg for Chum; 3.5 to 7 kg for Coho; 2 to 4 kg for Sockeye; and 6 to 18 kg for Chinook (the largest recorded Chinook was 57.27 kg). As anadromous species, Pacific salmon migrate back into rivers and streams as adults to spawn (often to the same river and even gravel bed from which they hatched). The return migration to fresh water can occur from spring to fall (timing is species- and/or population-dependent), but spawning generally takes place through the fall and early winter. In general, Sockeye and Chinook travel the farthest upstream to spawn—some as far as 1,500 kilometres. Chum, Coho and Pink usually originate from spawning sites located closer to the ocean. A notable exception is Yukon River Chum salmon that travel 3,200 kilometres to their spawning grounds. Following courtship, spawning females release eggs that are fertilized by a spawning male; the eggs are then buried by the female to start the next generation. Both adults die after spawning. Total life spans range from two years (for Pink salmon populations) up to six or seven years (for some Sockeye and Chinook salmon populations).

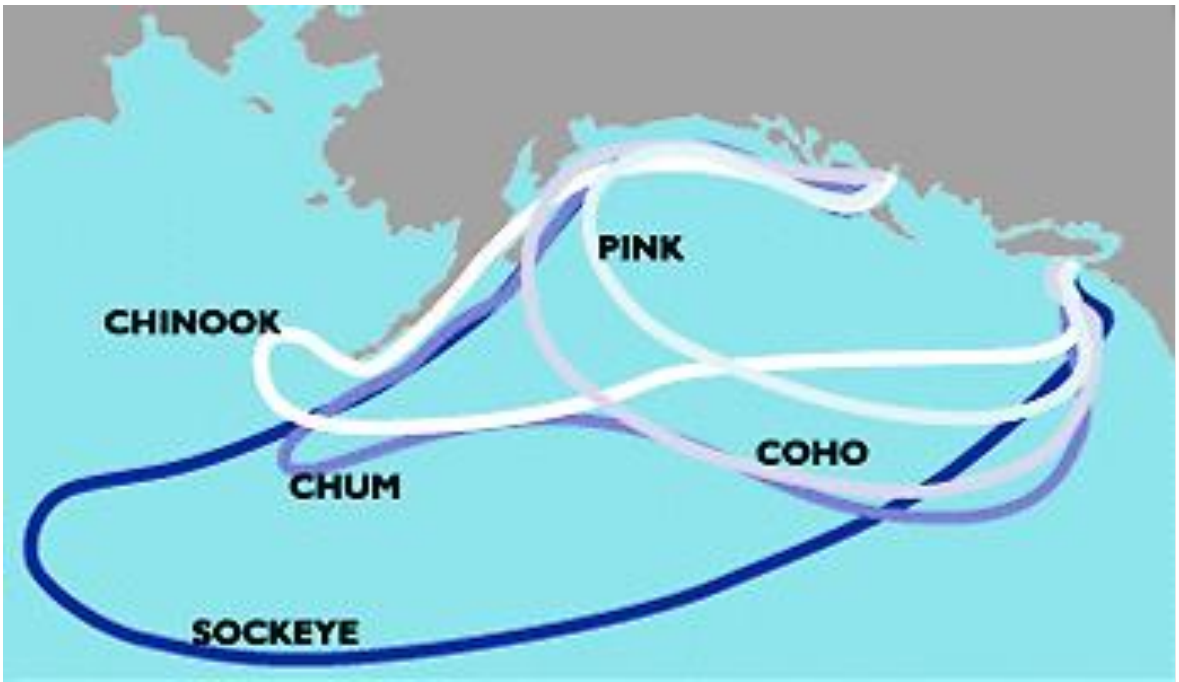


Figure 2.1-1: Generalized habitat of British Columbia Pacific salmon species in the North Pacific Ocean.

2.2 Ecosystem Interactions

As a consequence of their anadromous life history, salmon are sensitive to changes in both the marine and freshwater ecosystems. Salmon are an ecologically important species supporting

complex food webs in oceanic, estuarine, freshwater and terrestrial ecosystems by providing nutrients every year during their migration to the rivers and lakes to spawn.

DFO is moving away from management on a single species and moving towards an integrated ecosystem approach to science and management. Strategy 3 of the Wild Salmon Policy (WSP), Inclusion of Ecosystem Values and Monitoring, states the Department's intent to progressively incorporate ecosystem values in salmon management. The main focus of this effort will be on developing ecosystem-related indicators and science-based tools to better understand the pressures on Conservation Units (CUs) of Pacific Salmon and for integrating salmon conservation and other planning objectives. This strategy will include extraction of relevant information on environmental conditions in marine and freshwater ecosystems, in a risk-based framework.

The greatest challenge in implementation of the WSP is balancing the goals of maintaining and restoring healthy and diverse salmon populations and their habitats, with social and economic objectives that reflect people's values and preferences. Standardized monitoring and assessment of wild salmon populations, habitat and eventually ecosystem status will facilitate the development of comprehensive integrated strategic plans (WSP Strategy 4) that will address the goals of the WSP while addressing the needs of people. Outcomes of these plans will include biological objectives for salmon production from CUs and, where appropriate, anticipated timeframes for rebuilding, as well as management plans for fisheries and watersheds, which reflect open, transparent, and inclusive decision processes involving First Nations, communities, environmental organizations, fishers and governments.

For strategic planning and successful management of Pacific salmon, it will be essential to link variation in salmon production with changes in climate and their ecosystems. Salmon productivity in the Pacific is clearly sensitive to climate-related changes in stream, estuary and ocean conditions. Historically, warm periods in the coastal ocean have coincided with relatively low abundances of salmon, while cooler ocean periods have coincided with relatively high salmon numbers. In the past century, most Pacific salmon populations have fared best in periods having high precipitation, deep mountain snowpack, cool air and water temperatures, cool coastal ocean temperatures, and abundant north-to-south upwelling winds in spring and summer.

The Department conducts programs to monitor and study environmental conditions. Information on these programs is available at: http://www.pac.dfo-mpo.gc.ca/science/index-eng.html.

These programs include:

The Strait of Georgia Ecosystem Research Initiative

Fraser River Environmental Watch

Monitoring of physical, biological, and chemical freshwater and marine conditions

Chlorophyll and phytoplankton timing and abundance

The annual State of the Pacific Ocean Report describes changes and trends in atmospheric and oceanic conditions which have the potential to affect Pacific salmon (and other species) populations and informs science-based decision-making and DFO's management of fisheries and marine resources in the Pacific Region. It is available at: http://www.dfo-mpo.gc.ca/oceans/publications/index-eng.html.

2.2.1 ENVIRONMENTAL CONDITIONS INFLUENCING 2022 SALMON RETURNS

B.L. MacDonald, N. Wilson, S.C.H. Grant, J.L. Boldt, J. King, T. Ross, D.A. Patterson, A. Sastri

Summary

We predict that 2022 Canadian Pacific salmon productivity will generally be below historical averages. Productivity is defined as the number of adult recruits produced per adult parental spawner. This prediction is based on the environmental and biological data from 2017-2021, which coincides with parental spawning and egg incubation through to ocean rearing conditions for the 2022 salmon returns across populations.

While we do not have relevant data for each salmon population, we provide a general description of what is known about conditions experienced by Pacific salmon returning in 2022.

Specifically:

1) Higher than average river temperatures occurred from 2017 to 2020. Summer river temperatures are increasingly exceeding upper thermal tolerances for salmon in assessed systems.
2) Snow melted earlier in snow-dominated fresh water habitats. Most BC snowpacks were anomalously low by early May in 2018 and 2019, 2020 and by early June in 2017. In general, this contributed to warmer summer river and lake temperatures in snow-dominated systems in those years.
3) Record summer droughts occurred in 2017 and 2018. Lower water levels can increase temperatures, block passage to key spawning habitat, strand salmon, and increase their exposure to predators.

4) Unprecedented Northeast Pacific marine heatwaves were present during late-2013-2016 and in 2019 and 2020. This has negatively affected physical and biological ocean processes relating to salmon growth and productivity.
5) Ocean food webs shifted. Northeast Pacific Ocean zooplankton community composition continued to exhibit characteristics consistent with a warmer ocean from 2017 to 2020, contributing a higher proportion of lower quality species near the base of the salmon food web.

The effect of these challenges on 2022 returning salmon populations will depend on specific conditions encountered by each population, and their life-histories. The greatest impact will likely be felt by more southern BC populations, and species that spend more time in fresh water. Environmental conditions will interact with landscape changes in fresh water that have occurred from natural events like forest fires or mountain pine beetle kills, and human activities, such as logging, agriculture, and urban development.

General Distribution of the 2022 Pacific Salmon Returns

Five species of Pacific salmon are assessed and managed by the Department of Fisheries and Oceans: sockeye, Chinook, coho, pink and chum. Species and populations exhibit considerable variation in the habitats they occupy and the life history strategies they employ.

Most Canadian Pacific salmon returning in 2022 would have been deposited as eggs in their fresh water spawning grounds between 2017 and 2020, and will therefore return at an age falling between two and five years old (Figure 1). Many sockeye and Chinook populations, and all coho populations, rear in fresh water for one to two years as juveniles, before migrating to the ocean. Other sockeye and Chinook populations, and all chum and pink populations, migrate to the ocean shortly after hatching and emergence, with only a limited fresh water juvenile stage. Since the majority of 2022 returns would have inhabited fresh water environments between 2017 and 2020 (Figure 1), we present general fresh water conditions specific to these years.

The majority of 2022 Pacific salmon returns would have entered into the marine environment between 2019 and 2021, depending on their species and population, and will remain there until they return to fresh water in 2022. We present general marine conditions for 2019 to 2021 where available.

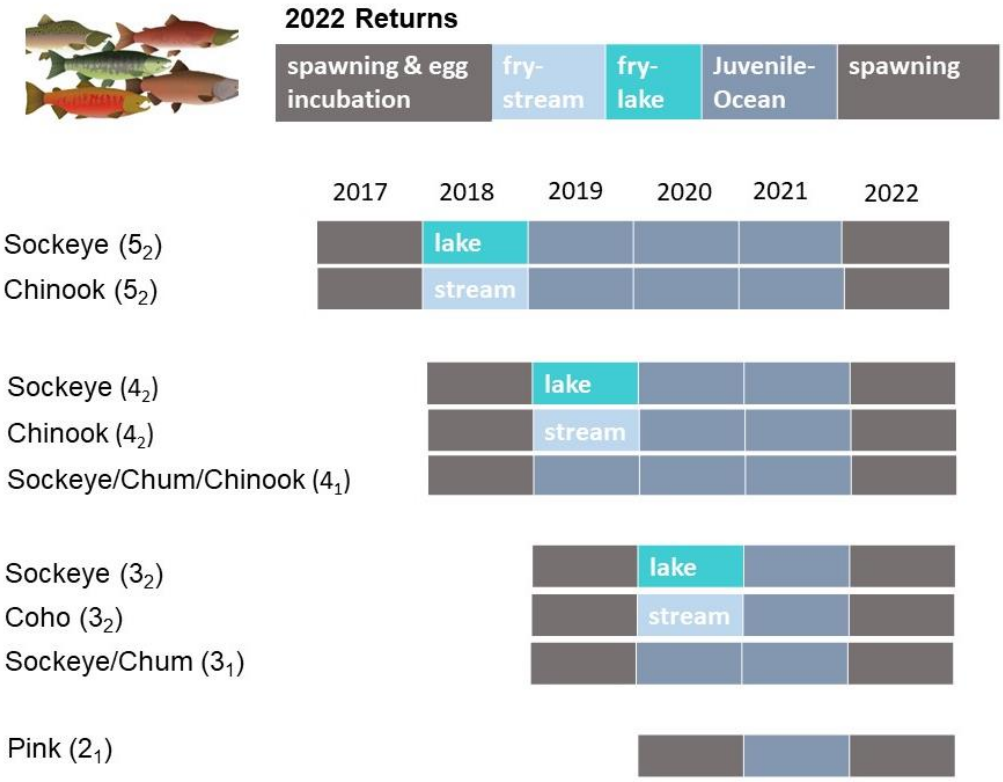


Figure 2.2-1 Timing of common age classes of Pacific salmon returning in 2022 in each habitat they occupy. For each species, the most common life-history types are presented, using the Gilbert-Rich age designation system (in brackets); the number on the left indicates the total age at return, while the subscript shows the number of winters spent in fresh water prior to migrating to the ocean. Coloured boxes show the life stage and habitat occupied by each group of animals in every year of their life, leading up to their return to fresh water in 2022.

Global and Regional Environmental Context for Salmon Outlook

The planet is warming (Figure 2.2-2). Average land-ocean temperature has risen by 1°C over the last century (IPCC 2018), and the years 2015 to 2020 were the warmest on record (NOAA National Centers for Environmental Information 2021). Canada is warming at double the rate of the global average, due to its northern latitude (Bush and Lemmen 2019). British Columbia warmed by 1.9°C between 1948 to 2016, while northern Canada warmed by 2.3°C (Bush and Lemmen 2019).

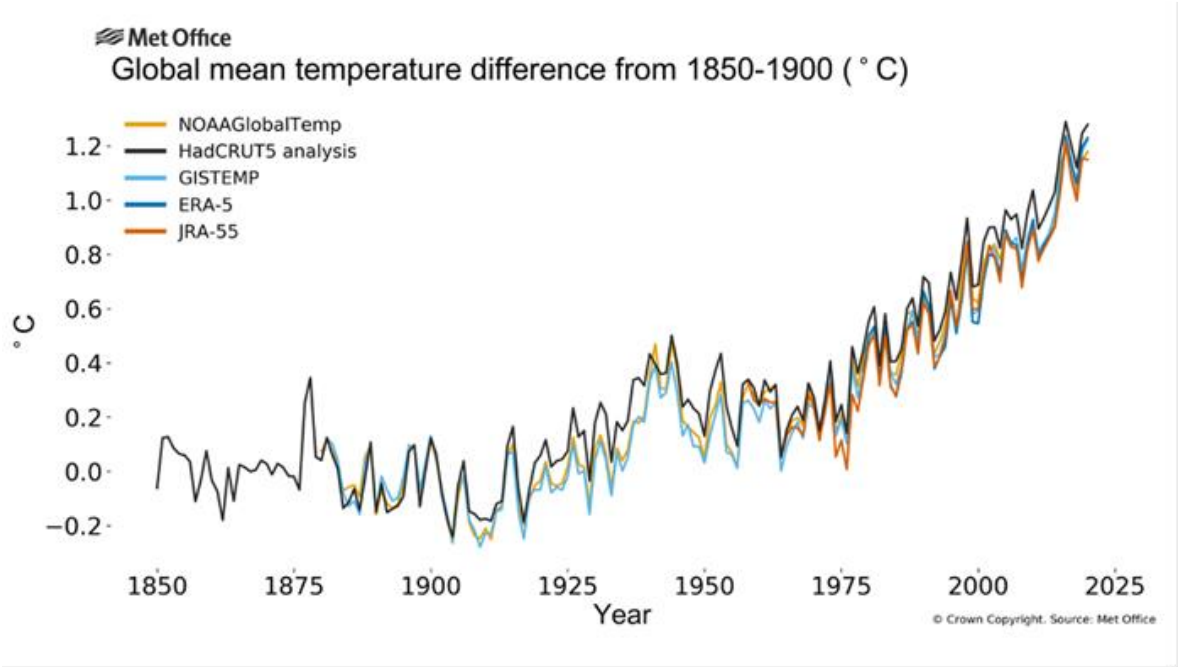


Figure 2.2-2 Global annual mean temperature difference from pre-industrial conditions (1850-1900). Canada's temperature increases are double this global rate of warming, typical of countries occupying northern latitudes.

Source: Met Office Hadley Centre and the Climatic Research Unit at the University of East Anglia, UK, as it appears on the World Meteorological Organization website: https://public.wmo.int/en/media/press-release/2020-was-one-of-three-warmest-years-record. [Accessed Oct 15, 2021]

Profound environmental changes are already occurring in Western Canada as a result of the warming that has taken place to date. In B.C., average precipitation is increasing; snowpacks are melting earlier, altering the hydrographs of rivers in snow-dominated systems; lakes and rivers are becoming ice-free earlier in the spring; river temperatures are warming, and sea-surface temperatures are also warming along the coast (White et al. 2016). The Yukon has experienced accelerated warming during the winter months, increases in precipitation, melting glaciers, thawing permafrost, and earlier snowmelt over the past 50 years. Such changes are affecting the hydrologic regime in the Yukon, leading to increases in flooding and winter low flows (Streicker 2016).

Climatic conditions were unprecedented in 2021 in Western Canada. The summer of 2021 began with an extreme heatwave that blanketed Western Canada and the Pacific Northwest in late June, sending temperatures soaring well above all-time heat records across the region (Di Liberto 2021). Lytton, BC, set a record for the highest temperature ever measured in Canada, at 49.6°C on June 29, 2021, nearly 5°C higher than any temperature previously recorded in the

country before this event. This heatwave was attributed to climate change; it was found to be "virtually impossible" in the absence of human-caused climate change (Philip et al. 2021). Continued warm and dry conditions over summer 2021 contributed to the third worst forest fire season in BC, with 8,800 km^2 burned; following consecutive records set in 2017 (12,161 km^2) and 2018 (13,540 km^2) (Canadian Council of Forest Ministers 2021). Moving into fall, extended periods of extreme rainfall in November 2021 caused unprecedented flooding in multiple areas of BC. Flooding events in rivers and streams across portions of Vancouver Island, and the Squamish, Lower Fraser, Thompson and Nicola watersheds may have scoured eggs and negatively affected juvenile salmon rearing in these areas.

While the events of 2021 are unprecedented, heatwaves and heavy precipitation events are likely to become more common and more severe in the Pacific Region as global temperatures continue to rise (White et al. 2016; Philip et al. 2021). A heatwave like the one experienced in 2021 historically would have occurred once every 1,000 years. With 2°C of global warming above the pre-industrial (1850-1900) average, the frequency of such an event would increase to roughly every 5 to 10 years (Philip et al. 2021).

Global temperatures are projected to rise 1.5°C to 3.7°C above the 1850-1900 average by the end of this century. We are already approaching the 1.5°C global limit of warming that the IPCC recommends as critical if we are to avoid significant issues related to food, water, and other life support systems on the planet (IPCC 2014, 2018, UNEP 2019). Temperatures in BC are expected to increase between 1.6°C to 5.2°C above the 1986-2005 average by the end of this century, according to low (RCP2.6) or "business as usual" high (RCP8.5) emission scenarios (Bush and Lemmen 2019). These projected changes will be accompanied by further increases in precipitation, loss of glaciers, and summer/early fall drought in southern BC (White et al. 2016). Average temperatures in Northern Canada are projected to increase by 2.1 to 7.8°C by the end of the century (Bush and Lemmen 2019). Precipitation will likely continue to increase in the Yukon, and will increasingly fall as rain rather than snow, while glaciers continue to melt, and permafrost continues to thaw (Bush and Lemmen 2019).

Environmental Conditions are Affecting the Salmon Outlook for 2022: Why does this matter?

Pacific salmon are already responding to environmental changes driven by climate change and other human activities (Grant et al. 2019). Though there are exceptions, Chinook salmon abundances have declined throughout their range across BC and the Yukon, while sockeye and coho populations have declined in Southern BC (Grant et al. 2019). Pink and chum salmon generally have not exhibited declines, though Chum returns were poor in both 2019 and 2020 (Grant et al. 2019, 2020, 2021).

This qualitative outlook attempts to describe broad-scale patterns in fresh water and marine conditions to provide an indication of overall conditions for salmon survival, specifically for the

2022 returns. Physical changes in fresh water and marine environments affect Pacific salmon through their habitats and food availability, and salmon respond through their behaviour, growth rates, and overall survival (NOAA Fisheries 2021). While we do not have relevant data for all species in all locations, we provide a general description of what is known about environmental conditions experienced by the 2022 returns, in relation to historical conditions.

We predict that 2022 Canadian Pacific salmon productivity will generally be below average, given the environmental information available. Salmon populations returning in 2022 will have been exposed to varying fresh water and marine conditions during the years 2017-2021, usually reflected through warmer than average water temperatures. However, the specific environmental conditions experienced by each population are determined by their spawning and juvenile rearing distributions, age of return, and other characteristics such as migration timing. Additional factors can also contribute to salmon productivity, including habitat alteration from natural and human activities, particularly in fresh water, hatchery contributions, disease, contaminants, predation, competition, and other local environmental conditions.

Given the environmental changes already being observed and predicted for the future in BC and the Yukon, we do not anticipate that general salmon survival patterns will return to what we have seen historically. Climate vulnerability assessments for Pacific salmon on the west coast of the US indicate that vulnerability to climate change varies across Pacific salmon species and populations, determined by their unique combinations of geographical distribution and life history characteristics (Crozier et al. 2019). Climate vulnerability is largely higher for southern and interior populations, and this interacts with fresh water and estuary residence times (Crozier et al. 2019). These patterns corroborate some of the general trends that have already been observed across Pacific salmon populations in Canada (Grant et al. 2019).

As environmental conditions continue to change, we see climate vulnerability assessments as a valuable tool for providing a longer-range outlook for Canadian Pacific salmon. Such assessments will provide a more detailed understanding of the distribution of climate vulnerabilities across Pacific salmon populations in Canada, to better inform current and future management decisions.

Fresh Water Indicators of Health for Spawning, Egg Incubation, and Juvenile Rearing Life Stages between 2017-2020

Air Temperature: Air temperature is an important determinant of river temperature, and therefore an important indicator of health for salmon in the fresh water stages of their lifecycle. Canadian Pacific salmon returning in 2022 have lived during three of the five hottest years on record (NOAA National Centers for Environmental Information 2021). Though the annual data are still being collated for 2021, so far the year has seen well above average global temperatures (NOAA 2021). More locally, air temperature has been warmer than average in BC and the

Yukon in recent decades (Figure 2.2-3). Warm temperature anomalies have been even greater in the Yukon than BC, due to its more northern location (Figure 3; Bush and Lemmen 2019). Spring and summer months were notably warmer from 2017 to 2019, with the exception of summer 2019, which was more variable and at times cooler than average (PCIC 2020). In 2020, B.C. experienced near normal maximum daily temperatures and above normal minimum daily temperatures.

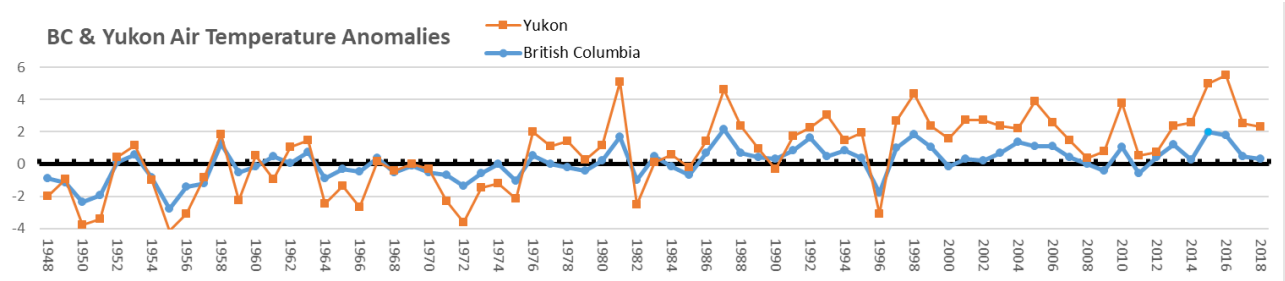


Figure 2.2-3 Canadian gridded temperature and precipitation anomalies (CANGRD) from the Government of Canada: https://climate-change.canada.ca/climate-data/#/historical-gridded-data. Temperatures for 2017 to 2020 coincide with the fresh water residence period of 2022 salmon returns. These data are interpolated from adjusted and homogenized climate station data at a 50km resolution. Anomalies represent the departure from a mean reference period (1961-1990). Temperature anomalies are expressed as degree Celsius (C).

River Temperatures: Salmon have challenges migrating upstream to their spawning grounds when rivers are too warm. Annual river temperatures are not available for most BC/Yukon systems, but in the Fraser River system, where data are available, summer temperatures regularly exceeded upper thermal thresholds for salmon from 2017 to 2019.

Fisheries and Oceans Canada Fraser River environmental watch reports: https://www.pac.dfo-mpo.gc.ca/science/habitat/frw-rfo/reports-rapports/archives-eng.html. [Accessed December 10, 2020]

In 2020, river temperatures were relatively average, except for a short period at the end of July where they exceeded 18°C.

Fisheries and Oceans Canada Fraser River environmental watch reports: https://www.pac.dfo-mpo.gc.ca/science/habitat/frw-rfo/index-eng.html. [Accessed October 12, 2021]

Peak summer water temperatures in the Fraser River increased by greater than 1.8 °C in the fifty years preceding 2008 (Farrell et al. 2008). It is now common each year to have days where river temperatures exceed 18°C at some point in the spring/summer. Temperatures above 18°C can result in decreased adult salmon swimming performance, and above 20°C can increase adult mortality, adult disease, egg viability, and cause legacy effects that have negative impacts on juvenile condition (Tierney et al. 2009; Burt et al. 2011; Eliason et al. 2011; Sopinka et al. 2016). High in-river spawning and incubation temperatures can have population-specific negative

effects on fertilization success and embryo survival, affect timing of hatch (Whitney et al. 2014), emergence (Macdonald et al. 1998), and reduce swimming endurance and impair swimming behaviour of fry (Burt et al. 2012). For juveniles that rear in fresh water, warmer temperatures can improve juvenile growth rates when prey are not limiting (Brett 1971, Edmundson & Mazumder 2001), and also increase the length of the growing season in some areas (Schindler et al. 2005). The exposure of a salmon population to these various temperature-related fresh water conditions will vary by system. However, as temperatures continue to increase from global climate change, the net effect is expected to be negative (Crozier et al. 2019).

Snowpack: The timing and rate of snowpack loss are significant factors in the volume and timing of spring freshets. The size and melting rate of winter snowpack in the mountains is a strong indicator of river water volume, flow rates and temperature in the summer months. Early loss of snowpack reduces the cool water inputs into rivers and lakes from snowmelt in warmer summer months.

In 2018 and 2019, the onset of snowmelt began several weeks earlier than normal. In these years, most regions of BC had below-average snowpacks by the second week of May. In 2017, the onset of snowmelt began several weeks later than normal, with extreme hot temperatures resulting in rapid snow melt in the second half of May. By June 2017, snowpacks were anomalously low for this month in northern latitudes and were closer to average in southern latitudes of BC. The 2020 season had a mix of snowmelt conditions, with early melt in low and mid-elevation areas and a delay in the melt of high elevation snowpacks.

https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/drought-flooding-dikes-dams/river-forecast-centre/snow-survey-water-supply-bulletin

Spring Freshnet timing: Spring freshets were close to normal in 2017, 2018, 2019. In 2020, earlier seasonal melt and lower peak snow accumulation in some areas of the province saw some rivers trend towards an earlier freshet and below seasonal stream flow, while others remained close to normal or slightly above.

Ministry of Forests, Lands, Natural Resource Operations, and Rural Development, River Forecast Center, Snow Conditions & Water Supply Bulletin:
https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/drought-flooding-dikes-dams/river-forecast-centre/snow-survey-water-supply-bulletin

Summer drought

Drought can result in lower river and lake levels, deteriorate water quality, block access to spawning habitat, strand salmon, increase exposure to predators and increase the risk of low oxygen levels in some fresh water systems. Recent years hit records for summer droughts in BC; 2017, and 2018 were both particularly dry years. The most significant drought occurred in 2017,

during which records were set for the driest season, with almost no rain falling in southern BC from June to late October, and peak drought occurring in October. In 2018, a heatwave in early spring depleted snowpacks, and lack of precipitation from July to November created extensive dry conditions from July to November. In 2019, a spring heatwave created dry conditions across the province, and drove down streamflow levels. Heavy rains in July began to help relieve the drought. Most of the province experienced average rainfall in 2020, with the exception of Vancouver Island and some southern watersheds that were very dry by late summer. In both 2019 and 2020, by October, most of the province had returned to average. https://governmentofbc.maps.arcgis.com/apps/MapSeries/index.html?appid=838d533d8062411c820eef50b08f7ebc

Marine indicators of Health for Juvenile Rearing to Adulthood Life Stages between 2019-2021

Ocean Temperature: Salmon metabolic demands increase with temperature. Without a concurrent increase in prey quality or quantity, salmon growth and productivity will decrease under warming conditions (Holsman et al. 2018). In recent years Chinook body weight for a given length declined (Daly et al. 2017). Sizes of mature Fraser River sockeye declined from the 1970s to the early 1990s, increased in the early 2000s, then again decreased through the 2010s. Lake-type Fraser Sockeye were amongst the smallest on record in 2019 and 2020 (Latham et al. 2021). Predation also can intensify in warmer ocean conditions, increasing salmon mortality (Holsman et al. 2012).

Sea surface temperatures have been warmer than average in the Northeast Pacific Ocean in recent decades (Figure 2.2-4) and have increased linearly by 0.88°C over the past 100 years (Chandler 2021). Following the notable "The Blob", the North Pacific marine heatwave of 2013 to 2016, there was a return to near-average sea-surface temperatures in 2017 and 2018. However, this was likely due to the cooling effect of the La Niña that persisted until the second half of 2018 (Ross and Robert 2018, 2019). New heatwaves were observed in the late summer and fall of 2018 and throughout most of 2019 and 2020 (Hannah et al. 2019; Ross and Robert 2020, 2021). The 2019 and 2020 heat waves were the second and third most expansive, respectively, in recorded history (NOAA Fisheries 2020), though neither reached the water column depths of The Blob. The cooling influences of a La Niña that emerged in the latter half of 2020 kept extreme warm ocean temperatures away from coastal B.C. waters (Boldt et al. 2021). At the time of writing, this La Niña is expected to continue through the Northern Hemisphere winter of 2021-2022 (~95% chance), and there is a 60% likelihood it will transition to neutral conditions during spring 2022 (NOAA National Weather Service 2021).

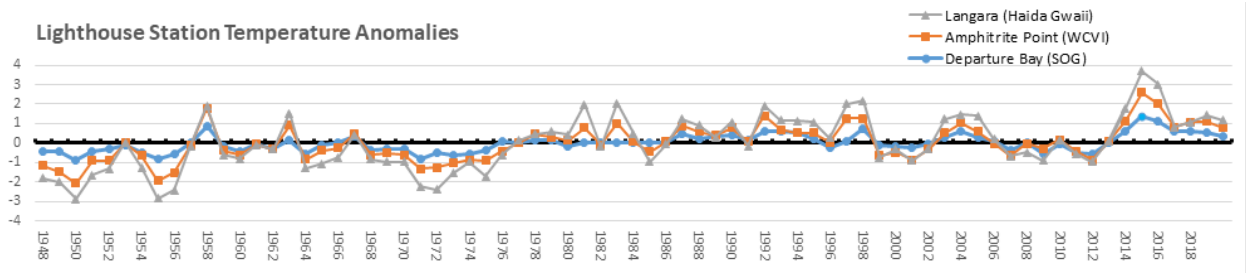


Figure 2.2-4 Annual average sea-surface-temperature anomalies from Fisheries & Oceans Canada lighthouse stations: https://www.dfo-mpo.gc.ca/science/data-donnees/lightstations-phares/index-eng.html. Anomalies represent the departure from a mean reference period (1948-2020). Temperature anomalies are expressed as degree Celsius (C).

Physical oceanography: Deep water convection is one of the major processes driving open-ocean primary productivity in the Pacific Ocean. Strong winter mixing brings more nutrients to the surface. Mixing during the 2018/2019 winter was very weak, suggesting lower than average availability of surface nutrients in early spring 2019 (Ross and Robert 2020). The mixing in the winter of 2019/20 was weak, though surface nutrients were likely not as low as they were in 2019 (Ross and Robert 2021).

Food Web - Phytoplankton: Phytoplankton are the base of the aquatic food web, feeding a host of other animals, such as zooplankton. The size and composition of phytoplankton communities affect the zooplankton that are able to feed on them, causing impacts further up the food chain (Batten and Ostle 2020).

Off the west coast of B.C. (along Line P), phytoplankton biomass was similar to previous years in spring/summer 2019, but relatively low in 2020 (Boldt et al. 2020, 2021). The phytoplankton community was composed of relatively high abundances of diatoms at several open-ocean sampling locations in June 2019, similar to 2018 (Peña and Nemcek 2020). In the winter of 2020, the phytoplankton community composition was similar to 2015 (a marine heatwave year), but in the summer it was similar to pre-marine heatwave years. There was no survey in the spring of 2020 (Boldt et al. 2021).

Food Web - Zooplankton: Zooplankton play a key role in the food web, supporting higher trophic levels. Boreal and sub-Arctic copepod species of zooplankton occur along the outer BC coast, and are lipid-rich and very nutritious. Southern copepods (which have their distributions centered off California) are less nutritious, as they are smaller and comparatively lipid-poor. Warmer ocean temperatures such as those seen in marine heatwaves like The Blob cause northward shifts in the distribution of southern copepod species to occupy habitats otherwise

too cold for them (Mackas et al. 2004). Such shifts in zooplankton composition are a key pathway potentially linking reduced salmon productivity to warmer temperatures in the Northeast Pacific Ocean (Mackas et al. 2007).

From 2019 to 2020, zooplankton composition and biomass varied across regions. In general, biomass of gelatinous zooplankton, characterized by high water content and low nutritional value, were closer to average, compared to the anomalous highs observed since 2014 during the Blob (Galbraith and Young 2021). Crustacean biomass anomalies were close to average (Galbraith and Young 2021).

Among those crustaceans, though, there was a continuing trend of higher than average abundances of southern, lipid-poor copepod species, and low abundances of lipid-rich, subarctic copepods (Galbraith and Young 2021). However, sampling in the coastal waters of Vancouver Island (North and South) and Hecate Strait regions showed declining trends in southern copepods since 2017/18, with an increase in 2020 in the Southern Vancouver Island region. Southern copepod biomass has remained above average in deep oceanic waters of the NE Pacific (along Line P; Galbraith and Young 2021).

In the Strait of Georgia, zooplankton biomass has been trending upwards since 2011 (Perry et al. 2021), and was above average in both 2019 and 2020 (Young et al. 2021). Zooplankton biomass was dominated by medium and large bodied copepods and larger crustaceans (Young et al. 2021), which tend to be the preferred prey for several species of juvenile fish of commercial interest (Perry et al. 2021).

References

Batten, S., and Ostle, C. 2020. Lower trophic levels in the Northeast Pacific. *In* State of physical, biological and selected fishery resources of Pacific Canadian marine ecoystems in 2019. *Edited by* J.L. Boldt, A. Javorski, and P.C. Chandler. Can. Tech. Rep. Fish. Aquat. Sci. 3377. pp. 58–62.

Boldt, J.L., Javorski, A., and Chandler, P.C. (*Editors*). 2020. State of physical, biological and selected fishery resources of Pacific Canadian marine ecoystems in 2019. Can. Tech. Rep. Fish. Aquat. Sci. 3377. xi + 288 pp. Available from https://www.dfo-mpo.gc.ca/oceans/publications/soto-rceo/2019/index-eng.html.

Boldt, J.L., Javorski, A., and Chandler, P.C. (*Editors*). 2021. State of the physical, biological and selected fishery resources of Pacific Canadian marine ecosystems in 2020. Can. Tech. Rep. Fish. Aquat. Sci. 3434. vii + 231 pp. Available from https://publications.gc.ca/collections/collection_2021/mpo-dfo/Fs97-6-3434-eng.pdf.

Brett, J.R. 1971. Energetic responses of salmon to temperature. A study of some thermal relations in the physiology and freshwater ecology of sockeye salmon (*Oncorhynchus nerka*). Am. Zool. **11**(1): 99–113. doi:198.103.39.129.

Burt, J.M., Hinch, S.G., and Patterson, D.A. 2011. The importance of parentage in assessing temperature

effects on fish early life history: a review of the experimental literature. Rev. Fish Biol. Fish. **21**: 377–406. doi:10.1007/s11160-010-9179-1.

Burt, J.M., Hinch, S.G., and Patterson, D.A. 2012. Developmental temperature stress and parental identity shape offspring burst swimming performance in sockeye salmon (*Oncorhynchus nerka*). Ecol. Freshw. Fish **21**(2): 176–188. doi:10.1111/j.1600-0633.2011.00535.x.

Bush, E., and Lemmen, D.S. (*Editors*). 2019. Canada's changing climate report. Government of Canada, Ottawa, ON. Available from www.ChangingClimate.ca/CCCR2019.

Canadian Council of Forest Ministers. 2021. Forest Fires. Available from http://nfdp.ccfm.org/en/index.php [accessed 24 November 2021].

Chandler, P. 2021. Sea surface temperature and salinity observed at shore stations and weather buoys along the B.C. coast in 2020. *In* State of the physical, biological and selected fishery resources of Pacific Canadian marine ecosystems in 2020. *Edited by* J.L. Boldt, A. Javorski, and P. Chandler. Can. Tech. Rep. Fish. Aquat. Sci. 3434. pp. 40–43.

Crozier, L.G., McClure, M.M., Beechie, T., Bograd, S.J., Boughton, D.A., Carr, M., Cooney, T.D., Dunham, J.B., Greene, C.M., Haltuch, M.A., Hazen, E.L., Holzer, D.M., Huff, D.D., Johnson, R.C., Jordan, C.E., Kaplan, I.C., Lindley, S.T., Mantua, N.J., Moyle, P.B., Myers, J.M., Nelson, M.W., Spence, B.C., Weitkamp, L.A., Williams, T.H., and Willis-Norton, E. 2019. Climate vulnerability assessment for Pacific salmon and steelhead in the California Current Large Marine Ecosystem. PLoS One **14**(7): e0217711. doi:10.1371/journal.pone.0217711.

Daly, E.A., Brodeur, R.D., and Auth, T.D. 2017. Anomalous ocean conditions in 2015 : impacts on spring Chinook salmon and their prey field. Mar. Ecol. Prog. Ser. **566**: 169–182. doi:10.3354/meps12021.

Edmundson, J.A., and Mazumder, A. 2001. Linking growth of juvenile sockeye salmon to habitat temperature in Alaskan lakes. Trans. Am. Fish. Soc. **130**: 644–662. doi:10.1577/1548-8659(2001)130<0644:LGOJSS>2.0.CO;2.

Eliason, E.J., Clark, T.D., Hague, M.J., Hanson, L.M., Gallagher, Z.S., Jeffries, K.M., Gale, M.K., Patterson, D.A., Hinch, S.G., and Farrell, A.P. 2011. Differences in thermal tolerance among sockeye salmon populations. Science (80-.). **332**(6025): 109–112. doi:10.1126/science.1199158.

Farrell, A.P., Hinch, S.G., Cooke, S.J., Patterson, D.A., Crossin, G.T., Lapointe, M., and Mathes, M.T. 2008. Pacific salmon in hot water: applying aerobic scope models and biotelemetry to predict the success of spawning migrations. Physiol. Biochem. Zool. **81**(6): 697–708. doi:10.1086/592057.

Galbraith, M., and Young, K. 2021. West Coast British Columbia zooplankton biomass anomalies 2020. *In* State of the physical, biological and selected fishery resources of Pacific Canadian marine ecosystems in 2020. *Edited by* J.L. Boldt, A. Javorski, and P. Chandler. Can. Tech. Rep. Fish. Aquat. Sci. 3434. pp. 75–80.

Grant, S.C.H., MacDonald, B.L., Lewis, D., G.J., N.L.W.C., and Michielsens, C.G.J. 2021. State of Canadian pacific salmon in 2020. *In* State of the Physical, Biological and Selected Fishery Resources of Pacific Canadian Marine Ecosystems in 2020. Can. Tech. Rep. Fish. & Aquat. Sci. 3434. pp. vii + 231. *Edited*

by J.L. Boldt, A. Javorski, and P.C. Chandler.

Grant, S.C.H., Macdonald, B.L., and Michielsens, C.G.J. 2020. State of Canadian Pacific Salmon in 2019. *In* State of the Physical , Biological and Selected Fishery Resources of Pacific Canadian Marine Ecosystems in 2019. Can. Tech. Rep. Fish. Aquat. Sci. 3377. pp. x + 288. *Edited by* and P.C.C. J.L. Boldt, A. Javorski. pp. 86–91. Available from https://www.dfo-mpo.gc.ca/oceans/publications/soto-rceo/2019/index-eng.html.

Grant, S.C.H., MacDonald, B.L., and Winston, M.L. 2019. State of the Canadian Pacific Salmon: Responses to Changing Climate and Habitats. Can. Tech. Rep. Fish. Aquat. Sci. **3332**: ix + 50 pp. Available from http://www.dfo-mpo.gc.ca/species-especes/publications/salmon-saumon/state-etat-2019/abstract-resume/index-eng.html.

Hannah, C., Page, S., and Ross, T. 2019. Ocean surface temperatures in 2018: another marine heat wave? *In* State of the Physical, Biological and Selected Fishery Resources of Pacific Canadian Marine Ecosystems in 2018. Can. Tech. Rep. Fish. Aquat. Sci. 3314. *Edited by* J.L. Boldt, J. Leonard, and P.C. Chandler. pp. 31–36. Available from https://dfo-mpo.gc.ca/oceans/publications/soto-rceo/2018/index-eng.html.

Holsman, K., Hollowed, A., Shin-Ichi, I., Bograd, S., Hazen, E., King, J., Mueter, F., and Perry, R.I. 2018. Climate change impacts, vulnerabilities and adaptations: North Pacific and Pacific Arctic marine fisheries. *In* Impacts of climate change on fisheries and aquaculture: synthesis of current knowledge, adaptation and mitigation options. *Edited by* M. Barange, T. Bahri, M.C.M. Beveridge, K.L. Cochrane, S. Funge-Smith, and F. Poulain. FAO Fisheries and Aquaculture Technical Paper, No. 627. FAO, Rome. pp. 113–138. Available from http://www.fao.org/3/i9705en/i9705en.pdf.

Holsman, K.K., Scheuerell, M.D., Buhle, E., and Emmett, R. 2012. Interacting effects of translocation, artificial propagation, and environmental conditions on the marine survival of Chinook salmon from the Columbia River, Washington, U.S.A. Conserv. Biol. **26**(5): 912–922. doi:10.1111/j.1523-1739.2012.01895.x.

IPCC. 2014. Climate change 2014: impacts, adaptation, and vulnerability. Part A: global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. *Edited By* C.B. Field, V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 1132 pp. Available from https://www.ipcc.ch/report/ar5/wg2/.

IPCC. 2018. Summary for policymakers. *In* Global warming of 1.5°C. An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change. *Edited By* V. Masson-Delmotte, P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield. World Meterological Organization, Geneva, Switzerland. 32 pp. Available from http://www.ipcc.ch/report/sr15/.

Latham, S., Phung, A., Brkic, D., Ball, C., Sellars, J., Dailey, C., and Taylor, E. 2021. Size and age trends of mature Fraser River Sockeye salmon (*Oncorhynchus nerka)* through 2020. *In* State of the physical, biological and selected fishery resources of Pacific Canadian marine ecosystems in 2020. *Edited by* J.L. Boldt, A. Javorski, and P. Chandler. Can. Tech. Rep. Fish. Aquat. Sci. 3434. pp. 122–126.

Di Liberto, T. 2021. Astounding heat obliterates all-time records across the Pacific Northwest and Western Canada in June 2021. Available from https://www.climate.gov/news-features/event-tracker/astounding-heat-obliterates-all-time-records-across-pacific-northwest [accessed 25 November 2021].

Macdonald, J.S., Scrivener, J.C., Patterson, D.A., and Dixon-Warren, A. 1998. Temperatures in aquatic habitats: the impacts of forest harvesting and the biological consequences to sockeye salmon incubation habitats in the interior of B.C. *In* Forest-fish conference: land mananagment practices affecting aquatic ecosystems. Proc. Forest-Fish Conf., May 1-4, 1996, Calgary, AB. *Edited by* M.K. Brewin and D.M.A. Monita. Natural Resources Canada, Edmonton, AB. pp. 313–324.

Mackas, D.L., Batten, S., and Trudel, M. 2007. Effects on zooplankton of a warmer ocean: recent evidence from the Northeast Pacific. Prog. Oceanogr. **75**(2): 223–252. doi:10.1016/j.pocean.2007.08.010.

Mackas, D.L., Peterson, W.T., and Zamon, J.E. 2004. Comparisons of interannual biomass anomalies of zooplankton communities along the continental margins of British Columbia and Oregon. Deep Sea Res. Part II Top. Stud. Oceanogr. **51**(6–9): 875–896. doi:10.1016/j.dsr2.2004.05.011.

NOAA. 2021. November 2021 was Earth's 4th warmest on record. Available from https://www.noaa.gov/news/november-2021-was-earths-4th-warmest-on-record [accessed 15 December 2021].

NOAA Fisheries. 2020. String of Marine Heatwaves Continues to Dominate Northeast Pacific. Available from https://www.fisheries.noaa.gov/feature-story/string-marine-heatwaves-continues-dominate-northeast-pacific [accessed 12 October 2021].

NOAA Fisheries. 2021. Literature Review of Climate Change Impacts on Pacific Salmon and Steelhead. Available from https://www.fisheries.noaa.gov/west-coast/climate/literature-review-climate-change-impacts-pacific-salmon-and-steelhead [accessed 29 November 2021].

NOAA National Centers for Environmental Information. 2021. Climate at a Glance: Global Time Series. Available from https://www.ncdc.noaa.gov/cag/global/time-series/globe/land_ocean/ytd/10/1880-2020 [accessed 1 December 2021].

NOAA National Weather Service. 2021. El Nino/Southern Oscillation (ENSO) Diagnostic Discussion, December 9, 2021. Available from https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml [accessed 15 December 2021].

PCIC. 2019. Seasonal Anomaly Maps. Available from https://www.pacificclimate.org/analysis-tools/seasonal-anomaly-maps [accessed 10 January 2020].

Peña, A., and Nemcek, N. 2020. Nutrients and phytoplankton along Line P and West Coast of Vancouver

Island. *In* State of the physical, biological and selected fishery resources of Pacific Canadian marine ecosystems in 2019. *Edited by* J.L. Boldt, A. Javorski, and P.C. Chandler. Can. Tech. Rep. Fish. Aquat. Sci. 3377. pp. 53–57.

Perry, I.R., Young, K., Galbraith, M., Chandler, P., Velez-Espino, A., and Baillie, S. 2021. Zooplankton variability in the Strait of Georgia, Canada, and relationships with the marine survivals of Chinook and Coho salmon. *In* PLoS ONE. doi:10.1371/journal.pone.0245941.

Philip, S.Y., Kew, S.F., Oldenborgh, G.J. Van, Yang, W., Vecchi, G.A., Anslow, F.S., Li, S., Seneviratne, S.I., Luu, L.N., Arrighi, J., Singh, R., Aalst, V., Hauser, M., Schumacher, D.L., Marghidan, C.P., Ebi, K.L., Vautard, R., Tradowsky, J., Coumou, D., Lehner, F., Rodell, C., Stull, R., Howard, R., Gillett, N., and Otto, F.E.L. 2021. Rapid attribution analysis of the extraordinary heatwave on the Pacific Coast of the US and Canada June 2021. Available from https://www.worldweatherattribution.org/wp-content/uploads/NW-US-extreme-heat-2021-scientific-report-WWA.pdf.

Ross, T., and Robert, M. 2018. La Niña and another warm year. *In* State of the Physical, Biological and Selected Fishery Resources of Pacific Canadian Marine Ecosystems in 2017. Can. Tech. Rep. Fish. Aquat. Sci. 3225. *Edited by* P.C. Chandler, S.A. King, and J.L. Boldt. pp. 27–32. Available from https://dfo-mpo.gc.ca/oceans/publications/soto-rceo/2017/index-eng.html.

Ross, T., and Robert, M. 2019. Another warm, but almost normal, year in the Northeast Pacific Ocean. *In* State of the Physical, Biological and Selected Fishery Resources of Pacific Canadian Marine Ecosystems in 2018. Can. Tech. Rep. Fish. Aquat. Sci. 3314. *Edited by* J.L. Boldt, J. Leonard, and P.C. Chandler. Can. Tech. Rep. Fish. Aquat. Sci. 3314. pp. 15–20. Available from https://dfo-mpo.gc.ca/oceans/publications/soto-rceo/2018/index-eng.html.

Ross, T., and Robert, M. 2020. Are marine heatwaves the new normal for the Northeast Pacific Ocean? *In* State of the Physical , Biological and Selected Fishery Resources of Pacific Canadian Marine Ecosystems in 2019. Can. Tech. Rep. Fish. Aquat. Sci. 3377. *Edited by* J.L. Boldt, A. Javorski, and P.C. Chandler. pp. 21-25. Available from https://waves-vagues.dfo-mpo.gc.ca/Library/40884569.pdf.

Ross, T., and Robert, M. 2021. Marine heatwave persists despite growing La Niña. *In* State of the physical, biological and selected fishery resources of Pacific Canadian marine ecosystems in 2020. *Edited by* J.L. Boldt, A. Javorski, and P. Chandler. Can. Tech. Rep. Fish. Aquat. Sci. 3434. pp. 24–28.

Schindler, D.E., Rogers, D.E., Scheuerell, M.D., and Abrey, C.A. 2005. Effect of changing climate on zooplankton and juvenile sockeye salmon growth in Southwestern Alaska. Ecology **86**(1): 198–209. doi:10.1890/03-0408].

Sopinka, N.M., Middleton, C.T., Patterson, D.A., and Hinch, S.G. 2016. Does maternal captivity of wild, migratory sockeye salmon influence offspring performance? Hydrobiologia **779**(1): 1–10. doi:10.1007/s10750-016-2763-1.

Streicker, J. 2016. Yukon climate change indicators and key findings in 2015. Northern Climate ExChange, Yukon Research Centre, Yukon College, 84 pp. Available from https://www.yukoncollege.yk.ca/sites/default/files/inline-files/Indicator_Report_Final_web.pdf.

Tierney, K.B., Patterson, D.A., and Kennedy, C.J. 2009. The influence of maternal condition on offspring

performance in sockeye salmon *Oncorhynchus nerka*. J. Fish Biol. **75**(6): 1244–1257. doi:10.1111/j.1095-8649.2009.02360.x.

United Nations Environment Programme. 2019. Emissions gap report 2019. UNEP, Nairobi. doi:10.18356/ff6d1a84-en.

White, T., Wolf, J., Anslow, F., and Werner, A. 2016. Indicators of climate change for British Columbia: Update 2016. Victoria, B.C. doi:ISBN 0-7726-4732-1.

Whitney, C.K., Hinch, S.G., and Patterson, D.A. 2014. Population origin and water temperature affect development timing in embryonic sockeye salmon. Trans. Am. Fish. Soc. **143**(5): 1316–1329. doi:10.1080/00028487.2014.935481.

Young, K., Galbraith, M., Perry, R.I., and Sastra, A. 2021. Zooplankton status and trends in the central and northern Strait of Georgia, 2020. *In* State of the physical, biological and selected fishery resources of Pacific Canadian marine ecosystems in 2020. *Edited by* J.L. Boldt, A. Javorski, and P. Chandler. Can. Tech. Rep. Fish. Aquat. Sci. 3434. pp. 186–190.2

2.3 INDIGENOUS KNOWLEDGE SYSTEMS (IKS)

Indigenous Knowledge is needed to inform and fill knowledge gaps related to the health of salmon stocks and to aid decision making related to development and resource use. The Government of Canada and the scientific community acknowledge the need to access and incorporate IK in meaningful and respectful ways. The challenge for resource managers is how to engage knowledge holders and how to ensure that the information can be accessed and considered in a mutually acceptable manner, by both knowledge holders, and the broader community of First Nations, stakeholders, managers, and policy makers involved in the fisheries.

The Wild Salmon Policy (2005) and Wild Salmon Policy Implementation Plan (2018) both acknowledge the importance of integrating IKS and Traditional Ecological Knowledge (TEK) into the strategic planning process. The Department is exploring best practices to develop an approach for incorporating IKS into WSP integrated planning. The Department may identify potential partnerships with First Nations organizations to develop an approach for integrating IKS into WSP, particularly in planning initiatives.

The *Species at Risk Act* makes a special reference to the inclusion of Traditional Knowledge in the recovery of species at risk. The Department has developed an operational guidance document for SARA practitioners (Guidance on Considering Traditional Knowledge in Species at Risk Implementation, 2011). Aboriginal groups have participated in the development and implementation of Interior Fraser River Coho and Cultus Lake Sockeye salmon species recovery

strategies. The Department utilized Indigenous knowledge about traditional fisheries, and the historical distribution and relative abundance of salmon in local watersheds in the selection of index streams for escapement monitoring of Interior Fraser Coho (Decker and Irvine 2013), and also for determining historical abundance ranges of Kitwanga and Morice Lake Sockeye.

In 2019, the *Fisheries Act* was amended to include provisions for the where the Minister may, or shall consider provided Indigenous Knowledge in making decisions pertaining to fisheries, fish and fish habitat, as well as provisions for the additional protection of that knowledge when shared in confidence. The Department is working to develop a process to improve how DFO receives and provides the knowledge to the Minister for their consideration. This will be an iterative process done in collaboration with First Nations, Indigenous groups and knowledge holders, to ensure the protection of the knowledge provided.

2.4 Stock Assessment

Salmon stock assessment is primarily concerned with providing sound scientific information to inform activities relating to the conservation and management of salmon resources. Stock assessment describes the past and present state of salmon stocks and may provide forecasts of future states. Stock assessment programs contribute information to the fisheries management process, from the initial setting of objectives (and policies) to providing expert advice in the implementation of management plans. Stock assessment information also supports First Nations and Treaty obligations, integrated ocean management planning, development of marine protected areas, protection and recovery of species at risk, and international Treaty obligations and negotiations.

Historically, stock assessment has primarily focused on population dynamics of individual exploited stocks, as well as biological and population processes such as growth, reproduction, recruitment and mortality. As DFO moves to implementation of an ecosystem approach, populations must be considered in a broader context and all activities impacting status, not just fishing, must be considered.

In the Pacific Region, salmon stock assessment advice is provided through the Salmon Assessment Section within each Area (Yukon and Transboundary, North Coast, South Coast and Fraser and Interior Area), in conjunction with core Salmon Stock Assessment staff in the Stock Assessment and Research Division of Science Branch. External partners and clients play an increasing role in delivery of stock assessment activities. Some First Nations, recreational and commercial harvesters contribute directly through data collection and reporting. First Nations and community groups conduct field data collection projects. Universities and non-government organizations (NGOs) are active in analytical and peer review processes. Stock assessment staff

collaborate with other regional, national and international organizations and conduct numerous cooperative and/or joint programs.

The Salmon Stock Assessment Framework is shaped by the WSP Strategy 1 which specifies requirements for standardized monitoring, status & management predicated on benchmarks. Strategy 1 identifies three elements:

- WSP Strategy 1 provides a standardized process for organizing Pacific salmon into Conservation Units (CUs), groups of wild salmon living in an area that are sufficiently isolated from other wild salmon such that the area is unlikely to be recolonized naturally in an acceptable period of time if they are extirpated. Scientists have grouped the greater than 9,600 Pacific salmon stocks into just over 450 discreet Conservation Units.
- DFO has developed criteria to assess CUs and identified a range of metrics for setting upper and lower CU benchmarks of status, dependent on data quality and availability (Holt et al. 2009; Holt et al. 2018). For each metric, lower and upper benchmarks will delimit three status zones of a CU. Management actions will be determined based on a CUs biological status relative to these benchmarks. Management will be focused on conservation measures for CUs in the red zone (i.e. below the lower benchmark), shift to cautionary management in the amber zone (between the lower and upper benchmark), and emphasizes sustainable use in the green zone (i.e., above the upper benchmark).
- A key requirement of the WSP is ongoing monitoring and assessment of the status of CUs. Monitoring wild salmon status in a cost-effective manner poses a challenge. It is not practical or cost effective to monitor all salmon demes. (A deme, as defined in the WSP, is a term for a local population of organisms of one species that actively interbreed with one another and share a distinct gene pool.) When groups of CUs are exposed to common threats, the approach will be to monitor a subset of these units. Annually, assessment monitoring plans are updated by the Salmon Assessment Coordinating Committee (SACC) based on CU status determination and risks. The CU status will generally determine the frequency and intensity of the assessment effort. For example, when a CU falls within the Red Zone, ongoing annual assessment of its status including fishery and habitat impacts may be required. The SACC is developing a database that describes benchmarks, status, major risk factors, resource management objectives, and assessment requirements. Assessment procedures will build on existing programs and local partnerships.

The vast number of stocks and the complex life cycle of salmon present substantial assessment and management challenges. Stock assessment activities are largely project-based and required on an ongoing basis because populations are dynamic and subject to shifts in productivity and abundance in response to environmental, biological, and human-induced factors. Responsible management requires continual updating of assessment information and advice. Scientists use a variety of techniques to generate estimates and forecasts of abundance (e.g., enumeration of juvenile "recruits", females or adults on the spawning grounds, tagging and mark recapture studies, etc.). For most species, several methods may be used to generate the estimates and forecasts of abundance.

2.5 Science Information Sources

The Canadian Science Advisory Secretariat (CSAS) serves as the primary departmental forum for peer review and evaluation of scientific research and literature, including TEK, relating to Pacific salmon. CSAS fosters national standards of excellence and coordinates the peer review of scientific assessments and advice for the DFO in the Pacific region. This review body allows for participation by outside experts, First Nations, fisheries stakeholders and the public. CSAS also coordinates communication of the results of the scientific review and advisory processes.

Additional information about CSAS, the peer review process and meeting schedule, as well as reports on the status of salmon, environmental and ecosystem overviews prior to 2014, and existing research documents are available from CSAS web site: http://www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm

DFO is continuing to implement WSP Strategy 1.2, determination of biological benchmarks and assess status. Benchmarks for Fraser Sockeye Conservation Units were developed in 2010 (Grant et al. 2011), initial status assessed in 2011 (Grant and Pestal 2013) and updated in June 2017 (DFO 2018a) through CSAS Regional Peer Review (RPR) processes. DFO completed a CSAS RPR process of WSP benchmarks and status assessment for Southern BC Chinook in February 2014 (DFO 2016). An assessment of WSP benchmarks and status assessment for Interior Fraser Coho was completed in November 2014 (DFO 2015a). Additionally, results are available from review of a habitat-based approach to determine benchmarks for Strait of Georgia and Lower Fraser River Coho Conservation Units (DFO 2015b). Finally, a process for evaluating biological benchmarks for data-limited populations (Conservation Units) of Pacific salmon with a focus on Chum Salmon in Southern BC was reviewed in a July 12-13, 2017 CSAS RPR process (Holt et al. 2018).

Other recent research projects and Science advice processes include:

- estimates of a biologically-based spawning goal and biological benchmarks for the Canadian-origin Taku River Coho stock aggregate (DFO 2015c);
- an evaluation and update of biologically-based targets for enhanced contributions to Chinook populations (DFO 2018b);
- review of a proposed framework for determination of Pacific Salmon Commission reference points for status determination and associated allowable exploitation rates for select Canadian southern Coho Salmon management units (DFO 2018c);
- Science information to support Chinook Salmon management measures in 2018 (DFO 2018d); and
- development of a framework for reviewing and approving revisions to Wild Salmon Policy Conservation Units (October 2018; http://www.dfo-mpo.gc.ca/csas-sccs/Schedule-Horraire/2018/10_25-26-eng.html).

Annually, DFO provides a qualitative outlook of status for salmon management, the Salmon Outlook, for planning purposes prior to formal forecasts of abundance. The Salmon Outlook for the current year is available in Appendix 9.

The number of salmon returning to spawn in a river, called "escapement", has long been an important stock assessment measure of abundance. Salmon escapement data are now available from the Government of Canada Open Data portal at:
http://open.canada.ca/data/en/dataset/c48669a3-045b-400d-b730-48aafe8c5ee6

2.6 PRECAUTIONARY APPROACH

Generally, science advice to fisheries management considers data quality and incorporates uncertainty (i.e. stock status forecasts presented as a statistical distribution rather than point estimate). WSP benchmarks of biological status will inform the development of a precautionary approach to management of salmon resources. Decisions on recovery and fisheries objectives will be made as part of the Strategic Planning Process described under WSP Strategy 4. To date benchmarks have been reviewed for Southern BC Chinook; Interior Fraser River, Georgia Strait Mainland, East Vancouver Island Coho; and Fraser Sockeye CUs. Until benchmarks are determined for each CU, DFO must rely on indicators of status and existing species- and stock-specific constraints established for escapement goals and harvest rates by domestic and international (e.g. Pacific Salmon Treaty) processes.

2.7 SHARED STEWARDSHIP

In the context of fisheries management, stewardship is often considered in terms of "shared stewardship," whereby First Nations, fishery participants, and other interests are effectively involved in fisheries management decision-making processes at appropriate levels, contributing specialized knowledge and experience, and sharing in accountability for outcomes.

Moving toward shared stewardship is a strategic priority for DFO. This is reflected in a number of policies and initiatives, including the *Wild Salmon Policy* (WSP), the Resource Management Sustainable Fisheries Framework (SFF), Pacific Fisheries Reform, Aboriginal Aquatic Resource and Oceans Management (AAROM) Program, and the Aboriginal Fisheries Strategy (AFS).

DFO is advancing shared stewardship by promoting collaboration, participatory decision-making, and shared responsibility and accountability with resource users and others. Essentially, shared stewardship means that those involved in fisheries management work cooperatively in inclusive, transparent, and stable processes, to achieve conservation and management goals.

2.8 RESEARCH

An overview of the science & research in the Pacific region is available on the regional website: http://www.pac.dfo-mpo.gc.ca/science/index-eng.html

Current research projects on salmon and environmental and human induced factors affecting their status include:

- Climate change impacts on Pacific salmon are being investigated by multiple sectors within DFO and in collaboration with external partners: university, other organizations and agencies. In 2011, DFO implemented a science-based climate change program focused on adaptation in decisions and activities to consider the vulnerabilities, risks, impacts, and opportunities associated with a changing climate. https://www.dfo-mpo.gc.ca/science/oceanography-oceanographie/index-eng.html
- An example of this work is the Aquatic Climate Change Adaptation Services Program (ACCASP) which has an emphasis on the development of new science knowledge to support the development of adaptation tools and strategies that will enable the integration of climate change considerations into the delivery of the Department's programs and policies. More information on this program is available at: http://www.dfo-mpo.gc.ca/science/rp-pr/accasp-psaccma/index-eng.html

- State of Salmon Program (SOS): this program integrates information on Pacific salmon (abundance, productivity, size, fecundity, run timing, etc.) and their freshwater and marine ecosystems (water temperatures, river discharge, ocean upwelling, etc.) to understand the state of Pacific salmon, and the factors that contribute to these states. Collaboration across DFO Science, DFO Areas, and other Sectors is foundational to this program.
- Salmon in Regional Ecosystems (SIRE) program investigates the mechanisms controlling recruitment variations and changes in productive capacity of salmon stocks within freshwater and/or marine ecosystems.
- On-going research related to improving forecasting ability for salmon stocks and CUs is being conducted by DFO Stock Assessment and the Fisheries & Oceanography Working Group. The annual State of the Pacific Ocean Reports was published by the Canadian Science Advisory Secretariat (CSAS) until 2012. Recent reports are available at: http://www.dfo-mpo.gc.ca/oceans/publications/index-eng.html.
- The Fraser River Environmental Watch program provides scientific advice on the impact of different environmental factors on the migration success of Pacific salmon in fresh water. http://www.pac.dfo-mpo.gc.ca/science/habitat/frw-rfo/index-eng.html
- DFO scientists in collaboration with other organizations including the North Pacific Anadromous Fisheries Commission (NPAFC), the Pacific Salmon Commission (PSC), and the Pacific Salmon Foundation (PSF) are studying salmon production, distribution and survival in the North Pacific Ocean including the Salish Sea, and developing leading indicators of salmon returns.
- Annual juvenile salmon surveys monitor the distribution, migration, and survival of salmon in their freshwater and early marine life history.
- On-going collaborative research between DFO and aquaculture industry to investigate the interactions between wild and cultured salmon through the Program for Aquaculture Regulatory Research (PARR) and Aquaculture Collaborative Research and Development Program (ACRDP)
- Research carried out in the freshwater and marine environments is being considered to provide a biological context as Supplementary Information for the forecast of Fraser River Sockeye. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2016/2016_047-eng.html

- On-going development of quantitative tools to inform rebuilding plans for depleted (red-status) CUs given climate/oceanographic change and variability and constraints from mixed-CU fisheries.

Added Reference:

Holt, C.A., Davis, B, Dobson, D., Godbout, L., Luedke, W., Tadey, J., Van Will, P. Evaluating Benchmarks of Biological Status for Data-limited Populations (Conservation Units) of Pacific Salmon, Focusing on Chum Salmon in Southern BC. Can. Sci. Advis. Sec. Res. Doc. 2018/11

3 STEWARDSHIP, CO-MANAGEMENT, CONSULTATION AND ADVISORY BOARDS

Stewardship refers to the care, supervision or management of something, especially the careful and responsible management of something entrusted to one's care.[1]

[1]As defined in the Atlantic Fisheries Policy Review (AFPR): https://www.dfo-mpo.gc.ca/reports-rapports/regs/afpr-rppa/framework-cadre-eng.htm#toc6

3.1 PACIFIC SALMON TREATY

In March 1985, the United States and Canada agreed to co-operate in the management, research and enhancement of Pacific salmon stocks of mutual concern by ratifying the Pacific Salmon Treaty (PST). The PST includes several "fishing chapters" contained in Annex IV which set out the specific conservation and harvest sharing (allocation) arrangements for migratory salmon stocks subject to the Treaty. These chapters are critical to the functioning of the Treaty and are periodically renegotiated by the Parties, normally on a 10-year cycle. The bilateral Pacific Salmon Commission (PSC), established under the Pacific Salmon Treaty, consists of four Commissioners and four Alternates from each country, and supported by several bilateral panels and technical committees. The PSC provides regulatory and policy advice as well as recommendations to the Governments of Canada and the United States (U.S.) with respect to interception salmon fisheries. Under the terms of the Treaty, the responsibility for in-season management of all species rests with the Parties to the agreement. One exception is the in-season management of Fraser River Sockeye and Pink salmon which is specifically delegated to the Fraser River Panel with support from the Pacific Salmon Commission Secretariat staff.

Coded-wire tag (CWT) data are essential to the management of Chinook and Coho salmon stocks under the Pacific Salmon Treaty. On August 13, 1985, the United States and Canada entered into a Memorandum of Understanding in which "the Parties agree to maintain a coded-wire tagging and recapture program designed to provide statistically reliable data for stock assessments and fishery evaluations". Both countries recognize the importance of the coded-wire tag program to provide the data required to evaluate the effectiveness of bilateral conservation and fishing agreements. In addition, alternatives to CWT data have been explored by the PSC, including the feasibility of parentage-based genetic tagging.

In August 2018, the PSC recommended new provisions, under Annex IV of the PST, to the Governments of Canada and the U.S. for review and ratification. Both governments agreed to the provisional application of the new agreements as of January 1, 2019 while the ratification process was completed. Effective May 3, 2019, the Annex IV amendments came fully into force

through the exchange of diplomatic notes between Canada and the U.S., and will remain in place for 10 years.

The renewed chapters are: Chapter 1 (Transboundary Rivers), Chapter 2 (Northern British Columbia and Southeast Alaska), Chapter 3 (Chinook), Chapter 5 (Coho) and Chapter 6 (Chum). Chapter 7 (General Obligations) does not have an expiry date; however, the PSC recommended minor updates to "Attachment E" containing general provisions on salmon habitat.

Chapter 4 (Fraser River Sockeye and Pink) expired on December 31, 2019. The negotiating team, made up of Canadian and U.S. representatives on the PSC's Fraser River Panel, met regularly between November 2018 and February 2019 to discuss proposed amendments to Chapter 4. In February 2019, agreement-in-principle was reached and the proposed amendments were referred to the Governments of Canada and the U.S. for review and ratification. Both governments agreed to the provisional application of the amendments as of January 1, 2020 while the ratification process was completed in February 2021. The new amendments will remain in place for 9 years, bringing Chapter 4 into alignment with the five other fishing Chapters under the PST.

In addition to direct involvement and representation in the PSC process, the Department consulted extensively with First Nations and stakeholders leading up to, and throughout, the negotiations. Moving forward, DFO will continue to schedule consultation sessions and meetings, as needed, to identify, discuss, and help mitigate potential concerns regarding the agreement.

Key elements from the renewed chapters, under Annex IV, are identified, below:

Chapter 2 (Northern Boundary): Covers marine fisheries for sockeye, pink and chum stocks in Northern B.C. and Southeast Alaska, including the Nass and Skeena rivers. The new chapter includes a joint technical review of escapement goals for Nass River and Skeena River sockeye, new management measures in Alaska to reduce harvest impacts on Canadian Nass and Skeena sockeye in years of low abundance, a joint technical review of the impacts of the Alaskan District 4 pink salmon fishery on Skeena and Nass sockeye abundances, and a joint review of the effectiveness of the new chapter after five years (to inform a decision by the Commission as to whether further changes may be required for the balance of the regime). This chapter along with Chapter 3 (Chinook) and Chapter 5 (Coho), govern fisheries covered in the North Coast Salmon Integrated Fisheries Management Plan.

Chapter 3 (Chinook salmon): Provides a framework for bilateral conservation and coordination of chinook fisheries coastwide from Oregon to Alaska. In response to conservation concerns for chinook in both countries, several changes were made to the chapter, including targeted harvest

reductions in both Canadian and U.S. fisheries, adoption of a new metric to manage and evaluate performance in specific Canadian and U.S. individual stock-based management or "inside" fisheries (the calendar year exploitation rate), a renewed commitment (and investment) in the coastwide stock assessment program for chinook (including the Coded-Wire Tag program), a 10-year Catch and Escapement Indicator Improvement program to provide more robust and timely information for managing chinook, and enhanced fishery monitoring.

The harvest reductions are:

- For the U.S., up to a 7.5 per cent reduction in the Southeast Alaska aggregate abundance-based management or "outside, mixed-stock" fishery, as well as reductions of up to 15 per cent from 2009-2015 harvest levels for individual stocks in Washington and Oregon individual stock-based management fisheries.
- For Canada, up to a 12.5 per cent reduction in the West Coast Vancouver Island aggregate abundance-based management fishery and reductions of up to 12.5 per cent from 2009-2015 levels in Canadian individual stock-based management fisheries.

Chapter 4 (Fraser River Sockeye and Pink Salmon): The 2019 amendments are largely operational in nature designed to ensure the long-term sustainability of Fraser River Sockeye and Pink salmon stocks while supporting an economically viable fishing industry on both sides of the Canada-U.S. border. Key adjustments to the Chapter allow for the Panel to make management decisions considering sub-components of the four Fraser River Sockeye management groups, which provides greater flexibility to address stock-specific conservation or harvest objectives; the maintenance of Canada's share of Fraser River Sockeye and Pink salmon; and the ability of the Panel to consider both the Sockeye and Pink salmon Total Allowable Catch throughout the season for best use of the fisheries resource. Other changes include new language that enables Canada to identify concerns, if they arise, regarding incidental catches of Fraser River Sockeye in Alaska as well as updates to how the Aboriginal Fisheries Exemption is distributed across the Sockeye management groups. 2019 was the final year under the previous 2014 arrangement with changes to Chapter 4 language provisionally applied starting January 1, 2020 until formal ratification is completed by the countries (expected Spring 2021).

Chapter 5 (Coho Salmon, Southern BC and Washington State): Addresses two geographically defined groupings of Coho salmon stocks originating from British Columbia, Washington and Oregon. For northern-origin stocks (those originating from waters between Cape Caution (in north-central British Columbia) and Cape Suckling (in southeast Alaska), the Northern Panel's Technical Committee (Coho sub-Committee) has been tasked with developing a state of knowledge report which describes the current status and recent trends in spawning, production and harvest. This technical report is to be presented to the Northern Panel and Commissioners

in advance of the 2021 fishing season to inform the Parties with respect to future management actions or recommended conservation measures. For southern-origin stocks (those origination from Treaty-area waters south of Cape Caution), proposed changes to the chapter include the amalgamation of two southern Canadian Coho management units into a single Strait of Georgia management unit, commitment to develop a new status-based management approach for southern Canadian management units (i.e., classification of Canadian Coho management units as low, moderate or abundant), and improvements in the stock assessment used to determine the status of southern-origin Coho stocks subject to the Treaty.

Chapter 6 (Chum Salmon, Southern BC and Washington State): Covers Chum salmon stocks in Southern B.C. and Washington. The revised chapter includes new management thresholds ("break points") for Canadian (Fraser River) Chum stocks, lower U.S. catch ceilings in years of moderate abundance for Fraser Chum with higher catch ceilings in years of high abundance, and new requirements related to stock assessment and escapement monitoring to inform decision-making.

3.2 SALMONID ENHANCEMENT PROGRAM

The Salmonid Enhancement Program (SEP) produces Pacific salmon at enhancement facilities, restores habitat, and undertakes projects that include public participation by local communities and First Nations in fisheries and watershed stewardship activities. Enhanced salmon enable economic, social and cultural harvest opportunities for commercial, recreational and First Nations harvesters, support vulnerable stock rebuilding, and contribute to Canada's stock assessment commitments under the Pacific Salmon Treaty with the United States. Projects with community partners include stewardship activities and the development of integrated local and area watershed plans. SEP also support school education and public awareness projects.

With respect to projects that undertake fish culture, about 170 projects release fish annually from sites throughout British Columbia and the Yukon. Projects range in size from spawning channels releasing nearly 100 million juveniles annually to school classroom incubators releasing fewer than one hundred juveniles. SEP enhances Chinook, Coho, Chum, Pink, and Sockeye salmon, as well as small numbers of Steelhead and cutthroat trout. Project types include hatcheries, fishways, spawning and rearing channels, habitat improvements, flow control works, lake fertilization, and small classroom incubators. Projects are operated by SEP staff or contracted with some SEP support to First Nations and community and volunteer groups.

The program is delivered through three components:

- Major Operations (OPS) SEP facilities that rebuild stocks, support assessment and provide harvest opportunities through hatcheries and spawning channels;
- The Community Involvement Program (CIP), which includes:
    - The Community Economic Development Program (CEDP) that operates contracted SEP facility operations with local community groups;
    - Public Involvement Program projects (PIPS) which include facilities operated by First Nations and public/community groups with technical support provided by SEP. The majority of PIPs are smaller projects that focus on outreach, stewardship and educational activities, and do not produce large numbers of fish.
    - The Resource Restoration Unit, which supports habitat improvements, effectiveness monitoring, watershed planning, and partnerships related to habitat initiatives.
- SEP Planning and Assessment (SPA) which through data coordination, analysis, and sector integration, provide biological advice in support of DFO's salmon enhancement activities throughout the Pacific Region, and facilitates salmon production and related assessment within the formal integrated production planning process.

SEP facilities are subject to the *Pacific Aquaculture Regulations* (PAR) under the *Fisheries Act*. PAR licences for all SEP and SEP licensed facilities include a production plan, which is developed within a formal integrated planning process. Production planning meetings involve SEP, Science, and Fisheries Management. External consultation and involvement is achieved through the IFMP process. The production planning cycle establishes maximum numbers of eggs to be collected and juveniles to be released for each enhanced system, using strategies that will produce the number of adults desired to meet specific objectives while considering species interactions, effects on existing stocks, harvest, habitat capacity, project capacity and overall conservation unit (CU) objectives. SEP priorities are established annually based on the national and regional priorities using a consistent approach across the program.

The information available at the link below addresses production from major DFO Operations (OPS) facilities, contracted Community Economic Development Program hatcheries (CEDP), Public Involvement Projects (PIP) operated by volunteers, and Aboriginal Fisheries Strategy (AFS). There are two datasets available at the link below:

- Post-Season Production from the 2020 brood year (i.e. 2021 releases, and numbers on hand for 2022 release)

- Draft SEP Production Plan, which includes proposed targets for the 2022 brood year. The Production Plan dataset is preliminary, and the final version will be available upon the final publication of the IFMP in July 2022.

http://www.pac.dfo-mpo.gc.ca/sep-pmvs/projects-projets/ifmp-pgip-eng.html

Significant production adjustment proposals for 2022 are incorporated into the *Enhancement Information* in each Species Overview of the Section 13 Fishing Plans.

3.3 Fisheries Act: Fish Stocks Provisions

Amendments to the *Fisheries Act* (Bill C-68) were passed into legislation in 2019. The *Fishery (General) Regulations* were amended on April 4, 2022 and include requirements to maintain major fish stocks at sustainable levels, and develop and implement rebuilding plans for stocks that have declined to their critical zone. The amended regulation can be found here: https://www.gazette.gc.ca/rp-pr/p2/2022/2022-04-13/html/sor-dors73-eng.html

Three major stocks of Pacific Salmon were prescribed in regulation: West Coast Vancouver Island (WCVI) Chinook, Interior Fraser Coho, and Okanagan Chinook. As per Section 6.2 (1) of the *Fisheries Act*, "if a major fish stock has declined to or below its limit reference point (LRP), the Minister shall develop a plan to rebuild the stock above that point in the affected area." Okanagan Chinook and WCVI Chinook are expected to be below their LRP and therefore subject to the fish stocks provisions and require rebuilding plans. Information on the requirements for rebuilding plans is available at: https://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precautionary-precaution-eng.htm

3.4 Consultation

In Pacific Region, DFO consults with and engages First Nations and other interests through a wide range of processes. For salmon, the focal point for DFO's engagement with First Nations, the harvest sectors and environmental interests is around the development and implementation of the annual IFMP.

The Crown has a legal duty to consult and if appropriate, accommodate, when the Crown contemplates conduct that might adversely impact section 35 rights (established or potential) (Source: Aboriginal Consultation and Accommodation: Interim Guidelines for Federal Officials to Fulfill the Legal Duty to Consult, February 2008). In addition to the legal duty, consultation supports good governance, sound policy and effective decision making.

In addition, Canada is committed to implementing the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and recognizes the right of Indigenous peoples to

participate in decision-making in matters that affect their rights through their own representative institutions and the need to consult and cooperate in good faith with the aim of securing their free, prior, and informed consent.

Consultation and engagement with First Nations takes place at a number of levels and through a variety of processes. A significant amount of consultation and dialogue takes place through direct, bilateral meetings between DFO and First Nations at a local level. This can include specific engagement on the draft IFMP or other issues during the pre-season, in-season or post-season. In addition to consultations at the local level, DFO works with First Nations at the aggregate or watershed level.

For Treaty Nations, consistent with the Cabinet Directive on the Federal Approach to Modern Treaty Implementation, DFO consults on a broad suite of fish and fishery related items, including shared stewardship arrangements, through formal processes such as Joint Fisheries Committees.

3.5 COLLABORATIVE GOVERNANCE AGREEMENTS

3.5.1 CANADA AND FIRST NATION RECONCILIATION AGREEMENTS

In addition to negotiating treaties, the Government of Canada and Indigenous peoples can also negotiate Recognition of Indigenous Rights and Self-Determination (RIRSD) agreements, to explore new ways of working together to advance the recognition of Indigenous rights and self-determination. These agreements are led by Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). DFO can also negotiate Fisheries Resources Reconciliation Agreements directly with First Nations to enhance First Nations and DFO collaborative governance and management on fisheries, marine and aquatic matters.

Reconciliation agreements work within the legislative framework of the Fisheries Act. The Act provides the Minister of Fisheries and Oceans Canada with the legislative authority for the proper management and control of the fisheries, the conservation and protection of fish, and regulation of the fishery.

Since 2019, the Government of Canada entered into several framework agreements with First Nations that lay the foundation for incremental development and implementation of new arrangements for collaborative governance on fisheries and marine matters. A 'framework agreement' sets out the subject matter for negotiation and describes how negotiations will proceed towards a final agreement. A final reconciliation agreement

includes substantive commitments the Parties have agreed to implementing and governs the relationship between the Parties for its term of the agreement.

See the BC Treaty Commission at https://www.bctreaty.ca/index.php and CIRNAC for more information on current treaty tables at https://www.rcaanc-cirnac.gc.ca/eng/1100100028574/1529354437231 and for current RIRSD tables at https://www.rcaanc-cirnac.gc.ca/eng/1511969222951/1529103469169.

North Coast Framework Agreements:

- *GayGahlda "Changing Tide" Framework Agreement* between Haida and Canada

North Coast Reconciliation Agreements:

- *Haíłcístut Incremental House Post Agreement* between Heiltsuk and Canada

- *Coastal First Nations Fisheries Resource Reconciliation Agreement* between Canada and Metlakatla, Gitxaala, Gitga'at, Kitasoo/Xai-Xais, Nuxalk, Heiltsuk, Wuikinuxv, and Haida Nations

As DFO and First Nations develop and implement new fisheries and collaborative governance arrangements, DFO works with these Nations to engage neighbouring First Nations and stakeholders (e.g. commercial and recreational sectors).

3.6 Advisory Committees and Boards

3.6.1 SALMON COORDINATING COMMITTEE

The First Nations Salmon Coordinating Committee (SCC) facilitates dialogue between First Nations and DFO. First Nations representatives from 13 geographical areas within the Pacific Region meet with DFO resource management to discuss priority issues among BC First Nations as they relate to salmon. SCC priorities include advancing Indigenous fisheries; building First Nations capacity and fisheries governance; and advising on salmon conservation and rebuilding, and the sustainability of pacific salmon fisheries concerns.

3.6.2 INTEGRATED HARVEST PLANNING COMMITTEE

At a broad, Province-wide level, the Integrated Harvest Planning Committee (IHPC) was developed to bring together First Nations, commercial and recreational harvesters, and environmental interests to review and provide input on the IFMP, as well as co-ordinate fishing plans and (where possible) resolve potential issues between the sectors. The IHPC also meets

post-season to review information regarding stocks and fisheries and implementation of the IFMP. The current IHPC advisory membership list is located in Appendix 5.

In addition to integrated dialogue through the IHPC, the Department also works directly with the commercial and recreational sectors, largely through the Commercial Salmon Advisory Board (CSAB) and Sport Fishing Advisory Board (SFAB), respectively. The Department also consults with the Pacific Marine Conservation Caucus, an umbrella group representing nine core environment groups (http://www.mccpacific.org/).

3.6.3 COMMERCIAL SALMON ADVISORY BOARD

The Commercial Salmon Advisory Board (CSAB) consists of two representatives from each Area Harvest Committee (AHC A-H), as well as representatives from the Native Brotherhood of BC (2), the processing sector (2), and the UFAWU (2). The CSAB serves as the consultative body on issues that affect commercial salmon fisheries. Two representatives from each area are nominated to sit on the DFO Integrated Harvest Planning Committee. The current CSAB members list is available at: https://www.pac.dfo-mpo.gc.ca/consultation/smon/csab-ccpcs/membs-eng.html

3.6.3.1 AREA HARVEST COMMITTEES

Area Harvest Committees (AHC) consist of representatives nominated and elected by salmon licence eligibility holders. Elections are normally held every year where half of the board will be up for re-election. AHCs provide pre-season and in-season advice and recommendations on fishing related matters to DFO as appropriate to the area and gear type. Two representatives from the AHC are elected to represent the interests of the specific area and gear type on the CSAB. The current AHC members list is available at: https://www.pac.dfo-mpo.gc.ca/consultation/smon/csab-ccpcs/ahc-ces-membs-eng.html

3.6.4 SPORT FISHING ADVISORY BOARD

The Sport Fishing Advisory Board has been an advisory body to Fisheries and Oceans Canada (DFO) on recreational issues since 1964. The Board's role is to provide advice and make recommendations to DFO on matters affecting tidal waters fisheries and non-tidal anadromous fisheries and in tidal waters on matters affecting all species and forms of recreational fishing. A terms of reference for this board is available at:

https://www.pac.dfo-mpo.gc.ca/consultation/smon/sfab-ccps/index-eng.html

4 ECONOMIC, SOCIAL AND CULTURAL IMPORTANCE

The intent of this section is to provide a socio-economic overview of the salmon fisheries in British Columbia using available information. In future years, information on the social and cultural context of the various fisheries can be added, where available. This summary addresses salmon in the context of the Aboriginal food, social, and ceremonial fishery, the recreational fishery, and commercial fishery (harvest, processing and export activity including that generated by the Aboriginal communal commercial fishery). This section does not provide measures of economic value (i.e. consumer and producer surplus). DFO recognizes the unique values of each of the fisheries described here. The overview provided in this profile is intended to help build a common understanding of the socio-economic dimensions of each fishery rather than compare the fisheries. Where possible this summary highlights information specific to the North Coast.

4.1 INDIGENOUS FISHERIES

Fisheries and Oceans Canada recognizes that the following section does not reflect Indigenous perspectives on the economic, social and cultural importance of salmon fisheries to First Nations, and is considering how Indigenous perspectives may be better reflected in future Integrated Fisheries Management Plans for salmon.

Section 35(1) of the Constitution Act, recognizes and affirms the existing Aboriginal and treaty rights of the Aboriginal peoples in Canada, however it does not specify the nature or content of the rights that are protected. In 1990, the Supreme Court of Canada issued a landmark ruling in the Sparrow decision. This decision found that the Musqueam First Nation has an Aboriginal right to fish for FSC purposes. The Supreme Court found that where an Aboriginal group has a right to fish for FSC purposes, it takes priority, after conservation, over other uses of the resource. The Supreme Court also indicated the importance of consulting with Aboriginal groups when their fishing rights might be affected.

The Aboriginal Fisheries Strategy (AFS) was implemented in 1992 to address several objectives related to First Nations and their access to the resource. These included:

a) To provide a framework for the management of fishing by Aboriginal groups for food, social and ceremonial purposes.

b) To provide Aboriginal groups with an opportunity to participate in the management of fisheries, thereby improving conservation, management and enhancement of the resource.

c) To contribute to the economic self-sufficiency of Aboriginal communities.

d) To provide a foundation for the development of self-government agreements and treaties.

e) To improve the fisheries management skills and capacity of Aboriginal groups.

In the region in 2020/21, there were approximately 85 AFS agreements. AFS fisheries agreements may identify the amounts of species including salmon that may be fished for FSC purposes, terms and conditions that will be included in the communal fishing licence and fisheries management arrangements. AFS continues to be one of the principal mechanisms – in addition to Treaties and reconciliation agreements - to support the development of relationships with First Nations including the consultation, planning and implementation of fisheries, and the development of capacity to undertake fisheries management, stock assessment, enhancement and habitat protection programs. Additional information on AFS implementation for FSC, including harvest target amounts for North Coast are provided in Section 10.2.

Fisheries chapters in modern treaties may articulate a treaty fishing right for domestic purposes that are protected under Section 35 of the *Constitution Act*, 1982. Negotiated through a side agreement, some modern treaty First Nations have been provided commercial access either through the general commercial fishery or a Harvest Agreement outside of the constitutionally protected treaty.

There are four modern treaties in British Columbia, which all have fisheries chapters: Nisga'a Final Agreement, Tsawwassen First Nation Final Agreement, Maa-nulth First Nations Final Agreement, and Tla'amin (Sliammon) Nation Final Agreement. Further information can be found in Section 1.5. For information on Tsawwassen First Nation, Maa-nulth First Nations and Tla'amin Nation fisheries please see Section **Error! Reference source not found.**.

In addition to modern-day treaties, there are historic treaties in British Columbia: Douglas Treaties (1850-1852), and Treaty 8 (1899).

4.1.1 ECONOMIC VALUE

In terms of Indigenous commercial harvest opportunities, the Department's general approach is that Indigenous commercial harvest opportunities are managed using the same harvest decision guidelines as the commercial fishery. Indigenous commercial harvest opportunities may be implemented with different times, areas, gears and regulations consistent with the overall

management approach for the commercial fishery. The landings and value attributable to Indigenous commercial harvest are included in the values reported for the commercial sector above and this includes inland fisheries. Participation in the commercial salmon fishery provides socio-economic benefits to Indigenous communities and individuals from fishery revenues and employment-generated income.

Indigenous participation within the Indigenous commercial salmon fishery occurs under four licence categories (A, A-I, N, and F). An Indigenous vessel owner may elect to pay a reduced fee for a category A licence; thereafter only an Indigenous person may own the vessel. Since 2005, an average of 14% of commercial licences in the North Coast have been reduced fee licences, while the coast-wide average is 11%. Licence categories N and F provide similar fishing privileges as A licence eligibilities, but are non-transferable and are intended to be held permanently for the benefit of the recipient First Nations communities. Both licence categories allow Indigenous communities to designate vessels and individual fish harvesters to carry out the fishing. The Northern Native Fishing Corporation holds 254 gillnet licences (Category N), of which 61 are in the South Coast.

Since 1994, DFO has obtained a total of 492 commercial salmon fishing licence eligibilities through a voluntary relinquishment process. Once obtained by DFO, licence eligibilities are converted to communal commercial (category F) licence eligibilities and used to support various Indigenous programs and initiatives including the Aboriginal Fisheries Strategy (AFS, see section **Error! Reference source not found.**), the Allocation Transfer Program (ATP), the P acific Integrated Commercial Fisheries Initiative (PICFI), First Nations Inland Demonstration Fisheries projects, Economic Opportunity Fishery arrangements and treaties. As of January 2022, 144 communal commercial salmon licence eligibilities were issued to First Nations under the AFS and ATP, 46 were issued under PICFI, 257 were used to offset First Nations demonstration fisheries projects and Economic Opportunity fishery arrangements with First Nations in the lower Fraser, Somass, Skeena and Nass Rivers, and 33 were used for treaties or other contingencies.

Tsawwassen and Maa-nulth First Nations Treaties came into effect on April 3, 2009 and April 1, 2011, respectively. Most recently, the Tla'amin First Nation's Treaty came into effect on April 5, 2016. For additional information please see Section 10.1.

4.2 Recreational Fishery

Recreational fishing for salmon occurs to provide food for personal use, as a leisure activity, or as a combination of the two. These activities provide non-quantifiable benefits to the individual participants as well as contribute directly and indirectly to the economy through fishery related expenditures. This section focuses on economic activity rather than the economic benefits to

individual anglers or businesses. Catch levels in the recreational fishery are managed using area specific openings and retention levels.

In the most recent Survey of Recreational Fishing in Canada (2015), tidal water recreational fishing led to more than $600 million dollars (2020$) in expenditures and major purchases in British Columbia. Recreational fishing effort directed toward salmon accounted for an estimated 64% of all angler expenditures, or $383 million.[1] Of these, $294 million was spent in Southern BC (Johnstone Strait, Georgia Strait, Barkley Sound, and West Coast Vancouver Island).

However, due to conservation related fishery management measures, the 2019 fishing season experienced significant restrictions which would have lowered participation, catches, and expenditures. In addition to these conservation related management measures, the 2020 season was also significantly impacted by travel restrictions and a downturn in the economy related to the coronavirus pandemic. Similar effects could be expected to have extended into the 2021 season. Even if BC residents were less likely to be impacted by travel restrictions, it would be reasonable to expect a reduction in their anglings days, distance they traveled to fish, and in their total investments and purchases. BC residents make up a majority of active anglers and days fished and are responsible for the lion share of the expenditures generated by the sector. However, anglers from outside BC spend more on fishing trip packages and make up an important client base for lodges and charter operations.

In order to fish for salmon recreationally an angler must purchase either a tidal or a freshwater licence. Further, in order to keep this catch the licence must have a Pacific Salmon Conservation (PSF) Stamp. The number of licences and stamps that can be sold is not restricted and is one way to highlight the level of participation of angler groups in the fishery. Licence data show that the total number of licences and salmon stamps sold was relatively stable from 2001 to 2008 (Figure 4.2-1, below). Starting in 2008, there were consecutive drops in sales of licences to non-residents (i.e. anglers that did not reside in BC). Some of the drop was made up by increased sales to residents and the number of licences sold was relatively steady at the lower level until 2013/14. Sharp increases in the sale of licences to both residents and non-residents in the 2014/15 season resulted in one of the largest annual licence sales in at least 14 years. Since then, annual licence sales remained relatively steady at this higher level, with a minor drop in 2019 potentially driven in part by management restrictions put in place due to conservation related fishery management measures. Total licence sales in the 2020/21 season were severely impacted due to COVID-19 with respect to travel restrictions leading to zero non-resident licences sold.

[1] DFO Internal Analysis; note that values paid for final goods (such as angler expenditures on fishing trips) should not be considered measures of economic impact of a sector.

However, licence sales to residents rose by 2% year over year, though general economic impacts of the pandemic likely weighed on participation generally, as can be seen in the recreational catch statistics for the 2020 season below

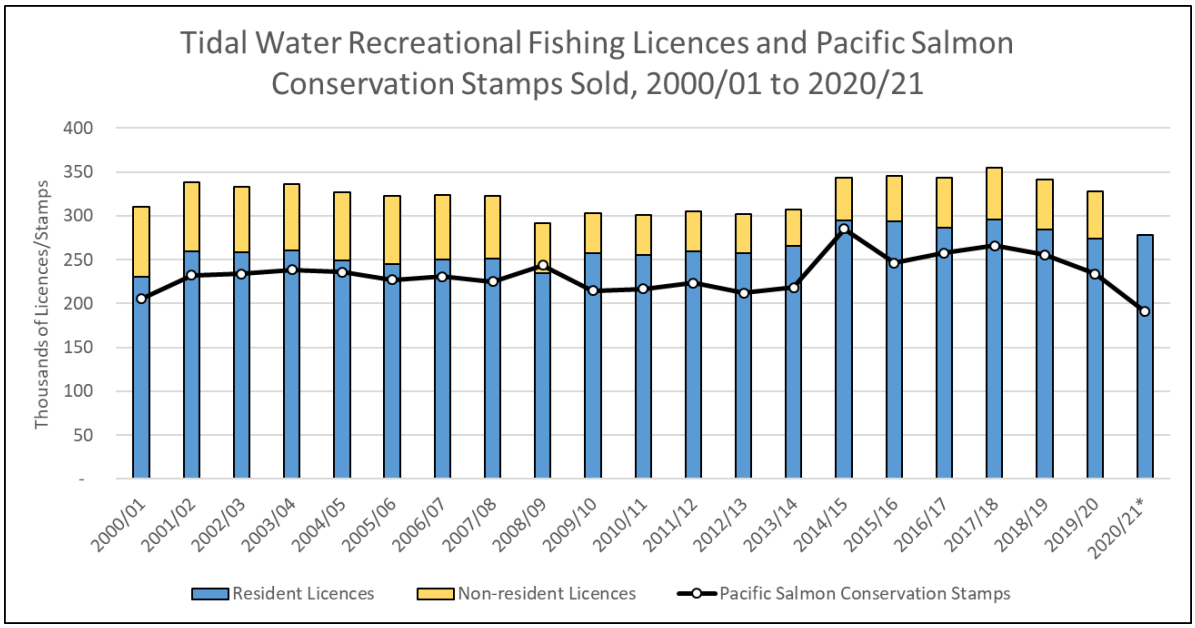


Figure 4.2-1: Tidal Water Recreational Fishing Licences and Pacific Salmon Conservation Stamps Sold, 2000/01 to 2020/21*

*Note: Licence sales for the 2020/21 season are preliminary and should be treated as such

Source: DFO. https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/licence-permis/stats-eng.html

These restrictions will affect pariticpation in the recreational fishery and also the expenditures and economic impacts generated by the sector. The Survey of Recreational Fishing in Canada provides an estimate of individual expenditures and investment for recreational fishing. This information is used when estimating the direct and indirect contribution of recreational fishing to the economy (e.g. GDP, employment). The survey is administered every 5 years, but it is reasonable to expect highlighted trends to be fairly constant from year to year, barring any significant changes in fishing opportunities, like those we have seen in the last two years. Historically, the combined tidal and freshwater fisheries of BC were the second largest recreational fisheries in Canada in terms of direct and package expenditures, and third largest in terms of investments (DFO 2015). While resident anglers have the largest expenditures, recreational fishing by non-residents also contributes to the provincial economy. In 2015, non-resident direct expenditures (including fishing packages) and investments totaled $159 million (2020$). This number understates the contribution of non-resident tidal water anglers to the overall economy, however, as it only includes expenditures directly attributable to their fishing

experience[2]. Fishing opportunities in BC's tidal waters draw Canadian and international tourists to the province: of 47,269 non-resident anglers surveyed in 2010, 40% reported that they would not have come to British Columbia at all if there had been no opportunities for tidal water angling[3]. A further 19% would have shortened their stay in the province.

Recreational salmon catch fluctuates year to year, both as a consequence of user participation as well as ecological/biological factors. On average, from 2016-2019, 819 thousand pieces of salmon were caught recreationally coastwide in BC[4]. The 2020 season saw a dramatic decline, dropping 36% from the previous 4-year average to 526 thousand pieces. However, preliminary catch estimates for 2021 show a 48% increase over 2020 levels to 778 thousand pieces. It is clear that COVID-19 travel restrictions severly impacted the recreational salmon fishing sector in 2020. These effects, though lessened, continued to be seen in the 2021 fishing season as catch estimates remain roughly 5% lower than the 2016-2019 average. Although catch numbers have fallen in the past two years, the proportion of species caught has remained fairly the same. From 2016-2021, more than half of the recreational catch can be attributed to Chinook (56%), followed by Coho (31%), Pink (6%), Sockeye (6%), and Chum (2%).

Figure 4.2-2 shows the tidal recreational expenditures for all recreational fishing species by resident and non-resident anglers from 2000 to 2015, adjusted to reflect constant 2020 dollars. Though recreational fishing continues to be important to the BC economy, the rate of growth overall has slowed and now declined in the last few years: total expenditures and investments grew by nearly 15% from 2000 to 2005, but by only 1% from 2005 to 2010. From 2010 to 2015, total expenditures and investments in the tidal recreational fishing industry decreased by 26%. This slowdown is due mainly to a drop in visits (and therefore expenditures) to BC by non-resident anglers, particularly other (i.e. international) non-resident anglers whose total expenditures in BC dropped by 48% between 2005 and 2010, and dropped again by 12% between 2010 and 2015. Expenditure on fishing packages by resident anglers increased considerably from 2000-2010; in real terms, it increased by 139% in that time period. However, in the following 5 years, expenditures on fishing packages by resident anglers decreased by

[2] The British Columbia's Fisheries and Aquaculture Sector (BC Stats 2013) report, which calculates direct and indirect economic activity, indicates that non-resident participants in recreational tidal water fishing also spend money on, for example, shopping, cultural events and attractions (such as museums and the theatre), and sightseeing at locations other than where they go fishing.

[3] This can be further broken down into Canadian non-residents and international non-residents. Opportunities for tidal water recreational fishing are more important to international visitors: 47% of them reported they would not have come to BC had there not been tidal water fishing opportunities, while 32% of Canadian visitors would not have come.

21%, as total expenditures by residents fell by 32%. Nonetheless, BC residents are still the primary consumers of fishing trip packages in the province.

	B.C. Tidal Water Recreational Fishing Expenditures for all Species by Angler Type (2020$)			
	2000			
	Direct Expenses	Packages	Investments	Total
Resident	$ 154,727,355	$ 24,885,069	$ 278,846,736	$ 458,459,160
CDN Non-Resident	$ 33,801,797	$ 28,955,880	$ 34,442,854	$ 97,200,531
Other non-resident	$ 73,060,080	$ 60,000,461	$ 17,249,129	$ 150,309,670
Total	$ 261,589,231	$ 113,841,411	$ 330,538,720	$ 705,969,361
	2005			
	Direct Expenses	Packages	Investments	Total
Resident	$ 188,239,452	$ 51,428,029	$ 318,097,398	$ 557,764,879
CDN Non-Resident	$ 41,245,404	$ 48,113,193	$ 15,116,119	$ 104,474,716
Other non-resident	$ 59,263,191	$ 79,138,810	$ 9,875,269	$ 148,277,270
Total	$ 288,748,047	$ 178,680,031	$ 343,088,786	$ 810,516,864
	2010			
	Direct Expenses	Packages	Investments	Total
Resident	$ 227,634,455	$ 59,569,112	$ 364,375,049	$ 651,578,616
CDN Non-Resident	$ 36,428,664	$ 30,475,085	$ 21,461,464	$ 88,365,213
Other non-resident	$ 37,208,810	$ 34,255,185	$ 5,780,209	$ 77,244,204
Total	$ 301,271,929	$ 124,299,382	$ 391,616,723	$ 817,188,034
	2015			
	Direct Expenses	Packages	Investments	Total
Resident	$ 196,069,764	$ 46,954,789	$ 199,577,259	$ 442,601,812
CDN Non-Resident	$ 42,825,731	$ 35,624,179	$ 12,186,101	$ 90,636,011
Other non-resident	$ 38,444,833	$ 28,292,831	$ 1,516,747	$ 68,254,411
Total	$ 277,340,328	$ 110,871,799	$ 213,280,108	$ 601,492,234

Figure 4.2-2: Tidal Water Recreational Fishing Direct and Package Expenditures and Investments for all species, in constant (2020) dollars

Source: Survey of Recreational Fishing in Canada (DFO, multiple years)

The past few years since 2019 can be expected to have accentuated the trend in declining expenditures by international anglers, given salmon management restrictions and especially COVID-19 travel restrictions. In 2015, salmon accounted for roughly 67% of expenditures on fishing trip packages and 64% of total expenditures overall in the tidal recreational fishing industry in British Columbia (DFO 2015) (Figure 4.2-3, below). Given the restrictions highlighted above, participation, expenditures, and economic impacts from the recreational fishing sector will have been significantly impacted. Travel restrictions, impacting both Canadian non-BC residents and foreign (non-Canadian) anglers, will certainly have led to much lower expenditures for the sector.

Additional information on the history and vision for recreational fisheries can be found in the document "Vision for Recreational Fisheries in BC": http://www.pac.dfo-mpo.gc.ca/consultation/smon/sfab-ccps/docs/rec-vision-eng.pdf

	2015 North Coast Salmon Tidal Rec. Expenditures (2020$)			
	Direct Expenditures	Packages	Investments	Total
Residents	$ 13,746,467	$ 17,445,155	$ 12,821,442	$ 44,013,065
Canadian non-resident	$ 7,622,006	$ 16,259,779	$ 3,735,238	$ 27,617,023
Other non-resident	$ 5,540,964	$ 11,680,487	$ 137,401	$ 17,358,853
Total	$ 26,909,438	$ 45,385,422	$ 16,694,081	$ 88,988,941

	2015 South Coast Salmon Tidal Rec. Expenditures (2020$)			
	Direct Expenditures	Packages	Investments	Total
Residents	$ 104,885,553	$ 13,888,187	$ 116,795,121	$ 235,568,862
Canadian non-resident	$ 20,231,973	$ 7,047,390	$ 2,704,342	$ 29,983,705
Other non-resident	$ 19,889,793	$ 7,968,018	$ 538,529	$ 28,396,339
Total	$ 145,007,320	$ 28,903,595	$ 120,037,992	$ 293,948,906

Figure 4.2-3: Tidal Water Recreational Fishing Direct and Package Expenditures and Investments for Salmon North Coast and South Coast, in constant (2020) dollars

Source: Survey of Recreational Fishing in Canada (DFO, 2015)

4.3 COMMERCIAL FISHERY

4.3.1 HARVEST SECTOR

In BC, the salmon fishery is a limited access fishery, mostly managed as a competitive fishery[4]; however, several parts of the fishery are operated under individual quotas. Since 2005, five areas using seine, troll or gill net gear have participated in demonstration fisheries with alternative implementations of individual quotas or pooling arrangements. In addition, there have been several commercial First Nations economic opportunity and demonstration fisheries. Commercially-harvested salmon supports BC's seafood processing sector, much of which is ultimately exported, bringing new money into the province.

Between 2013 and 2020, salmon contributed an average of 17% of the landed value and 14% of the total volume of BC wild caught seafood (DFO Official Catch, 2013-2020). The real value, in 2020 constant dollars (2020$), ranged from a high of $127.8 million in 2014 to a low of $17.7 million in 2021 (Figure 4.3-1 below).

Due to conservation related fishery management measures, the 2019 fishing season was the worst on record and saw salmon commercial landed value fall to roughly 25% of the previous 4 year average (2015-2018). All areas were impacted but areas B, E, and H were most restricted with no (or virtually no) catch. Many vessels elected not to take part in the fishery. In fact, the number of active vessels fell from 924 in 2018 (a high return/high participation year) to 601 in 2019, a decrease of 35%.

In 2020, there was a slight resurgence in effort in the commercial fishery, with 635 active vessels. The number remained low due to conservation related fishery management measures continuing, along with pandemic-related health and safety restrictions delaying the start of the fishing season, among other impacts. However, based on preliminary data for the 2021 season, this number fell again by roughly 40% to 378 active vessels, likely associated with the significant reduction in the number of openings for the fishery associated with Pacific salmon conservation measures, as well as continuing pandemic-related health and safety restrictions.-Preliminary landing estimates show a 55% decrease from 2020 to 2021 with landed value only falling by 16% to $17.6 million. This was in part the result of a higher proportion of 2021 landings being Chinook salmon – up to 38% in 2021 from 15% in 2020 - which is the highest valued salmon in terms of price per kg. In most years, Pink salmon accounts for an average of 18% of total salmon catch. However, in 2013 and 2020, Pink made up 63% and 60% of salmon catch, respectively, contributing to relatively low landed value totals in those years. Conservation concerns are

[4] Other names for this style of fishery include derby and Olympic style fishery

expected to continue into future years, negatively impacting the returns to the commercial fleet, while additional closures may further reduce access in the short term.

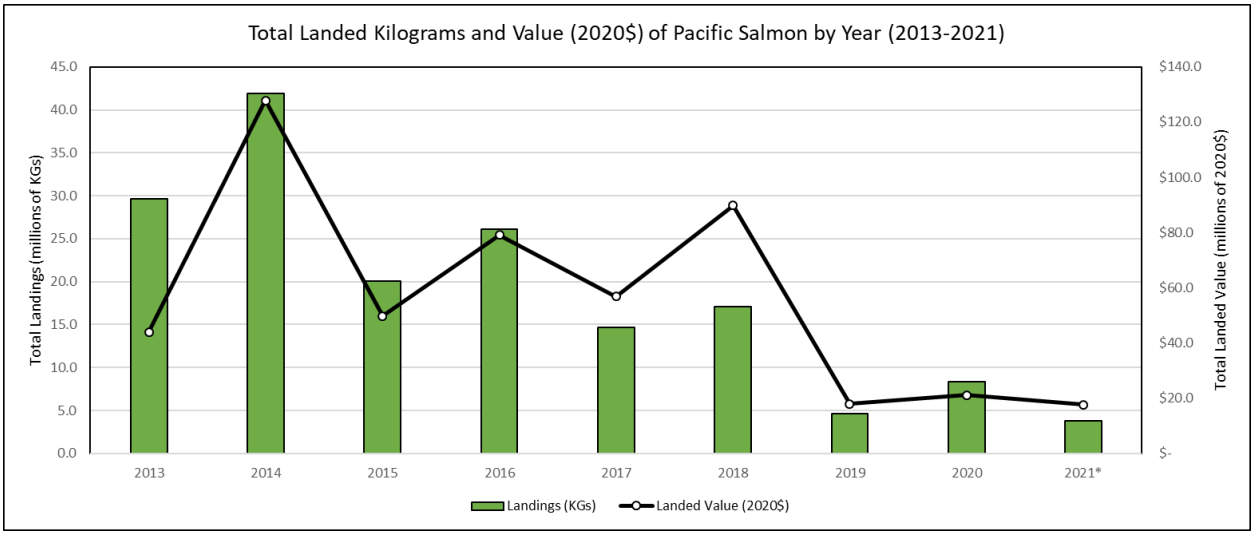


Figure 4.3-1: Total Landed Kilograms and Value (2020$) of Pacific Salmon by Year (2013-2021*)

Source: DFO Official Catch matched to the best available price from sales slips.

*Estimates for 2021 are to be treated as preliminary

Note: Salmon landed value estimates may differ slightly from other sources due to varying price estimates. Prices used here are "best available" based on matching criteria using date, gear and area.

Chinook and Chum make up the majority of the landed value in most years, with the exception being years when there is a high return of Sockeye (see Figure 4.3-2 below).

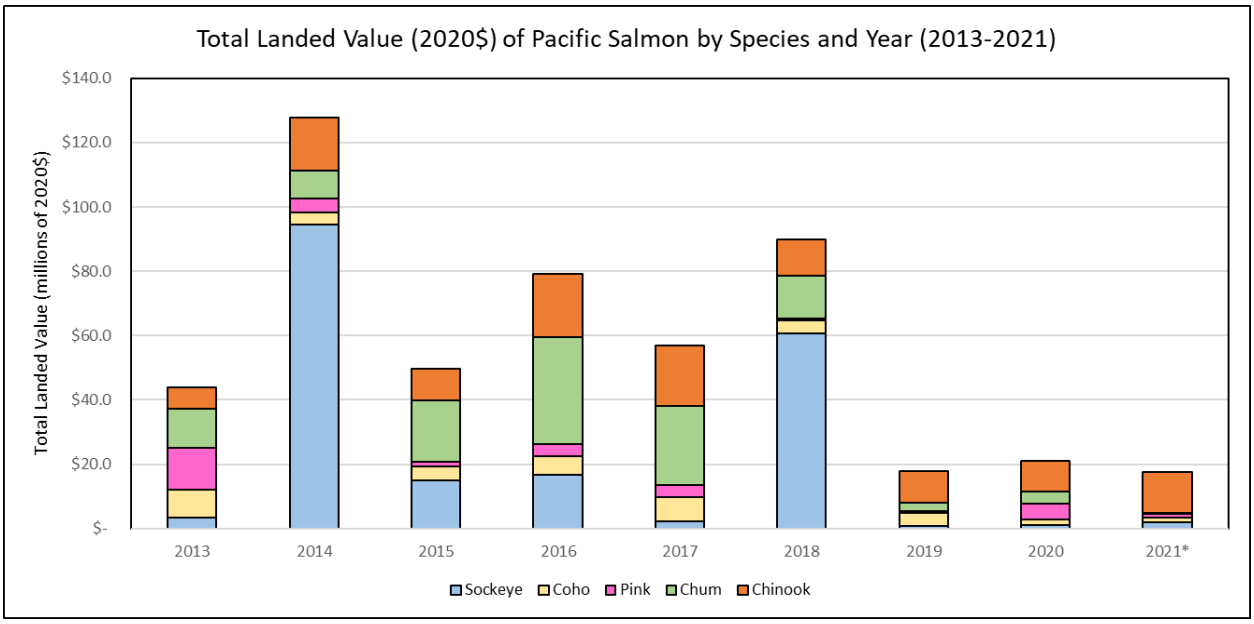


Figure 4.3-2: Total Landed Value (2020$) of Pacific Salmon by Species by Year (2013-2021*)

Source: DFO Official Catch matched to the best available price from sales slips.
*Estimates for 2021 are to be treated as preliminary

Note: Salmon landed value estimates may differ slightly from other sources due to varying price estimates. Prices used here are "best available" based on matching criteria using date, gear and area.

Figure 4.3-3 and Figure 4.3-4 (below) present landings (kilograms) and landed value (2020$) of Pacific Salmon by licence area from 2016-2021. For the most part, the graphs coincide with one another; higher landings result in higher landed value. However, salmon licence areas A and F show the opposite story: licence area A has higher landings each year (except for 2019, 2021) compared to licence area F, but area F has higher landed values. This is the result of the majority of catch over the period in area A being Pink Salmon (63%), which has the lowest value in terms of price per kg, and area F landing primarily Chinook (41%) and Coho (41%), which have the highest and third highest value in terms of price per kg in the North Coast, respectively.

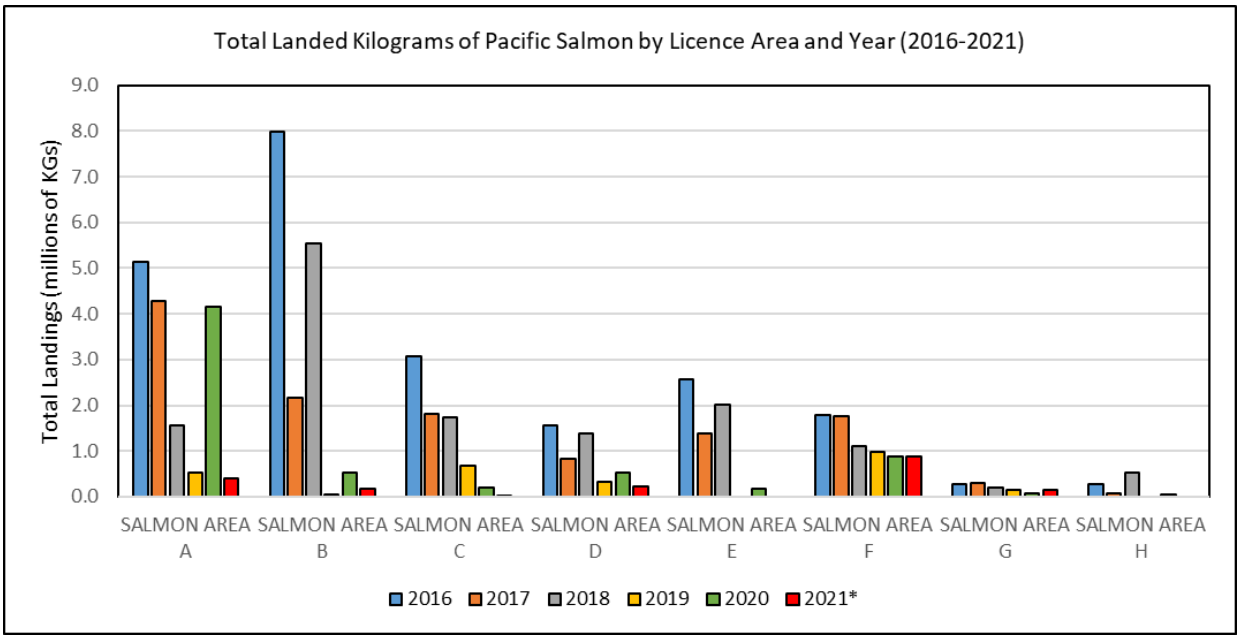


Figure 4.3-3: Total Landed Kilograms of Pacific Salmon by Licence Area by Year (2016-2021*)

Source: DFO Official Catch matched to the best available price from sales slips.
*Estimates for 2021 are to be treated as preliminary

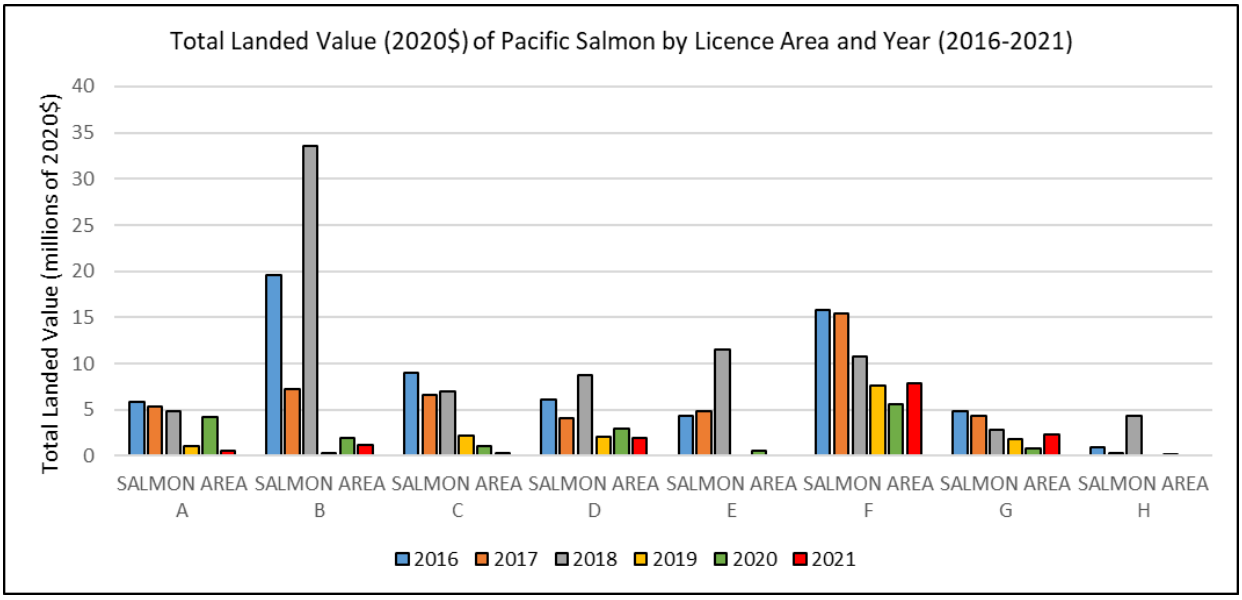


Figure 4.3-4: Total Landed Value (2020$) of Pacific Salmon by Licence Area by Year (2016-2021*)

Source: DFO Official Catch matched to the best available price from sales slips.
*Estimates for 2021 are to be treated as preliminary

Between 2013 and 2021, the South Coast fishery was responsible for an average of 52%of the total volume of salmon landings and 52% of the total landed value, with the North Coast making up the remainder. The record Fraser River Sockeye run in 2014 meant that the South Coast accounted for 71% and 78% of the landed volume and value in that year, respectively. With another Sockeye boom in 2018, the South Coast again accounted for 71% and 74% of the landed volume and value, respectively. In non-Sockeye bump years, the North Coast catches more salmon than the South Coast, but the South coast has secured most of the benefits of the large salmon runs in years like 2014 and 2018. In 2020, the South Coast catch made up 34% and 45% of the coastwide landed volume and value, while in 2021, it made up 55% and 46% of the coastwide landed volume and value, respectively.

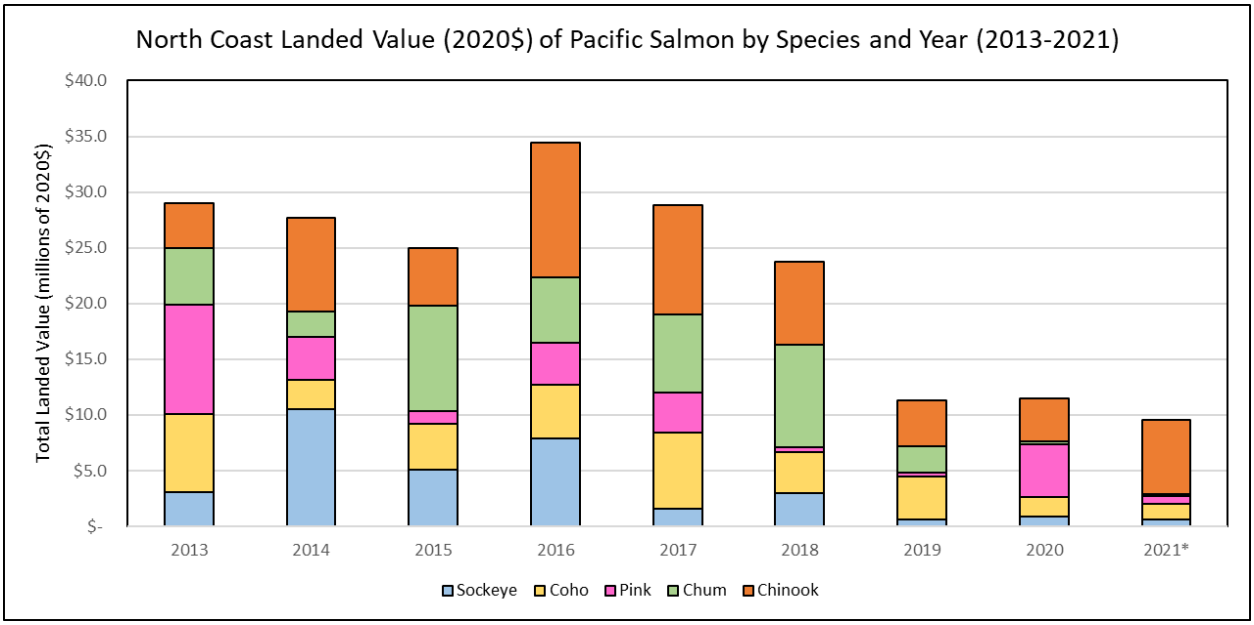


Figure 4.3-5: North Coast salmon value by species, 2013-2021* (in 2020$)

Source: DFO Official Catch matched to best available price from sales slips.
*Estimates for 2021 are to be treated as preliminary

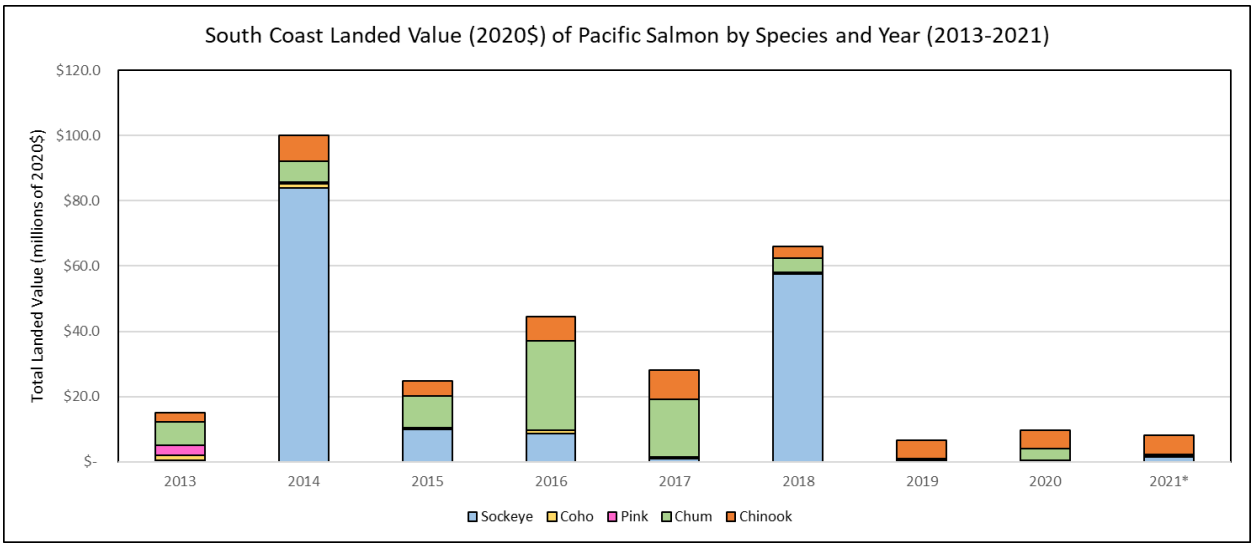


Figure 4.3-6: South Coast salmon value by species, 2013-2021* (in 2020$)

Source: DFO Official Catch matched to best available price from sales slips.
*Estimates for 2021 are to be treated as preliminary

Note: Salmon landed value estimates may differ slightly from other sources due to varying price estimates. Prices used here are "best available" based on matching criteria using date, gear and area.

Salmon licence values declined steadily from 2005 to 2010, reflecting poor returns to the fleets (Nelson, various years). Seine licences have recovered somewhat since then, while gillnet and troll licences have been steady with troll showing improvements in 2014. License values are a reflection of expected future financial returns but also of speculation. The value of a seine licence remained constant from 2015-2018 ($422K) and increased by 26% to $530K in 2019 (Castlemain, various years). Gillnet licence values steadily increased from 2015-2018 ($54K to $69K), but fell back to $56K in 2019. Troll licence values experienced a similar trend to gillnet, increasing from 2015-2018 ($125K to $199K), and falling in 2019 to $167K. The salmon fleet's financial performance is best reviewed over several years, given the fisheries significant annual swing in harvest. For the seine fishery, the percentage of revenue attributed to the diversified fleet fell from 17% to 15%, when comparing the 2016-2019 average to the 2020 year[5]. For the gillnet fishery, the percentage of revenue attributed to the diversified fleet also fell from 14% to 10% in comparing 2016-2019 average to the 2020 year. For the troll fishery, the percentage of revenue attributed to the troll diversified fleet also decreased from 51% to 47% in comparing the

[5] DFO Fleet Diversification Table Tool

2016-2019 average to the 2020 year. The cost structure of salmon fleets in BC is available through various reports (Nelson, 2009 & 2011 as well as Gislason 2011).

4.3.2 PROCESSING SECTOR

In previous years, wild salmon accounted for an average of 22% of the total wholesale value of wild caught seafood in BC (SYIR, 2014-2019). Although more recent estimates are not yet available, they would likely reflect the change in salmon harvest in these years – both in magnitude and species mix – relative to 2019.

The latest study on linkages between seafood harvesting and processing prepared by GS Gislason & Associates in August 2017 allows estimation of the total labour wages in salmon processing sector in 2016, by salmon species. Between 2016-2019, Chum accounted for nearly half of processing sector wages (45%), followed by Sockeye (31%), Pink (11%), Chinook (7%) and Coho (6%). In 2020, processing sector wages were down 59% compared to the previous 4-year average. This season saw a large year over year increase in the proportion of Pink Salmon, resulting in it accounting for most of the processing sector wages (51%), followed by Chum (20%), Chinook (15%), Coho (8%), and Sockeye (6%). In 2021, processing sector wages fell by 51% over 2020, translating into roughly one fifth of the 2016-2019 average. Applying the Gislason & Associates (2017) estimated to 2021 DFO logbook information, processing of salmon species delivered about $0.7M (Chinook), $0.5M (Pink), $0.4M (Sockeye), $0.2M (Coho), and $0.1M (Chum) in processing sector labour wages (Figure 4.3-7).

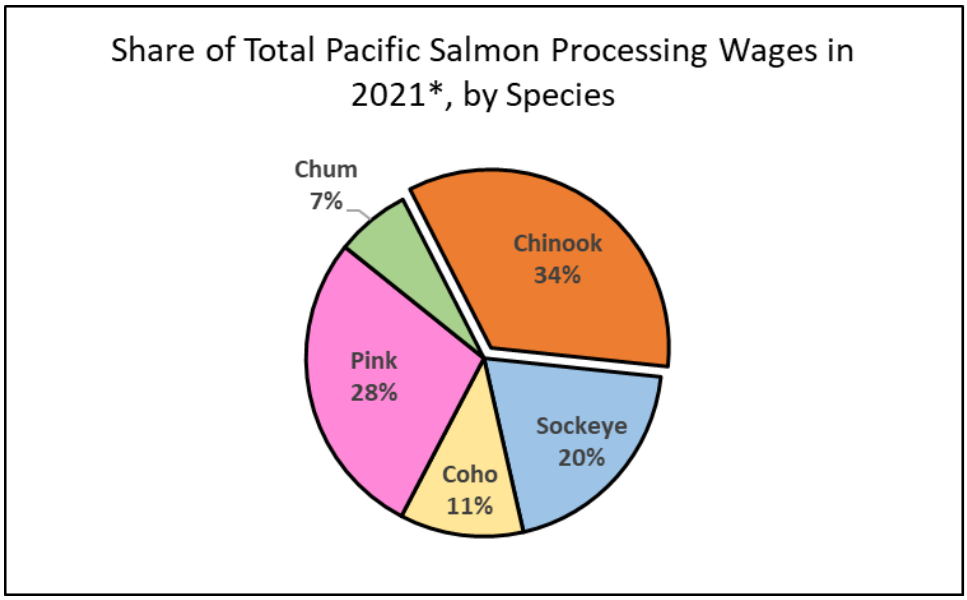


Figure 4.3-7: Share of the total value of processing sector wages in 2021* (by salmon species)

Source: GS Gislason and Associates (2017), DFO Official Catch

*Estimates for 2021 are to be treated as preliminary

While Chinook was the most processed salmon species by volume and total value of processing sector wages among all BC wild salmon in 2021, it is worth noting that Sockeye was estimated as the most labour intensive species in processing with a labour intensity of about 34 hours per metric tonne (MT) (GSGislason & Associates, 2017).

The GSGislason 2017 study also indicates that salmon processing is frequently pursued in a different region than the area where landings are loaded off the fishing vessels. For example, while Chinook landings occur mostly on the North Coast, its processing happens mainly in the Lower Mainland (about 65% of all processed Chinook). Similarly, landings of Coho also happen mainly on the North Coast (80%), but its processing is pursued mainly in the Lower Mainland (74%). Pink salmon is landed mainly in the North Coast (about 60%) and is processed in the North Coast and Lower Mainland (45% and 40%, respectively). Chum landings (63%) and processing (75%) occurs mostly in Lower Mainland. Sockeye landings and processing occurs mostly on Vancouver Island (58% and 55%, respectively) (GSGislason & Associates, 2017).

4.4 EXPORT MARKET

The province of British Columbia benefits from strong seafood exports that in 2021 were valued at roughly $1.3 billion, a 3% decrease when compared to 2020, and a 7% decrease over the annual average between 2017-2020.[6] This total value was realized via a combination of seafood supplied by domestic wild harvest and aquaculture (Statistics Canada EXIM Database). Chinook, Sockeye, and Chum salmon were among the most widely exported Pacific salmon species in 2021 (by volume). They constituted 51%, 17% and 15% of the total volume of Pacific salmon exports from BC, respectively. In 2021, Chum was shipped to 14 countries, up from 13 countries the previous year, with the largest proportions exported to the US and France (by value). Pink salmon was exported to 9 countries, with the largest proportions exported to the US and Thailand (by value), and Sockeye was exported to 17 countries, with the largest proportions of exports going to the US and Hong Kong (by value).

Notwithstanding the above, salmon exports in recent years have been affected by the lower harvest levels. The annual value of all Pacific salmon exports from 2010-2018 averaged $137M annually, while the average annual value between 2019-2021 was roughly $72M, or approximately 53% of the previous 9-year average (in 2020$). Chinook made up approximately 31% of the average annual export value of Pacific salmon between 2010 and 2018, while it made up 59% of the annual value on average between 2019 and 2021. Further, the proportion of total annual export value attributable to Chum went from 16% to 8% between 2010 and 2018 and

[6] Statistics Canada EXIM Database; value in nominal terms.

between 2019 and 2021, respectively. The proportion attributable to Coho went from 6% to 8%, while Pink went from 15% to 5% and Sockeye went from 33% to 20% between the two time periods, respectively. (See Figure 4.3-1, 4.3-2 below).

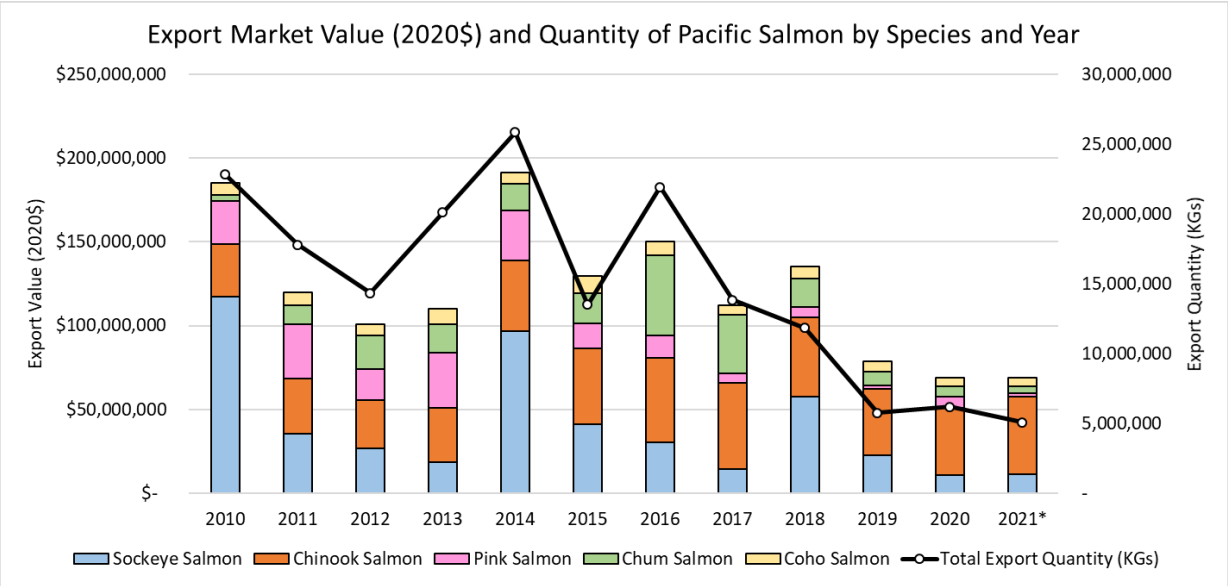


Figure 4.4-1: Total value and quantity of Pacific salmon exports (in 2020 constant dollars), 2010-2021*
Source: Statistics Canada EXIM database accessed on Jan 31, 2022.
*Estimates for 2021 are to be treated as preliminary

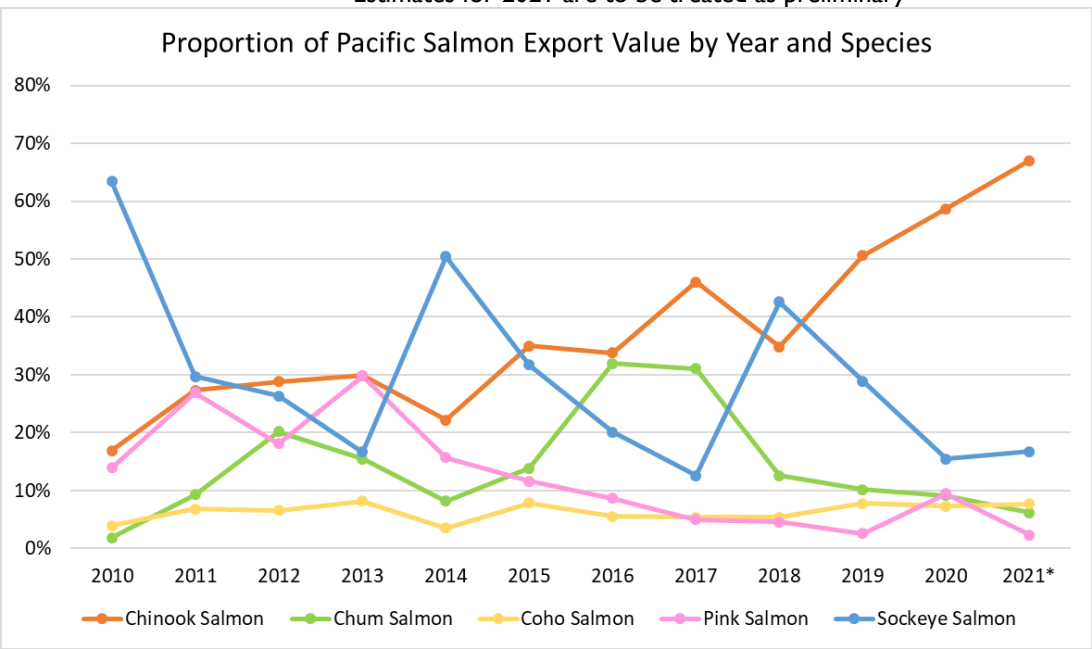


Figure 4.44.4-2: Proportion of Pacific salmon annual export value by species, 2010-2021*
Source: Statistics Canada EXIM database accessed on Jan 31, 2022.
*Estimates for 2021 are to be treated as preliminary

Note: this total includes all exports of wild Pacific salmon and exports of all farmed Pacific salmon. There might be slight differences in total export value when comparing exports in previous versions/previous years of IFMP due to changing products definitions in EXIM data. In this data only Pacific salmon species were included.

Overall, over the past five years (2017 to 2021), BC exported Pacific salmon to 55 countries. The US accounted for about 72% of the total export value in that period, followed by Japan (10%) and the UK (4%). China and France were the next largest individual importers of BC Pacific salmon in that period (3% and 2%, respectively). For more details, please refer to Figure 4.4-3 below.

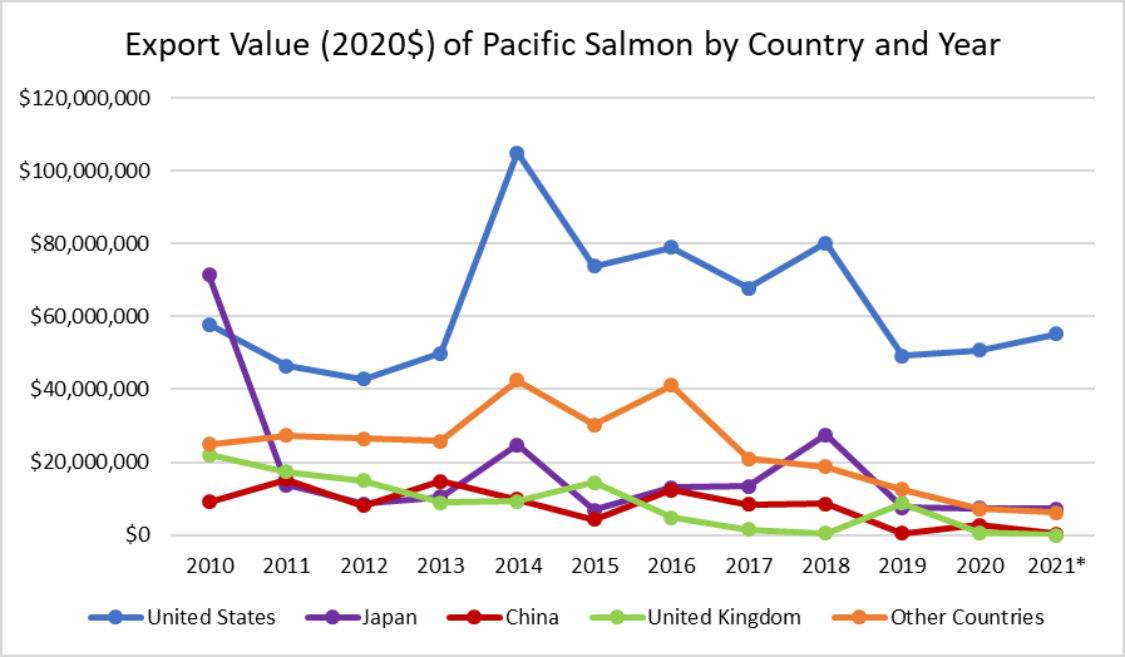


Figure 4.4-4 Total value of Pacific salmon exports from BC per main importers, 2010-2021* (in 2020$)

Source: Statistics Canada EXIM database accessed on Jan 31, 2022.
*Estimates for 2021 are to be treated as preliminary

Figure 4.4-5 below shows the proportions of Pacific Salmon exported by value (in 2020$) by destination country in 2021. In that year, approximately $69.0M worth of Pacific salmon was exported from BC. The export value has been decreasing over the past 5 years, with 2021 export value roughly 46% of 2016 levels. Of the total $69.0M, about 80% of the total export value of Pacific salmon is attributable to the United States ($55.2m), 10% to Japan ($7.2m), 2% to Italy ($1.5m), 2% to the France ($1.2m), and the remaining 6% to all other countries ($3.9m).

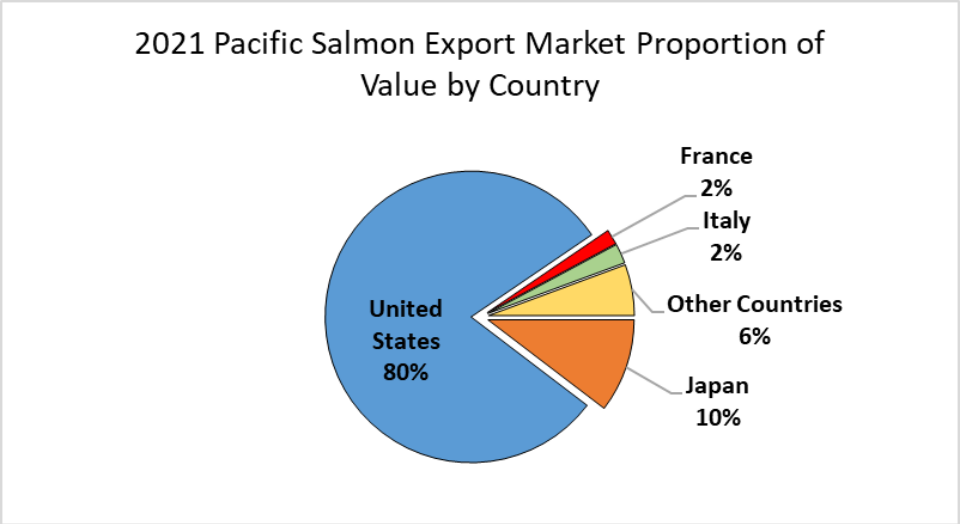


Figure 4.4-6 Proportions of total value of Pacific salmon exports from BC by main destination countries in 2021* (in 2020$)

Source: Statistics Canada EXIM database accessed on Jan 31, 2022.
*Estimates for 2021 are to be treated as preliminary

REFERENCES:

- BC Ministry of Agriculture (BCMOA). 2016, 2017. Sector Snapshot: B.C. Seafood – 2016, 2017. http://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/statistics/industry-and-sector-profiles
- BC Ministry of Environment (BCMOE). Various years. British Columbia Seafood Industry Year in Review. http://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/statistics/industry-and-sector-profiles
- BC Stats. 2013. British Columbia's Fisheries and Aquaculture Sector, 2012 Edition. http://www.bcstats.gov.bc.ca/StatisticsBySubject/BusinessIndustry/FisheriesAquacultureHuntingTrapping.aspx
- Castlemain. Various Years. Analysis of Commercial Fishing Licence, Quota, and Vessel Values.
- Fisheries and Oceans Canada (DFO). Various years. Survey of Recreational Fishing in Canada. http://www.dfo-mpo.gc.ca/stats/rec/canada-rec-eng.htm
- Gislason, G. 2011. The British Columbia Salmon Fleet Financial Profile 2009. http://waves-vagues.dfo-mpo.gc.ca/Library/343812.pdf
- Gislason, G and Associates. 2017. Linkages between seafood harvesting and processing.pp.1-7.
- Nelson, Stuart. Various Years. West Coast Fishing Fleet: Analysis of Commercial Fishing Licence, Quota, and Vessel Values. http://waves-vagues.dfo-mpo.gc.ca/waves-vagues/
- Nelson, Stuart. 2009. Pacific Commercial Fishing Fleet: Financial Profiles for 2007. http://www.dfo-mpo.gc.ca/Library/343814.pdf
- Nelson, Stuart. 2011. Pacific Commercial Fishing Fleet: Financial Profiles for 2009. http://www.dfo-mpo.gc.ca/Library/343762.pdf

5 MANAGEMENT ISSUES

5.1 CONSERVATION

Given the importance of Pacific salmon to the culture and socio-economic fabric of Canada, conservation of these stocks is of utmost importance. In order to achieve this, specific actions are taken to not only ensure protection of fish stocks, but also freshwater and marine habitats. Protecting a broad range of stocks is the most prudent way of maintaining biodiversity and genetic integrity.

Management of a natural resource like salmon has a number of inherent risks. Uncertain forecasting, environmental and biological variability as well as changes in harvester behavior all add risks that can threaten conservation. Accordingly, management actions will be precautionary and risks will be specifically evaluated where possible.

5.1.1 WILD SALMON POLICY

Canada's Policy for Conservation of Wild Pacific Salmon (the Wild Salmon Policy) sets out the vision regarding the importance and role of Pacific wild salmon as well as a strategy for their protection.

To communicate the work the Department is doing in support of the policy, Canada's Minister of Fisheries, and Oceans, and the Canadian Coast Guard released the *Wild Salmon Policy 2018-2022 Implementation Plan* in October 2018. This collaboratively developed plan was consulted on broadly throughout fall 2017, and lays out nine overarching approaches to implementation and 48 specific activities. The plan is organized under three key themes: Assessment; Maintaining and Rebuilding Stocks; and Accountability. The 2020/2021 Annual Report can be found at https://www.pac.dfo-mpo.gc.ca/fm-gp/salmon-saumon/wsp-pss/annual-annuel/2020-2021-eng.html. Work has also begun on a five year review of the Plan, which will be completed in 2022.

For a copy of the *Wild Salmon Policy*, the *Wild Salmon Policy 2018-2022 Implementation Plan*, information on what we heard during consultations and response, annual reports, and other Wild Salmon Policy related materials, please see: https://www.pac.dfo-mpo.gc.ca/fm-gp/salmon-saumon/wsp-pss/index-eng.html

5.1.2 SPECIES AT RISK ACT

The *Species at Risk Act* (SARA) came into force in 2003 "to prevent wildlife species from being extirpated or becoming extinct, and to provide for the recovery of a wildlife species that are

extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened."

SARA contains several prohibitions to protect species listed on Schedule 1 of SARA. Under sections 32 and 33 of SARA, it is an offence to: 1) kill, harm, harass, capture or take an individual of a wildlife species listed as extirpated, endangered or threatened under SARA; 2) possess, collect, buy, sell or trade an individual (or any part or derivative of such an individual) of a wildlife species listed as extirpated, endangered or threatened under SARA; and 3) damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered or threatened species, or that is listed as an extirpated species if a recovery strategy has recommended its reintroduction into the wild in Canada. These prohibitions apply unless a person is authorized, by a permit, licence or other similar document issued in accordance with SARA, to engage in an activity affecting the listed species or the residences of its individuals.

Species listed as special concern are not included in these prohibitions. Section 58(1) contains provisions to prohibit the destruction of any part of the critical habitat of listed endangered or threatened species or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species in the wild in Canada. Critical habitat is the habitat necessary for the survival or recovery of a listed wildlife species and is identified in the recovery strategy or an action plan for the species.

To view the list of extirpated, endangered, threatened, and special concern species currently listed under Schedule 1 of SARA, please visit: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

The process to list a wildlife species on Schedule 1 of SARA is initiated after an assessment by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for that species is completed. The SARA legal listing process formally begins when the Minister of Environment and Climate Change issues a response statement, detailing how he intends to proceed with the COSEWIC species designations. Response statements can be found at: Response statements - Canada.ca

5.1.2.1 COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was formed in 1977 to provide Canadians with a single, scientifically sound classification of wildlife species at risk of extinction. COSEWIC began its assessments in 1978 and has met each year since then to review information collected to assess wildlife species.

With the proclamation of SARA, COSEWIC has been established as an independent advisory panel responsible for identifying and assessing wildlife species considered as being in danger of disappearing in Canada. The assessments are carried out in accordance with section 15 of SARA, which, among other provisions, requires COSEWIC to determine the status of species it considers and to identify existing and potential threats. This is the first step towards protecting wildlife species which are potentially at risk. Subsequent steps include COSEWIC reporting its results to the Canadian government and the public, and the Minister of the Environment and Climate Change's official response to the assessment results. Wildlife species that have been designated by COSEWIC may then qualify for legal protection and recovery under SARA.

For a full list of species identified and assessed by COSEWIC, please visit: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-list-species-assessed.html.

5.2 Protection of Marine and Non-Tidal Habitat

5.2.1 OCEANS ACT

The *Oceans Act* provides a foundation for an integrated and balanced national oceans policy framework supported by regional management and implementation strategies. The *Oceans Act* was amended in May 2019 to include interim protection measures, time limits for establishment, the precautionary principle, and to strengthen enforcement powers.

The *Oceans Act* (along with the *Canada Wildlife Act*, and the *National Marine Conservation Areas Act*) have given rise to several initiatives on the BC coast. As goals, objectives, and management plans are finalized for these initiatives, the Department's management of fisheries will be adapted as appropriate, in consultation with interested parties through Integrated Fisheries Management processes. Other important mandate commitments that inform the implementation of spatial marine conservation efforts include the considerations under the Fisheries Act, Sustainable Fisheries Policy suite, and mandate commitments to the Blue Economy Strategy and Reconciliation with First Nations. For more information on the *Oceans Act*, please visit: https://www.dfo-mpo.gc.ca/oceans/index-eng.html

5.2.2 CANADA'S MARINE AND COASTAL AREAS CONSERVATION MANDATE

In August 2019, the Government of Canada surpassed its milestone of protecting 10% of Canada's marine and coastal areas by 2020, a target which is a reflection of Canada's United Nation Convention on Biological Diversity Aichi Targets commitments, collectively referred to as Canada's marine conservation targets.

The Government of Canada further committed domestically to protecting 25% by 2025, and working towards 30% by 2030. To meet its marine conservation targets, Canada is establishing Marine Protected Areas (MPAs) and other effective area-based conservation measures (other measures), in consultation with industry, non-governmental organizations, and other interested parties. In Pacific Region, DFO manages one MPA in Southern B.C.—the Endeavour Hydrothermal Vents MPA. In addition, DFO has initiated marine spatial planning processes that cover much of Canada's Pacific Ocean waters. This includes the Offshore Pacific Area of Interest (AOI) which DFO intends to designate as an MPA in 2022.

For more information, please visit the following links:

- Background and drivers for Canada's marine conservation targets: http://www.dfo-mpo.gc.ca/oceans/conservation/index-eng.html
- A list of the sites that count towards Canada's marine conservation targets: https://www.dfo-mpo.gc.ca/oceans/conservation/areas-zones/index-eng.html#MCTtable
- Marine Protected Areas in Pacific Region, and across Canada: https://www.dfo-mpo.gc.ca/oceans/mpa-zpm-aoi-si-eng.html

5.2.3 PACIFIC NORTH COAST INTEGRATED MANAGEMENT PLAN

As Endorsed in February 2017, the Pacific North Coast Integrated Management Area (PNCIMA) plan was developed, in collaboration with the Province of British Columbia, First Nations and stakeholders to help coordinate various ocean management processes and to complement existing processes and tools including IFMPs. High level and strategic, the plan provides direction on integrated, ecosystem-based and adaptive management of marine activities and resources in the planning area as opposed to detailed operational direction for management. The plan outlines an ecosystem-based management (EBM) framework for PNCIMA that has been developed to be broadly applicable to decision-makers, regulators, community members and resource users alike, as federal, provincial and First Nations governments, along with stakeholders, move together towards a more holistic and integrated approach to ocean use in the planning area.

The endorsement of the PNCIMA plan supports the Government of Canada's commitment to collaborative oceans management for the Pacific North Coast and provides a joint federal-provincial-First Nations planning framework for conservation and the management of human activities in the Pacific North Coast. One of the key priorities for the plan is the development of a marine protected area network.

The Pacific North Coast Integrated Management Area Plan is available at:

https://www.dfo-mpo.gc.ca/oceans/management-gestion/index-eng.html

5.2.4 NORTHERN SHELF BIOREGION MPA NETWORK

As The Government of Canada, the Province of BC and 18 First Nations are working together to develop a Network of marine protected areas for the Northern Shelf Bioregion which extends from the top of Vancouver Island (Quadra Island/Bute Inlet) and reaches north to the Canada - Alaska border. This bioregion has the same footprint as the Pacific North Coast Integrated Management Area. The planning process is being developed under the policy direction outlined in the National Framework for Canada's Network of MPAs, the Canada-British Columbia MPA Network Strategy, and is informed by previously developed First Nation marine plans. The planning for this network is ongoing in the Northern Shelf Bioregion, and the current focus of work is the completion of a draft Network Action Plan which will subsequently be released for consultation with First Nations, stakeholders, and the public. More information on MPA Network Planning is available at: http://www.mpanetwork.ca

5.2.5 SGAAN KINGHLAS – BOWIE SEAMOUNT MPA

The SGaan Kinghlas – Bowie Seamount Marine Protected Area (SK-B MPA) was designated under the Oceans Act in 2008 and was established to conserve and protect the unique biodiversity and biological productivity of the area's marine ecosystem, including three seamounts (SGaan Kinghlas – Bowie, Hodgkins, and Davidson) and the surrounding waters, seabed, and subsoil. The SK-B MPA is cooperatively managed by DFO and the Council of the Haida Nation (CHN) through the SK-B MPA Management Board, and the SK-B MPA Management Plan guides the conservation and protection of the MPA. The SK-B MPA is closed to all commercial fishing activities. The SK-B MPA is also closed to recreational and FSC bottom-contact fishing activities. For more information on the SK-B MPA—including maps, boundaries, and restrictions to other fisheries or human activities—please visit: http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/bowie-eng.html

5.2.6 HECATE STRAIT & QUEEN CHARLOTTE SOUND GLASS SPONGE REEFS MPA

The Hecate Strait and Queen Charlotte Sound Glass Sponge Reefs Marine Protected Areas (Hecate MPA) was designated under the Oceans Act in February 2017 to conserve the biological diversity, structural habitat and ecosystem function of four glass sponge reefs off the coast of British Columbia. The Hecate MPA protects rare glass sponges from human activities that may break their silica (glass) structure, or may result in smothering through increased suspended sediment. Under the Hecate MPA Regulations, human activities are regulated/managed using three different management zone types:

I. Core Protection Zones (CPZs) include the seabed and waters surrounding the glass sponge reefs. CPZs extend from the seabed to depths (below the sea surface) that vary depending on the Reef ; 100 m in Northern Reef, 120 m in the Central Reefs, 146 m in the Southern Reef. The CPZs also include the subsoil to a depth of 20 m below the seabed.

II. Vertical Adaptive Management Zones (VAMZs) include water columns immediately above the CPZs, and each extends from that boundary to the sea surface.

III. Adaptive Management Zones (AMZs) consist of the seabed, subsoil, and waters of the Hecate MPA that are not a part of the CPZs or VAMZs.

The entire MPA is closed to commercial bottom-contact fishing activities. The CPZs are closed to anchoring and all fishing activities. For more information on the Hecate MPA—including maps, boundaries, and restrictions to other fisheries or human activities—please visit: http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/hecate-charlotte/index-eng.html

5.2.7 OFFSHORE PACIFIC AREA OF INTEREST & FISHERY CLOSURE

In May 2017, DFO announced the new Pacific Offshore Area of Interest (AOI) with the intention of making it one of Canada's largest MPAs by 2022. The proposed MPA will provide protection to ecologically and biologically significant seamount and hydrothermal vent features within the Offshore Pacific Bioregion. Although the AOI has not yet been designated as an MPA, much of it is protected under the Offshore Pacific Seamounts and Vents Closure (Offshore Fishery Closure). The Offshore Fishery Closure is closed to commercial bottom-contact fishing activities. For more information on the Offshore Fishery Closure—including maps, boundaries and restrictions to other fisheries or human activities—please visit: https://www.dfo-mpo.gc.ca/oceans/oecm-amcepz/refuges/offshore-hauturiere-eng.html.

5.2.8 GHOST GEAR INITIATIVE

One of the biggest threats to oceans internationally is marine litter, and in particular, ghost fishing gear. Ghost gear refers to any fishing equipment or fishing-related litter that has been abandoned, lost or otherwise discarded. It is some of the most harmful and deadly debris found in oceans.

In support of international efforts to reduce marine litter, in 2018, Canada signed the G7 Charlevoix Blueprint for Healthy Oceans, Seas and Resilient Coastal Communities. In doing so:

- Canada committed to accelerating the implementation of the 2015 Oceans Plastics Charter; and,
- Strengthened our domestic and international commitment to addressing marine litter by signing onto the Global Ghost Gear Initiative.

These commitments were further strengthened in the Canada-Wide Action Plan on Zero Plastic Waste Phase 2 developed by the Canadian Council of Ministers of the Environment, available from: https://ccme.ca/en/current-activities/waste.

Conditions of Licence to Report Lost and Retrieved Gear

In the spring of 2020, it became a mandatory condition of licence for commercial harvesters to report lost and retrieved fishing gear. While the Department is taking a stewardship approach to ghost gear and working with harvesters to reduce the effects of ghost fishing, the inclusion of the reporting requirement as a condition of licence means that not reporting lost and/or retrieved gear is now a chargeable offence.

Lost gear can be reported through the online Fishing Gear Reporting System, available at: https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/reporting-declaration-eng.html.

The Ghost Gear Fund (Sustainable Fisheries Solutions and Retrieval Support Contributions Program)

2020-2022, the DFO Ghost Gear Fund has provided over $18 million in funding to projects falling under four pillars of activity:

- Abandoned, lost or otherwise discarded fishing gear (ALDFG) retrieval
- Responsible disposal
- Acquisition and piloting of currently available innovative technologies
- International leadership

To learn more about the DFO Ghost Gear Fund, go to: https://www.dfo-mpo.gc.ca/fisheries-peches/management-gestion/ghostgear-equipementfantome/program-programme/projects-projets-eng.html

5.3 Conservation of Species that May be affected by Salmon Fisheries

5.3.1 ROCKFISH

2022/2023: The management objective for Bocaccio and inshore rockfish species (which include Yelloweye, Quillback, Copper, China, and Tiger) is to continue conservation strategies that will ensure stock rebuilding over time. **These inshore rockfish species are currently non-retention in the commercial salmon troll fisheries.**

In 2002, an inshore rockfish conservation strategy was established with initial measures introduced for recreational and commercial fisheries. The strategy addresses four areas under the fisheries management and stock assessment regime:

a) Protect a part of inshore rockfish populations from harvest through the use of rockfish conservation areas.

b) Collect information on total fishery mortalities through improved catch monitoring programs.

c) Reduce harvests to levels that are less than the estimates of natural mortality (i.e. less than two percent).

d) Improve the ability to assess the status of inshore rockfish populations and monitor changes in abundance.

5.3.1.1 ROCKFISH CONSERVATION AREAS

There are 162 Rockfish Conservation Areas (RCAs) in British Columbia, covering roughly 4,350km^2 of the Canadian Pacific Coast. These areas are closed to a range of recreational and commercial fisheries to protect inshore rockfish and their habitat.

DFO is currently undertaking a multi-year review of the conservation effectiveness of RCAs, including meeting the national criteria and standards for marine refuges to better conserve sensitive areas and contribute towards Canada's Marine Conservation Targets (MCT). To meet these standards, the risks to inshore rockfish, their habitat, and benthic communities will need to be avoided or mitigated. Peer-reviewed science advice also recommends that boundary changes to some RCAs will improve their spatial design by better capturing rockfish habitat features. RCAs in the Northern Shelf Bioregion have been selected for the first phase of engagement to align with the MPA network planning process in that area. Workshops with First Nations and stakeholders and online consultations were held in 2019. A summary of what we heard is available online at: https://www.pac.dfo-mpo.gc.ca/consultation/ground-fond/rca-acs/2020-heard-entendu-eng.html#6. There will be more opportunities to provide feedback on Rockfish Conservation Areas in the Northern Shelf Bioregion in the near future. We're also planning to review Rockfish Conservation Areas in other regions of British Columbia at a later date.

Further information on RCAs and the boundary proposals are available online at: http://dfo-mpo.gc.ca/rockfish-conservation or for further information on this, please contact DFO.RCA-ACS.MPO@dfo-mpo.gc.ca.

5.3.1.2 ROCKFISH REBUILDING PLANS

Fisheries and Oceans Canada (DFO) has developed "A Fisheries Decision-Making Framework Fisheries and Oceans Canada (DFO) has developed "A Fisheries Decision-Making Framework Incorporating the Precautionary Approach" (PA Framework) under the auspices of the Sustainable Fisheries Framework. It outlines the departmental methodology for applying the precautionary approach (PA) to Canadian fisheries. A key component of the PA Framework requires that when a stock has reached or fallen below a limit reference point (LRP), a rebuilding plan must be in place with the aim of having a high probability of the stock growing above the LRP within a reasonable timeframe.

The purpose of rebuilding plans is to identify the main objectives and requirements for any species below an LRP (i.e., in the "critical zone" of the PA Framework), as well as the management measures that will be used to achieve these objectives. The Integrated Fisheries Management Plan for Groundfish outlines rebuilding plans for groundfish species that (a) have been identified by peer reviewed stock assessments as currently in the critical zone under the PA framework and (b) are not covered by other management planning tools for depleted species, such as *Species At Risk Act*-listed species that require a recovery plan or management plan.

The primary objective of any rebuilding plan, outlined in the PA Framework, is to:

Promote stock growth out of the critical zone (B > 0.4 Bmsy) by ensuring removals from all fishing sources are kept to the lowest possible level until the stock has cleared this zone. There will be no tolerance for preventable decline. This objective remains the same whether the stock is declining, stable, or increasing.

More information on the Bocaccio and Yelloweye Rockfish Rebuilding Plans is available in Appendix 9 of the Groundfish IFMP.

5.3.2 GLASS SPONGE REEFS

Strait of Georgia and Howe Sound Glass Sponge Reef Marine Refuges:

17 marine refuges were established between 2016 and 2019 under the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative, which aims to protect glass sponge reefs from all bottom-contact fishing activities in alignment with DFO's Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas. All commercial, recreational and Indigenous food, social and ceremonial (FSC) bottom-contact fishing activities for prawn, shrimp, crab and groundfish, are prohibited within the 17 marine refuges as well as the use of downrigger gear for recreational salmon trolling (restricted via Condition of Licence) are prohibited within the 17

marine refuges within Subareas 28-2 and 28-4 to protect Howe Sound glass sponge reefs. Prohibited fishing activities include:

- prawn and crab by trap
- shrimp and groundfish by trawl
- groundfish by hook and line
- use of downrigger gear in recreational salmon trolling

In 2020, a DFO Canadian Science Advisory Secretariat publication confirmed the presence of five additional live sponge reefs and one dead reef in Howe Sound. As glass sponge reefs are slow growing and vulnerable to physical disturbances, the report suggested the reefs be closed to bottom-contact fishing. Between September 2020 and February 2021, DFO officials undertook consultation and engagement on proposed commercial and recreational and Indigenous FSC closures to invertebrate trap, groundfish trawl, groundfish hook and line, and the use of downriggers within the new sites with the aim of establishing marine refuges. Commercial and recreational bottom-contact fishery closures went into effect on January 17, 2022 within the five sites in portions of Subareas 28-1, 28-2 and 28-3 to protect these five additional Howe Sound glass sponge reefs. The use of downrigger gear in recreational salmon trolling will also be prohibited within the five sites and at one existing site (Queen Charlotte Channel) via a Condition of Licence, which will come into effect on April 1, 2022.

For further information on this, please contact Danielle Derrick at Danielle.Derrick@dfo-mpo.gc.ca.

A description of the closures is provided on the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative website, here: https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html

5.3.3 MARINE MAMMALS

In order to address conservation concerns with marine mammals, it is important that measures are taken to reduce the harm to and mortality of marine mammals resulting from primary threats they face, including those that may be associated with fishing activity, as well as to improve data quality of any interactions. As such, commercial fishing licenses have been amended to include a Condition of License for Marine Mammals that specify mitigation measures and reporting requirements. This includes mandatory reporting of all interactions with marine mammals, prohibition to disturb marine mammals and requirement for minimum approach distances to marine mammals as set out under the *Marine Mammal Regulations* (see

Section 5.7), prohibition of encirclement of marine mammals in purse seine fisheries, and prohibition against the lethal removal of nuisance seals.

5.3.4 TURTLE AND BASKING SHARK INCIDENT AND SIGHTINGS REPORTS

5.3.4.1 INCIDENT REPORTING

Marine Mammal Incident Reporting Hotline

The Department is responsible for assisting marine mammals and sea turtles in distress. If your vessel strikes a whale, or if you observe an entangled, sick, injured, distressed, or dead marine mammal in B.C. waters, please contact the B.C. Marine Mammal Response Network Incident Reporting Hotline immediately:

1-800-465-4336 OR VHF CHANNEL 16

What to report:

- Your name and contact information
- Date and time of incident
- Location: Latitude/Longitude coordinates, landmarks
- Species
- Animal alive/dead (animal condition)
- Nature of injury and supporting details (if possible)
- Pictures/Video taken

5.3.4.2 SIGHTING REPORTING

The Department appreciates your assistance in tracking the sightings of live cetaceans (whales, dolphins and porpoises), sea turtles and Basking Sharks. While there are many whale species found in Pacific Canadian waters, sightings of Basking Sharks and Leatherback Sea Turtles are infrequent. The collection of sighting data is useful to scientists in determining population size and species distribution and aids in recovery efforts under the *Species at Risk Act* (SARA).

To report whale or turtle sightings, contact the BC Cetacean Sightings Network:

Toll free: 1.866.I.SAW.ONE (1-866-472-9663)
Email: sightings@ocean.org
Website: http://wildwhales.org/
App: WhaleReport

To report Basking Shark sightings contact the Basking Shark Sightings Network:

Toll free: 1-877-50-SHARK (1-877-507-4275)
Email: sharks@dfo-mpo.gc.ca
Website: www.pac.dfo-mpo.gc.ca/SharkSightings

5.3.5 SEABIRDS

Environment and Climate Change Canada (ECCC) is looking for your help to measure gill net fishing's impact on local seabird populations.

Populations of a number of seabird species around the world have declined in recent years; seabird bycatch is a part of the reason.

Seabird bycatch has been reported in all types of fisheries in BC and in fisheries in Alaska and Washington State. However, the number of local seabirds getting entangled in gill nets as a result of the BC salmon gill net fishery is not well known.

ECCC wants to know how, when and where gill net fishing may impact local seabirds and to find ways to reduce impacts. ECCC, with Fisheries and Oceans Canada, fishermen, First Nations, non-government organizations, and other coastal communities, have a program to answer these questions. Without this information, it will be difficult to determine if there is a significant impact. Should impacts be determined this information helps support solutions that benefit both the fishery and healthy bird populations.

To help us, we would like to be informed about any dead birds found or reported in gill nets and/or found floating dead on fishing grounds. Please report all incidents to our 24-hour reporting line: 1-866-431-BIRD (2473).

For additional information, please contact:

Laurie Wilson
Wildlife Biologist, Environment and Climate Change Canada
Canadian Wildlife Service, Delta, BC
Telephone: (604) 862-8817
Email: laurie.wilson@ec.gc.ca

5.3.6 SHARKS

Out of the fourteen shark species in Canadian Pacific waters, three species are listed under SARA. The Basking Shark *(Cetorinus maximus)* is listed as Endangered, and the Bluntnose Sixgill Shark *(Hexanchus griseus)* and Tope Shark *(Galeorhinus galeus)* are listed as species of Special Concern. The primary threats to shark species have been identified as bycatch and entanglement. In order to address the conservation concerns with shark species, it is important

that measures are taken to reduce the mortality of sharks resulting from these primary threats. As such, commercial fishing licences have been amended to include a Condition of Licence for Basking Sharks that specify mitigation measures in accordance with SARA permit requirements.

Additionally, two 'Code of Conduct for Shark Encounters' documents have been developed to reduce the mortality of Basking Shark, as well as other Canadian Pacific shark species such as Bluntnose Sixgill and Tope Shark resulting from entanglement and bycatch in commercial, aquaculture and recreational fisheries. These guidelines include boat handling procedures during visual encounters with Basking Sharks as well as best practices for handling Canadian Pacific shark species during entanglement encounters.

These documents have been posted online and can be found at the following URL links:

Code of conduct for sharks:
https://www.dfo-mpo.gc.ca/species-especes/publications/sharks/coc/coc-sharks/index-eng.html

Code of conduct for Basking Sharks:
https://www.dfo-mpo.gc.ca/species-especes/publications/sharks/coc/coc-basking/index-eng.html

5.3.7 SARA LISTED SPECIES

In the Pacific Region, the following SARA-listed species may be encountered by salmon fisheries:

BIRDS

- Ancient Murrelet – Special Concern
- Marbled Murrelet – Threatened
- Black-footed Albatross – Special Concern
- Short-tailed Albatross – Threatened
- Pink-footed Shearwater – Threatened
- Marbled Murrelet – Threatened
- Black-footed Albatross – Special Concern
- Short-tailed Albatross – Threatened
- Pink-footed Shearwater – Endangered
- Cassin Auklet – Special Concern

FISH

- Basking Shark, Pacific population – Endangered
- Bluntnose Sixgill Shark – Special Concern

- Bull Trout - South Coast population – Special Concern
- Green Sturgeon – Special Concern
- Longspine Thornyhead – Special Concern
- Rougheye Rockfish Types I & II – Special Concern
- Tope Shark – Special Concern
- White Sturgeon – Upper Columbia River population – Endangered
- White Sturgeon – Upper Fraser River population – Endangered
- White Sturgeon – Nechako River Population – Endangered
- White Sturgeon – Upper Kootenay River population – Endangered
- Yelloweye Rockfish, Pacific Ocean inside waters and outside waters populations – Special Concern (re-assessed by COSEWIC as Threatened in 2020)

MAMMALS

- Blue Whale, Pacific population – Endangered
- Fin Whale, Pacific population – Threatened (re-assessed by COSEWIC as special concern in 2019)
- Grey Whale – Eastern North Pacific Population – Special Concern (reassessed and split into two populations by COSEWIC in 2017: Northern Pacific Migratory, assessed as Not at Risk, and Pacific Coast Feeding Group, assessed as Endangered)
- Harbour Porpoise, Pacific Ocean population – Special Concern
- Humpback Whale, North Pacific population – Special Concern
- Killer Whale, Northeast Pacific – northern resident population – Threatened
- Killer Whale, Northeast Pacific – southern resident population – Endangered
- Killer Whale, Northeast Pacific – offshore population – Threatened
- Killer Whale, Northeast Pacific – transient population – Threatened
- North Pacific Right Whale – Endangered
- Sea Otter – Special Concern
- Sei Whale, Pacific population – Endangered
- Steller Sea Lion – Special Concern

REPTILES

- Leatherback Sea Turtle – Endangered

Marine or anadromous species assessed by COSEWIC that are currently under consideration for listing under SARA include:

FISH

- Bocaccio – assessed as Endangered
- Darkblotched Rockfish – assessed as Special Concern
- Eulachon – Fraser River Designatable Unit (DU) – assessed as Endangered
- Eulachon – Central Pacific Coast DU – assessed as Endangered
- Eulachon – Nass/Skeena Rivers DU – assessed as Special Concern
- North Pacific Spiny Dogfish – assessed as Special Concern
- Salmon, Chinook (Okanagan population) – assessed as Endangered
- Salmon, Coho (Interior Fraser population) – assessed as Threatened
- Salmon, Sockeye (Sakinaw population) – assessed as Endangered
- Salmon, Sockeye (15 Fraser River DUs) – assessed as Endangered (8 DUs), Threatened (2 DUs), Special Concern (5 DUs)
- Salmon, Chinook (Southern BC DUs) - assessed as Endangered (8 DUs), Threatened (4 DUs), Special Concern (1 DU)
- Salmon, Chinook (Southern BC *hatchery enhanced* DUs) – assessed as Endangered (4 DUs), Threatened (3 DUs), Special Concern (1 DU)
- Interior Fraser Steelhead (Chilcotin & Thompson populations) – assessed as Endangered (2 DUs)
- Quillback Rockfish – assessed as Threatened
- White Sturgeon- Lower Fraser River DU - assessed as Threatened
- White Sturgeon – Mid-Fraser Nationally Significant Population – assessed as Endangered as part of the Upper Fraser DU

MAMMALS

- Northern Fur Seal – Threatened
- Grey Whale, Pacific Coast Feeding Group population – Endangered (this population represents a portion of the currently listed Special Concern Eastern North Pacific Grey Whale population)
- Grey Whale, Western Pacific population –Endangered

5.3.7.1 SALMON AND STEELHEAD SARA LISTING PROCESSES

Over 60 salmon and two anadromous trout designatable units (DUs) have been recently, or will soon be, assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). COSEWIC's submission of its assessments to the Government of Canada, via its annual report, initiates the process to determine whether or not to list a species under the *Species at Risk Act* (SARA). For regular (non-emergency) processes, the Governor in Council (Cabinet)

may, on the recommendation of the Minister of Environment and Climate Change, add the species to the List of Wildlife Species at Risk; decide not to add the species to the List; or refer the matter back to COSEWIC. To inform the recommendation and final listing decision, DFO prepares the following regional information: a Recovery Potential Assessment (science advice); management scenarios (outlining measures to potentially be taken if the species is, or is not listed); Indigenous Cultural Significance information; a Cost-Benefit Analysis; and, consultations with First Nations, stakeholders, and the general public. More details on timelines and opportunities for engagement will be provided at a later date.

Species	COSEWIC Assessment	# of DUs*	COSEWIC Assessment Date	COSEWIC Annual Report Date
Sakinaw Sockeye	EN	1	April 2016	Oct 2016
Interior Fraser Coho	TH	1	November 2016	Oct 2017
Okanagan Chinook	EN	1	April 2017	Oct 2017
Fraser Sockeye (Group I)	8 EN, 2 TH, 5 SC, 9 NAR	24	November 2017	Oct 2018
Southern BC Chinook (Group I)	8 EN, 4 TH, 1 SC, 2 DD, 1 NAR	16	November 2018	Oct 2019
Interior Fraser Steelhead (Thompson & Chilcotin) – Regular Assessment	2 EN	2	November 2020	Expected Fall 2021
Southern BC Chinook (Group II)	4 EN, 3 TH, 1 SC, 2 DD, 2 NAR	12	November 2020	Expected Fall 2021
Fraser Sockeye (Group II)	Assessment not yet performed	7	Expected November 2021	Expected Fall 2022

EN – Endangered; TH- Threatened; SC- Special Concern; DD- Data Deficient; NAR – Not at Risk
*DU refers to "designatable unit" or population.
Further information on the SARA listing process can be found at:
http://www.dfo-mpo.gc.ca/species-especes/publications/sara-lep/policy-politique/index-eng.html

DFO has co-developed the following conservation strategies for species that were previously declined for SARA listing:

- *Conservation Strategy for Coho Salmon, Interior Fraser River Populations*: https://waves-vagues.dfo-mpo.gc.ca/Library/329140.pdf

- *National Conservation Strategy for Cultus Lake Sockeye Salmon (Oncorhynchus Nerka):* https://waves-vagues.dfo-mpo.gc.ca/Library/337479.pdf
- *Conservation Strategy for Sockeye Salmon (Oncorhynchus nerka), Sakinaw Lake Population:* http://waves-vagues.dfo-mpo.gc.ca/Library/347720.pdf

In addition to these documents, this IFMP identifies specific conservation objectives for these and other salmon stocks, found in Section 6, Fishery Management Objectives for Stocks of Concern.

5.3.7.2 SARA LISTING PROCESS FOR PACIFIC COAST FEEDING GROUP AND WESTERN PACIFIC GREY WHALE POPULATIONS

The Grey Whale is a medium- to large-sized baleen cetacean. As of 2017, COSEWIC recognizes three Grey Whale populations in Canadian Pacific waters. The Eastern North Pacific population, currently Special Concern on Schedule 1 of SARA, was split into two populations. A broader Northern Pacific Migratory population, which migrates from winter breeding grounds in Mexico to summer feeding areas in the Bering Sea and Arctic waters, was assessed by COSEWIC as Not at Risk. A small population which over-winters in Mexico and resides and feeds in British Columbia waters in summer and fall, the Pacific Coast Feeding Group, was assessed as Endangered. A new Western Pacific population, which was recently found to contain individuals that migrate through British Columbia waters to breeding areas in Mexico, was also assessed as Endangered.

The two COSEWIC-assessed Endangered Grey Whale populations are under consideration for SARA listing. Consultations on these proposed amendments under SARA and the potential impacts of SARA listing are anticipated to be held in 2022. For further information, please contact the Species at Risk Program at SARA.XPAC@dfo-mpo.gc.ca.

5.4 DEPREDATION

Depredation (the removal of fish from fishing gear) by Killer Whales has been reported by groundfish longline, salmon troll, and recreational harvesters in B.C.

Depredation is a learned behaviour that can spread throughout whale social groups and once established is impossible to eliminate. It is critical that B.C. harvesters do not encourage this learning by allowing whales to associate obtaining fish with fishing activity; encouraging this behaviour will quickly lead to significant losses for harvesters.

The most important approach to prevent this from spreading is by NOT feeding whales directly or indirectly and not hauling gear in the vicinity of Killer Whales. It is prohibited to approach

marine mammals to feed or attempt to feed them under s. 7 of the *Marine Mammal Regulations*. Typically Killer Whales pass quickly through an area allowing fishing to resume. It is also recommended that you advise other fish harvesters in the area if you encounter depredation. Additional tips on avoiding depredation events can be found in the DFO Marine Mammal Bulletin #2. DFO link:
http://www.pac.dfo-mpo.gc.ca/publications/marinemammals/depredation-4-2010-eng.pdf

If you experience depredation by whales, please report the incident by calling 1-800-465-4336, by email at marinemammals@pac.dfo-mpo.gc.ca or by reporting accidental contact through the marine mammal interaction form. Reporting all incidents will assist DFO and fish harvesters in understanding this problem and help in developing strategies to avoid it.

5.5 Resident Killer Whale

Two distinct populations of Resident Killer Whales, known as the Northern and Southern Residents, occupy the waters off the west coast of British Columbia. These two populations have overlapping ranges but are acoustically, genetically, and culturally distinct from each other. Since 2003, the Northern and Southern Resident Killer Whales have been listed in Schedule 1 of the *Species at Risk Act* (SARA), as threatened and endangered respectively. The "Recovery Strategy for the Northern and Southern Resident Killer Whales (*Orcinus orca*) in Canada" was finalized and published on the Species at Risk Public Registry in 2008, amended in 2011 to clarify critical habitat attributes, and amended in 2018 to include two additional areas protected under the SARA Critical Habitat Order.

The principal threats identified in the recovery strategy for Northern Resident Killer Whales (NRKW) and Southern Resident Killer Whales (SRKW) include: reduced prey availability, environmental contaminants, and physical and acoustic disturbance. An additional emerging threat, vessel strikes, was identified during a science-based review of recovery actions for SRKW.

The Action Plan identifies 98 recovery measures to support recovery of Resident Killer Whales. These measures were developed to support recovery and to address the three primary threats to the population – including prey availability.

Relevant Key Threats:

Reduced Prey Availability

Northern and Southern Resident Killer Whales are dietary specialists and feed primarily on salmon. The seasonal distribution and movement patterns of Resident Killer Whales are strongly associated with the availability of their preferred prey, Chinook salmon (*Oncorhynchus*

tshawytscha), and secondarily, Chum salmon (*O. keta*). Trends in the mortality rates of Southern and Northern Resident Killer Whales are also both strongly related to fluctuations in the abundance of Chinook Salmon. Key foraging areas for SRKW were identified in SRKW critical habitat using best available science to inform salmon fishery management measures to support Chinook Salmon prey availability for SRKW. In 2021, analyses of SRKW behaviour confirmed Haro Strait as a foraging area and identified foraging as the dominant behaviour in the waters surrounding Swiftsure Bank and Juan de Fuca Strait[7].

DFO and other researchers continue to advance new scientific information and analyses to address the three principal threats to RKW, including prey availability.

Physical and Acoustic Disturbance:

All cetaceans, including Resident Killer Whales, have been subjected to increasing amounts of disturbance from vessels and anthropogenic noise in recent years. This includes chronic noise from shipping, and acute noise from industrial activities such as dredging, pile driving, and construction, as well as seismic testing, military sonar, and vessel use of low and mid-frequency sonars and high frequency echosounders. Killer whales use echolocation to detect prey, to communicate and to acquire information about their environment. Underwater noise can interfere with all these activities in critically important ways, such as disrupting communication, reducing the distance over which social groups can detect each other, masking echolocation and hence reducing the distance over which the animals can detect their prey, potentially displacing them from preferred feeding habitats, displacing prey, impairing hearing, either temporarily or permanently and in extreme cases causing death. While Resident Killer Whales travel in high vessel traffic areas such as Johnstone Strait and the Strait of Georgia, they must also coexist with both commercial and recreational sports fishing boats specifically targeting salmon in 'hot spots' that are also feeding areas for Killer Whales. Conflict for space may force Killer Whales to alter their foraging behaviour in order to successfully capture prey or to avoid collision or entanglement.

[7] DFO. 2021. Identification of areas for mitigation of vessel-related threats to survival and recovery for Southern Resident Killer Whales. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2021/025.

5.6 Southern Resident Killer Whale Management Measures to Address Reduced Prey Availability, and Physical and Acoustic Disturbance

The Government of Canada taking important steps to protect and recover the Southern Resident Killer Whale population, in keeping with recovery measures identified in *Species at Risk Act* (SARA) recovery documents. In May 2018, the Minister of Fisheries, Oceans and the Canadian Coast Guard and Minister of Environment and Climate Change determined the Southern Resident Killer Whale population faces imminent threats to its survival and recovery. Since 2018, the Government of Canada, with input from the Indigenous and Multi-Stakeholder Advisory Group, Technical Working Groups and consultation with Indigenous groups, stakeholders and the public, has implemented a number of management measures aimed at increasing prey availability for Southern Resident Killer Whales – particularly Chinook salmon—and reducing threats related to physical and acoustic disturbance with a focus in key foraging areas within Southern Resident Killer Whale critical habitat.

The fishery management measures for 2022 include area-based fishery closures for recreational and commercial salmon fisheries in e Juan de Fuca Strait (consisting of a portion of Subarea 20-1 from July 15 to October 31, 2022, and a portion of Subarea 20-5 from August 1 to October 31, 2022); Swiftsure Bank (consisting of portions of Subareas 121-1 and 121-2 from July 15 to October 31, 2022); the mouth of the Fraser River (consisting of a portion of Subarea 29-3 from August 1 to September 30, 2022); and the Southern Gulf Islands (Subarea 18-9 and portions of Subareas 18-2, 18-4 and 18-5) from May 27, 2022 based on first confirmed presence of Southern Resident Killer Whales in the area until October 31, 2022. Details are provided via Fishery Notices and are available here: www.pac.dfo-mpo.gc.ca/southern-resident-killer-whale Similar to 2021, DFO continued the fishing closure protocol for the Southern Gulf Islands commercial and recreational salmon fisheries where fishery closures are triggered to be implemented by the first confirmed presence of Southern Resident Killer Whales in the area. The Vancouver Fraser Port Authority Enhancing Cetacean and Observation (ECHO) Program, working closely with its local partners, and our Whale Tracking Network began monitoring the area on May 5, 2022, and confirmed Southern Resident killer whale presence which initiated the closures from May 27 to October 31, 2022. Interim Sanctuary Zones off the coasts of North Pender Island and Saturna Island prohibit vessels from entering and fishing within their boundaries (with some exceptions) from June 1 to November 30, 2022 as per the Interim Order enacted under the *Canada Shipping Act*.

These closures do not apply to individuals or vessels being used to fish for food, social or ceremonial purposes, or for domestic purposes pursuant to a treaty, under a license issued under the Aboriginal Communal Fishing License Regulations.

To address vessel disturbance in the presence of whales, a mandatory 400-metre vessel approach distance for all killer whales is in effect until May 31, 2023 in southern BC coastal waters between Campbell River and just north of Ucluelet. The *Marine Mammal Regulations* remain in effect year-round, and require a minimum 200-metre approach distance from all killer whales in Canadian Pacific waters other than those described above. A 100-metre approach distance applies for other whales, porpoises and dolphins or 200-metres when the animal is in resting position or with a calf. New in 2022, two mandatory Seasonal Slowdown Areas are being piloted near Swiftsure Bank from June 1 until November 30, 2022 in portions of Subarea 121-1 and the near the mouth of the Nitinat River from Carmanah Point to Longitude 125 degrees west (Subarea 21-0). This measure requires all vessels to slow down to a maximum of 10 knots while in the areas, with limited exceptions.

The Government of Canada is asking vessel operators to respect the following voluntary measures:

- Stop fishing (do not haul gear) within 1,000 metres of killer whales and let them pass;
- Reduce speed to less than 7 knots when within 1,000 metres of the nearest marine mammal;
- When safe to do so, turn off echo sounders and fish finders; and
- Place engine in neutral idle and allow animals to pass if your vessel is not in compliance with the approach distance regulations.

For more information on the best ways to help whales while on the water, when on both sides of the border, please visit: bewhalewise.org.

For more information regarding the Southern Resident Killer Whale management measures to support recovery, please contact the Marine Mammal Team (DFO.SRKW-ERS.MPO@dfo-mpo.gc.ca) or visit www.pac.dfo-mpo.gc.ca/southern-resident-killer-whale

5.7 U.S. Marine Mammal Protection Act Provisions

In 2016, the U.S. published new regulations (80 FR 54390) pursuant to the *Marine Mammal Protection Act* which focus on the reduction of marine mammal bycatch in foreign commercial fishing operations. Under these regulations, harvesting nations intending to continue to export fish and fish products to the USA after January 1, 2023, must apply to the U.S. National Oceanic and Atmospheric Administration (NOAA) for a comparability finding for each of its commercial fisheries listed in the US List of Foreign Fisheries. Harvesting nations must demonstrate: 1) the prohibition of intentional mortality or serious injury of marine mammals in the course of commercial fishing operations; and 2) the implementation of a regulatory program comparable in effectiveness to the US, including mandatory reporting of marine mammal bycatch, monitoring programs and management/mitigation measures where appropriate.

Depending on information provided, foreign commercial fisheries that export fish and fish products to the United States can be classified as either "export" or "exempt" based on the frequency and likelihood of incidental mortality and serious injury of marine mammals. On October 8, 2020, the 2020 US List of Foreign Fisheries was published on the NOAA public registry. For the Pacific Region, all Salmon Gillnet fisheries are classified as *Export* (LOFF pg.97), all Salmon Trolling Line fisheries are classified as *Exempt* (LOFF pg.31), and all Salmon Purse Seine fisheries are classified as *Exempt* (LOFF pg.48).

DFO will continue to share information about the U.S. Marine Mammal Protection Act Import Provisions and the process for ensuring continued access to US markets. Further information can be found on the NOAA website, or by contacting the Regional Fisheries Coordinator or the DFO Marine Mammal Unit (MMU) (Contact: Lee Harber, Marine Mammal Advisor; Lee.Harber@dfo-mpo.gc.ca).

5.8 Marine Mammal Regulations

The *Marine Mammal Regulations* provide direction on conservation and protection of marine mammals, provide guidance for recovery of at-risk species under the Species at Risk Act, and set out provisions related to reducing human disturbance of marine mammals (e.g., viewing of marine mammals) and mandatory reporting requirements in the case there is accidental contact with a marine mammal and a vessel or fishing gear. These regulations were amended in 2018 and now specify mandatory requirements to reduce disturbance of marine mammals.

As per section 7(2) of the *Marine Mammal Regulations*, disturbance is defined as a number of human actions, including:

- Feeding, swimming or interacting with a marine mammal;

- Moving a marine mammal (or enticing/causing them to move);
- Separating a marine mammal from its group or going between them and a calf;
- Trapping marine mammals between a vessel and the shore, or between a vessel and other vessels; and
- Tagging or marking a marine mammal.

Boats are required to maintain a minimum approach distance of 100 metres for whales, dolphins or porpoises, 200 metres when whales, dolphins or porpoises are in a resting position or with a calf, and 200 metres from all Killer Whales in Pacific Canadian waters except when in southern BC coastal waters which requires a 400 metre minimum approach distance to all killer whales (please see section 5.2).

Ensure to check nautical charts for the locations of various protected areas and no go zones.

For more information on safe boating behavior around whales please visit: Watching Marine Mammals and Be Whale Wise.

Any operator of a vessel or fishing gear involved in accidental contact with a marine mammal must notify DFO of the incident, as per section 39 of the *Marine Mammal Regulations.* Incident reporting includes:

- Reporting an injured, stranded, entangled or dead marine mammal to the BC Marine Mammal Response Network (Observe, Record, Report): 1-800-465-4336
- Reporting as bycatch in a log book
- Reporting accidental contact through the marine mammal interaction form
- Depredation reporting to DFO by email at marinemammals@pac.dfo-mpo.gc.ca, by calling 1-800-465-4336 or by reporting accidental contact through the marine mammal interaction form.

Please note, incidents involving abuse or harassment of a marine mammal should be reported as a fisheries violation, while injured, stranded, entangled or dead marine mammals should be reported to the BC Marine Mammal Response Network to enable a response if appropriate.

Please note, incidents involving abuse or harassment of a marine mammal should be reported as a fisheries violation, while injured, stranded, entangled or dead marine mammals should be reported to the BC Marine Mammal Response Network to enable a response if appropriate.

Further information regarding the *Marine Mammal Regulations* can be obtained by contacting your Regional Fisheries Coordinator or the DFO Marine Mammal Unit (MMU; marinemammals@pac.dfo-mpo.gc.ca).

5.9 AQUACULTURE MANAGEMENT

REGULATORY REGIME:

In December 2010 the *Pacific Aquaculture Regulations* (PAR) came into effect, giving DFO the authority to govern the management and regulation of aquaculture activities at marine finfish, shellfish, freshwater/land-based and enhancement facilities. The *Aquaculture Activities Regulations* (AAR), which came into force in 2015, further clarify conditions under which aquaculture operators may treat their fish for disease and parasites, as well as deposit organic matter.

DFO also administers the provisions of the *Fishery (General) Regulations* (FGRs) including sections 54 to 57 in regard to licencing introductions and transfers of fish. These provisions include requirements relating to disease. All aquaculture operators must be authorized under the FGRs to bring fish onto the farm site, whether it is on land or in the marine environment. After fish are introduced to the farm site, fish health is addressed through conditions of licence under the PARs throughout the rearing process. The Framework on the Transfer of Live Fish developed in 2019 provides further guidance related to licencing under the FGRs. This is nested under the Framework for Aquaculture Risk Management.

As part of adaptive management, DFO Aquaculture Management continues to refine management approaches. The marine finfish aquaculture conditions were amended in March 2020 to improve sea lice management. Ongoing review and improvements to licence conditions are underway for the planned 2022 licence re-issuance. DFO Aquaculture Management is also exploring an Area-based Aquaculture Management approach, with a goal of managing aquaculture in a way that ensures environmental, social, and economic factors are considered.

In response to 2019 mandate commitments, DFO is developing a responsible plan to transition from open net-pen salmon farming in coastal British Columbia waters by 2025 and is working to introduce Canada's first-ever Aquaculture Act.

The Province of British Columbia continues to have authority over land tenures and workplace safety related to aquaculture in BC. New applications, amendments and related referrals are coordinated through FrontCounter BC. More information is available on the BC Government's website: http://www.frontcounterbc.gov.bc.ca.

DFO requires comprehensive environmental monitoring to be undertaken by the marine finfish industry, and the department also conducts additional monitoring, audits, and investigations (where warranted) to verify information submitted by licence holders and to obtain samples for analysis. Public reporting on the environmental performance of the aquaculture sector in BC is undertaken to ensure the transparency and accountability of the industry. Associated reporting can be found on this DFO web page: http://www.pac.dfo-mpo.gc.ca/aquaculture/reporting-rapports/index-eng.html.

Within the BC Aquaculture Regulatory Program there is a Compliance and Enforcement Unit, dedicated to aquaculture compliance, as well as an Aquaculture Environmental Operations Unit, which monitors the activities of industry on an ongoing basis. The Program provides oversight and works to ensure the orderly management of the industry, including planning and licensing, linkages with national and regional policy, as well as consultation and communications. Contact information for staff with responsibilities related to aquaculture management within DFO can be found in the Department Contacts section of this plan.

INTEGRATED MANAGEMENT OF AQUACULTURE PLANS:

Integrated Management of Aquaculture Plans (IMAPs) provide an overview of each aquaculture sector and associated management and regulation. IMAPs are available on the DFO Consultations web pages: http://www.pac.dfo-mpo.gc.ca/aquaculture/regs-eng.html.

IMAPs complement IFMPs and the two are reviewed periodically to ensure consistency of management approaches.

More information on IMAPs is available through: IMAPS@dfo-mpo.gc.ca.

5.10 Fishing Vessel Safety

Commercial fishing is recognized as a very dangerous activity. Concerns over fishing related injuries and deaths have prompted DFO to proactively work with Transport Canada and WorkSafe B.C. to ensure coordinated approaches to improving fishermen's safety. See Appendix 2 for more information.

5.11 Catch Monitoring

Robust fishery monitoring information is essential for stock assessment and to effectively implement management measures such as target and bycatch limits, quotas and closed areas. Fishery monitoring information is also needed to support the long-term sustainable use of fish

resources for Food, Social, and Ceremonial and other Indigenous fisheries, commercial fisheries, recreational fisheries, and to support market access for Canadian fish products.

Following multi-sectoral consultations, DFO released the national Fishery Monitoring Policy in 2019, replacing the regional "Strategic Framework for Fisheries Monitoring and Catch Reporting in the Pacific Fisheries" (2012). The Fishery Monitoring Policy seeks to provide dependable, timely and accessible fishery information through application of a common set of procedural steps used to establish fishery monitoring requirements across fisheries. Policy principles include respecting Indigenous and Treaty rights, linkage of monitoring requirements to the degree of risk and complexity of fisheries, linkage of monitoring programs to fishery and policy objectives while accounting for cost-effectiveness and practicality of implementation, and shared accountability and responsibility between DFO, Indigenous groups and stakeholders.

To ensure consistent national application of the Fishery Monitoring Policy, further guidance is provided through the "Introduction to the Procedural Steps of Implementing the Fishery Monitoring Policy". Fisheries are first prioritized for assessment through collaboration with Indigenous groups and Stakeholders. Risk and data quality assessments are then conducted on priority stocks and associated fisheries and monitoring programs. Next, monitoring objectives are set in alignment with the Fishery Monitoring Policy, followed by specifying monitoring requirements and then monitoring programs are operationalized. Finally, a review and evaluation of the fishery monitoring programs against the monitoring objectives will be conducted and reported on.

The Fishery Monitoring Policy is part of DFO's Sustainable Fisheries Framework and is available at:

https://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/fishery-monitoring-surveillance-des-peches-eng.htm

The "Introduction to the Procedural Steps of Implementing the Fishery Monitoring Policy" is available at:

https://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/fmp-implementation-psp-mise-en-oeuvre-eng.htm

In cases where assessment of monitoring programs identifies a gap between the current and target level of monitoring, discussions will be held between DFO Indigenous groups and stakeholders to identify options to address the monitoring gap, and the feasibility of these options (e.g. cost, technical considerations, etc.).To support Fishery Monitoring Policy principles, a collaborative approach is required.

Where monitoring options are determined to be feasible, the monitoring and reporting regime will be revised to incorporate these options, providing resource managers with sufficient information to meet Fishery Monitoring Policy objectives. Where monitoring options are not feasible, alternative management approaches are required to reduce the risk posed by the fishery. If there is no gap between the current and target level of monitoring, the management approach will not require any change.

6 FISHERY MANAGEMENT OBJECTIVES FOR STOCKS OF CONCERN

Section 6 outlines fishery management objectives for those salmon stocks of concern in Northern BC whose status affects management of fisheries throughout the region. This section is not intended to provide a complete listing of all Northern BC salmon stocks of concern. Stock status and management measures implemented to protect stocks of concern not covered in Section 6 will be outlined in the species specific portions of Section 13.

6.1 RIVERS AND SMITH INLET SOCKEYE

The objective for Rivers and Smith Inlet Sockeye salmon is to allow rebuilding of these stocks to consistently reach escapement goals and achieve a sustainable stock that will support harvest.

Smith Inlet Sockeye: Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

The Docee Fence has historically provided an accurate in-season estimate of returns that was used to inform management decisions for potential fisheries. Unfortunately, the fence has not been in operation since 2017. Without the Docee Fence in-season monitoring program, new methods for determining in-season run strength based on alternate indicators will need to be developed in order to assess commercial Sockeye opportunities.

Rivers Inlet Sockeye: Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Future openings are unlikely until a clear trend towards higher productivity and consistently better escapements is established and documented by the annual surveys of spawning adults. Currently, there is not an established in-season assessment tool to estimate run size in this area.

Updated upper and lower biological escapement targets for Rivers Inlet Sockeye are under development and a process is underway to review the available information, and identify data gaps and associated uncertainties, with the final steps including a full science review of the

updated benchmarks through the Canadian Science Advice Secretariat (CSAS) and establishment of updated Management Reference Points.

6.2 Skeena River Sockeye

The objective for Skeena River Sockeye is to maintain sustainable stocks consistent with the WSP and support FSC, commercial, and recreational harvests.

Over the past five years, the Skeena First Nations Technical Committee (SFNTC) has provided recommendations to guide management of First Nations FSC fisheries in the Skeena. The Skeena Sockeye abundance (Total Return to Canada TRTC) trigger level for First Nations Section 35(1) fisheries closures will be maintained at 400,000. Technical work by the SFNTC has identified that the total aggregate escapement of 600,000 Skeena Sockeye is required to meet the interim lower biological benchmark of 240,000 for wild Skeena Sockeye stocks. As proposed in previous SFNTC fishing plans, Skeena First Nations may choose to close or curtail First Nations section 35(1) FSC Sockeye fisheries anytime if the in-season TRTC estimate is below 600,000.

A review of biological benchmarks for all Skeena Sockeye CUs is being undertaken as a part of the obligations resulting from the updates to Chapter 2 of the Pacific Salmon Treaty. This work will further inform both updated biological benchmarks for individual Sockeye CUs as well as Management Reference Points for the Skeena Sockeye aggregate.

Skeena Sockeye directed commercial fisheries have been identified as needing additional mitigation measures to protect wild Sockeye stocks and reduce bycatch interceptions, including Steelhead and Coho. Harvest rates will continue to be based on an abundance-based formula that accounts for the forecasted aggregate Skeena Sockeye return to Canada and the status of Skeena Sockeye stocks where information is available, and additional measures are described in Section 13.

6.3 Nass River Sockeye

The objective for Nass Sockeye is to maintain sustainable stocks that will meet WSP objectives and support FSC and Treaty harvests, as well as commercial and recreational harvests. In particular, management objectives to reduce harvest impacts on weak stocks such as Kwinageese and Damdochax Sockeye will remain until improvements are observed. Nass Sockeye will be managed to achieve an aggregate spawning escapement target of 200,000.

Returns in excess of the escapement target may be harvested in FSC, Nisga'a Treaty, recreational, and commercial harvest opportunities. Beginning in 2022, additional mitigation measures will be implemented in Nass sockeye directed fisheries to increase protection for stocks of conservation concern. These measures include implementation of a delayed fishing

date to when in-season escapement estimates become more accurate and a season end date in late July to avoid wild Area 3 Chum. See Appendix 10 for a complete list of fisheries where additional mitigations measures will be implemented.

6.4 North Coast Chum

The objective for wild north coast Chum is to rebuild weak wild stocks while providing opportunities to harvest surplus stocks.

North Coast wild Chum stocks remain depressed and management actions in Areas 3 to 6 will continue to be taken to maintain low fishery impacts. Specific Chum rebuilding plans have been developed for Skeena and Nass stocks. Please see Appendix 7 and Appendix 8 for more details.

6.5 Skeena and Nass Chinook

The objective for Skeena and Nass Chinook is to promote Chinook conservation and support rebuilding.

Most Skeena and Nass River Chinook conservation units (CUs) experienced declines in abundance in 2016 and 2017, followed by increases in 2018, and weaker escapements since 2019. A more precautionary approach to management will be implemented for the 2022 season, with a focus on Skeena Chinook to address concerns for the longer term decline in overall abundance of these stocks, and uncertain environmental conditions. The Department is implementing additional management actionsbeyond those taken in 2021, including continued precautionary measures in commercial troll fisheries, temporal and spatial closures, and quota reductions in the recreational fishery. Additional measures will be implemented in net fisheries in Area 3 to 5 to reduce Chinook interception. Please see Section 13 for more details.

Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

6.6 Northern Coho

The objective for Northern Coho is to reduce exploitation in domestic fisheries to promote Coho conservation and support rebuilding.

Returns of Northern Coho in 2018 were the second lowest recorded since the mid 1990's. While preliminary estimates of escapement in 2020 and 2021 showed modest improvement for some CUs, there is still broad concern for most of the Coho CUs across the North Coast. Reduced survival rates, productivity, and uncertain marine conditions are all potential causes for the persistent poor survival.

From 2019 to 2021, reductions to Coho exploitation were implemented in Northern commercial and recreational fisheries. In 2021, the Area F Coho mixed-stock directed fishery was closed as an interim measure to support stock rebuilding under PSSI.

Beginning in 2022, the North Coast mixed-stock Coho directed commercial troll fishery and the Central Coast Coho demonstration fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Please see Section 13 for more details.

6.7 West Coast of Vancouver Island (WCVI) Chinook

The objective for West Coast of Vancouver Island (WCVI) Chinook is to manage Canadian ocean fisheries (specified below) to an exploitation rate of 10%. The objective for North Coast Chinook is to manage in accordance with the allocation policy, and to manage the northern troll fishery to a WCVI Chinook exploitation rate of 3.2%.

For the past two decades WCVI wild Chinook have experienced poor marine survival rates and low spawner levels despite improved returns of enhanced stocks in recent years. WCVI wild Chinook continue to be stocks of concern.

Management actions will continue to be required consistent with the exploitation rate objective. For purposes of calculating the WCVI exploitation rate for North Coast Chinook fisheries, all WCVI Chinook caught and kept in Canadian fisheries are assumed to be returning in the present year. Fisheries that this limit applies to are the northern troll, Haida Gwaii recreational, WCVI troll and WCVI recreational. The exploitation rate is measured by Coded Wire Tag (CWT) data gathered from these fisheries. The exploitation rate limit includes Chinook caught and kept, as well as an estimate of fishing related mortalities.

DFO will manage commercial troll fisheries in the North Coast to a 3.2% exploitation rate ceiling on total WCVI Chinook return to Canada. The harvest rate of WCVI Chinook in the Area F troll fishery is calculated based on 3.2% of the total WCVI return to Canada and is used as an

in-season proxy for exploitation rate. The in-season harvest rate will be estimated using the mean effort-harvest rate relationship developed from historical DNA analysis. The fishery will be further constrained by remaining closed during the first half of June and parts of August as these periods are known to have higher proportions of WCVI Chinook in the total catch. DNA analysis and coded-wire tag analysis of catch will be used to assess the 3.2% exploitation rate objective post season.

Chinook will be managed as per Annex IV provisions of the 2019 PST agreement. The harvest reductions are:

- For the U.S., up to a 7.5 percent reduction in the Southeast Alaska aggregate abundance-based management or "outside, mixed-stock" fishery, as well as reductions of up to 15 per cent from 2009-2015 harvest levels for individual stocks in Washington and Oregon individual stock-based management fisheries.
- For Canada, up to a 12.5 percent reduction in the West Coast Vancouver Island aggregate abundance-based management fishery and reductions of up to 12.5 per cent from 2009-2015 levels in Canadian individual stock-based management fisheries.

6.8 SKEENA STEELHEAD

DFO and the province of B.C. have renewed discussions on a joint approach to the management of Steelhead returning to the Skeena watershed consistent with the 1999 fisheries management protocol between the federal and provincial governments. This work is intended to specify clear management objectives, management responses and mechanisms for technical support, management planning, communication and dispute resolution. Work on this approach will include consultations with First Nations and stakeholders. Significant declines in 2021 steelhead numbers highlight the importance of these discussions.

7 GENERAL DECISION GUIDELINES, ACCESS AND ALLOCATION

The Minister can — for reasons of conservation or for any other valid reasons — modify access, allocations, and sharing arrangements as outlined in this IFMP in accordance with the powers granted pursuant to the *Fisheries Act*.

7.1 ACCESS AND ALLOCATION OBJECTIVES

7.1.1 INTERNATIONAL OBJECTIVES

The objective is to manage Canadian treaty fisheries to ensure that obligations within the Pacific Salmon Treaty (PST) are achieved. As of January 1, 2019, treaty fisheries were managed in accordance with new amendments under the PST, which were being provisionally applied until the treaty formally entered into force as of May 3, 2019.

Details can be found at the Pacific Salmon Commission (PSC) website at: https://www.psc.org/.

Review of the performance of the PST provisions occurs annually at two bilateral meetings of the Northern Panel of the PSC and those results are published post-season.

7.1.2 DOMESTIC ALLOCATION OBJECTIVES

The objective is to manage fisheries in a manner that is consistent with the constitutional protection provided to existing aboriginal and treaty rights and An Allocation Policy for Pacific Salmon.

An Allocation Policy for Pacific Salmon can be found on-line at: https://waves-vagues.dfo-mpo.gc.ca/Library/240366.pdf

An Allocation Policy for Pacific Salmon sets out principals for allocation between the recreational and commercial sectors and also identifies sharing arrangements for commercial fisheries. An explanation of some of the features of Allocation planning is set out in Section 7.2.

An update on the review of the Salmon Allocation Policy can be found in Section 0.

7.2 ALLOCATION GUIDELINES

Allocation decisions are made in accordance with *An Allocation Policy for Pacific Salmon*: https://waves-vagues.dfo-mpo.gc.ca/Library/240366.pdf

An update on the review of the Salmon Allocation Policy can be found in Section 0.

Table 7.2-1: Allocation guidelines

	Low Abundance		High Abundance		
First Nations FSC	Non-retention / closed	Bycatch Retention	Directed	Directed	Directed
Recreational	Non-retention / closed	Non-retention	Bycatch Retention	Directed	Directed
Commercial	Non-retention / closed	Non-retention	Bycatch Retention	Bycatch Retention	Directed

NOTE: This table describes conceptually how First Nations, recreational and commercial fisheries might be undertaken across a range of returns. It does not imply that specific management actions for all stocks exactly follow these guidelines, but rather is an attempt to depict the broad approach.

The allocation guidelines above refer to target stocks. The application of *An Allocation Policy for Pacific Salmon* on non-target stocks is case specific. The inadvertent harvest of different species is referred to as *bycatch*. The inadvertent harvest of stocks of concern within the same species (i.e. Cultus Lake Sockeye when harvesting Summer Run Sockeye) is referred to as *incidental harvest*. Both *bycatch* and *incidental harvest* are factored into the calculation of exploitation rates on various stocks, and therefore, fishing plans are designed to be consistent with existing policies and to keep exploitation rates on stocks of concern within the limits described in the fishery management objectives.

The Department does not allocate bycatch or portions of the acceptable exploitation rate on stocks of concern. The Department considers a number of fishing plan options and attempts to address a range of objectives including minimizing bycatch and incidental catch.

7.2.1 FIRST NATIONS – FOOD, SOCIAL, AND CEREMONIAL (FSC) AND TREATY DOMESTIC HARVEST

An Allocation Policy for Pacific Salmon provides that after requirements for conservation, the first priority in salmon allocation is to treaty rights for harvest opportunities for domestic purposes (consistent with Treaty Final Agreements) and for FSC for harvest opportunities (under communal FSC licences issued to First Nations). The Department has announced plans to review *An Allocation Policy for Pacific Salmon*; further details can be found in Section 1.6.1.

While these opportunities will be provided on a priority basis, it does not necessarily mean that fishery targets for First Nations will be fully achieved before other fisheries can proceed. For example, many First Nations conduct their FSC fisheries in terminal areas while other fisheries are undertaken in marine or approach areas. The general guideline is that fishing plans must adequately provide for the First Nations' FSC and/or domestic Treaty harvests that will occur further along the migration route over a reasonable range of potential run sizes.

7.2.2 TEST FISHERIES

DFO uses a range of methodologies to determine in-season stock abundance and composition. Test fisheries play an essential role in providing information to support in-season abundance estimation, driving determination of TACs and ensuring that conservation objectives are met in fisheries management. From 2007 to 2012, $58 million (Larocque Relief Funding) was provided to support the test fishery programs. In 2012, an amendment to the *Fisheries Act* granted the Minister the authority to allocate fish for financing purposes. To implement this authority, DFO adopted a two-track approach.

Track one included a transition where feasible for existing projects previously funded by Larocque relief funding to the new use-of-fish authority for a period starting April 1, 2013 pending completion of Track two.

Track two included the development of a national policy framework to provide a standardized, rigorous and transparent process for all existing and new project evaluations and approvals. The draft National Policy for Allocating Fish for Financing Purposes has been implemented since 2013 and the Policy has recently been finalized.

While an objective of the use-of-fish arrangements is for fish revenues to address program costs, in a number of cases since 2013, low salmon stock abundance has curtailed test fish revenues, and alternative funding arrangements to support programs have been pursued.

There is one project proposed for the North Coast for 2022; the Tyee Test Fishery in Area 4 (Skeena River Gillnet), which the North Coast Skeena First Nations Stewardship Society will continue to administer the test fishery via a collaborative agreement with the Department.

Salmon Test Fisheries - Pacific Region Webpage:

https://www.pac.dfo-mpo.gc.ca/pacific-smon-pacifique/science/research-recherche/testfishery-pechedessai-eng.html

DFO will work in close collaboration with resource users to ensure that the fisheries data collections necessary to set TACs and ensure conservation will continue to be undertaken.

7.2.3 RECREATIONAL FISHERIES

Recreational fisheries are managed to maintain opportunity wherever stock status allows and to allow fisheries to be managed in a predictable manner, where possible. Under *An Allocation Policy for Pacific Salmon*, after FSC fisheries, the recreational sector has priority to directed fisheries for Chinook and Coho salmon. For Sockeye, Pink, and Chum salmon, the policy states that recreational harvesters be provided predictable and stable fishing opportunities. Recreational harvest of Sockeye, Pink, and Chum will be limited to a maximum of 5% of the combined recreational and commercial harvest of each species on a coast-wide basis averaged over a rolling five-year period.

If stock abundance information suggests that conservation objectives cannot be attained, closures or non-retention regulations will generally be applied. In some cases, recreational fisheries with a non-retention restriction in place may remain open provided the recreational fishery is not directed on any stocks of concern, nor is the impact on any stocks of concern significant in accordance with the *Selective Fishing Policy*.

Prior to a directed commercial fishery on specific Chinook and Coho stocks, the fishing plan will provide for full daily and possession limits for the recreational sector on those stocks. Decision guidelines may also identify considerations for changing the area of the fishery, modifying dates, or changing daily limits.

7.2.4 COMMERCIAL FISHERIES

Commercial fisheries are managed to optimize the economic performance of the fisheries, to provide certainty to participate where possible and to optimize harvest opportunities. However, stocks of concern will continue to constrain opportunities in many fisheries resulting in less than optimal opportunities.

An Allocation Policy for Pacific Salmon provides for a commercial harvest of Sockeye, Pink, and Chum of at least 95% of the combined recreational and commercial harvest of each species on a coast-wide basis over time. Commercial harvest of Chinook and Coho salmon will occur when abundance permits and First Nations and recreational priorities are considered to have been addressed.

Please see Section 13– Species Specific Salmon Fishing Plans for the commercial allocation plan with shares by species, fleet, and fishery production area. The ability to achieve allocations is often limited by conservation constraints and other factors. Low impact fisheries (limited number of vessels) often occur prior to those having a higher impact (full fleet), particularly at low run sizes, at the start of the run when run sizes are uncertain or when stocks of concern

have peaked but continue to migrate through an area. Appendix 6 provides further information on updates to commercial sharing arrangements.

When one commercial gear type is unlikely to achieve its allocation, the usual approach will be that the same gear type, but in a different area, will be provided opportunities to harvest the uncaught balance.

Allocation targets are not catch targets for each sector. While the Department will usually plan and implement fisheries to harvest fish in accordance with allocation targets, opportunities may be provided that are inconsistent with the allocation targets.

7.2.5 FIRST NATIONS ECONOMIC OPPORTUNITY AND CSAF AND INLAND DEMONSTRATION FISHERIES

The Allocation Transfer Program (ATP) facilitates the voluntary retirement of commercial licences and the issuance of licences to eligible First Nation groups in a manner that does not add to the existing fishing effort on the resource, thereby providing First Nation groups with employment, income, and increasing participation in commercial fisheries as part of relationship-building with the Department. First Nations' economic opportunities are managed under the same allocation guidelines as commercial fisheries under *An Allocation Policy for Pacific Salmon.*

Since 1994–95, when the ATP was first launched and including PICFI since 2007, 502 commercial licences have been relinquished for First Nation groups. For a more detailed description of First Nations' commercial fishing opportunities please refer to Section 13 — Species Specific Salmon Fishing Plans.

7.2.6 EXCESS SALMON TO SPAWNING REQUIREMENTS FISHERIES

Salmon fisheries are managed with the objective of reaching escapement targets or harvesting a certain proportion of the run. Uncertain forecasts, unanticipated differences in in-season run size estimates, and mixed-stock concerns can result in escapement to terminal areas that are in excess of their required habitat or hatchery spawning capacity. In these cases, Excess Salmon to Spawning Requirements (ESSR) fisheries may occur.

The Department will attempt, wherever practical, to eliminate or minimize ESSRs by harvesting in the FSC, recreational, and commercial fisheries. It is not the intention of the Department to establish new ESSR fisheries to displace existing fisheries.

First priority will be to use identified surpluses to meet outstanding FSC requirements, which cannot be met through approved FSC fisheries. This may be done under a communal licence. As

a second priority, the local band or Tribal Council may be offered the opportunity to harvest all or part of the surplus under an ESSR licence, which authorizes the sale of the surplus.

7.3 GENERAL DECISION GUIDELINES

The following comprehensive decision guidelines outline management responses that will be invoked under a range of in-season circumstances, and the general rationale to be applied in making management decisions.

Decision guidelines are meant to capture general management approaches with the intention of working towards multi-year management plans.

Specific fishing plans are described in Section 13 — Species Specific Salmon Fishing Plans.

7.3.1 PRE-SEASON PLANNING

Development of decision guidelines is part of the pre-season planning process. Development is guided by relevant departmental policies, scientific advice, consultation with First Nations, commercial and recreational harvesters, and other interests, and the experience of fishery managers and stock assessment staff.

Pre-season decisions include the development of escapement targets, exploitation rate limits, sector allocations, and enforcement objectives.

7.3.2 IN-SEASON DECISIONS

In-season decision points vary from fishery to fishery depending on type, availability, and quality of in-season information; and the established advisory, consultation, and decision-making processes. Decisions include opening and closing of fisheries, level of effort deemed acceptable, gear type restrictions, deployment of special projects, etc.

Where possible, in-season decisions will be consistent with guidelines established pre-season; however, the implementation and applicability of decision guidelines and pre-season plans can be influenced in-season by a number of factors. These include unanticipated differences between pre-season forecasts and in-season run size estimates, unexpected differences in the strength and timing of co-migrating stocks, unusual migratory conditions, and the availability and timeliness of in-season information.

7.3.3 SELECTIVE FISHERIES

Selective fishing is defined as the ability to avoid non-target fish, invertebrates, seabirds, and marine mammals or — if encountered — to release them alive and unharmed (see *Policy for*

Selective Fishing in Canada's Pacific Fisheries). Selective fishing technology and practices will be adopted where appropriate in all fisheries in the Pacific Region and there will be attempts to continually improve harvesting gear and related practices.

7.3.4 POST-RELEASE MORTALITY RATES USED TO ACCESS FRIMS

The salmon conservation and fisheries management measures in this IFMP are based on many considerations, including estimates of the mortality rates of salmon that are released from the various types of fishing gear that are used in commercial, recreational, and First Nations fisheries. Post-release mortality rates can vary substantially and depend on many factors, including the location of the fishery, the unique characteristics of each type of fishing gear and method, and the species of salmon that is captured and released. In April 2001 DFO announced revisions to the post-release mortality rates that had been used by DFO in previous years. The mortality rates applied by DFO to each gear type and fishery prior to 2001, and the revised rates announced by DFO in 2001 with some more recent revisions are summarized in Table 7.3-1. The revised rates reflected the results of additional research on post-release mortality rates that were available at that time. DFO has generally continued to use these post-release mortality rates each year in the development of annual fishing plans including this salmon IFMP.

DFO will review the post-release mortality rates currently used for salmon fisheries in Canadian waters and update Table 7.3-1 as new information becomes available. Since 2001 additional research has been conducted on post-release mortality rates of salmon, and additional fishing methods and gear types have been implemented (e.g. beach seining, recreational catch, and release study for Fraser Sockeye salmon) in some salmon fisheries. The pre-2001 post-release mortality rates are included for historical comparison indicating which fisheries rates have changed. The 2001 post-release mortality rates currently applied by DFO for salmon fisheries, in some cases, are not the same as the rates that are currently applied by the bi-lateral Chinook Technical Committee under the Pacific Salmon Treaty. The results from the DFO review of mortality rates will be used to inform any additional revisions to the post-release mortality rates that are required to address these issues in the development of salmon IFMPs in future years.

For post-season assessments of Chinook salmon, DFO uses the exploitation rates developed by the Pacific salmon Commission Chinook Technical Committee, which employs the mortality rates reported by the PSC (2007).

Table 7.3-1: Post-Release Mortality Rates

Fishery	Pre 2001 Post-Release Rates (for historical comparison)	Post 2001-Release Rates
First Nations Fisheries	Note: When using the same gear and methods noted below the same mortality rates were applied.	Various – Depending on gear used and fishery Gill net – 60% same as commercial below Beach seine – 5% for Sockeye and Coho in-river Fraser Modified Shallow Seine- 10% for Sockeye and Coho in-river Fraser Tooth Tangle net – 3.5″ mesh is 10% Sockeye and 15% Coho Fishwheel - 5% for Sockeye and Coho in-river Fraser
Recreational **troll gear – Sockeye, Coho, Pink and Chum**	10%	10% except 3% for Sockeye in-river Fraser
Recreational **Troll gear – Chinook**	15%	15%
Recreational mooching gear – Coho and Chinook	10% for Coho; 15% for Chinook	10% for Coho in South Coast areas; 15% for Chinook in all areas
Commercial gill net (South Coast)	60% to 70%	60% with provision for rates as low as 40% where selective techniques warrant
Commercial seine – South Coast **(Areas 11 to 29)**	15% to 25%	25% Johnstone Strait; 50%* Area 20 – Coho; 25% all areas for Sockeye
Commercial troll – All Areas	26%	10% Sockeye, 15% Coho and Chinook

Fishery	Pre 2001 Post-Release Rates (for historical comparison)	Post 2001-Release Rates
Commercial tooth tangle net 3.5" mesh	n/a	10% Sockeye, 15% Coho

*Recent work by researchers from Carleton University, the University of British Columbia, and the Area B Harvest Committee has been undertaken in 2012 and 2013 to re-evaluate the release mortality rates for Coho caught using purse seine gear in Area 20. Results to-date indicates that short-term release mortality rates are less than the current 70% estimate. For the 2022 fishery, the Department will use a 50% release mortality estimate for planning purposes subject to at-sea-observer coverage to assess Coho encounter rates and fish condition during any commercial fishery openings.

8 COMPLIANCE PLAN

8.1 COMPLIANCE AND ENFORCEMENT OBJECTIVES

CONSERVATION AND PROTECTION PROGRAM DESCRIPTION

Conservation and Protection (C&P) is mandated to protect fisheries, waterways, aquatic ecosystems and resources from unlawful exploitation and interference. Fishery officers provide compliance promotion and enforcement services in support of legislation, regulations and management measures implemented to achieve the conservation and sustainable use of Canada's aquatic resources, the protection of species at risk, fish habitat and oceans.

In carrying out activities associated with the compliance and enforcement of Pacific salmon fisheries, outlined in this management plan, C&P will utilize intelligence-led and principle-based approaches and practices consistent with the *Three Pillars of the C&P National Compliance Framework* and the *DFO Compliance Model*:

I. Voluntary **compliance promotion** through education, stewardship and stakeholder engagement;

II. Intelligence-led **monitoring, control and surveillance** activities;

III. Management of **major cases /special investigations** in relation to complex compliance issues.

8.2 REGIONAL COMPLIANCE PROGRAM DELIVERY

C&P utilizes a broad scope of activities to deliver compliance and enforcement services within Pacific Region salmon fisheries. The main activities of C&P include:

Prioritizing compliance and enforcement measures that support DFO management objectives which aim to sustain the salmon stocks and fisheries;

Developing and maintaining positive relationships with First Nations communities, recreational groups and commercial interests through dialogue, education and shared stewardship;

Ensuring the development and supporting of a professional fishery officer complement that is skilled, well-equipped, well-informed, safe and effective;

Ensuring that salmon fisheries participants are aware of their obligations to comply with the various Acts, Regulations and licence conditions.

Inspecting fishers, vessels, vehicles, totes and containers, fish processors, cold storage facilities, restaurants and retail outlets to verify compliant product and compliance with Federal and Provincial Acts and Regulations.

Collecting and analyzing required samples for inspection or investigative purposes

Conducting high-profile fishery officer presence during patrols by vehicle, vessel and aircraft to detect and deter violations;

Maintaining a violation reporting 24-hour hotline to facilitate the reporting of violations;

Supporting traceability initiatives within the salmon fishery for enhanced accountability, e.g., monitoring and verifying salmon catches and offloads to ensure accurate and timely catch reporting and accounting, including coverage of dual-fishing opportunities;

Collecting and utilizing intelligence to identify and target repeat and more serious offenders for enforcement effort, including laundering and illegal sales of salmon;

Utilization of enhanced surveillance techniques, technology and covert surveillance techniques as a means to detect violations and gather evidence in salmon fisheries-of-concern;

Responding to the most serious habitat violations identified by the DFO Fish and Fish Habitat Protection Program;

Continue to utilize restorative justice forums to reduce harm to fisheries, species-at-risk, and fisheries habitat.

8.3 CONSULTATION

Education, information and shared stewardship activities are the foundation for achieving voluntary compliance. C&P fishery officers regularly participate in consultations with resource users and the general public. C&P participates in all levels of the advisory process and is committed to including local fishery officers to provide users and the community-at-large with specific information related to compliance and enforcement perspectives. C&P will continue to meet with individual First Nations at the local level through the First Nations Liaison Program and with First Nations planning committee meetings where many First Nations gather.

8.4 COMPLIANCE STRATEGY

Salmon fishery compliance and enforcement continues to be a significant priority for C&P. Concurrent to the salmon season, compliance and enforcement attention may be required to address violations related to fisheries habitat, shellfish harvest in contaminated areas, Whale initiative/response and the protection of species at risk. In order to balance multiple program demands, C&P applies a risk-based integrated work planning process at the Regional and Area levels. This process identifies priorities so that resources are allocated to the areas of greatest need.

9 PERFORMANCE/EVALUATION CRITERIA

This section is intended to outline measurable indicators to determine whether or not those management issues outlined in the IFMP are being addressed. These indicators may include those specifically developed for the IFMP, as well as from existing evaluation processes.

Potential performance indicators will be required for assessing conservation and fishery sustainability; WSP objectives; domestic and international objectives; First Nations, commercial and recreational objectives; allocation objectives; enhancement objectives, as well as other indicators of interest.

The Department intends to work collaboratively with First Nations and stakeholders to review existing and/or develop new performance indicators that should be included as part of the performance/evaluation criteria.

The results of the previous year's annual review (e.g. 2021 season) follow below:

9.1 2021/2022 POST SEASON REVIEW FOR STOCKS OF CONCERN

NOTE: The objectives shown in **bold** below is the wording from the previous year's Integrated Fisheries Management Plan.

9.1.1 RIVERS AND SMITH INLET SOCKEYE

2021/2022: The objective for Rivers and Smith Inlets Sockeye salmon is to continue allowing rebuilding of these stocks to reach escapement goals and achieve a sustainable stock that will support harvest.

There have been no commercial or recreational fisheries targeting River Inlet Sockeye for many years. Escapements, with the exception of 2011 and 2016, have fallen short of target levels and thus commercial and recreational fisheries remain unlikely until a trend towards consistently higher productivity has been established. This trend will be established from the adult spawner survey and a process is underway to establish updated biological benchmarks for Rivers Inlet Sockeye and associated Management Reference Points. The Docee Fence has not operated since 2017 and consequently the strength of returns to Smith Inlet were unknown. There is interest in seeking alternate in-season methods to determine run strength in order to realize potential commercial harvest opportunities**.** Rivers and Smith Inlet Sockeye directed commercial fisheries were not implemented in 2021 and have been identified for longer-term closures starting in 2022.

9.1.2 SKEENA RIVER SOCKEYE

2021/2022: The objective for Skeena River Sockeye is to maintain sustainable stocks consistent with the WSP and support FSC, commercial, and recreational harvests.

The preliminary post-season estimate of the Skeena Sockeye total return for 2021 was 1,726,883 (1,262,329 estimated total return to Canada).

As a result of a combination of factors such as, high water levels and later run timing, the in-season estimate generated from the Tyee test fishery was lower than the final observed escapements. In 2021, there were no Skeena Sockeye directed commercial gill net fisheries as the commercial trigger was not reached in-season. There were no demonstrations fisheries implemented in 2021 due to low returns. While there were sufficient fish in Babine Lake to conduct an ESSR fishery, due to concerns of safety related to COVID-19, the fishery did not proceed in 2021. The recreational fishery started the season closed; however, the fishery was opened on August 18 based on escapement estimates at Tyee. The preliminary total Skeena Sockeye FSC catch estimate for 2021 is 139,553 pieces.

9.1.3 NASS RIVER SOCKEYE

2021/22: The objective for Nass Sockeye is to maintain sustainable stocks that will meet WSP objectives and support FSC and Treaty harvests, as well as commercial and recreational harvests.

Nisga'a Fisheries Program assessment activities continued providing DFO and Nisga'a stock assessment managers with valuable information (e.g., run size and Nisga'a catch) required to successfully manage the Nisga'a fishery and assess Nass area stocks.

The preliminary post-season estimate of the Nass Sockeye total return for 2021 was 514,000 and the Total Return to Canada estimate 413,000. The gillnet commercial fisheries in the Nass were closed due to PSSI in 2021. One Sockeye-directed demonstration fishery was implemented in the Nass River in 2021. The four Pink targeted seine openings in July had no Sockeye retention. In 2021 the recreational fisheries opened with normal daily limits and opening times for Nass Sockeye. On July 15th, all recreational salmon fishing in the Nass River watershed was closed to address low Chinook and Sockeye returns. Once returns improved, on July 30th Chinook, Sockeye, and Coho salmon were re-opened in the Nass River.

First Nations FSC fisheries for Nass Sockeye were open in the marine approaches and the Nass River for the duration of the season. The preliminary Nass Sockeye FSC catch estimate for 2021 is 12,510. No individual sale fisheries were conducted in 2021 and the Nisga'a food, social, and ceremonial fishery was closed for 6 days from July 15-20 due to low observed returns of Nass

Sockeye and Chinook at the Nass fish wheels. There were 39,195 Sockeye harvested under the Nisga'a Treaty.

9.1.4 NORTH COAST CHUM

2021/2022: The objective for wild north coast Chum is to rebuild weak wild runs, while providing opportunities to harvest surplus stocks.

Chum stock status remained a concern in 2021. There were no commercial net fisheries that targeted wild Chum from Areas 3 to 6 in 2021. Retention of Chum was permitted in the Pink targeted seine fishery in accordance with the Area 3 Chum Rebuilding Plan. There were 4 seine fisheries openings held on July 12, 19, 20, and 30, with a total Chum retention of 13,925 fish. Preliminary estimates indicate that exploitation rates have remained below the 10% rebuilding exploitation rate objective.

9.1.5 WCVI CHINOOK

2021/2022: The objective for West Coast of Vancouver Island (WCVI) Chinook is to manage Catch Year Exploitation Rate (CYER) in specified Canadian ocean fisheries (see below) to an exploitation rate of 10%. The objective for North Coast fisheries is to manage in accordance with the allocation policy, and to manage the northern troll fishery to a WCVI Chinook exploitation rate limit of 3.2%.

The Catch Year Exploitation Rates (CYER) are based on analysis of Estimated Coded-Wire-Tags (CWT) within the Pacific Salmon Commission process. Annual results are available on www.psc.org under the Chinook Technical Committee publications. With respect to 2021 CYER in Canadian fisheries of the indicator stock Robertson Creek Hatchery, the total in the specified Canadian ocean fisheries (AABM fisheries, including all WCVI sport outside Barkley Sound) was 11.8% including 2.2% in the northern BC troll fishery, 2.5% in the Haida Gwaii recreational fishery, 5.5% in the WCVI recreational fishery, and 0.5% in the WCVI troll fishery.

Post season estimates of coastwide exploitation of WCVI origin Chinook using DNA are expected to be available in the near future. The total Area F Troll Chinook catch in 2021 was 64,470 pieces which contained 8,795 WCVI Chinook estimated from DNA analysis of the catch. The post-season reconstructed WCVI Chinook return to Canada in 2021 was estimated at 267,556 Chinook salmon.

9.1.6 INSHORE ROCKFISH

2022/2023: The management objective for Bocaccio and inshore rockfish species (which include Yelloweye, Quillback, Copper, China, and Tiger) is to continue conservation

strategies that will ensure stock rebuilding over time. These species are currently non-retention in the commercial salmon troll fisheries.

Based on science information, the Department implemented stepped reductions of total Bocaccio harvest from the estimated total catch mortality of 137 metric tonnes (MT) in 2013 to a mortality cap of 75 MT over 3 years (2013-14 to 2015-16). Through the process of regular evaluation of the rebuilding plan, science advice on stock status and rebuilding strategies for Bocaccio was peer-reviewed in autumn 2019. More information on the Bocaccio Rebuilding Plan is available in Appendix 9 of the Groundfish IFMP, which will be linked in the final salmon IFMP once available. The Department has also implemented stepped reductions of total Yelloweye Rockfish (outside population) harvest from the estimated total catch mortality of 287 MT in 2014 to a mortality cap of 100 MT over 3 years (2016/17 to 2018/19). Through the process of regular evaluation of the rebuilding plan, science advice on stock status and rebuilding strategies for Yelloweye Rockfish outside population was peer-reviewed in autumn 2019. More information on the Bocaccio Rebuilding Plan is available in Appendix 9 of the Groundfish IFMP. The Department is working collaboratively with all fishing interests to achieve rockfish conservation and rebuilding. For the salmon troll, recreational, and FSC fisheries, the current emphasis is on increasing awareness, given the limited data available on catch. Current work with these fisheries is focused on:

- Improving rockfish identification among fishers, technicians, guides, lodges, creel surveyors, and other catch monitors; and
- Improving fishery monitoring and catch reporting of rockfish by species.

9.2 2021/2022 Post Season Review for Access and Allocation Objectives

9.2.1 INTERNATIONAL OBJECTIVES

The objective was to manage Canadian treaty fisheries to ensure that obligations within the Pacific Salmon Treaty (PST) are achieved.

Review and performance of the PST provisions for Sockeye, Coho, Chum and Chinook salmon occur annually at bilateral meetings. Results of the meetings are published in the annual post-season reports available from the Pacific Salmon Commission (PSC). More information is available on the PSC website at:
http://www.psc.org/index.htm

9.2.2 DOMESTIC ALLOCATION OBJECTIVES

The objective was to manage fisheries in a manner that is consistent with the Allocation Policy for Pacific Salmon and the Pacific Salmon Commercial Allocation Implementation Plan.

Fisheries were generally conducted in a manner consistent with the Allocation Policy for Pacific Salmon. Post-season reviews were conducted to provide information on stock status, catches and other fishery information.

9.2.3 FIRST NATIONS OBJECTIVES

The objective was to manage fisheries to ensure that, after conservation needs are met, First Nations' food, social and ceremonial requirements and treaty obligations to First Nations have first priority in salmon allocations in accordance with the Allocation Policy for Pacific Salmon.

In 2021, early in-season indicators suggested that Nass sockeye returns were much lower than the pre-season forecast, consequently Nisga'a Lisims Government closed Sockeye targeted treaty fisheries a period of 6 days starting July 15. There were no commercial gill net fisheries for Nass Sockeye in 2021 to support PSSIs goals of rebuilding stocks. The Meziadin fishery recreational trigger was reached and recreational fishing in Meziadin Lake opened on August 14 until September 7. Marine angling for Sockeye in Area 3 remained open the duration of the 2021 season.

9.2.4 RECREATIONAL AND COMMERCIAL OBJECTIVES

The objective was to manage fisheries for sustainable benefits consistent with established policies.

The primary objective in the recreational fishery to maintain the expectation and opportunity to catch fish in a stable manner was achieved. In the commercial fishery, harvest opportunities were planned based on the identification of commercial surpluses and based on the commercial allocation plan.

9.3 2021/2022 POST SEASON REVIEW OF COMPLIANCE MANAGEMENT OBJECTIVES

Fishery officers carry out inspections on vessels, buying stations, processors, transporters, cold storage facilities, brokers, restaurants and retailers. In-season and future compliance and enforcement activities are adjusted, in consideration of the outcomes of the inspections

program. The annual post-season review of the inspection program further informs C&P about the successes of the program and where to align resources to provide the greatest value to Canadians.

10 NORTHERN BC FIRST NATIONS FISHERIES

10.1 FISHERY MONITORING AND CATCH REPORTING INITIATIVES

The *Strategic Framework for Fisheries Monitoring and Catch Reporting in Pacific Fisheries* is being applied to all fisheries across the region including First Nations FSC fisheries. Work includes assessing the ecological risk of fisheries as they are currently managed and ensuring monitoring and reporting programs provide sufficient information to appropriately manage for those risks. The First Nations Fishery Council (FNFC) and other area aggregate groups have assisted in engagement to communicate the requirements of the Framework and importance of improving catch information. In addition, a significant focus has been on the development of integrated and coordinated data management and data entry systems within DFO and First Nations Band offices.

10.1.1 ABORIGINAL HARVEST MANAGEMENT SYSTEM

Since the year 2000, Fisheries and Oceans Canada have been working with First Nations groups to design and develop electronic recording and reporting systems for First Nations FSC catch data, to improve the efficiency and accuracy of reporting FSC catch and other fishing information used by Aboriginal fishery managers and the Department. The software has incorporated recommendations from numerous First Nations members and is based on their reporting requirements within their communities and those required by the Department. The application also has a harvester designation system, allowing First Nations to track FSC effort and harvest as well as other fishing information for their members.

The initiative first utilized a Microsoft Access database used by interested First Nations groups within the Pacific Region, including the BC Interior area, South Coast, and the Central Coast. In the late 2000s, approximately 34 First Nations groups employed this software application with different success rates, with a few sending FSC data to DFO's Regional catch database. In 2010, work started on compiling all aspects of the 34 current MS Access databases into one system called the Aboriginal Harvest Management System (AHMS) that could be customizable for each Nation's needs. Since 2010, new Nations have been brought onboard each year, bringing the total to 16 First Nation's currently using AHMS throughout the Region, with 6 First Nations still using MS Access databases in 2018. FSC data is now being maintained by DFO within KREST (the Kept and Released Estimation Survey Tool).

For more information please contact Aleta Rushton at 250-230-1227.

10.1.2 CHINOOK AND COHO CODED WIRE TAG (CWT SAMPLING)

CWT target sample rates are established by the Department to meet bilateral Pacific Salmon Treaty standards. The minimum required sample rates are 20% of the estimated catch of the fishery to recover a minimum quantity of CWTs from indicator stocks. CWT sampling programs in First Nations fisheries are comparable in overall design to CWT sampling in commercial and recreational fisheries but may be different in some aspects to recognize the differences in First Nations economic or demonstration fisheries and FSC fisheries, to recognize regional differences in priorities for CWT sampling, and to integrate sampling into First Nations catch monitoring programs.

In economic and demonstration fisheries, sampling for CWTs is a mandatory catch monitoring requirement in Chinook and Coho retention fisheries that intercept CWT indicator stocks. Where needed, the Department will:

- Count the landed Chinook and Coho catch by adipose fin-clip status of randomly selected landings or at fish processing plants using designated observers and sample the landed catch to collect snouts from fish that contain CWTs, or
- Work with First Nations catch monitoring programs to establish comparable requirements.

In FSC fisheries, the success in achieving the 20% target sample rate relies on CWT sampling that is integrated into the catch monitoring program or on individual submissions of Chinook or Coho heads to catch monitors or to First Nations Salmon Head Depots. Sample rates may also be known as submission rates in these fisheries. Essential requirements for the "submission-style" sampling for CWTs are:

- Submission of heads from hatchery-marked (adipose fin-clipped) Chinook and Coho. With mass marking, not all hatchery-marked Chinook and Coho contain a CWT, but the missing adipose fin is the only external clue to identify the possibility of an internal CWT.
- Completed head label(s) attached to each head with required catch information including location caught and date caught. For salmon caught together (same date and location), one label may be placed in a sealed bag with multiple heads.
- Provision of catch information (number of hatchery marked kept Chinook and Coho) to monitoring programs.

First Nations Salmon Head Depots with head labels exist in communities where submission-style programs are established. Servicing and maintenance of First Nations Salmon Head

Depots will be delivered by Department employees. In submission-style programs, information about the origin of their fish will be provided to individuals and First Nations when CWT dissection results are available.

For additional information or locations of First Nations Salmon Head Depots:
Salmon Head Recovery Program
Telephone: 1-866-483-9994 (toll-free)

10.1.3 FISHERY MONITORING AND CATCH REPORTING RISK ASSESSMENT TOOL

The Department finalized the "Strategic Framework for Fisheries Monitoring and Catch Reporting in the Pacific Fisheries" (the Framework) in the spring of 2012. The Framework directs that an ecological risk assessment be undertaken for all fisheries to determine the level of monitoring required to provide information necessary to manage for the ecosystem risks posed by a fishery, while allowing for final monitoring and reporting programs to reflect the fishery's unique characteristics.

Risk assessments are performed using an Excel-based tool that provides for a consistent approach to a structured conversation regarding ecological risk and other resource management considerations. For salmon, the draft risk assessments are planned to be initially completed by DFO, then presented to harvesters for review, comment, and revision through existing advisory processes established for fisheries management purposes.

Should the risk assessment indicate a gap between the current level and target level of monitoring identified through the risk assessment, options to address the monitoring gap are to be identified through discussion between DFO and harvesters. The feasibility of these options (e.g. cost, technical considerations etc.) is also to be considered through these discussions. The Strategic Framework directs that monitoring and reporting programs must be both cost-effective and tailor-made for a fishery; as such, a collaborative approach is required.

Where monitoring options are determined to be feasible, the current monitoring and reporting program is to be revised to incorporate these options so the program provides sufficient information to resource managers to manage the ecological risk of the fishery effectively. Where monitoring options are not feasible, alternative management approaches are required to reduce the ecological risk posed by the fishery. If there is no gap between the current and target level of monitoring, then the management approach would not require any change.

As of January 2019, the Department is in the process of gathering feedback on and will subsequently be finalizing a draft national Fishery Monitoring Policy. This national Policy—an evolution of the existing Strategic Framework—looks to bring consistency in the development, delivery and evaluation of monitoring programs for all federally-managed wild fisheries in Canada, and will ultimately supersede the existing Pacific Framework.

More information on the Pacific Framework and risk assessment is available on the internet at:

https://www.pac.dfo-mpo.gc.ca/fm-gp/docs/framework-monitoring-cadre-surveillance-eng.html

10.2 Communal Licence Harvest Target Amounts

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings and describe the details of the FSC fishery including the dates, times, methods, locations of harvest. Communal licences for Northern Coastal First Nations are typically multi-species and are issued on an annual basis. Shorter duration amendments to licences are also issued on occasion.

Fisheries and Oceans Canada seeks to provide for the effective management and regulation of First Nations fisheries through the negotiation of mutually acceptable and time-limited Fisheries Agreements, frequently referred to as AFS agreements. Where agreement is reached, agreed-to fisheries provisions form the basis of the communal licence issued by DFO. Where agreement cannot be reached, Fisheries and Oceans Canada will nonetheless issue an Aboriginal communal fishing licence to the group based on DFO's best understanding of the group's Aboriginal fishery.

Target harvest amounts for communal licences in Northern BC are outlined in Table 10.2-1 below. Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Where requests are put forward by First Nations for changes in FSC access arrangement, these are evaluated against a common set of criteria. FSC access should reflect some balance between the diversity and abundance of resources that are locally available, community needs and preferences, and operational management considerations. The department's operational approach and criteria can be found online at:

http://www.pac.dfo-mpo.gc.ca/consultation/fn-pn/fnfc-2014/docs/aboriginal-fishing-peches-autochtones-eng.pdf

Table 10.2-1: Communal Licence Harvest Target Amounts

	Areas 1 & 2	Areas 3 to 6 North	Areas 6 South to 10	Total
Sockeye	20,000	209,250	50,000	279,250
Coho	5,000	8,650	8,470	22,120
Pink	2,500	32,425	13,270	48,195
Chum	2,500	4,975	12,520	19,995
Chinook	3,000	15,860	7,970	26,830
Total Salmon	33,000	271,160	92,230	396,390

10.3 Indigenous Commercial Fishing Opportunities

The AFS was implemented to address several objectives related to First Nations and their access to the resource. One of these objectives was to contribute to the economic self-sufficiency of Aboriginal communities. An integral component of the AFS is the Allocation Transfer Program (ATP). This Program facilitates the voluntary retirement of commercial licences and the issuance of licences to eligible Aboriginal groups in a manner that does not add to the existing fishing effort on the resource, thereby providing Aboriginal groups with much needed employment and income, and increasing participation in commercial fisheries as part of relationship-building with the Department. Since 1994-95, when the ATP was first launched and including PICFI, 481 commercial licences have been relinquished for Aboriginal groups.

Discussions regarding demonstration fisheries that will provide commercial opportunities for First Nations and allow for experimentation and testing of inland fisheries are on-going with First Nations and stakeholders through the Commercial Salmon Allocation Framework process. For 2022, as in previous years, the focus with First Nations will be on experimenting mainly in terminal areas on abundant stocks. These fisheries will be conducted separately from FSC fisheries, using the same harvest decision guidelines as the commercial fishery and fish harvested will be off-set with licences voluntarily relinquished from the commercial fishery.

10.4 TREATY FISHERIES

NISGA'A FISHERIES

The Nisga'a Treaty came into effect on May 11, 2000. Under the treaty an Annual Fishing Plan (NAFP) is developed by the Joint Fisheries Management Committee (JFMC) and governed by the terms of the Nisga'a Final Agreement and the Nisga'a Harvest Agreement. The NAFP defines the escapement goals required to guide management decisions for Nass salmon stocks, calculates Nisga'a allocations for each salmon species and provides the general regulatory requirements for catches of each salmon species. The Annual Fishing Plan remains in effect until replaced the following year. The fishing plan applies to persons who harvest fish, other than Steelhead, in Nisga'a fisheries.

More information on this Treaty can be found at:

Nisga'a Final Agreement

https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/99002_00

More information on the Treaty process can be found at:

https://www.rcaanc-cirnac.gc.ca/eng/1100100028568/1529354090684

Refer to Section 13 – Species Specific Salmon Fishing Plans for the specific domestic and commercial allocations.

11 NORTHERN BC RECREATIONAL FISHERIES

11.1 RECREATIONAL VISION

In May 2018, the Sports Fish Advisory Board created *'Vision 2021' - A Strategic 10-point framework to grow Canada's recreational fishing sector on the Pacific coast.* It serves as a framework for developing initiatives and actions to support achievement of a collective vision for the recreational fishery in BC. The recreational fisheries Vision 2021 document is available from the A/Regional Recreational Fisheries Coordinator Greg Hornby (250) 286-5886.

11.2 LICENCING

Tidal Waters Sport Fishing licences may be purchased for a 1, 3, 5 day, or annual period. Fees depend on licence duration, age (senior, adult, juvenile), and residency status. Licences for juveniles (ages 15 and under) are free. Check for applicable fees and purchase your licence online via the National Recreational Licensing System: http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/licence-permis/application-eng.html

11.2.1 INFORMATION ON OPENINGS AND CLOSURES

The regulations for recreational fishing are provided online in the British Columbia Tidal Waters Sport Fishing Guide, which lists open and closed times, catch limits, size limits (where applicable), and open and closed areas.

Changes to regulations are issued in Fishery Notices which are posted online and sent to subscribers by email.

The printed Sport Fishing Guide booklet is no longer being produced or distributed to reduce costs and environmental impacts. The online Sport Fish Guide allows for in-season regulations to be accurately provided and ensures all the regulations are up to date. Staff at local DFO fishery offices can also provide regulatory information for an area of interest.

The British Columbia Tidal Waters Sport Fishing Guide is available at:

http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

To view or subscribe to receive Fishery Notice notifications by email is available at:

http://notices.dfo-mpo.gc.ca/fns-sap/index-eng.cfm

Local DFO fishery office contact information is available at:

https://www.dfo-mpo.gc.ca/contact/regions/pacific-pacifique-eng.html

or call 604-666-0384 or email info@dfo-mpo.gc.ca

4.1.1.1 FISHERY NOTICES

To sign up to have recreational Fishery Notices sent directly to your email, there is a link to subscribe to Fishery Notices on the left hand side of the *British Columbia Sport Fishing Guide* web page. Fishery Notices include important alerts to in-season changes for areas and species, fishery openings and closures, as well as timely health advisories for e.g. marine biotoxins or fuel spills.

4.1.1.2 USING MOBILE DEVICES AND THE FISHINGBC APP

The FishingBC App, developed by the Sport Fishing Institute of BC, can be downloaded to a mobile device to assist with having access to regulatory information for species, areas, fishing gear while out on the water (along with other functionalities).

Please note: the DFO Sport Fishing Guide website is the official site for regulatory information in the event of a discrepancy with the FishingBC App.

The FishingBC App may be downloaded at:

http://www.fishingbcapp.ca/

The online DFO Sport Fishing Guide is available at:

https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

At this time most fishers continue to use the traditional paper copy of their licence; however, an e-licence, which is an electronic/pdf copy of the licence, may be used on a mobile device but there are restrictions on its use.

Please consider these licensing requirements before a fishing trip:

- For all recreational tidal waters fishers that do not have an electronic copy of their licence on their mobile device, fishers must have a paper copy of their licence with proof of licence purchase to show to a fishery officer;
- For users of the FishingBC App or on any electronic device, a PDF copy of theirlicence on the device is acceptable and must be immediately presented to a fishery officer upon request. Please note catch recording requirements below;
- Immediately upon retention of Chinook, Halibut, or Lingcod, fishers must record these catches on their paper licence (preferred) or in their National Recreational Licensing System account (requires internet access).
- For all fishers retaining Chinook, Halibut, or Lingcod, even with an e-licence and catch details in the FishingBC App or in their mobile device, fishers must immediately record catch for these three species on their paper licence or in their National Recreational Licensing System

Account and show these records to a fishery officer upon request.

- a paper copy of their licence; or
- their National Recreational Licensing System account (where internet access for their mobile device is available). Fisher may find it helpful to immediately take a screenshot of their catch records when they have internet access should they subsequently move out of cell range.

11.3 CATCH MONITORING

The SFAB has been working with DFO on initiatives to strengthen fishery monitoring and catch reporting in the recreational fishery. To this end, a plan has been developed to meet the objectives of the *Strategic Framework for Fishery Monitoring and Catch Reporting in Pacific Fisheries* (2012)(Appendix 8). Following multi-sectoral consultations, DFO released the national *Fishery Monitoring Policy* in 2019, replacing the regional Strategic Framework. A phased approach to implementation of the national *Fishery Monitoring Policy* will result in a transition period from the Strategic Framework to the national policy. For more information on the new national *Fishery Monitoring Policy*, please see Section 1.6.3. The requirement to report catch is a condition of the Tidal Waters Sport Fishing Licence. Licence holders must report information on their recreational fishing activity and catch or provide biological samples to DFO representatives when requested.

11.3.1 CREEL SURVEYS

The Department collects information used to estimate boat based angling harvest of finfish in marine waters and salmon in fresh waters throughout BC using a variety of methods. Recreational harvesters may be requested by a Fishery Officer or designated DFO representative, such as a creel interviewer, to provide mandatory catch and effort information or biological samples either on the water or at the dock. Approximately 20,000 such interviews and sampling events are conducted annually. Creel surveys for boat based angling in marine waters are the main source of recreational catch and effort information in the highest risk fisheries.

11.3.2 INTERNET RECREATIONAL CATCH AND EFFORT (IREC)

The internet Recreational Effort and Catch (iREC) reporting program is an online program that has been collecting effort and catch information from Tidal Waters Sport Fishing licence holders since July 2012. All 2022/23 adult Tidal Water Recreational Fishing licences will be selected to iREC reporting program and randomly assigned to report for one month. Licence holders are required to report for only one month to limit the reporting burden. Information regarding

completing the iREC report, including the month selected for reporting, the website at which to report, a unique iREC Access ID and reporting deadline are printed on each licence. Further, licence holders with a valid email address in the National Recreational Licencing system will receive emails reminding them to complete their iREC reports. Providing complete and accurate information to the iREC program when selected is a condition of licence (i.e. mandatory requirement).

The iREC reporting program is one of the sources used in developing DFO official catch and effort estimates. The iREC reporting program methodology was peer reviewed and published by the Canadian Science Advisory Secretariat (CSAS) in 2015. This program provides monthly estimates of effort for 6 fishing methods and catch for over 80 species of sport caught finfish and invertebrates in all Pacific Fishery Management Areas based on responses by Tidal Waters Sport Fishing Licence holders. The recreational fishing methods covered by the iREC reporting program include boat-based angling, angling from shore, shellfish trapping from boat and shore, beach collecting, and diving. iREC estimates are developed for methods and species not covered by the marine creel surveys, which cover only boat-based angling, and for months and areas not covered by marine creel surveys.

More information about the iREC reporting program is available at:
http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/irec/index-eng.html

11.3.3 INTERNET ANNUAL RECREATIONAL CATCH (IARC)

A separate online reporting program - the internet Annual Recreational Catch (iARC) reporting program – was held at the end of the season to collect the catch records of Chinook, Lingcod, and Halibut from Tidal Waters Sport Fishing Licence holders as written on their licence(s). This program ran for 8 years between 2014/15 and 2021/22. It provided information for Chinook, Lingcod and Halibut on annual quota, annual and monthly catch estimates, and Halibut length statistics.

More information about the iARC reporting program is available at:

http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/irec/iarc-eng.html

11.3.4 LOGBOOKS

Finally, the Department is continuing to work with identified groups - sport fishing guides, fishing lodges, associations – with the assistance of the Sport Fishing Institute of BC to implement logbooks in areas of highest risk or areas conducive to reporting through the use of logbooks. The latter includes areas such as the Central Coast, Kyuquot Sound, Port Hardy, and parts of PFMA 13 where there are concentrations of lodges and guided effort.

The development of an improved catch monitoring regime, including reporting standards, will continue to be a priority in the management of recreational fisheries. The Department continues to work with the Sport Fishing Institute of BC, and identified groups - sport fishing guides, fishing lodges, and associations - to develop a Recreational Electronic Logbook (Rec E-Log) as a tool to collect catch and other fishing information and to report this information to the Department.

11.3.5 CHINOOK AND COHO CODED WIRE TAG (CWT) SAMPLING

Essential requirements for the sampling for CWTs in recreational fisheries are:

I. Submission of heads from hatchery-marked (adipose fin-clipped) Chinook and Coho. With mass marking, not all hatchery-marked Chinook and Coho contain a CWT, but the missing adipose fin is the only external clue to identify the possibility of an internal CWT.

II. Completed DFO-supplied head label(s) attached to each head with required catch information including location caught and date caught. For salmon caught together (same date and location), one label may be placed in a sealed bag with multiple heads.

III. Provision of catch information (number of hatchery marked kept Chinook and Coho) to DFO catch monitoring programs.

CWT target sample rates are established by the Department to meet bilateral Pacific Salmon Treaty standards. The minimum required sample rates in recreational fisheries are 20% of the estimated hatchery-marked catch to recover a minimum quantity of CWTs from indicator stocks. It is not cost effective or possible to acquire this quota through direct sampling of recreational fisheries due to the wide distribution of the fishery throughout the year and throughout the province. Instead, the success in achieving the 20% sample rate relies on submissions by anglers to a network of Salmon Head Depots. Because of the reliance on fisher-provided samples, sample rates are also known as submission rates in recreational fisheries.

Salmon Head Depots exist at more than 250 locations in BC and are situated at marinas, tackle stores, fishing lodges, and hatcheries. Depot operators provide head labels and store the heads in freezers or buckets containing a brine solution. Servicing and maintenance of Salmon Head Depots will be delivered by a federal government contractor or by Department employees. Information about the origin of their fish will be provided to anglers, guides and depots, when CWT dissection results are available.

While the majority of CWTs are collected from submissions to Salmon Head Depots, recreational harvesters are also required as a condition of the Tidal Waters Sport Fishing Licence to provide biological samples (salmon heads) to Department representatives when requested.

For additional information or locations of Salmon Head Depots:
Salmon Head Recovery Program
Phone: 1-866-483-9994 (toll-free)
Search: DFO Salmon Head Recovery

12 NORTHERN BC COMMERCIAL FISHERIES

Details regarding specific commercial fisheries are contained in the Section 13 - Species Specific Salmon Fishing Plans.

12.1 LICENSING

12.1.1 NATIONAL ONLINE LICENSING SYSTEM (NOLS) CLIENT SUPPORT - LICENSING SERVICES

All Fish harvesters/Licence Holders/vessel owners are now required to use the National Online Licensing System (NOLS) to view, pay for and print their commercial fishing licences, licence conditions and/or receipts.

Training materials, including step-by-step guides and a detailed user training manual, are available online (http://www.dfo-mpo.gc.ca/FM-GP/SDC-CPS/licence-permis-eng.htm) to guide users of the system in completing their licensing transactions. The Department also provides client support and assistance on how to use the system via e-mail at fishing-peche@dfo-mpo.gc.ca or by calling toll-free at 1-877-535-7307. Telephone support is available Monday to Friday (excluding holidays) from (07:00 AM to 19:00 PM Eastern).

For more information on how to register and use the system, visit the Department's website at the website address above, or contact our client support.

12.1.2 LICENCE CATEGORY

A salmon licence, category A, NAG or FA, is required to commercially harvest salmon. Salmon, category A, licence eligibilities are limited entry and vessel based. Category FA and NAG licence eligibilities are party based and must be designated to a registered commercial fishing vessel that meets established length restrictions. Category NAG licence eligibilities are held by the Northern Native Fishing Corporation (NNFC). Category FA is communal commercial licence eligibilities, category FA, an aboriginal group is the licence eligibility holder.

Vessels authorized to fish under the authority of a salmon licence are also permitted to catch and retain species described in Schedule II, Part 2 of the *Pacific Fishery Regulations, 1993*, transport species caught by other vessels, and be designated to fish under the authority of a category Z licence.

12.1.3 LICENCE CATEGORY BACKGROUND

Salmon has been a limited entry vessel based fishery since 1969. In 1996 under the Pacific Salmon Revitalisation Plan, area and gear selection were introduced in the salmon fishery. Salmon licensed vessel owners selected a gear and area for each licence eligibility. Gear selections were seine, gill net or troll. Gear selection was permanent.

Area selections for seine were area A or B; for gill net, areas C, D or E; and, for troll, areas F, G or H. A vessel may hold only one licence eligibility per area. Area licensing has been a feature of salmon management for the past 10 years with area selections processes in 1996, 2000, 2006 and 2007. Initial area selection was for a four year period.

Licence Stacking was also introduced in 1996 as a method to decrease the number of vessels actively participating in the fishery while allowing vessel owners to fish in more than one area or with more than one gear.

12.1.4 LICENCE RENEWAL

Renewal of a Category A licence and payment of the licence renewal fees must be done on an annual basis to retain the privilege to be issued the licence in the future, regardless of whether or not fishing is carried out. Those category A licenses not renewed by March 31, 2022 will cease and licence issuance requests will be unable to be considered in future.

Salmon licence renewal fees are available at full fee and reduced rates. Annual licence renewal fees are based on the length of the vessel. Reduced fee eligibilities must be held on vessels owned by aboriginal individuals.

In accordance with the *Service Fees Act*, annual licence renewal fees will be adjusted by the annual rate of inflation determined by the Consumer Price Index (CPI) published by Statistics Canada.

The commercial Salmon (Categories AG, AT, and AS) licence renewal fees may be found on the following link: https://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/fees-frais-21-22-eng.html

There is no annual licence renewal fee for communal commercial category FAG, FAT, and FAS licences.

12.1.5 LICENCE ISSUANCE

Upon the Department receiving the required payment, and information, the salmon licence will be issued and notification will be sent via email to advise vessel owners/licence holders that a

change has been made to the vessel owners/licence holder's online account. The salmon licence documents, licence conditions and receipt will be available to be printed at that time.

Prior to annual licence issuance of a communal commercial licence, licence eligibility holders are required to annually designate the fishing vessel to hold the licence. This must be done by navigating to the 'Submit a Request' menu selection within the National Online Licensing System (NOLS). Full instructions are available at: https://www.dfo-mpo.gc.ca/fisheries-peches/sdc-cps/products-produits/user-manual-utilisateurs-sec1-eng.html.

Prior to annual application of a salmon licence, vessel owner(s)/licence eligibility holders are required to:

- Meet any Ministerial conditions placed on the licence eligibility
- Ensure any conditions of the previous year's licence are met, such as:
  - Catch reporting requirements (i.e. all trips are closed), and that all harvest logs are submitted. Submit a nil report if no fishing occurred. For further information contact the Commercial Salmon Catch Monitoring Unit at cscmu-usccs@dfo-mpo.gc.ca; and
  - Submission of all fish slips (for further information contact the Regional Data Unit at (604) 666-2716).
- The designated vessel's overall length does not exceed the maximum vessel length of the category FAG, FAT, FAS licence eligibility

CLEARANCE

Copies of the Nil Reports and Statutory Declarations may be found under 'Additional Licensing Services Forms' on the licensing webpage located at:
http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.html.

LICENCE DOCUMENTS

Salmon licence documents are valid from the date of issue to March 31, 2023.

Replacements for lost or destroyed licence documents may be obtained by reprinting the licence documents through the National Online Licensing System.

For further licencing information see:
http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.html

DESIGNATION OF HARVESTERS TO FISH A COMMUNAL COMMERCIAL LICENCE

Under the *Aboriginal Communal Fishing Licence Regulations*, every person working on a vessel that is only fishing under authority of a Communal Commercial Licence, must be designated by the First Nation that holds the licence. The designation must be made in writing and include the person's name and reference the Communal Commercial Licence.

First Nations licence holders interested in obtaining an example template to use to designate their fish harvesters may contact a DFO Resource Manager or Pacific Fishery Licensing Unit office.

VESSEL REPLACEMENT (CATEGORY A ONLY)

The owner(s) of a category A licensed Salmon vessel may make an application to replace the commercial fishing vessel. Both the replacement vessel and the vessel being replaced must have a survey on file with the Pacific Fishery Licence Unit (PFLU) or submitted with the vessel replacement application. Vessels must be surveyed according to the Department guidelines.

Communal commercial licenses are not eligible for vessel replacement as the licence eligibility is party-based.

A salmon licence eligibility may not be split from other vessel based licence eligibilities.

Replacement vessels for salmon licence eligibilities where no stacking is involved remain at exact overall length or smaller of the existing vessel.

Temporary vessel replacement (e.g. total loss of vessel) requests are not eligible for any of the salmon stacking allowances.

STACKING

Processing of salmon licence eligibility stacking applications ends May 31. Stacking applications are not accepted from June 1 to November 30, annually.

A salmon licence may not be split from other licence eligibilities.

Different gear and area licence eligibilities may be combined on one vessel. That is, one vessel may have a salmon gill net licence eligibility and a salmon troll licence eligibility. Multiple licence eligibilities of the same gear may be stacked on one vessel, as each licence eligibility will have a different area. A vessel may not hold more than one licence eligibility for the same area.

For the purpose of stacking licenses, a single salmon licence eligibility may be stacked to a vessel that is up to 30% longer in overall length than the overall length of the vessel from which the licence eligibility is being removed.

Salmon licence eligibilities that are married to other licence categories (or another salmon licence) may be stacked, but the additional 30% in overall length is not applicable and the salmon stacking cannot result in the stacking of other licence categories, except where permitted for that licence category.

An area change request may only be made at the time of submission of an application for licence stacking and the area change may only be made for the licence eligibility that is being stacked. The owner of the receiving vessel must make the request by completion of the applicable section on the form.

Reduced fee category A licence eligibilities may be stacked with either another reduced fee licence eligibility or a full fee licence eligibility, but the receiving vessel must be owned by an aboriginal person.

Category N licence eligibilities may be stacked with any category A licence eligibility, full fee or reduced fee, or another category N licence eligibility, in compliance with all stacking rules except that they will not be tied to the other salmon licence eligibility. Stacking a category N licence eligibility does not result in a change of licence area for the category N licence eligibility.

Category F licence eligibilities may be stacked with any category A or category N licence eligibility or another category F licence eligibility, in compliance with all stacking rules except that they will not be tied to the other salmon licence eligibility. Stacking deadline dates may vary for category F licence eligibilities due to the sign off dates of communal or contribution agreements. Stacking a category F licence eligibility does not result in a change of licence area for the category F licence eligibility.

Please visit the Salmon licence page for further information at:
http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/salmon-saumon/fisheries-peches/licence-permis-eng.html

12.2 Openings and Closures

Due to uncertainty of both timing and size of returning salmon runs, many commercial openings are not confirmed until a few days prior to the actual opening. Also, the management plan for any area may change in-season. Fishing Areas and Subareas (or portions thereof), provisions for extensions, opening patterns, and the duration of the fishing season can all be

adjusted based on factors such as weak stock concerns, target stock abundance, fishing effort, rate of gear selectivity, domestic allocations, and other factors.

This fishing plan is designed to minimize the incidental harvest and bycatch of a range of stocks of concern (see Section 0 – Management Objectives for Stocks of Concern). Fisheries that occur on the South Coast may be required to release all non-target species to the water with the least harm, depending on local stock concerns.

Under circumstances where there appears to be an abundance of fish that could support a commercial fishery and that fishery is not specifically addressed in the IFMP, DFO will address requests to fish as identified below:

1. Attempt to verify the abundance using available observations and information of the salmon species and to determine whether or not it could provide a fishing opportunity consistent with conservation objectives and Allocation priorities for First Nations FSC and recreational fisheries. DFO will consult with local First Nations regarding any interests or concerns they may have.
2. If 1 is addressed and there appears to be adequate numbers of fish to support some level of a commercial fishery; then a precautionary approach will be taken and information requirements will be discussed and agreed upon. Initially, a limited number of vessels may be licenced, and independent catch verification will be required with timely reporting of harvest data.
3. Regular dialogue between harvesters, DFO, and others — as appropriate — will take place throughout the fishery including whether the scope of the fishery could be increased and other relevant parameters.

DFO continues to encourage the development of demonstration fisheries that promote biologically sustainable and economically viable fisheries. Fishery managers are working with fleet advisors to develop demonstration fisheries that experiment with meeting a range of objectives including matching fleet size to the available harvest, pacing fisheries to maximize value of the harvest, and developing more cooperative fishing arrangements between harvesters.

In addition to existing demonstration fisheries reviewed and approved prior to 2016; the collaborative work of the Department, FNFC, SCC, and CSAB through the initiative to update the CSAF has resulted in a common assessment process to review and develop flexible harvest arrangements (CSAF Demonstration fisheries). Additional detail on CSAF demonstration fisheries proposed for this season and information on other related work is outlined in Appendix 6: Updates to the Commercial Salmon Allocation Framework.

12.3 LICENCE CONDITIONS

12.3.1 TRANSPORTING

Please see Part III of the commercial conditions of licence for transporting of salmon for additional details and information.

Transporting conditions for the salmon fisheries include a requirement to submit fish slips for all fish transferred to any commercial vessel transporting salmon; the requirement to maintain a salmon transfer log on board the vessel receiving fish; and a phone-in hail requirement to the DFO Fishery Manager.

The requirement to submit fish slips is currently in place for commercial salmon licence eligibility holders and has previously been a provincial requirement for transport (packer) vessels. It is a federal requirement for transport (packer) vessels to submit fish slips as a condition of licence.

The phone-in hail will alert DFO fishery managers prior to an opening that the vessel is active for transporting salmon in a fishery and will provide managers a better understanding of the fishing effort during an opening. After each opening, there is a requirement to phone the DFO Fishery Manager with information on where the transport (packer) vessel received fish, approximate amount of fish, total number of landings, and the time and location of the final offload. No service provider is needed to deliver on this requirement currently.

The salmon transfer log will identify when, where, and from whom fish were received. This transfer log will be required to be on board the vessel and produced for examination when requested by a representative of DFO. The completed transfer log must also be submitted to the Regional Data Unit at the end of the calendar year. No service provider is needed to deliver on this requirement currently. This condition will complement the existing fish slip program and support improved enforcement of unreported harvests and unauthorized sales in the commercial salmon fishery.

A copy of the salmon transfer log template is available on DFO website at:
https://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/forms/smon-trans-log-journal-eng.html

12.3.2 NON-RETENTION SPECIES

All opening announcements will contain the species that will be allowed to be retained, and those which must be released to the water with the least possible harm. The fishing season will begin with the following non-retention rules in place:

Species	Non-retention fisheries
Steelhead	All commercial fisheries
Chum	Troll, seine and gill net in Areas 4 and 5
Coho	All commercial net fisheries
Chinook	All commercial net fisheries

In-season management actions may take place to include other non-retention species or allow retention of some species that show in-season strength.

12.3.3 RETENTION OF LINGCOD BY SALMON TROLL

To help meet the conservation and sustainability objectives under groundfish integration, an individual transferable quota (ITQ) management system has been established for the lingcod fishery.

Implementation of an integrated commercial groundfish fishery has monitoring and reporting requirements for those wishing to retain Lingcod while salmon trolling. As in previous years, all vessels wishing to retain any amount of lingcod must have their fish validated through the established Dockside Monitoring Program. In addition to this, any vessel wishing to land lingcod must hold or acquire sufficient quota to cover catch.

Requirements include the following (less than 500 lbs. of lingcod per trip):

Vessel must have or acquire sufficient lingcod to cover catch.

Transportation requirement — All lingcod must be transported by the licenced vessel either directly to land or to a fish pen.

In addition to submitting Start Fishing and End Fishing Reports to the designated salmon service provider, the vessel master must report to the designated groundfish hail service provider to create Hail-in and Hail-out Reports. The vessel master must adhere to specific dates, times and port locations when landing groundfish catch.

Landing requirements — The landing of any fish of any species is not permitted unless a designated observer is present to authorize the commencement of weight verification.

Vessels wishing to retain and land **more than 500 lbs**. per trip of lingcod must, in addition to all of the above, meet the electronic monitoring requirements described in the Groundfish Integrated Fisheries Management Plan.

12.3.4 RETENTION OF FREEZER TROLL CHINOOK AND COHO HEADS

These requirements apply to all troll licences, unless the license is listed in a fisheries notice that identifies the troll licenses that are exempted from retaining salmon heads during the fishing season.

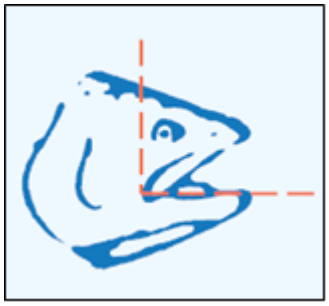


Figure 12.3-1: Fish Head CWT Portion

Head Retention: Troll vessel masters that are freezing their catch at sea must retain all heads from Chinook and Coho. Recognizing that vessels may have space limitations for retaining heads, the Department allows the alternative of retaining only the portion of the head likely to contain the CWT, referred to as the 'snout'. At a minimum, the portion of each head retained must include the upper portion of the head extending from the tip of the snout to a cut travelling from the top of the head, passing 1 centimeter behind the eye, and ending at the back corner of the mouth.

Head Storage: Heads must be stored in Salmon Head Recovery Program bags with labels. Bags and labels are available free of charge from the Department. Heads must be kept frozen until delivery and each bag must contain only the heads from a single week of fishing (where weeks run from Sunday to Saturday). All bags must be labelled completely and securely closed. Bags and labels can be obtained in three ways:

Pick them up at DFO offices announced via fishery notice,

Contact DFO toll-free at 1-866-483-9994 to make arrangements for shipping, or

Obtain them from CWT samplers at fish landing stations.

Head Delivery: The vessel master shall ensure that all bags containing heads are offloaded at the first designated fish landing station at which Chinook or Coho catch is offloaded.

In accordance with the conditions of Area G and F troll licenses, all vessels that freeze their catch at sea are required to bring all Chinook and Coho heads (or snouts) to the dock for submission, unless the license is listed in a fisheries notice listing the troll licenses that are exempted during the fishing season.

For Area F, the fisheries notice that lists the Area F troll licenses that are exempted from retaining salmon heads during the fishing season is released prior to the opening of the fishery. For Area F, the exemption rate this year will be approximately 75%. As in past seasons, licenses

that were insufficiently diligent in carrying out their conditions of license to bring in all Chinook and Coho heads will not be exempted this year.

For Area G, the small number of vessels that freeze their catch at sea has led to the requirement that 100% of the Area G troll fleet retain salmon heads. If the number of vessels that freeze their catch at sea increases significantly, the Department may introduce exemptions by releasing a fisheries notice listing Area G licenses that are exempted from retaining salmon heads.

Vessels that hold licenses in both Area F and G who are exempt from retaining heads in Area F are required to retain heads in Area G unless their license is listed as exempt to this condition of license in an Area G notice.

For complete head retention requirements, vessel masters freezing their catch at sea should refer to their conditions of license.

12.3.5 CHINOOK AND COHO CODED WIRE TAG (CWT) SAMPLING

Fisheries and Oceans Canada uses independent designated dockside monitoring program observers (CWT samplers) who are federally-contracted to the DFO Mark Recovery Program to sample the entire catch from randomly selected vessels at fish landing stations or processors. CWT target sample rates are established by the Department to meet bilateral Pacific Salmon Treaty standards for statistically reliable data. The minimum required sample rate is 20% of the estimated catch in all Chinook or Coho retention fisheries that intercept CWT indicator stocks. CWT target sampling rates may be adjusted in-season for high abundance or to meet additional CWT program requirements to recover a minimum quantity of CWTs from indicator stocks.

Sampling for CWTs is a mandatory catch monitoring requirement for commercial salmon fisheries. Conforming to the *Fishery (General) Regulations*, when requested, the master or owner of fishing vessels and the owner or any person who has the care, charge or control of a fish landing station must permit access to the catch and provide CWT samplers with assistance that is reasonably necessary to enable them to perform their duties according to DFO-approved sampling protocols including:

Making the fish readily accessible to the CWT samplers;

Providing samplers with a suitable work area; and

Permitting CWT samplers to remove the head from the fish free of charge

In the past, Chinook and Coho were checked for a missing adipose fin to indicate that it had a CWT. Due to mass marking, it is necessary to use electronic equipment such as handheld wands or tube detectors to recover CWTs in most fisheries. Because detection rates may be affected by

sampling technique, it is important to ensure CWT samplers are given adequate time and opportunity to sample the entire catch of each vessel selected. Incomplete or unrepresentative sampling of CWTs in fisheries is a serious concern because it generates unknown bias in stock identification for fisheries management, stock assessment, hatchery assessment, and implementation of Pacific Salmon Treaty management regimes.

12.3.6 COMMERCIAL HARVEST LOGS AND IN-SEASON REPORTING

A mandatory harvest log and in-season reporting program for catch information is required in all commercial fisheries. Harvest logs are a record of fishing activities and are required to be kept under the conditions of licence and can be administered through either a hard copy (paper) logbook version or an electronic (E-Log) version, unless otherwise specified. Commercial salmon harvesters are required to maintain a harvest log of all harvest operations and are responsible for any associated financial costs.

To facilitate reporting of catch information, the Commercial Salmon Advisory Board (CSAB) has identified the following service provider for the paper logbook program for 2022:

Paper logbook Program:
Archipelago Marine Research Ltd. (AMR)
525 Head Street
Victoria, BC
V9A 5S1

Telephone: (250) 383-4535
Fax: (250) 383-0103
Toll Free: 1-877-280-3474
Website: http://www.archipelago.ca
Email: SalmonRegistration@archipelago.ca

Harvesters may also meet their reporting licence conditions through the E-log Program. The service provider for the E-log Program in 2022 is:

E-log Program:
M.C. Wright and Associates Ltd.
Telephone: (250) 753-1055 Ext: 3
Website: http://www.mcwrightonline.com
Email: support@mcwrightonline.com

To make arrangements for their 2022 harvest log requirement, harvesters are required to enlist the services of one of these identified service providers. Sample logbook pages are provided in Appendix 1.

Harvesters can continue to use their existing E-logs as long as software changes are not required to meet licence conditions. If software changes are required to meet licence conditions, harvesters can select to use a paper logbook or arrange to pay for any associated costs for software updates with a service provider.

The Department has been working with the Canadian Pacific Sustainable Fisheries Society to address conditions set out in the Marine Stewardship Council action plan for the continued certification of BC Pink, Chum, and Sockeye salmon fisheries. Several conditions within the action plan identify the need for improved reporting of catch, particularly in reference to Endangered, Threatened, and Protected species. The harvest logs have been updated and include additional materials for identifying groundfish, seabirds, Sturgeon, and marine mammals at the species level. Harvesters are encouraged to provide the correct identification of all catch to the species level in the harvest logs and when submitting catch reports to the service provider.

12.4 Catch Monitoring

Since 2011, the Department has been working with the Commercial Salmon Advisory Board as part of a Catch Monitoring Working Group to review catch monitoring requirements consistent with the *Strategic Framework for Fishery Monitoring and Catch Reporting in the Pacific Fisheries* (2012). A set of minimum requirements has been developed for commercial salmon catch monitoring programs. Minimum catch monitoring requirements identified by DFO and the Commercial Salmon Advisory Board Catch Monitoring Working Group (CSAB CMWG) include:

Independent verification of fishery specific effort

Independent verification of landed catch

Independent verification of at-sea releases

Fishery specific minimum biological sampling standards

Independent verification of compliance with fishery rules

Following multi-sectoral consultations, DFO released the national *Fishery Monitoring Policy* in 2019 (available at: http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/fishery-monitoring-surveillance-des-peches-eng.htm), replacing the regional *Strategic Framework for Fisheries*

Monitoring and Catch Reporting in the Pacific Fisheries. The national *Fishery Monitoring Policy* seeks to provide dependable, timely and accessible fishery information through application of a common set of procedural steps used to establish fishery monitoring requirements across fisheries. A phased approach to implementation of the national *Fishery Monitoring Policy* will result in a transition period from the Strategic Framework to the national policy.

12.5 Commercial Salmon Allocation Implementation Plan

This section describes the commercial salmon allocation implementation plan. An overview of the process to update the CSAF initiated in 2013, with principles and guidelines approved in 2015 and an evaluation framework for assessing CSAF demonstration fishery proposals implemented in 2016. For background information on the CSAF initiative please see: http://www.pac.dfo-mpo.gc.ca/consultation/smon/saf-crrs/index-eng.html

COMMERCIAL ALLOCATION IMPLEMENTATION PLAN FOR 2015 – CURRENT PERIOD

Shares recommended by the CSAB were intended to apply for a 5 year period (2015 through 2019 seasons) with provision for a review after year 4 (2018 season) to determine if adjustments should be made to any sharing arrangements in subsequent years. For 2022, the sharing arrangements outlined in this IFMP are expected to remain in effect for the current fishing season. Consideration of changes to the commercial allocation implementation plan may be considered in the future based on advice for the Commercial Salmon Advisory Board and any changes will be consulted on in advance of the fishing season through the IFMP process.

The sharing arrangements described in this plan are intended to guide fishing arrangements at the local level and are not fixed entitlements. Application of these sharing arrangements is subject to meeting all conservation objectives, First Nations obligations, international commitments, deliverability and manageability constraints and other management considerations.

Although best efforts will be made to achieve these allocation targets/shares, no guarantees are offered that allocations will actually be achieved in any given year. The achievement of these shares will depend upon the ability to fish selectively and the conservation needs of the resource. In the event that allocations are not achieved, no compensatory adjustments will be made to future allocations.

As in previous years, there will be no directed commercial fisheries for Fraser River Sockeye or Fraser River Pink salmon in the north (i.e. area licence categories A, C and F and First Nations economic fisheries).

The tables below provide a complete list of allocation shares by gear type, species and production area for fisheries starting in 2015 for a period of 5 years with a review planned following the 4th year. Three new productions were approved in 2015 to clarify sharing arrangements associated with the Pacific Salmon Treaty for troll harvests of AABM Chinook and AB line Pink fisheries. For 2022, the sharing arrangements outlined in this IFMP are expected to remain in effect for the current fishing season.

SOCKEYE

Description	Areas	Seine A	Gill Net C	Troll F
Skeena/Nass	1, 3 to 5, 101 to 105	25%	75%	*
Central Coast	6 to 8	80%[a]	20%[b]	*
Rivers/Smiths Inlets	9 to 10	5%	95%	[c]

Notes on Sockeye allocation (north):
* bycatch provisions
[a] share reflects current Sockeye bycatch during Pink directed fisheries
[b] potential for re-negotiation of sharing arrangements in event of a future directed Sockeye fishery
[c] potential for future re-negotiation

Description	Areas	Seine B	Gill Net D	Gill Net E	Troll G	Troll H
South Local	23	60.0%	40.0%	0.0%	0.0%[c]	0.0%
South -Fraser	11 to 20, 29, 121, 123 to 127	48.5%	21.6%	25.1%	0.0%[d]	4.8%
South-Fraser – Large return year (eg. 2010, 2014, 2018)	11 to 20, 29, 121, 123 to 127	48. 5%	21.6%	25.1%	0% [d]	4.8%

Notes on Sockeye allocation (south):
[c] potential for future re-negotiation
[d] a 1% share to occur in large Fraser River return years only. A 1% reduction will be proportionately applied across other fleets in those years

PINK

Description	Areas	Seine A	Gill Net C	Troll F
North	1, 2E, 2W (even), 3 to 5, 101 to 105	75.5%	22.5%[a]	2.0%
Central	6 to 10	95.0%	5.0%[b]	*

Notes on Pink allocations (north):
* bycatch provision
[a] Skeena sharing 75% seine: 25% gill net
[b] potential for future re-negotiation

Description	Areas	Seine B	Gill Net D	Gill Net E	Troll G	Troll H
Fraser	11 to 20, 29, 121, 123 to 127	82.5%	4.0%*	3.0%*	0.5%[c]	10.0%
Mainland	12 to 13 (mainland inlets only)	73.0%	9.0%	0.0%	0.0%	18.0%

Notes on Pink allocations (south):
[*] Pink bycatch provision required for fisheries on more abundant species
[C] potential for future re-negotiation. Pink bycatch required for fisheries on more abundant species

<<NEW PRODUCTION AREA STARTED IN 2015>>

Description	Area	Troll F
A-B line Pink troll fishery	101	100%

CHUM

Description	Areas	Seine A	Gill Net C	Troll F
North	1, 2E, 2W, 101 to 111, 130, 142	54.0%	43.0%	3.0%
North	3 to 5	55.0%[b]	45.0%[b]	*
Central	6 to 10	45.0%[c]	55.0%	*

Notes on Chum allocations (north):
[b] recent Chum non-retention; fishery allows bycatch of Chum only
[C] currently Chum non-retention
[*] bycatch provision

Description	Areas	Seine B	Gill Net D	Gill Net E	Troll G	Troll H
South Inside	11 to 19, 28 to 29	63.0%	19.2%	12.0%	0.0%	5.8%
Nitinat	21 to 22	65.5%	0.0%	34.5%	*	0.0%
South Outside	23 to 27	0.0%d	98.0%	0.0%	2.0%	0.0%

Notes on Chum allocations (south):
[*] bycatch provision
[d] potential for future re-negotiation if Chum populations re-build

Commercial allocation sharing arrangements in Johnstone Strait are; seine Area B – 77 percent; gill net Area D – 17 percent; and troll Area H – 6 percent.

COHO

Description	Areas	Seine A	Gill Net C	Troll F
North	1 to 10, 101 to 111, 130, 142	12.5%	6.5%	81.0%

Notes on Coho allocations (north):

Description	Areas	Seine B	Gill Net D	Gill Net E	Troll G	Troll H
South Inside	11 to 20, 29	TBD	TBD	TBD	TBD	TBD
South Outside	21 to 27, 121 to 127	9.5%	9.5%	1.0%	80.0%[a]	0.0%

Notes on Coho allocations (south):
[TBD] currently no directed fisheries in this area. Will be reviewed should future directed opportunity develop. Principles to be drafted regarding how to distribute impacts.
[a] Coho taken primarily in offshore fisheries

CHINOOK

Description	Areas	Seine A	Gill Net C	Troll F
Northern BC AABM Chinook	1, 2E, 2W, 101-105, 130, 142	*	*	100.0%[a]
Central	6 to 10	*	100.0%[b]	*[c]

<< NEW PRODUCTION AREA STARTED IN 2015 >>

Description	Areas	Seine A	Gill Net C	Troll F
North-Inside	3 to 5	*	100.0%[d]	*

Notes on Chinook allocations (north):
[*] bycatch provisions
[a] Northern BC AABM Chinook harvest
[b] near-terminal fisheries (primarily hatchery origin)
[c] review potential re-entry of troll into Production Areas 6 + 7. Bycatch provisions
[d] bycatch provision and near-terminal directed fisheries (e.g. Skeena)

Description	Areas	Seine B	Gill Net D	Gill Net E	Troll G	Troll H
South- Inside	11 to 20, 29	1.0%[e]	3.0%	90.0%[f]	0.0%	6.0%
South - WCVI AABM Chinook	21, 23 to 27, 121 to 127	*	*	0.0%	100.0%[g]	0.0%

<< NEW PRODUCTION AREA STARTED IN 2015>>

Description	Areas	Seine B	Gill Net D	Gill Net E	Troll G	Troll H
South- WCVI Inside	21 to 27	5.0%[h]	75.0%[i]	5.0%[i]	15.0%[j]	0.0%

Notes on Chinook allocations (south):
[e] subject review pending completion of southern BC Chinook initiative
[f] directed Fraser Chinook fishery
[g] this is WCVI AABM Chinook fishery
[h] Area 23 sharing arrangement currently 33.3% seine: 66.7% gill net. May need to review
[I] Area 25 fishery (potential for future review. 75% fishery to Area D (e.g. Conuma Bay fishery); potential 5% to Area E if future surplus at Nitinat; otherwise default to Area D)
[j] winter troll fishery

12.6 Conservation Measures

12.6.1 SELECTIVE FISHING

The Department will work with Area Harvest Committee representatives to implement selective fishing measures to avoid non-target fish or, if encountered, to release them alive and unharmed. These measures include but are not limited to: the use of troll plugs, Alaska twist gill nets, maximum gill net set time and net length, gill net mesh size, gill net depth, seine bunt mesh size, brailing and sorting for seine vessels, and revival tanks.

12.6.2 ROBSON BIGHT

DFO will once again be seeking the co-operation of harvesters in minimizing fishing activities in Robson Bight. This is part of a long-term management plan to afford protection to the killer whale populations that frequent this area during periods from mid-May to early October. Fish harvesters are requested not to moor in the Robson Bight area. See Section 5 – Southern Resident Killer Whales for more information. Information on this management initiative can also be obtained from Department charter patrol vessels on the grounds and from Fisheries and Oceans Canada offices.

12.6.3 ROCKFISH CONSERVATION MEASURES IN SALMON TROLL

BOCACCIO

Bocaccio was recommended as “threatened” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2006. Following consultation and review, the Government of

Canada decided not to add Bocaccio to the list of wildlife species at risk. COSEWIC reassessed Bocaccio in November 2013 and recommended it as "endangered": https://species-registry.canada.ca/index-en.html#/species/740-315.

Based on updated science information and DFO's policy document "Guidance for the Development of Rebuilding Plans under the Precautionary Approach Framework", the Department set out a rebuilding plan in 2013 for stepped reductions of total Bocaccio harvest to a target level of 75 tonnes over 3 years (2013-14 to 2015-16). The rebuilding plan accounts for First Nations' priority access for food, social, and ceremonial purposes. Through the process of regular evaluation of the rebuilding plan, science advice on stock status and rebuilding strategies for Bocaccio was peer-reviewed in autumn 2019. Based on updated science information, the 2021/22 mortality cap for Bocaccio will be increased to 500 t, in the same proportion as the 2013 mortality cap. The Bocaccio mortality cap for the salmon troll fishery is 24 tonnes and is subject to daily limits specifically for Bocaccio (please refer to Conditions of Licence for details).

More information on the Bocaccio Rebuilding Plan is available in Appendix 9 of the Groundfish IFMP, which will be linked in the final salmon IFMP once available.

YELLOWEYE ROCKFISH

Yelloweye Rockfish (Outside and Inside populations) was recommended as "threatened" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2020: https://species-registry.canada.ca/index-en.html#/species/1023-707.

In 2015 the Department set out a plan for stepped reductions of total Yelloweye outside population harvest from the estimated total catch mortality of 287 MT in 2014 to a mortality cap of 100 MT over 3 years (2016-17 to 2018-19). Through the process of regular evaluation of the rebuilding plan, science advice on stock status and rebuilding strategies for Yelloweye Rockfish outside population was peer-reviewed in autumn 2019 (Outside population) and spring 2020 (Inside population). Based on updated science information, the 2022/23 mortality cap for Yelloweye Rockfish outside population will be increased to 223.7 t. Based on updated science information, the 2022/23 mortality cap for Yelloweye Rockfish inside population will remain at 15 t. Additional information is available in Appendix 9 of the Groundfish IFMP.

12.7 COMMERCIAL DEMONSTRATION FISHERIES

The Department has conducted extensive consultations with the commercial salmon industry and First Nations concerning fisheries reform and renewal. Changes in the fishery will be designed to improve biological and economic performance of the fishery.

In an ever-changing environment such as resource conservation, a group may want to explore special harvesting initiatives or new management approaches to develop flexible fisheries with greater harvester control that improve product quality, increase value to the fleet and have better catch monitoring and compliance with catch limits.

The Department is interested in continuing to explore innovative ways to access TAC more efficiently, to increase market value of the product, or to access TAC that may be unavailable due to conservation concerns or that a full fleet fishery is unable to access.

To contribute to the Pacific Fisheries Reform vision, the Department will consider demonstration projects that support alternative management strategies that:

- Maintains or improves management control and conservation performance in the fishery;
- Promotes the use of clearly defined shares to improve manageability and industry viability; and
- Increases the ability of harvesters to work cooperatively to harvest available surpluses and to take on greater responsibility for control and monitoring of their fishery.

Details regarding demonstration fisheries that the department is considering are contained in Section 13 - Species Specific Salmon Fishing Plans.

In addition to existing demonstration fisheries within Section 13, additional opportunities to demonstrate flexible harvest arrangements were initiated in 2016 in support of updates to the Commercial Salmon Allocation Framework (CSAF). Guidelines and principles associated with CSAF as well as a list of CSAF demonstration fisheries are included in Appendix 6.

12.7.1 TRANSFER GUIDELINES FOR THE TEMPORARY TRANSFER OF COMMERCIAL SALMON SHARES

In consideration of discussions with the First Nations SCC, the CSAB and any feedback received, these guidelines will be reviewed and may be updated annually. **For 2022 there are no proposed updates and the transfer guidelines have remained unchanged since 2017.**

These guidelines address the transfer of commercial salmon shares between the following groups:

- Area A-H Fishery participants with a defined percentage share of the commercial TAC

- Area A-H fleets or portions of fleets or individual licences
- Marine Demonstration Fishery participants
- In-river Demonstration Fishery participants
- First Nations with one or more Area A-H licences
- First Nations entities who are signatories to current arrangements or area provided communal licences allowing sale that provides a defined commercial share of salmon for the given year including;

- Economic Opportunity agreements
- Harvest Agreements
- Demonstration Fisheries

Transfers of harvest shares may occur when there is a formal arrangement outlining possibilities as defined by the Guiding Principles and Operational Considerations below, (approved by DFO) between the original share-holders and the recipient. Requests can include transfer from downstream to upstream locations, and vice versa. These arrangements should identify mechanisms pre-season that will be used for transfers to ensure proper management and accounting of shares (actual transfers may occur in-season; e.g. between ITQ fishery participants using established transfer request processes). For transfers of commercial licences, arrangements will need to be made in advance of the fishery opening for which the transfer is intended to apply to ensure appropriate allocations associated with the licence can be set aside.

In-season proposals to transfer uncaught commercial Total Allowable Catch (TAC) allocations between the above groups will reviewed and DFO will determine whether to allow the transfer of some or all of the uncaught TAC.

Requests for temporary transfers of commercial salmon shares will be reviewed with consideration to the following general principles and the operational considerations identified below.

Guiding Principles for Temporary Transfer of Salmon Shares:

- Result in similar or better management control and/or conservation performance in the fishery (both for target and bycatch species/stocks)
- Consistent with conservation measures and allocation approaches (if any) for stocks of concern, including bycatch species/stocks;
- Respect existing Aboriginal and treaty rights and the priority of Food, Social and Ceremonial access.

- Consistent with international obligations;
- Consistent with objectives and management measures outlined in Salmon Integrated Fishery Management Plans;
- Respect the Common property nature of the fisheries resource: subject to Principle 3, access to the resource does not imply ownership of the resource or any portion of the resource, and is not conferred irrevocably to individuals.
- Support opportunities to utilize Canadian commercial total allowable catch while respecting conservation requirements.
- First Nations commercial fisheries and Area A-H commercial fisheries conducted in tidal waters will be managed under common and transparent rules for each gear type. For example, First Nations commercial troll fisheries conducted in tidal waters where Area F licences are permitted to operate will be managed in accordance with the same rules as the Area F commercial fishery for those tidal waters.
- First Nations commercial fisheries conducted in non-tidal waters will be managed under transparent rules that are consistent with the rules used to manage marine commercial fisheries that target similar stocks associated with that production area.
- Affordable to implement i.e. would not result in any substantive incremental costs to DFO in areas such as monitoring stock assessment and enforcement.

Operational Considerations Regarding Requests for Temporary Transfers:

- Transfers of commercial salmon allocation shares will only occur when there is a Canadian commercial Total Allowable Catch (TAC) (i.e. commercial harvestable surplus) identified for the target stock or species which is available for harvest.
- Transfers of commercial salmon shares between parties will only be considered for commercial fisheries and commercial participants with a clearly defined percentage share of the Canadian commercial total allowable catch.
- In most cases, transfers will be based on a percentage share of the available commercial TAC. Alternate approaches for calculating transfer shares may be considered.
- In-season transfers may occur if pre-season plans outline possibilities. For share transfers between Area A-H commercial fisheries, individual salmon shareholders or groups of salmon shareholders; the mechanism (e.g. tracking,

management and accounting of shares) for facilitating transfers needs to be described and agreed upon by all parties to the arrangement and DFO pre-season. Individual commercial licence holders or groups of commercial licence holders will not be permitted to make their own allocation transfer arrangements unless these are part of a pre-season plan approved by the Department.

- DFO will not be responsible for leading or facilitating the negotiation of transfer arrangements between parties.
- For commercial salmon licences held by the Department, individual licence allocations will be based on an equal percentage allocation of the commercial TAC for all licences in that commercial licence area (i.e. Areas A to H).
- If, despite the best efforts of any commercial harvest group, it becomes apparent that it will be unable to harvest its share, and no mechanisms are in place that would permit the transfer of the share to another commercial harvest group, the Department may consider transfers of uncaught commercial harvest shares to any other commercial harvest group already holding a clearly defined percentage share of the Canadian commercial total allowable catch, on a case by case basis, assuming that harvest can occur using fishing methods, times and locations permitted for that commercial harvest group.
- Transfers of commercial salmon allocations must consider shares of all stocks that will be harvested in the recipient area.

  a) Allocations transferred inland will be reduced proportionately to reflect the reduced stock composition in the more terminal harvest location (e.g. Area F troll licence shares allocated to the Kamloops Lake inland demo fishery will be only for the proportion of Thompson Chinook encountered in the marine commercial troll fishery). Alternative approaches may be considered in specific circumstances (e.g. allocation may not be proportionally reduced if harvest of an allocation in a terminal area reduces impact on stocks of conservation concern). DFO will document the rationale for its decision and make it publicly available.

  b) For co-migrating stocks or management units of concern or where little or no Commercial TAC has been identified, transfers will need to consider and/or mitigate potential impacts. For example: access to a harvest share of Fraser Pink salmon might require the fishing group or individuals to have some Sockeye remaining in their harvest share of co-migrating Fraser Sockeye.

c) For co-migrating stocks/species or management units of concern where exploitation rate caps or some other limit on mortalities have been defined (e.g. Interior Fraser River Coho), the parties to the transfer arrangements are responsible for demonstrating that the transfer arrangement will be neutral or of benefit to the stock or management unit of concern (i.e. same or lower impact in the new fishing area). Limiting stocks/species will only be transferred to the extent needed to harvest the target stock transfer amount with residual amounts being available for the use by all other commercial harvest groups with a share of the targeted stocks.

d) Transfers into areas that require management adjustments need to be accounted for in determining TAC (e.g. a similar accounting process to current Fraser Sockeye).

e) Priority will be given to those proposals that allow shares to be harvested using fishing techniques that are more selective than the original technique, and / or allow harvesting in fishing areas that avoid stocks or management units of concern.

- Harvest of commercial salmon allocations is not guaranteed and actual harvest opportunities may be limited by constraints to protect species or stocks of concern. Commercial fishery participants that demonstrate an ability to fish selectively may be able to access a greater amount of their harvest share.
- Enhanced fisheries monitoring and catch reporting programs must be in place for participants to ensure that there is reliable accounting for both retained and released fish and that harvests do not exceed defined shares. Incremental monitoring costs will not be assumed by DFO, and will need to be covered by parties to the transfer arrangement.
- Proposals for transfer arrangement must include contingencies for situations where shares are exceeded. Parties not complying with agreed-to arrangements could face enforcement actions.
- Transfers of commercial salmon shares will not be permitted when this may adversely affect First Nations Food, Social and Ceremonial harvest opportunities in the area.
- Surpluses of salmon in terminal areas (i.e. ESSR fisheries) will continue to be managed using existing ESSR guidelines.

All decisions regarding temporary salmon share transfers are one-time only. Unless otherwise communicated by DFO at the time of the decision, all future transfer requests must undergo new process of application, review and approval from DFO.

13 SPECIES SPECIFIC SALMON FISHING PLANS

TABLE OF CONTENTS

13.1 Northern Chinook Salmon Fishing Plan 190

13.1.1 Northern Chinook Overview 193

13.1.1.1 Overview of northern Chinook conservation concerns 194

13.1.1.2 Overview AABM Fisheries 194

13.1.1.3 Overview ISBM Fisheries 195

13.1.1.4 Northern Chinook Enhancement Information 195

13.1.2 Northern AABM Chinook 196

13.1.2.1 Snapshot Overview and Map of Management Unit 196

13.1.2.2 Stock Assessment Information 197

13.1.2.2.1 Pre-season 197

13.1.2.2.2 In-season 198

13.1.2.3 Decision Guidelines and Management Actions 198

13.1.2.4 Incidental Harvest, By-catch and Constraints to AABM Chinook Fisheries 200

13.1.2.5 Allocation and Fishing Plans 201

13.1.2.5.1 First Nations Fisheries 201

13.1.2.5.2 Recreational Fisheries 202

13.1.2.6 Allocation 203

13.1.2.6.1 Recreational Fisheries 203

13.1.2.6.2 Commercial Fisheries 203

13.1.2.6.3 ESSR Fisheries 206

13.1.3 Skeena-Nass ISBM Chinook 206

13.1.3.1 Snapshot Overview and Map of Management Unit 206

13.1.3.2 Stock Assessment Information 209

13.1.3.2.1 Pre-season 209

13.1.3.2.2 In-season 209

13.1.3.3 Decision Guidelines and Management Actions 209

13.1.3.4 Incidental Harvest, By-Catch and Constraints to Skeena-Nass ISBM Chinook Fisheries 210

13.1.3.5 Allocation and Fishing Plans 211

13.1.3.5.1 First Nations Fisheries 211

13.1.3.5.2 Recreational Fisheries 213

13.1.3.5.3 Commercial Fisheries 214

13.1.3.5.4 ESSR Fisheries 215

13.1.4 Central Coast ISBM Chinook 216

13.1.4.1 Snapshot Overview and Map of Management Unit 216

13.1.4.2 Stock Assessment Information 217

13.1.4.2.1 Pre-season 217

13.1.4.3 Decision Guidelines and Management Actions 217

13.1.4.4 Allocation and Fishing Plans 218

13.1.4.4.1 First Nations Fisheries 218

13.1.4.4.2 Recreational Fisheries 219

13.1.4.4.3 Commercial Fisheries 220

13.1.4.4.4 ESSR Fisheries 221

13.2 Northern Chum Salmon Fishing Plan 222

13.2.1 Northern Chum Overview 225

13.2.1.1 Northern Chum Enhancement Information: 225

13.2.2 Haida Gwaii Chum – Overview 226

13.2.2.1 Snapshot Overview and Map of Management Unit 226

13.2.2.2 Stock Assessment Information 227

13.2.2.2.1 Pre-season 227

13.2.2.2.2 In-Season 227

13.2.2.3 Decision Guidelines and Management Actions 227

13.2.2.4 Incidental Harvest, By-catch and Constraints to Fisheries 227

13.2.2.5 Allocation and Fishing Plans 228

13.2.2.5.1 First Nations Fisheries 228

13.2.2.5.2 Recreational Fisheries 229

13.2.2.5.3 Commercial Fisheries 230
13.2.2.5.4 ESSR Fisheries 231
13.2.3 Skeena-Nass Chum 231
13.2.3.1 Snapshot Overview and Map of Management Unit 231
13.2.3.2 Stock Assessment Information 232
13.2.3.2.1 Pre-season 232
13.2.3.2.2 In-season 233
13.2.3.3 Decision Guidelines and Management Actions 233
13.2.3.4 Incidental Harvest, By-catch and Constraints to Skeena and Nass Chum Fisheries 234
13.2.3.5 Allocation and Fishing Plans 235
13.2.3.5.1 First Nations Fisheries 235
13.2.3.5.2 Recreational Fisheries 237
13.2.3.5.3 Commercial Fisheries 237
13.2.3.5.4 ESSR Fisheries 238
13.2.4 Central Coast Chum 239
13.2.4.1 Snapshot Overview and Map of Management Unit 239
13.2.4.2 Stock Assessment Information 239
13.2.4.2.1 Pre-season 239
13.2.4.2.2 In-season 240
13.2.4.3 Decision Guidelines and Management Actions 240
13.2.4.4 Incidental Harvest, By-catch and Constraints to Central Coast Chum Fisheries 242
13.2.4.5 Allocation and Fishing Plans 243
13.2.4.5.1 First Nations Fisheries 243
13.2.4.5.2 Recreational Fisheries 244
13.2.4.5.3 Commercial Fisheries 245
13.2.4.5.4 ESSR Fisheries 247
13.3 Northern Coho Salmon Fishing Plan 248
13.3.1 Northern Coho Overview 250
13.3.1.1 Northern Coho Enhancement Information: 250
13.3.2 Northern Coho 251

13.3.2.1 Snapshot Overview and Map of Management Unit 251

13.3.2.2 Stock Assessment Information 252

13.3.2.2.1 Pre-season 252

13.3.2.2.2 In-season Assessment 252

13.3.2.3 Decision Guidelines and Management Actions 253

13.3.2.4 Incidental Harvest, By-Catch and Constraints to Northern Coho Fisheries 253

13.3.2.5 Allocation and Fishing Plans 254

13.3.2.5.1 First Nations Fisheries 254

13.3.2.5.2 Recreational Fisheries 256

13.3.2.5.3 Commercial Fisheries 259

13.3.2.5.4 ESSR Fisheries 261

13.4 Northern Pink Salmon Fishing Plan 263

13.4.1 Northern Pink Salmon Overview 266

13.4.2 Haida Gwaii Pink Salmon 267

13.4.2.1 Snapshot Overview and Map of Management Unit 267

13.4.2.2 Stock Assessment Information 267

13.4.2.2.1 Pre-season 267

13.4.2.2.2 In-season 268

13.4.2.3 Decision Guidelines and Management Actions 268

13.4.2.4 Incidental Harvest, By-catch and Constraints to Haida Gwaii Pink Fisheries 268

13.4.2.5 Allocation and Fishing Plan 269

13.4.2.5.1 First Nations Fisheries 269

13.4.2.5.2 Recreational Fisheries 270

13.4.2.5.3 Commercial Fisheries 270

13.4.2.5.4 ESSR Fisheries 271

13.4.3 Skeena-Nass Pinks 272

13.4.3.1 Snapshot Overview and Map of Management Unit 272

13.4.3.2 Stock Assessment Information 273

13.4.3.2.1 Pre-season 273

13.4.3.2.2 In-season 273

13.4.3.3 Decision Guidelines and Management Actions 273

13.4.3.4 Incidental Harvest, By-catch and Constraints to Skeena and Nass Pink Fisheries 275

13.4.3.5 Allocation and Fishing Plans 276

13.4.3.5.1 First Nations Fisheries 276

13.4.3.5.2 Recreational Fisheries 278

13.4.3.5.3 Commercial Fisheries 278

13.4.3.5.4 ESSR Fisheries 280

13.4.4 Central Coast Pink Salmon 281

13.4.4.1 Snapshot Overview and Map of Management Unit 281

13.4.4.2 Stock Assessment Information 282

13.4.4.2.1 Pre-season 282

13.4.4.2.2 In-season 282

13.4.4.3 Decision Guidelines and Management Actions 282

13.4.4.3.1 In-season Decisions 282

13.4.4.4 Incidental Harvest, By-catch and Constraints to Central Coast Pink Fisheries 283

13.4.4.5 Allocation and Fishing Plans 285

13.4.4.5.1 Recreational Fisheries 285

13.4.4.5.2 Commercial Fisheries 287

13.4.4.5.3 ESSR Fisheries 289

13.5 Northern Sockeye Salmon Fishing Plan 290

13.5.1 Northern Sockeye Overview 294

13.5.1.1 Northern Sockeye Enhancement Information 294

13.5.2 Haida Gwaii Sockeye (Areas 1, 2W and 2E) 295

13.5.2.1 Snapshot Overview and Map of Management Unit 295

13.5.2.2 Stock Assessment Information 296

13.5.2.2.1 Pre-season 296

13.5.2.2.2 In-season 296

13.5.2.3 Decision Guidelines and Management Actions 296

13.5.2.4 Incidental Harvest, By-catch and Constraints to Haida Gwaii Sockeye Fisheries 296

13.5.2.5 Allocation and Fishing Plans 297

13.5.2.5.1 First Nations Fisheries 297
13.5.2.5.2 Recreational Fisheries 298
13.5.2.5.3 Commercial Fisheries 298
13.5.2.5.4 ESSR Fisheries 299
13.5.3 Nass Sockeye 300
13.5.3.1 Snapshot Overview and Map of Management Unit 300
13.5.3.2 Stock Assessment Information 301
13.5.3.2.1 Pre-season 301
13.5.3.2.2 In-season 302
13.5.3.3 Decision Guidelines and Management Actions 302
13.5.3.4 Incidental Harvest, By-catch and Constraints to Nass River Fisheries 302
13.5.3.5 Allocation and Fishing Plans 305
13.5.3.5.1 First Nations Fisheries 305
13.5.3.5.2 Recreational Fisheries 308
13.5.3.5.3 Commercial Fisheries 309
13.5.3.5.4 ESSR Fisheries 312
13.5.4 Skeena Sockeye 313
13.5.4.1 Snapshot Overview and Map of Management Unit 313
13.5.4.2 Stock Assessment Information 314
13.5.4.2.1 Pre-season 314
13.5.4.2.2 In-season Assessment 315
13.5.4.3 Decision Guidelines and Management Actions 315
13.5.4.4 Incidental Harvest, By-catch and Constraints to Skeena Sockeye Fisheries 317
13.5.4.5 Allocation and Fishing Plans 321
13.5.4.5.1 First Nations Fisheries 321
13.5.4.5.2 Recreational Fisheries 322
13.5.4.5.3 Commercial Fisheries 324
13.5.4.5.4 ESSR Fisheries 328
13.5.5 Central Coast Sockeye 330
13.5.5.1 Snapshot Overview and Map of Management Unit 330

13.5.5.2 Stock Assessment Information 330

13.5.5.2.1 Pre-season 330

13.5.5.2.2 In-season Assessment 331

13.5.5.3 Decision Guidelines and Management Actions 331

13.5.5.4 Incidental Harvest, By-catch and Constraints to Central Coast Sockeye Fisheries 331

13.5.5.5 Allocation and Fishing Plans 333

13.5.5.5.1 First Nations Fisheries 333

13.5.5.5.2 Recreational Fisheries 334

13.5.5.5.3 Commercial Fisheries 335

13.5.5.5.4 ESSR Fisheries 336

13.5.6 Rivers & Smith Inlet Sockeye 337

13.5.6.1 Snapshot Overview and Map of Management Unit 337

13.5.6.2 Stock Assessment Information 338

13.5.6.2.1 Pre-season 338

13.5.6.2.2 In-season Assessment 339

13.5.6.3 Decision Guidelines and Management Actions 339

13.5.6.4 Incidental Harvest, By-catch and Constraints to Rivers and Smith Inlet Sockeye Fisheries 341

13.5.6.5 Allocation and Fishing Plans 343

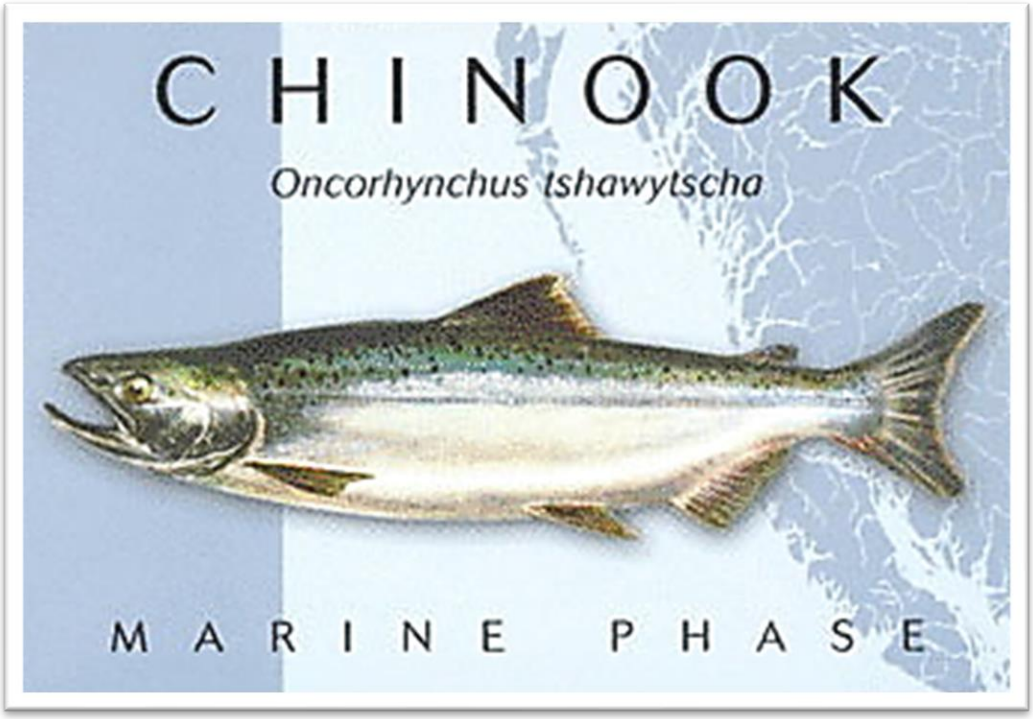
13.5.6.5.1 First Nations Fisheries 343

13.5.6.5.2 Recreational Fisheries 344

13.5.6.5.3 Commercial Fisheries 344

13.5.6.5.4 ESSR Fisheries 345

13.1 NORTHERN CHINOOK SALMON FISHING PLAN



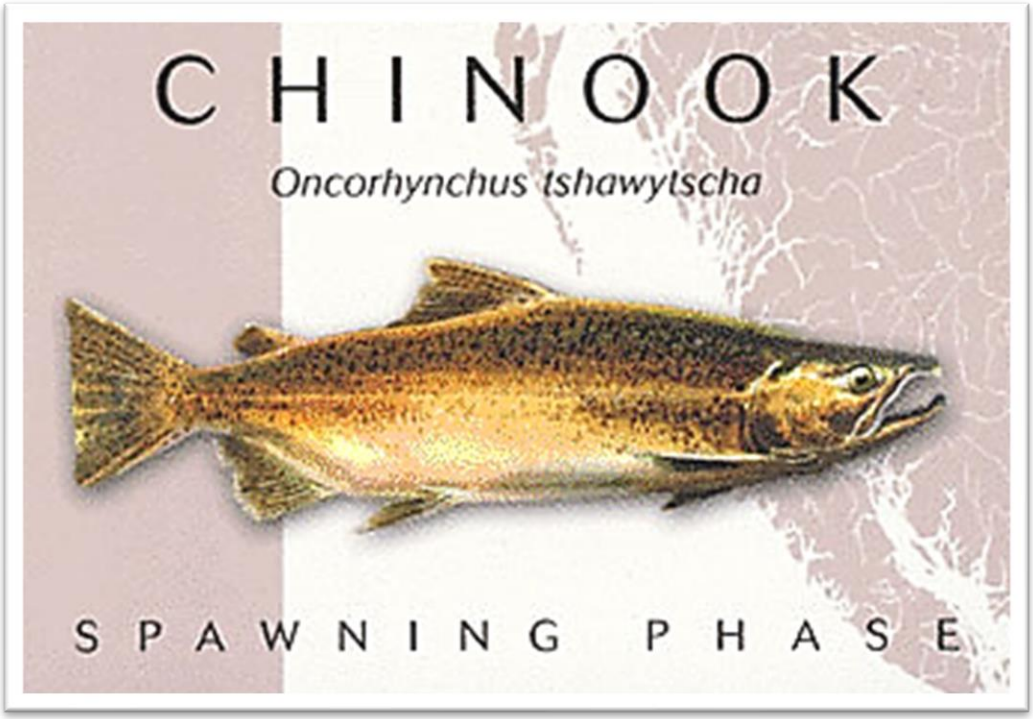


TABLE OF CONTENTS

13.1.1 Northern Chinook Overview 193

13.1.1.1 Overview of northern Chinook conservation concerns 194

13.1.1.2 Overview AABM Fisheries 194

13.1.1.3 Overview ISBM Fisheries 195

13.1.1.4 Northern Chinook Enhancement Information 195

13.1.2 Northern AABM Chinook 196

13.1.2.1 Snapshot Overview and Map of Management Unit 196

13.1.2.2 Stock Assessment Information 197

13.1.2.2.1 Pre-season 197

13.1.2.2.2 In-season 198

13.1.2.3 Decision Guidelines and Management Actions 198

13.1.2.4 Incidental Harvest, By-catch and Constraints to AABM Chinook Fisheries 200

13.1.2.5 Allocation and Fishing Plans 201

13.1.2.5.1 First Nations Fisheries 201

13.1.2.5.2 Recreational Fisheries 202

13.1.2.6 Allocation 203

13.1.2.6.1 Recreational Fisheries 203

13.1.2.6.2 Commercial Fisheries 203

13.1.2.6.3 ESSR Fisheries 206

13.1.3 Skeena-Nass ISBM Chinook 206

13.1.3.1 Snapshot Overview and Map of Management Unit 206

13.1.3.2 Stock Assessment Information 209

13.1.3.2.1 Pre-season 209

13.1.3.2.2 In-season 209

13.1.3.3 Decision Guidelines and Management Actions 209

13.1.3.4 Incidental Harvest, By-Catch and Constraints to Skeena-Nass ISBM Chinook Fisheries 210

13.1.3.5 Allocation and Fishing Plans 211

13.1.3.5.1 First Nations Fisheries 211

13.1.3.5.2 Recreational Fisheries 213
13.1.3.5.3 Commercial Fisheries 214
13.1.3.5.4 ESSR Fisheries 215
13.1.4 Central Coast ISBM Chinook 216
13.1.4.1 Snapshot Overview and Map of Management Unit 216
13.1.4.2 Stock Assessment Information 217
13.1.4.2.1 Pre-season 217
13.1.4.3 Decision Guidelines and Management Actions 217
13.1.4.4 Allocation and Fishing Plans 218
13.1.4.4.1 First Nations Fisheries 218
13.1.4.4.2 Recreational Fisheries 219
13.1.4.4.3 Commercial Fisheries 220
13.1.4.4.4 ESSR Fisheries 221

13.1.1 NORTHERN CHINOOK OVERVIEW

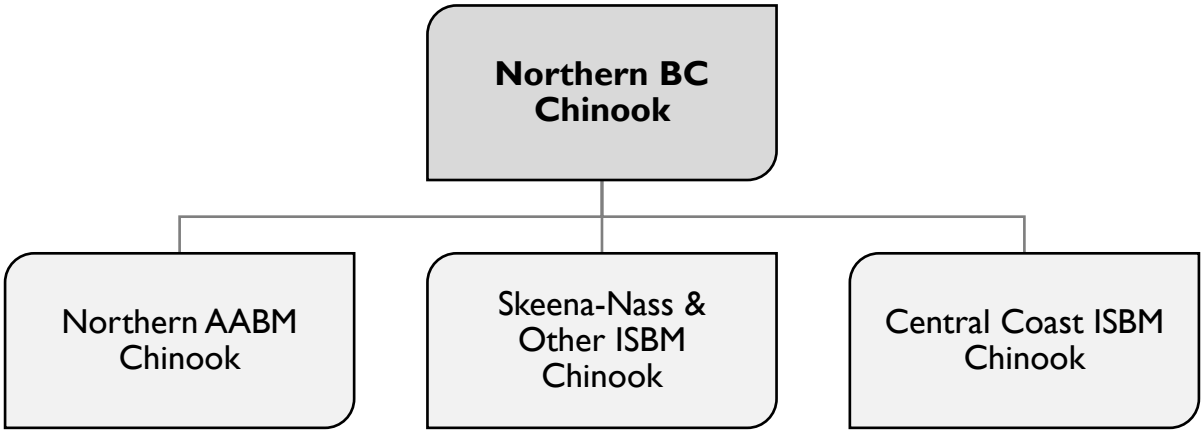


Figure 13.1-1: Overview of Northern Chinook salmon

Chinook salmon fisheries in British Columbia are managed under the umbrella of the Pacific Salmon Treaty (PST) between Canada and the United States of America. Canada's domestic management considerations include stocks of concern, allocations between sectors, and application of selective fishing practices.

With the exception of the Transboundary Rivers, the basis for managing fisheries impacting Chinook salmon from Alaska to Oregon is the Chinook abundance-based management system in Chapter 3 of the PST. This management system was adopted in 1999 and defined harvests of Chinook through 2008. Chapter 3 of the PST was revised for implementation in 2009 to maintain the abundance-based management framework established under the 1999 Agreement until 2018. This chapter was recently re-negotiated and the updated version implemented as of January 1, 2019 for a ten-year period.

Further explanation and the text of the Chinook salmon agreements can be found on the PSC website at:

https://www.psc.org/

Accounting of Chinook salmon fisheries for the PST occurs from October 1 in one calendar year, to September 30 in the next calendar year.

Two types of fisheries are identified in the PST, Chapter 3:

Aggregate Abundance Based Management (AABM) fisheries; and

Individual Stock Based Management (ISBM) fisheries.

Within the PST Chinook management framework, Canadian domestic policy further defines fishing opportunities. The domestic objectives or policies which affect fishing opportunities include: conservation, Canada's constitutional obligations to First Nations, the Wild Salmon Policy (WSP), An Allocation Policy for Pacific Salmon, and the Policy for Selective Fishing in Canada's Pacific Fisheries.

13.1.1.1 OVERVIEW OF NORTHERN CHINOOK CONSERVATION CONCERNS

Escapement of northern Chinook salmon declined dramatically in recent years. Reduced survival rates and productivity have been observed across British Columbia and South East Alaska. This led to unprecedented declines of northern Chinook in 2017 and triggered significant management measures that were implemented for 2018 salmon fisheries and again in 2019 through 2021. Post season evaluation of Nass and Skeena Chinook returns in 2021 remain poor. For 2022, management measures will be put in place to support conservation and promote rebuilding of Skeena Chinook. A suite of measures modelled on the actions initiated in 2018, including spatial and temporal closures and quota reductions, will be implemented in 2022. More information on the specific management actions can be found in the Recreational Fisheries sections.

To address Fraser Chinook conservation concerns for the 2022 season, the Department is continuing the precautionary approach for Fraser River Chinook populations (including Spring 42, Spring 52, Summer 52, and Fall 41) to support conservation and promote rebuilding. These measures are planned in addition to existing fishery management measures already in place. Management measures implemented in 2019 through 2021 are being reviewed to refine measures for implementation in the 2022 season for Northern BC AABM troll fisheries and further information will be released by fisheries notice.

13.1.1.2 OVERVIEW AABM FISHERIES

Chinook salmon fisheries implemented under the PST AABM management regime include three mixed-stock fisheries:

a) Southeast Alaska recreational, net and troll (SEAK);

b) Northern British Columbia troll and Haida Gwaii recreational (NBC); and

c) West Coast of Vancouver Island troll and outside recreational (WCVI).

These fisheries are managed to an annual total allowable catch (TAC) based on the forecast abundance of the aggregate of stocks that contribute to each fishery. Annual quotas for each

AABM fishery are developed by prediction of Chinook salmon abundance based upon a Cohort analysis model. For NBC fisheries, a single AABM quota is applied to troll fisheries Pacific Fishery Management Areas (PFMA) 1 to 5, 101 to 105 and 142 and to recreational fisheries in PFMA's 1, 2, 101, 102 and 142.

In Canada, conservation is the first priority in fisheries management. Once conservation obligations are met, priority access is given to First Nations for food, social, ceremonial, and treaty requirements. Once those obligations are met, priority access to Chinook salmon is provided to the recreational fishery, with commercial fisheries next in priority. Once the AABM quota is defined for the combined troll and recreational fishery, the projected recreational catch is subtracted from the TAC, with the remainder allocated to the troll fishery. Thus, the troll fishery is the first fishery to be impacted if stocks of conservation concern require management actions in NBC fisheries. Management constraints to the fishery include management for stocks of conservation concern, minimizing encounters of undersized Chinook salmon and non-target species and minimizing fisheries where legal and sublegal-sized Chinook salmon have to be released.

Canadian Chinook fisheries in all other areas of the North and Central Coast are managed as ISBM fisheries.

13.1.1.3 OVERVIEW ISBM FISHERIES

Under the PST, an ISBM fishery is an abundance-based regime that constrains to a numerical limit the total catch or the total adult equivalent mortality rate within the fisheries of a jurisdiction for a naturally spawning Chinook salmon stock or stock group. For Canadian ISBM fisheries, the agreement identifies a general obligation that limits the total adult equivalent mortality rate across all fisheries for individual stock groups to 63.5% of that which occurred in the 1979 to 1982 base period.

ISBM management regimes apply to all Chinook salmon fisheries subject to the PST that are not AABM fisheries and include marine and freshwater salmon fisheries from northern British Columbia to northern Oregon coast. ISBM fisheries for Chinook salmon in the North and Central Coast include all First Nations fisheries in both marine and fresh waters, all commercial gillnet and seine fisheries, all freshwater recreational fisheries, marine recreational fisheries in PFMA's 3 to 10, 103 to 110 and 130, and troll fisheries in PFMA's 6 to 10, 106 to 110 and 130.

13.1.1.4 NORTHERN CHINOOK ENHANCEMENT INFORMATION

The major BC North Coast DFO operation enhancement facilities that produce Chinook are:

- Kitimat River hatchery

- Snootli Creek hatchery

There are two Chinook salmon exploitation rate indicator stocks in the North Coast that rely on hatchery production of coded wire tagged releases. The Atnarko River Chinook indicator stock is produced at the Snootli Creek Hatchery and the Kitsumkalum River Chinook indicator stock is produced at Deep Creek Hatchery. Deep Creek Hatchery does not appear in the list above since it is not considered a major DFO Operations facility and these fish are raised for assessment purposes only.

The information available at the link below addresses production from major DFO Operations (OPS) facilities, contracted Community Economic Development Program hatcheries (CEDP), Public Involvement Projects (PIP) operated by volunteers, and Aboriginal Fisheries Strategy (AFS).

There are two datasets available: **Post-Season Production** from the 2020 brood year (i.e. 2021 releases, and numbers on hand for 2022 release), and the **Production Plan**, which includes proposed targets for the upcoming 2022 brood year. These are available at the following website:

http://www.pac.dfo-mpo.gc.ca/sep-pmvs/projects-projets/ifmp-pgip-eng.html

13.1.2 NORTHERN AABM CHINOOK

13.1.2.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT

An AABM fishery is an abundance-based regime that constrains catch or total mortality to a numerical limit computed from a pre-season forecast of abundance, from which a harvest rate index can be calculated, expressed as a proportion of the 1979 to 1982 base period. Although in-season estimates of abundance are permitted under the PST, none have been approved by the Chinook Technical Committee (CTC) for use in Canadian AABM fisheries.

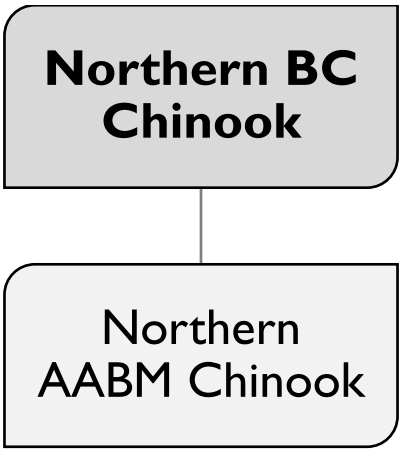


Figure 13.1-2: Overview of Northern AABM Chinook

The Northern AABM fishery includes commercial troll caught Chinook salmon in Pacific Fishery Management Areas 1 to 5, 101-105 and 142 and recreational Chinook fisheries in Haida Gwaii in Areas 1, 2, 101, 102 and 142.

The AABM Chinook fishery targets Canadian and U.S. origin wild and enhanced Chinook populations. The main components of the harvest are U.S. and Fraser origin Chinook; however, most BC Chinook conservation units may be encountered in this area. Most of the catch consists of mature fish migrating to spawn but a small portion of the catch includes immature or rearing fish (feeders).

13.1.2.2 STOCK ASSESSMENT INFORMATION

13.1.2.2.1 Pre-season

See Appendix 9 for more information.

The Chinook Technical Committee (CTC) provides a final calibration of the Chinook Model annually. The completed calibration provides the Abundance Indices (AI) that are required for determining the pre-season estimated allowable catches for the three AABM fisheries.

The Chinook Technical Committee (CTC) provides a final calibration of the Chinook Model annually. The completed calibration provides the Abundance Indices (AI) that are required for determining the pre-season estimated allowable catches for the three AABM fisheries.

Pre-season Abundance indices and associated allowable catches for the October 1, 2020 to September 30, 2021 NBC AABM Fisheries:	SEAK	NBC	WCVI
Abundance Index	7.02(CPUE)*	1.17	0.88
Allowable Catch	266,585	142,800	100,700

*SEAK uses a CPUE model (not an AI) to determine annual allowable catch

13.1.2.2.2 In-season

Sport and troll catch and effort in NBC are monitored in-season. Genetic samples are collected from Chinook salmon caught in both fisheries and troll fishery samples are analyzed in-season. Troll effort data are monitored to help inform the effort-based approach to predict WCVI Chinook harvest rates by the Area F Troll fishery.

13.1.2.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Within the PST Chinook management framework, Canadian domestic policy further defines fishing opportunities. The domestic objectives or policies which will most affect fishing opportunities include conservation, Canada's constitutional obligations to First Nations, the WSP, *An Allocation Policy for Pacific Salmon, and the Policy for Selective Fishing in Canada's Pacific Fisheries*. Domestic conservation concerns may reduce the TAC to levels less than identified under the PST Chinook AABM fisheries.

When there is a TAC identified for the AABM management area, targeted Chinook fisheries are planned for recreational and commercial sectors. The table below describes management measures that will be taken to minimize impacts on stocks of concern in AABM Chinook fisheries.

Table 13.1-1: Stock management actions anticipated in Northern British Columbia AABM Chinook fisheries to limit impacts on stocks of concern

Stock of Concern (constraint)	First Nations (FN) Fishery	Recreational Fishery	Commercial Fishery
Nass / Skeena Chinook	No impacts on First Nations fisheries anticipated	Management actions to reduce impacts on Skeena Chinook stocks during peak Skeena timing. AABM: • 1 per day, 2 possession June 15 – July 31 ISBM: • 1 per day, 2	Area F – Delayed fishery opening to approximately mid-August will avoid the majority of Nass/Skeena Chinook stocks.
WCVI Chinook	No impacts on First Nations fisheries anticipated	No impacts on North Coast recreational fisheries anticipated	Area F – restrictions in the North Coast troll fishery to limit ER to 3.2%. Time and area closures and effort limits.
Fraser River Chinook	No impacts on First Nations fisheries anticipated	No impacts on North Coast recreational fisheries anticipated	Delayed fishery opening to mid-August to minimize impacts on Fraser River 4_2 and 5_2 Chinook.

The Department manages domestic stocks of concern using various approaches. Management actions in northern fisheries to reduce impacts on Fraser River 4_2 and 5_2 Chinook includes delaying the start of the Area F Troll fishery to allow these stocks to migrate through the area. The Area F Chinook troll fishery is also managed to limit its catch of WCVI Chinook to 3.2% of the return to Canada. The Department developed and implemented an in-season management tool to estimate the WCVI harvest rate in 2014. This approach uses the historical daily fishing effort daily WCVI Chinook catch derived from DNA-based stock composition estimates and post-season estimates of WCVI returns to Canada.

For 2022, the Area F fishery will be delayed until approximately mid-August in order to minimize impacts on Fraser stream-type Chinook.

The Department will continue to collect and analyze DNA samples from the catch which will be used for post-season identification of stock composition in the catch and post-season evaluation of management objectives.

The projected catch of Chinook by the Haida Gwaii recreational Chinook fishery for 2022, is 41,700. If the in-season estimate of total annual recreational catch is expected to be less than the forecasted amount, a portion of the total AABM TAC may be reallocated to the troll fishery. In this case, the amount will be divided up amongst licences based on their in-season proportion of the troll TAC, after all transfers have been taken into account.

13.1.2.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO AABM CHINOOK FISHERIES

AABM fisheries may be subject to constraints due to concerns for specific domestic stocks and or co-migrating species (such as Coho) as described in the table below.

Fishery Period	Risk of impact on stocks of concern
Oct. – Jan	Low risk. This period is outside the migration timing and area for stocks of concern such as WCVI Chinook, Fraser River Spring 4_2 and Spring and Summer 5_2 Chinook.
Feb. – June	High risk. Specific concerns for WCVI and spring timed Fraser River 4_2 and 5_2 Chinook as these stocks are prevalent during parts of this period. For 2022 there is ongoing heightened concern for Fraser Chinook. Risk declines in August as the majority of Fraser River Spring stocks have migrated out of the area by early July and Summer 5_2 stocks are only present in very low abundance. Impacts on WCVI Chinook are reduced by time and area restrictions.
July	Low risk for WCVI Chinook. Spatial restrictions are implemented to avoid areas with higher prevalence of WCVI Chinook. Fishery is managed to ensure NBC troll impacts do not exceed 3.2% ER. Continuing high risk for Fraser River Spring 4_2 and Spring and Summer 5_2 Chinook. Management actions in 2022 will include delaying start of the troll fishery until mid-August to pass more abundant Fraser stocks to higher priority fisheries.

Fishery Period	Risk of impact on stocks of concern
August	Moderate risk. Specific concerns for WCVI Chinook as peak migration of this stock through the area occurs during August. Reduced NBC troll Chinook fishing opportunities during August. Troll effort data are monitored to help inform the effort-based approach to predict WCVI Chinook harvest rates by the Area F Troll.
September	Low Risk. WCVI Chinook may be avoided by area restrictions. Risk declines through September as most stocks of concern have migrated out of the area in September.

In addition to the poor outlook for Fraser River Spring 4_2 and 5_2 and Summer 5_2 Chinook, very poor returns are expected for Chinook across many parts of the region. The Department will therefore continue with the precautionary management strategy for 2022 that may include TAC reductions in addition to targeted time and area closures in areas where stocks of concern are prevalent. Additional restrictions may be implemented if required.

The Area F Chinook fishery will close on September 30th which is defined as the end of the AABM Chinook fishing year within Chapter 3 of the Pacific Salmon Treaty. All Chinook must be unloaded and validated within 5 days of the closure date.

13.1.2.5 ALLOCATION AND FISHING PLANS

13.1.2.5.1 First Nations Fisheries

Food, Social and Ceremonial

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe details of the FSC fishery, including the dates, times, methods, and locations of harvest. Communal licences for north coast First Nations are typically multi-species, and are issued on an annual basis. Licences may also be amended for shorter durations.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive, and at the end of each month between November 1 and March 31.

Treaty Fisheries

There are no Treaty fisheries for Northern AABM Chinook.

13.1.2.5.2 Recreational Fisheries

The recreational total annual limit for Chinook from any tidal waters was set at 10 Chinook in April 2019 as part of conservation measures to address the poor status of many Chinook stocks in BC. This annual limit will remain in place for the 2022/23 season. Recreational anglers must record all Chinook retained catch either on their licence, or if mobile internet access is immediately available, the licence holder may alternatively record catch immediately in their National Recreational Licensing System (NRLS) account. DFO is also proposing to reduce the number of slots on the recreational licence to match the annual limit in effect at the time of licence issuance, pursuant to that decision.

Sport fisheries in Canada receive priority access over commercial fisheries to Chinook salmon. Two of the largest recreational fisheries in Northern BC (NBC) occur in Haida Gwaii and Chatham Sound. NBC recreational fisheries experienced significant growth until 2005 when they reached a maximum catch of 82,000 Chinook. Since that time, catches have fluctuated between 40,000-55,000 Chinook salmon annually. AABM recreational Chinook fisheries occur in the tidal waters surrounding Haida Gwaii, with the majority of effort focused along the shoreline from Masset to Langara Island in Area 1 and between Englefield Bay and Port Louis in Area 2W. Recreational fishing occurs primarily between May and September with peak effort and catch occurring in July and August.

Daily aggregate limits and updates to recreational fisheries are provided via Fishery Notice and published on the recreational fisheries website at:
http://www.bcsportfishingguide.ca

Fishery Monitoring and Catch Reporting

DFO has been collecting recreational catch data through the Lodge Log Book Program and the Haida Creel Program since 1995. Participation in monitoring and reporting of recreational catch in Areas 1 and 2 has been excellent over the past 26 years. Monitoring is continuing to improve with region-wide initiatives.

13.1.2.6 ALLOCATION

For PST purposes, the accounting year for Chinook runs from October 1 to September 30 of the following year. The northern B.C. AABM total allowable catch (Management Areas 1 to 5) for 2022 is 142,800.

13.1.2.6.1 Recreational Fisheries

The projected catch of Chinook by the Haida Gwaii recreational Chinook fishery for 2022, based on normal limits, is 41,700. The recreational harvest will be re-assessed in-season. If the in-season estimate of total annual recreational catch is anticipated to be less than the forecasted amount, a portion of the total AABM TAC may be reallocated to the Area F troll fishery. If this is the case, the amount will be divided up amongst licences based on their in-season proportion of the troll TAC, after all transfers have been taken into account.

13.1.2.6.2 Commercial Fisheries

The preliminary Area F troll allowable catch is 101,100 (The total AABM for northern BC minus the projected recreational harvest).

Specific Conservation Measures:

The Department is implementing reductions in Chinook harvest targeted for specific stocks of concern in 2022, specifically several Fraser River stocks of concern, and Skeena River stocks. Management measures for the Area F troll fishery to reduce impacts on these stocks will include a delayed fishery opening to approximately mid-August. The fishery will be further restricted by area closures to restrict impacts to a maximum 3.2% harvest rate objective on WCVI Chinook.

Allocation

The overall TAC for northern BC Chinook fisheries is calculated using the Abundance Index (AI) determined by the Chinook Technical Committee of the PSC. The commercial TAC is derived by deducting the expected use by the Haida Gwaii recreational fleet from the overall TAC for northern BC AABM Chinook.

Table 13.1-2: Commercial Allocation Implementation Plan for the 2015–2022 period

Description	Areas	Seine A	Gill Net C	Troll F
Northern BC AABM Chinook	1, 2E, 2W, 101-105, 130, 142	*	*	100.0%[a]

Notes on Chinook allocations (North):

[*] by-catch provisions
[a] Northern BC AABM Chinook harvest

AABM Chinook Fishing Plan

Area F Troll Fishing Plan

All dates are anticipatory. Subareas open and hours of fishing will be announced in fishery notices prior to openings.

Please note: All Chinook must be validated within 5 days of a Chinook closure.

The number of Area F troll licences is 217 and the number of Chinook for each Area F licence based on an Individual Transferable Quota (ITQ) will be 0.4608 % of the Area F TAC. The troll fishery will be managed to a maximum 3.2% harvest rate on WCVI Chinook.

The Chinook fishery will be conducted under the ITQ rules. With the management measures similar to 2021 to reduce impacts on Fraser and Skeena Chinook, the opening of the fishery will be delayed to approximately mid-August. As such, there is expected to be a low likelihood of the fishery exceeding the 3.2% harvest rate on WCVI Chinook. The harvest rate is determined in-season by the relationship between effort and harvest rate developed from historical DNA catch information. The harvest rate will be validated by CWT and DNA analysis of catch post-season. The fishery will close on September 30th.

The ceiling on the number of uncaught Chinook that can be held on any single licence is the equivalent to the sum of three licence ITQ allocations which equates to 1.38% of the TAC. The amount of uncaught quota shall be determined by fisher-supplied catch reports, dockside

validations or a combination of the two. This is intended to prevent speculation and large scale amassing of quota.

All Areas and Subareas mentioned are subject to change in-season. Below is a list of areas and Subareas expected to open:

Subareas 1-1, 101-1, 101-2, 101-4, 101-5.

Those portions of Subareas 1-2, 1-3 and 1-7 that are outside and seaward of 1 nautical mile from the Graham Island and Langara Island shorelines (defined at the mean high water mark).

Subarea 1-5, inside or shoreward of a line commencing at Wiah Point then following the Subarea boundary east for one nautical mile, then running parallel to the mean high water mark of Graham Island at a distance of one nautical mile to a point true north of Skonun point, then running true south to Skonun Point.

Those portions of Subareas 101-3, 101-6 and 101-7 except those portions inside or shoreward of a line commencing at 54 degrees 14.976 minutes north latitude and 133° 04.386 minutes west longitude then true west for one nautical mile then north and east running parallel to the mean high water mark of the shorelines of Langara Island and Graham Island at a distance of one nautical mile.

That portion of Subarea 2-88 north of 53 degrees 37-minutes north latitude. Subareas 2-92, 2-97, 2-98.

That portion of Subarea 142-2 north of 53 degrees 37-minutes north latitude.

The Frederick Island Rockfish Conservation Area remains closed to hook and line fisheries (see below for description).

Those portions of Subareas 1-1, 101-1 and 142-2 that lies outside a line that: begins at 53 degrees 56.246 minutes north and 133 degrees 17.500 minutes west then true East to 53 degrees 56. 246 minutes north and 133 degrees 11.862 minutes west (Hope Point) then to 53 degrees 57.144 minutes north and 133 degrees 07.938 minutes west (Graham Island) then southerly following the shoreline of Graham Island to the intersection with 53 degrees 47.0 minutes north, then to 53 degrees 47.00 minutes north and 133 degrees 10.00 minutes west thence to the beginning point.

The above boundaries retains the 1.0 nautical mile ribbon boundary in Areas 1 and 101 following the Graham Island and Langara Island shorelines initiating at Langara Island and terminating at Skonun Point. There will be no commercial trolling shoreward of this ribbon boundary.

Fishery Monitoring and Catch Reporting

The Area F troll fishery has three levels of catch monitoring. This includes fisher-reported catch, dockside validation and dockside sampling of catch. The first level of catch monitoring is provided fisher reported catch logs. Fishers are required to provide a daily record of their catch and releases by species and area within 24 hours of landing their catch. This information is entered into the Fisheries Operating System (FOS) database by a third party service provider.

The second level of catch monitoring is dockside monitoring of Chinook landings, which is mandatory in ITQ fisheries. Therefore 100% of all offloads containing Chinook are required to be validated by a dockside validation service provider. All species are accounted for in these offloads. The third level of monitoring is dockside sampling of catch. This sampling program includes DNA sampling of Chinook as well as salmon head recovery in Chinook and Coho to estimate the stock-specific impacts of the troll fishery.

In accordance with the conditions of the Area F troll license, all vessels are required to bring all Chinook and Coho heads (or snouts if they are cut properly to include any CWT) to the dock for submission, unless the license is listed in a fisheries notice listing the Area F troll licenses that are exempted from retaining salmon heads during the 2022 fishing season. This fisheries notice is expected to be released prior to the opening of the fishery.

Poor compliance and head retention practices in past fishing seasons led to the requirement that 50% of the Area F troll fleet retain salmon heads to ensure that Canada met its obligation to sample a minimum of 20%. Salmon head recovery compliance by the Area F troll fleet has improved, since 2013 and allowed for a reduction in the number for vessels that retain salmon heads.

For 2022, the exemption rate will be approximately 70%. As in past seasons, licences that were insufficiently diligent in carrying out their conditions of license to bring in all Chinook and Coho heads will not be exempted in 2022.

13.1.2.6.3 ESSR Fisheries

There are no ESSR fisheries for northern AABM Chinook.

13.1.3 SKEENA-NASS ISBM CHINOOK

13.1.3.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT

Escapement of northern Chinook salmon declined significantly until 2017, and then recovered somewhat in 2018 due in part to improved productivity and also implementation of restrictive management measures. From 2019 through 2021, Skeena Chinook stocks continued to return at

low levels, and in 2022 a continued precautionary approach will be implemented to further promote rebuilding.

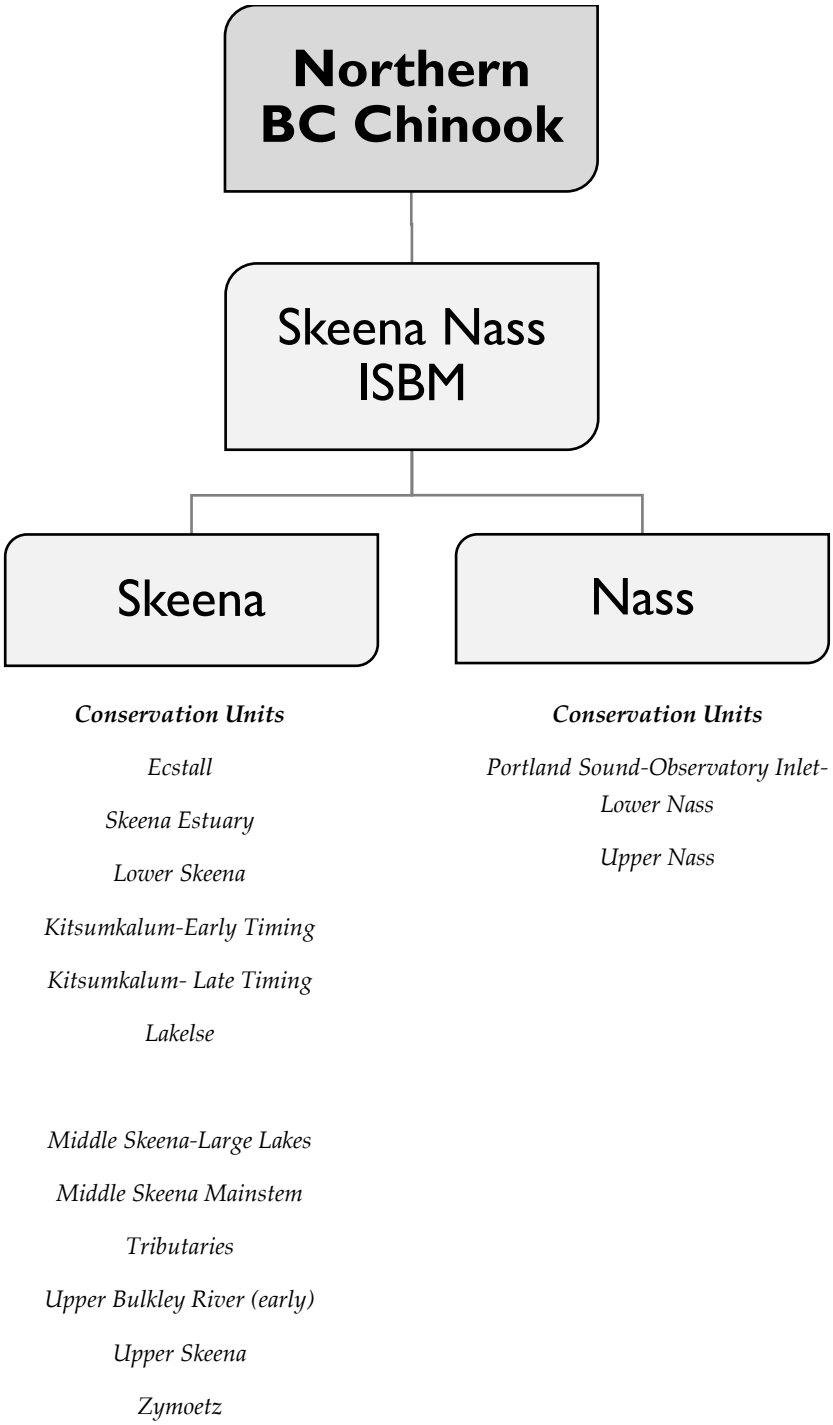


Figure 13.1-3: Overview of the Skeena-Nass ISBM Chinook

13.1.3.2 STOCK ASSESSMENT INFORMATION

13.1.3.2.1 Pre-season

Nisga'a Fisheries and Wildlife has provided an average forecasted return for Nass ISBM Chinook in 2022. Chinook returns to the Nass are anticipated to be above the escapement goal, however concerns exist over weaker stocks; particularly poor returns to Kwinageese in 2017 and low water conditions in 2018 at time of spawn.

There are no formal pre-season forecasts for Skeena ISBM Chinook stocks; however, the poor performance since 2018 and continued low returns suggests the need for a continued precautionary approach in 2022.

13.1.3.2.2 In-season

The status of North Coast Chinook stocks is evaluated primarily by observed escapements to individual streams. On the Nass, in-season assessments of Chinook stocks are conducted by Nisga'a Fisheries through fish wheel catch information. A mark-recapture program is used post-season to estimate Chinook escapements to the Nass River.

The Tyee test fishery is the main in-season stock assessment tool for estimating the relative abundance of Skeena River salmon and Steelhead through the use of a multi-panel gill net with varying mesh sizes. Daily in-season escapement estimates and total run size estimates by the Tyee test fishery are only available for Sockeye. Tyee test information requires calibration and this is only currently possible for Sockeye as a result of Babine fish fence operations which capture the majority of Skeena Sockeye. A collaborative process between DFO and SFNTC/SFC is currently underway to analyse the historical data and evaluate the use of the Tyee Test Fishery as an in-season abundance indicator for Skeena Chinook. The calibration of historical Tyee Test Fisheries indices for Chinook is being investigated using historical (1984-2021) aggregate Skeena Chinook abundances calculated based on mark-recapture estimates of the Kitsumkalum stock and the Kitsumkalum stock proportion at Tyee (GSI). Salmon returns of other species are more variable as estimates are subject to error as annual run timing and the annual catchability of salmon by the Tyee test fishery net varies.

13.1.3.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Skeena River

The returning final escapement to the Skeena River in 2022 is anticipated to be below average. A precautionary approach to management will continue in 2022 to further promote rebuilding of these stocks and to address concerns for uncertain and changing environmental conditions. Consultation with First Nations and stakeholders has been on-going to determine the appropriate management actions. Management actions will be in accordance with the allocation policy and Pacific Salmon Strategy Initiative (PSSI).

When FSC fisheries for Skeena Sockeye are closed for conservation purposes, the following will be implemented:

1 Recreational fisheries for salmon in the Skeena River will be closed.

2 Recreational marine fisheries for salmon in Area 3, 4, and 5 will have existing retention limits reduced by half.

3 Area 4 commercial fishing opportunities would be suspended.

The management actions listed above may be modified should abundances of other salmon species be sufficient to allow harvest beyond food, social, and ceremonial requirements, and will be determined in season.

Should in-season estimates indicate FSC closures are no longer warranted, these management measures would be reversed in when the FSC closures are lifted, and they do not preclude management measures already in place for each species.

Nass River

A precautionary approach to management will continue for Nass Chinook in 2022 Consultation with First Nations and stakeholders is ongoing to determinate appropriate management actions. While Nass Chinook returns are anticipated to be above the escapement goal, concerns remain for some stocks within the watershed, particularly Kwinageese Chinook, due to poor returns in 2017 and low water levels in 2018 during spawning season.

13.1.3.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO SKEENA-NASS ISBM CHINOOK FISHERIES

The management regime for Skeena Chinook in 2022 will be a continued precautionary approach. No directed commercial harvest on Skeena-Nass Chinook will be implemented in 2022. Beginning in 2022, the Area 4 Gillnet fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Any net fisheries implemented in Areas 3 through 5 will be non-retention Chinook, with potential for additional measures to avoid interception.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

13.1.3.5 ALLOCATION AND FISHING PLANS

13.1.3.5.1 First Nations Fisheries

Food, Social and Ceremonial

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe details of the FSC fishery, including the dates, times, methods, and locations of harvest. Communal licences for north coast First Nations are typically multi-species, and are issued on an annual basis. Licences may also be amended for shorter durations.

Actual opportunities and catches will be dependent on, among other factors: in-season stock strength; management measures taken to ensure conservation of individual stocks; community needs of First Nations; and alternative sources of salmon if preferred species are not available locally due to low abundance.

The Department will be actively consulting and First Nations regarding appropriate strategies in 2022 and supporting collaborative process of engagement such as the Skeena First Nations Technical Committee.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Specific Conservation Measures for First Nations Fisheries

Protective measures may be considered in terminal areas to reduce harvest impacts. Potential measures will be the subject of discussion with First Nations communities prior to development of First Nations fishing plans.

Treaty Fisheries

Nisga'a Fisheries

The Nisga'a Annual Fishing Plan (NAFP) is developed by the Nisga'a-Canada-BC Joint Fisheries Management Committee (JFMC) and governed by the terms of the Nisga'a Final Agreement and the Nisga'a Harvest Agreement of the Nisga'a Treaty. The Nisga'a Harvest Agreement includes Nisga'a fish allocations expressed as a percentage of the adjusted total allowable catch of Sockeye and Pink salmon. The NAFP is developed in accordance with Chapter 8 of the Nisga'a Final Agreement. Once approved by the Minister, the Nisga'a Annual Fishing Plan remains in effect until replaced the following year. The fishing plan applies to persons who harvest fish, other than steelhead, in Nisga'a fisheries.

Nisga'a salmon allocations, as defined in the Nisga'a Treaty, are set out as a percentage of the Total Return to Canada (TRTC) up to maximum catch thresholds (63,000 Sockeye [10.5%], 6,300 Pink [0.6%], 12,600 Chinook [21%], 19,200 Coho [8%], and 12,000 Chum [8%]) in large return years. These Nisga'a salmon allocations have the same priority in fisheries management decisions as domestic [food, social and ceremonial (FSC)] fisheries that target Nass salmon.

The NAFP defines the escapement goals required to guide management decisions for Nass salmon stocks, calculates Nisga'a allocations for each salmon species and provides the general

regulatory requirements for catches of each salmon species. The NAFP is provided to other Nass watershed First Nations for their information and is reviewed by the JFMC prior to being submitted to the Minister for approval. Nisga'a Lisims Government is responsible for the internal allocation of catch opportunities between Nisga'a fishers and day to day operation of the Nisga'a fishery.

Pre-season estimates and ranges for the Nisga'a salmon allocations in 2022 are:

Nass Chinook: Two methods (sibling and a 5-year average) are used to estimate the pre-season TRTC forecasts that are based on Total Run forecast estimates and a mean Alaska Harvest Rate (5.7%) from 2000 to 2017. The TRTC 50% probability point estimate for 2022 from the average of the two different pre-season forecast methods and a 5.7% Alaska Harvest rate (~1,300 Nass Chinook) is 22,000 with a range of point estimates from 16,000 (75% probability estimate) to 28,000 (25% probability estimate) and is projected to return below average (30,000) based on returns from 1994 to 2021. The averaging forecast method's mean absolute accuracy for predicting TRTC returns is fair to good, 74.1% (range: 12–99%) based on 2000 to 2021 returns. Based on the pre-season TRTC forecasts and the minimum escapement goal (10,000) for Nass Chinook for 2022, the Nisga'a allocation ranges between 3,500 and 6,000. While returns of Chinook to the Nass are anticipated to be above the escapement goal (15,000) in 2022, harvests in all fisheries need to be carefully monitored during the season due to poor returns in 2017 (spawners only totalled 5,000) and 2018 (extreme low water conditions during migration and spawning with spawner success potentially less than 5,000) that make up the 5- and 4-year-old returns, respectively. The mean TRTC forecast (22,000) will be used for calculating the initial target for the in-season Nisga'a allocation (4,600) of Nass Chinook for 2022. The actual Nisga'a allocation target for Nass Chinook in 2022 may be higher depending on in-season run strength and reaching the aggregate escapement goal (15,000) to account for the current Nisga'a Treaty cumulative underage (approximately 7,000) accrued from 2000 to 2021.

13.1.3.5.2 Recreational Fisheries

The recreational total annual limit for Chinook from any tidal waters was set at 10 Chinook in April 2019 as part of conservation measures to address the poor status of many Chinook stocks in BC. This annual limit will remain in place for the 2022/23 season. Recreational anglers must record all Chinook retained catch either on their licence, or if mobile internet access is immediately available, the licence holder may alternatively record catch immediately in their National Recreational Licensing System (NRLS) account. DFO is also proposing to reduce the number of slots on the recreational licence to match the annual limit in effect at the time of licence issuance, pursuant to that decision.

Recreational fisheries in Canada receive priority access to Chinook over commercial fisheries. Two of the largest recreational fisheries in Northern BC (NBC) occur in Haida Gwaii and in

Chatham Sound. NBC recreational fisheries experienced significant growth until 2005 when they reached a maximum catch of approximately 82,000 Chinook.

The recreational fisheries in Haida Gwaii and Chatham Sound are mixed stock fisheries and migrating stocks of Chinook salmon originating from Alaska to California are encountered.

The Department is developing a suite of management actions intended to promote rebuilding of Nass and Skeena Chinook. These management actions will be informed through consultations with First Nations and stakeholders in the IHPC and bilaterally.

In-season updates and fishery regulation changes can be found on the recreational fisheries website: https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

The Area 3 and 4 creel program is conducted by the North Coast Skeena First Nations Stewardship Society, and typically runs May through August.

A creel survey of freshwater recreational fisheries on the lower Skeena River watershed is conducted by Kitsumkalum Fish and Wildlife program and LGL. Information collected through this program is shared through in-season and post-season processes.

13.1.3.5.3 Commercial Fisheries

Allocation

Table 13.1-3: Commercial Allocation Implementation Plan for the 2015–2022 period

Description	Areas	Seine A	Gill Net C	Troll F
North-Inside	3 to 5	*	100.0%[d]	*

Notes on Chinook allocations (North):

[*] by-catch provisions
[d] by-catch provision and near-terminal directed fisheries (e.g. Skeena)

Skeena ISBM Chinook Fishing Plan

Area C Gill Net Fisheries

Beginning in 2022, the Area 4 Gillnet fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Fishery Monitoring and Catch Reporting

Fishery Monitoring and Catch Reporting includes the following:

Mandatory requirement to file fishing reports in all commercial fisheries, including "Start/Pause/Cancel/End" Fishing reports.

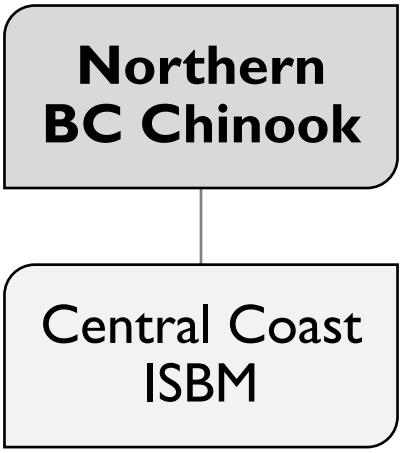
Mandatory catch reporting by phone-in with a paper harvest log and electronic transmission with an electronic harvest log (E-log) in all commercial fisheries. (*Catch reporting requirements are specific to each licence group and are detailed in the conditions of licence for each gear type*).

13.1.3.5.4 ESSR Fisheries

There are no ESSR fisheries for Chinook on the North Coast.

13.1.4 CENTRAL COAST ISBM CHINOOK

13.1.4.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT



Conservation Units

Docee

Rivers Inlet

Wannock

Bella Coola-Bentinck

Dean River

North & Central Coast-early timing

North & Central Coast-late timing

Figure 13.1-4: Overview of Central Coast ISBM Chinook

ISBM management regimes apply to all Chinook salmon fisheries subject to the PST that are not AABM fisheries and include marine and freshwater salmon fisheries from Northern British Columbia to Northern Oregon coast. ISBM fisheries in Northern BC include First Nations, recreational, and Central Coast gill net.

Atnarko Chinook

The Atnarko Chinook stock in Area 8 is an enhanced Chinook population that supports First Nations FSC and recreational fisheries, as well as a terminal commercial Chinook gill net fishery.

13.1.4.2 STOCK ASSESSMENT INFORMATION

13.1.4.2.1 Pre-season

There is no formal pre-season forecast for Central Coast ISBM Chinook.

There are no known Chinook populations within Area 7. The Outlook for Area 8 for 2022 is "below-average to average." Returns for the Bella Coola/Atnarko system have been good over the last several years with an exceptional escapement in 2015, and a slightly lower than average escapement in 2017. Should the stocks remain productive, the 2022 returns to the Bella Coola/Atnarko River should be moderate, mainly due to anticipated average 4 year, and below average 5 year age return. The outlook for Areas 9 and 10 is "below average" for the Wannock River and "below average" for Owikeno tributary stocks and the Chuckwalla/Kilbella systems based on recent trends.

There are few in-season estimates of abundance for Central Coast ISBM Chinook.

For Atnarko Chinook, commercial catch per unit effort and the Nuxalk First Nation's FSC fishery provide the best indication of run strength.

13.1.4.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Atnarko Chinook

DFO is working with local advisors and the First Nations Central Coast Salmon Coordinating Committee for advice on fisheries in these areas.

There are currently no biologically based escapement goals for Atnarko Chinook but there are estimates of the escapement required to produce maximum sustained yield (S_{MSY}) and the spawning escapement at replacement (S_{REP}). S_{MSY} was estimated to be 5,009 and the spawning escapement at replacement S_{REP} was estimated to be 14,595 (Vélez-Espino et. al. 2014).

Opportunities for a one day gill net fishery on the last week in May or the first week in June are evaluated during the pre-season planning process in November/December. If recent escapement estimates indicate an increasing or stable run, the fishery will likely go ahead. In-season, these opportunities are evaluated based mainly on First Nations FSC fishery catches with consideration of commercial and recreational catches as well.

Incidental Harvest, By-catch and Constraints to Inside Chinook ISBM Fisheries

Atnarko Sockeye continue to be a stock of concern and any fisheries will be managed to avoid or minimize impacts on these stocks. Mandatory release of Sockeye will be in place for all Area 8 commercial net fisheries for 2022.

13.1.4.4 ALLOCATION AND FISHING PLANS

13.1.4.4.1 First Nations Fisheries

First Nations Food Social and Ceremonial

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe details of the FSC fishery, including the dates, times, methods, and locations of harvest. Communal licences for North Coast First Nations are typically multi-species, and are issued on an annual basis. Licences may also be amended for shorter durations.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Specific Conservation Measures for First Nations Fisheries

Protective measures may be considered in terminal areas to reduce harvest impacts. Potential measures will be the subject of discussion with First Nations communities prior to development of fishing plans.

Treaty Fisheries

There are no treaty fisheries for Central Coast ISBM Chinook stocks.

13.1.4.4.2 Recreational Fisheries

The recreational total annual limit for Chinook from any tidal waters was set at 10 Chinook in April 2019 as part of conservation measures to address the poor status of many Chinook stocks in BC. This annual limit remained in place for 2021/22 and DFO will maintain this annual limit for the 2022/23 season. Recreational anglers must record all Chinook retained catch either on their licence, or if mobile internet access is immediately available, the licence holder may alternatively record catch immediately in their National Recreational Licensing System (NRLS) account. DFO is also proposing to reduce the number of slots on the recreational licence to match the annual limit in effect at the time of licence issuance, pursuant to that decision.

Recreational salmon fishing occurs in the tidal waters of the Central Coast (Areas 6 to 10), with interception fisheries beginning in late April and the peak of the season being from June to August. The minimum size limit for Chinook salmon is 45 cm, and the daily limit is 2. The open time is April 1st to March 31st. The possession limit for salmon is twice the daily limit.

In Area 9, a condition of licence in the recreational Tidal Waters Sport Fishing Licence, applies to all angling in the Rivers Inlet Special Management Zone (SMZ). Any anglers fishing in this area should consult the Tidal Waters Sport Fishing Regulations before commencing fishing.

Recreational harvesting occurs in Area 10 with participation by independent anglers and charter operators.

The Central Coast non-tidal waters are in Regions 5B and 6 freshwater fishing areas, and there are openings for Chinook salmon in the different watersheds at different time periods. Daily possession, annual limits, and size limits may apply, dependent on the river system.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:
https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html.

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

In Areas 6 to 9, DFO has been collecting recreational catch data through the Lodge Log Book Program.

The Heiltsuk, Kitasoo/Xai'xais, Nuxalk, and Wuikinuxv Nations, under the direction of the Central Coast Indigenous Resource Alliance (CCIRA) will continue collecting data through a creel survey and over-flight program. The program will assess recreational and First Nations' Food, Social, and Ceremonial (FSC) fisheries in marine portions of Areas 6 to 9, and in the Bella Coola River system within freshwater Region 5B Survey. Survey work will occur between June and September 2022. Recreational and Indigenous fishers should be aware that they may be approached by creel surveyors from the Nations to collect important data from these fisheries.

In Area 10, Logbook information is used to provide catch and release numbers from anglers fishing there.

13.1.4.4.3 Commercial Fisheries

Allocation and Fishing Plans

Table 13.1-4: Commercial Allocation Implementation Plan for the 2015–2021 period

Description	Areas	Seine A	Gill Net C	Troll F
Central	6 to 10	*	100.0%[b]	*[c]

Notes on Chinook allocations (North):

[*] by-catch provisions
[b] near-terminal fisheries (primarily hatchery origin)
[c] review potential re-entry of troll into Production Areas 6 + 7. By-catch provisions

Central Coast Chinook ISBM Fishing Plan

Area C

All dates are anticipatory.

Area 8: May 30 – First anticipated gill net opening in the Bella Coola gillnet area. This will be a directed Chinook fishery. Minimum mesh size 203 mm (7.99 inches).

Atnarko Chinook are harvested by the commercial gillnet fleet in North Bentinck Arm, a portion of South Bentinck Arm, Labouchere Channel and Burke Channel. A fleet of approximately 40 gill net vessels maximum using large mesh nets is normal for recent years.

Gill nets have a 203 mm (7.99 inches) mesh restriction. This restriction is in place so that Chinook are selectively targeted and other non-target species, such as sockeye, are impacted minimally.

Fishery Monitoring and Catch Reporting

Fishery Monitoring and Catch Reporting includes the following:

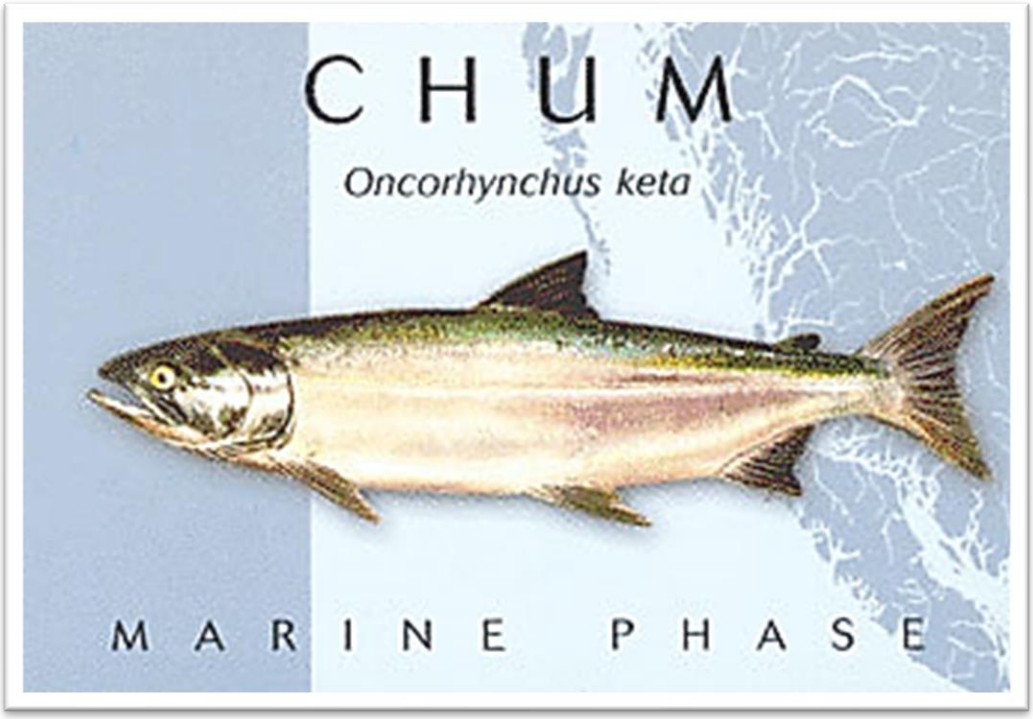
Mandatory requirement to file fishing reports in all commercial fisheries, including "Start/Pause/Cancel/End" Fishing reports.

Mandatory catch reporting by phone-in with a paper harvest log and electronic transmission with an electronic harvest log (E-log) in all commercial fisheries. (*Catch reporting requirements are specific to each licence group and are detailed in the conditions of licence for each gear type*).

13.1.4.4.4 ESSR Fisheries

There are currently no ESSR fisheries for Central Coast Chinook.

13.2 NORTHERN CHUM SALMON FISHING PLAN



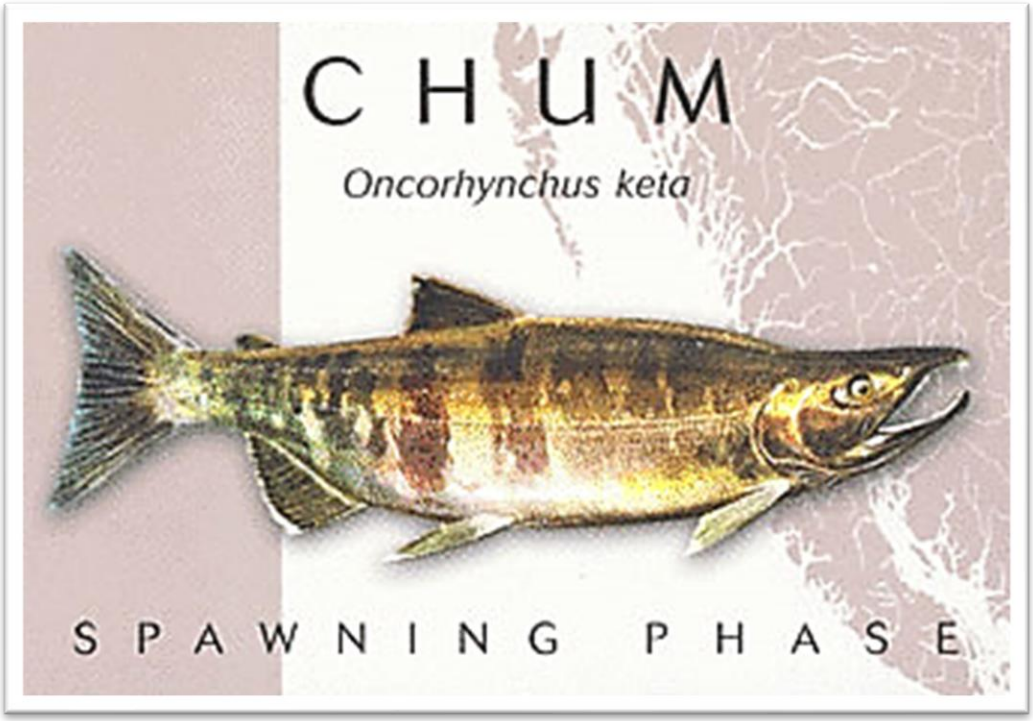


TABLE OF CONTENTS

13.2.1 Northern Chum Overview 225

13.2.1.1 Northern Chum Enhancement Information: *225*

13.2.2 Haida Gwaii Chum – Overview 226

13.2.2.1 Snapshot Overview and Map of Management Unit *226*

13.2.2.2 Stock Assessment Information *227*

13.2.2.2.1 Pre-season 227

13.2.2.2.2 In-Season 227

13.2.2.3 Decision Guidelines and Management Actions *227*

13.2.2.4 Incidental Harvest, By-catch and Constraints to Fisheries *227*

13.2.2.5 Allocation and Fishing Plans *228*

13.2.2.5.1 First Nations Fisheries 228

13.2.2.5.2 Recreational Fisheries 229

13.2.2.5.3 Commercial Fisheries 230

13.2.2.5.4 ESSR Fisheries 231

13.2.3 Skeena-Nass Chum 231

13.2.3.1 Snapshot Overview and Map of Management Unit *231*

13.2.3.2 Stock Assessment Information *232*

13.2.3.2.1 Pre-season 232

13.2.3.2.2 In-season 233

13.2.3.3 Decision Guidelines and Management Actions *233*

13.2.3.4 Incidental Harvest, By-catch and Constraints to Skeena and Nass Chum Fisheries *234*

13.2.3.5 Allocation and Fishing Plans *235*

13.2.3.5.1 First Nations Fisheries 235

13.2.3.5.2 Recreational Fisheries 237

13.2.3.5.3 Commercial Fisheries 237

13.2.3.5.4 ESSR Fisheries 238

13.2.4 Central Coast Chum 239

13.2.4.1 Snapshot Overview and Map of Management Unit *239*

13.2.4.2 Stock Assessment Information *239*

13.2.4.2.1 Pre-season 239

13.2.4.2.2 In-season 240

13.2.4.3 Decision Guidelines and Management Actions 240

13.2.4.4 Incidental Harvest, By-catch and Constraints to Central Coast Chum Fisheries 242

13.2.4.5 Allocation and Fishing Plans 243

13.2.4.5.1 First Nations Fisheries 243

13.2.4.5.2 Recreational Fisheries 244

13.2.4.5.3 Commercial Fisheries 245

13.2.4.5.4 ESSR Fisheries 247

13.2.1 NORTHERN CHUM OVERVIEW

Chum salmon have the most extensive geographic distribution of all the salmon species and can be found from northern California to Alaska, including the Aleutian Islands, as well as the Yukon and Mackenzie rivers in the Arctic.

Returns are predominately age 3 to 5 fish and in some systems are the latest of the five salmon species to enter their natal rivers and stream to spawn. Chum salmon have pale flesh and a low fat content, and are usually marketed as a fresh, frozen or smoked product.

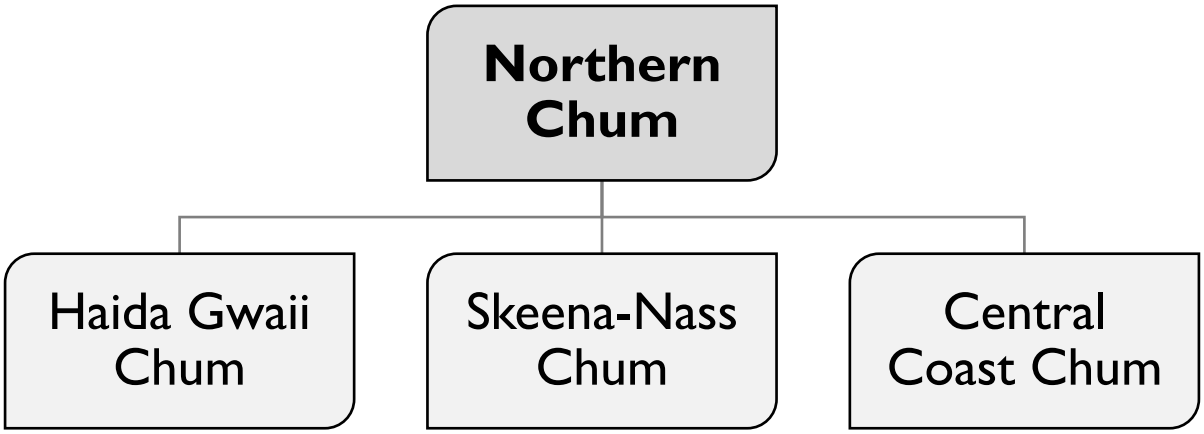


Figure 13.2-1: Overview of Northern Chum

13.2.1.1 NORTHERN CHUM ENHANCEMENT INFORMATION:

The major BC North Coast DFO operation enhancement facilities that produce Chum are:

- Kitimat River hatchery
- Snootli Creek hatchery

The information available at the link below addresses production from major DFO Operations (OPS) facilities, contracted Community Economic Development Program hatcheries (CEDP), Public Involvement Projects (PIP) operated by volunteers, and Aboriginal Fisheries Strategy (AFS).

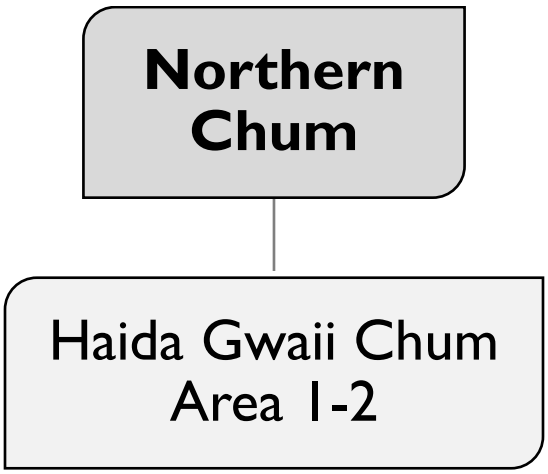
There are two datasets available: **Post-Season Production** from the 2020 brood year (i.e. 2021 releases, and numbers on hand for 2022 release), and the **Production Plan**, which includes proposed targets for the upcoming 2022 brood year. These are available at the following website:

http://www.pac.dfo-mpo.gc.ca/sep-pmvs/projects-projets/ifmp-pgip-eng.html

NORTHERN BC CHUM – SEP PROPOSALS OR UPDATES FOR 2022

- Noosgulch and Nusatsum chum are being considered for small pilot rebuilding projects (50K egg targets each)
- Pending further discussion and consultation on longer term fishery closures, lines of production for harvest impacted by these fishery changes will be re-assessed and have their release targets adjusted to re-align hatchery production with intended objectives. Haida Gwaii Chum – Overview

13.2.1.2 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT



Conservation Units

East Haida Gwaii

North Haida Gwaii

North Haida Gwaii/Stanley Creek
Skidegate

West Haida Gwaii

Figure 13.2-2: Overview of Haida Gwaii Chum

Historically, terminal Chum salmon harvesting opportunities have occurred in a variety of wild stock locations in Haida Gwaii. In general, returns to Haida Gwaii have been below management targets. Chum returns have declined to levels where fishing opportunities for commercial net fisheries are infrequent. The size of the runs to these systems can usually be determined by observations of fish holding in front of the streams and the historic average run timing for that system. Chum net fisheries will be managed in-season on a local basis.

13.2.1.3 STOCK ASSESSMENT INFORMATION

13.2.1.3.1 Pre-season

Beginning in 2022, additional mitigation measures will be implemented in this fishery to increase protection for stocks of conservation concern. These measures include enhanced and more precautionary application of current measures (terminal fisheries, small and short duration fisheries, timing and boundary changes to avoid Coho. See Appendix 10 for a complete list of fisheries where additional mitigations measures will be implemented.

Formal quantitative forecasts are not prepared for Haida Gwaii Chum. See Appendix 9 for more information. Based on low abundance over the last several years, Haida Gwaii Chum salmon harvest opportunities are expected to be limited in 2022.

13.2.1.3.2 In-Season

Monitoring to determine incoming runs throughout the season will be concentrated on the east coast of Haida Gwaii between Skidegate Inlet and Darwin Sound, and on the west coast between Dawson Inlet and Tasu Sound.

13.2.1.4 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Terminal net fishery openings are based on fish observed to be schooling in front of the various systems. Fisheries will only be considered if the estimated return of salmon is sufficient to meet escapement goals. The size of the return will be estimated by charter patrolmen using visual assessments.

For Area F troll, there will be non-retention of Chum in effect to protect Haida Gwaii and northern mainland BC Chum stocks.

13.2.1.5 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO FISHERIES

Assessment of escapements to streams in and near any identified surpluses to be harvested will need to be conducted. Conservation of smaller and/or weaker returning stocks that may be affected by a potential harvest opportunity may influence the timing and/or location of the fishery or may result in the foregoing of the fishery.

Coho by-catch may be a concern in some areas; brailing by seines and the use of revival tanks by both gill nets and seines may be required.

To minimize the amount of by-catch, all fisheries will be held during daylight hours, generally 11 or 12 hour days during September reducing to 10 or 11 hour days in October.

All net fisheries are managed so that catch may be delivered within two days, at the request of the commercial industry.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

13.2.1.6 ALLOCATION AND FISHING PLANS

13.2.1.6.1 First Nations Fisheries

Food Social and Ceremonial

First Nations opportunities to harvest salmon for FSC purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe details of the FSC fishery, including the dates, times, methods, and locations of harvest. Communal licences for north coast First Nations are typically multi-species, and are issued on an annual basis. Licences may also be amended for shorter durations.

Actual opportunities and catches will be dependent on, among other factors: in-season stock strength; management measures taken to ensure conservation of individual stocks; community needs of First Nations; and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in the Northern BC / First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

There are no Treaty fisheries for Haida Gwaii Chum.

13.2.1.6.2 Recreational Fisheries

Recreational salmon fishing occurs primarily in the tidal waters surrounding Haida Gwaii, with the majority of effort focused along the shoreline from Masset to Langara Island in Area 1 and between Englefield Bay and Port Louis in Area 2W. Recreational fishing occurs primarily between May and September with peak effort and catch occurring in July and August. Chum salmon are incidentally retained in the recreational fishery which primarily targets Chinook and Coho salmon. The daily aggregate limit of salmon is four (4) per day and a maximum 2 of which may be Chinook.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:
https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

DFO has been collecting recreational catch data through the Lodge Log Book Program and the Haida Creel Program since 1995. Participation in monitoring and reporting of recreational catch in Areas 1 and 2 has been excellent over the past 27 years. Monitoring is continuing to improve with region wide initiatives.

13.2.1.6.3 Commercial Fisheries

Allocation

Table 13.2-1: Commercial Allocation Implementation Plan for the 2015–2022 period

Description	Areas	Seine A	Gill Net C	Troll F
North	1, 2E, 2W, 101 to 111, 130, 142	54.0%	43.0%	3.0%

Haida Gwaii Chum Fisheries

Area A

Mid-September to October: Possible terminal fisheries directed on identified surpluses of local Chum stocks in Areas 1, 2E and 2W.

No gill net or seine fisheries will be directed on passing stocks.

Area C

Beginning in 2022, additional mitigation measures will be implemented in this fishery to increase protection for stocks of conservation concern. These measures include enhanced and more precautionary application of current measures (terminal fisheries, small and short duration fisheries, timing and boundary changes to avoid Coho. See Appendix 10 for a complete list of fisheries where additional mitigations measures will be implemented.

Appendix 10**Mid-September to October**: Possible terminal fisheries directed on identified surpluses of local Chum stocks in Areas 1, 2E and 2W.

No gill net or seine fisheries will be directed on passing stocks.

Area F Troll

Due to ongoing low abundance for Haida Gwaii and Northern Mainland stocks Chum retention will not be permitted.

Fishery Monitoring and Catch Reporting

Fishery Monitoring and Catch Reporting includes the following:

Mandatory requirement to file fishing reports in all commercial fisheries, including "Start/Pause/Cancel/End" Fishing reports.

Mandatory catch reporting by phone-in with a paper harvest log and electronic transmission with an electronic harvest log (E-log) in all commercial fisheries. (*Catch reporting requirements are specific to each licence group and are detailed in the conditions of licence for each gear type*).

13.2.1.6.4 ESSR Fisheries

There are no ESSR fisheries anticipated for Haida Gwaii Chum.

13.2.2 SKEENA-NASS CHUM

13.2.2.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT

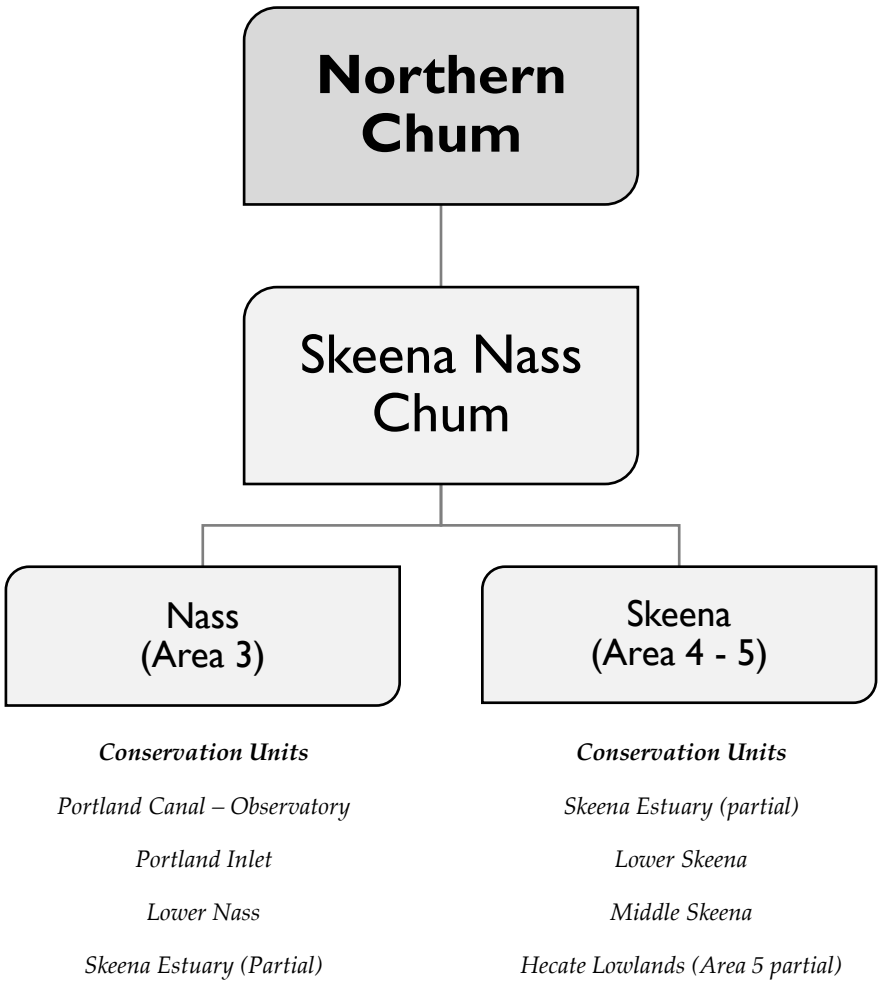


Figure 13.2-3: Overview of Skeena-Nass Chum

Chum salmon are the least abundant salmon species in Areas 3 to 5 and return to the fewest number of streams.

Nass and Skeena River-destined Chum are considered depressed and thus directed-effort by commercial fisheries on wild stocks is not permitted. There are some limited commercial opportunities as by-catch in Pink and Sockeye-directed fisheries in Area 3 when enhanced Chum are present. Rebuilding plans for both stocks can be found in Appendix 7 and Appendix 8.

13.2.2.2 STOCK ASSESSMENT INFORMATION

13.2.2.2.1 Pre-season

Formal quantitative forecasts are not prepared for Nass or Skeena (Area 3 to 4) Chum. See Appendix 9 for more information. Chum salmon surpluses are not expected in 2022.

Table 13.2-2: Management Escapement Goals (MEGs) and escapements for major Chum systems in Areas 3-5. Note: MEGs were developed in the 1980s and require review.

Area	System	MEG	2021*	2020	2019	2018	2017	2016	2015	2014	2013
3	Khutzeymateen River	20,000	2,510	123.342	68,000	6,600	N/I	N/I	31000	5100	4800
3	Kshwan River	15,000	55,461	13,918	7,310	18,686	7,272	820	17400	N/I	1100
3	Stagoo Creek	15,000	10,602	152,080	6,367	9,164	6,804	8,139	6758	8200	7100
3	Toon River	7,000	N/I	37,800	9,000	2,091	N/I	N/I	N/I	N/I	1080
4	Ecstall River	20,000	135	15	610	130	255	3,351	A/P	A/P	A/P
5	No major producers										

N/I defines Not Inspected, and A/P defines that Adults were present but that an estimate was not developed due to a lack of sufficient inspection information.

13.2.2.2.2 In-season

Returns of Chum salmon to the Nass River are monitored through the fish wheel program operated by Nisga'a Fisheries and by escapement surveys to indicator systems. Chum stocks are managed to stream-specific escapement goals in Area 3.

The Tyee test fishery on the Skeena River is the main indicator for relative abundance of Chum salmon in Areas 4 and 5 through the use of a multi-panel gill net with varying mesh sizes. Returns are variable and estimates are subject to error as annual run timing and catchability of salmon by the Tyee test fishery net varies.

13.2.2.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Commercial fisheries in Areas 3 to 5 will be managed to avoid wild Chum stocks. There will be no opportunities for directed harvest on wild Nass or Skeena Chum.

Retention of Chum in Area 3 will be permitted as by-catch in times and areas coinciding with high abundances of enhanced Chum, while still meeting the objective of maintaining reduced impact on Canadian wild stocks. All other times and areas will remain non-retention/non-possession of Chum in Area 3 fisheries. Otolith and DNA samples may be collected in Area 3 to determine the presence of US hatchery Chum in both retention and non-retention areas.

When FSC fisheries for Skeena Sockeye are closed for conservation purposes, the following will be implemented:

- Recreational fisheries for salmon in the Skeena River will be closed.
- Recreational marine fisheries for salmon in Area 3, 4, and 5 will have existing retention limits reduced by half.
- Area 4 commercial fishing opportunities would be suspended.

The management actions listed above may be modified should abundances of other salmon species be sufficient to allow harvest beyond food, social, and ceremonial requirements, and will be determined in season.

Should in-season estimates indicate FSC closures are no longer warranted, these management measures would be reversed in when the FSC closures are lifted, and they do not preclude management measures already in place for each species.

13.2.2.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO SKEENA AND NASS CHUM FISHERIES

Area 3:

Area 3 Chum are considered a stock of concern and will require focused management planning. A rebuilding plan can be found in Appendix 7. Fisheries will continue to be managed to reduce impacts to Canadian Chum. Part of the rebuilding plan for the immediate future is to keep the Canadian average exploitation rate (ER) on Area 3 and 4 Chum below 10%.

Commercial fisheries are limited to daylight hours.

Non-retention of Steelhead is mandatory in all fisheries.

Gill nets have a 137mm (5.39 inch) maximum mesh restriction. This restriction is in place so that Sockeye is targeted and larger, non-target species such as Chum and Chinook are impacted to a lesser degree.

Pink fishing opportunities will be managed to conserve weak stocks of Area 3 Chum.

Area 4:

Retention of Chum and Steelhead is prohibited in all fisheries.

Gill nets have a 137 mm (5.39 inch) maximum mesh restriction during the Sockeye fishery. This restriction is in place so that Sockeye is targeted and larger, non-target species such as Chum and Chinook are impacted to a lesser degree.

Skeena Chum remain a stock of concern and Canadian harvest impacts will be limited to a maximum exploitation rate of 10%. This is a ceiling and harvest impacts would be expected to be well below this level in most years. It is anticipated that these management measures will be in place for an extended period. A rebuilding plan for Skeena Chum can be found in Appendix 8.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

13.2.2.5 ALLOCATION AND FISHING PLANS

13.2.2.5.1 First Nations Fisheries

First Nations opportunities to harvest salmon for FSC purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe details of the FSC fishery, including the dates, times, methods, and locations of harvest. Communal licences for north coast First Nations are typically multi-species, and are issued on an annual basis.

Licences may also be amended for shorter durations.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in the Northern BC First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

Nisga'a Fisheries

The Nisga'a Annual Fishing Plan (NAFP) is developed by the Nisga'a-Canada-BC Joint Fisheries Management Committee (JFMC) and governed by the terms of the Nisga'a Final Agreement and the Nisga'a Harvest Agreement of the Nisga'a Treaty. The Nisga'a Harvest Agreement includes Nisga'a fish allocations expressed as a percentage of the adjusted total allowable catch of Sockeye and Pink salmon. The NAFP is developed in accordance with Chapter 8 of the Nisga'a Final Agreement. Once approved by the Minister of Fisheries, the Nisga'a Annual Fishing Plan remains in effect until replaced the following year. The fishing plan applies to persons who harvest fish, other than steelhead, in Nisga'a fisheries.

Nisga'a salmon allocations, as defined in the Nisga'a Treaty, are set out as a percentage of the Total Return to Canada (TRTC) up to maximum catch thresholds (63,000 Sockeye [10.5%], 6,300 Pink [0.6%], 12,600 Chinook [21%], 19,200 Coho [8%], and 12,000 Chum [8%]) in large return years. These Nisga'a salmon allocations have the same priority in fisheries management decisions as domestic [food, social and ceremonial (FSC)] fisheries that target Nass salmon.

The NAFP defines the escapement goals required to guide management decisions for Nass salmon stocks, calculates Nisga'a allocations for each salmon species and provides the general regulatory requirements for catches of each salmon species. The NAFP is provided to other Nass watershed First Nations for their information and is reviewed by the JFMC prior to being submitted to the Minister for approval. Nisga'a Lisims Government is responsible for the internal allocation of catch opportunities between Nisga'a fishers and day to day operation of the Nisga'a fishery.

Pre-season estimates and ranges for the Nisga'a salmon allocations in 2022 are:

Nass Chum: The Total Run size probability point estimate for 2022 from a pre-season model based on a 4-year average brood return is 55,000 (50%) with a range in point estimates between 33,000 (75%) and 92,000 (25%). Assuming a 11% Alaskan exploitation rate (based on the average of even-year harvests from 2010 to 2020, approximately 6,000 Nass Chum), the 50% probability point estimate for the Total Return to Canada (TRTC) of Nass Chum is 61,000 with a range of point estimates from 37,000 (75% probability) to 97,000 (25% probability) and is projected to return above average (54,000) based on returns from 1994 to 2021. The forecast method's mean absolute accuracy for predicting TRTC returns is poor, only 50.1% (range: 20–94%) and highly variable over the past five years (2017 to 2021) of Nass Chum returns. Based on the pre-season TRTC forecasts and the minimum escapement goal (30,000) for 2022, the Nisga'a allocation of Nass Area Chum ranges between <500 (incidental by-catch only) and 7,800 with a point estimate of 4,900 (50% probability). To support reaching the escapement goal (45,000) with

highly variable pre-season forecasts and relatively low decadal returns, a base TRTC forecast (50,000) will be used for calculating the initial target for the in-season Nisga'a allocation (4,000) of Nass Area Chum for 2022. The actual Nisga'a allocation target for Nass Chum in 2022 may be higher depending on in-season run strength and reaching aggregate escapement goal (45,000) to account for the current cumulative Nisga'a Treaty underage (approximately 7,700) accrued from 2000 to 2021.

13.2.2.5.2 Recreational Fisheries

Due to the fact that both Nass and Skeena Chum are subject to rebuilding plans, the daily limit for Chum salmon is zero.

The Skeena and Nass Rivers are in Region 6 freshwater fishing area, and are closed to fishing for Chum salmon.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:
https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

The Area 3 and 4 creel program operated by the North Coast Skeena First Nations Stewardship Society typically runs from May 1 to August 31. Information collected through this program is shared through in-season and post-season processes.

A creel survey of freshwater recreational fisheries on the lower Skeena River watershed is conducted by Kitsumkalum Fish and Wildlife program and LGL. Information collected through this program is shared through in-season and post-season processes.

13.2.2.5.3 Commercial Fisheries

Table 13.2-2: Commercial Allocation Implementation Plan for the 2015–2021 period

Description	Areas	Seine A	Gill Net C	Troll F
North	3 to 5	55.0%[b]	45.0%[b]	*

Notes on Chum allocations (North):

[b] recent Chum non-retention; fishery allows by-catch of Chum
[*] by-catch provision

Area A (Seine) and Area C (Gillnet)

There will be no directed commercial opportunities for wild Nass or Skeena Chum.

Retention of Chum as by-catch in Area 3 will be permitted in times and areas coinciding with high abundances of enhanced Chum, while still meeting the objective of maintaining reduced impact on Canadian wild stocks. All other times and areas will remain non-retention/non-possession of Chum in Area 3 fisheries. Otolith and DNA samples may be collected in Area 3 to determine the presence of US hatchery Chum in both retention and non-retention area. All fisheries will be announced via fishery notice.

Area F (Troll)

There will be non-retention of Chum in effect all year in Dixon Entrance and Hecate Strait to protect wild Skeena and Nass Chum.

Fishery Monitoring and Catch Reporting

Mandatory requirement to file fishing reports in all commercial fisheries, including "Start/Pause/Cancel/End" Fishing reports.

Mandatory catch reporting by phone-in with a paper harvest log and electronic transmission with an electronic harvest log (E-log) in all commercial fisheries. *(Catch reporting requirements are specific to each licence group and are detailed in the conditions of licence for each gear type).*

13.2.2.5.4 ESSR Fisheries

There are no ESSR fisheries for Skeena or Nass Chum.

13.2.3 CENTRAL COAST CHUM

13.2.3.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT

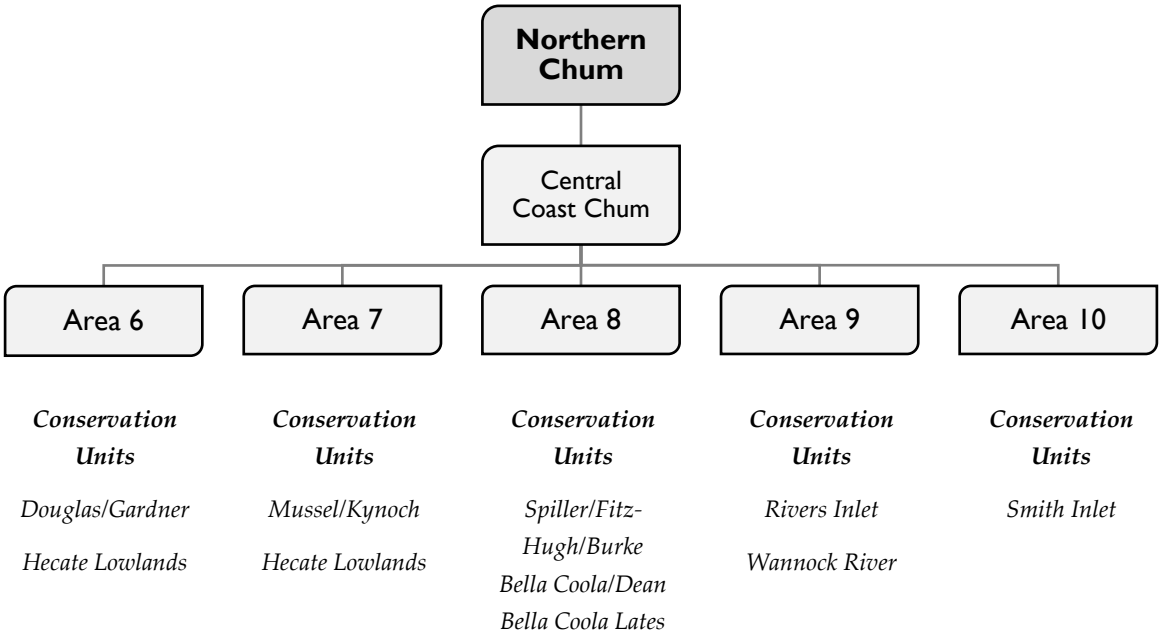


Figure 13.2-4: Overview of Central Coast Chum

Wild Chum stocks in Area 6 to 10 have been trending below average since 2010.

Commercial fisheries target hatchery enhanced Chum stocks in Area 6 (Kitimat Hatchery), Area 7 (Kitasoo and McLoughlin Bay Hatcheries), and Area 8 (Snootli Hatchery). The fisheries occur in approach areas where timings of the returns are known.

Commercial fisheries also target stronger wild stocks. For instance, in Area 7, fisheries for Mussel and Kainet Chum generally occur in late July and August, while fisheries for the other stocks occur in the later part of August and September. Chum fisheries in Area 8 occur on returns to Kimsquit and Lower Dean Channel streams (Elcho, Cascade, and Jenny). There are no anticipated fisheries in Areas 9 and 10 in 2022 due to continued trend of poor returns.

13.2.3.2 STOCK ASSESSMENT INFORMATION

13.2.3.2.1 Pre-season

Formal quantitative forecasts are not prepared for Central Coast Chum (Area 6 to 10). See Appendix 9 for more information.

13.2.3.2.2 In-season

Opportunities for harvest will be considered based on in-stream escapement assessments in Area 6 and reports from the hatchery on run strength of the enhanced stock.

In Areas 7 and 8, harvest opportunities will be based on brood year escapements, in-stream escapement assessments and the success of assessment fisheries that may be run to gauge run strength.

There are no commercial fisheries anticipated for Areas 7, 9 and 10.

13.2.3.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Area 6:

Opportunities for a directed terminal gill net fishery in Kitimat Arm are based on Kitimat Hatchery Chum production, assessment fisheries and in-season escapement estimates. The Department's plans to pilot an otolith study to determine the enhanced contribution to the fishery expects to proceed for 2022.

Area 7:

For Areas 7 to 10, decisions are made in consultation with local First Nations, the Central Coast First Nations Salmon Coordinating Committee, and Central Coast advisors, for the management of fisheries in these areas.

Opportunities for one-day gillnet and seine assessment fisheries in the last week of July or first week of August are determined pre-season based on recent trends in brood year escapement and in-season information. If recent escapements indicate an increasing or stable run, the assessment fisheries will likely proceed. Given the recent trend of poor returns, one-day assessment fisheries for lower Finlayson, lower Mathieson, Sheep Pass and the eastern portion of Seaforth Channel will be curtailed unless in-river assessment suggest improved returns.

July and First Week of August: One additional day of fishing during daylight hours is considered if the run appears strong. The assessment of run strength is based on a review of catch data and salmon escapements to the Mussel and Kainet Rivers to-date.

Second Week of August until Mid-October: The results of the past week's fisheries, status of target stocks and their implications for any potential by-catch are reviewed with the local advisory group. If stock strength permits, fishing opportunities are considered each week until mid-October. Announcements for the next week's opportunities are made on the Thursday at 16:00 hours or Friday of the week preceding the proposed fishery.

Subject to in-season assessment, Lama Pass (McLoughlin Bay) may be opened in mid-August and the fishing time may be spread over more than one day each week, depending on observed Chum abundance and processing capacity. Seines and gill nets will alternate fishing opportunities each week with the gill net fleet going first in 2022.

Subject to in-season assessment, the Klemtu Pass area may be opened to harvest surplus Chum returning to the Kitasoo Creek Hatchery. Openings targeting Kitasoo Creek Hatchery stocks and surplus Chum in terminal areas would follow the pattern of gill nets fishing first day and seines the second day.

Subject to in-season assessment, portions of Spiller Channel may be opened to seines and gill nets in late August. Openings in that area will depend on Chum returns to Neekas Creek.

Subject to in-season assessment, portions of Johnson Channel and Roscoe Inlet may be opened to seines and gill nets in late August. Openings in that area will depend on Chum returns to the Roscoe, Quartcha, and Clatse systems.

Area 8:

Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years), or until the fishery is restructured with development of substantial mitigation measures and benchmarks, or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Area 9:

Escapement levels for Area 9 Chum have been below target for several years. No fishery is anticipated in 2022.

Area 10:

In-season escapement information will be used to evaluate fishing opportunities for Nekite Chum. No fishery is anticipated. Should commercial Sockeye opportunities occur during the 2022 season, Chum retention is unlikely to be permitted.

13.2.3.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO CENTRAL COAST CHUM FISHERIES

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

Area 6:

Commercial net fishing is limited to daylight hours.

Mandatory brailing for all seine sets and non-retention of Chinook, Coho, Sockeye and Steelhead in all fisheries and non-retention of Chum at the Gil Island seine fishery.

Constraints for the Kitimat gill net Chum fishery are as follows:

Gill nets will be required to have a 149mm minimum and 165mm maximum mesh restriction when fishing Chum to reduce encounters of non-target species.

> Gill net Chum fisheries will be restricted to 6-1 and a portion of 6-2 unless surplus stocks are identified elsewhere in-season. Additional spatial management measures may be implemented.

Area 7:

Gill nets with 149mm minimum mesh restriction all season to protect Sockeye stocks in central coast systems.

Seines are required to brail and release Sockeye, Chinook and Steelhead to the water with the least possible harm for the duration of the season.

Fishing is limited to daylight hours.

Net fisheries will be non-retention Coho. In McLoughlin Bay and Kitasoo hatchery Chum targeted fisheries, Coho retention would only be permitted at high abundance, due to the terminal nature of these fisheries and the hatchery origin of the stocks.

The half-mile radius boundary around Mary's Cove Creek and Sockeye Creek are in effect year- round to conserve Sockeye Creek, Mary's Cove and Lagoon Creek Sockeye.

During periods of high salmon catches in Areas 7 or 8, fisheries will most likely be managed so that there is a maximum of two consecutive days of fishing. This action has been recommended by fishers and processors to maximize the value of the salmon caught.

Additional fishing time: A large fleet size could adversely affect small mixed-stock runs in the area. Extra fishing time may depend on openings in other areas in the North Coast.

Area 8:

Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years), or until the fishery is restructured with development of substantial mitigation measures and benchmarks, or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Area 10:

If a fishery takes place, a maximum mesh restriction of 150mm will be in place to protect Docee River Chinook stocks.

Boundaries will be restrictive to protect non-targeted stocks. There will be no Coho retention.

13.2.3.5 ALLOCATION AND FISHING PLANS

13.2.3.5.1 First Nations Fisheries

Food Social and Ceremonial

First Nations target local salmon stocks for food, social and ceremonial (FSC) purposes throughout the North Coast.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community

needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

There are no Treaty fisheries for Central Coast Chum.

13.2.3.5.2 Recreational Fisheries

Recreational salmon fishing occurs in the tidal waters of the Central Coast (Areas 6 to 10). The Chum salmon fishery is open April 1st to March 31st, with the peak of the season being from June to August. The daily limit for Chum salmon is four (4) per day, unless otherwise varied.

The minimum size limit for Chum salmon is 30 cm, in tidal waters and freshwater. The possession limit for salmon is twice the daily limit.

In Area 9, there is a condition of licence in the recreational Tidal Waters Sport Fishing Licence that applies to all angling in the Rivers Inlet Special Management Zone (SMZ). Any anglers fishing in this area should consult the Tidal Waters Sport Fishing Regulations prior to commencing fishing.

The Central Coast non-tidal waters are in Regions 5B and 6 freshwater fishing areas, and there are openings for Chum salmon in the different watersheds at different time periods. The minimum size limit is 30 cm, with daily and total possession limits.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:
https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

In Areas 6 to 9, DFO has been collecting recreational catch data through the Lodge Log Book Program.

The Heiltsuk, Kitasoo/Xai'xais, Nuxalk, and Wuikinuxv Nations, under the direction of the Central Coast Indigenous Resource Alliance (CCIRA) will continue collecting data through a creel survey and over-flight program. The program will assess recreational and First Nations' Food, Social, and Ceremonial (FSC) fisheries in marine portions of Areas 6 to 9, and in the Bella Coola River system within freshwater Region 5B Survey. Survey work will occur between June and September 2022. Recreational and Indigenous fishers should be aware that they may be approached by creel surveyors from the Nations to collect important data from these fisheries.

In Area 10, logbook information is used to provide catch and release numbers from anglers fishing in the area.

13.2.3.5.3 Commercial Fisheries

Table 13.2-3: Commercial Allocation Implementation Plan for the 2015–2022 period

Description	Areas	Seine A	Gill Net C	Troll F
Central	6 to 10	45.0%[c]	55.0%	*

Notes on Chum allocations (North):

[c] currently Chum non-retention
[*] by-catch provision

Area 6

Area C: Gill net openings will be dependent upon in-season assessments of hatchery Chum returns to the Kitimat River.

Area A: Seine openings target Pink salmon populations in the Area. Bycatch of Chum is not permitted. Opportunities for targeting hatchery Chum will be assessed in-season.

Area F: No troll opportunities for Chum fisheries in this area in 2022.

Area 7

Area A & C: July 27 – First potential gill net and seine opening in 7-5, portion of 7-6 (Finlayson), portions of 7-9 (Mathieson) and 7-29 (Sheep), dependent on in-season assessment. Minimum mesh size 149 mm.

Mid-late August – Consideration for net openings in 7-17 (McLoughlin Bay hatchery Chum). Gear types will alternate each week; Subarea 7-5 terminal Chum harvest on Kitasoo Creek Hatchery stocks with gill nets first and seines second. Net opening in Spiller Channell to harvest Neekas Creek Chum.

Late August to early September – Considerations for net openings in 7-30 (Johnson Channel), 7-15 (Roscoe Inlet) and 7-13 (Spiller Channel).

Area F: No troll opportunities for Chum fisheries in this area in 2021.

Area 8

Area C*:

Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years), or until the fishery is restructured with development of substantial mitigation measures and benchmarks, or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Area A*:

Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years), or until the fishery is restructured with development of substantial mitigation measures and benchmarks, or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Area F: No troll opportunities for Chum fisheries in this area in 2022.

Area 9

No Chum fisheries for any gear type are anticipated for this area in 2022.

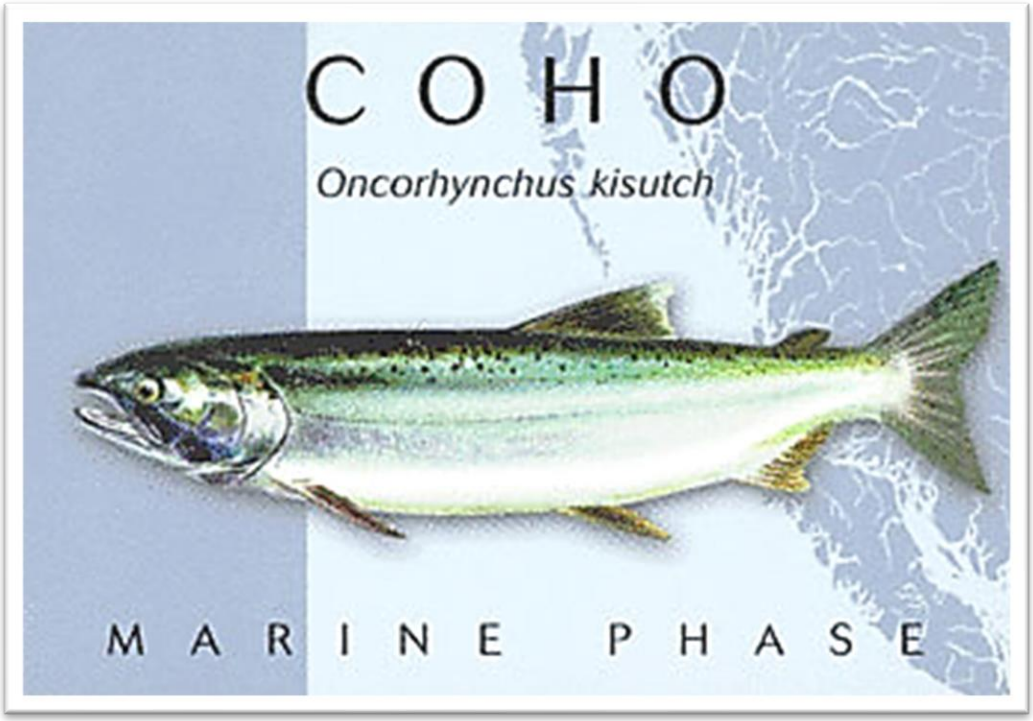
Area 10

No Chum fisheries for any gear type are anticipated for this area in 2022.

13.2.3.5.4 ESSR Fisheries

There are no ESSR fisheries for Central Coast Chum.

13.3 NORTHERN COHO SALMON FISHING PLAN



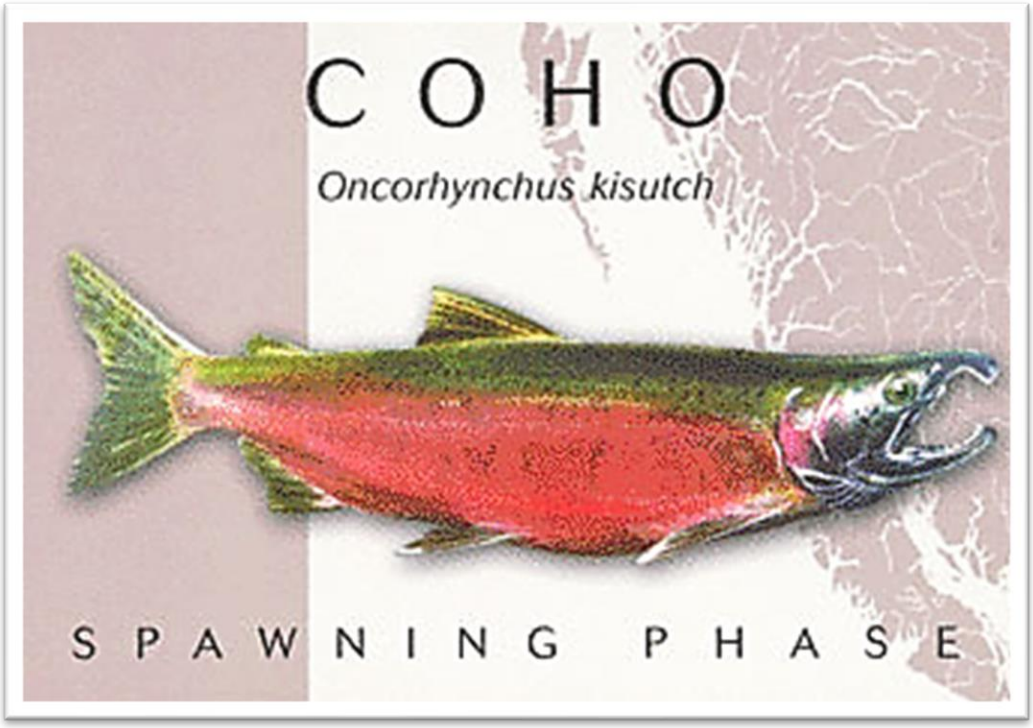


TABLE OF CONTENTS

13.3.1 Northern Coho Overview 250

13.3.1.1 Northern Coho Enhancement Information: 250

13.3.2 Northern Coho 251

13.3.2.1 Snapshot Overview and Map of Management Unit 251

13.3.2.2 Stock Assessment Information 252

13.3.2.2.1 Pre-season 252

13.3.2.2.2 In-season Assessment 252

13.3.2.3 Decision Guidelines and Management Actions 253

13.3.2.4 Incidental Harvest, By-Catch and Constraints to Northern Coho Fisheries 253

13.3.2.5 Allocation and Fishing Plans 254

13.3.2.5.1 First Nations Fisheries 254

13.3.2.5.2 Recreational Fisheries 256

13.3.2.5.3 Commercial Fisheries 259

13.3.2.5.4 ESSR Fisheries 261

13.3.1 NORTHERN COHO OVERVIEW

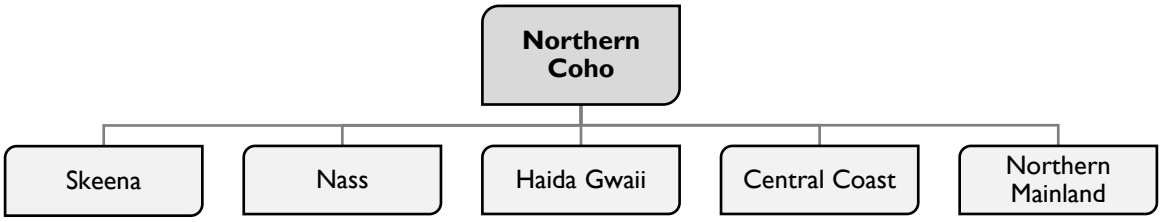


Figure 13.3-1: Overview of North Coast Coho

In recent years, Northern Coho are primarily harvested through commercial troll and mixed-species fisheries; formal guidelines for abundance based harvest levels have not been developed. In general, commercial net fisheries on the North Coast and Central Coast start with Coho non-retention, which is reviewed in- season in each area based on observed abundance.

For 2022, North Coast Coho returns are expected to be low following poor brood years and continued lower marine survival. Commercial net fisheries on the North Coast and Central Coast will be non-retention Coho, and additional mitigation measures may be implemented to reduce interceptions.

13.3.1.1 NORTHERN COHO ENHANCEMENT INFORMATION:

The major BC North Coast DFO operation enhancement facilities that produce Coho are:

- Kitimat River hatchery

There is one Coho salmon exploitation rate indicator stock in the North Coast that relies on hatchery production of coded wire tagged releases. The Toboggan Creek Coho indicator stock is produced at the Toboggan Creek Hatchery. Toboggan Creek hatchery does not appear in the list above since it is not a production facility and these fish are raised for assessment purposes only.

The information available at the link below addresses production from major DFO Operations (OPS) facilities, contracted Community Economic Development Program hatcheries (CEDP), Public Involvement Projects (PIP) operated by volunteers, and Aboriginal Fisheries Strategy (AFS).

There are two datasets available: **Post-Season Production** from the 2020 brood year (i.e. 2021 releases, and numbers on hand for 2022 release), and the **Production Plan**, which includes

proposed targets for the upcoming 2022 brood year. These are available at the following website:

http://www.pac.dfo-mpo.gc.ca/sep-pmvs/projects-projets/ifmp-pgip-eng.html

13.3.2 NORTHERN COHO

13.3.2.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT

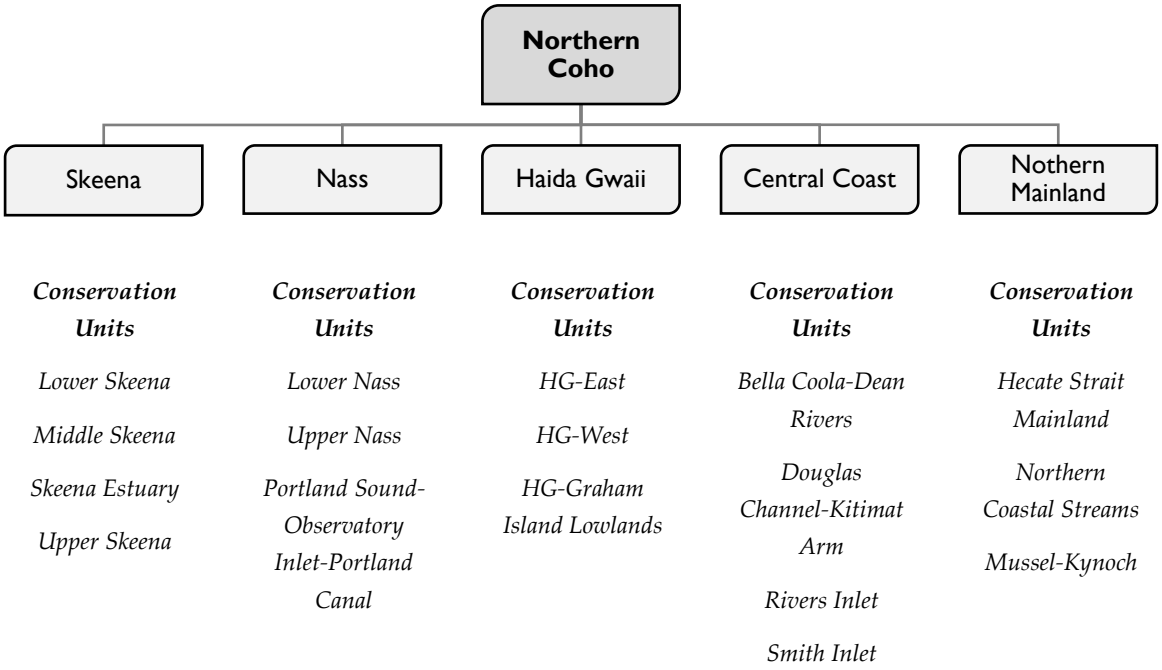


Figure 13.3-2: Overview of North Coast and Central Coast Coho

In Northern BC, Coho are typically caught as by-catch during First Nations' FSC fisheries that are directed on Sockeye; however, some small directed Coho FSC fisheries do occur. Nisga'a Coho catches are limited by the Nisga'a Final Agreement that depends on in-season abundance estimates generated from the Nass fishwheel mark-recapture program. First Nations Coho FSC catches have rarely been constrained by conservation objectives in the North and Central Coast.

Coho catches in the recreational fishery are managed by daily/possession limits and time and area closures. Poor returns of Coho to many North and Central Coast areas in recent years have resulted in precautionary management measures to reduce overall exploitation in 2022.

13.3.2.2 STOCK ASSESSMENT INFORMATION

13.3.2.2.1 Pre-season

There are no formal pre-season forecasts for Northern BC Coho. Most adults returning in 2022 are from the 2019 brood year that went to sea in 2021. Ocean indicators suggest conditions affecting early marine survival have been variable in recent years. See Appendix 9 for more information.

Haida Gwaii

See Appendix 9 for more information. Deena Coho in the East Haida Gwaii CU are used as an indicator stock for Haida Gwaii. Returning Coho and are also enumerated at the Tlell counting fence. Limited stock assessment information is available for the remainder of Haida Gwaii CU's. Coho returns to Haida Gwaii are generally considered to be healthy.

Nass River

Total escapement is expected to be below average in 2022. The 2021 run size was improved over recent years but remains well below average.

Skeena River

Returns are expected to be low due to recent lower productivity, poor marine survivals and low returns in 2018 through 2021. Returns are uncertain and depend on the survivals of the juveniles that went to sea in 2021.

Areas 5 and 6

Returns are uncertain and depend on the survival of the juveniles that went to sea in 2021.

Central Coast

Low returns are anticipated due to a period of lower productivity and low returns in 2021. However, there is very little data to develop an overall assessment. Returns are uncertain and depend on the survival of juveniles in the marine environment.

13.3.2.2.2 In-season Assessment

At this time, there are no in-season assessments done on most Northern BC Coho stocks. On the Skeena River, the Tyee test fishery provides a relative index abundance but can only provide in-season escapement estimates for Sockeye due to calibration from Babine fence counts. On the

Nass River, in-season estimates of Coho abundance are gained from the Nass fish wheel program operated by Nisga'a Fisheries.

13.3.2.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

A precautionary approach to management will be implemented in 2022 in response to poor returns in recent years and to address concerns for uncertain and changing environmental conditions.

For 2022 there will be non-retention of Coho in all North Coast net fisheries. Additional measures may also be considered to reduce interceptions.

Area 3 Coho directed Troll fisheries will not be considered for 2022, as this fishery has be identified for longer-term clsoures to support rebuilding of Northern Coho stocks.

The Central Coast Limited Effort Coho Demonstration Fishery, as proposed within Commercial Salmon Allocation Framework has been identified for longer-term closures to support rebuilding of Northern Coho stocks.

When FSC fisheries for Skeena Sockeye are closed for conservation purposes, the following will be implemented:

- Recreational fisheries for salmon in the Skeena River will be closed.
- Recreational marine fisheries for salmon in Area 3, 4, and 5 will have existing retention limits reduced by half.
- Area 4 commercial fishing opportunities would be suspended.

The management actions listed above may be modified should abundances of other salmon species be sufficient to allow harvest beyond Food, Social, and Ceremonial requirements, and will be determined in season.

Should in-season estimates indicate FSC closures are no longer warranted, these management measures would be reversed in when the FSC closures are lifted, and they do not preclude management measures already in place for each species.

13.3.2.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO NORTHERN COHO FISHERIES

In-river recreational Coho fisheries will be permitted in the Nass and Skeena Rivers. Daily, possession, and annual limits are in effect. Reduced retention limits during openings and spatial closures will be implemented for both river systems in 2022, including:

- Skeena River mainstem at the mouth of the Kitsumkalum River (including Kitsumkalum River), Kitwanga River, Kispiox River, and Bulkley-Morice.
- Nass River mainstem at the confluence of the Meziadin River until September 15, 2022.

Marine recreational fisheries will be permitted. Daily, possession, and annual limits are in effect.

Non-retention of Coho in commercial net fisheries in Areas 1 through 10.

The Pacific Salmon Treaty (PST) includes a provision for closing North Coast troll fisheries. Specifically, a Coho CPUE for a specified time period and location of the southeast Alaska troll fishery is used as a trigger for closures to areas 1, 3, 4, 5 and adjacent offshore areas. This provision of the treaty was invoked for the first time in 2019. Further work to develop this trigger and others for use in domestic management decisions regarding Coho is currently underway.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

13.3.2.5 ALLOCATION AND FISHING PLANS

13.3.2.5.1 First Nations Fisheries

Food Social and Ceremonial

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe details of the FSC fishery, including the

dates, times, methods, and locations of harvest. Communal licences for north coast First Nations are typically multi-species, and are issued on an annual basis. Licences may also be amended for shorter durations.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in the Northern BC First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

Nisga'a Fisheries

The Nisga'a Nisga'a Annual Fishing Plan (NAFP) is developed by the Nisga'a-Canada-BC Joint Fisheries Management Committee (JFMC) and governed by the terms of the Nisga'a Final Agreement and the Nisga'a Harvest Agreement of the Nisga'a Treaty. The Nisga'a Harvest Agreement includes Nisga'a fish allocations expressed as a percentage of the adjusted total allowable catch of Sockeye and Pink salmon. The NAFP is developed in accordance with Chapter 8 of the Nisga'a Final Agreement. Once approved by the Minister of Fisheries, the Nisga'a Annual Fishing Plan remains in effect until replaced the following year. The fishing plan applies to persons who harvest fish, other than steelhead, in Nisga'a fisheries.

Nisga'a salmon allocations, as defined in the Nisga'a Treaty, are set out as a percentage of the Total Return to Canada (TRTC) up to maximum catch thresholds (63,000 Sockeye [10.5%], 6,300 Pink [0.6%], 12,600 Chinook [21%], 19,200 Coho [8%], and 12,000 Chum [8%]) in large return years. These Nisga'a salmon allocations have the same priority in fisheries management decisions as domestic [food, social and ceremonial (FSC)] fisheries that target Nass salmon.

The NAFP defines the escapement goals required to guide management decisions for Nass salmon stocks, calculates Nisga'a allocations for each salmon species and provides the general regulatory requirements for catches of each salmon species. The NAFP is provided to other Nass watershed First Nations for their information and is reviewed by the JFMC prior to being submitted to the Minister for approval. Nisga'a Lisims Government is responsible for the internal allocation of catch opportunities between Nisga'a fishers and day to day operation of the Nisga'a fishery.

Pre-season estimates and ranges for the Nisga'a salmon allocations in 2022 are:

Nass Coho: The Total Run size probability point estimate for 2022 from a pre-season brood regression model of 3- and 4-year-old returns for Coastal, Lower, and Upper Nass Coho stocks is 211,000 (50%) with a range in point estimates between 145,000 (75%) and 317,000 (25%). Assuming a 41.9% Alaskan exploitation rate (based on the average from 2018 to 2021, approximately 88,000 Nass Coho), the 50% probability point estimate for the Total Return to Canada (TRTC) of Nass Coho is 123,000 with a range of point estimates from 84,000 (75% probability) to 184,000 (25% probability) and is projected to return below average (188,000) based on returns from 1994 to 2021. The forecast method's mean absolute accuracy for predicting TRTC returns is fair; 60.1% (range: <1–95%) based on 2000 to 2021 returns. Based on the pre-season TRTC forecasts and the minimum escapement goal (40,000) for Nass Coho for 2022, the Nisga'a allocation ranges between 6,700 and 14,700. The mean TRTC forecast (123,000) will be used for calculating the initial target for the in-season Nisga'a allocation (9,800) of Nass Coho for 2022. The actual Nisga'a allocation target for Nass Coho in 2022 may be higher depending on in-season run strength and reaching aggregate escapement goal (60,000) to account for the current cumulative Nisga'a Treaty underage (approximately 18,900) accrued from 2000 to 2021.

13.3.2.5.2 Recreational Fisheries

Recreational fisheries targeting Northern BC Coho take place in marine Areas 1 through 10 and in-river. Conservation measures to protect Coho will be in place in a number of areas and times.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:
https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

The possession limit for salmon is twice the daily limit.

In North Coast tidal waters, the minimum size limit for Coho salmon is 30 cm, with daily and total possession limits in effect. The open time is April 1st to March 31st.

Haida Gwaii (Areas 1 and 2)

Recreational salmon fishing primarily occurs in the tidal waters surrounding Haida Gwaii, with the majority of effort focused along the shoreline from Masset to Langara Island in Area 1 and between Englefield Bay and Port Louis in Area 2W. Recreational fishing occurs primarily between May and September with peak effort and catch occurring in July and August. The recreational fishery targets Coho of mixed stocks from across the north and central coast of B.C.

Nass (Area 3)

Recreational salmon fishing occurs in the tidal waters adjacent to the Nass River, with the peak of the season being from June to August.

The Nass River and tributaries are in Region 6 freshwater fishing area, and there are openings for Coho salmon throughout the watershed at different time periods. The standard close time for Coho is November 1st to December 31st. The minimum size limit is 30 cm, with daily and total possession limits in effect.

Skeena (Area 4)

Recreational salmon fishing occurs in the tidal waters adjacent to the Skeena River, with the peak of the season being from June to August.

The tidal waters salmon recreational fishery in Pacific Fishery Management Area 4 begins with low effort in late April with early season participation by local area residents. Independent and guided day charter effort increases significantly in late May and remains high throughout the peak season in June, July and August, decreasing at the end of August with primarily local participants again by the end of September.

The Skeena River and tributaries are in Region 6 freshwater fishing area, and there are openings for Coho throughout the watershed at different time periods. On the lower Skeena River mainstem, the standard opening is July 15th to November 30th, with daily and total possession limits in effect. On the upper Skeena River mainstem, the standard opening is July 15th to October 15th. The minimum size limit is 30 cm.

Areas 5 & 6 Tidal Waters

The Area 5 tidal water interception salmon recreational fishery begins in late April. Initial effort is mostly by local independent anglers out of Prince Rupert and Port Edward; however, the most significant portion of the recreational fishing season develops late May and continues to

mid- September. The fleet operating in Area 5 is made up mainly of independent anglers and charter operators.

The Area 6 tidal water interception salmon recreational fishery begins in late April. Initial effort is mostly by local independent anglers out of Kitimat. One recreational fishing lodge and a number of charter operators also fish in Area 6 with the most significant portion of the recreational fishing season taking place between late May and mid-September.

In the mainland watersheds of Region 6 freshwater fishing area, a standard closed time for Coho is November 1st to December 31st. Depending on the watershed, openings occur on different dates, with daily and total possession limits in effect.

Central Coast (Areas 7 to 10)

Central Coast First Nations, and DFO are concerned over poor productivity of Central Coast Coho stocks in recent years. The Department is committed to working collaboratively with First Nations and stakeholder groups to better assess both the status of these stocks and the impacts of existing fisheries. These include a suite of new stock assessment activities jointly operated by Central Coast First Nations and the Department, which will be used to inform management decisions in the future.

The main recreational fishing activity takes place in Milbanke Sound off St. Johns Harbour and in Seaforth Channel between St. Johns and Idol Point; fishing effort is primarily from several recreational lodges and charter operators.

In Area 8, the main recreational fishing effort in tidal water is concentrated in the Hakai Pass area by guests of the recreational lodges in the area. There is also individual angler effort within the area. In Area 9, the main recreational fishing effort in tidal water in concentrated in Rivers Inlet area by guests of the recreational lodges in the area. There is also individual angler effort within the area.

In Area 9, a condition of licence in the recreational Tidal Waters Sport Fishing Licence, applies to all angling in the Rivers Inlet Special Management Zone. Any anglers fishing in this area should consult the Tidal Waters Sport Fishing Regulations prior to commencing fishing. The online guide can be found at:
http://www.bcsportfishingguide.ca

Recreational harvesting does occur in Area 10, with participation by independent anglers and charter operators.

The Central Coast non-tidal waters are in Regions 5B and 6 freshwater fishing areas, and there are openings for Coho salmon in the different watersheds at different time periods. The

minimum size limit is 30 cm, with daily and total possession limits in effect. Many rivers have closures from October to December.

Fishery Monitoring and Catch Reporting

In Haida Gwaii, DFO has been collecting recreational catch data through the Lodge Log Book Program and the Haida Creel Program since 1995. Participation in monitoring and reporting of recreational catch in Areas 1 and 2 has been excellent over the past 27 years. Monitoring is continuing to improve with region wide initiatives.

The Area 3 and 4 creel program operated by the North Coast Skeena First Nations Stewardship Society typically runs from May 1 to August 31. Information collected through this program is shared through in-season and post-season processes. A creel survey of freshwater recreational fisheries on the lower Skeena River watershed is conducted by Kitsumkalum Fish and Wildlife program and LGL. Information collected through this program is shared through in-season and post-season processes.

A creel survey of the freshwater recreational fisheries in the Nass watershed was not conducted in 2021. The mean average in-river recreational catch of Nass Sockeye from 2000-2015 is 540 fish.

In Areas 6 to 9, DFO has been collecting recreational catch data through the Lodge Log Book Program.

The Heiltsuk, Kitasoo/Xai'xais, Nuxalk, and Wuikinuxv Nations, under the direction of the Central Coast Indigenous Resource Alliance (CCIRA) will continue collecting data through a creel survey and over-flight program. The program will assess recreational and First Nations' Food, Social, and Ceremonial (FSC) fisheries in marine portions of Areas 6 to 9, and in the Bella Coola River system within freshwater Region 5B Survey. Survey work will occur between June and September 2022. Recreational and Indigenous fishers should be aware that they may be approached by creel surveyors from the Nations to collect important data from these fisheries.

In Area 10, Logbook information is used to provide catch and release numbers from anglers fishing there.

13.3.2.5.3 Commercial Fisheries

Commercial opportunities for Coho for the Area F troll fleet occur in off-shore portions of Haida Gwaii and in Dixon Entrance. Additional opportunities in Area 3 and in the Central Coast are possible in years of sufficient abundance.

Allocation

Table 13.3-1: Commercial Allocation Implementation Plan for the 2015–2022 period

Description	Areas	Seine A	Gill Net C	Troll F
North	1 to 10, 101 to 111, 130, 142	12.5%	6.5%	81.0%

Northern BC Coho Fisheries

Area C Gillnet

Retention of Coho will not be allowed in Sockeye-directed gill net fisheries in Areas 3 and 4. Additional measures may be implemented to avoid interceptions.

Non-retention of Coho in all gill net fisheries in Areas 1 and 2.

In the Central Coast, gill net opportunities will be non-retention Coho unless otherwise specified in the fishery notice.

Area A Seine

There are no directed fisheries for Northern BC Coho.

Retention of Coho will not be allowed in Sockeye and Pink-directed seine fisheries in Areas 3 and 4. Non-retention of Coho in all seine fisheries in Areas 1, 2 and 6.

In the Central Coast, seine openings will be non-retention of Coho.

Area F Troll

Beginning in 2022, the Area F directed mixed stock Coho fishery, and Central Coast Coho Demonstration fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures. Opening dates for the Area F Chinook-directed Troll fishery are anticipated for mid-August and will be released via fisheries notice.

Fishery Monitoring and Catch Reporting

Fishery Monitoring and Catch Reporting includes the following:

Mandatory requirement to file fishing reports in all commercial fisheries, including "Start/Pause/Cancel/End" Fishing reports.

Mandatory catch reporting by phone-in with a paper harvest log and electronic transmission with an electronic harvest log (E-log) in all commercial fisheries. *(Catch reporting requirements are specific to each licence group and are detailed in the conditions of licence for each gear type)*.

Mandatory validation of all salmon for vessels that have retained Chinook.

All Area F trollers are required to submit daily catch reports within 24 hours of landing.

Retention of freezer troll salmon heads

In accordance with the conditions of the Area F troll license, all vessels are required to bring all Chinook and Coho heads (or snouts if they are cut properly to include any CWT) to the dock for submission, unless the license is listed in a fisheries notice listing the Area F troll licenses that are exempted from retaining salmon heads during the 2022 fishing season. This fisheries notice is expected to be released prior to the opening of the fishery.

Poor compliance and head retention practices prior to 2013 led to the requirement that 50% of the Area F troll fleet retain salmon heads to ensure that Canada met its obligation to sample a minimum of 20%. In recent years, salmon head recovery compliance by the Area F troll fleet has improved allowing for a reduction in the number for vessels that retain salmon heads.

For 2022, the exemption rate is expected to be approximately 70% (TBD). As in past seasons, licences that were insufficiently diligent in carrying out their conditions of license to bring in all Chinook and Coho heads will not be exempted in 2022.

13.3.2.5.4 Demonstration and ESSR Fisheries

Skeena Coho Inland Demonstration Fishery

In 2018, a proposal to permit Coho retention within the existing Wet'suwet'en Pink directed ESSR fishery at Moricetown Canyon was approved through updates to the Commercial Salmon Allocation Framework. The total inland allocation is determined in-season and based on historic

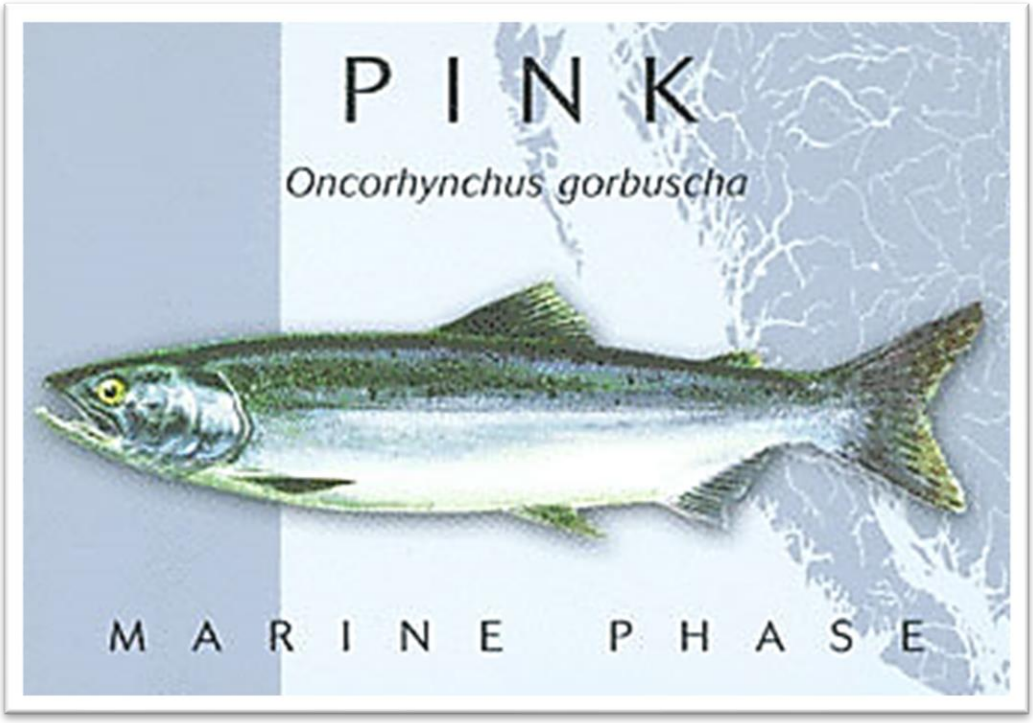
and in-season stock assessment information, specific to the harvest area. For more information on this fishery, please see Appendix 6: Updates to Commercial Salmon Allocation Framework.

The DFO contact for more information is Jen Gordon at (250) 600-0246.

ESSR Fisheries

There are currently no ESSR fisheries for Northern BC Coho.

13.4 NORTHERN PINK SALMON FISHING PLAN



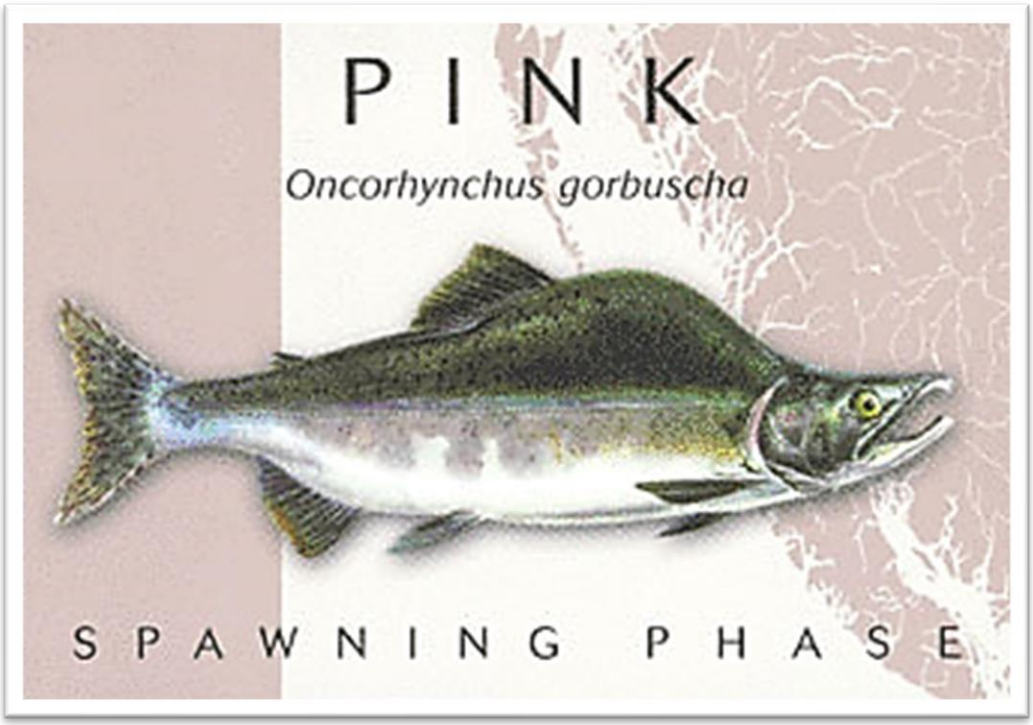


TABLE OF CONTENTS

13.4.1 Northern Pink Salmon Overview 266

13.4.2 Haida Gwaii Pink Salmon 267

13.4.2.1 Snapshot Overview and Map of Management Unit 267

13.4.2.2 Stock Assessment Information 267

13.4.2.2.1 Pre-season 267

13.4.2.2.2 In-season 268

13.4.2.3 Decision Guidelines and Management Actions 268

13.4.2.4 Incidental Harvest, By-catch and Constraints to Haida Gwaii Pink Fisheries 268

13.4.2.5 Allocation and Fishing Plan 269

13.4.2.5.1 First Nations Fisheries 269

13.4.2.5.2 Recreational Fisheries 270

13.4.2.5.3 Commercial Fisheries 270

13.4.2.5.4 ESSR Fisheries 271

13.4.3 Skeena-Nass Pinks 272

13.4.3.1 Snapshot Overview and Map of Management Unit 272

13.4.3.2 Stock Assessment Information 273

13.4.3.2.1 Pre-season 273

13.4.3.2.2 In-season 273

13.4.3.3 Decision Guidelines and Management Actions 273

13.4.3.4 Incidental Harvest, By-catch and Constraints to Skeena and Nass Pink Fisheries 275

13.4.3.5 Allocation and Fishing Plans 276

13.4.3.5.1 First Nations Fisheries 276

13.4.3.5.2 Recreational Fisheries 278

13.4.3.5.3 Commercial Fisheries 278

13.4.3.5.4 ESSR Fisheries 280

13.4.4 Central Coast Pink Salmon 281

13.4.4.1 Snapshot Overview and Map of Management Unit 281

13.4.4.2 Stock Assessment Information 282

13.4.4.2.1 Pre-season 282

13.4.4.2.2 In-season 282

13.4.4.3 Decision Guidelines and Management Actions 282

13.4.4.3.1 In-season Decisions 282

13.4.4.4 Incidental Harvest, By-catch and Constraints to Central Coast Pink Fisheries 283

13.4.4.5 Allocation and Fishing Plans 285

13.4.4.5.1 Recreational Fisheries 285

13.4.4.5.2 Commercial Fisheries 287

13.4.4.5.3 ESSR Fisheries 289

13.4.1 NORTHERN PINK SALMON OVERVIEW

Pink salmon are the most abundant but smallest of the Pacific salmon species. They are unusual in having a fixed 2-year life span, with one year class sometimes have stronger returns than the other.

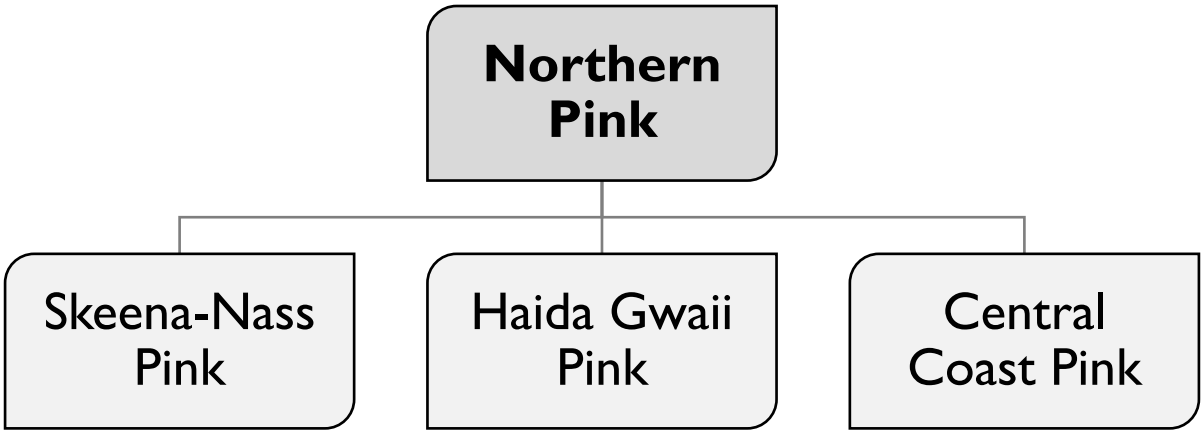


Figure 13.4-1: Overview of Northern Pink Salmon

13.4.2 HAIDA GWAII PINK SALMON

13.4.2.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT

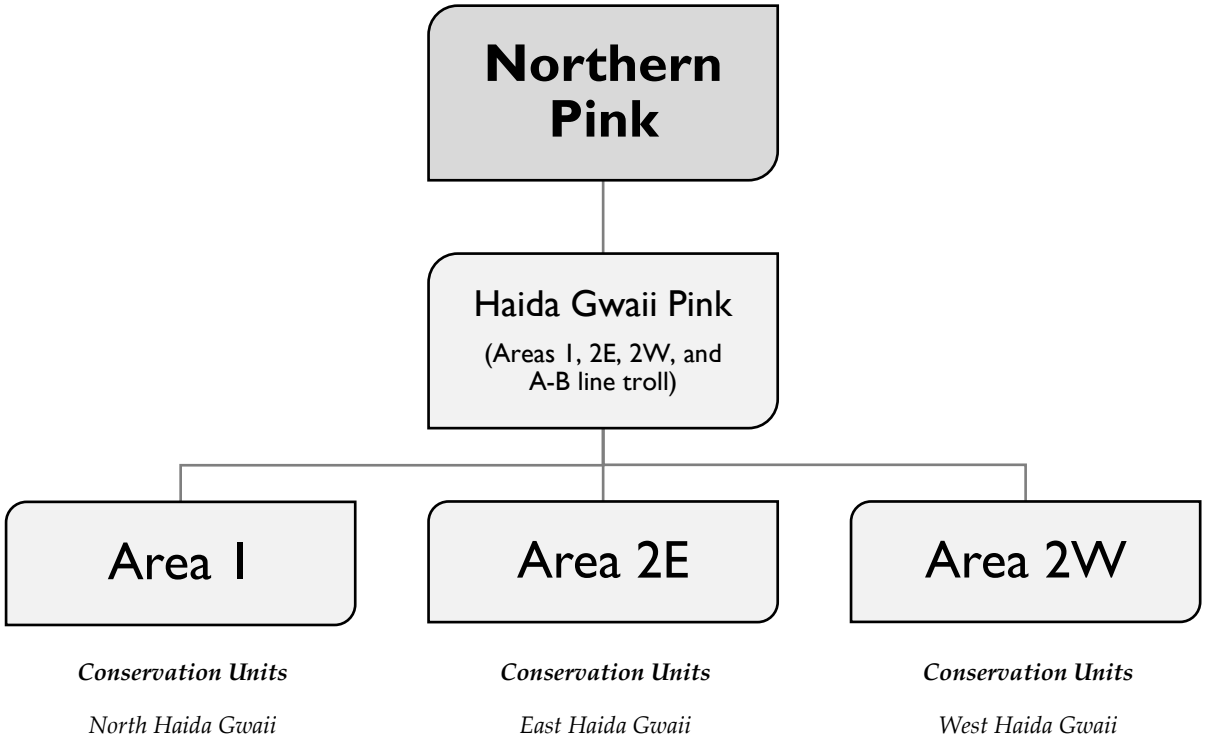


Figure 13.4-2: Conservation Units in the Haida Gwaii Pink Salmon Management Unit (1 CU)

Haida Gwaii Pink salmon return on a two year cycle, with dramatic differences in return strength between even and odd calendar years. Most streams have a strong return of Haida Gwaii Pink salmon during even calendar years only. Directed harvests are only anticipated during even years.

Pink salmon are also harvested in the Area F troll fishery.

13.4.2.2 STOCK ASSESSMENT INFORMATION

13.4.2.2.1 Pre-season

There are no formal pre-season forecasts for Haida Gwaii Pinks. Opportunities for Pink salmon fisheries are determined in-season. The Outlook prediction for Haida Gwaii even year Pinks is average based on average overall brood year escapements in 2020. Brood year escapements in 2020 were strong in Area 1, but highly variable in Area 2E and 2W.

See Appendix 9 for more information.

13.4.2.2.2 In-season

In-season Pink salmon assessments will determine if harvest opportunities are viable.

The assessments of Haida Gwaii Pink run size and escapement are done visually by charter patrolmen and opportunistically by DFO staff. Additional assessments are coordinated with the Haida Fisheries Program and Parks Canada. The main areas assessed for harvest opportunities are Masset Inlet, Skidegate Inlet, Cumshewa Inlet, Selwyn Inlet, Darwin Sound, Rennell Sound, West Skidegate and Englefield Bay.

13.4.2.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Terminal net fishery openings are based on fish observed schooling in front of the various systems. Fisheries will only be considered if sufficient salmon return to meet escapement goals.

For Area F troll, Canada will manage the Area 1 troll fishery to achieve an annual catch share of 2.57 percent of the annual allowable harvest (AAH) of a portion of south-east Alaska, as agreed to in the Pacific Salmon Treaty (PST). The methodology for AAH calculations is provided in the PST. Canada can carry forward from year to year annual deviations from the prescribed catch. To optimize the Pink catch, the northern section of Dixon Entrance will open to Pink salmon fishing on July 1st. During this fishery, Coho retention will also be allowed. Pink salmon retention will also be allowed during the Chinook fishery.

13.4.2.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO HAIDA GWAII PINK FISHERIES

Before a harvest can occur, assessment of escapements to streams in and near the surplus to be harvested will need to be conducted. Conservation of smaller and/or weaker returning stocks that may be affected by a potential harvest opportunity may influence the timing and/or location of the fishery or may result in the forgoing of the fishing opportunity.

Coho by-catch may be a concern in some areas. Brailing by seines and the use of revival boxes by both gill nets and seines will be required.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

13.4.2.5 ALLOCATION AND FISHING PLAN

13.4.2.5.1 First Nations Fisheries

Food Social and Ceremonial Fisheries

First Nations opportunities to harvest salmon for FSC purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe details of the FSC fishery, including the dates, times, methods, and locations of harvest. Communal licences for north coast First Nations are typically multi-species, and are issued on an annual basis. Licences may also be amended for shorter durations.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

There are currently no Treaty fisheries for Haida Gwaii Pink salmon.

13.4.2.5.2 Recreational Fisheries

Recreational salmon fishing occurs primarily occurs in the tidal waters surrounding Haida Gwaii, with the majority of effort focused along the shoreline from Masset to Langara Island in Area 1 and between Englefield Bay and Port Louis in Area 2W. Recreational fishing occurs primarily between May and September with peak effort and catch occurring in July and August. Pink salmon are incidentally retained in the recreational fishery which primarily targets Chinook and Coho salmon. The daily aggregate limit of salmon is four (4) per day and a maximum 2 of which may be Chinook.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:
http://www.dfo-mpo.gc.ca/fisheries-peches/recreational-recreative/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

DFO has been collecting recreational catch data through the Lodge Log Book Program and the Haida Creel Program since 1995. Participation in monitoring and reporting of recreational catch in Areas 1 and 2 has been excellent over the past 26 years. Monitoring is continuing to improve with region wide initiatives.

13.4.2.5.3 Commercial Fisheries

In 2022, potential opportunities for commercial fisheries for Haida Gwaii Pink salmon will be assessed in-season.

Description	Areas	Seine A	Gill Net C	Troll F
North	1, 2E, 2W (even), 3 to 5, 101 to 105	75.5%	22.5%[a]	2.0%

Notes on Pink allocations (North):

[a] Skeena sharing 75% seine: 25% gillnet

Haida Gwaii Pink Fisheries

Fishing opportunities may be considered if stocks appear to be returning in sufficient abundance. Commercial harvest opportunities are dependent on run timing, but typically occur in the last half of August. Area A (Seine)

No seine fisheries will be directed on passing Pink stocks.

Area C (Gill Net)

No gillnet fisheries will be directed on passing Pink stocks.

Area F Troll

Retention of Pink salmon will be permitted in conjunction with troll openings targeting Chinook as follows:

July 1– AB Line Targeted Pink opening with Coho retention. See Section 13.3 – Northern Coho for details.

Mid-August – Chinook ITQ opening with Coho retention. See Section 13.1 – Northern AABM Chinook for details.

Fishery Monitoring and Catch Reporting

Fishery Monitoring and Catch Reporting includes the following:

Mandatory requirement to file fishing reports in all commercial fisheries, including "Start/Pause/Cancel/End" Fishing reports.

Mandatory catch reporting by phone-in with a paper harvest log and electronic transmission with an electronic harvest log (E-log) in all commercial fisheries. *(Catch reporting requirements are specific to each licence group and are detailed in the conditions of licence for each gear type).*

13.4.2.5.4 ESSR Fisheries

There are no anticipated ESSR fisheries for Haida Gwaii Pink salmon.

13.4.3 SKEENA-NASS PINKS

13.4.3.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT

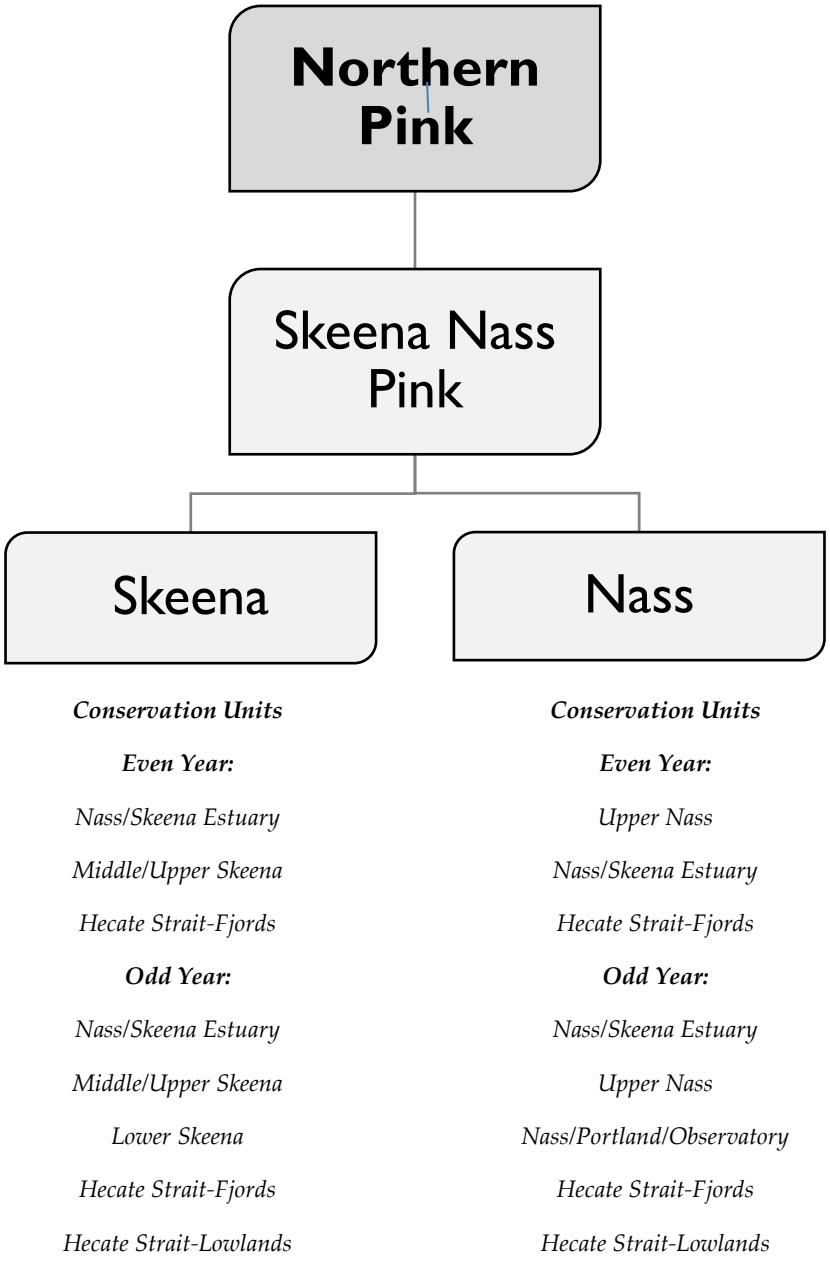


Figure 13.4-3: Conservation Units in the Skeena-Nass Pink Salmon Management Unit

Pink returns to the Nass watershed are dominant in odd-years with major returns seen to the Iknouk, Kwinimass and Khutzeymateen Rivers. Most Area 3 Pink stocks arrive in the fishing

area at approximately the same time, usually in mid-July. The outer coastal stocks are an exception, arriving in August and early September.

In the Skeena River, 128 systems have recorded Pink salmon presence. Tagging studies were conducted in 1982, 1984 and 1985. These studies were designed primarily to provide information on interception rates of southeast Alaskan Pink stocks, but also provided information on stock abundance, migration and timing of Canadian stocks. Management stock groupings are Skeena River and Coastal. There are no major coastal Pink stocks in Areas 4 or 5; the majority of returns to these areas are from a number of small streams that contribute to the total return.

13.4.3.2 STOCK ASSESSMENT INFORMATION

13.4.3.2.1 Pre-season

There are no formal pre-season forecasts for Pinks in the Nass or Skeena watersheds. Both areas usually see greater returns in odd years, with smaller returns in even years. Historically Pink returns have been highly variable and expectations are highly uncertain.

See Appendix 9 for more information. Returns are known to be highly variable. Fishing opportunities in Areas 3, 4, and 5 will be based on in-season indications of abundance.

13.4.3.2.2 In-season

Returns of Pink salmon to the Nass River are monitored through the fish wheel program operated by Nisga'a Fisheries. Pink stocks are managed to stream-specific escapement goals in Area 3 while keeping within the Pacific Salmon Treaty Pink annex considerations. Targeted net Pink fisheries will be based upon identified surpluses with consideration for stocks of concern.

The Tyee test fishery on the Skeena River is the main indicator for relative abundance of Pink salmon in Areas 4 and 5 through the use of a multi-panel gill net with varying mesh sizes. Returns are variable and estimates are also subject to error as annual run timing and the annual catchability of salmon by the Tyee test fishery net varies. Fishing opportunities for Pinks in Area 5 are managed through in-season assessments.

13.4.3.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

In-season Decisions

Weekly in-season decisions for Area 3 Pinks are made from run size predictions based on:

Catch and effort data from the Area 3 and Alaskan Tree Point commercial net fisheries.

Escapement information from the Nisga'a Fishwheel Program conducted at test-fishing sites near Gitwinksihlkw on the Nass River, and later from individual stream inspections for Pinks.

Pink stocks are managed to stream-specific escapement goals in Area 3 while keeping within the Pacific Salmon Treaty Pink annex considerations. Targeted net Pink fisheries will be based upon identified surpluses with consideration for stocks of concern.

Fisheries on the Skeena traditionally switch focus from Sockeye to Pink salmon in mid-August when abundance permits. Once the fishery switches to Pink management, if the yearly escapement is not expected to reach one million, the fishery may close. Pink returns between one and two million are managed with a balance between catch and escapement. This balance depends on escapement distribution and concern for other species. Coastal Area 4 and 5 Pink stocks are traditionally managed in accordance with Skeena runs until early-August when local Pink stocks become prevalent. Care will be taken not to over-harvest local stocks while conducting the Skeena directed fishery. For instance, in years when there are large surpluses of Skeena Pink salmon, boundaries may be established around local, coastal Pink streams to protect Pinks holding in front of these systems while conducting the main Skeena directed Pink fishery. Seine fisheries for coastal Pink stocks are then considered based on catch and stream escapement information generated from Charter Patrol assessments.

Seine fisheries for Area 5 Pink stocks are considered starting in mid-August based on catch and stream escapement information. A targeted selective gill net fishery for Pinks in Area 5 is possible while Skeena Pinks are transiting the area and before the terminal stocks in Ogden Channel appear. Small mesh nets would be implemented to minimize the by-catch of Sockeye and Chum, and the fishery would be terminated if by-catch encounters were found to be high.

If abundances permit, a troll Pink fishery in Area 3 may be conducted. This fishery would be managed to minimize by-catch of Chum and gear conflicts with net fleets.

When FSC fisheries for Skeena Sockeye are closed for conservation purposes, the following will be implemented:

1. Recreational fisheries for salmon in the Skeena River will be closed.

2. Recreational marine fisheries for salmon in Area 3, 4, and 5 will have existing retention limits reduced by half.

3. Area 4 commercial fishing opportunities would be suspended.

The management actions listed above may be modified should abundances of other salmon species be sufficient to allow harvest beyond Food, Social, and Ceremonial requirements, and will be determined in season.

Should in-season estimates indicate FSC closures are no longer warranted, these management measures would be reversed in when the FSC closures are lifted, and they do not preclude management measures already in place for each species.

13.4.3.4 INCIDENTAL HARVEST, BY-CATCH, AND CONSTRAINTS TO SKEENA AND NASS PINK FISHERIES

For Nass area fisheries, Pink fishing opportunities will be managed to conserve weak stocks of Area 3 Chum. Area 3 Chum are subject to a rebuilding plan (see Appendix 7: Nass Chum Draft Rebuilding Plan) and will require continued focused management planning. Measures to limit impacts on Nass Sockeye from Area 3 seine fisheries may be required depending on requirements of PSSI.

Area 4 and 5 fisheries will be managed in late July and early August to minimize impacts to weak Sockeye and Chum stocks.

Skeena Pink fishing opportunities may be limited to reduce harvest impacts on Skeena Sockeye and Chum stocks by restricting late season openings and ensuring compliance during seine Pink harvests.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

13.4.3.5 ALLOCATION AND FISHING PLANS

13.4.3.5.1 First Nations Fisheries

Food Social and Ceremonial Fisheries

First Nations opportunities to harvest salmon for FSC purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe details of the FSC fishery, including the dates, times, methods, and locations of harvest. Communal licences for north coast First Nations are typically multi-species, and are issued on an annual basis. Licences may also be amended for shorter durations.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements, if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

Nisga'a Fisheries

The Nisga'a Annual Fishing Plan (NAFP) is developed by the Nisga'a-Canada-BC Joint Fisheries Management Committee (JFMC) and governed by the terms of the Nisga'a Final Agreement and the Nisga'a Harvest Agreement of the Nisga'a Treaty. The Nisga'a Harvest Agreement includes Nisga'a fish allocations expressed as a percentage of the adjusted total allowable catch of Sockeye and Pink salmon. The NAFP is developed in accordance with

Chapter 8 of the Nisga'a Final Agreement. Once approved by the Minister, the Nisga'a Annual Fishing Plan remains in effect until replaced the following year. The fishing plan applies to persons who harvest fish, other than steelhead, in Nisga'a fisheries.

Nisga'a salmon allocations, as defined in the Nisga'a Treaty, are set out as a percentage of the Total Return to Canada (TRTC) up to maximum catch thresholds (63,000 Sockeye [10.5%], 6,300 Pink [0.6%], 12,600 Chinook [21%], 19,200 Coho [8%], and 12,000 Chum [8%]) in large return years. These Nisga'a salmon allocations have the same priority in fisheries management decisions as domestic [food, social and ceremonial (FSC)] fisheries that target Nass salmon.

The NAFP defines the escapement goals required to guide management decisions for Nass salmon stocks, calculates Nisga'a allocations for each salmon species and provides the general regulatory requirements for catches of each salmon species. The NAFP is provided to other Nass watershed First Nations for their information and is reviewed by the JFMC prior to being submitted to the Minister for approval. Nisga'a Lisims Government is responsible for the internal allocation of catch opportunities between Nisga'a fishers and day to day operation of the Nisga'a fishery.

Pre-season estimates and ranges for the Nisga'a salmon allocations in 2022 are:

Nass Pink: The Total Run size probability point estimate for 2022 from a pre-season even-year brood regression model (2 year) is 454,000 (50%) with a range in point estimates between 266,000 (75%) and 775,000 (25%). Assuming an 8.4% Alaskan exploitation rate (based on the average of even years from 2010 to 2020, approximately 38,000 Nass Pink), the 50% probability point estimate for the Total Return to Canada (TRTC) of Nass Pink is 416,000 with a range of point estimates from 244,000 (75% probability) to 710,000 (25% probability) and is projected to return above average (324,000) based on returns from 1994 to 2021. The forecast method's mean absolute accuracy for predicting TRTC returns is poor to fair, 58.1% (range: 41–96%) based on even-year returns from 2014 and 2020 returns. Based on the pre-season TRTC forecasts and the minimum escapement goal (225,000) for 2022, the Nisga'a allocation ranges between 4,000 and 77,000. The mean TRTC forecast (416,000) will be used for calculating the initial target for the in-season Nisga'a allocation (31,000) for Nass Area Pink in 2022. The actual Nisga'a allocation target for Nass Pink in 2022 may be higher depending on in-season run strength and reaching aggregate escapement goal (225,000) to account for the current Nisga'a Treaty cumulative underage (approximately 2,000) accrued from even-year returns from 2000 to 2020.

13.4.3.5.2 Recreational Fisheries

Recreational salmon fishing occurs in the tidal waters adjacent to the Nass and Skeena Rivers, Areas 3 and 4. The fishery is open April 1st to March 31st, with the peak of the season being from June to August. The daily limit for Pink salmon in Areas 3 & 4 is four (4) per day, unless otherwise varied.

The Nass and Skeena Rivers and tributaries are in Region 6 freshwater fishing area, and an opening for Pink salmon occurs on the Nass and Skeena mainstems from July 1st to September 15th. The minimum size limit is 30 cm, and a daily limit of 2 fish.

The minimum size limit for Pink salmon is 30 cm, in tidal waters and freshwater. The possession limit for salmon is twice the daily limit.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:
http://www.dfo-mpo.gc.ca/fisheries-peches/recreational-recreative/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

The Area 3 and 4 creel program operated by the North Coast Skeena First Nations Stewardship Society typically runs from May 1 to August 31. Information collected through this program is shared through in-season and post-season processes.

A creel survey of freshwater recreational fisheries on the lower Skeena River watershed is conducted by Kitsumkalum Fish and Wildlife program and LGL. Information collected through this program is shared through in-season and post-season processes.

13.4.3.5.3 Commercial Fisheries

Allocations

Table 13.4-1: Commercial Allocation Implementation Plan for the 2015–2022 period

Description	Areas	Seine A	Gill Net C	Troll F
North	1, 2E, 2W (even), 3 to 5, 101 to 105	75.5%	22.5%[a]	2.0%

Notes on Pink allocations (North):

[a] Skeena sharing 75% seine: 25% gillnet

Skeena-Nass Pink Fisheries

Fishing opportunities may be considered if stocks appear to be returning in sufficient abundance. Commercial harvest opportunities are dependent on run timing, but typically occur between mid-July and mid-August. The areas typically fished are outlined below and may be updated in-season.

For Area 3, seine Pink fishing opportunities and opening dates are evaluated pre-season based on brood year escapements, run timing and any concurrent fisheries taking place in other areas.

For 2022, the Department is proposing a one-day Seine assessment opening in the first week of July to assess opportunities to target Pink stocks returning to Area 3, including the Iknouk, Kwinimass and Khutzeymateen Rivers. This fishery is planned to get an early assessment of relative run strength. It will have very little impact on the stock because it occurs early in the run and provides information to better manage the fishery later in the season. Additional fishing opportunities are based on in-season assessments of commercial catch per unit effort (CPUE), with high CPUE's being indicative of a strong return. As the season progresses, the in-season indicator changes to the assessment of stream escapements to determine if further fishing opportunities are available.

Area A Seine

Area 3: July 11 – One day Seine Pink assessment opening. Sockeye retention will be determined when the fishery is announced, and will be informed by in-season estimates of abundance and PSSI requirements. Additional seine fishery openings will be determined in-season based on both Sockeye and Pink abundance. Minimum bunt mesh size 70 mm (2.76 inches). Assessment fishery will be limited to one day only.

Areas 4 and 5: Openings will be based on Skeena salmon returns and the target annual exploitation rate and will be similar to previous years subject to ongoing discussions with First Nations and commercial fishing interests.

Area C Gill Net

Area 3: Late June/Early July – Potential one day Gill Net Sockeye opening with Pink retention Maximum mesh size is 137 mm (5.39 in). This fishery will assess opportunities to target returning Nass River Sockeye based on run strength. Fisheries will be operated with spatial closures in place to avoid Nass Chinook. Fishery will be limited to one day only. The fishery will be informed by data from the Nass fish wheels.

Areas 4 and 5: Openings will be based on Skeena salmon returns and the target annual exploitation rate and will be similar to previous years subject to ongoing discussions with First Nations and commercial fishing interests.

Area F Troll

Area 3: If abundances permit, a troll Pink fishery may be conducted. This fishery would be managed to minimize by-catch of Chum and gear conflicts with net fleets.

Fishery Monitoring and Catch Reporting

For 2022, the Department is continuing to work with Area Harvest Committees on catch monitoring programs in the following areas:

Area A Seine (PFMA 3 to 6):

Designated landing sites (list to be developed based on recommendations from the Area Harvest Committees)

Catch estimates to be communicated prior to any shore-based offload.

Independent verification of landed catch through a designated service provider

Deployment of at-sea observers with priority placed on highest profile fisheries occurring concurrently.

Area C Gill net (PFMA 3 to 5):

Designated landing sites (list to be developed based on recommendations from the Area Harvest Committees)

Catch estimates to be communicated prior to any shore-based offload.

Additional details on the catch monitoring programs will be communicated via Fisheries Notices.

13.4.3.5.4 Demonstration and ESSR Fisheries

Commercial Salmon Allocation Framework (CSAF) Demonstration Fisheries

Two pink directed demonstration fisheries have been approved and implemented in Area 3. These fisheries are proposed by Lax Kw'alaams First Nation and Metlakatla First Nation and North Coast Skeena First Nations Stewardship Society, and are implemented using similar gear types and fishery controls as the Area A fleet. These fisheries are proposed for implementation again in 2022, subject to area approval of the fishing plans.

For more information on CSAF demonstration fisheries, please see Appendix 6.

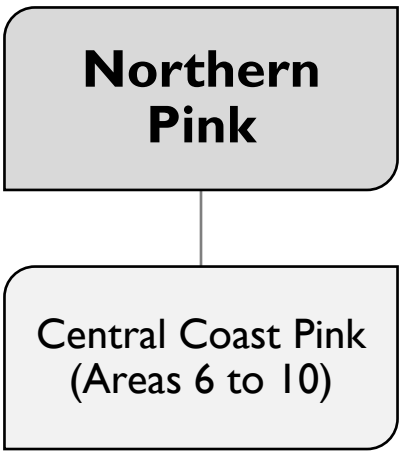
ESSR Fisheries

All Pink ESSR fisheries will be by selective means with live release of all non-target species. Historically, an ESSR opportunity has occurred at the Kitwanga weir (Gitanyow First Nation). More recently, ESSR fisheries are implemented at Moricetown Canyon (Wet'suwet'en First Nation).

For more information on CSAF Demonstration Fisheries and ESSR fisheries, please contact DFO Resource Manager Jen Gordon at (250) 600-0246.

13.4.4 CENTRAL COAST PINK SALMON

13.4.4.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT



Conservation Units

Areas 6 to 10

Even Year:

Hecate Strait Fjords

Hecate Strait Lowlands

Odd Year:

Hecate Strait Fjords

Hecate Strait Lowlands

Areas 9 and 10

Homathko-Klinaklini Rivers-Smith
Inlet-Bella Coola-Dean

Figure 13.4-4: Conservation Units in the Central Coast Pink Salmon Management Unit

The Central Coast has more than 250 streams and rivers that support populations of Pink salmon. Central Coast streams support both odd and even year stocks with odd year stocks being more abundant in all areas since the early 2000s. Both Area 6 and Area 8 can see extremely large returns of Pink salmon, with total run averages over a million since 2000 even in even years, which have not been dominant since that time.

13.4.4.2 STOCK ASSESSMENT INFORMATION

13.4.4.2.1 Pre-season

There are no formal pre-season forecasts for Pinks in the Central Coast. Area 6 usually sees greater returns in odd years, while Areas 7 to 10 historically saw larger runs in even years. However, since flood events in 2010 the greater returns to Area 8 have been in odd years. Pink returns have been highly variable and expectations are highly uncertain.

See Appendix 9 for more information.

For Areas 7 to 10, poor returns are expected based on low returns in the 2019 brood year. Fishing opportunities in Areas 6 to 10 will be based on in-season indications of abundance.

13.4.4.2.2 In-season

Catch and spawning escapement data are used as indicators of stock abundance for Central Coast Pink stocks. Catch per unit effort in the commercial fishery is monitored as an indicator of overall Pink abundance, and can be used as an indicator as to whether or not escapement targets will be met. Each area contains key streams whose escapements are actively monitored in-season to determine run timing and size. This is accomplished by visual counts of fish in streams, either from the air or by walking the streams.

13.4.4.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

13.4.4.3.1 In-season Decisions

For Area 6, seine Pink fishing opportunities are evaluated pre-season based on brood year escapements, run timing and any concurrent fisheries taking place in other areas. Seine fisheries will target Pink stocks returning to numerous streams near Gil Island with the Quaal and

Kemano Rivers being the main producers in this area. Additional fishing opportunities are based on in-season assessments of commercial catch per unit effort (CPUE), with high CPUE's being indicative of a strong return. As the season progresses, the in-season indicator changes to the assessment of stream escapements to determine if further fishing opportunities are available.

For Areas 7 through 10, in-season decisions are made in consultation with local First Nations, the Central Coast First Nations Salmon Coordinating Committee and Central Coast Advisors for the management of fisheries in these areas.

Pink salmon are mainly caught as by-catch in Chum-directed fisheries in Area 7. In Area 8, Pink fisheries target mainly Atnarko River stocks but there is a component of Kwatna River and Koeye River Pinks that are fished. The Pink fishery on Kwatna stocks occurs at the same time as the Atnarko fishery, while Koeye Pinks are harvested during the latter part of August. There are no Pink-directed fisheries in Areas 9 or 10.

13.4.4.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO CENTRAL COAST PINK FISHERIES

Area 6:

Area 6 can produce large returns of Pink salmon in some years. Seine fisheries targeting large Pink returns will be managed with consideration of impacts to non- target species such as wild Chum.

Commercial net fishing is limited to daylight hours.

Other management measures in effect include mandatory brailing for all seine sets and non- retention of Chinook, Coho, Sockeye and Steelhead in all fisheries and non-retention of Chum at the Gil Island seine fishery.

Area 7:

Fishing will be limited to daylight hours.

Net fisheries will be non-retention of Coho. In McLoughlin Bay and Kitasoo hatchery Chum targeted fisheries, Coho retention would only be permitted at high abundance, due to the terminal nature of these fisheries and the hatchery origin of the stocks.

Harvesting opportunities for Pink salmon will be coincidental to Chum-directed harvests.

Seines are required to brail their catch and release Sockeye, Coho, Chinook and Steelhead. Gill nets are required to release Steelhead and Coho.

During periods of high salmon catches in Areas 7 or 8, fisheries will be managed so that there is a maximum of two consecutive days of fishing. This action has been recommended by fishers and processors to maximize the value of the salmon harvested.

Area 8:

Fishing will be limited to daylight hours.

Net fisheries will be non-retention of Coho. Seines are required to brail their catch and release Sockeye, Coho, Chinook, and Steelhead. Gill nets are required to release Steelhead and Coho.

If salmon stocks surplus to escapement requirements are identified, fisheries could occur in areas where incidental catch or by-catch concerns do not preclude harvest activities.

Between July 11 and August 14, weedlines are required for all gill nets in Subareas 8-5 north of Bold Point and 8-8 to reduce Steelhead interceptions.

During periods of high salmon catches in Areas 7 or 8, fisheries will be managed so that there is a maximum of two consecutive days of fishing. This action has been recommended by fishers and processors to maximize the value of the salmon harvested.

Areas 9 and 10:

There are no Pink-directed fisheries in these areas.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

13.4.4.5 ALLOCATION AND FISHING PLANS

First Nations Fisheries

Food Social and Ceremonial Fisheries

First Nations opportunities to harvest salmon for FSC purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe details of the FSC fishery, including the dates, times, methods, and locations of harvest. Communal licences for north coast First Nations are typically multi-species, and are issued on an annual basis. Licences may also be amended for shorter durations.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

There are no Treaty fisheries for Central Coast Pink salmon.

13.4.4.5.1 Recreational Fisheries

Recreational salmon fishing occurs in the tidal waters of the Central Coast (Areas 6 to 10). The Pink salmon fishery is open April 1st to March 31st, with the peak of the season being from June to August. Daily and total possession limits are in effect.

The minimum size limit for Pink salmon is 30 cm, in tidal waters and freshwater. The possession limit for salmon is twice the daily limit.

The Area 6 tidal water recreational salmon fishery begins in late April. Initial effort is mostly by local independent anglers out of Kitimat. One recreational fishing lodge and a number of charter operators also fish in Area 6 with the most significant portion of the recreational fishing season taking place between late May and mid-September.

In Area 7, the main recreational fishing activity takes place in Milbanke Sound off of St. Johns Harbour and in Seaforth Channel between St. Johns and Idol Point; fishing effort is primarily from several recreational lodges and charter operators.

In Area 8, the main recreational fishing effort in tidal water is concentrated in the Hakai Pass area by guests of the recreational lodges in the area. There is also individual angler effort within the area.

In Area 9, the main recreational fishing effort in tidal water in concentrated in Rivers Inlet area by guests of the recreational lodges in the area. There is also individual angler effort within the area.

In Area 9, a condition of licence in the recreational Tidal Waters Sport Fishing Licence, applies to all angling in the Rivers Inlet Special Management Zone (SMZ), and any anglers fishing in this area should consult the Tidal Waters Sport Fishing Regulations prior to commencing fishing.

Recreational harvesting occurs in Area 10 with participation by independent anglers and charter operators.

The Central Coast non-tidal waters are in Regions 5B and 6 freshwater fishing areas, and there are openings for Pink salmon in the different watersheds at different time periods. The minimum size limit is 30 cm, with daily and total possession limits in effect.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:
http://www.dfo-mpo.gc.ca/fisheries-peches/recreational-recreative/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

In Areas 6 to 9, DFO has been collecting recreational catch data through the Lodge Log Book Program. In Area 10, logbook information is used to provide catch and release numbers from anglers fishing in the area.

The Heiltsuk, Kitasoo/Xai'xais, Nuxalk, and Wuikinuxv Nations, under the direction of the Central Coast Indigenous Resource Alliance (CCIRA) will continue collecting data through a creel survey and over-flight program. The program will assess recreational and First Nations' Food, Social, and Ceremonial (FSC) fisheries in marine portions of Areas 6 to 9, and in the Bella Coola River system within freshwater Region 5B Survey. Survey work will occur between June and September 2022. Recreational and Indigenous fishers should be aware that they may be approached by creel surveyors from the Nations to collect important data from these fisheries.

In Area 10, Logbook information is used to provide catch and release numbers from anglers fishing there.

13.4.4.5.2 Commercial Fisheries

Allocations

Table 13.4-2: Commercial Allocation Implementation Plan for the 2015–2022 period

Description	Areas	Seine A	Gill Net C	Troll F
Central	6 to 10	95.0%	5.0%[b]	*

Notes on Pink allocations (north):

[*] by-catch provision
[b] potential for future re-negotiation

Central Coast Pink Fisheries

Fishing opportunities may be considered if stocks appear to be returning in sufficient abundance. Commercial harvest opportunities are dependent on run timing, but typically occur between mid-July and mid-August. The areas typically fished are outlined below and may be updated in-season.

Area 6

July 15: First potential seine opening; areas open will be determined in-season. Minimum bunt mesh size 70mm. Catch rates in this fishery will be used as an indicator of returning abundances of Pink salmon to Area 6.

Area 7

Harvest opportunities for Pink salmon will be incidental to Chum-directed fisheries for both seine and gillnets.

Area 8

Second week of July: The assessment openings may be extended if the runs appear strong based on a review of catches to-date. Opportunities for a gill net and seine opening on Monday in the third week of July are considered, based on the results of the assessment fisheries:

If Atnarko Pink stocks are weak but Bella Coola and Kimsquit Chum stocks are strong, Subareas 8-3 and a portion of Subarea 8-4 south of a line from Walker Point to Hergest Point may be closed;

If Kimsquit Chum are weak but Bella Coola Chum are strong, Subarea 8-5 may be closed;

If Kimsquit Chum are very weak but Bella Coola Chum are strong, Subareas 8-5 and 8-4 north of Walker Point may be closed.

Areas 9 and 10

No commercial harvesting of Pink salmon is anticipated in these areas in 2021.

Fishery Monitoring and Catch Reporting

Fishery Monitoring and Catch Reporting includes the following:

Mandatory requirement to file fishing reports in all commercial fisheries, including "Start/Pause/Cancel/End" Fishing reports.

Mandatory catch reporting by phone-in with a paper harvest log and electronic transmission with an electronic harvest log (E-log) in all commercial fisheries.

In addition, for any fisheries in Area 6 the following will be implemented as a part of the catch monitoring pilots (Area A Seine: PFMA 3 and 6; Area C Gill net: PFMA 3 to 5):

Area A Seine (PFMA 3 and 6):

Designated landing sites (list to be developed based on recommendations from the Area Harvest Committees)

Catch estimates to be communicated prior to any shore-based offload

Independent verification of landed catch through a designated service provider

Deployment of at-sea observers with priority placed on highest profile fisheries occurring concurrently

Additional details on the catch monitoring programs will be communicated via Fisheries Notices.

13.4.4.5.3 Demonstration and ESSR Fisheries

Commercial Salmon Allocation Framework (CSAF) Demonstration Fisheries

In 2021, a demonstration fishery proposed by Gitga'at First Nation targeting Area 6 pink salmon was approved but not implemented due to insufficient returns. This fishery is proposed for implementation again in 2022, subject to area approval of the fishing plan and identified in-season abundance to support a fishery.

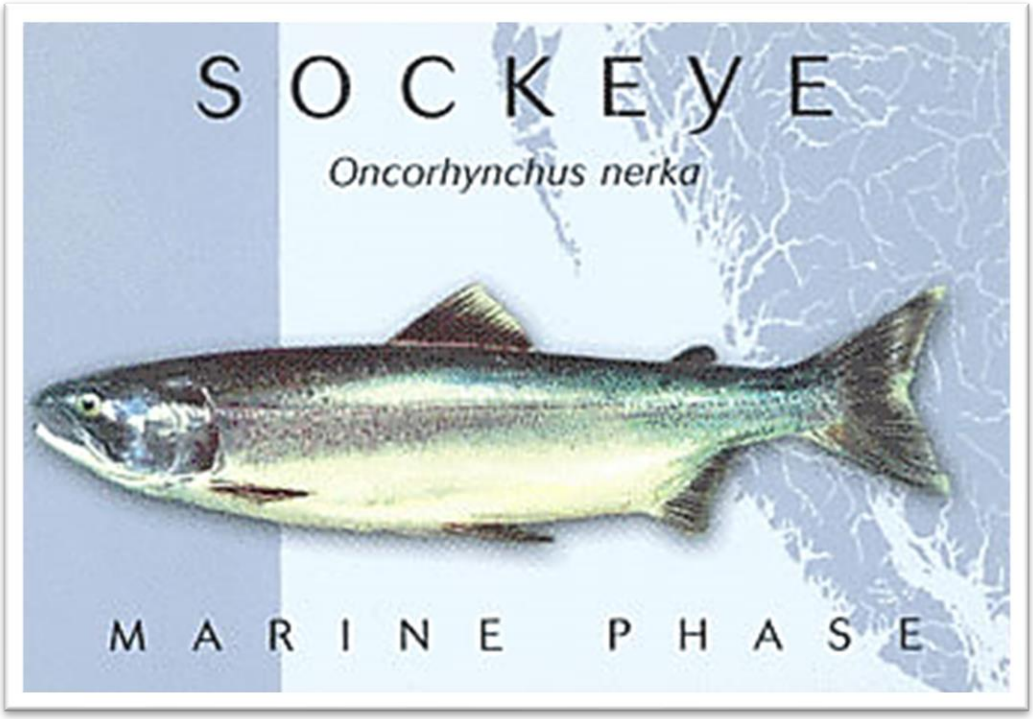
For more information on CSAF demonstration fisheries, please see Appendix 6.

ESSR Fisheries

Historically, ESSR opportunities have been provided on the Kemano River and Bish Creek. No Pink ESSR fisheries are anticipated in Area 6 in 2022.

For more information on CSAF Demonstration Fisheries or ESSR fisheries, please contact DFO Resource Manager Jen Gordon at (250) 600-0246.

13.5 NORTHERN SOCKEYE SALMON FISHING PLAN



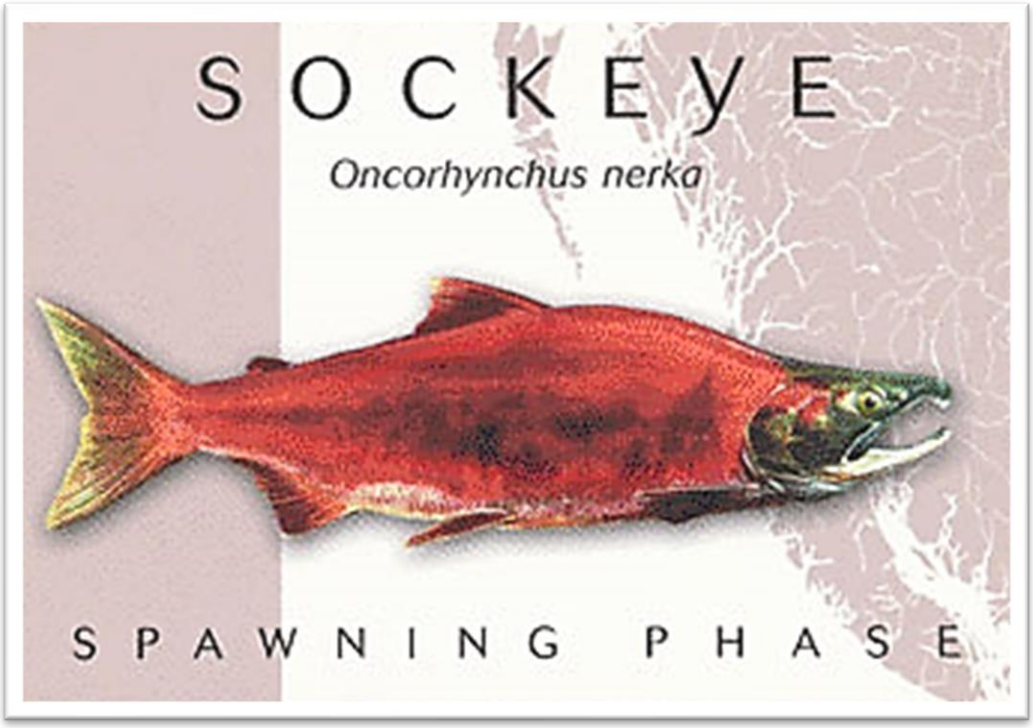


TABLE OF CONTENTS

13.5.1 Northern Sockeye Overview 294

13.5.1.1 Northern Sockeye Enhancement Information 294

13.5.2 Haida Gwaii Sockeye (Areas 1, 2W and 2E) 295

13.5.2.1 Snapshot Overview and Map of Management Unit 295

13.5.2.2 Stock Assessment Information 296

13.5.2.2.1 Pre-season 296

13.5.2.2.2 In-season 296

13.5.2.3 Decision Guidelines and Management Actions 296

13.5.2.4 Incidental Harvest, By-catch and Constraints to Haida Gwaii Sockeye Fisheries 296

13.5.2.5 Allocation and Fishing Plans 297

13.5.2.5.1 First Nations Fisheries 297

13.5.2.5.2 Recreational Fisheries 298

13.5.2.5.3 Commercial Fisheries 298

13.5.2.5.4 ESSR Fisheries 299

13.5.3 Nass Sockeye 300

13.5.3.1 Snapshot Overview and Map of Management Unit 300

13.5.3.2 Stock Assessment Information 301

13.5.3.2.1 Pre-season 301

13.5.3.2.2 In-season 302

13.5.3.3 Decision Guidelines and Management Actions 302

13.5.3.4 Incidental Harvest, By-catch and Constraints to Nass River Fisheries 302

13.5.3.5 Allocation and Fishing Plans 305

13.5.3.5.1 First Nations Fisheries 305

13.5.3.5.2 Recreational Fisheries 308

13.5.3.5.3 Commercial Fisheries 309

13.5.3.5.4 ESSR Fisheries 312

13.5.4 Skeena Sockeye 313

13.5.4.1 Snapshot Overview and Map of Management Unit 313

13.5.4.2 Stock Assessment Information *314*

13.5.4.2.1 Pre-season 314

13.5.4.2.2 In-season Assessment 315

13.5.4.3 Decision Guidelines and Management Actions *315*

13.5.4.4 Incidental Harvest, By-catch and Constraints to Skeena Sockeye Fisheries *317*

13.5.4.5 Allocation and Fishing Plans *321*

13.5.4.5.1 First Nations Fisheries 321

13.5.4.5.2 Recreational Fisheries 322

13.5.4.5.3 Commercial Fisheries 324

13.5.4.5.4 ESSR Fisheries 328

13.5.5 Central Coast Sockeye 330

13.5.5.1 Snapshot Overview and Map of Management Unit *330*

13.5.5.2 Stock Assessment Information *330*

13.5.5.2.1 Pre-season 330

13.5.5.2.2 In-season Assessment 331

13.5.5.3 Decision Guidelines and Management Actions *331*

13.5.5.4 Incidental Harvest, By-catch and Constraints to Central Coast Sockeye Fisheries *331*

13.5.5.5 Allocation and Fishing Plans *333*

13.5.5.5.1 First Nations Fisheries 333

13.5.5.5.2 Recreational Fisheries 334

13.5.5.5.3 Commercial Fisheries 335

13.5.5.5.4 ESSR Fisheries 336

13.5.6 Rivers & Smith Inlet Sockeye 337

13.5.6.1 Snapshot Overview and Map of Management Unit *337*

13.5.6.2 Stock Assessment Information *338*

13.5.6.2.1 Pre-season 338

13.5.6.2.2 In-season Assessment 339

13.5.6.3 Decision Guidelines and Management Actions *339*

13.5.6.4 Incidental Harvest, By-catch and Constraints to Rivers and Smith Inlet Sockeye Fisheries 341

13.5.6.5 Allocation and Fishing Plans *343*

13.5.6.5.1 First Nations Fisheries 343

13.5.6.5.2 Recreational Fisheries 344

13.5.6.5.3 Commercial Fisheries 344

13.5.6.5.4 ESSR Fisheries 345

13.5.1 NORTHERN SOCKEYE OVERVIEW

Major spawning runs of Sockeye salmon occur in the Skeena and Nass watersheds and historically in Rivers and Smith Inlets. Sockeye salmon are among the most economically and culturally important of Pacific salmon species.

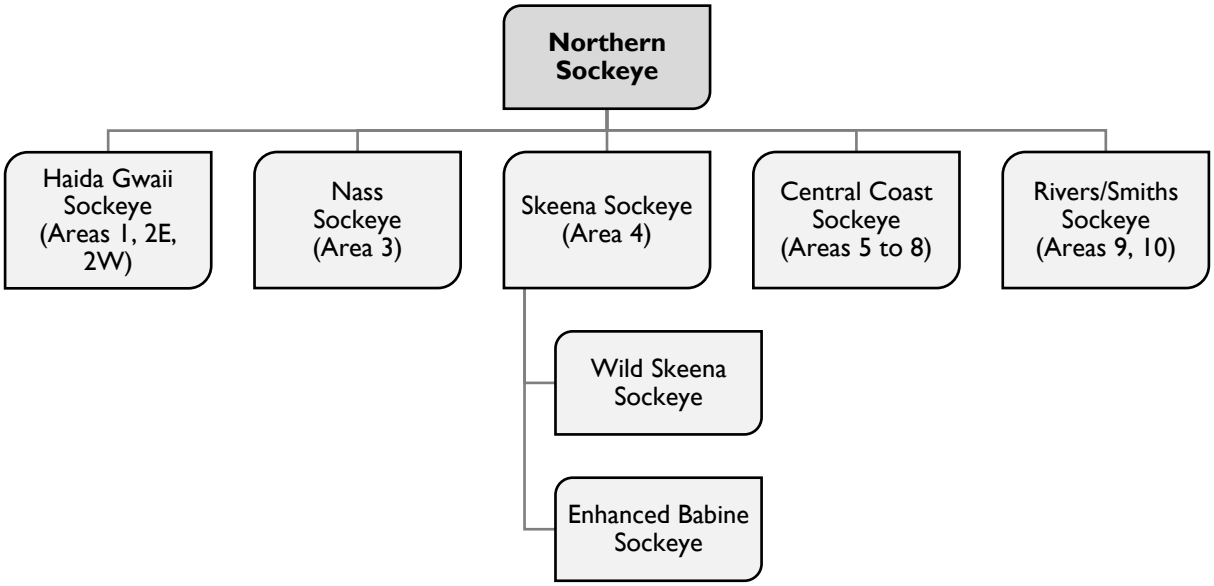


Figure 13.5-1: Overview of Northern Sockeye Salmon

13.5.1.1 NORTHERN SOCKEYE ENHANCEMENT INFORMATION

The major BC North Coast DFO operation enhancement facilities that produce Sockeye are:

- Fulton River project
- Pinkut Creek project
- Snootli Creek hatchery

The information available at the link below addresses production from major DFO Operations (OPS) facilities, contracted Community Economic Development Program hatcheries (CEDP), Public Involvement Projects (PIP) operated by volunteers, and Aboriginal Fisheries Strategy (AFS).

There are two datasets available: **Post-Season Production** from the 2020 brood year (i.e. 2021 releases, and numbers on hand for 2022 release), and the **Production Plan**, which includes proposed targets for the upcoming 2022 brood year. These are available at the following website:

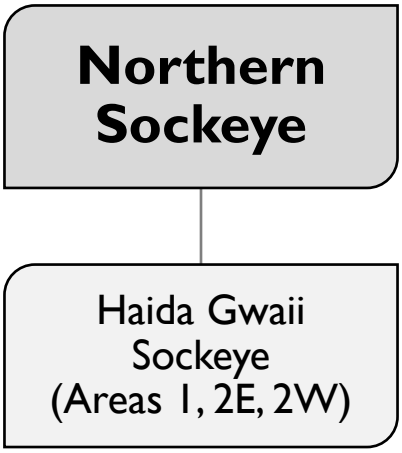
http://www.pac.dfo-mpo.gc.ca/sep-pmvs/projects-projets/ifmp-pgip-eng.html

NORTHERN SOCKEYE – SEP PROPSALS OR UPDATES for 2022

For 2022, there is a proposed Kitwanga sockeye pilot conservation enhancement project (egg target of 30K).

13.5.2 HAIDA GWAII SOCKEYE (AREAS 1, 2W AND 2E)

13.5.2.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT



Conservation Units

Ain/Skundale

Awun

Fairfax

Jalun

Marian/Eden

Marie

Mathers

Mercer

Skidegate

Yakoun

Figure 13.5-2: Overview of Haida Gwaii Sockeye

Sockeye returning to Haida Gwaii are relatively small stocks and are primarily harvested in targeted Haida food, social and ceremonial (FSC) fisheries.

13.5.2.2 STOCK ASSESSMENT INFORMATION

13.5.2.2.1 Pre-season

There are no formal quantitative pre-season forecasts for Haida Gwaii Sockeye. See Appendix 9 for more information.

13.5.2.2.2 In-season

The Haida Fisheries Program conducts the stock assessment of Haida Gwaii Sockeye to facilitate management of FSC fisheries. Sockeye returning to Skidegate Lake are visually enumerated at a floating fish fence at Copper Creek while the remainder of Sockeye stocks are typically enumerated using visual stream counts during spawning. The Haida Fisheries Program is developing a pilot ARIS program (sonar based counter) on the lower Yakoun River, which has been operational since 2019.

13.5.2.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

There are no commercial fisheries and very little recreational effort directed on Haida Gwaii Sockeye. The Haida Fisheries Program facilitates the management of the FSC harvest by conducting stock assessment, monitoring, FSC harvesting and develops FSC fishery management guidelines based on consultation with the Haida community.

13.5.2.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO HAIDA GWAII SOCKEYE FISHERIES

Haida Gwaii Sockeye are generally very early-timed and return from mid-May to late June. Sockeye are very small in size and do not contribute to any commercial net harvest as a target species or as by-catch, and are not subject to any known recreational harvest. Haida Gwaii Sockeye are mainly harvested in First Nations FSC fisheries.

The main producers of Sockeye harvested in the Area F troll fishery are the Skeena and Nass Rivers, and trollers at times intercept a small amount of these fish in Dixon Entrance as by-catch in their directed Fisheries on Coho, Pink and Chinook. Fisheries are managed to avoid the interception of migrating Fraser River Sockeye by prohibiting Sockeye retention west of 133 degrees West Longitude. In years of low Skeena or Nass Sockeye returns, Sockeye retention may be prohibited throughout the North Coast area.

13.5.2.5 ALLOCATION AND FISHING PLANS

13.5.2.5.1 First Nations Fisheries

Food Social and Ceremonial

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe the details of the FSC fishery including the dates, times, methods, locations of harvest. Communal licences for Northern Coastal First Nations are typically multi-species and are issued on an annual basis. Shorter duration amendments to licences are also issued on occasion.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

First Nations Specific Conservation Measures

When a conservation concern has been identified for an individual stock that is harvested by First Nations, consultations will be undertaken to adapt the fishing plan to provide the necessary protection to the weak stock.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish

harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

There are currently no Treaty fisheries for Sockeye in Haida Gwaii.

13.5.2.5.2 Recreational Fisheries

Recreational salmon fishing occurs primarily in the tidal waters surrounding Haida Gwaii, with the majority of effort focused along the shoreline from Masset to Langara Island in Area 1 and between Englefield Bay and Port Louis in Area 2W. Recreational fishing occurs primarily between May and September with peak effort and catch occurring in July and August. Sockeye salmon are incidentally retained in the recreational fishery which primarily targets Chinook and Coho salmon. The daily aggregate limit of salmon is four (4) per day.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:

https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

DFO has been collecting recreational catch data through the Lodge Log Book Program and the Haida Creel Program since 1995. Participation in monitoring and reporting of recreational catch in Areas 1 and 2 has been excellent over the past 26 years. Monitoring is continuing to improve with region wide initiatives.

13.5.2.5.3 Commercial Fisheries

Allocation

Description	Areas	Seine A	Gill Net C	Troll F
Skeena/Nass	1, 3 to 5, 101 to 105	25%	75%	*

Notes on Sockeye allocation (North):

* by-catch provisions

Haida Gwaii Local Sockeye Fisheries

There are no commercial fisheries targeting Haida Gwaii Sockeye stocks, and incidental harvest by the Area F troll fishery is thought to be negligible.

Area A&C

There are no commercial net fisheries that target Haida Gwaii Sockeye salmon.

Area F Troll

Forecasted returns to the Skeena River are expected to support commercial net fisheries. Therefore, retention of Sockeye salmon will be permitted as by-catch in 2022.

Troll fisheries will be managed to avoid migrating Fraser River Sockeye. This includes prohibitions of Sockeye salmon retention West of 133 degrees West longitude as well as in-season closures should Sockeye targeting be observed by Area F Troll.

Fishery Monitoring and Catch Reporting

Fishery Monitoring and Catch Reporting includes the following:

Mandatory requirement to file fishing reports in all commercial fisheries, including "Start/Pause/Cancel/End" Fishing reports.

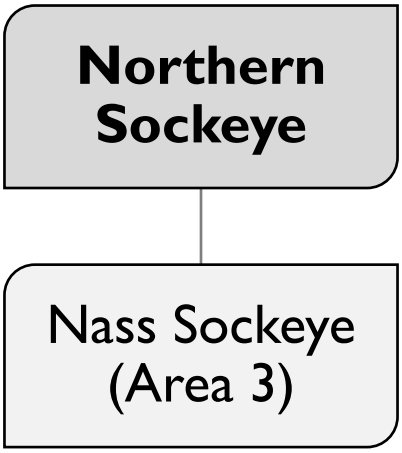
Mandatory catch reporting by phone-in with a paper harvest log and electronic transmission with an electronic harvest log (E-log) in all commercial fisheries. *(Catch reporting requirements are specific to each licence group and are detailed in the conditions of licence for each gear type)*.

13.5.2.5.4 ESSR Fisheries

There are currently no ESSR fisheries taking place for Haida Gwaii Sockeye.

13.5.3 NASS SOCKEYE

13.5.3.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT



Conservation Units

Bowser

Damdochax/Wiminasik

Fred Wright

Kwinageese

Meziadin

Oweegee

Figure 13.5-3: Overview of Nass Sockeye Salmon

There are 14 Sockeye streams in Area 3, of which all but two are tributaries to the Nass River. The major producers of lake-type Sockeye are Bowser, Damdochax, Kwinageese and Meziadin lakes, of which Meziadin Lake is the most significant and accounts for up to 75% of Sockeye salmon production in the Nass watershed. Recent escapements to Meziadin have been below the target escapement. Kwinageese River Sockeye returns were severely affected by a rockslide in 2009 that blocked access to spawning grounds. Sockeye salmon escapements have improved since 2011, when fish passage improvement measures were implemented by Nisga'a Fisheries.

Fisheries targeting Nass Sockeye are managed to meet commitments in accordance with the Nisga'a Final Agreement (NFA), to meet First Nations FSC goals, Pacific Salmon Treaty (PST) obligations and to provide ocean commercial and inland commercial fisheries harvest opportunities.

The northern Chatham Sound portion of Area 3 is managed in conjunction with the Skeena River fishery after the beginning of July due to the large numbers of Skeena Sockeye and Pink salmon passing through the area at that time.

13.5.3.2 STOCK ASSESSMENT INFORMATION

13.5.3.2.1 Pre-season

Decisions are made about the spawning escapement plan, management priorities and identification of conservation constraints prior to each fishing season. These decisions are made based on pre-season forecasts of run size, timing, stock composition, other technical information and input from various consultative processes. Potential fishing opportunities are identified based on these pre-season guidelines and subsequently updated using in-season information.

Seasonal management, assessment of Nass Area salmon stocks and minimum and production-based salmon escapement goals are discussed in the Nass Fisheries Operational Guidelines (FOG) which were developed to aid in the implementation of the Nisga'a Final Agreement. Additional information regarding the Nisga'a Fisheries Program can be found at: https://www.nisgaanation.ca/fisheries-management

Nass Sockeye are managed to achieve an aggregate spawning escapement target of 200,000. Returns in excess of the escapement target are harvested in Nisga'a Treaty, First Nations, recreational, and commercial harvest opportunities. Management measures will be in place to reduce impacts to specific stocks of concern.

Opportunities for a gillnet fishery are evaluated during the pre-season planning process and implemented based on in-season returns. The seine fishery is usually a targeted Pink fishery with restrictions such as time, area and gear restrictions in place to pass stocks of concern through to the spawning grounds.

See Appendix 9 for more information.

2022 Pre-season Nass River Sockeye Run Size Forecast:

Nass River Sockeye returns are forecasted to be below average with an expected total return to Canada from 225,000 (75% probability) to 1,007,000 (25% probability) and a point estimate of 471,000 (50% probability) based on a sibling-regression model. Nass Sockeye returns will be carefully monitored to take into account increasing uncertainty and recent trends towards lower survival.

13.5.3.2.2 In-season

In-season Decisions

Weekly decisions are made from run size predictions based on:

Catch and effort data from the Area 3 and Alaskan Tree Point commercial net fisheries;

Escapement information from the Nisga'a Fishwheel Program conducted at test fishing sites near Gitwinksihlkw on the Nass River, fish counts at the Meziadin fishway, fish counts at the Kwinageese weir, and later from individual stream inspections.

13.5.3.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Nass Sockeye are managed to achieve an aggregate spawning escapement target of 200,000. Returns in excess of the escapement target are harvested in Nisga'a Treaty, recreational and commercial harvest opportunities, both in marine and in-river fisheries. The escapement target for Meziadin Sockeye is 160,000. In years when Meziadin Sockeye escapement is expected to be below this target, management considerations to reduce impacts on this stock will influence decision-making for terminal commercial Sockeye harvests.

13.5.3.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO NASS RIVER FISHERIES

All Nass area net fisheries will normally be restricted to daylight hours.

The local manager may vary these net fishing times depending on circumstances such as by-catch concerns, strong returns of target species and abundance of prohibited species, weather or other factors. Fishing times will be specified in fishery notices released prior to the fishery.

Commercial marine constraints this year include:

Non-retention of Steelhead is mandatory in all fisheries.

Fisheries will continue to be managed to reduce impacts to Canadian Chum. The rebuilding plan for the immediate future is to keep the Canadian average ER to below 10%.

Brailing and sorting, with the mandatory release of all Chinook, Coho, and Steelhead will be in place for the seine fishery; gill net fisheries will be non-retention of Chinook, Coho, and Steelhead.

Gill nets have a 137 mm (5.39 in) maximum mesh restriction. This restriction is in place so that Sockeye is targeted and larger non-target species such as Chum and Chinook are impacted to a lesser degree.

Figure 13.5-4 KWINAGEESE SOCKEYE BROOD RETURN STATUS, 2011 TO 2024

		Return Year										
Brood year	Escapement	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2010	48	Age 5										
2011	10,273	Age 4	Age 5									
2012	3,688		Age 4	Age 5								
2013	398			Age 4	Age 5							
2014	438				Age 4	Age 5						
2015	6,888					Age 4	Age 5					
2016	19,797						Age 4	Age 5				
2017	7,240							Age 4	Age 5			
2018	290								Age 4	Age 5		
2019	6,007									Age 4	Age 5	
2020	3,256										Age 4	Age 5
2021	8,478											Age 4

Kwinageese sockeye returns for 2022 are expected to be poor following moderate brood year escapement 2017 and very low brood year escapement in 2018. The majority of Kwinageese Sockeye pass through the Area 3 commercial fishery areas from July 8th to July 28th with the peak occurring between July 12th and July 24th.

For 2022, the Department is proposing the following management actions to reduce harvest impacts on Kwinageese Sockeye for a one week period (July 17-23):

1. 1-week closure for commercial gillnet fisheries throughout PFMA Area 3
2. 1-week non-retention Sockeye period for commercial seine fisheries throughout PFMA Area 3.

Spatial restrictions to protect Chinook, and retention restrictions to protect Chum will also be implemented.

Revival Tanks

Tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the

water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

Gill Net Construction

In Management Areas 1 to 10, gill nets of different constructions may be used. Net construction may be either multistrand (30 filaments), or four, five or six filaments (Alaska twist). Specific restrictions such as the specifications for net construction and revival boxes are found in the conditions of the individual licences, which are attached to the licence. Fishers are urged to read these conditions carefully to ensure that their vessel and fishing techniques are in accordance with their licence.

All gill nets will meet one of the following configurations:

Nets may be hung without a weed line (corkline to web distance 0 to 45 cm) to a maximum of 60 meshes deep.

In Management Areas 3 to 5, nets may be greater than 60 meshes deep, but must be hung with a weedline (corkline to web distance minimum 0.76 m, maximum 1.5 m) to a maximum of 90 meshes deep. As well, every fifth cork must be red or another distinctive colour (not white).

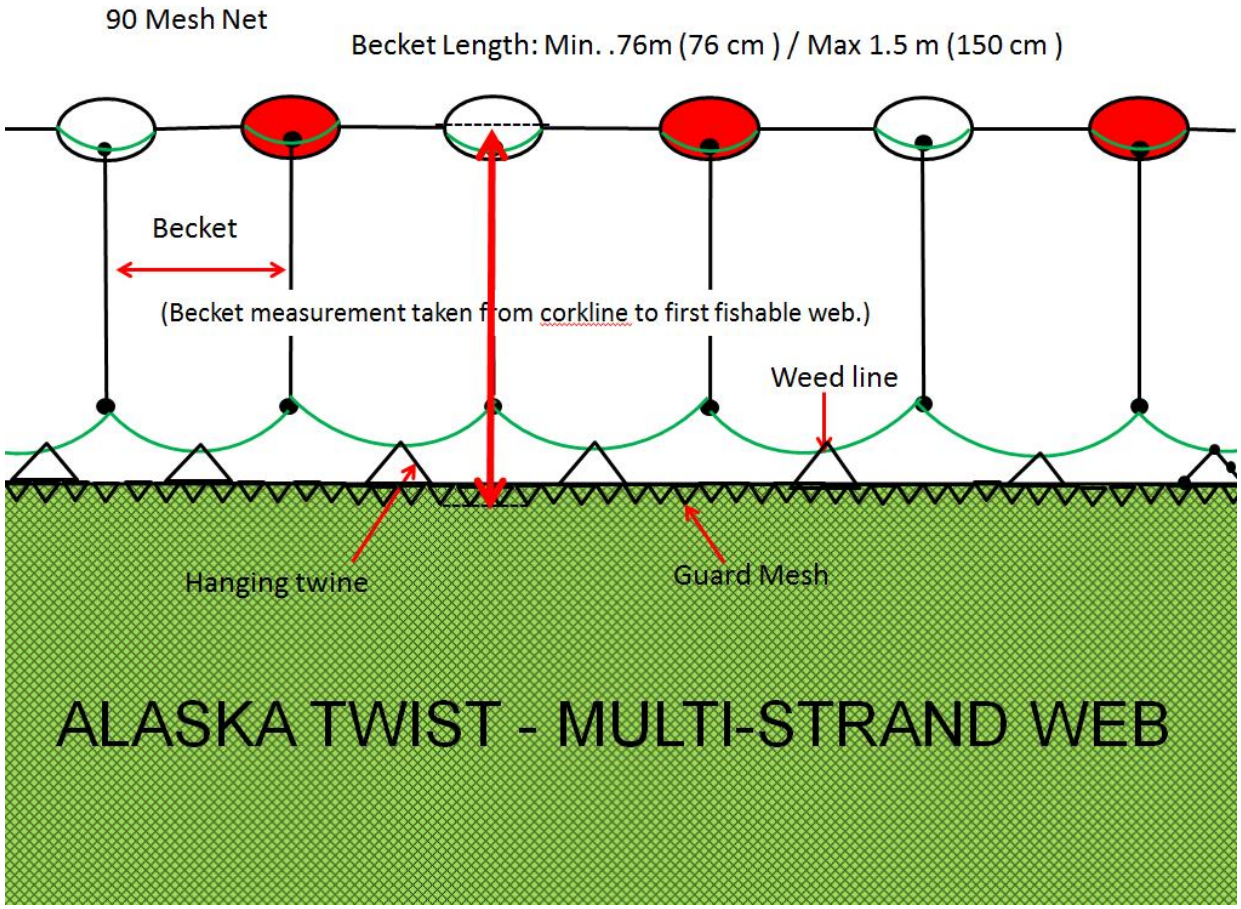


Figure 13.5-5: 90 Mesh Net Construction

Specific restrictions for net configuration are found in the Fishery Notice issued prior to every commercial fishery. Fishers must ensure that are urged to read these carefully to ensure that their fishing gear is in accordance with the regulations for each opening.

13.5.3.5 ALLOCATION AND FISHING PLANS

13.5.3.5.1 First Nations Fisheries

Food Social and Ceremonial

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe the details of the FSC fishery including the dates, times, methods, locations of harvest. Communal licences for Northern Coastal First

Nations are typically multi-species and are issued on an annual basis. Shorter duration amendments to licences are also issued on occasion.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

First Nations Specific Conservation Measures

When a conservation concern has been identified for an individual stock that is harvested by First Nations, consultations will be undertaken to adapt the fishing plan to provide the necessary protection to the weak stock.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

Nisga'a Fisheries

The Nisga'a Annual Fishing Plan (NAFP) is developed by the Nisga'a-Canada-BC Joint Fisheries Management Committee (JFMC) and governed by the terms of the Nisga'a Final Agreement and the Nisga'a Harvest Agreement of the Nisga'a Treaty. The Nisga'a Harvest Agreement includes Nisga'a fish allocations expressed as a percentage of the adjusted total allowable catch of Sockeye and Pink salmon. The NAFP is developed in accordance with Chapter 8 of the Nisga'a Final Agreement. Once approved by the Minister of Fisheries, the Nisga'a Annual Fishing Plan remains in effect until replaced the following year. The fishing plan applies to persons who harvest fish, other than steelhead, in Nisga'a fisheries.

Nisga'a salmon allocations, as defined in the Nisga'a Treaty, are set out as a percentage of the Total Return to Canada (TRTC) up to maximum catch thresholds (63,000 Sockeye [10.5%], 6,300 Pink [0.6%], 12,600 Chinook [21%], 19,200 Coho [8%], and 12,000 Chum [8%]) in large return years. These Nisga'a salmon allocations have the same priority in fisheries management decisions as domestic [food, social and ceremonial (FSC)] fisheries that target Nass salmon.

The NAFP defines the escapement goals required to guide management decisions for Nass salmon stocks, calculates Nisga'a allocations for each salmon species and provides the general regulatory requirements for catches of each salmon species. The NAFP is provided to other Nass watershed First Nations for their information and is reviewed by the JFMC prior to being submitted to the Minister for approval. Nisga'a Lisims Government is responsible for the internal allocation of catch opportunities between Nisga'a fishers and day to day operation of the Nisga'a fishery.

Pre-season estimates and ranges for the Nisga'a salmon allocations in 2022 are:

Nass Sockeye: The Total Run size probability point estimate for 2022 from a pre-season sibling-regression model is 560,000 (50%) with a range in point estimates between 380,000 (75%) and 828,000 (25%). Assuming a 16% Alaskan exploitation rate (based on the average of run reconstructed even years from 1998 to 2020, approximately 89,000 Nass Sockeye), the 50% probability point estimate for the Total Return to Canada (TRTC) of Nass Sockeye is 471,000 with a range of point estimates from 320,000 (75% probability) to 696,000 (25% probability) and is projected to return below average (603,000) based on returns from 1994 to 2021. The forecast method's mean absolute accuracy for predicting TRTC returns is good; 79.3% (range: 52–99%) based on 2003 to 2021 returns. Based on the pre-season TRTC forecasts and the minimum escapement goal (200,000) for 2022, the Nisga'a allocation ranges between 34,000 and 119,000. The mean TRTC forecast (471,000) will be used for calculating the initial target for the in-season Nisga'a allocation (78,000) for Nass Sockeye in 2022. While returns of Sockeye to the Nass River are anticipated to be above the escapement goal (200,000) in 2022, harvests in all fisheries need to be carefully monitored during the season due to poor returns in 2018 to Kwinageese River (<300 spawners) and extreme low water conditions during migration and spawning. Depending on in-season run strength and reaching the aggregate escapement goal for 2022, the actual Nisga'a allocation target for Nass Sockeye in 2022 may be higher to account for the current cumulative Nisga'a Treaty underage (approximately 3,000) accrued from 2000 to 2021.

13.5.3.5.2 Recreational Fisheries

Recreational salmon fishing occurs in the tidal waters adjacent to the Nass River, with the peak of the season being from June to August.

The Nass River and tributaries are in Region 6 freshwater fishing area and a Sockeye opening occurs in Meziadin Lake and the Nass mainstem from July to September. The minimum size limit is 30 cm, and daily and total possession limits are in effect.

Triggers for the recreational fishery in Meziadin Lake were implemented in 2020 in response to recent poor returns of Meziadin Sockeye. These triggers will continue in 2022.

Table 13.5 Recreational Sockeye Fishery Triggers for Meziadin Lake

Sockeye Past Meziadin Fishway	Daily Recreational Retention Limit – Meziadin Lake
Less than 120,000	0 per day
Between 120,000 and 160,000	1 per day
Greater than 160,000	2 per day

In-season updates and fishery regulation changes can be found on the recreational fisheries website:
https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

The Area 3 and 4 creel program operated by the North Coast Skeena First Nations Stewardship Society typically runs May through August, information collected by this program typically is shared through in-season and post season process. There is continued interest in implementing a creel survey of the freshwater recreational fisheries in the Nass watershed, however there is no program currently in place. The mean average in-river recreational catch of Nass Sockeye from 2000-2015 is 540 fish.

13.5.3.5.3 Commercial Fisheries

Allocation and Fishing Plans

Description	Areas	Seine A	Gill Net C	Troll F
Skeena/Nass	1, 3 to 5, 101 to 105	25%	75%	*

Notes on Sockeye allocation (North):

* by-catch provisions

Nass Fisheries

For 2022, the Department will be maintaining a precautionary approach. Any fishery openings will be informed by in-season assessment of run size from the Nass fish wheels and other available sources of information.

Fishing opportunities will also be subject to achieving fisheries management objectives for constraining stocks and species of concern (e.g. Kwinageese Sockeye, Nass Chinook, Nass Chum) in areas where they are present. Later-timed fisheries will not be permitted in order to minimize interactions with wild Nass Chum stocks of concern. Additional management considerations to address concerns for Nass Coho may be required.

Anticipated Net Opening Dates:

Area C Gill Net

Beginning in 2022, additional mitigation measures will be implemented in this fishery to increase protection for stocks of conservation concern. These measures include: delayed fishing start to when in-season escapement estimates become more accurate and to avoid weak Meziadin Sockeye and Northern Chinook stocks, season end date late July to avoid wild Area 3 Chum stocks. See Appendix 10 for a complete list of fisheries where additional mitigations measures will be implemented.

Early July: First Sockeye-directed opening will occur only if supported by in-season run size information from sources such as the Nass fish wheels. This will be a one-day gill net Sockeye fishery to inform further commercial fishing opportunities. Maximum mesh size is 137 mm (5.39 in). This fishery will be operated with spatial closures in place to avoid Nass Chinook.

Area A Seine

July 11: First anticipated Pink targeted seine fishery opening will be determined in-season based on Pink abundance. Sockeye retention and other management actions in this fishery will

be informed by in-season abundance and other considerations. Minimum bunt mesh size 70 mm (2.76 in).

Fishery Monitoring and Catch Reporting

For 2022, the Department is continuing to work with Area Harvest Committees on catch monitoring programs in the following areas:

Area A Seine (PFMA 3 to 6):

- Designated landing sites (list to be developed based on recommendations from the Area Harvest Committees)
- Catch estimates to be communicated prior to any shore-based offload.
- Independent verification of landed catch through a designated service provider
- Deployment of at-sea observers with priority placed on highest profile fisheries occurring concurrently.
- Area C Gill net (PFMA 3 to 5): Designated landing sites (list to be developed based on recommendations from the Area Harvest Committees)
- Catch estimates to be communicated prior to any shore-based offload.
- Additional details on the catch monitoring programs will be communicated via Fisheries Notices.

Nass Sockeye Inland Demonstration Fisheries

The concept of the inland demonstration fishery is to transfer the catch of commercial gill net or seine licences to inland portions of the Nass system. These inland demonstration fisheries will only take place if the Nass Sockeye run returns in sufficient strength to implement commercial fisheries. These fisheries will be managed in accordance with the approved fishing plans.

Gill net or seine licence shares set aside for the inland demonstration fisheries will be based on each commercial licence having an equal share of the available commercial allocation, by gear type in the Management Area 3 commercial fishery, and the weekly in-season forecast for aggregate Sockeye returns to the Nass system. The total inland allocation will be equal to the gill net and seine shares multiplied by the number of licences set aside for the inland fishery. There are approximately 107 Area A seine licences and 626 Area C gill net licences in the commercial fleets (these numbers could vary slightly prior to the fishery). The licence share will be further adjusted to reflect the stock proportion available in a specific fishing area. Two Sockeye-directed demonstration fisheries have been approved for 2022, subject to area approval

of the fishing plans. These fisheries are implemented by Nisga'a Lisims Govermernt and Gitanyow First Nations. Allocations for these fisheries are calculated as a percent share of the harvestable surplus and not marine commercial catch.

For the inland demonstration fisheries, the intent will be to continue the selective methods that have been developed during the 1990s pilot sales fisheries. These could include beach seine, dip net, fishwheels or other selective gear types. Sockeye (and possibly Pink and Coho when abundance permits) may be retained, based on the weekly allocation issued by Prince Rupert DFO, and all other species will be returned to the water with the least possible harm.

All inland commercial Sockeye salmon harvests shall be checked through a compulsory landing station. All appropriate records are to be kept for proper monitoring and enforcement. No FSC fishing or retention will be allowed while participating in the inland demonstration fishery.

Each First Nations engaging in an inland demonstration fishery must submit a demonstration fishery plan. This plan must be approved by the Department prior to harvesting.

The DFO contact for more information is Jen Gordon at 250-600-0246.

Licence Set-aside rules:

DFO may contribute commercial licences that are currently held by the Department. In addition, commercial licences may also be solicited through private ventures, through an arrangement between Nass First Nations and individual licence holders.

All licences that will be used in the inland demonstration fisheries will have to be either Area C gill net or Area A seine, and annual renewal fees will be paid in full for the current season. These licences cannot have been fished in any Area C or A fisheries during the current year. Licence documents will be held in the DFO office. This process may be updated to be consistent with licence issuance through the National Online Licensing System. Catch share transfers will be calculated based on the number of licences as indicated above. Catch shares will not be provided for marine commercial fisheries that have been announced prior to the licence transfer. Licenses transferred inland may be used simultaneously in other inland watershed demonstration fisheries as approved by DFO.

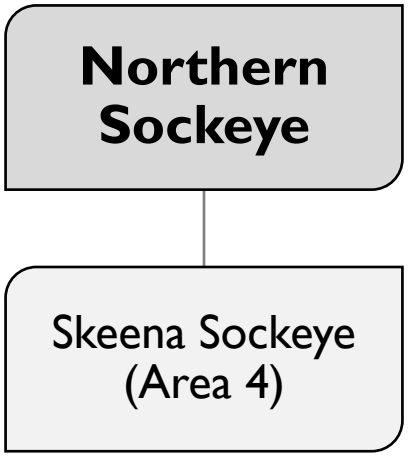
It is anticipated that the Nisga'a Lisims Government and Gitanyow First Nations demonstration fishery proposals under the Commercial Salmon Allocation Framework process will be considered in 2022. See Appendix 6 for more details.

13.5.3.5.4 ESSR Fisheries

Historically, ESSR fisheries for Sockeye have taken place in Meziadin Lake for the Gitanyow and Nisga'a First Nations. In 2021, Gitanyow First Nation approached the Department with a proposal to explore opportunities to update the Meziadin Lake ESSR fishing plan. Discussions around this proposal are expected to be informed by the ongoing Nass Sockeye Escapement Goal analysis work being completed through updates to Chapter 2 of the Pacific Salmon Treaty. Further discussions are expected to take place through the Nass Watershed Technical Committee, the Nisga'a JFMC, the North Coast IHPC, and other processes.

13.5.4 SKEENA SOCKEYE

13.5.4.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT



Conservation Units

Alastair	*Clements*	*Johnston*	*Maxan*	*Slamgeesh*
Adlrich	*Damshilgwit*	*Kitsumkalum*	*Mcdonell*	*Spawning*
Asitika	*Dennis*	*Kitwanga*	*Morice*	*Split Mountain/Leverson*
Atna	*Ecstall/Lower*	*Kluatantan*	*Motase*	*Stephens*
Azuklotz	*Footsore/Hodder*	*Kluayaz*	*Nilkitkwa*	*Sustut*
Babine River-early	*Johanson*	*Lakelse*	*Sicintine*	
Babine River-late	*Tahlo/Morrison*			
Bear				
Swan				

Figure 13.5-6: Overview of Skeena Sockeye Salmon

The Skeena River is the second largest producer of Sockeye in B.C. The largest producers of Sockeye salmon in the Skeena system are the enhanced runs to the Babine Lake tributary spawning channels at Fulton River and Pinkut Creek.

Sockeye from various streams and lake systems migrate up the Skeena from June through August. Wild stocks are generally less productive and therefore cannot withstand the same exploitation rate as the enhanced Babine stocks of Pinkut Creek and Fulton River. While there are a number of wild stocks of concern, current IFMP discussions have focused on three wild Sockeye stocks, the Nanika-Morice, Kitwanga and Babine River. The Nanika-Morice Sockeye

peak through the fishing area in early July (early timing), and the Kitwanga and Babine River Sockeye stocks peak through the fishing area in late July and early August.

Measures have been taken to reduce fishery impacts on Skeena River Chinook, Chum, Steelhead, and wild Sockeye stocks. These measures include non-retention in commercial fisheries, gear and fishing modifications, and specific timing closures or Sockeye harvest rate reductions when weak stocks are present.

Skeena River Sockeye returns are harvested in Areas 3, 4 and 5.

13.5.4.2 STOCK ASSESSMENT INFORMATION

13.5.4.2.1 Pre-season

The aggregate escapement target for Skeena Sockeye is currently under review. The current interim minimum escapement goal, of 400,000 is based on the lowest observed escapement from which Skeena Sockeye recovered after a landslide in 1950 that blocked fish passage into Babine River. This aggregate escapement goal does not account for the higher proportion of enhanced Babine Sockeye in the aggregate return since the inception of the Fulton and Pinkut spawning channels.

In 2017, the Skeena First Nations Technical Committee (SFNTC) provided advice to guide management of First Nations FSC fisheries in the Skeena and approach areas. At the time, the SFNTC recommended that the FSC management trigger be increased from the minimum escapement goal of 400,000 to 600,000. This recommendation was supported by the North Coast Stock Assessment Division as an interim measure to increase the likelihood of attaining a higher escapement goal for wild Skeena Sockeye populations. As a part of recent updates to Chapter 2 of the Pacific Salmon Treaty, a review of biological benchmarks for aggregate and component Skeena and Nass sockeye stocks, which may result in an updated aggregate escapement goal for Skeena River Sockeye. This updated information is scheduled to be completed by 2023.

See Appendix 9 for more information.

Pre-season Skeena River Sockeye Run Size Forecast:

The total Skeena Sockeye return is expected to be low to average with a pre-season return forecast from 0.97 million (90% probability) to 4.37million (10% probability) and a point estimate of 2.05 million (50% probability) based on the sibling model. For more information, see Appendix 9.

13.5.4.2.2 In-season Assessment

The Tyee Test fishery is the main in-season stock assessment tool for estimating the relative abundance of Skeena River salmon and Steelhead through the use of a multi-panel gill net with varying mesh sizes. Daily in-season escapements and total run size are estimated for Sockeye only. These in-season estimates are made possible due to the Babine fence operations that allow for post-season calibration of the Tyee Test fishery for Sockeye. Salmon returns are variable and estimates are also subject to error as annual run timing and the annual catchability of salmon by the Tyee test fishery net varies.

13.5.4.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Historically, an in-season return to Canada forecasts of less than 550,000 Skeena Sockeye would trigger consultations with First Nations who harvest Skeena Sockeye, to limit food, social and ceremonial fisheries. If Skeena Sockeye return to Canada are forecasted to be less than 400,000 all fishing activity on Sockeye will cease.

For 2022, it is anticipated that there will be sufficient Skeena Sockeye to meet Skeena First Nations FSC needs. However, the Department will continue to support the management recommendations developed by the Skeena First Nations Technical Committee and supported by individual Skeena First Nations regarding Skeena Sockeye.

The Skeena First Nations Technical Committee has recommended that the FSC management trigger level for First Nations Section 35(1) Sockeye fisheries be maintained at 400,000. As proposed in previous SFNTC fishing plans, Skeena First Nations may choose to close or curtail First Nations section 35(1) FSC sockeye fisheries anytime if the in-season TRTC estimate is below 600.000. Individual Skeena First Nations FSC harvest plans will continue to be developed and refined based on in-season salmon return information including FSC opportunities in marine areas.

The current Skeena Sockeye aggregate escapement target is 900,000 and combined First Nations food, social and ceremonial fishery requirements are in the range of 150,000 annually.

Commercial fisheries will not take place until the in-season run size prediction is greater than 1.05 million.

The allowable Canadian commercial exploitation rate on the Skeena Sockeye aggregate increases as the return to Canada increases. The allowable commercial exploitation rate will be 0% for returns to Canada less than 1,050,000. The allowable exploitation rate will increase linearly from 0% at 1,050,000 to 20% at a run size of 2.0 million, 30% at 3.0 million, and up to a maximum of 40% at a return of 4.0 million or greater. See Figure 13.5-7.

Early and late commercial gill net fisheries may require additional management measures to protect weak stocks. Any gill net fisheries on or after August 1 will have additional management measure to protect bycatch and wild later timed Sockeye stocks. While the aggregate harvest rate schedule shown in Figure 13.5-7 guides the overall commercial exploitation rate, other important considerations include protecting and rebuilding identified stocks and species of concern, incorporating concerns expressed by First Nations and stakeholders and impacts of other fisheries in setting weekly harvest rates. These additional considerations will guide weekly harvest rates in late July and early August.

DFO may reserve Sockeye allocation for seine vessels to account for Sockeye by-catch during a directed Pink fishery.

Excess to Salmon Spawning Requirement opportunities for Sockeye at the Babine Lake spawning channels may be considered should abundance permit, even in the absence of marine commercial fishing opportunities.

When FSC fisheries for Skeena Sockeye are closed for conservation purposes, the following will be implemented:

- Recreational fisheries for salmon in the Skeena River will be closed.
- Recreational marine fisheries for salmon in Area 3, 4, and 5 will have existing retention limits reduced by half.
- Area 4 commercial fishing opportunities would be suspended.

The management actions listed above may be modified should abundances of other salmon species be sufficient to allow harvest beyond Food, Social, and Ceremonial requirements, and will be determined in season.

Should in-season estimates indicate FSC closures are no longer warranted, these management measures would be reversed in when the FSC closures are lifted, and they do not preclude management measures already in place for each species.

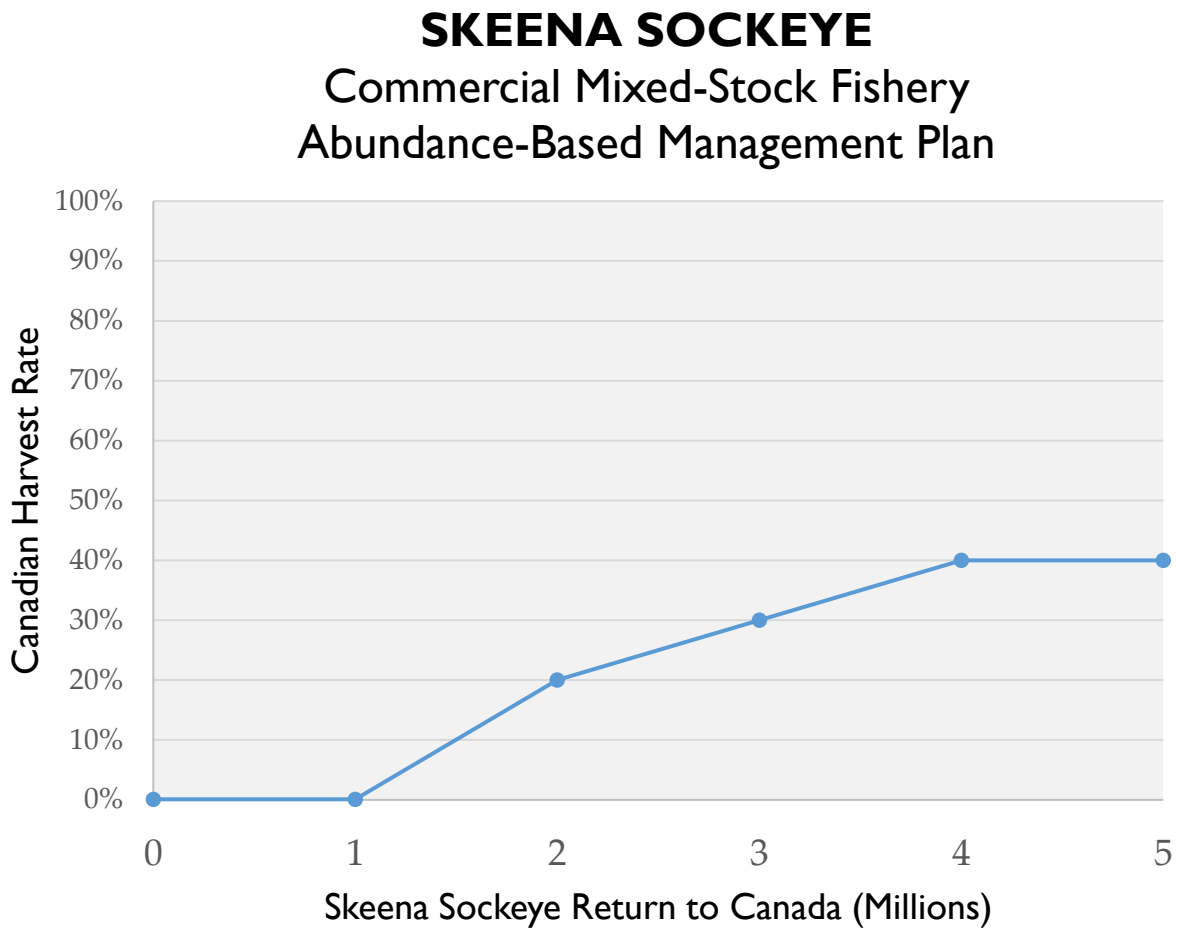


Figure 13.5-7: The allowable abundance based Canadian commercial harvest rate on Skeena Sockeye. This includes gillnet, seine and inland demonstration fisheries.

13.5.4.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO SKEENA SOCKEYE FISHERIES

Beginning in 2022, additional mitigation measures will be implemented in this fishery to increase protection for stocks of conservation concern. These measures include: implement season end date in early-August to avoid later timed wild stocks, implement August gillnet selective fishing practices for entire season to reduce bycatch mortalities (Steelhead, Chum, Coho) and support fisheries monitoring with option for enhanced at-sea observer coverage. See Appendix 10 for a complete list of fisheries where additional mitigations measures will be implemented.

Weaker runs of wild Sockeye salmon co-migrate with strong Sockeye stocks are, as well as stocks of all Pacific salmon species.

Fishing is limited to daylight hours. There is a request for First Nations not to fish near the confluence of the Kitwanga River, to protect Kitwanga Sockeye that may be holding in that area.

The first Sockeye opening will be delayed to after July 11th to reduce impacts on Nanika Sockeye. Retention of Coho, Chinook, Chum and Steelhead is prohibited in all net fisheries. The fishery will close in early August to avoid inteceptions of Chum and Steelhead.

Skeena Chum remain a stock of concern and Canadian harvest impacts will be limited to a maximum exploitation rate of 10% in Canadian fisheries. This is a ceiling, and harvest impacts would be expected to be well below this level in most years. It is anticipated that these management measures will be in place for an extended period.

Brailing and sorting with mandatory release of Chinook, Coho, Chum, and Steelhead will be in place for the seine fishery.

Gill net Sockeye fisheries will be mandatory non-retention for Chinook, Coho, Chum, and Steelhead. Additional restrictions to reduce impacts on these species may be necessary.

Gill nets have a 137 mm (5.39 in) maximum mesh restriction during the Sockeye fishery. This restriction is in place so that Sockeye is targeted selectively and larger non-target species such as Chum and Chinook are impacted to a lesser degree.

In-season assessments may change the management measures taken for various stocks. Measures taken could include non-retention of some species, gear and fishing modifications and specific timing closures or Sockeye harvest rate reductions when weak stocks are present.

Selective fishery constraints required to protect weak stocks will be maintained even if late season Sockeye run size upgrades indicate a remaining allowable harvest.

Any fisheries in 2022, will be short-net, short-set gill net fisheries to reduce impact on Steelhead and Chum. For the August gill net fishery, the following rules will apply:

- Half-length nets: Maximum net length will be 100 fathoms, or 187.5 m. It will not be acceptable to have a regular length net on your drum and only set half. It will also not be acceptable to have both halves of the net on your drum. Only one (half-length) net will be allowed on your drum or in the water.
- 20 minute soak times: The maximum amount of time the net is allowed to be in the water from the time it is completely set to the time it begins to be retrieved is 20 minutes. Note that this “soak time” is designed to equal a 40 minute time

from when the first portion of the net enters the water to the time when the last portion of the net leaves the water. Times will be monitored on the grounds.

- Fish handling: Gill net fishers are encouraged to handle prohibited species with the greatest of care. Operating revival boxes are mandatory as in all gill net fisheries. However, if the salmon is in a vigorous condition, it is best to release it directly to the water rather than put it in the revival box. Fishers are asked to use their judgment on which fish should go into the revival box before they are then released to the water.
- Reduced fishing area: In order to effectively monitor this selective fishery, the fishing area will be reduced. This will be achieved by closing the northern portions of Chatham Sound.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

Gill net revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

Gill Net Construction

In In Management Areas 1 to 10, gill nets of different constructions may be used. Net construction may be either multistrand (30 filaments), or four, five or six filaments (Alaska twist). Specific restrictions such as the specifications for net construction and revival boxes are found in the conditions of the individual licences, which are attached to the licence. Fishers are urged to read these conditions carefully to ensure that their vessel and fishing techniques are in accordance with their licence.

All gill nets will meet one of the following configurations:

Nets may be hung without a weed line (corkline to web distance 0 to 45 cm) to a maximum of 60 meshes deep.

In Management Areas 3 to 5, nets may be greater than 60 meshes deep, but must be hung with a weedline (corkline to web distance minimum 0.76 m, maximum 1.5 m) to a maximum of 90 meshes deep. As well, every fifth cork must be red or another distinctive colour (not white).

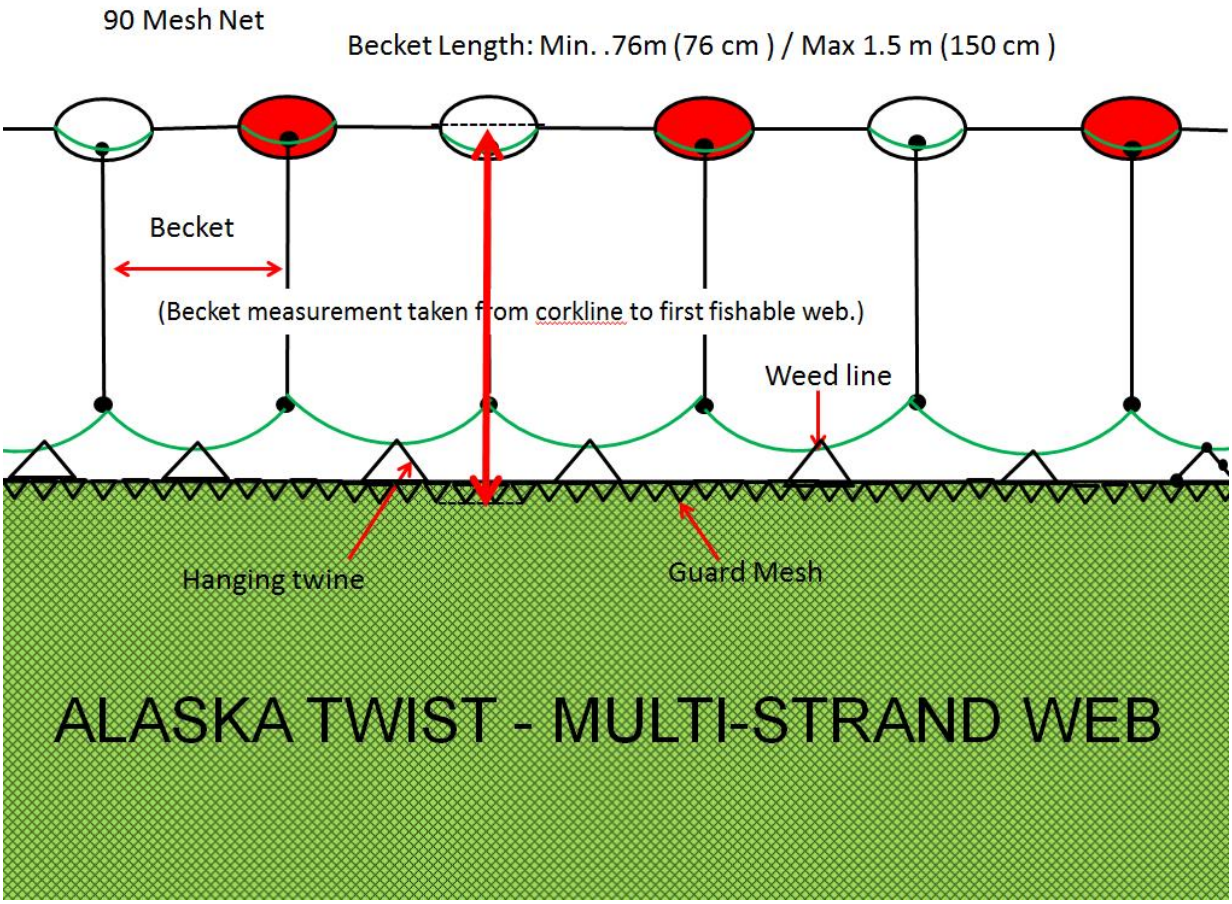


Figure 13.5-8: 90 Mesh Net Construction

Specific restrictions for net configuration are found in the Fishery Notice issued prior to every commercial fishery. Fishers are urged to read these carefully to ensure that their fishing gear is in accordance with the opening.

13.5.4.5 ALLOCATION AND FISHING PLANS

13.5.4.5.1 First Nations Fisheries

Food Social and Ceremonial

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe the details of the FSC fishery including the dates, times, methods, locations of harvest. Communal licences for Northern Coastal First Nations are typically multi-species and are issued on an annual basis. Shorter duration amendments to licences are also issued on occasion.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

First Nations Specific Conservation Measures

When a conservation concern has been identified for an individual stock that is harvested by First Nations, consultations will be undertaken to adapt the fishing plan to provide the necessary protection to the weak stock.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

There are currently no Treaty fisheries for Skeena Sockeye.

13.5.4.5.2 Recreational Fisheries

Recreational salmon fishing occurs in the tidal waters adjacent to the Skeena River, with the peak of the season being from June to August. The daily limit for Sockeye in Areas 3 to 5 is four (4) per day, unless otherwise varied, and open based on in-season estimates of escapement at the Tyee Test Fishery.

The minimum size limit for Sockeye salmon is 30 cm, in tidal waters and freshwater. The possession limit for salmon is twice the daily limit.

The Skeena River and tributaries are in Region 6 freshwater fishing area, and there are openings for Skeena Sockeye in Babine River and Lake, Pinkut Creek, Fulton River, and the Skeena mainstem.

The daily limits for Skeena Sockeye in non-tidal waters, are set by the guidelines for management actions table below.

Table 13.5-1: Guidelines for Management Actions for Recreational Sockeye Fisheries in the Skeena Watershed

Estimated Abundance	**Daily Limits**		
	Skeena Mainstem	Babine River	Babine Lake
Fewer than 0.8 million past Tyee	0	0	0
Between 0.8 million and 1.0 million past Tyee	1	1	1
Greater than 1.0 million past Tyee	2	2	2
Greater than 2.0 million return to Canada forecasted as of July 25th.	4	2	n/a
ESSR fishery on Babine Lake	n/a	n/a	4

* Return to Canada includes Sockeye caught in Canadian marine waters

For the 2022 season, the daily limit for Sockeye will be 0 per day from the start of the season until the in-season trigger of 800 thousand estimated past Tyee. In years of high abundance, the daily limit in Babine River will remain at 2 per day as per an agreement between DFO and BC Parks. Once DFO identifies a surplus to the spawning channels that would provide for an ESSR fishery on Babine Lake, the recreational Sockeye limits in Babine Lake will be increased to 4 per day.

In-season updates and fishery regulation changes can be found on the recreational fisheries website:

https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

When FSC fisheries for Skeena Sockeye are closed for conservation purposes, the following will be implemented:

- Recreational fisheries for salmon in the Skeena River will be closed.
- Recreational marine fisheries for salmon in Area 3, 4, and 5 will have existing retention limits reduced by half.
- Area 4 commercial fishing opportunities would be suspended.

The management actions listed above may be modified should abundances of other salmon species be sufficient to allow harvest beyond Food, Social, and Ceremonial requirements, and will be determined in season.

Should in-season estimates indicate FSC closures are no longer warranted, these management measures would be reversed in when the FSC closures are lifted, and they do not preclude management measures already in place for each species.

Fishery Monitoring and Catch Reporting

The Area 3 and 4 creel program operated by the North Coast Skeena First Nations Stewardship Society typically runs from May 1 to August 31. Information collected through this program is shared through in-season and post-season processes.

A creel survey of freshwater recreational fisheries on the lower Skeena River watershed is conducted by Kitsumkalum Fish and Wildlife program and LGL. Information collected through this program is shared through in-season and post-season processes.

13.5.4.5.3 Commercial Fisheries

Allocation

Description	Areas	Seine A	Gill Net C	Troll F
Skeena/Nass	1, 3 to 5, 101 to 105	25%	75%	*

* by-catch provisions

Skeena Fisheries

Commercial Sockeye fisheries will take place in Management Area 4 when the predicted return to Canada is greater than 1,050,000. Allowable exploitation rates for returns greater than 1,050,000, will be determined based on the abundance based exploitation rates showing in the Skeena Sockeye harvest rate table above.

For 2022 Skeena River Sockeye, returns are expected to be moderate (range from approximately 0.97million to 4.4 million). Fisheries will be informed by in-season assessments of actual Sockeye returns.

The commercial allocation of Skeena and Nass Sockeye (Areas 3 to 5) is 75% of the commercial TAC assigned to the gill net fleet, and 25% assigned to the seine fleet. The management strategy to achieve these allocations is to open the gill net fishery first, followed by the seine fishery, depending on estimated run size, current escapement information, and gill net catch to date. The Sockeye allocation for seines may be caught in Area 3 when Pink salmon are abundant in Area 3.

Area 4 Skeena River Sockeye Seine ITQ Fishery Management Plan

Any seine fishery for Sockeye salmon in Management Area 4 (Skeena) will be an Individual Transferable Quota (ITQ) demonstration fishery. The Sockeye fishery will be managed to an equal share of a weekly quota for Sockeye salmon for each of the registered seine licences (exact share of license to be determined once total licences in area is available) The opening times and quota will be posted weekly by fishery notice on the Department's web-site. ITQ management for the Sockeye fishery may not apply to Pink-directed seine fisheries that may occur in August. Any Sockeye harvested in a Pink-directed commercial fishery will still be subject to the Sockeye abundance-based management rules.

The Sockeye ITQ seine fishery will usually open for 5 days per week. Areas 4-12 and 4-15 will be among the Subareas open, but all vessels will be requested to exit this area if a concurrent gill net opening occurs. These areas will close on short notice if a gear conflict cannot be resolved.

Valid licence eligibilities will be permitted to reallocate (transfer) their quota to another valid licence eligibility each week or for the whole season. Both weekly and whole-season "Request for Temporary Reallocation of Quota" forms are available by email, fax or pick up at the Prince Rupert office. Verbal reallocation transfers will not be accepted. For an email or fax copy, please contact Jen Gordon (Jennifer.Gordon@dfo-mpo.gc.ca) or Corey Martens (Corey.Martens@dfo-mpo.gc.ca).

Vessels receiving a reallocation for the season will receive one licence amendment with a new quota amount expressed as a percentage. Vessels requesting a short-term reallocation (less than the whole season) will receive an amendment after the TAC has been set for the given management week and vessels will receive an amendment that includes the number of Sockeye reallocated.

Weekly TACs will expire, not be cumulative, and not carry over past the end of fishing on any given management week. Vessel masters must cease fishing when their quota has been achieved. All amendments to quota must be aboard the fishing vessel or the fishing vessel must have the DFO issued confirmation number of the quota transaction prior to fishing. As per the conditions of licence, quota reallocations will be permitted up to 48 hours after the fishery closes. Failure to reconcile quota within 48 hours of the fishery closure is a violation of the conditions of licence and will be forwarded on to DFO C&P for investigation.

Vessels must have a valid ASA licence (seine) with current Conditions prior to receiving or reallocating quota.

Start, end, pause and daily catch reports (per conditions of licence) must be made by Area A vessel masters to the salmon catch monitoring service provider or by E-log (refer to the conditions of licence).

Catch validation is mandatory for all ITQ fishery participants. This catch validation must be performed by an approved service provider, be done at dockside (no packers), and be done in Prince Rupert, Port Edward or Lax Kw'alaams. The contact number to arrange registration and validation will be published in a Fishery Notice immediately prior to any fishery.

Observers will be an integral part of this fishery and vessels may be requested to take an observer as per their licence conditions. Seines participating in the ITQ fishery will be required to participate in the at-sea observer program.

All vessels must enter Management Area 4 with clean holds, proper hail procedures and no overages from the previous week. If a vessel leaves the fishery to fish in another fishery, the catch shall be offloaded and verified by a validator prior to entering another fishery.

ITQ reallocations to the inland demonstration fishery will be allowed as long as there is at least one seine licence assigned to the inland demonstration fishery. The weekly inland transfer deadline will be announced in-season.

Anticipated Net Opening Dates

Openings will be based on Skeena salmon returns, PSSI considerations, and the target annual exploitation rate and will be similar to previous years subject to ongoing discussions with First Nations and commercial fishing interests.

Fishery Monitoring and Catch Reporting

For 2022, the Department is continuing to work with Area Harvest Committees on catch monitoring programs in the following areas:

Area A Seine (PFMA 3 to 6):

Designated landing sites (list to be developed based on recommendations from the Area Harvest Committees)

Catch estimates to be communicated prior to any shore-based offload

Independent verification of landed catch through a designated service provider

Deployment of at-sea observers with priority placed on highest profile fisheries occurring concurrently

Area C Gill net (PFMA 3 to 5):

Designated landing sites (list to be developed based on recommendations from the Area Harvest Committees)

Catch estimates to be communicated prior to any shore-based offload

Additional details on the catch monitoring programs will be communicated via Fisheries Notices.

Skeena Sockeye Inland Demonstration Fisheries

Opportunities for inland demonstration fisheries on Skeena River in 2022 are currently dependent on implementation of marine commercial fisheries in Area 4, although the Department has received recommendations from inland demonstration proponents to reconsider this approach in light of PSSI considerations. This fishery is managed as a part of the aggregate Skeena Sockeye Canadian commercial harvest decision rule ceiling.

The concept of the inland demonstration fishery is to transfer the catch of a number of commercial gill net or seine licences to the inland portion of the Skeena River. DFO may contribute licences that have been relinquished from the commercial fleet and remain in the Department's inventory. In addition, commercial licences may also be solicited through private ventures, through an arrangement between Skeena First Nations and individual licence holders.

The inland demonstration fisheries will only take place if the Skeena Sockeye run returns in sufficient strength to trigger commercial fisheries and the respective fishing plans are approved through the area office.

The Sockeye migration time from the marine commercial fishing area to the Terrace area is approximately 1 week; to the mid-river area around Hazelton is 2 weeks; and to the Babine River weir is 3 weeks. This timing is used to develop fishing plans with First Nation proponents on the Skeena, and any flexibilities will be reflected in the fishing plans.

Gill net licence shares set aside for the inland demonstration fishery, will be based on each commercial licence having an equal share of the available commercial allocation (currently based on actual weekly catches) by that gear type in the Management Area 4 commercial fishery. The total inland gill net allocation will be equal to the share multiplied by the number of licences set aside for the inland fishery. There are approximately 626 Area C gill net licences in the commercial fleet (these numbers could vary slightly prior to the fishery). The licence share will be further adjusted to reflect the stock proportion available in a specific inland fishing area (Marine – 100%; Mid-river – 95%; Upper-river – 93%).

Seine licence shares set aside for the inland demonstration fishery, will be based on each commercial licence having an equal share of the available commercial allocation by that gear type in the Management Area 4 commercial fishery. The individual vessel quota is set each week by the DFO Prince Rupert office. The total inland seine allocation will be equal to the share multiplied by the number of licences set aside for the inland fishery. There are approximately 107 Area A seine licences in the commercial fleet (these numbers could vary slightly prior to the fishery). The licence share will be further adjusted to reflect the stock proportion available in a specific inland fishing area (Marine – 100%; Mid-river – 95%; Upper-river – 93%).

For the inland demonstration fishery, the intent will be to continue the selective methods that were developed during the 1990s pilot sales fisheries. These could include beach seine, fishwheel, dip net, and weirs. Gill nets will not be permitted. Sockeye (and possibly Pink) may be retained, based on the weekly allocation issued by Prince Rupert DFO, and all other species will be returned to the water with the least possible harm.

All inland demonstration salmon harvest shall be checked through a compulsory landing station. All appropriate records are to be kept for proper monitoring and enforcement. No FSC fishing or retention will be allowed while participating in the inland demonstration fishery.

More information on approved or proposed demonstration fisheries can be found in Appendix 6.

The DFO contact for more information is Jen Gordon at (250) 600-0246.

Licence Set-aside rules:

DFO may contribute commercial licences that are currently held by the Department. In addition, commercial licences may also be solicited through private ventures, through an arrangement between Skeena First Nations and individual licence holders.

All licences that will be used in the inland demonstration fisheries will have to be either Area C gill net or Area A seine, and annual renewal fees will be paid in full for the current season. These licences cannot have been fished in any Area C or A fisheries during the current year. Licence documents will be held in the DFO office. This process may be updated to be consistent with licence issuance through the National Online Licensing System. Catch share transfers will be calculated based on the number of licences as indicated above. Catch shares will not be provided for marine commercial fisheries that have been announced prior to the licence transfer.

Licenses may be used simultaneously in other inland watershed demonstration fisheries (e.g. Nass) as approved by DFO.

13.5.4.5.4 ESSR Fisheries

All ESSR fisheries are opportunistic and are not guaranteed from year to year. Harvests will be terminal in location and conducted by selective means, with live release of all non-target species. ESSR opportunities for Sockeye at the Babine Lake spawning channels may be considered should abundance permit, even in the absence of marine commercial fishing opportunities.

The Lake Babine Nation has conducted ESSR fisheries in recent years in Babine Lake, targeting excess returns of enhanced Sockeye to the Pinkut and/or Fulton spawning channels. A fishing plan for this fishery has been developed and is reviewed on an annual basis; details are available upon request.

Harvest amounts are calculated in-season and along with harvest timing will be determined in close liaison with Pinkut Creek and Fulton River spawning channel managers and Lake Babine

Nation Fisheries to ensure enough Sockeye are available to meet the annual loading requirements for the Pinkut and Fulton systems.

Lake Babine Nation may implement a fishery on Jack Sockeye at the Babine Fence. A precautionary plan has been developed for this fishery and details are available upon request.

For more information on ESSR Fisheries, please contact Jennifer Gordon at (250) 600-0246.

13.5.5 CENTRAL COAST SOCKEYE

13.5.5.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT

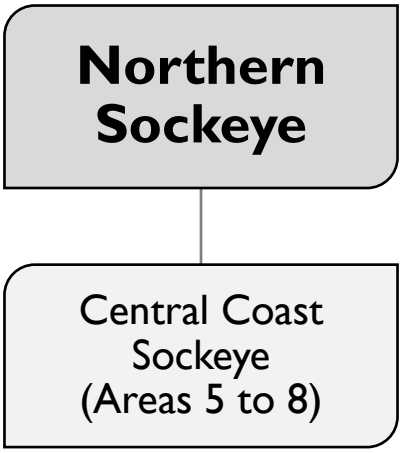


Figure 13.5-9: Overview of Central Coast Sockeye

The Central Coast MU is comprised of a number of small Sockeye stocks from Areas 5 through 8. Portions of Area 5 are traditionally managed in conjunction with Area 4 to target Skeena Sockeye and harvest opportunities may occur until mid- August when local Pink stocks become abundant. There are a number of Sockeye streams in Area 5 that may have small surpluses that have provided for some FSC harvest by local First Nations. Sockeye stocks in Areas 6, 7 and 8 have been weak in recent years and measures are in place to avoid interception of these stocks during commercial fisheries.

13.5.5.2 STOCK ASSESSMENT INFORMATION

13.5.5.2.1 Pre-season

There is no formal pre-season forecast done for Central Coast Sockeye.

Sockeye stocks in Areas 6 through 8 continue to be uncertain and measures will be implemented to avoid interception of these fish.

As noted above, commercial Sockeye opportunities in portions of Area 5 will be managed in conjunction with Area 4. These portions include sub-areas 5-1, 5-2, 5-3, 5-10, and a portion of 5-13.

See Appendix 9 for more information.

13.5.5.2.2 In-season Assessment

There is currently no in-season assessment tool for Sockeye in Areas 7 and 8. In-stream enumerations are performed on some systems as well as overflights to estimate total escapement.

13.5.5.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

In Area 5, local streams could develop small surpluses, and these will be monitored in-season. Portions of Area 5 may open in conjunction with Area 4 Sockeye-directed openings until early August.

For Area6, there will be no targeted Sockeye openings and Sockeye will not be permitted as by-catch in the seine fishery.

For Area 7 and 8, there will be no targeted Sockeye openings and Sockeye will not be permitted as by-catch in gillnet or seine fisheries.

13.5.5.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO CENTRAL COAST SOCKEYE FISHERIES

Commercial gillnet fisheries targeting local stocks in Area 5 may be considered after discussion with the Gitxaala Nation on FSC harvest opportunities. For commercial gillnet fisheries to take place on local stocks, a stock assessment, catch monitoring and enforcement plan will be required.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank.

The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

Gill Net Construction

In Management Areas 1 to 10, gill nets of different constructions may be used. Net construction may be either multistrand (30 filaments), or four, five or six filaments (Alaska twist). Specific restrictions such as the specifications for net construction and revival boxes are found in the conditions of the individual licences, which are attached to the licence. Fishers are urged to read these conditions carefully to ensure that their vessel and fishing techniques are in accordance with their licence.

All gill nets will meet one of the following configurations:

Nets may be hung without a weed line (corkline to web distance 0 to 45 cm) to a maximum of 60 meshes deep.

In Management Areas 3 to 5, nets may be greater than 60 meshes deep, but must be hung with a weedline (corkline to web distance minimum 0.76 m, maximum 1.5 m) to a maximum of 90 meshes deep. As well, every fifth cork must be red or another distinctive colour (not white).

Between July 11 and August 14 weed lines are required for gill nets in Subareas 8-5 north of Bold Point and 8-8. Maximum depth is 60 Meshes. Corkline to Web Distance a minimum of 100 cm and a maximum of 154 cm.

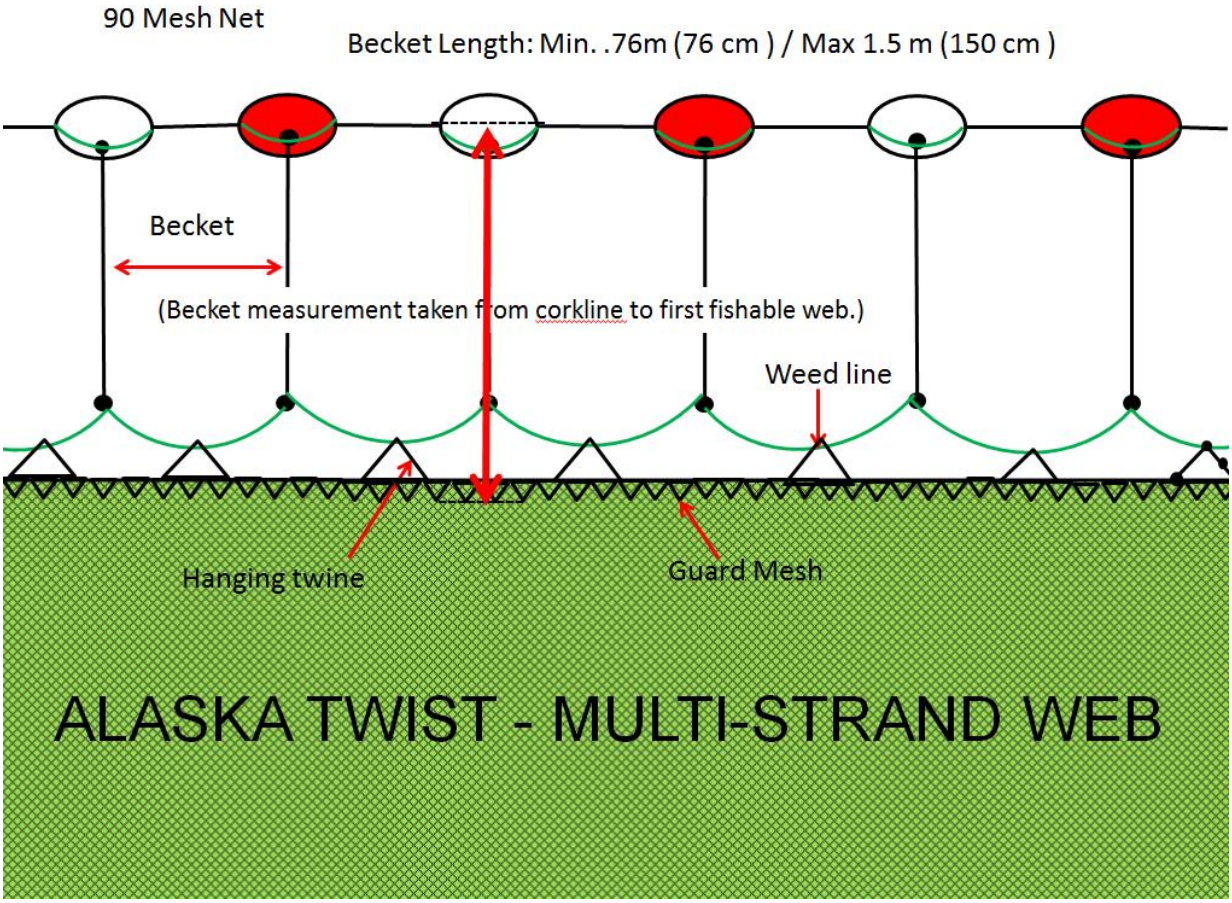


Figure 13.5-10: 90 Mesh Net Construction

Specific restrictions for net configuration are found in the Fishery Notice issued prior to every commercial fishery. Fishers are urged to read these carefully to ensure that their fishing gear is in accordance with the opening.

13.5.5.5 ALLOCATION AND FISHING PLANS

13.5.5.5.1 First Nations Fisheries

Food Social and Ceremonial

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe the details of the FSC fishery including the dates, times, methods, locations of harvest. Communal licences for Northern Coastal First

Nations are typically multi-species and are issued on an annual basis. Shorter duration amendments to licences are also issued on occasion.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

First Nations Specific Conservation Measures

When a conservation concern has been identified for an individual stock that is harvested by First Nations, consultations will be undertaken to adapt the fishing plan to provide the necessary protection to the weak stock.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly (Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

There are currently no Treaty fisheries for Central Coast Sockeye.

13.5.5.5.2 Recreational Fisheries

Recreational salmon fishing occurs in the tidal waters of the Central Coast (Areas 5 to 8) with interception fisheries beginning in late April and the peak of the season being from June to August.

In Area 5 the early season effort is mostly by local independent anglers out of Prince Rupert and Port Edward; however, the most significant portion of the recreational fishing season develops late May and continues to mid-September. The fleet operating in Area 5 is made up mainly of independent anglers and charter operators.

In Area 6, tidal water recreational salmon fisheries begin in late April. Initial effort is mostly by local independent anglers out of Kitimat. One recreational fishing lodge and a number of charter operators also fish in Area 6 with the most significant portion of the recreational fishing season taking place between late May and mid-September.

The daily limit for Sockeye in Areas 5 and 6 is four (4) per day, unless otherwise varied, and the open time is April 1st to March 31st. The catch of Sockeye is most likely very small.

There is no retention of recreationally caught Sockeye salmon in Areas 7 and 8 at any time of year. There are several recreational lodges and charter operators in these areas.

The Central Coast non-tidal waters are in Regions 5B and 6 freshwater fishing areas, and there are no openings for Sockeye.

Detailed information on salmon closures, daily limits, size limits, gear restrictions, and other management measures are found online at BC Sport Fishing Guide. This webpage contains a link to subscribe to recreational Fishery Notices, which can be sent to your email address.

BC Sport Fishing Guide link:
http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

Fishery Monitoring and Catch Reporting

In Areas 6 to 8, DFO has been collecting recreational catch data through the Lodge Log Book Program.

13.5.5.5.3 Commercial Fisheries

Allocation

Description	Areas		Seine A	Gill Net C	Troll F
Skeena/Nass	1, 3 to 5, 101 to 105	25%	75%	*	
Central Coast	6 to 8	80%[a]	20%[b]	*	

Notes on Sockeye allocation (North):

[*] by-catch provisions
[a] share reflects current Sockeye by-catch during Pink directed fisheries
[b] potential for re-negotiation of sharing arrangements in event of a future directed Sockeye fishery

Central Coast Fisheries

No commercial opportunities are expected for Sockeye stocks in Areas 6, 7 and 8. Area 5 fisheries may open in conjunction with Sockeye-directed openings in Area 4, should they occur.

13.5.5.5.4 ESSR Fisheries

There are currently no ESSR fisheries for Central Coast Sockeye.

13.5.6 RIVERS & SMITH INLET SOCKEYE

13.5.6.1 SNAPSHOT OVERVIEW AND MAP OF MANAGEMENT UNIT

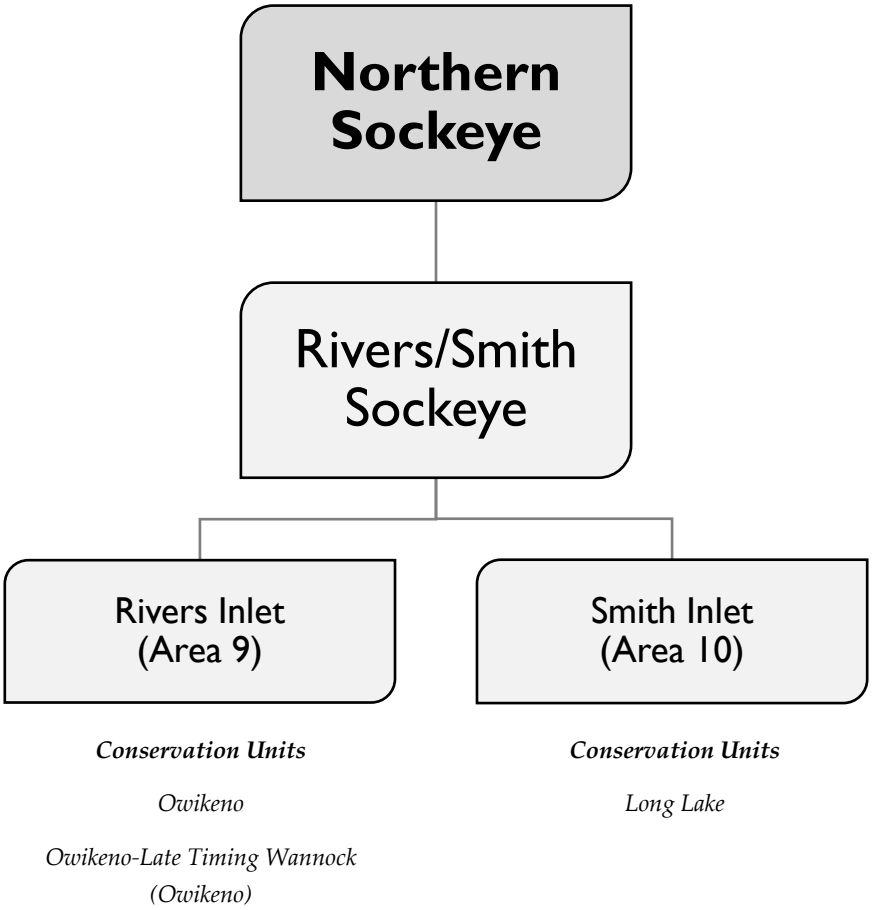


Figure 13.5-11: Overview of Rivers and Smith Inlet Sockeye

The Sockeye fishery on stocks from Rivers and Smith Inlets began in the late 19th century and increased rapidly during the early part of the 20th century. Both systems experienced dramatic declines in total returns of spawning adults since the mid-1990's and a high degree of variability in returns since that time.

There has been no gill net fishery in Rivers Inlet since 1995 after the Sockeye returns declined dramatically in 1994. This decline was caused by poor marine survival beginning with the 1990 and 1991 brood years. Stocks have shown some inconsistent improvement in recent years but remain in a period of low productivity.

Over the last 25 years Sockeye returns to Long Lake in Smith Inlet have generally been poor, resulting in only three commercial fisheries since 1996. In more recent years, returns have

shown signs of improving, resulting in the three previously mentioned fishery opportunities, including a strong return in 2016 which resulted in a substantial gill net opportunity. A long-term Smith Inlet counting weir program was suspended in 2017, as a result there has not been sufficient abundance data to assess the strength of the run since then.

Long Lake Sockeye productivity has probably decreased in recent years following cessation of a fertilization program that occurred in the 1980s and 1990s. The escapement goal is currently under review and a more cautious management strategy has been adopted.

13.5.6.2 STOCK ASSESSMENT INFORMATION

13.5.6.2.1 Pre-season

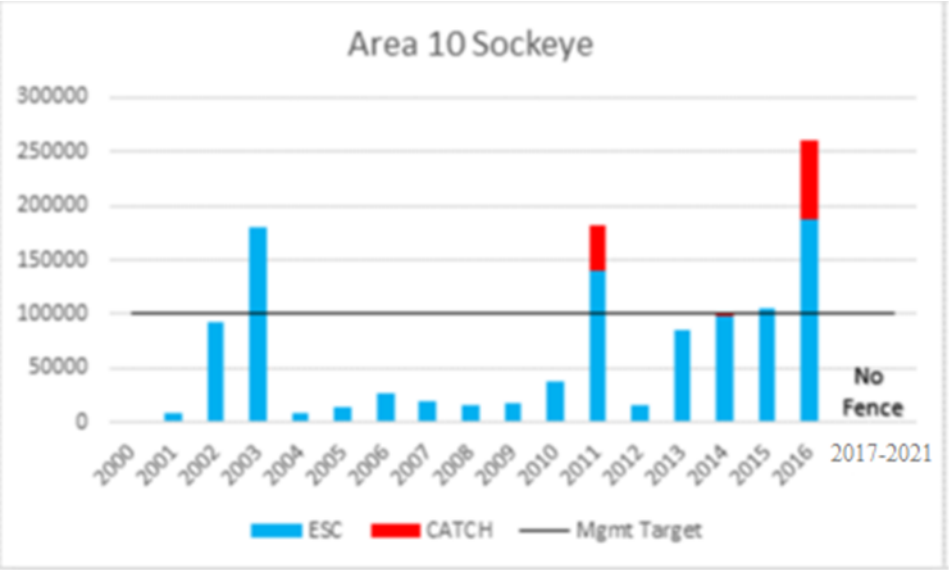
There is no formal pre-season forecast done for either Rivers Inlet or Smith Inlet Sockeye. See Appendix 9 for more information.

Pre-season Rivers and Smith Inlet Sockeye Run Size Forecast:

No commercial or recreational fisheries are expected in 2022.

The Docee River fence provided in-season assessment of sockeye salmon return to Long Lake in Area 10 from 1972-2016, but has not operated since 2017. As such, in-season estimation of returns to Long Lake are not possible. The 2022 return is coming off unknown returns.

Figure 13.5-12: Sockeye Salmon Catch and Escapement to Area 10



13.5.6.2.2 In-season Assessment

There is currently no in-season assessment tool for Rivers Inlet Sockeye. The Wuikinuxv Nation, with assistance from LGL and PSF, have designed and implemented an in-season escapement monitoring system for Rivers Inlet Sockeye from 2014-2021 using DIDSON/ARIS sonar and a gillnet test fishery, as documented in annual reports (e.g. English and Rojas 2020). This system provides daily estimates of Sockeye migrating past the sonar sites on the Wannock (Waanukv) River. The results from these monitoring efforts are currently under review.

Prior to 2017, in-season assessment of Smith Inlet Sockeye was conducted at the Docee counting fence. Installed in 1972, the Docee fence allowed for reliable in-season enumeration of escapements to Long Lake, facilitating the management of the Sockeye fishery in-season. As noted above, the Docee Fence has not been in operation since 2017 and is not expected to be operating in 2022.

13.5.6.3 DECISION GUIDELINES AND MANAGEMENT ACTIONS

Rivers Inlet

Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

DFO continues to work with the local First Nations via the First Nations Central Coast Salmon Coordinating Committee and local recreational and commercial advisors to review fishing plans for this area. The current target escapement has been set as a range with the lower threshold of 200,000 Sockeye. DFO continues to work collaboratively with First Nations and stakeholders to review this target using Science based evaluation of the system as a whole, through a request to the Canadian Science Advisory Secretariat (CSAS) process. Working with First Nations and stakeholders, it is anticipated that the results of this review will be used to inform a further evaluation of the management framework for Sockeye fisheries in Rivers Inlet.

Nevertheless, with a pre-season forecast expectation failing to meet the lower threshold of escapement currently in place for the system, no commercial or recreational Sockeye fisheries are planned for Area 9 in 2022.

Smith Inlet

Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Prior to 2017, the escapement target for Smith Inlet of 100,000 was evaluated in-season based on fish counts past the Docee counting fence. The Long Lake Sockeye stock remains a stock of concern because of the long period of generally low productivity. Opportunities for Long Lake Sockeye directed fisheries have been dependent on in-season evaluation from the Docee Fence which operates in collaboration with the Gwa'sala-'Nakwaxda'xw Nations (GNN).

The Docee fence has not operated since 2017 and operation of the Docee Fence in 2022 is not expected. The Government of Canada has made reconciliation with indigenous peoples of Canada, and respecting aboriginal rights a priority. The Department is committed to developing a collaborative approach that will lead to a long-term agreement with the GNN, enabling the operation of the Docee Fence Assessment program and other matters of common interest.

13.5.6.4 INCIDENTAL HARVEST, BY-CATCH AND CONSTRAINTS TO RIVERS AND SMITH INLET SOCKEYE FISHERIES

Rivers Inlet

Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Smith Inlet

Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.

Revival Tanks

Revival tanks conforming to the Conditions of Licence are required, and all prohibited species captured as by-catch must be either revived in the revival tank and released, or released directly to the water with the least possible harm. Management decisions will be influenced by compliance with revival tank provisions.

While gill net fishing, revival tanks must be operating from 10 minutes prior to the commencement of retrieval of the net and continue in operation at all times during retrieval and while fish are being held in the tank. For seine and troll fishers, the revival tanks must be operating while the seine net or hooks are in the water and while fish are being held in the tank. The revival tank(s) and equipment must be kept clean and in operable condition and shall be used for no other purpose than that outlined above.

Gill Net Construction

In Management Areas 1 to 10, gill nets of different constructions may be used. Net construction may be either multi-strand (30 filaments), or four, five or six filaments (Alaska twist). Specific restrictions such as the specifications for net construction and revival boxes are found in the conditions of the individual licences, which are attached to the licence. Fishers are urged to read

these conditions carefully to ensure that their vessel and fishing techniques are in accordance with their licence.

All gill nets will meet one of the following configurations:

Nets may be hung without a weed line (corkline to web distance 0 to 45 cm) to a maximum of 60 meshes deep.

In Management Areas 3 to 5, nets may be greater than 60 meshes deep, but must be hung with a weedline (corkline to web distance minimum 0.76 m, maximum 1.5 m) to a maximum of 90 meshes deep. As well, every fifth cork must be red or another distinctive colour (not white).

Between July 11 and August 14 weed lines are required for gill nets in Subareas 8-5 north of Bold Point and 8-8. Maximum depth is 60 Meshes. Corkline to Web Distance a minimum of 100 cm and a maximum of 154 cm.

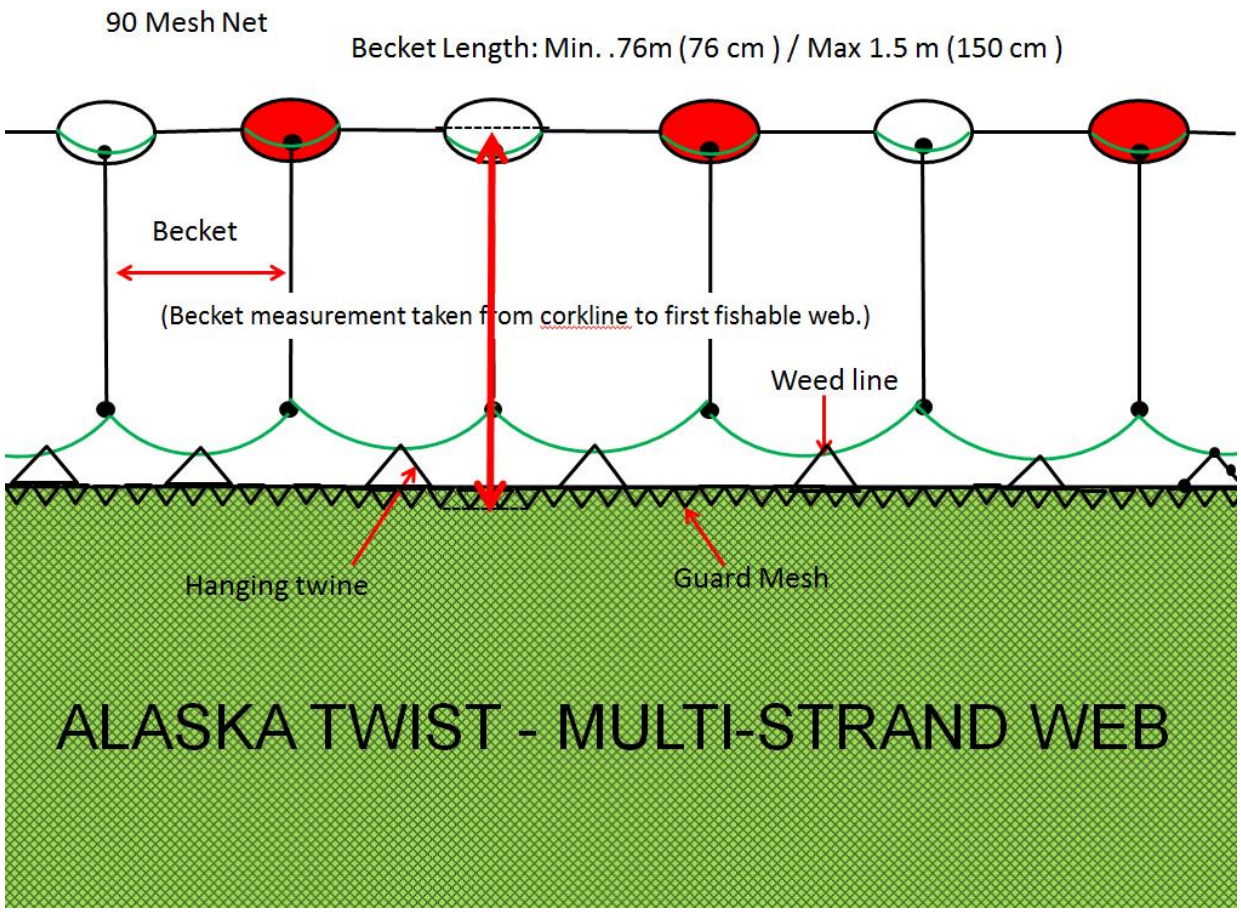


Figure 13.5-13: 90 Mesh Net Construction

Specific restrictions for net configuration are found in the Fishery Notice issued prior to every commercial fishery. Fishers are urged to read these carefully to ensure that their fishing gear is in accordance with the opening.

13.5.6.5 ALLOCATION AND FISHING PLANS

13.5.6.5.1 First Nations Fisheries

Food Social and Ceremonial

First Nations opportunities to harvest salmon for food, social and ceremonial purposes is provided through communal licences issued by DFO. These licences support the effective management and regulation of First Nations fisheries. These licences are typically issued to individual bands or tribal groupings, and describe the details of the FSC fishery including the dates, times, methods, locations of harvest. Communal licences for Northern Coastal First Nations are typically multi-species and are issued on an annual basis. Shorter duration amendments to licences are also issued on occasion.

Actual opportunities and catches will be dependent on, among other factors; in-season stock strength, management measures taken to ensure conservation of individual stocks, community needs of First Nations, and alternative sources of salmon if preferred species are not available locally due to low abundance.

Refer to Section 10.2 for Communal Licence Harvest Target Amount Table 10.2-1 in Northern BC First Nations Fisheries.

First Nations Specific Conservation Measures

When a conservation concern has been identified for an individual stock that is harvested by First Nations, consultations will be undertaken to adapt the fishing plan to provide the necessary protection to the weak stock.

Fishery Monitoring and Catch Reporting

Fishery monitoring will be conducted by DFO and the First Nations under Fisheries Agreements if applicable. First Nations keep records of harvest and provide catch information to DFO in a variety of formats. If a commercial vessel is used for fishing under this licence, First Nations are asked to provide information respecting the species and quantity of fish harvested by the vessel to the DFO Catch Reporting Officer within 24 hours of the landing of fish harvested from that vessel. With respect to timing of catch reports, First Nations are requested to report as follows: by the end of each month between April 1 and May 14; weekly

(Wednesdays) between May 15 and October 31 inclusive; and at the end of each month between November 1 and March 31.

Treaty Fisheries

There are currently no Treaty fisheries for Rivers or Smith Inlet Sockeye.

13.5.6.5.2 Recreational Fisheries

Recreational salmon fishing occurs in the tidal waters of Rivers and Smith Inlets, with several recreational lodges and independent anglers fishing from late June to early September.

In 2022, Rivers and Smith Inlets will remained closed to recreational Sockeye fishing. A condition of licence in the recreational Tidal Waters Sport Fishing Licence applies to all angling in the Rivers Inlet Special Management Zone (SMZ).

Please consult the regulations on tidal and freshwater salmon recreational fishing which can be found online at:
http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html

For direct notification of regulatory changes, individuals may sign up to have recreational fishery notices sent directly to their email at the website above. Refer to the link to subscribe to fishery notices on the right hand side of the page.

Fishery Monitoring and Catch Reporting

In Area 9, DFO has been collecting recreational catch data through the Lodge Log Book Program. In Area 10, logbook information is used to provide catch and release numbers from anglers fishing in the area.

13.5.6.5.3 Commercial Fisheries

Allocation

Description	Areas	Seine A	Gill Net C	Troll F
Rivers/Smith Inlets	9 to 10	5%	95%	0%*

[c] potential for future re-negotiation

Rivers and Smith Inlet Fisheries

No commercial or recreational fisheries are expected for Rivers or Smith Inlet Sockeye in 2022, and will remain unlikely until there is a trend towards higher ocean survival and significant and consistent improvements in escapement.

ESSR Fisheries

There are currently no ESSR fisheries for Rivers Inlet or Smith Inlet Sockeye.

APPENDIX 1: LOGBOOK SAMPLES

SALMON TROLL Logbook I.D. # **T21001** ***SAMPLE*** **Report Catch to: 1-(888) 387-0007** Record all catch in pieces **Page #**

Vessel Name: *Shirley May* VRN (CFV#): *12346*

Date Day	Date Mon.	Mgmt. Area	Zone ☐ or Subarea ☒	Hours Fished	Catch: Frozen or Iced?	[1] Kept or Released	Sockeye	Coho	Pink	Chum	[2] Legal Sized Chinook	[2] Sublegal Sized Chinook	[3] Grilse	Atlantic	[4] Rockfish	[5] Other Species
8	Aug	101	4	7.5	F or I	Kept		20	54							
Trip ID #:		FOS-12345				Rel.					4	2			4 Yellowtail, 3 Canary	1 L, 2 H
Comments:		Lots of seals around													[6] DCR Conf. #:	FOS-12346
Vessel Master Name:		Dan Doe				Signature:			Dan Doe						[7] F.I.N.:	99999
9	Aug	101	4	6	F or I	Kept		23	37							
Trip ID #:		FOS-12345				Rel.										
Comments:		Released 2 Salmon Sharks													[6] DCR Conf. #:	FOS-12347
Vessel Master Name:		Dan Doe				Signature:			Dan Doe						[7] F.I.N.:	99999
10	Aug	101	4	8	F or I	Kept		23	47							
Trip ID #:		FOS-12345				Rel.					2				2 Chilipepper, 6 unknown rockfish	3 H
Comments:															[6] DCR Conf. #:	FOS-12348
Vessel Master Name:		Dan Doe				Signature:			Dan Doe						[7] F.I.N.:	99999
12	Aug	101	3	12	F or I	Kept		17	17		19				3 Black RF	4 L
Trip ID #:		FOS-12398				Rel.						4	2			10 D, 2 H
Comments:		Saw a sea turtle. Suspect it was Leatherback													[6] DCR Conf. #:	FOS-12402
Vessel Master Name:		John Smith				Signature:			John Smith						[7] F.I.N.:	77777
13	Aug	142	2	14	F or I	Kept		79	12		36				8 Yellowtail RF	2 L
Trip ID #:		FOS-12398				Rel.	1									2 D
Comments:		Killer Whales													[6] DCR Conf. #:	FOS-12403
Vessel Master Name:		John Smith				Signature:			John Smith						[7] F.I.N.:	77777

1. Catch: **Kept** are species retained on board; **Released** are species returned to the ocean. **2.** As defined in the applicable Fishery Notice. **3. Grilse** are juvenile salmon under 30 cm. **4.** Rockfish are to be identified by species; if unsure of species, record as Unknown Rockfish. **5. Other Species:** L=Lingcod, H=Halibut, D=Dogfish, M= Mackerel, S= Steelhead. Please specify **White or Green Sturgeon** in Comments Section. If any **birds, marine mammals, or turtles** were encountered, give time of capture and full name of species in comments. **6. DCR Conf. #** is the confirmation number received upon completion of the Daily Catch Report. **7.** Vessel master's **Fisher**

2022

Sample

SALMON GILLNET Logbook I.D. # **G24001** **Report Catch to: 1-(888) 387-0007** Record all catch in pieces **Page #** ***11111***

Vessel Name: ***Shirley May*** VRN (CFV#): ***12346***

Net Details | Type[1]: ***A*** # Strands[2]: ***6*** Length: ***200*** (fathoms) Weedline Depth[3]: ***30cm*** Hang Ratio: ***3*** :1 Mesh Size[3]: ***4 7/8"*** # Meshes: ***90***

Daily Catch Records

Date Day	Date Mon.	Mgmt. Area	Sub-area(s)	Hours Fished	# of sets	[4] Kept or Released	Sockeye	Coho	Pink	Chum	Chinook	Steel-head	Atlantic	Dogfish	[5] Sturg-eon	[6] Other Fish	[7] Non-fish
4	Aug	12	12-4	5.5	5	Kept	4		23	127					X		Yes
Trip ID #:		FOS-12480				Rel.		9									No
Comments:		2 birds killed in 10AM set, kept for research program. Rhinoceros Auklets .														[8] DCR Conf. #: FOS-12346	
Vessel Master Name:		Dan Doe				Signature:				Dan Doe					[9] F.I.N.:	99999	
5	Aug	12	12-5	7	3	Kept	73		245	4			1		X		Yes
Trip ID #:		FOS-12480				Rel.		2						2		2M, 1 salmon shark	No
Comments:		Offloaded at CANFISCO in Port Hardy on August 5 at 14:00.														[8] DCR Conf. #: FOS-12367	
Vessel Master Name:		Dan Doe				Signature:				Dan Doe					[9] F.I.N.:	99999	
6	Aug	12	12-4	6	3	Kept	88		116	7			2		X		Yes
Trip ID #:		FOS-12480				Rel.						1				11 M, 2 R	No
Comments:		Steelhead released in good condition. 2 sea lions released alive around 11AM.														[8] DCR Conf. #: FOS-12382	
Vessel Master Name:		Dan Doe				Signature:				Dan Doe					[9] F.I.N.:	99999	
29	Aug	17	17-11	6	6	Kept	163		328						X		Yes
Trip ID #:		FOS-12773				Rel.					3	1					No
Comments:		Fished two management areas today														[8] DCR Conf. #: FOS-12521	
Vessel Master Name:		John Smith				Signature:				John Smith					[9] F.I.N.:	77777	
29	Aug	29	29-2	4	6	Kept	205		493						X		Yes
Trip ID #:		FOS-12773				Rel.		2			1	1					No
Comments:		Both coho put in rev. tank, one died, one released in good condition														[8] DCR Conf. #: FOS-12523	
Vessel Master Name:		John Smith				Signature:				John Smith					[9] F.I.N.:	77777	

1. **Net Types**: enter '*A*' for Alaska Twist, '*M*' for Multi Strand or '*C*' for Combination. 2. Enter number of strands if net is 'Alaska Twist' type mesh. 3. Give measurement units (*in* or *"* = inches, *cm* = centimeters, *mm* = millimeters). 4. **Kept** are species retained on board; **Released** are species returned to the ocean. 5. Please specify White or Green Sturgeon in **Comments** Section. 6. **Other Fish**: M= Mackerel, L= Lingcod, H= Halibut. Give full name for other species. 7. Circle Yes or No as appropriate if any **birds, marine mammals,** or **turtles** were encountered. Give time of capture and species details in comments. 8. **DCR Conf. #** is the confirmation number received upon completion of the Daily Catch Report. 9. **F.I.N**. Is the Fisher Identification Number.

2022

Sample

SALMON SEINE Logbook I.D. # S20001 **Report Catch to: 1-(888) 387-0007** Record all catch in pieces **Page #** ***11111***

Vessel Name: ***Shirley May*** VRN (CFV#): ***12346***

Daily Catch Records

Date Day	Date Mon.	Mgmt. Area	Sub-area(s)	Hours Fished	# of sets	[1] Kept or Released	Sockeye	Coho	Pink	Chum	*Adult* Chinook	[2] *Jack* Chinook	Steel-head	Atlantic	[3] Other Fish	[4] Non-fish
14	Aug	3	3-3, 3-2	8	5	Kept	42		431					6		(Yes)
Trip ID #:		FOS-12281				Rel.		3		12	2					No
Comments: 2 Rhinoceros Auklets released alive at 10 AM,1 coho clipped, 2 coho dead, 1 rel'd alive													DCR Conf. #: [5] FOS-12346			
Vessel Master Name: Dan Doe							Signature: Dan Doe						[7] F.I.N.: 99999			
15	Aug	4	5	5.5	2	Kept	38		850							(Yes)
Trip ID #:		FOS-12281				Rel.				2	1		1		4 D, 1 L, 1 salmon shark	No
Comments: 1 harbour seal released, steelhead revived in tank, then released in good condition													DCR Conf. #: [6] FOS-12358			
Vessel Master Name: Dan Doe							Signature: Dan Doe						[7] F.I.N.: 99999			
19	Aug	4	5	9	4	Kept	53		560							Yes
Trip ID #:		FOS-12403				Rel.		2		17	4	12				(No)
Comments: Both coho rel'd in good condition. 12 jack chinook squishers all dead.													DCR Conf. #: [6] FOS-12428			
Vessel Master Name: John Smith							Signature: John Smith						[7] F.I.N.: 77777			

Offload Catch Records

Dates Fished First date Day	First date Month	Last date Day	Last date Month	# Days Fished	Date Offloaded Day	Date Offloaded Month	Sockeye (☐ Pieces ☒ Lbs ☐ Kgs)	Coho (☐ Pcs ☐ Lbs ☐ Kgs)	Pink (☐ Pieces ☒ Lbs ☐ Kgs)	Chum (☐ Pieces ☐ Lbs ☐ Kgs)	Chinook (☐ Pieces ☐ Lbs ☐ Kgs)	(Other) (☐ Pcs ☒ Lbs ☐ Kgs)	Complete if catch pooled with that of another vessel: Received from:	Offloaded to:	Vessel
14	Aug	15	Aug	2	15	Aug	471		3958			42	☐	☐	Name:
Business and port offloaded to: Canfisco, Pr. Rupert								Fish slip #: 79768			OCR Conf. #: 6 FOS-12380				VRN (CFV#):
19	Aug	19	Aug	1	20	Aug	310		1692				☐	☑	Name: Wind Viper
Business and port offloaded to:								Fish slip #: 79801			OCR Conf. #: 6 FOS-12482				VRN (CFV#): 12347

1. Catch: Kept are species retained on board; Released are species returned to the ocean. 2. **Jack Chinook** are all chinook smaller than 67 cm fork length (approx 26 inches). 3. **Other Fish**: M= Mackerel, L= Lingcod, H= Halibut, D= Dogfish. Please specify **White or Green Sturgeon** in Comments Section. Give full name for other species. 4. Circle Yes or No as appropriate if any **birds**, **marine mammals**, or **turtles** were encountered. Give time of capture and full name of species in comments. 5. **DCR Conf. #** is the confirmation number received upon completion of the Daily Catch Report. 6. **OCR Conf. #** is the Offload Catch confirmation number. 7. Enter the vessel master's Fisher Identification Number.

2022

Sample

APPENDIX 2: FISHING VESSEL SAFETY

TABLE OF CONTENTS

1 Overview – Fishing Vessel Safety 350

2 Important Priorities for Vessel Safety 351

2.1 Fishing Vessel Stability 352

2.2 Emergency Drill Requirements 354

2.3 Cold Water Immersion 354

2.4 Other Issues 355

2.4.1 Weather 355

2.4.2 Emergency Radio Procedures, EPIRB's and AIS 355

2.4.3 Collision Regulations 356

2.4.4 Buddy System 357

3 WorkSafeBC 357

4 Fish Safe BC 358

5 Transportation Safety Board 360

1 OVERVIEW – FISHING VESSEL SAFETY

Vessel owners and masters have a duty to ensure the safety of their crew and vessel. Adherence to safety regulations and good practices by owners, masters and crew of fishing vessels will help save lives, prevent vessel damage and protect the environment. All fishing vessels must be in a seaworthy condition and maintained as required by Transport Canada (TC), WorkSafeBC, and other applicable agencies. Vessels subject to inspection should ensure that the certificate of inspection is valid for the area of intended operation.

In the federal government, responsibility for shipping, navigation, and vessel safety regulations and inspections lies with TC; emergency response with the Canadian Coast Guard (CCG) and DFO has responsibility for management of the fisheries resources. The Transportation Safety Board is an independent agency that advances transportation safety by investigating selected occurrences in the air, marine, pipeline and rail modes of transportation including fishing vessel occurrences. In BC, WorkSafeBC exercises jurisdiction over workplace health and safety and conducts inspections on commercial fishing vessels in order to ascertain compliance with the *Workers Compensation Act* (WCA) and the *Occupational Health and Safety Regulation* (OHSR).

Before departing on a voyage the owner, master or operator must ensure that the fishing vessel is capable of and safe for the intended voyage and fishing operations. Critical factors for a safe voyage include the seaworthiness of the vessel, having the required personal protective and life-saving equipment in good working order, adequate number of properly trained crew, and knowledge of current and forecasted weather conditions. As safety requirements and guidelines may change, the vessel owner, crew, and other workers must be aware of the latest legislation, policies and guidelines prior to each trip.

There are many useful tools available for ensuring a safe voyage. These include:

Education and training programs

Marine emergency duties training

Fish Safe – Stability Education Program & 1 Day Stability Workshop

Fish Safe – SVOP (Subsidized rate for BC commercial fishers provided)

Fish Safe – Safest Catch program – **FREE** for BC commercial fishers

Fish Safe *At Sea* DVD Series – Fish Safe

Fish Safe Stability Handbook – *Safe at Sea* and *Safest Catch* – DVD Series

Fish Safe *Safest Catch* Log Book

Fish Safe Safety Quiz

First Aid training

Radio Operators Course (Subsidized rate for BC commercial fishers provided)

Fishing Masters Certificate training

Small Vessel Operators Certificate training

Publications:

- Gearing Up for Safety – WorkSafeBC
- https://tc.canada.ca/en/marine-transportation/marine-safety/tp-15393e-adequate-stability-safety-guidelines-fishing-vessels TP 15393E - Adequate stability and safety guidelines for fishing vessels
- TP 15392E - Guidelines for fishing vessel major modification or a change in activity. https://tc.canada.ca/en/marine-transportation/marine-safety/tp-15392e-guidelines-fishing-vessel-major-modification-change-activity Transport Canada Publication TP 10038 Small Fishing Vessel Safety Manual (can be obtained at Transport Canada Offices from their website at: http://www.tc.gc.ca/eng/marinesafety/tp-tp10038-menu-548.htm
- Amendments to the *Small Fishing Vessel Inspection Regulations* (can be obtained from: http://www.gazette.gc.ca/rp-pr/p2/2016/2016-07-13/html/sor-dors163-eng.php
- Safety Issues Investigation into Fishing Safety in Canada report can be accessed: https://www.tsb.gc.ca/eng/rapports-reports/marine/etudes-studies/M09Z0001/M09Z0001.html

For further information see: https://tc.canada.ca/en/marine-transportation
http://www.fishsafebc.com
http://www.worksafebc.com
www.tsb.gc.ca/eng/rapports-reports/marine/index.html

2 IMPORTANT PRIORITIES FOR VESSEL SAFETY

There are three areas of fishing vessel safety that should be considered a priority. These are: vessel stability, emergency preparedness, and cold water immersion.

2.1 FISHING VESSEL STABILITY

Vessel stability is paramount for safety. Care must be given to the stowage and securing of all cargo, skiffs, equipment, fuel containers and supplies and to correct ballasting. Fish harvesters must be familiar with their vessel's centre of gravity, the effect of liquid free surfaces on stability (e.g. loose water or fish on deck), loading and unloading operations, watertight integrity and the vessel's freeboard. Know the limitations of your vessel; if you are unsure, contact a naval architect, marine surveyor or the local Transport Canada Marine Safety Office.

Fishing vessel owners are required to develop detailed instructions addressing the limits of stability for each of their vessels. These instructions must include detailed safe operation documentation kept on board the vessel.

In 2017, Transport Canada Marine Safety (TC) issued Ship Safety Bulletin (SSB) No. 03/2017 announcing the coming into force of the *New Fishing Vessel Safety Regulations*. The initial regulations were published in the Canada Gazette Part II on July 13, 2016 and came into force on July 13, 2017. The bulletin includes important information on changes to requirements for Written Safety Procedures, Safety Equipment and Vessel Stability.

As of July 13, 2017, new regulations pertaining to stability assessments to be performed by a competent person came into effect, as follows:

- A new fishing vessel that has a hull length of more than 9 m where the vessel construction was started or that a contract was signed for the construction after July 13, 2018;
- A fishing vessel more than 9 m and that has undergone a major modification or a change in activity that is likely to adversely affect its stability;
- A fishing vessel that is fitted with an anti-roll tank at any time;
- A fishing vessel more than 15 gross tonnage and used for catching herring or capelin during the period beginning on July 6, 1977 and ending on July 13, 2017.
- For an existing fishing vessel that is not required to undergo a stability assessment, the owner shall be capable of demonstrating that their vessel has adequate stability to safely carry out the vessel's intended operations. Guidelines have been developed and are available online to help small fishing vessel owners and operators meet their regulatory requirements
- Two good resources can be found here: TP 15393 - Adequate stability and safety guidelines for fishing vessels (2018) and TP 15392 – Guidelines for fishing vessel major modification or a change in activity (2018)

Further, the new Regulation requires a "Stability Notice" to be developed after a stability assessment. This notice includes a simple diagrammatic of the vessel, its tanks and fish holds, or deck storage as the case may be. It is intended to assist fishing vessel crews in quickly determining the safe carriage limits of the vessel without having to reference a complicated Trim and Stability Book.

Additionally, Transport Canada published a Stability Questionnaire (SSB No. 04/2006) and Fishing Vessel Modifications Form (SSB No. 01/2008) which enable operators to identify the criteria which will trigger a stability assessment. Please contact the nearest Transport Canada office if you need to determine whether your vessel requires a stability assessment or to receive guidance on obtaining competent assessor.

In 2019, TC provided an updated SSB 03/2019, which sets out a voluntary record of modifications for the benefit of owners/masters of any fishing vessels. For vessels of more than 15 gross tons, the record of modifications was to be reviewed by TC inspectors during regular inspections and entered on the vessel's inspection record. However, information gathered during the Transportation Safety Board's (TSB) Safety Issues Investigation into the fishing industry showed minimal recording of vessel modifications prior to this date.

The TSB has investigated several fishing vessel accidents since 2005 and found a variety of factors that effected the vessel's stability were identified as contributing factors in vessels capsizing, such as with: M05W0110 - *Morning Sunrise*, M07M0088 - *Big Sisters*, M08W0189 - *Love and Anarchy*, M09L0074 – *Le Marsouin I*, M10M0014 - *Craig and Justin*, M12W0054 – *Jessie G*, M12W0062 - *Pacific Siren*, M14P0121 – *Five Star*, M15P0286 – *Caledonian*, M16A0140 – *C19496NB*, M17C0061 – *Emma Joan*, *M*17P0052 – *Miss Cory and M18P0073* – *Western Commander*, and M18A0425 – *Charlene A* and M18A0454 – *Atlantic Sapphire.*

Vessel masters are advised to carefully consider stability when transporting gear. Care must be given to the stowage and securing of all traps, cargo, skiffs, equipment, fuel containers and supplies and also to correct ballasting. Know the limitations of your vessel; if you are unsure contact a reputable marine surveyor, naval architect or the local Transport Canada Marine Safety office.

WorkSafeBC's *Occupational Health and Safety Regulations* (OHSR) require owners of fishing vessels to provide documentation on board, readily accessible to crew members, which describes vessel characteristics, including stability.

Fish Safe has developed a code of best practices for the food and bait/roe herring fisheries and the prawn fishery: These Best Practices are available on Fish Safe's website for convenient download here: https://www.fishsafebc.com/best-practices. Please contact Ryan Ford at Fish

Safe for a copy of the program materials they developed to address safety and vessel stability in these fisheries. Ryan Ford – Office: (604) 261-9700 - Email: ryan@fishsafebc.com.

2.2 EMERGENCY DRILL REQUIREMENTS

The *Canada Shipping Act* 2001 requires that the Authorized Representative of a Canadian Vessel shall develop procedures for the safe operation of the vessel and for dealing with emergencies. The Act also requires that crew and passengers receive safety training. The *Marine Personnel Regulations* require that all personnel on board required to meet the minimum safe manning levels have received MED (Marine Emergency Duties) training to an A1 or A3 level, depending on the vessel's voyage limits, within 6 months of serving aboard. MED A3 training is 8 hours in duration and is applicable to seafarers on fishing vessels less than 150 GRT that are within 25 miles from shore (NC2). MED A1 training is 19.5 hours duration and is applicable to all other fishing vessels.

To assist fishers in meeting their crew training requirements, Fish Safe has created a downloadable '*New Crew Orientation Form and How To Guide*' available on Fish Safe's website here: https://www.fishsafebc.com/downloadable-tools

MED provides a basic understanding of the hazards associated with the marine environment; the prevention of shipboard incidents; raising and reacting to alarms; fire and abandonment situations; and the skills necessary for survival and rescue.

WorkSafeBC's *Occupational Health and Safety Regulation* (OHSR) requires written rescue and evacuation procedures for work on or over water. Additionally, fishing vessel masters must establish procedures and assign responsibilities to each crew member to cover all emergencies, including the following: crew member overboard, fire on board, flooding of the vessel, abandoning ship, and calling for help. Fishing vessel masters are also required to conduct emergency drills at the start of each fishing season, when there is a change of crew, and at periodic intervals to ensure that crewmembers are familiar with emergency procedures.

Between 2011 and 2015 the TSB investigated 17 fishing vessel accidents which resulted in 17 fatalities. The report's findings highlighted the lack of safety drills and safety procedures and practices.

The *Safest Catch* program, delivered by Fish Safe and free to BC commercial fishers, includes comprehensive practice of drills such as abandon ship, man overboard and firefighting drills.

2.3 COLD WATER IMMERSION

Drowning is the number one cause of death in BC's fishing industry. Cold water is defined as water below 25 degrees Celsius, but the greatest effects occur below 15 degrees C. BC waters are

usually below 15 degrees C. Normal body temperature is around 37 degrees Celsius; cold water rapidly draws heat away from the body. The effects of cold water on the body occur in four stages: cold shock, swimming failure, hypothermia and post-rescue collapse. Know what to do to prevent you or your crew from falling into the water and what to do if that occurs. More information is available in the WorkSafeBC Bulletin *Cold Water Immersion* (available from the WorkSafeBC website at www.worksafebc.com)

Under the recently amended (June 2019) *OHS Regulation*, section 24.96.1, a crewmember must wear a PFD or lifejacket when on board a fishing vessel that has no deck or deck structure or when on the deck of a fishing vessel that has a deck or deck structure. The use of a PFD will prepare a crewmember to remain afloat, to survive the effects of cold shock, reduce the need to swim and give rescuers time to respond.

Section 8.26, which requires workers to wear a PFD or lifejacket when working "under conditions which involve a risk of drowning", would continue to apply to fishing crewmembers and other workers (e.g. when they are working on shore, docks and other vessels).

The specific requirements can be found on WorkSafeBC's PFD Primer provided on Fish Safe's website here: https://www.fishsafebc.com/cold-water-survival.
It has been demonstrated time and again that, when worn, PFD's save lives - and the chance of surviving a mishap increases significantly when these devices are worn while working on deck.

Resulting from the TSB investigations into the *Diane Louise* - M14P0110 and the *Caledonian* – M15P0286 fishing vessel accidents, the Board recommended that both TC and WorkSafeBC require that persons wear a suitable personal flotation devices (PFDs) at all times when: on the deck of a commercial fishing vessel; or, when on board a commercial fishing vessel without a deck or deck structure, and ensure that programs are developed to confirm compliance.

2.4 OTHER ISSUES

2.4.1 WEATHER

Vessel owners and masters are reminded of the importance of paying close attention to current weather trends and forecasts during the voyage. Marine weather information and forecasts can be obtained on VHF channels 21B, Wx1, Wx2, Wx3, or Wx4. Weather information is also available from Environment Canada website at: https://weather.gc.ca/marine/index_e.html

2.4.2 EMERGENCY RADIO PROCEDURES, EPIRB'S AND AIS

Vessel owners and masters should ensure that all crew are able to activate the Search and Rescue (SAR) system early rather than later by contacting the Canadian Coast Guard (CCG). All

fishing vessels greater than 20m in length must carry a Class A AIS, as well as a float free 406 MHz Emergency Position Indicating Radio Beacon (EPIRB). These beacons must be registered with the Canadian Beacon Registry. When activated, an EPIRB transmits a distress call that is picked up or relayed by satellites and transmitted via land earth stations to the Joint Rescue Co-ordination Centre (JRCC), which will task and co-ordinate rescue resources. The TSB notes that there have been several recent occurrences on board vessels not equipped with an EPIRB, and that were either unable or did not use any other means of emergency signaling distress (e.g. M14P0121, M14A0289, M15A0189, M16A0327, M18A0076, M18A0303, M18A0078, M18P0184, M19A0082, M19P0242, M20A0258, M20A0160, M21A0315) which resulted in 26 fatalities. The carriage of both AIS and EPIRB is strongly encouraged for all fishing vessels who do not fall under the mandatory threshold.

Fish harvesters should monitor VHF channel 16 or MF 2182 KHz and make themselves and their crews familiar with other radio frequencies. All crew should know how to make a distress call and should obtain their restricted operator certificate from Industry Canada. However, whenever possible, masters should contact the nearest Canadian Coast Guard (CCG) Marine Communications and Traffic Services (MCTS) station (on VHF channel 16 or MF 2182 kHz) prior to a distress situation developing. Correct radio procedures are important for communications in an emergency. Incorrect or misunderstood communications may hinder a rescue response. Further information is available at Radio Aids to Marine Navigation General

Since August 1, 2003, all commercial vessels greater than 8 metres in length are required to carry a Class D VHF Digital Selective Calling (DSC) radio. A registered DSC VHF radio has the capability to alert other DSC equipped vessels in your immediate area and MCTS that your vessel is in distress. Masters should be aware that they should register their DSC radios with Industry Canada to obtain a Marine Mobile Services Identity (MMSI) number or the automatic distress calling feature of the radio may not work. For further information see the Coast Guard website at: http://www.ccg-gcc.gc.ca/eng/CCG/Home or go directly to the Industry Canada web page: www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01032.html

A DSC radio that is connected to a GPS unit will also automatically include your vessel's current position in the distress message. More detailed information DSC can be found here: TC DSC Safety Bulletin. Questions regarding Coast Guard DSC capabilities can be obtained by contacting your local MCTS centre (Prince Rupert MCTS (250) 627-3070 or Victoria MCTS (250)363-6333).

2.4.3 COLLISION REGULATIONS

Fish harvesters must be knowledgeable of the Collision Regulations and the responsibilities between vessels where risk of collision exists. Navigation lights must be kept in good working

order and must be displayed from sunset to sunrise and during all times of restricted visibility. To help reduce the potential for collision or close quarters situations which may also result in the loss of fishing gear, fish harvesters are encouraged to monitor the appropriate local Vessel Traffic Services (VTS) VHF channel when travelling or fishing near shipping lanes or other areas frequented by large commercial vessels. Vessels required to participate in VTS include:

- every ship twenty metres or more in length, every ship engaged in towing or pushing any vessel or object, other than fishing gear,

where the combined length of the ship and any vessel or object towed or pushed by the ship is forty five metres or more in length; or

where the length of the vessel or object being towed or pushed by the ship is twenty metres or more in length.

Exceptions include:

- a ship towing or pushing inside a log booming ground,

a pleasure yacht less than 30 metres in length, and

a fishing vessel that is less than 24 metres in length and *not* more than 150 tons gross.

More detailed information on VTS can be obtained by calling (either Prince Rupert MCTS (250)627-3070 or Victoria MCTS (250)363-6333 or from the Coast Guard website:

https://www.ccg-gcc.gc.ca/publications/mcts-sctm/ramn-arnm/part3-eng.html

2.4.4 BUDDY SYSTEM

Fish harvesters are encouraged to use the buddy system when transiting and fishing as this allows for the ability to provide mutual aid. An important trip consideration is the use of a sail/voyage plan which includes the particulars of the vessel, crew and voyage. The sail plan should be left with a responsible person on shore or filed with the local MCTS. After leaving port the fish harvester should contact the holder of the sail plan daily or as per another schedule. The sail plan should ensure notification to JRCC when communication is not maintained which might indicate your vessel is in distress. Be sure to cancel the sail plan upon completion of the voyage.

3 WORKSAFEBC

WorkSafeBC exercises jurisdiction over workplace health and safety, including the activities of crews of fishing vessels. Commercial fishing, diving and other marine operations are subject to the provisions of the *Workers Compensation Act (WCA,)* and requirements in Part 24 of the *Occupational Health and Safety Regulation* (OHSR).

Examples of Part 24 regulatory requirements related to fishing include, but are not limited to, the requirement to establish emergency procedures, to conduct emergency drills, to provide immersion suits for the crew, to provide stability documentation for the vessel, safe work procedures, injury reporting, correction of unsafe working conditions, the requirement to wear personal flotation devices (PFDs), etc.

Other sections of the OHSR also apply to commercial fishing operations. For example, Part 3 addresses training of young and new workers, first aid and employer incident/accident investigations. Part 4 addresses general conditions such as maintenance of equipment, workplace conduct and impairment. Part 8 addresses issues related to safety headgear, safety footwear, eye and face protection, limb and body protection and personal flotation devices (PFDs) when working on the dock. Part 12 addresses issues related to tools, machinery and equipment, including safeguarding. Part 15 addresses issues related to rigging.

Both owners and masters of fishing vessels are considered to be employers. Under the *Workers Compensation Act* and the *OHS Regulation* (OHSR) they have varying and overlapping duties and responsibilities. Masters, because they have the most control during fishing and related activities, are considered to be the employer with primary responsibility for the health and safety of the crew.

The OHSR and the *WCA* are available from the Provincial Crown Printers or by visiting the WorkSafeBC website: www.worksafebc.com

NOTE: Regarding the OHSR requirement to wear PFD's, WorkSafeBC has produced a video entitled "Turning the Tide – PFD's in the Fishing Industry". For more information on PFD use, including a link to the video, please access the following site:

https://www.worksafebc.com/en/about-us/news-events/news-releases/2018/November/new-fishing-industry-safety-video?origin=s&returnurl=https%3A%2F%2Fwww.worksafebc.com%2Fen%2Fsearch%23q%3DTurning%2520the%2520Tide%26sort%3Drelevancy%26f%3Alanguage-facet%3D%5BEnglish%5D

For further information, contact an Occupational Safety Officer:

For further information, contact an Occupational Safety Officer:

Bruce Logan	Field Services - Vancouver/Richmond/Delta	(604) 244-6477
Cody King	Field Services - Courtenay	(250) 334-8733
Paul Matthews	Field Services - Courtenay	(250) 334-8741

Wayne Tracey – Field Services Central (604) 232-1939 or the Manager of Interest for Marine and Fishing, Pat Olsen (250) 334-8777.

For information on projects and initiatives related to commercial fishing health and safety please contact Tom Pawlowski, Manager, OHS Consultation and Education Services, at (604) 233-4062 or by email: tom.pawlowski@worksafebc.com or Helen Chandler, OHS Consultant at (604) 276-3174 or by email: helen.chandler@worksafebc.com.

4 FISH SAFE BC

Fish Safe encourages Vessel masters and crew to take ownership of fishing vessel safety. Through this industry driven and funded program, Fish Safe provides fishing relevant tools and programs to assist fishers in this goal. The Fish Safe Stability Education Program and 1 Day Stability Workshop are available to all fishers who want to improve their understanding of stability and find practical application to their vessel's operation. The SVOP (Small Vessel Operator Proficiency) Course is designed to equip crew with the skills they need to safely navigate during their wheel watch. The Safest Catch Program, along with fisher-trained Safety Advisors, is designed to give fishers the tools they need to create a vessel specific safety management system.

As referenced throughout the above documentation, Fish Safe provides a broad range of courses, programs and services that are either free for BC commercial fishers or highly subsidized.

Fish Safe is managed by Ryan Ford, Program Manager and support staff including John Krgovich, Program Coordinator, Stephanie Nguyen, Program Assistant, Rhoda Huey, Bookkeeper/Administrative Assistant and an experienced team of fisher Safety Advisors. All activities and program development is directed by the Fish Safe Advisory Committee (membership is open to all interested in improving safety on board fishing vessels). The Advisory Committee meets two to three times annually to discuss safety issues and give direction to Fish Safe in the development of education and tools for fish harvesters.

Fish Safe also works closely with WorkSafeBC to improve the fishing injury claims process. For further information contact:

Ryan Ford	
Program Manager	Cell: (604) 739-0540
Fish Safe	Office: (604) 261-9700
#100, 12051 Horseshoe Way	Email: ryan@fishsafebc.com
Richmond, BC V7A 4V4	www.fishsafebc.com

5 TRANSPORTATION SAFETY BOARD

The Transportation Safety Board (TSB) is not a regulatory board. The TSB is an independent agency that investigates marine, pipeline, railway and aviation transportation occurrences to determine the underlying risks and contributing factors. Its sole aim is the advancement of transportation safety by reporting publicly through Accident Investigation Reports or Marine Safety Information Letters or Advisors. It is not the function of the Board to assign fault or determine civil or criminal liability. Under the *TSB Act*, all information collected during an investigation is completely confidential.

In 2014 the TSB pacific region released three investigation reports:

- the collision between trawl fishing vessel *Viking Storm* and US long line fishing vessel *Maverick* and the subsequent fatality,
- the person over board off the prawn fishing vessel *Diane Louise* and the subsequent fatality, and
- the capsizing of the crab fishing vessel *Five Star* and subsequent fatality.

In 2016 the TSB pacific region released one investigation report:

- the capsizing of the trawl *Caledonian* and subsequent fatalities.

In 2018 the TSB pacific region released two investigation reports:

- the capsizing and sinking of the Miss Cory and subsequent fatality.
- the sinking of the Western Commander and loss of life.

In 2020 the TSB pacific region is investigated the fatal accident involving the *Arctic Fox II* on August 11.

The TSB issued five recommendations following the *Caledonian* report. Three recommendations issued are aimed at ensuring all crews have access to adequate stability information that meets their needs. That means:

- All commercial fishing vessels should have a stability assessment appropriate for their size and operation.
- The information from that assessment must then be kept current, and it must be used to determine safe operating limits.

Moreover, these operating limits must be easily measurable, and relevant to the vessel's operation. For example, that could mean marking the sides of a vessel's hull to indicate the maximum operating waterline, or maximum permitted loads can be specified in the most relevant unit of measure—total catch weight for instance, or the safe number of traps.

Regardless, for it to be of real, practical use, the information must be presented in a format that is clearly understood and easily accessible to crew.

The other two recommendations address the most basic step that harvesters can take: wearing a personal flotation device. Here in British Columbia, roughly 70 percent of all fishing-related fatalities in the past decade came while not wearing a PFD. Yet many harvesters still do not wear them. TC regulations currently require that PFDs be worn only if harvesters identify a risk, however; you never know when you could end up in the water. So the TSB is recommending to TC to require persons to wear suitable personal flotation devices at all times when on the deck of a commercial fishing vessel or when on board a commercial fishing vessel without a deck or deck structure and that programs are developed to confirm compliance. In June 2019, WorksafeBC amended its fishing regulation related to the use of PFDs. Under the amendments, crewmembers must wear a PFD or lifejacket when on board a fishing vessel that has no deck or deck structure, or when on the deck of a fishing vessel that has a deck or deck structure. Crewmembers are not required to wear lifejackets or PFDs below deck or when inside a deck structure where there is risk of entrapment. This amendment removes the need for a risk of drowning to be present before a PFD must be worn.

For more information about the TSB, visit the website at www.tsb.gc.ca

For information about the TSB's investigation into fishing safety, or to view a brief video, visit: http://www.tsb.gc.ca/eng/medias-media/videos/marine/m09z0001/index.asp

To view information on the TSB's recent safety Watchlist, visit: http://www.tsb.gc.ca/eng/surveillance-watchlist/marine/2020/marine-01.html

Reporting an Occurrence: www.tsb.gc.ca/eng/incidents-occurrence/marine/
After a reportable occurrence happens; you can fill out the TSB 1808 form or call the TSB at the contact information below.

Recently the TSB produced a Safe at Sea: Activity book on fishing safety intended for the next generation of fish harvesters (ages 4-7). Download a copy.

www.tsb.gc.ca › eng › medias-media › prudence-safe › safe-at-sea

Glenn Budden, Investigator, Marine - Fishing Vessels
Transportation Safety Board of Canada
4 - 3071 No. 5 Road
Richmond, BC, V6X 2T4

Telephone: (604) 619-6090

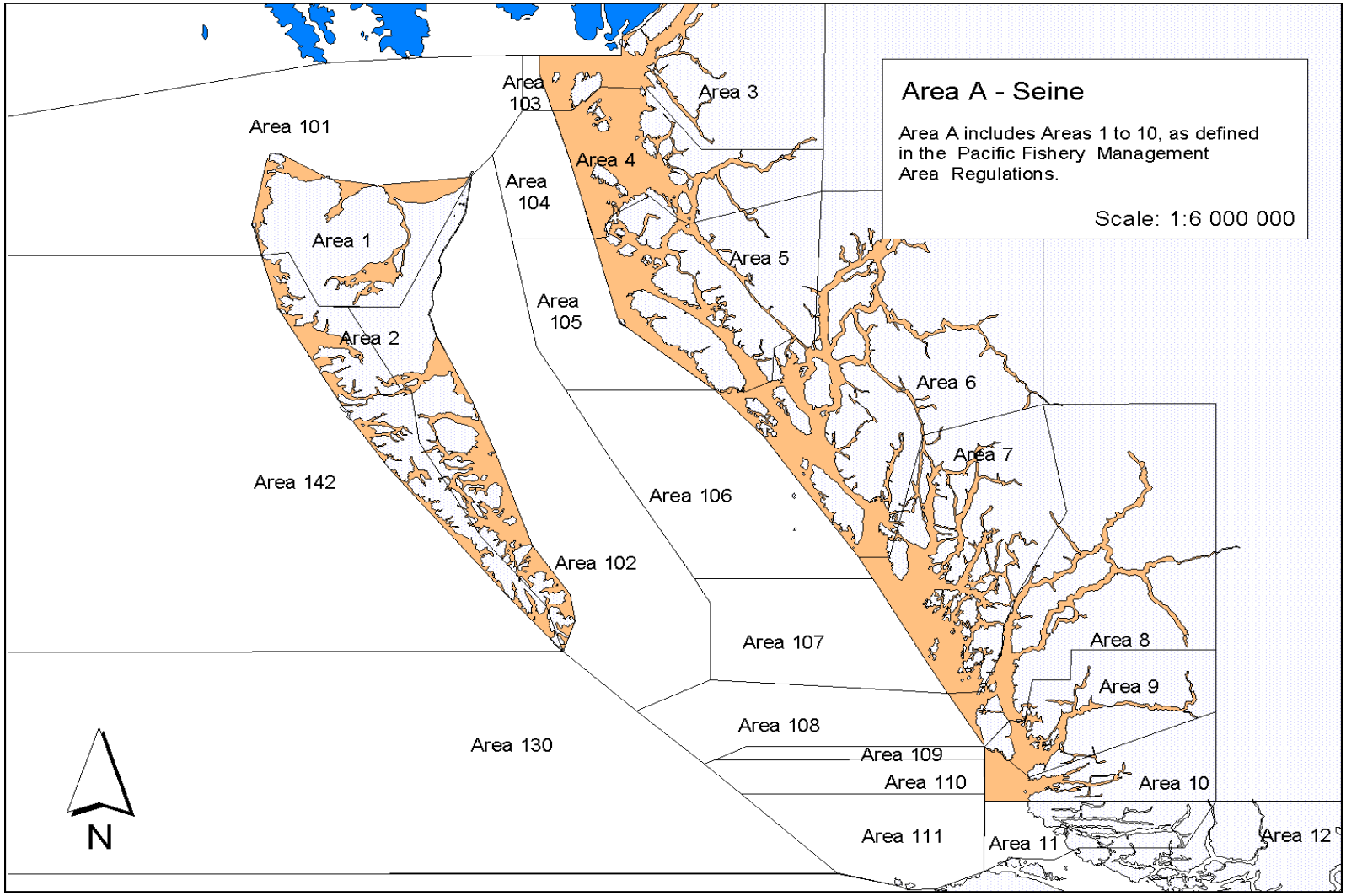
Email: glenn.budden@tsb-bst.gc.ca

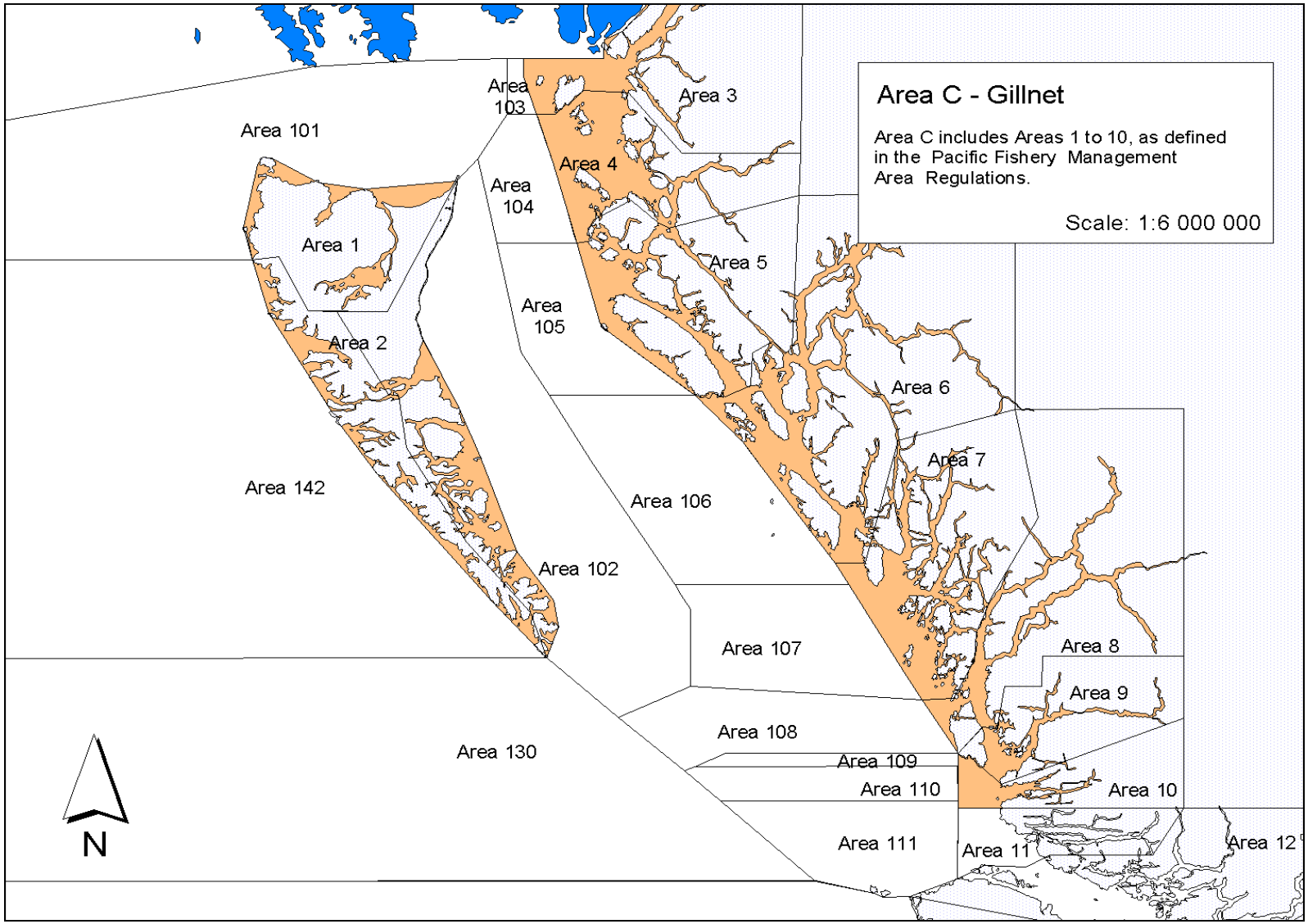
APPENDIX 3: COMMERCIAL SALMON LICENCE AREAS

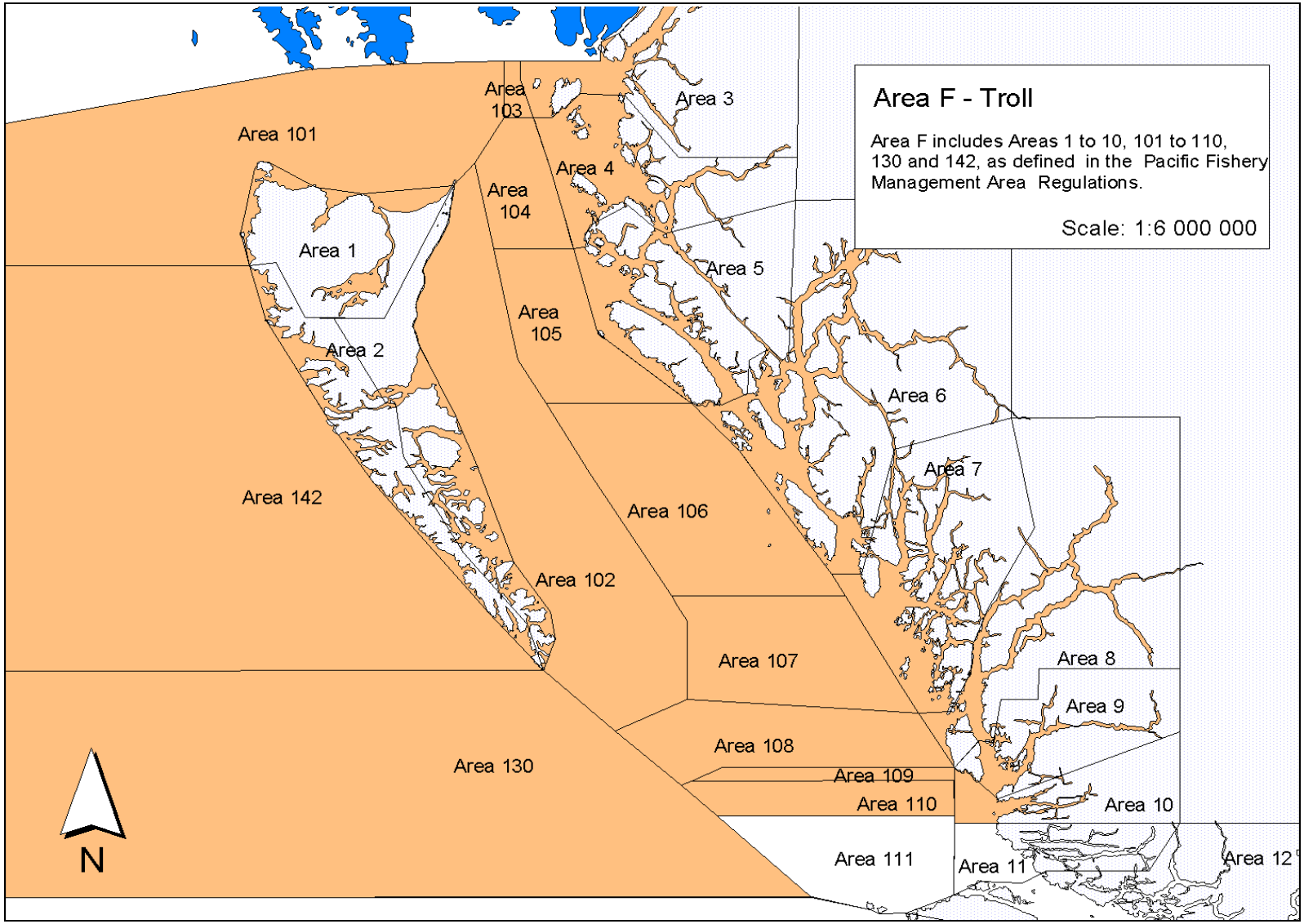
Pacific Salmon Fishing Area	Gear	Corresponding Pacific Fisheries Management Areas (PFMA)
Salmon Area A	Seine	Areas 1 to 10, Subarea 101-7
Salmon Area B	Seine	Areas 11 to 29 and 121
Salmon Area C	Gill net	Areas 1 to 10, Subarea 101-7
Salmon Area D	Gill net	Areas 11 to 15 and 23 – 27
Salmon Area E	Gill net	Areas 16 to 22, 28, 29 and 121
Salmon Area F	Troll	Areas 1 to 10, 101 to 110, 130 and 142
Salmon Area G	Troll	Areas 11, 20 to 28, 111, 121, 123 to 127 and Subareas 12-5 and 12-6
Salmon Area H	Troll	Areas 12 to 19, 28 and 29

For maps of North Coast commercial licence areas, please see Appendix 4: Maps of Northern BC Commercial Licence.

APPENDIX 4: MAPS OF NORTHERN BC COMMERCIAL LICENCE AREAS




Area C - Gillnet
Area C includes Areas 1 to 10, as defined in the Pacific Fishery Management Area Regulations.
Scale: 1:6 000 000
Area 101
Area 103
Area 3
Area 4
Area 104
Area 1
Area 5
Area 105
Area 2
Area 6
Area 7
Area 142
Area 106
Area 102
Area 107
Area 8
Area 9
Area 108
Area 130
Area 109
Area 110
Area 10
Area 111
Area 11
Area 12
N


Area F - Troll
Area F includes Areas 1 to 10, 101 to 110, 130 and 142, as defined in the Pacific Fishery Management Area Regulations.
Scale: 1:6 000 000
Area 101
Area 103
Area 3
Area 4
Area 104
Area 1
Area 5
Area 105
Area 2
Area 6
Area 7
Area 142
Area 106
Area 102
Area 107
Area 8
Area 9
Area 108
Area 130
Area 109
Area 110
Area 10
Area 111
Area 11
Area 12
N

APPENDIX 5: ADVISORY BOARD MEMBERSHIPS

Meeting dates and records of consultation can be found at:
http://www.pac.dfo-mpo.gc.ca/consultation/fisheries-peche/smon/ihpc-cpip/index-eng.htm

The IHPC membership list can also be found on the DFO website at:
http://www.pac.dfo-mpo.gc.ca/consultation/smon/ihpc-cpip/membs-eng.html

INTEGRATED HARVEST PLANNING COMMITTEE NORTH COAST SUBCOMMITTEE MEMBERS

RECREATIONAL (THREE) MEMBERS

Urs Thomas ..... info@goldenspruce.ca

Jason Harris ..... jharris@triton-env.com

John McCulloch ..... john.mcculloch@langara.com

ALTERNATES

Ken Franzen ..... kenfranzen@hotmail.com

Rupert Gale ..... ruperta@telus.net

COMMERCIAL (FOUR) MEMBERS

Rick Haugan - Area A ..... richardjhaugan@gmail.com

Mabel Mazurek - Area C ..... nnfc@citytel.net

Lawrence Paulson - Area F ..... lpaulson@citytel.net

Rob Morley - Processor ..... rob.morley@canfisco.com

ALTERNATES

Joy Thorkelson - Area C ..... ufawupr@citytel.net

Chris Acheson - Area F ..... pacpro@telus.net

MARINE CONSERVATION CAUCUS (TWO) MEMBERS

Greg Knox ..... gregk@skeenawild.org

Aaron Hill ..... hillfish@telus.net

FIRST NATIONS (FOUR) MEMBERS

Harry Nyce - Nisga'a Lisims Government ..... eagle1@nisgaa.net

Vacant - Council of the Haida Nation ..... N/A

ALTERNATES

Mark Cleveland - Skeena Fisheries Commission ..... gfa99@telus.net

Walter Joseph - Wet'suwet'en First Nation ..... walter.joseph@wetsuweten.com

PROVINCE (EX-OFFICIO)

Vacant

APPENDIX 6: UPDATES TO THE COMMERCIAL SALMON ALLOCATION FRAMEWORK

TABLE OF CONTENTS

APPENDIX 6: UPDATES TO THE COMMERCIAL SALMON ALLOCATION FRAMEWORK 369

1 Introduction and Purpose 370

2 Background 370

3 Principles and Guidelines for Calculating Salmon Shares 371

4 CSAF Demonstration Fishery Proposals for Flexible Harvest Arrangements 377

4.4 Coast Tsimshian Area 3 Demonstration Pink Fishery (Metlakatla and Lax Kw'alaams First Nations) 382

4.5 Skeena Sockeye (Metlakatla First Nation) ..... **Error! Bookmark not defined.**

4.6 Trout Bay Chum (Kitasoo First Nation) 383

4.7 McLoughlin Bay Chum (Heiltsuk First Nation) 384

4.8 Bella Coola Chum and Chinook (Nuxalk Nation) 384

4.9 Nass River Sockeye (Nisga'a Lisims Government) 385

4.10 Nass River Sockeye (Gitanyow Fisheries Authority) 386

4.11 Skeena Sockeye (North Coast Skeena First Nation Stewardship Society (NCSFNSS)) 387

4.12 Skeena Sockeye (Lake Babine Nation) 388

4.13 Skeena Sockeye (Gitksan Watershed Authorities) 389

4.14 Nass Pink (North Coast Skeena First Nation Stewardship Society (NCSFNSS)) 390

4.15 Haida Gwaii Coho (Council of the Haida Nation (CHN)) 391

4.16 Central Coast Coho (Area F) 392

4.17 Bulkley River Coho (Wet'suwet'sen First Nation) 392

4.18 Central Coast Chum and Pink (Heiltsuk First Nation) 393

1 INTRODUCTION AND PURPOSE

The purpose of this appendix is to outline progress related to updates to the Commercial Salmon Allocation Framework (CSAF), including:

Document progress on key work plan items for the season agreed to by the Salmon Coordinating Committee, Commercial Salmon Advisory Board and DFO;

Describe principles and guidelines for sharing arrangements, building on guidelines approved in the 2015/2016 IFMP;

Outline CSAF demonstration fishery proposals assessed through the Departments' Evaluation Framework. These may be implemented subject to a final fishing plan being approved in the area which addresses any outstanding elements highlighted and sufficient returns for commercial fishing.

2 BACKGROUND

In September 2013, as part of the Pacific Salmon Treaty Mitigation program, Fisheries and Oceans Canada started a process to obtain advice on updating the CSAF to address deficiencies raised by commercial harvesters and First Nations. The Department engaged the existing advisory processes, principally the First Nations Salmon Coordinating Committee (SCC) and the Commercial Salmon Advisory Board (CSAB), and also sought the views of other First Nations and commercial interests on possible changes to the framework. Discussions with the SCC and CSAB were completed at the end of January 2015. Updates approved are detailed in the final 2015/16 IFMP. Work to address key issues raised continue. Key items being discussed include:

f) Supporting local area collaboration: to improve integration and collaboration among CSAF Demonstration, commercial marine and First Nation fishers;

g) Providing support to local proponents and DFO area staff in reviewing and developing existing and new CSAF demonstration fishery proposals; and

h) Using the CSAF small group forum to explore timelines and information needs to support the 5 year review of the CSAF sharing arrangements among fleets. Any proposed changes will be included in next year's draft IFMP for feedback prior to being implemented.

The Department's broad interests in continuing to support this process are to improve the long term sustainability of Pacific wild salmon, help commercial fishery participants achieve greater economic benefit, and create more resilient commercial salmon fisheries. The Department's role

has not been to propose changes to the CSAF; rather its focus has been to consider proposed changes to ensure that these were consistent with key Departmental objectives, policies, and programs.

A summary of previous work completed related to the initiative to update the CSAF is also available through the following link: http://www.pac.dfo-mpo.gc.ca/consultation/smon/saf-crrs/index-eng.html.

Principles and guidelines approved through the 2015 IFMP and expanded on in 2017 are included in Section 3 below. No changes have been suggested for the 2022 season.

3 PRINCIPLES AND GUIDELINES FOR CALCULATING SALMON SHARES

Below are principles and guidelines intended to provide clarity on commercial sharing arrangements. They have been developed as part of the initiative to update the CSAF in collaboration with the CSAB and SCC.

Please note: these guidelines and principles may be reviewed and updated annually to ensure they remain relevant and clear. Proposed changes will be included in draft IFMPs for feedback prior to being approved. There are no changes proposed for the 2022 season.

APPROVED PRINCIPLES

For simplicity, the updates to the CSAF are organized into three categories: 1. Stabilizing commercial shares; 2. Flexibility to harvest the shares and integrated planning process; and 3. Additional elements for future discussion.

CATEGORY 1: STABILIZING COMMERCIAL SHARES

The following recommendations form the basis for the commercial allocation plan starting in 2015:

a) Commercial salmon shares (specified as a % allocation of the allowable commercial harvest) will be assigned by species, fleet and fishery production area. Shares at the species, fleet and fishery production area are provided in Section 12.7 of the IFMP;

b) Shares will apply for a 5 year period with a provision for a review after year 4 to determine if adjustments should be made to Area A-H sharing arrangements in subsequent years. An earlier review could be considered if circumstances warrant by majority agreement of the commercial advisory board;

c) Sockeye equivalents will no longer be used to adjust shares on an annual basis;

d) Licences transferred to First Nations communities for commercial purposes, from an individual relinquished commercial licence, will be based on an equal percentage allocation of the allowable commercial harvest for all licences (e.g. 1/X where X = total licences per fleet) in that commercial licence area (i.e. Areas A to H). Please note that licence shares may change over time due to changes in fleet size (e.g. licence retirements, stacking) or updates to the A-H sharing arrangements outlined in the commercial salmon allocation plan based on the periodic review.

e) A central, common tracking system developed to provide an open and transparent annual accounting of all commercial A to H licences/allocations and First Nation economic fishery allocations by each First Nations economic fishery.

f) In addition to the 22 fishery production areas that existed pre-2015, three new areas have been added, as of 2015, to better define sharing arrangements for troll fisheries limited by the Pacific Salmon Treaty including the WCVI Aggregate Abundance Based Management (AABM) Chinook, Northern BC AABM Chinook and the AB-line Pink troll fisheries.

g) Sharing arrangements in the commercial salmon allocation plan are not fixed entitlements. Although best efforts will be made to achieve fishery production area target allocations over the course of the season, no guarantees are offered that allocations will actually be achieved in any given year. The achievement of commercial allocations will depend upon the ability to fish selectively and the conservation needs of the resource. In the event that allocations are not achieved over the course of the season, no compensatory adjustments (i.e. overage/underage provisions) will be made to future allocations.

h) Fishing opportunities for all commercial fisheries, including First Nations commercial fisheries, targeting the same fishery management unit should be planned to provide reasonable opportunities to harvest shares. No fishery should be allowed such that its operation puts another fleet out of the water (e.g. using a disproportionate amount of bi-catch to target share or using insufficient effort such that it takes an unreasonable amount of time to achieve weekly target). Post season reviews will address whether fisheries adjustments may be required in future years to address situations where allocations are not achieved.

i) In the event of extenuating circumstances (e.g. when fisheries are opened until further notice after escapement objectives are met in a terminal fishery), commercial sharing arrangements may be set aside and commercial opportunities will focus on harvesting

surplus salmon. These situations will be discussed at local processes where possible to coordinate fishing plans.

Further considerations on Stabilizing Commercial Shares

In addition to the three additional production areas which were approved starting in 2015, the SCC recommended adding an additional fishery production area for a total of 26. This 26th fishery production area would result by dividing the Fraser River Chum from the southern inside Chum production area. This additional production area was not approved, however may be considered in the future pending additional discussion.

It is expected that annual post-season reviews will be conducted to consider how well the approved allocation arrangements have been implemented in commercial fisheries that season.

CATEGORY 2: FLEXIBILITY TO HARVEST SHARES AND INTEGRATED PLANNING PROCESS

Both the CSAB and the SCC are seeking greater flexibility to harvest the shares that are assigned at the fishery production area level and/or are associated with voluntarily relinquished commercial licences transferred to First Nations.

The following principles and operational guidelines form the basis for the incremental testing of flexibilities to harvest shares which started in 2016 informed through the collaborative advisory process (CSAF small group, which includes participants of from the SCC, CSAB and DFO) and a Departmental evaluation framework (these are described in more detail under "further considerations on flexibilities" below).

a) Greater flexibility, such as fishing location and methods, should be provided to harvest the shares; however, 'one size does not fit all' and each gear type through its area harvest committee or First Nations economic fishery should determine the best approach to harvest their shares;

b) First Nations that have Area A-H licences may continue to fish those licences in the current A-H fisheries or they may choose to transfer the harvest share associated with those licences to a First Nation economic fishery. Under the SCC proposal, any First Nations economic fishery would have to be managed in coordination with other fisheries and would require approval from the Department (including proposed fishing method, location and time);

c) A revised collaborative process will be required to coordinate the collective interests of the A-H fisheries and First Nations economic fisheries in order to produce integrated fishing plans. This could also include more local harvest planning processes as required;

d) In-season transfers of shares among and between A-H and First Nation economic fisheries will be considered. These arrangements will be subject to operational guidelines for pre-season and in-season transfers (see the current Guidelines and any proposals for Temporary Commercial Salmon Share Transfers, Section 12.7.1);

e) Transfers between fisheries, including marine and inland areas, must account for similar stocks/species, as well as, any management adjustments that may need to be taken into consideration for transfers to inland areas;

f) Bycatch and stocks of concern (i.e. non-targeted species that limit target species access) will not be formally allocated at this time. Available impacts must be shared between all commercial fisheries, including First Nation economic fisheries, in the development of operational plans to allow every fishery reasonable access to its target species. Operational plans should be discussed annually through a collaborative process among all commercial fishery participants, including First Nations economic interests. The use of bycatch will require more discussion to further clarify how bycatch is best used under different scenarios;

g) There will be a requirement to have accurate, timely and accessible fisheries data, such that there is sufficient information for all Pacific salmon fisheries to be managed sustainably and to meet other reporting obligations and objectives; and

h) Common standards and approach will be used for evaluating and approving flexibilities to harvest shares whether these are Area A-H or First Nations economic fisheries. Operational issues about how to operationalize harvest flexibilities in different areas has underscored the need for greater clarity and transparency in applying any of the proposed changes.

i) Assessment fisheries should take into consideration existing sharing arrangements between A to H and First Nations commercial fisheries; opportunities for assessment fisheries should be proportionate with existing shares or as agreed to by the relevant parties.

Further Considerations on Flexibility to Harvest Shares:

The SCC proposal envisaged that any First Nations that have Area A-H licence(s) may continue to fish those licence(s) in A-H fisheries or choose to transfer the harvest share associated with

that licence to a First Nation economic fishery. This could result in First Nation economic fisheries in marine or inland areas based on shares converted from A-H fisheries. The relevant First Nations economic fishery (including any proposed fishing methods, times and locations) would need approval from the Department. Any First Nations fishery would have to be managed in coordination with other commercial fisheries (including A-H), on the same species and would have to meet Department requirements for stock assessment, catch monitoring, compliance and enforcement.

Similarly, the CSAB suggested that fleets in the A-H fisheries should decide how to best harvest their shares through harvest committee deliberations and thus endorsed the view that "one size does not fit all" when it came to how fleets may choose to harvest their shares.

The Department will adopt an incremental approach to implementation of harvesting flexibilities starting in 2016, informed through a collaborative advisory process and a common evaluation framework to review proposals submitted.

Collaborative Process

An inclusive commercial advisory process including commercial representatives from the A – H fisheries and First Nations economic fisheries will be required for the Department supporting implementation of any proposed flexibilities. Since 2015, a small working group comprised of CSAB, SCC and DFO representatives has been effective at exploring opportunities for collaboration and improving understanding of various perspectives, while communicating with each host organization to ensure consistency and accuracy of feedback included. The purpose of this CSAF small working group is as a forum to discuss and make recommendations for the Department's consideration on implementation of the revised allocation framework, the operational details associated with proposed flexibilities and how to prioritize testing of potential harvesting flexibilities including: reviewing and assessing proposals pre-season and considering the results of pilots against evaluation criteria post-season. The Department will continue to work with the existing CSAB and SCC to determine next steps, other priority items for discussion, relevant for this forum and support the use of the CSAF small group process for collaborative discussions.

Local Fishing Area Discussions:

Discussions on commercial harvest plans including which group fishes first, sequencing of opportunities, amounts of fishing time and other fishing plan parameters should be discussed among fishery participants at planning processes suitable to the scale of the fishery (e.g. local area) and included within the IFMP as required. The Department will continue to consider

advice and recommendations on proposed fishing plans from the local First Nations, Area Harvest Committees, and other groups to promote integrated fishery planning.

Local management committees are encouraged to promote effective communication, consultation and support increased collaboration and integration of commercial fisheries. Structure and protocol for any local committees should promote effective management through open, transparent and collaborative process to develop and implement commercial fishing plans. Existing processes will be used whenever possible/practical to support pre-season planning, in-season management and post-season review. Operational plans should be guided by the principles and guidelines outlined in this document and, where possible, identify clear decision guidelines that address the potential fishery configurations and effort associated with a range of potential commercial harvest scenarios.

Pre-agreed methods for calculating in-season harvest amounts associated with commercial allocations for all groups should be identified in local area fishing plans and/or the IFMP where appropriate and communicated preseason so all commercial participants have clarity on sharing arrangements. Methods should account for all commercial allocations including A to H fleets, FN demonstration, economic opportunities and harvest agreement fisheries.

Approaches for in-season communication (e.g. integrated conference calls, Fisheries Notices, etc.) of fishing opportunities, sharing arrangements and catch to date should be provided for discussion with First Nations and stakeholders.

Evaluation Framework

In 2016, DFO in collaboration with the SCC and CSAB developed an Evaluation Framework (E.F.) supported by all parties. The E.F. outlines the objectives and criteria that are used to assess CSAF proposals for flexible harvest arrangements for all commercial/economic fisheries. The E.F. may be reviewed and updated annually based on post-season discussions.

CATEGORY 3: ADDITIONAL ELEMENTS FOR DISCUSSION:

In addition to commercial allocation arrangements within Section 0 of the IFMP and those listed above in Category 2: *Flexibility to Harvest Shares*, there are a number of additional elements in the SCC and CSAB proposals where differences remain. These elements may have policy implications and require additional discussion, collaboration and analysis by commercial harvesters, First Nations and the Department.

Details are included within the original proposals received by both the SCC and CSAB in 2015 which can be reviewed at:
http://www.pac.dfo-mpo.gc.ca/consultation/smon/saf-crrs/index-eng.html

Further considerations on additional elements:

The following areas have been highlighted by the SCC and CSAB where there was no agreement concerning the proposed changes.

There was also a difference of views on the approach to dual fishing (the retention of fish for food, social and ceremonial purposes during a commercial fishery under agreed circumstances). The SCC has proposed that First Nations economic fisheries be permitted to have dual fishing whereas the CSAB has raised concerns about fairness of this approach to the A to H fishery and its potential conservation issues on stocks of concern. The Department has initiated discussions with the SCC on draft dual fishing principles, intended to guide under what circumstances dual fishing pilots may be considered in the future.

The CSAB has indicated concerns with the guidelines for the conversion of an existing marine A-H commercial licence (not including licences held in DFO inventory) into a First Nation economic fishery allocation (guidelines the CSAB would like to be consider prior to approval of conversions include timing (e.g. pre-season vs. in-season), notification, and transfer/tracking requirements. Please see the transfer guidelines in Section 12.7.1 for more details.

In addition, there are some proposed changes that are principally matters best handled between DFO and the relevant group. These matters will require further discussion with the Department.

The SCC has proposed a separate management body/process to manage First Nations salmon shares including a proposed body (a 'First Nations' licensing board') to administer use of shares associated with relinquished commercial salmon licences from the DFO inventory or licences otherwise set aside for First Nations use. The Department has not initiated development of a separate board; however DFO would be interested in hearing any principles for the distribution of licences which the SCC may suggest for consideration.

The CSAB had indicated interest in reviewing commercial licencing policy, however initial discussions highlighted the diversity of views and priorities on potential areas of work within the CSAB.

4 CSAF Demonstration Fishery Proposals for Flexible Harvest Arrangements

As part of implementing changes to the CSAF, the Department adopted an incremental approach to providing increased flexibility to harvest salmon shares starting in 2016. Each proposal is assessed by the same Evaluation Framework which defines the principles and operational guidelines required by DFO to ensure appropriate implementation of proposed

harvesting flexibilities. The Department's Evaluation Framework was developed to assess proposals with input from the SCC and CSAB. There continues to be agreement from DFO, the SCC and CSAB to continue using the Evaluation Framework with no updates to the principles, objectives and criteria currently in use.

Below is a table outlining demonstration fishery proposals that were reviewed using the Department's Evaluation Framework. For details on proposals or fishing plans for CSAF demonstrations which were included in the final IFMP and implemented in previous years, please contact the local resource manager in the area or Ge Li (Ge.Li@dfo-mpo.gc.ca).

Approved CSAF demonstration fisheries listed below will be implemented contingent on any remaining considerations being resolved with a fishing plan approved in the local area and sufficient returns for commercial harvest. The Department will be discussing operational details with First Nations and stakeholders in each demonstration fishery proposal area to develop fishing plans. Should operational considerations not be resolved or sufficient abundance not materialize, the demonstration fishery will not occur in the coming season.

Any demonstration fishery that does proceed in 2022 will be reviewed as part of the post-season review process. Below is a table which outlines the section and related demonstration fishery project included within this appendix.

Year Approved	Salmon Coordinating Committee	Commercial Salmon Advisory Board
	Northern B.C.	Northern B.C.
2016	Central Coast hatchery Chum (Heiltsuk/Kitasoo)	Central Coast Coho (Area F)
2016	Nass River Sockeye (Nisga'a Lisims Government)	
2016	Nass River Sockeye (Gitanyow Fisheries Authority)	
2016	Skeena Sockeye (NCSFNSS)	
2016	Skeena Sockeye (Lake Babine Nation)	
2016	Skeena Sockeye (Gitksan Watershed Authorities)	
2017	Central Coast Chum (Nuxalk)	
2017	Haida Gwaii Coho (CHN)	

Year Approved	Salmon Coordinating Committee	Commercial Salmon Advisory Board
2018	Area 3 Pink (NCSFNSS)	
2018	Coho bycatch within existing Pink ESSR (Office of the Wet'suwet'en)	
2018	Central Coast Chinook (Nuxalk)	
2019	Skeena Sockeye (Metlakatla First Nation)	
2020	Central Coast Chum and Pink (Heiltsuk First Nation)	
2020	Skeena Sockeye (Lax Kw'alaams First Nation/Metlakatla First Nation)	
2020	Area 3 Pink (Metlakatla First Nation /Lax Kw'alaams First Nation)	
2021	Area 6 Pink (Gitga'at First Nation)	
	Southern B.C.	Southern B.C.
2016	Cowichan Chum (Cowichan Tribes)	
2017	Goldstream Chum (Saanich Tribes)	Qualicum/Puntledge (Chum Area D)
2017		Area 12 – 9 Encounter study (Area D)
2017		Mainland/Inlet Pink and Chum (Area H)
2018	Bute Inlet Chum (Homalco First Nation)	Bute Inlet Chum (Area H)
2018		Bute Inlet Chum (Area D)
2019	Terminal Chum (K'omoks First Nation)	Mainland Inlet Pink & Chum Fishery: Area 12 Broughton Archipelago (Area H)
2019	Nanaimo Terminal Chum (Snuneymuxw First Nation)	
2020		Fraser Chum ITQ (Area E)

First Nations requests for access to salmon allocations associated with licences in the Departmental licence inventory will be reviewed internally by the Department and outcomes will be confirmed First Nations proponents. Demonstration fisheries that do not receive requested allocations will not proceed.

Full versions of the original proposals or final fishing plans is available upon request to Ge.Li@dfo-mpo.gc.ca or the local fishery manager. To view the list of South Coast CSAF demonstration fisheries, please see Appendix 6 of the Southern BC IFMP.

4.1 AREA 6 PINK (GITGA'AT FIRST NATION)

	Area 6 Pink
Include in Final IFMP	2021
Status (Implemented/Developing)	2021: Insufficient returns
Allocation*	16.76%
Location	Portions of sub-areas 6-5, 6-6, 6-10, 6-28 where Area A commercial fisheries are permitted for Pink salmon.
Size	1-2 purse seine vessels, with at least one operated by a Gitga'at member. Anticipated to be 1 or 2 vessels per opening.
Catch Monitoring (Key Elements)	One individual on each vessel will be responsible of recording all catches and reporting to the Gitga'at fishery manager; mandatory fisher logs; landing sites; same level of dockside validation as Area A.
Communication	Gitga'at will be responsible for all pre-season, in-season and post-season communications with DFO and participating individuals through pre-season planning meetings, in-season weekly conference calls and any related post-season review meetings.
Further Information	Jennifer Gordon, DFO Resource Manager (Jennifer.Gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.2 COAST TSIMSHIAN AREA 4 DEMONSTRATION SOCKEYE FISHERY (METLAKATLA AND LAX KW'ALAAMS FIRST NATIONS)

	Area 4 Sockeye
Included in Final IFMP	2020
Status (Implemented/Developing)	2020: Implemented 2021: Insufficient returns

Allocation*	Equal share of the Skeena Sockeye allocation (Lax Kw'alaams and Metlakatla to receive a combined 1/3 of the marine portion and NCSFNSS will receive 2/3 for the four member Nations).
Location	Area 4 and a fresh water area within the Skeena River mainstem.
Size	TBD after allocations are determined.
Catch Monitoring (Key Elements)	At-sea patrols; hail in/out; mandatory fisher logs; landing sites; 100% dockside validation; monitoring plan will be implemented by Coast Tsimshian technical staff.
Communication	Coast Tsimshian technical staff will be responsible for all communications with DFO and participating fishers.
Additional Comments	Beginning in 2022, additional mitigation measures will be implemented in this fishery to increase protection for stocks of conservation concern. These measures include: Implementation of a season end date in early-August to avoid later timed wild stocks; Implementation of August gillnet selective fishing practices for the whole season to reduce bycatch mortalities (Steelhead, Coho, Chum) and support fisheries monitoring with option for enhanced at-sea observer coverage.
Further Information	Jennifer Gordon, DFO Resource Manager (Jennifer.Gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.3 COAST TSIMSHIAN AREA 3 DEMONSTRATION PINK FISHERY (METLAKATLA AND LAX KW'ALAAMS FIRST NATIONS)

	Area 3 Pink
Included in Final IFMP	2020
Status (Implemented/Developing)	2020: Implemented 2021: Implemented
Allocation*	Equal share of the Northern Pink allocation (Lax Kw'alaams and Metlakatla to receive a combined 1/3 of the 13.41% and NCSFNSS will receive 2/3 for the four member Nations).

Location	Area 3
Size	The number of vessels for each fishing week will be determined after the allocations are calculated in order to provide a meaningful financial opportunity for selected fishers.
Catch Monitoring (Key Elements)	At-sea patrols; hail in/out; mandatory fisher logs; landing sites; 100% dockside validation.
Communication	Coast Tsimshian technical staff will be responsible for all communications with DFO and participating fishers.
Further Information	Jennifer Gordon, DFO Resource Manager (Jennifer.Gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.4 TROUT BAY CHUM (KITASOO FIRST NATION)

	Trout Bay Chum (Kitasoo First Nation)
Included in Final IFMP	2016
Status (Implemented/ Developing)	2016: insufficient returns 2017: insufficient returns 2018: insufficient returns 2019: insufficient returns 2020: not implemented 2021: not implemented
Allocation*	15.71% of Chum
Location	7-5
Size	1 seine or 2- 6 gillnet vessels. Final number based on the number of fish to be harvested.
Catch Monitoring (Key Elements)	At-sea patrols by a member of the Kitasoo Co-mgt program and/or DFO; mandatory landing site (Trout Bay dock); 100% dock side enumeration
Communication	Kitasoo Fisheries Program will be responsible for all pre-season, in-season and post-season communications with DFO and participating FNs.
Further Information	Justinas Savickas – DFO Fisheries Manager

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.5 MCLOUGHLIN BAY CHUM (HEILTSUK FIRST NATION)

	McLoughlin Bay Chum (Heiltsuk First Nation)
Included in Final IFMP	2016
Status (Implemented/ Developing)	2016: implemented 2017: insufficient returns 2018: insufficient returns 2019: insufficient returns 2020: not implemented 2021: not implemented
Allocation*	15.71% of Chum
Location	7-17
Size	1 – 2 seines or 3 - 8 gillnet vessels. Final number based on the number of fish to be harvested.
Catch Monitoring (Key Elements)	At-sea patrols by a member of the Heiltsuk Co-mgt program and/or DFO; mandatory landing site (McLoughlin Bay – Heiltsuk fish plant); 100% dock side enumeration
Communication	Heiltsuk Fisheries Program will be responsible for all pre-season, in-season and post-season communications with DFO and participating FNs.
Further Information	Justinas Savickas – DFO Fisheries Manager

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.6 BELLA COOLA CHUM AND CHINOOK (NUXALK NATION)

	Bella Coola: Terminal Chum and Chinook (Nuxalk Nation)
Included in Final IFMP	2017
Status (Implemented/ Developing)	2017: Implemented for Chum 2018: Implemented for Chum (addition of Chinook in proposal) 2019: Implemented for Chinook 2020: Not implemented 2021: Implemented for Chinook
Allocation*	15.71% of Chum and 14.04% of Chinook.
Location	8-10, Portions of 8-11 and 8-12 and 8-15
Size	17 Vessels. Final number based on the number of fish to be harvested.

Catch Monitoring (Key Elements)	Single designated mandatory landing site; monitor will be the Nuxalk Coastal Guardian Watchmen; Level of coverage – 50% on water; 100% dock side enumeration
Communication	A representative/manager of the Nuxalk Stewardship Office will be assigned as the demonstration fishery manager and will be responsible for the coordination of the Nuxalk fishery
Additional Comments	Beginning in 2022, the Bella Coola Chum fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.
Further Information	Justinas Savickas – DFO Fisheries Manager

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.7 NASS RIVER SOCKEYE (NISGA'A LISIMS GOVERNMENT)

	Nass River Sockeye (Nisga'a Lisims Government)
Included in Final IFMP	2016
Status (Implemented/ Developing)	2016: insufficient returns 2017: insufficient returns 2018: insufficient returns 2019: not implemented 2020: not implemented 2021: not implemented
Allocation*	8.68% of the combined Area A and C commercial TAC.
Location	3
Size	Within existing Nisga'a Treaty fishery**, with gear types including marine gillnets, river gillnets, and fish wheels
Catch Monitoring (Key Elements)	100% catch monitoring and validation at either a marine packer or the Nisga'a Processing Plant in Gitlakdamiks; all Nisga'a fisheries are sampled for marks; all non-target salmon caught (released and kept) accounted for in all Nisga'a salmon fisheries
Communication	NFWD managers will participate in weekly conference calls with DFO throughout the Sockeye fishing season and will continue to provide in-season and post-season Nass escapement and run size

	information needed to manage Nass Area Sockeye and other salmon species like in other
Further Information	Jen Gordon, DFO Fisheries Manager (Jennifer.gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.
**Please see Section 10.4 of the Northern IFMP for further details on the Nisga'a Treaty fisheries

4.8 NASS RIVER SOCKEYE (GITANYOW FISHERIES AUTHORITY)

	Nass River Sockeye (Gitanyow Fisheries Authority)
Included in Final IFMP	2016
Status (Implemented/ Developing)	2016: insufficient returns 2017: insufficient returns 2018: insufficient returns 2019: implemented 2020: not implemented 2021: implemented
Allocation*	6.30% of the combined Area A and C commercial TAC.
Location	3
Size	To be finalized prior to the fishery and based on available allocation
Catch Monitoring (Key Elements)	Combination of fishing site and landing site monitoring will take place in-season. To be confirmed with DFO area staff.
Communication	GFA representatives will participate in the Local Harvest Planning Committee (LHPC) to discuss and coordinate fishing plans with other Nass Nations, CSAB and DFO. GFA will also participate at in-season weekly conference calls and any post-season review.
Additional Comments	A 2022 proposal to develop abundance based trigger to allow retention of Coho bycatch in this fishery is under discussion.
Further Information	Jen Gordon, DFO Fisheries Manager (Jennifer.gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.9 SKEENA SOCKEYE (NORTH COAST SKEENA FIRST NATION STEWARDSHIP SOCIETY (NCSFNSS))

	Skeena Sockeye (NCSFNSS)
Included in Final IFMP	2016
Status (Implemented/ Developing)	2016: Implemented 2017: Insufficient returns 2018: Implemented 2019: Insufficient returns 2020: Implemented 2021: Insufficient returns
Allocation*	3.995% of the allowable commercial harvest of Skeena Sockeye which has been recently based on actual weekly commercial catches of Sockeye in Area 4. This percentage is based on sharing of the 1/3 share of the 14.99% of Skeena Sockeye allocation associated with the 88 Area C and 19 Area A licences in the DFO Inventory between the Metlakatla First Nation and NCSFNSS proposals.
Location	Area 4-12 and 4-15
Size	1-3 Vessels. Final number based on the number of fish to be harvested and participating First Nations.
Catch Monitoring (Key Elements)	At-sea patrols; mandatory fisher logs; landing sites; 100% dockside validation
Communication	NCSFNSS will work with other Skeena First Nations, DFO and CSAB through the Local Harvest Planning Committee (LHPC) to discuss and coordinate fishing plans.
Additional Comments	A 2022 proposal to implement a CTAC approach to calculating allocation for this fishery is being reviewed over the 2022 fishing season. Beginning in 2022, additional mitigation measures will be implemented in this fishery to increase protection for stocks of conservation concern. These measures include: Implementation of a season end date in early-August to avoid later timed wild stocks; Implementation of August gillnet selective fishing practices for the whole season to reduce bycatch mortalities (Steelhead, Coho, Chum) and support fisheries monitoring with option for enhanced at-sea observer coverage.

	DFO has received a proposal from North Coast Skeena First Nations Stewardship Society (NCSFNSS) to pilot dual fishing as part of Commercial Salmon Allocation Framework (CSAF) demonstration fisheries for Area 4 Sockeye. Specifically, NCSFNSS proposes that Tsimshian fishers be permitted to retain non-target species for FSC purposes (if there are FSC allocations remaining) while conducting this fishery. In the event that a non-target species is under conservation concern, retention of that species would not be permitted and they would be released with the least possible harm. Retained FSC harvest would be distributed to Tsimshian community members. As indicated at the May IHPC meeting and recent engagement with the First Nations Fisheries Council, DFO will be considering opportunities to pilot this proposal for 2022, noting retention of bycatch for FSC would be permitted subject to any remaining allocation, sufficient abundance and a valid FSC licence for the fishing area, as well as well as compliance with communal license areas and mandatory landing, catch monitoring and reporting requirements to separately account for FSC and sales harvests. Evaluation of proposals is currently in progress, and will be informed by collaboratively developed draft dual fishing principles as well as criteria related to four key objectives: conservation and sustainable harvest, FSC priority, orderly and manageable fisheries, and transparency and predictability. A decision is anticipated in early July 2022. This would be a limited pilot for the 2022 season and results will be reviewed and evaluated post-season.
Further Information	Jen Gordon, DFO Fisheries Manager (Jennifer.gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.10 SKEENA SOCKEYE (LAKE BABINE NATION)

	Skeena Sockeye (Lake Babine Nation)
Included in Final IFMP	This fishery has been implemented since 90's as pilot sales fisheries (see Skeena River Sockeye Inland Demonstration Fishery Management Plan for more information). Since 2016, this fishery has been implemented through updates to CSAF.

Status (Implemented/Developing)	2016: Implemented 2017: Insufficient returns 2018: Implemented 2019: Insufficient returns 2020: Implemented 2021: Not implemented
Allocation*	4.99% of the allowable commercial harvest of Skeena Sockeye which as been recently based on actual weekly commercial catches of Sockeye in Area 4 and the weekly allocation per licence for the Area 4 Seine ITQ fishery. This percentage is based on 1/3 share of the 14.99% of Skeena Sockeye allocation associated with the 88 Area C and 19 Area A licences in the DFO Inventory.
Location	Babine River Counting Fence
Size	To be finalized prior to the fishery and based on available allocation.
Catch Monitoring (Key Elements)	Combination of fishing site catch monitoring and dockside validation will take place in-season.
Communication	Lake Babine Nation (LBN) representatives will participate in the Local Area Committee (LAC) to discuss and coordinate fishing plans with other Skeena Demonstration fishery proponents, CSAB, and DFO.
Further Information	Jen Gordon, DFO Fisheries Manager (Jennifer.gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.11 SKEENA SOCKEYE (GITKSAN WATERSHED AUTHORITIES)

	Skeena Sockeye (Gitksan Watershed Authorities)
Included in Final IFMP	This fishery has been implemented since 90's as pilot sales fisheries (see *Skeena River Sockeye Inland Demonstration Fishery Management Plan* for more information). Since 2016, this fishery has been implemented through updates to CSAF.
Status (Implemented/Developing)	2016: Implemented 2017: Insufficient returns 2018: Implemented 2019: Insufficient returns 2020: Implemented 2021: Not implemented

Allocation*	4.99% of the allowable commercial harvest of Skeena Sockeye which has been recently based on actual weekly commercial catches of Sockeye in Area 4 and the weekly allocation per licence for the Area 4 Seine ITQ fishery. This percentage is based on 1/3 share of the 14.99% of Skeena Sockeye allocation associated with the 88 Area C and 19 Area A licences in the DFO Inventory.
Location	Mainstem Skeena River and Babine River
Size	To be finalized prior to the fishery and based on available allocation.
Catch Monitoring (Key Elements)	Combination of fishing site catch monitoring and dockside validation will take place in-season.
Communication	Gitksan Watershed Authorities (GWA) representatives will participate in the Local Area Committee (LAC) to discuss and coordinate fishing plans with other Skeena Demonstration fishery proponents, CSAB, and DFO.
Additional Comments	A 2022 proposal to implement a CTAC approach to calculating allocation for this fishery is being reviewed over the 2022 fishing season.
Further Information	Jen Gordon, DFO Fisheries Manager (Jennifer.gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.12 AREA 3 PINK (NORTH COAST SKEENA FIRST NATION STEWARDSHIP SOCIETY (NCSFNSS))

	Area 3 Pink (NCSFNSS)
Included in Final IFMP	2018
Status (Implemented/ Developing)	2018: Not Implemented 2019: Implemented 2020: Not Implemented 2021: Implemented
Allocation*	Equal share of the Northern Pink allocation (NCSFNSS will receive 2/3 for the four member Nations and Lax Kw'alaams and Metlakatla to receive a combined 1/3 of the 13.41%).
Location	Sub-areas in Areas 3 where commercial fisheries are permitted for Pink salmon

Size	1-2 Vessels. Final number based on the number of fish to be harvested and participating First Nations.
Catch Monitoring (Key Elements)	At-sea patrols; mandatory fisher logs; landing sites; 100% dockside validation
Communication	NCSFNSS will work with other Skeena First Nations, DFO and CSAB through the Local Harvest Planning Committee (LHPC) to discuss and coordinate fishing plans.
Further Information	Jen Gordon, DFO Fisheries Manager (Jennifer.gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.13 HAIDA GWAII COHO (COUNCIL OF THE HAIDA NATION (CHN))

	Haida Gwaii Coho Troll (CHN)
Included in Final IFMP	2017
Status (Implemented/ Developing)	2017: Implemented (not fished) 2018: Available for Implementation (did not fish) 2019: Not Implemented 2020: Not Implemented 2021: Not Implemented
Allocation*	3.13% of North Coast commercial Coho catch based on the respective gear shares in the North Coast Coho production area
Location	In Area 1 (North Coast of Haida Gwaii) DFO fishing management areas 1-3, 1-5 and a portion of 101-7 east of Klashwun Point (Shag Rock) to the eastern boundary of Rose Spit. In Area 2W (West Coast Haida Gwaii) DFO fishing management areas 2-63, 2-64 & 2-68 (West Skidegate Inlet and Cartwright Sound).
Size	Vessels will be limited to boats 17 feet to 26 feet long. Limit on the total number of vessels not anticipated. Expect participation of 20-30 total vessels.
Catch Monitoring (Key Elements)	At-sea patrols and validation of all offloads at designated landing sites; 100% dockside validation
Communication	A Haida Fisheries demonstration fishery manager will be identified and will be responsible for the coordination of the Haida fishery and will be the primary contact for all communication with DFO and fishers.
Further Information	Patrick Fairweather – DFO Fisheries Manager

*The Haida share depends on the allocation of the 21 Area F licences with no Chinook quota in the DFO Inventory.

4.14 CENTRAL COAST COHO (AREA F)

	Central Coast Coho (Area F)
Included in Final IFMP	2016
Status (Implemented/ Developing)	2016: Implemented 2017: Implemented 2018: Implemented 2019: Implemented 2020: Not implemented 2021: Not implemented
Allocation*	Limited effort, risk based fishery.
Location	Area 6, 7, 8
Size	As in previous years, approval for 4, 3 and 2 vessels in Areas 6, 7, and 8 respectively in consideration of increased potential to encounter stocks of concern in areas further south.
Catch Monitoring (Key Elements)	Limited number of catch validation/landing sites; 100% monitoring; logbook or e-log entry for each day of fishing
Communication	Communication in-season would be via the local harvest committee reps established pre-season.
Additional Comments	Beginning in 2022, this fishery will be closed to protect stocks of conservation concern. The closure is expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. See Appendix 10 for a complete list of longer term fishery closures.
Further Information	Patrick Fairweather – DFO Fisheries Manager

4.15 BULKLEY RIVER COHO (WET'SUWET'SEN FIRST NATION)

	Bulkley River Coho (Wet'suwet'en First Nation)
Included in Final IFMP	2018
Status (Implemented/ Developing)	2018: Insufficient returns 2019: Not implemented 2020: Not implemented 2021: Not implemented

Allocation*	~1000-2000 pieces. Coho are not managed to a TAC in Area A&C fisheries, but are retained as bycatch when abundance permits. The Bulkley River Coho demo will follow similar guidelines.
Location	4
Size	Within existing Wet'suwet'en Moricetown Canyon Pink ESSR fishery, with gear types including beach seine and dip net.
Catch Monitoring (Key Elements)	100% catch validation at designated landing sites; all non-target salmon caught (released and kept) accounted for by fishing site.
Communication	Wet'suwet'en managers will provide weekly in-season updates on numbers of each species caught, sold, retained, and released by fishing site.
Additional Comments	A 2022 proposal to develop abundance based trigger to inform implementation of this fishery is under discussion.
Further Information	Jennifer Gordon, DFO Fisheries Manager (Jennifer.gordon@dfo-mpo.gc.ca)

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

4.16 CENTRAL COAST CHUM (HEILTSUK FIRST NATION)

	Central Coast Chum (Heiltsuk First Nation)
Included in Final IFMP	2020
Status (Implemented/ Developing)	2020: Not Implemented 2021: Not Implemented
Allocation*	15.71% of Central Coast Chum
Location	Seaforth Channel, Spiller Channel, Return Channel, Roscoe Inlet, Lama Passage and Johnson Channel in Area 7
Size	TBD
Catch Monitoring (Key Elements)	At sea patrols, a single designated mandatory landing site, and mandatory fisher logs
Communication	Heiltsuk fisheries program representative will participate in pre-season meetings, in- season weekly calls and any post- season review meetings related to the operation of the Heiltsuk demonstration fisheries.
Additional Comments	

Further Information	Justinas Savickas – DFO Fisheries Manager

*Shares change annually based the respective gear shares for the production Area and licences held in DFO Inventory for use by First Nations. Shares are based on 88 Area C and 19 Area A licences held in the DFO Inventory.

APPENDIX 7: NASS CHUM DRAFT REBUILDING PLAN

CURRENT MANAGEMENT ACTIONS

The objective of the Area 3 Chum rebuilding plan is to: "protect Area 3 wild Chum and at the same time provide opportunities to retain enhanced US Chum in places and times where they are most abundant".

The Canadian Area 3 fishery is currently managed to significantly reduce exploitation rates on Area 3 Canadian Chum stocks from historical levels, as a rebuilding measure. The harvest reductions have been achieved, with current Canadian exploitation rates averaging below 10% which is down from the average of 28% from 1982 to 1999 (Figure 13.5-14). The Area 3 rebuilding plan for the immediate future is to keep the Canadian average exploitation rates below 10%.

Management measures that reduce Area 3 Pink and Sockeye fishery impacts on Area 3 wild Chum include, but are not limited to:

Non retention of Chum for most net fisheries with exceptions in the early season in areas where the otolith analysis confirmed US hatchery Chum are a very high proportion of the harvest.

Closed areas where Chum are relatively abundant compared to the target species

Brailing and sorting will be in place for the seine fishery.

Gill nets have a 137 mm (5.39 in) maximum mesh restriction. This restriction is in place so that Sockeye is targeted selectively and larger non-target species such as Chum and Chinook are impacted to a lesser degree.

BACKGROUND

General background information on Nass Chum was provided in Peacock and Spilsted (2010). The Fishery Operational Guidelines associated with the Nisga'a Treaty set minimum and target escapement goals for Chum and other species that are the limit and target reference points used to implement the Nisga'a Treaty. DFO uses the Management Escapement Goals (MEG) as both the limit and target reference points.

Details of the 2021 management approach for Chum and all fisheries in Area 3 are included in DFO fisheries management post-season reports. Limited Chum retention fisheries were

provided that intercepted US hatchery Chum returns in Pink directed commercial fisheries. Otolith samples have been collected in the past to refine our knowledge of the times and areas where the US hatchery stocks were most abundant relative to wild stocks. Thermal marks from US hatcheries were found on 67-93% of the Chum sampled from Chum retention fisheries from 2012-2018. In 2022 DFO will continue to work with partners to review the efficacy of management measures used to date to limit impacts on Area 3 Chum.

Stock Status to 2017

The Nisga'a Joint Technical Committee and recent DFO assessments indicate recent aggregate status in the amber zone for Portland Inlet and the Portland Canal-Observatory Inlet CUs and data deficiencies for the Lower Nass CU. Chum stocks are not rebuilding even though exploitation rates have been reduced since 2000. This may be partly the result of reduced productivity over the same period.

The management intent is to keep the Area 3 Chum Exploitation Rates low through a period of "normal" productivity to evaluate the productive potential.

Assessment of Fishery Impacts

LGL Limited provided Area 3 Chum exploitation rate time series for US and Canadian fisheries up to 2017 (Figure 13.5-14). Although for a period of time the total ER hovered between 40-70%, since 1998 it has decreased to an average of 22%, with the Canadian ER below 10% since 2006. The current ER is well below the level that would be expected to provide for rapid stock increases under "normal" productivity conditions. Unfortunately, a consistent stock rebuilding pattern has not been observed, potentially due to low productivity and/or marine conditions.

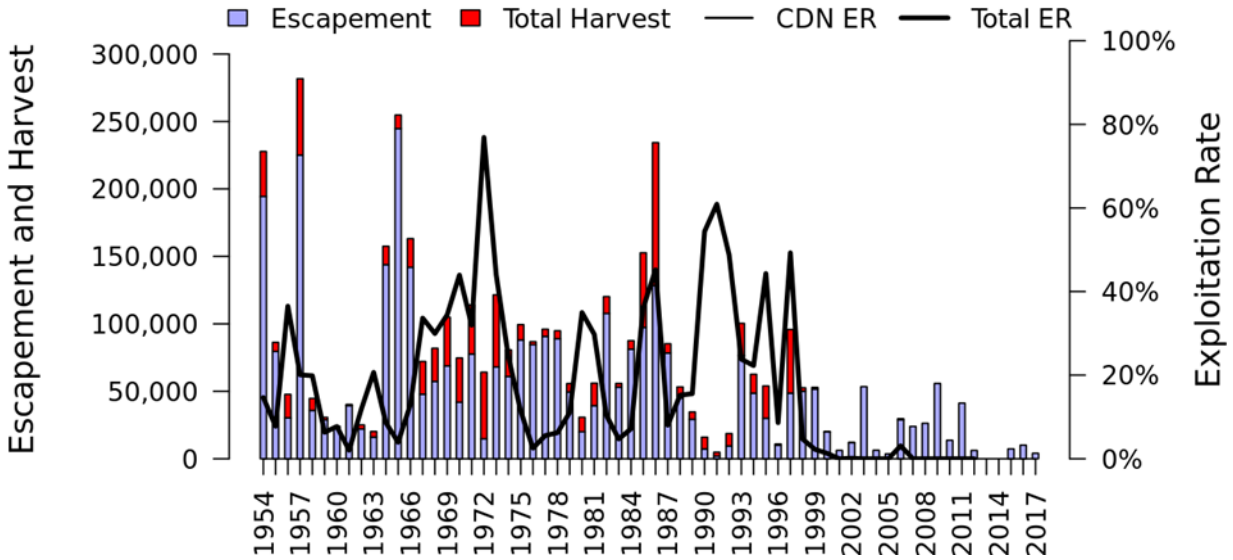


Figure 13.5-14: Area 3 Chum Exploitation Rates (US and Canada)

NASS CHUM REBUILDING PLAN ACTIVITIES

Key Activities	Status
Complete reconstructed time series of escapement, catch and run size for Nass Chum.	Completed as described in English et al 2019 and updated by DFO and the PSF. Updates provided regularly at http://shiny/lglsidney.com/ncc-salmon/
Develop Chum harvest rate assessment models for Nass Chum.	Nisga'a Joint Technical Committee has over the past 10 years developed methods to estimate Nass Chum escapement and catch. This technical background formed the basis for, and the technical committee participated in, the assessment model development revised and described in English 2013, and English et al 2012.
Analyze stock recruit metrics and indicated benchmarks and status interpretations.	Completed initial assessments by the Nisga'a Joint Technical Committee (for Nass area and CU's) and by DFO (by Stat area and CU) in September annually.

Key Activities	Status
Complete annual Northern Boundary Sockeye Reconstruction. Required to generate the weekly harvest rate estimates for Nass Sockeye model. The weekly Sockeye HR's are used in the Nass Chum HR assessment model.	Completed annually in January by the Pacific Salmon Commission's Northern Boundary Technical Committee.
Review 2022 Nass Chum escapement enumeration plans.	Enumerations plans reviewed each year through the Nisga'a Joint Technical committee. In addition, Nisga'a has submitted a northern fund proposal to refine and standardize Nass Chum escapement estimates.
Collect otoliths and DNA from Area 3 fisheries to determine US hatchery contributions in both retention and non-retention areas	Since 2011 otoliths have been collected and analyzed. DNA will be collected in 2022 if funding is available.
Evaluate enhancement and habitat restoration projects that would aid in Area 3 Chum rebuilding.	Kincolith side channel restoration work initiated in 2013 and planned for 2014 and 2015. Kitsault restoration activities that should be considered are presented in Gaboury and Bocking 2007. Monitoring of the progress and contribution of these restoration activities is an important component of any rebuilding plan.
Continue to work through the Pacific Salmon Commission's Northern Panel to discuss Chum management plans in the northern boundary area.	PSC Northern Panel meetings are scheduled for January and February each year.
Review and update Nass Chum harvest rate models, both Sockeye and Pink effort based. Include a sensitivity analysis of the model Area 3 Chum run timing assumptions.	Technical work scheduled for spring Nisga'a Joint Technical Committee annually.
The appropriateness of the ER objective should be reviewed each year taking into account the latest stock assessment information.	Review Nass Chum assessments, status and the rebuilding plan with FN technical committees and with the Nisga'a JFMC, the IHPC and other interested parties.

Key Activities	Status
Develop IFMP Nass Chum fishing plan in cooperation with FN technical committees, the Nisga'a JFMC, the IHPC and other interested parties.	Nisga'a and IHPC meetings scheduled through to the spring to discuss Chum fishing plans that meet the goals fo the rebuilding plan.

REFERENCES

English, K.K., T. Mochizuki and D, Robichaud. 2012. Review of North and Central Coast Salmon Indicator Streams and Estimating Escapement, Catch and Run Size for each Salmon Conservation Unit. Report for Pacific Salmon Foundation and Fisheries and Oceans, Canada. 78 p.

English, K.K. 2013. Extended Time-series of Catch and Escapement Estimates for Skeena Sockeye, Pink, Chum, Coho and Chinook Salmon Conservation Units. Report for Pacific Salmon Foundation. 19 p.

Gaboury, Marc and Robert Bocking. 2007. Assessment of Enhancement Opportunities for Wild Chum Stocks in Canadian Statistical Area 3. Prepared by LGL Limited, for the Pacific Salmon Commission Northern Fund.

Peacock. D. and B. Spilsted. 2010. Nass River Chum (Oncorhynchus keta) stock status. Canadian Science Advisory Secretariat Draft Report 2010. 58p. Available from authors.

APPENDIX 8: SKEENA CHUM DRAFT REBUILDING PLAN

CURRENT MANAGEMENT ACTIONS

The objective of the Skeena Chum rebuilding plan is to: "rebuild Skeena Chum and improve Skeena Chum stock status"

The Canadian Area 4 fishery is currently managed to significantly reduce Skeena Chum Canadian exploitation rates from historical levels, as a measure to rebuild Skeena Chum stocks. The harvest reductions have been achieved, with recent Canadian exploitation rates averaging well below 10%. The rebuilding plan for the immediate future is to keep the Canadian average exploitation rates below 10%.

Management measures that reduce Area 4 Sockeye and Pink fishery impacts on Skeena wild Chum include, but are not limited to:

Non retention of Chum in all Area 4 commercial fisheries.

Brailing and sorting will be in place for the seine fishery.

Gill nets have a 137 mm (5.39 in) maximum mesh restriction. This restriction is in place so that Sockeye is targeted selectively and larger non-target species such as Chum and Chinook are impacted to a lesser degree.

BACKGROUND

Background information on Skeena Chum is provided in Peacock and Spilsted (2010). A recent paper by Price et al (2013) evaluates the historical abundance of Skeena Chum.

STATUS

Skeena Chum assessments have been completed by Korman and English (2013). The key conclusions are that Skeena Chum are severely depressed, and are not rebuilding even though recent exploitation rates are well below the optimal equilibrium harvest rate (U_{msy}) values, likely due to reduced productivity in the last decade. DFO supports this assessment and has implemented sustained harvest reductions as a rebuilding plan.

FISHERY IMPACTS

LGL Limited provided Area 4 Chum exploitation rate time series for US and Canadian fisheries up to 2010 (Figure 13.5-15). The recent 4 year cycle average Canadian ER is below 2% and the last decade average is below 3%. This provides for total ER averaging below 14% over the last decade, down from the 42% average from 1982 to 1999. The current ER is well below the level that would be expected to provide for rapid stock increases if "normal" productivity returns (given the U_{msy} estimate of 0.44). Keep in mind there is concern that the Stock-Recruit (S-R) metrics are biased by long history of high ER, limiting S-R data range in the more recent time series. This will tend to over-estimate U_{msy}.

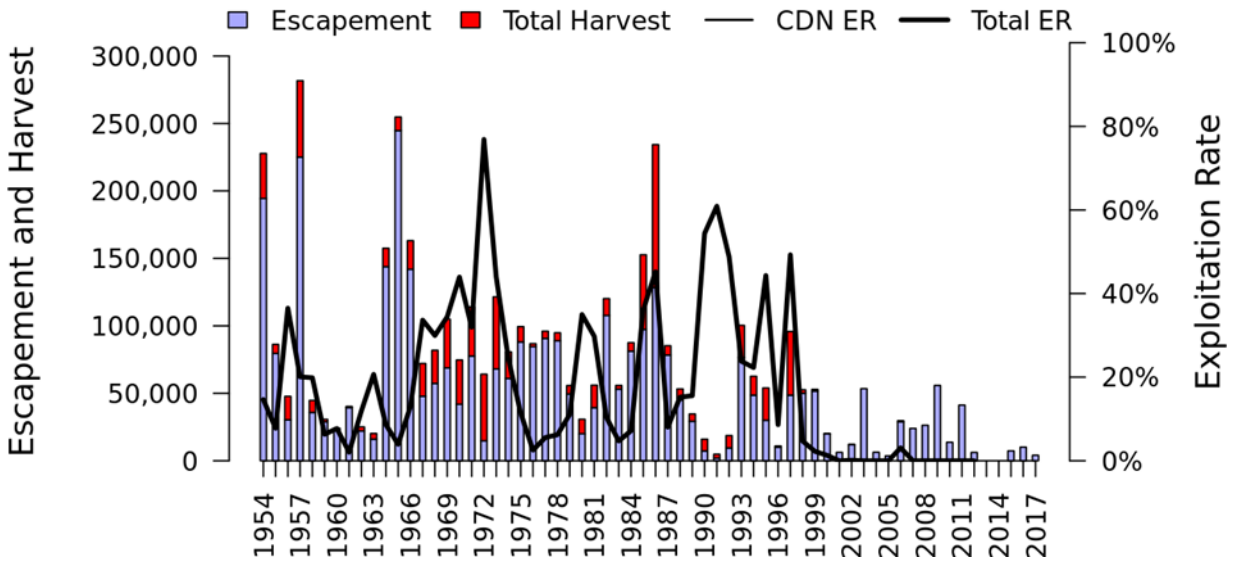


Figure 13.5-15: Area 4 Chum Exploitation Rates US and Canada

SKEENA CHUM REBUILDING PLAN ACTIVITIES

Key Activities	Status
Complete reconstructed time series of escapement, catch and run size for Skeena Chum.	Completed as described in English et al 2012, updated English 2013 and updated annually (unpublished DFO).
Develop Chum harvest rate assessment models for Skeena Chum.	First versions completed as described in English 2013 and English et al 2012.
Analyze stock recruit metrics and indicated benchmarks and status interpretations.	Completed assessments by Korman and English (2013).

Key Activities	Status
Continue to review potential enhancement and habitat measures to aid rebuilding.	A northern fund project "Kleanza Creek spawning weir" accepted through the first round of reviews.
Complete annual Northern Boundary Sockeye Reconstruction. The reconstruction is required to generate the weekly harvest rate estimates for Skeena Sockeye model. The weekly Sockeye HR's are used in the Skeena Chum HR assessment model.	Completed annually, Northern Boundary Technical Committee.
Evaluate Ecstall Chum spawner enumeration methods.	Two reports published.
Review and update Skeena Chum harvest rate model, and evaluate utility of using the Pink effort/HR model applied to Chum as a comparison.	Completed annually.
Review Skeena Chum assessments and status with FN technical committees and through the IHPC and other interested parties.	Chum update at post-season review, and discussions take place at the technical committees, and IHPC meetings.
Review Skeena Chum escapement enumeration plans.	Enumerations plans developed annually by DFO and participating First Nations.

REFERENCES

English, K.K., T. Mochizuki and D, Robichaud. 2012. Review of North and Central Coast Salmon Indicator Streams and Estimating Escapement, Catch and Run Size for each Salmon Conservation Unit. Report for Pacific Salmon Foundation and Fisheries and Oceans, Canada. 78 p.

English, K.K. 2013. Extended Time-series of Catch and Escapement Estimates for Skeena Sockeye, Pink, Chum, Coho and Chinook Salmon Conservation Units. Report for Pacific Salmon Foundation. 19 p.

Korman, J, and K. English. 2013. Benchmark Analysis for Pacific Salmon Conservation Units in the Skeena Watershed. Submitted to the Pacific Salmon Foundation.

Peacock. D. and B. Spilsted. 2010. Skeena River Chum (Oncorhynchus keta) stock status. Canadian Science Advisory Secretariat Draft Report 2010/059.

Price, M.H.H.., Gayeski, N., and J. A. Stanford. 2013. Abundance of Skeena River Chum salmon during the early rise of commercial fishing. Transactions of the American Fisheries Society 142:4, 989-1004.

APPENDIX 9: 2022 SALMON OUTLOOK

PURPOSE

The purpose of this document is to provide an 'Outlook' of expected abundance of salmon in 2022 to inform the harvest planning process.

The Outlook provides either an expected abundance for those stocks with statistical forecasts or a categorical abundance expectation based expert opinion.

CHANGES TO THE OUTLOOK

Changes were made to the Outlook document in order to:

1. Align CU groupings with stock management units (SMUs) to better inform decision-making consistent with *Fishery Act* and IFMP requirements.
2. For those SMUs with statistical forecasts, consolidate and report them in the Outlook Document.
3. For those SMUs without statistical forecasts, standardize the interpretation of SMU status in relation to outlook categories;
4. Remove language regarding fishery consequences.
5. Add information on SMU 'stock trajectories' and biological benchmarks and management references (where defined) for additional context. (In Progress)

It is hoped these changes will result in a document that provides more useful and relevant information to inform decision-making. These changes will continue in the 2022 Outlook.

BACKGROUND

STOCK MANAGEMENT UNITS

For the 2022 Outlook, 'Stock Management Units' (SMUs) are used to describe stock aggregates that inform development of Integrated Fisheries Management Plans (IFMPs) for salmon. This is required for implementation of the fisheries-related revisions to the *Fishery Act*.

For salmon, the working definition of a 'stock management unit' (SMU) is a 'group of one or more conservation units (CUs) that are managed together with the objective of achieving a joint status', meaning harvest control rules would apply to the aggregate, at least in a coarse sense. Use of SMUs does not preclude considerations related to conserving CU-level diversity, but rather is a practical aggregation of CUs for harvest planning and reporting purposes. That is, it is the scale at which harvest management plans, or better, management and assessment procedures, are developed in Integrated Fisheries Management Plans (IFMPs). In many cases,

elements of the Precautionary Approach are implemented at finer scales of organization within a SMU.

BIOLOGICAL AND MANAGEMENT REFERENCES

The purpose of a stock forecast or outlook is to provide information to harvest managers to potentially adjust harvest plans according to the expected stock abundance. Ideally in that regard, the status of the stock management unit (or sub-unit) is assessed against specified limits and targets and pre-defined harvest strategies (or harvest control rules) are in place that define the actions required to meet targets and avoid limits.

Therefore, where biological benchmarks and/or limit reference points are defined for CUs or SMUs, respectively, they are noted in the Outlook/Forecast tables below. Similarly, if management targets are in place they are identified. Lack of these references is a gap and work is on-going to develop methods and complete the analyses to define these references. The summary below describes how these biological and management references are applied and interpreted.

WSP LOWER BIOLOGICAL BENCHMARKS AND LIMIT REFERENCE POINTS (LRPS)

For implementation of the Wild Salmon Policy, the status of salmon Conservation Units (CU) is assessed against 'biological benchmarks'. The lower biological benchmark allows for substantial buffer between it and the level of abundance at which the stock would be considered at risk of extinction and is generally estimated as S_{GEN}. The upper biological benchmark delineates the 'amber' from 'green' WSP status zone and is generally estimated as .80 S_{MSY}. For more data-limited systems (i.e. where it is not possible to numerically estimate stock-recruit parameters), proxies for lower and upper biological benchmarks may be applied. For example, the lower and upper biological benchmarks are estimated as .25 and .60 percentiles of the long-term observed spawning abundance.

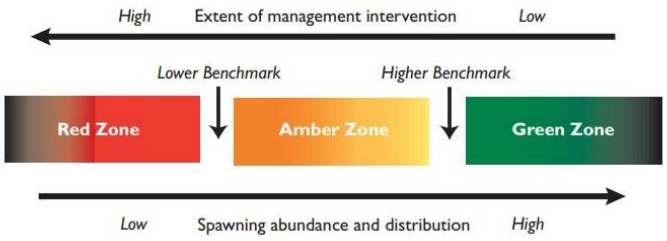


Figure 0-1. Benchmarks and biological status zones for CU assessments.

Under DFO's Precautionary Approach (PA), the stock management unit (SMU) limit reference point (LRP) is a biologically-defined reference that delineates the 'critical zone' from the 'cautious zone' for harvest management. It represents the status below which serious harm is occurring to the stock. There may also be resultant impacts to the ecosystem, associated species and a long-term loss of harvest opportunities.

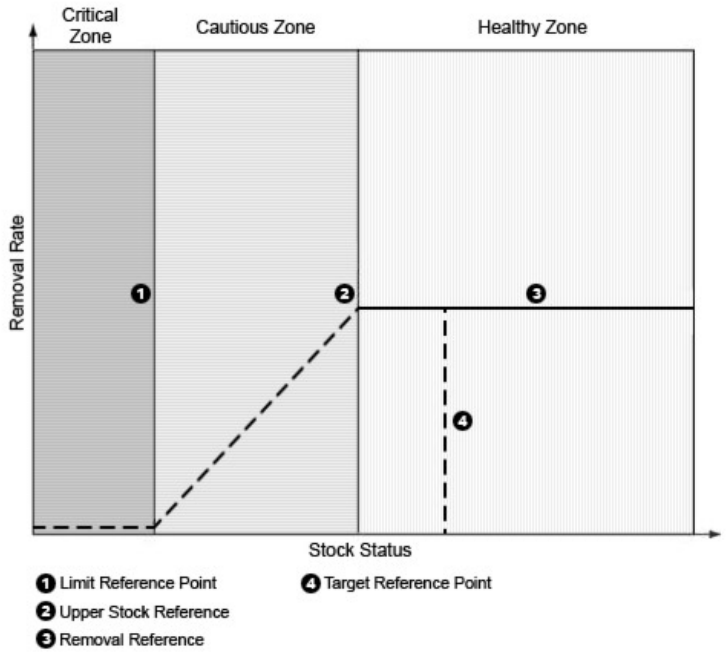


Figure 0-2. Schematic of a generalized harvest strategy under DFO's PA.

Given the intent is similar between the WSP and DFO's PA, it is practical to equate the SMU LRPs with lower biological benchmarks at the CU level. However, the WSP recognizes that serious harm to species occurs when CUs are depleted or lost. Therefore, to be consistent with the WSP, LRPs at the SMU scale should consider CU-scale biodiversity. Methodological approaches for defining LRPs are being developed to ensure CU-level biodiversity is taken into account and for both data-rich and data-limited assessment systems.

MANAGEMENT TARGETS AND OPERATIONAL CONTROL POINTS

While management targets or operational control points are often informed by biological benchmarks and stock-recruit reference points, they also take into account other objectives such as maximizing sustainable harvest, avoiding over-fishing, maintaining stable access and opportunity, allocation objectives such as how catch is distributed among harvesters, etc. As such, they are tightly linked to the harvest strategy and fishery management measures.

In some cases, the management target may be a simple trigger such as when a 'surplus-to-escapement-target' harvest control rule is in place. In other cases, there may be multiple management targets (or operational control points) used to adjust the harvest control rule at different levels of abundance.

Note that an SMU can be below its management target (and therefore subject to some level of harvest restriction as per the harvest control strategy), but well above levels that represent a serious conservation concern (i.e. the LRP or LBB). In other situations, an SMU may be well above its target but subject to harvest restrictions because the stock rears or co-migrates in mixed-stock fishing areas with other SMUs (or CUs) that are near or below their LRP (or LBB).

STOCK OUTLOOKS

CATEGORICAL STOCK OUTLOOKS

For the 'Preliminary Outlook' and for those SMUs for which statistical forecasts are not produced, either because the SMU is not intensively managed and/or is more data limited, categorical 'outlooks' are assigned. These outlooks are based on expert opinion qualified with information from monitoring programs. For each stock grouping an outlook of expected spawning abundance is assigned based on a scale of 1 to 4.

For CUs or SMUs with references in place (i.e. either lower (LBB) and upper biological benchmarks (UBB) and/or lower reference points (LRP) and upper stock references (USR) and Target Reference Point (TRP), these references are used to assign Outlook category. For more data-limited CUs or SMUs (i.e. those without defined stock or management references), expected spawning abundance is compared to average or median abundance based on available information.

SMUs for which insufficient data area available to determine an Outlook are noted as 'Data Deficient'.

Outlook Category	CUs or SMUs with references		Data Limited CUs or SMUs	
	Wild Salmon Policy (CU Level)	Precautionary Approach (SMU Level)	Category Definition	Expected spawning abundance
1	Red Zone (i.e. below the LBB)	Critical Zone (i.e. below the LRP)	Well below average	<25th percentile

Outlook Category	CUs or SMUs with references		Data Limited CUs or SMUs	
	Wild Salmon Policy (CU Level)	Precautionary Approach (SMU Level)	Category Definition	Expected spawning abundance
2	Amber Zone (i.e. below the LBB, below the UBB)	Cautious Zone (i.e. above the LRP below the USR)	Below Average	25 to 40th percentile
3	Green Zone (i.e. above the UBB)	Healthy Zone (i.e. above the USR)	Near Average	40 to 60th percentile
4	Green Zone (i.e. at or above the TRP)	Healthy Zone (at or above the TRP)	Abundant	>60th percentile
Data Deficient			Insufficient information	Unknown

SOUTH COAST AREA

WEST COAST VANCOUVER ISLAND

Stock Management Unit	Conservation Unit /Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
WCVI - BARKLEY SOCKEYE	**Somass Aggregate (GCL + SPL)**	**740,000** (Avg. Run Size 1977+)		**170,000** Run Size – lower operational control point	**400,000**
	Great Central Lake CU	400,000 (Avg. Run Size 1977+)	29,290 LBB		**Outlook Category 3**
	Sproat Lake CU	340,000 (Avg. Run Size 1977+)	41,350 LBB		**Outlook Category 3**
	The two main contributing brood years to the 2022 run are 2017 and 2018 and the two main contributing smolt years are 2019 and 2020. Brood abundance was near average in 2017 but below average in 2018. Smolt abundance low in 2019 and is not yet available for 2020. Based on ocean indicators, marine				

Stock Management Unit	Conservation Unit /Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
	survival rates for the 2019 and 2020 smolt years are likely to be low. Given the considerations above, expectations are for a below average Somass Sockeye return in 2022.				
	Henderson Lake CU	34,000 (Avg. Run Size 1978+)	5000 LBB	9% max. harvest rate at run sizes <15,000	**<15,000**
	For the 2022 return, the two main contributing brood years are 2017 and 2018 and the two main contributing smolt years are 2019 and 2020. Brood abundances were near average in both 2017 and 2018. Based on ocean indicators, marine survival rates for the 2019 and 2020 smolt years are likely to be low. Therefore, expectations are for a continued low Henderson sockeye return in 2022.				
WCVI - OTHER SOCKEYE	22 CUs are associated with this stock management unit.				**Data Deficient**
	Assessment data are not available to forecast others systems. However, WCVI populations tend to covary. Therefore, expectations are for low-to-moderate returns based on the outlooks for Somass and Henderson.				
WCVI PINK	3 CUs are associated with this stock management unit.				**Data Deficient**
	Since the collapse of WCVI pinks in the mid 1960s there has been negligible catch and only opportunistic assessment of returns during assessment of other species. The available data suggest WCVI pink salmon populations continue to persist at very low relative to historic levels with high variability.				
WCVI CHINOOK	Southwest Vancouver Island CU			10 – 15% maximum exploitation rate in key 'pre-terminal' CDN fisheries	**Outlook Category 1**
	Nootka and Kyuquot CU				
	Northwest Vancouver Island CU				
	Escapements of WCVI Chinook natural populations remain low. There has been improvement in Kyuquot (NWVI wild indicators) in recent years. The Clayoquot area (SWVI wild indicators) which remains the biggest concern saw slight improvement relative to last year but even with the slight contribution of enhanced Chinook to Bedwell the return is hovering around the lower benchmark. Survival rates of natural production is thought to be less than half that of hatchery production; similarly productivity remains relatively low. WCVI wild Chinook remain a stock of concern.				

Stock Management Unit	Conservation Unit /Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
	Somass/Robertson (Hatchery)	68,000 (Avg terminal run 1995-2020)	n/a	39M eggs (spawner target is adjusted for expected age/sex composition)	**135,000** (100,000-170,000)
	Conuma Hatchery	37,000 (Avg terminal run 1995-2020)	n/a	10,000 ESC target but varies to ensure escapement of eggs associated with an average 10,000 escapement.	**40,000** (24,000-56,000)
	Nitinat Hatchery	25,000 (Avg terminal run 1995-2010)	n/a	10,000 ESC including brood stock	**27,000** (18,000-36,000)
	WCVI Other Hatchery Supplemented (e.g. Burman R, Sarita R.)	Varies by individual river; see local plans for details.	Work is underway to develop lower bench marks (C. Holt lead).	Varies by individual river; see local plans for details.	**38,000** (25,000-51,000)
	Overall returns in 2022 will likely be similar to 2021 which was higher than average abundance in the SWVI and near average abundance in NWVI				
WCVI COHO	3 CUs are associated with this stock management unit.				**Outlook Category 3**
	Information to forecast Coho returns is limited. Therefore, there is considerable uncertainty in this assessment. Data suggests improved Coho marine survival relative to the 2020 returns; for example, escapement through Stamp Falls was in 70th percentile of all returns since 2010 and well above the 2018 brood. For 2022, most of the return will originate from the 2019 brood year that went to sea in 2021. Robertson Hatchery Coho jacks in 2021 were higher than the 2010-2020 average suggesting improvement in 2022 with average returns expected. Prior to 2021, most WCVI Coho spawning populations had seen declines in productivity.				
WCVI CHUM	Area 23 (Barkley) – Southwest Vancouver Island CU	**69,000** (Avg. Return, 1995+)		48,000 Run size – lower operational control point, 15% max harvest rate	**8,000** (6,000-12,000)
	Area 24 (Clayoquot) – Southwest Vancouver Island CU	**57,000** (Avg. Return, 1995+)		42,000 Run size – lower operational control point, 15% max harvest rate	**11,000** (9,000-15,000)
	Area 25 (Nootka) – Southwest	**41,000**		26,000 Run size – lower operational	**Outlook Category 2**

Stock Management Unit	Conservation Unit /Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
	Vancouver Island CU	(Avg. Return, 1995+)		control point, 20% max harvest rate	
	Area 25 (Esperanza Inlet) – Southwest Vancouver Island Cu	**49,000** (Avg. Return, 1995+)		24,000 Run size – lower operational control point, 15% max harvest rate	**Outlook Category 2**
	Area 26 (Kyuquot) – Southwest Vancouver Island CU	**60,000** (Avg. Return, 1995+)		25,000 Run size – lower operational control point, 15% max harvest rate	**13,000** (8,000-21,000)
	Area 27 (Quatsino Sound) – Northwest Vancouver Island CU				**Data Limited**
	Area 25 (Conuma Hatchery) – Southwest Vancouver Island CU	**88,000** (Avg. Return, 1995+)			**Outlook Category 2**
	Nitinat Hatchery	**491,000** (Avg. Return, 1995+)	n/a	225,000 Run size – lower operational control point	**121,000** (89,000-176,000)
	Preliminary 2021 returns of WCVI Chum were well below average continuing a trend in reduced Chum productivity. Brood years 2017, 2018 and 2019 will contribute to the 2022 return as age 5, 4 and 3, respectively. The 2017-2019 brood year returns were below average abundances, and the 2018 and 2019 sea entry years resulted in below average to average survival. This will limit both the age 4 (dominant age class) and 5 contributions to the 2022 return. The recent stock status of wild WCVI Chum has generally been poor with spawning abundance for wild indicator stocks frequently below upper biological benchmarks. In addition, hatchery production has declined in recent years. 2022 Outlook Category 2.				

EAST COAST VANCOUVER ISLAND/MAINLAND INLETS

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
	Nimpkish	60,000 median spawners			**Outlook Category 2-3**

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
ECVI / MAINLAND SOCKEYE	Sockeye returns to this system in 2021 were below average at approximately 40,000 adults. For the 2022 return, the two main contributing brood years are 2017 (30,029 adults) and 2018 (83,796), which are below and above average respectively. The two main contributing smolt years are 2019 and 2020. Recent escapement to nearby systems from Coho and Pink Salmon are encouraging, and may indicate that marine conditions are improving. Further, Nimpkish Sockeye returns are biased towards 4 year old fish (57%), so the higher than average escapement in 2018 should result in slightly improved overall escapement. Given the considerations above, expectations are for an escapement that approaches the average return.				
	Area 16 (Sakinaw)	**116** (Avg. Return, 1995+)	2,440	4,470	**Outlook Category 1**
	Of the 75,823 smolts that left Sakinaw Lake in 2019 a total of 26 adult Sockeye returned in 2021. Marine survival continues to be extremely low; for the 2019 ocean entry year the smolt-to-adult survival declined to 0.024% for hatchery-origin fish but improved to 0.55% for natural-origin smolts. Smolt production increased dramatically to 184,964 in 2020 although the 2019 fry release was not clipped so estimating natural production was not possible (only 2 natural spawners in 2018). If marine survival is near the 4-year average, a total of 94 adults are expected in 2022. The forecast could increase to 265 fish if marine survival is similar for the 2018 and 2020 ocean entry years.				
	Other (Areas 11 to 13)	Heydon: 2,600 median spawners Quaste: 2,200 median spawners			**Outlook Category 2-3**
	Expectations for other populations such as Quatse, Heydon and Phillips are similar to Nimpkish.				
ECVI / MAINLAND PINK	Areas 11 to 13	Reconstructed Median Returns Southern Fjords (Even): 1.6 million Southern Fjords (Odd): 613K Nahwitti (Odd): 12K			**Outlook Category 1** (NEVI and Area 12 Mainland Inlets)
	Georgia Strait	Strait of Georgia (Odd): 536K			**Outlook Category 3** (Southern

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
		Strait of Georgia (Even): 142K			portion of area on ECVI)
	Even Year: 2020 saw varied returns throughout the South Coast with poor returns in Northern Vancouver Island and generally improved/strong returns to the systems from Adam River south to Campbell River on the Island. Very poor (well below average) returns to Area 12 Mainland Inlets and very strong recovery and returns observed on the Philips River in Area 13 Mainland Inlets. Expectations for 2022 are for continued but improving low abundance for the NVI/Northern Mainland Inlet systems and average to above average returns from Adam River to Campbell River and Southern Mainland Inlets. Historically, Pink returns to this area have been highly variable and expectations continue to be highly uncertain. **Odd Year:** 2021 saw varied returns throughout South Coast. Generally Northern Vancouver Island is well below the historical adult abundance, although with clear signs of improvement since escapement hit its lowest point in 2016/2017. In contrast, the mainland inlets saw continued poor escapement of Pink Salmon. Returns to the Adam River approached the generational average, and the Campbell/Quinsam saw very strong returns. Abundance was above average for central ECVI systems with over 150K to Tsolum River and near average for Nanaimo/Qualicum. Aerial counts of Jervis Inlet systems indicated a moderate improvement with an aggregate estimate of 240K.				
MAINLAND INLET CHINOOK	This aggregate includes 4 CUs				**Data Deficient**
	Includes Homathko and Klinaklini. DFO is working to expand our programs into the Mainland Inlets, and 2021 was the first year where directed stock assessment activities were undertaken here since the early 2000's. A video counter was installed on Devereux Creek (Knight Inlet) to count adult Chinook Salmon, and data review is currently underway. Stock Assessment also collected baseline samples from Chinook from the Southgate and Homathko Rivers (Bute Inlet), as well as the Toba River (Toba Inlet). Chinook in all systems were relatively common, although insufficient data are available for a population estimate. Although still data deficient, efforts are underway to understand population abundance and trends in these areas.				
UPPER GEORGIA STRAIT CHINOOK	Quinsam River Fall Run	**7,072** (AVG. Terminal Run Index, 1979+)			**10,756 Esc**
	We saw above average escapement in 2021 for the Quinsam/Campbell River, and other systems in the region also saw average to above average escapement. Expectations in 2022 are for maintenance or slight improvements of present Chinook escapement, especially if harvest restrictions on early timed Fraser Chinook continue.2022 Outlook Category 3-4.				

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
MIDDLE GEORGIA STRAIT CHINOOK	Puntledge and Big Qualicum Rivers Fall Run Enhanced	**14,385** (AVG. Terminal Run Index, 1995+)	7,193		**27,283 Esc**
	The Puntledge River saw an above average return of 11,200 fall Chinook in 2021. Escapement to the Big Qualicum River was also above the four year average of 7,500 at 11,800. Stable production levels and modest survivals for several hatchery indicators combined with above average marine abundance of 2-year olds suggests average to above average returns are likely for 2022. 2022 Outlook Category 4.				
	Nanaimo and Puntledge Spring Summer Enhanced CK-83	1,712 AVG. Terminal Run Index, 2004+)			**516 Esc**
	A combination of additional snorkel surveys and a DIDSON project in the Nanaimo River produced an estimate of 992 fish in 2021 which was up from 583 in 2020 and above the 12 year average of 600. Puntledge summer Chinook were below the 4-year average of 820 fish at 517. Most of the reduction can be attributed to reduced smolt releases in preceding years. Rebuilding efforts for these populations are continuing with recovery potential assessments underway. At these levels, rebuilding will take several generations even with improved survival. 2022 Outlook Category 2-3.				
LOWER GEORGIA STRAIT CHINOOK	Cowichan River Fall Run Unenhanced (<20% hatchery origin)	**6,826** (AVG. Terminal Run Index, 1982+)	3,413	**6500 (Cowichan)** Escapement Target (S_{MSY})	**21,917 Esc**
	Adult Chinook returns to the Cowichan River in 2021 exceeded the target escapement of 6,500 naturally spawning adults for the sixth consecutive year. The preliminary number of jacks in the population was above average at 7.8K but less than 2020. Preliminary adult abundance was strong at 15.6K but dominated by 3 year old returns. The 2022 outlook is for average to above average returns while 2021 escapement estimates have yet to be finalized. Wild production continues to drive the escapement with the proportion of hatchery fish in the population estimated at 10% for adult age classes in 2021. A similar rebuilding trend has not been observed in the Nanaimo River although 2021 counts of 4.4K were above the 4 year average of 2.9K. Swim counts will be run through an AUC model prior to finalizing estimates. Expectations for 2022 are for average to above average returns. 2022 Outlook Category 4.				
	Area 12	2700			

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
JOHNSTONE STRAIT / MAINLAND INLET COHO		AVG Terminal Run Index (1998+)			Outlook Category 2-3
	Area 12 Coho returns are continuing to improve against the extremely poor escapement in 2016. Returns are now approaching the long-term average, which is very promising. Throughout the downturn in abundance, smolt production remained consistent but ongoing periods of poor marine survival remain a significant risk. Our preliminary escapement at the Keogh is 2,000 adults, which is approaching the average for this system. Estimated escapement has steadily increased from that observed in 2016 (230). Productivity on the Keogh began improving in 2011, and the annual smolt production since has remained above the long term average. The return in 2021 stems from an above average smolt abundance of 86,770. The 2021 smolt migration was the highest ever observed at 129,200. We expect stronger returns in 2022 due to the high smolt output and slightly improved marine survival conditions.				
	Area 13 - North				Outlook Category 2
	Hatchery indicators for this outlook unit are Quinsam and Big Qualicum. Adult returns to the Quinsam were below average, while the Big Qualicum saw above average returns. General observations to date suggest the forecasted returns are in line with observations, albeit with varied returns across the region. Village Bay Creek on Quadra Island is being monitored by video and has observed higher than average abundance of Coho through the fence. The wild indicator is Black Creek (included below in the Georgia Strait OU). The Area 13 forecast is 9% higher than the 2018 observed indices. Coho abundance in this region can be characterized as 'well below average'				
STRAIT OF GEORGIA COHO	Quinsam				Outlook Category 2-3
	Big Qualicum				
	Black Creek				
	Hatchery indicators for this Outlook Unit are the Quinsam and Big Qualicum rivers. 2021 adult returns of 11,400 to the Big Qualicum were above the four year average but less than 22,300 in 2020. An unplanned reduction in smolt output in 2018 produced a low return of 2,600 fish in 2019. Production levels are back to normal and 2022 returns are expected to be average to above average. The wild indicator is Black Creek. This year's estimate of 2,604 adults is slightly better than 2020 (1,935 adults) but below the long-term average. The modest increase to escapement was likely a result of a bump in 2020 smolt production to just over 80K from 40K in 2019. Jack returns were similar to last year and are still contributing to a large proportion of the total return. Improvement to marine survival was evident from 2019 to 2020 but fewer adults returned in 2021 than expected. Smolt production in 2021 (85K) is significantly above the long-term average which will likely lead to an average				

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
	or slightly above average return for 2022, although a continuation of low marine survival remains a risk to this forecast.				
INNER SOUTH COAST CHUM - Non-Fraser	Johnstone Strait Area and Mainland Inlets (Areas 11 to 13)				**Outlook Category – 1-2**
	Summer run Chum Salmon stocks in 2021 appear to have done poorly relative to recent years and remained below average throughout the area. This will likely continue through 2022, as the first fish from poor brood abundance begin to return. Fall run Chum returns in 2021 appears to be below average in most systems surveyed. Productivity of these stocks has declined over the last 4 years and has been attributed to poor marine conditions for salmon. There is some indication that survivals have been better in the Southern range of the distribution of Inside Southern Chum. For the 2022 return, below average parental brood abundances in both 2017 and 2018 and a 4 year decline in Chum productivity will likely mean below average return of fall Chum in 2022. Recovery initiatives continue for the Nimpkish Chum Stock within this area. Expect variability in Chum returns.				
	Jervis/Narrows Inlet (Brittian, Deserted, Skwawka, Tzoonie, Vancouver)	**51,151** (Avg. Return, 2004+)		85,000	**418** (Like Last Year) (12,000 normal)
	Mid-Vancouver Island (Puntledge, Big Qualicum, Little Qualicum)	**225,697** (Avg. Return, 1995+)		230,000	**18,400** (Like Last Year) (67,200 normal)
	Nanaimo River	**61,288** (Avg. Return, 2004+)		40,000	**21,017** (Like Last Year) (106,400 normal)
	Cowichan River	**177,032** (Avg. Return, 2006+)		160,000	**18,077** (Like Last Year) (188,000 normal)

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
	Goldstream River	**27,070** (Avg. Return, 2000+)		15,000	**17,750** (Like Last Year) (56,800 normal)
	Data for 2021 suggest well below target escapements for systems in mid to northern Georgia Strait and Jervis/Narrows Inlets. Returns to Nanaimo, Cowichan and Goldstream which have been near or slightly above target shifted to well below forecast values in 2021. For 2022, Mid-Island systems (Puntledge, Little Qualicum, Big Qualicum) are expected to remain well below target levels. Abundance of stocks in the southern Georgia Strait such as Cowichan, Nanaimo, and Goldstream is uncertain: expectations are well below escapement targets if low survivals persist or slightly above target if survival returns to normal. Jervis/Narrows Inlet stocks are forecast to be below target abundance.				**Outlook Category 1-2**

LOWER AND INTERIOR FRASER AREA

FRASER SOCKEYE SALMON

Quantitative forecasts for Fraser Sockeye stocks are produced annually. The 2022 forecasts will be presented to the Fraser River Panel at the Pacific Salmon Treaty meeting in February. This document provides a precursor look at the upcoming 2022 Sockeye forecast. The outlook is intended to provide a categorical assessment of brood-year escapements relative to Wild Salmon Policy (WSP) benchmarks and historical returns. Categorical outlook status ranges from poor return (1) to good return (4). Details about the definition of the outlook status and calculation of each metric are outlined in the Appendix.

AVERAGE AGGREGATE RETURN (ALL CYCLES, ALL STOCKS): 12,680,008

Stock management Unit: EARLY STUART

Average aggregate return (all cycles): 107,649

Conservation Unit	Average Return (all cycles)	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
Early Stuart *(CU: Takla-Trembleur-EStu)* - Cyclical: Yes	107,649 (cyc-year average)			WSP – RED COSEWIC – END	**105,000** (39,000 – 268,000)
	Below average returns are expected for this CU. The 2018 brood-year effective total spawners (ETS; 39,676) was below the WSP lower benchmark for ETS (111,753). Brood-year effective female spawners (EFS; 21,450) was above the long-term cycle line average EFS (18,852) but below the recent				

	cycle line average EFS (23,715). This stock was heavily impacted by the Big Bar landslide in 2019 and 2020 return years, with potentially additional en-route mortality. The situation is likely to be alleviated for 2022 with significant progress of the ongoing Big Bar site improvement.	

Stock management Unit: EARLY SUMMER

Average aggregate return (all cycles): 983,626

Conservation Unit	Average Return (all cycles)	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST
LOWER FRASER					
Upper Pitt River *(CU: Pitt-ES)* - Cyclical: No	66,907			WSP – Green COSEWIC – NAR	**35,000** (13,000 – 89,000)
	Good returns are expected for this CU. The five-year-old component has contributed substantially to this stock in the past, especially for this cycle line. The 2017 brood-year effective total spawners (ETS; 23,612) was above the WSP lower benchmark ETS (10,627) but below the upper benchmark (26,845). As well, brood-year effective female spawners (EFS; 13,297) was above the recent average EFS (11,031) and slightly below the long-term average EFS (13,322). Note: these comparisons include the Upper Pitt River spawning channel escapements to be consistent with Grant et al (2020).				
Chilliwack *(CU: Chilliwack-ES)* - Cyclical: Yes*		8,000		WSP – AM/GR COSEWIC – NAR	**10,000** (2,000 – 37,000)
	*While this stock exhibits cyclical returns, limited data preclude cycle-specific benchmarks (Grant et al 2020). The five-year-old component has contributed a considerable amount of the stock for this cycle line. The uncertainty in both the age structure and relevant benchmarks for comparison is reflected in the outlook status. Below average returns are expected for this CU. Both four-year-old (2018) and five-year-old (2017) effective total spawners (ETS; 1,910 and 6,525, respectively) were below the WSP lower benchmark (8,000). The 2018 effective female spawners (EFS; 975) was below both the long-term (1,388) and recent (1,196) average EFS, but the 2017 EFS (2,536) was above them.				
Nahatlatch River *(CU: Nahatlatch-ES)* - Cyclical: No				WSP – Amber COSEWIC – SC	**8,000** (2,000 – 29,000)
	Reliable recruitment data are not available for this CU, thus no WSP benchmarks are available for comparison (see Appendix). Low-to-moderate returns are expected for this CU. Brood-year effective female spawners (EFS; 987) was below both the long-term average EFS (2,091) and recent average EFS (1,127).				
SOUTH THOMPSON					
(CU: Shuswap-ES) Two populations represent this	Seymour: 353,951; Scotch: 377,826 (Cyc-year average)			WSP – Amber COSEWIC – NAR	**Seymour: 236,000** (70,000 – 920,000)

Conservation Unit	Average Return (all cycles)	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST
CU, but they share one set of benchmarks. - Cyclical: Yes & Yes	Good returns are expected for this CU given that both the Seymour River effective total spawners (ETS; 100,622) and Scotch Creek ETS (62,654) combined (163,276) were well above both the WSP lower (36,380) and upper (141,746) benchmarks. Seymour River brood-year EFS (52,420) was slightly above the long-term average EFS (48,688) but below the recent average EFS (109,301) for this cycle line. Scotch Creek brood-year effective female spawners (EFS; 29,348) was below both the long-term (32,714) and recent average EFS (111,187) for this cycle line.				**Scotch: 199,000** (45,000 – 825,000)
Misc. (ESHU)					**804,000** (184,000 – 2,850,000)
MID AND UPPER FRASER					
(CU: Anderson-Seton-ES) - Cyclical: No	50,019			WSP – AM/GR COSEWIC – NAR	**36,000** (11,000 – 126,000)
	Below-average returns are expected for this CU. The 2018 brood-year effective total spawners (ETS; 2,635) was below the WSP lower benchmark for ETS (3,662). Also, the brood-year effective female spawners (EFS; 1,573) was below the long-term (4,299) and recent average EFS (4,499). It is important to note that these comparisons include the Gates Spawning Channel, but as of January 2020 the channel operations are discontinued which may influence interpretation of these trends moving forward (Grant et al. 2020).				
(CU: Nadina-Francois-ES) - Cyclical: No	80,399			WSP – AM/GR COSEWIC – NAR	**193,000** (51,000 – 703,000)
	Good returns are expected for this CU. Historically, the four-year-old component dominates the escapement (>80%) but five-year-old component can contribute to up to 50% in some years. The 2018 effective total spawners (ETS; 111,175) was above the WSP upper benchmark (68,273), whereas the 2017 ETS (4,428) was below the lower benchmark of 21,694. The four-year-old (2018) effective female spawners (EFS; 58,024) was above both the long-term (10,495) and recent average EFS (21,467). However, the five-year-old (2017) EFS (2,323) was below both the long-term and recent average EFS. Note: These comparisons include the Nadina spawning channel escapement estimates to be consistent with Grant et al (2020).				
CU: Bowron-ES) - Cyclical: No	34,044			WSP – RED COSEWIC – END	**21,000** (5,000 – 87,000)
	Low-to-moderate returns are expected for this CU. The 2018 brood-year effective total spawners (ETS; 8,087) was above the WSP lower benchmark (5,249) but lower than the upper benchmark (19,369). The brood-year effective female spawners (EFS; 4,722) was above both the long-term (4,008) and recent average EFS (1,777). This stock was heavily impacted by the Big Bar landslide in 2019 and 2020 return years, with potentially additional en-				

Conservation Unit	Average Return (all cycles)	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST
	route mortality. The situation is likely to be alleviated for 2022 with significant progress of the ongoing Big Bar site improvement.				
Taseko-ES				WSP – RED COSEWIC – END	**200** (40 – 600)
	Reliable return data are not available for this CU, thus no WSP benchmarks are available (see Appendix). Poor returns are typically expected for this CU. Brood-year effective female spawners (EFS; 35) was far below both the long-term (1,196) and recent average EFS (152). Limited sample size precludes statements about the age structure of sockeye in Taseko Lake. This stock was heavily impacted by the Big Bar landslide in 2019 and 2020 return years, with potentially additional en-route mortality. The situation is likely to be alleviated for 2022 with significant progress of the ongoing Big Bar site improvement.				

Stock management Unit: SUMMER RUN

Average aggregate return (all cycles): 3,268,656

Conservation Unit	Average Return (all cycles)	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
Harrison River *(CU: Harrison (River-Type)-S)* - Cyclical: No	117,498			WSP – Green COSEWIC – NAR	**13,000** (2,000 – 94,000)
	Below-average returns are expected for this CU. Historically, this stock can have a considerable three-year-old component. Both the four-year-old (2018) and three-year-old (2019) effective total spawners (ETS; 14,998 and 3,689, respectively) were below the WSP lower benchmark for ETS (38,928). The 2018 and 2019 effective female spawners (EFS; 8,171 and 1,338, respectively) were also below both the long-term (29,627) and recent average EFS (32,569).				
Raft River *(CU: Kamloops-ES)* - Cyclical: No	29,367			WSP – Amber COSEWIC – SC	**10,000** (3,000 – 34,000)
	Below-average returns are expected for this CU. Brood-year effective total spawners (ETS; 3,361) was below the WSP lower benchmark for ETS (4,958). Brood-year effective female spawners (EFS; 1,756) was also below the long-term (4,251) and recent average EFS (4,143). This stock occasionally has a five-year-old component, but it is variable and inconsistent, thus only four-year-old was considered.				
Quesnel *(CU: Quesnel-S)* - Cyclical: Yes	1,167,892 (Cyc-year average)			WSP – RED/AM COSEWIC – END	**1,907,000** (485,000 – 8,531,000)
	Above-average returns are expected for this CU. The 2018 brood-year effective total spawners (ETS; 667,272) was above the WSP lower benchmark for ETS (197,467) but below the upper benchmark (1,307,742). Brood-year effective female spawners (EFS; 332,730) was above both the long-term (149,930) and recent average EFS (246,291). These comparisons include the Horsefly River spawning channel escapements. This stock was heavily impacted by the Big Bar landslide in 2019 and 2020 return years, with potentially additional en-route mortality. The situation is likely to be alleviated for 2022 with significant progress of the ongoing Big Bar site improvement.				
Stellako River *(CU: Francois-Fraser-S)* - Cyclical: No	434,078			WSP – AM/GR COSEWIC – SC	**536,000** (185,000 – 1,491,000)
	Good returns are expected for this CU. Brood-year effective total spawners (ETS; 176,667) was above the WSP upper benchmark (122,612). Also, brood-year effective female spawners (EFS; 95,963) was above the long-term (56,033) and recent average EFS (52,194). This stock was heavily impacted by the Big Bar landslide in 2019 and 2020 return years, with potentially additional en-route mortality. The situation is likely to be alleviated for 2022 with significant progress of the ongoing Big Bar site improvement.				

Chilko *(CUs: Chilko-S and Chilko-ES)* - Cyclical: No	1,334,527			WSP – Green COSEWIC – NAR	**1,463,000** (482,000 – 4,732,000)
	Good returns are expected for this CU. Brood-year effective total spawners (ETS; 609,460) was above the upper benchmark (353,863) for ETS. As well, brood-year effective female spawners (EFS; 388,737) was above both the long-term (226,361) and recent average EFS (274,197). No out-migratory smolt counting was conducted in 2020 due to the COVID pandemic restriction. These comparisons include the historical Chilko River spawning channel escapement. This stock was heavily impacted by the Big Bar landslide in 2019 and 2020 return years, with potentially additional en-route mortality. The situation is likely to be alleviated for 2022 with significant progress of the ongoing Big Bar site improvement.				
Late Stuart *(CU: Takla-Trembleur-Stuart-S)* - Cyclical: Yes	485,126			WSP – RED/AM COSEWIC – END	**458,000** (80,000 – 2,520,000)
	Below-average returns are expected for this CU. Brood-year effective total spawners (ETS; 111,455) was below the WSP lower benchmark for ETS (132,547). However, brood-year effective female spawners (EFS; 67,449) was above the long-term (27,440) and recent average EFS (38,269) for this cycle-line. This stock was heavily impacted by the Big Bar landslide in 2019 and 2020 return years, with potentially additional en-route mortality. The situation is likely to be alleviated for 2022 with significant progress of the ongoing Big Bar site improvement.				

Stock management Unit: LATE RUN

Average aggregate return (all cycles): 8,320,077

Conservation Unit	Average Return (all cycles)	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
Cultus Lake *(CU: Cultus-L)* - Cyclical: No	33,370			WSP – RED COSEWIC – END	**1,000** (400 – 5,000)
	Below-average returns are expected for this CU. Brood-year effective total spawners (EFS; 252) was far below the WSP lower benchmark for ETS (15,454). Brood-year effective female spawners (EFS; 153) was below the long-term mean EFS (831) but slightly above the recent mean EFS (140). No out-migratory smolt counting was conducted in 2020 due to the COVID pandemic restriction.				
Portage Creek *(CU: Seton-L)* - Cyclical: No	38,472			WSP – RED COSEWIC – END	**107,000** (27,000 – 444,000)
	Good returns are expected for this CU. Brood-year effective total spawners (EFS; 35,459) was far above the WSP upper benchmark for ETS (13,453).				

Conservation Unit	Average Return (all cycles)	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
	Similarly, brood-year effective female spawners (EFS; 22,395) was above both the long-term (4,362) and recent average EFS (5,718).				
South Thompson *(CU: Shuswap-L)* - Cyclical: Yes	7,645,476 (Cyc-year average)			WSP – AM/GR COSEWIC – NAR	**3,418,000** (645,000 – 17,166,000)
	Good returns are expected for this CU. Brood-year effective total spawners (EFS; 1,502,077) was far above the cycle-specific WSP lower benchmark for ETS (310,783), below the upper benchmark (1,794,869) but above 75% of the upper benchmark. However, brood-year effective female spawners (EFS; 801,099) was below the long-term (1,176,919) and recent average EFS (1,524,604). These comparisons include the historical Adams River spawning channel escapements.				
Birkenhead River *(CU: Lillooet-Harrison-L)* - Cyclical: No	302,983			WSP – Amber COSEWIC – SC	**61,000** (21,000 – 196,000)
	Low-to-moderate returns are expected for this CU. Historically, this stock has a considerable five-year-old component. The 2018 brood-year effective total spawners (ETS; 13,830) was slightly below the WSP lower benchmark (15,685). The 2017 brood-year ETS (17,667) was slightly above the lower benchmark but far below the upper benchmark (81,023). The 2018 and 2017 brood-year effective female spawners (EFS; 7,233 and 9,900) were below both the long-term (40,336) and recent average EFS (14,323).				
Weaver Creek *(CU: Harrison (U/S)-L)* - Cyclical: No	299,776			WSP – RED COSEWIC – END	**85,000** (16,000 – 423,000)
	Low-to-moderate returns are expected for this CU. Brood-year effective total spawners (EFS; 14,702) was above the WSP lower benchmark (10,731), but below the upper benchmark (84,597). Brood-year effective female spawners (EFS; 8,574) was below the long-term average EFS (20,844) but above the recent average EFS (6,039). These comparisons include the Weaver Creek spawning channel escapements to be consistent with Grant et al (2020).				
Big Silver Creek *(CU: Harrison (D/S)-L)* - Cyclical: No				WSP – AM/GR COSEWIC – SC	**16,000** (2,000 – 51,000)
	Reliable return data are not available for this CU, thus no WSP benchmarks are available (see Appendix). Below-average returns are expected for this stock. Brood-year effective female spawners (EFS; 496) was below the long-term (1,650) and recent average EFS (2,225).				
Widgeon Slough *(CU: Widgeon (River-Type))* - Cyclical: No				WSP – RED COSEWIC – Threat.	**600** (70-2,000)
	Reliable return data are not available for this CU, thus no WSP benchmarks are available (see Appendix). Below average returns are expected for this CU. The 2017 effective female spawners (EFS; 83) was below the long-term average EFS (324) and the recent average EFS (94). This population may				

Conservation Unit	Average Return (all cycles)	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
	have contribution from the 3-year-old component, but this is uncertain due to small population and sample sizes over time. For reference, the 2018 EFS (68) was below the long-term average EFS and below the recent average EFS.				

FRASER PINK

Conservation Unit	Average Return	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
Fraser - Odd only (CU: Fraser River)	11,500,000				**NA**

FRASER CHINOOK

Stock Management Unit	Conservation Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
SPRING RUN 4_2 CHINOOK SALMON	**Aggregate SMU**	**10,352** (CTC ESC[8] 1975-2020)		**22,146** Escapement Target (S_{MSY})		**8,293 TR**
	CK-17 Lower Thompson	**10,182** (ESC 1975-2020) **5,312** (Last Gen)	4000		WSP – Red COSEWIC – END.	
	CK-16 South Thompson-Bessette Creek	**123** (ESC 1975-2020) **10** (Last Gen)	1000		WSP – Red	
	The 2021 escapement estimates are below the long term average and near the parent brood escapement in 2017. Expectations are for continued depressed abundance in 2022 due to low parental escapements in 2018, ongoing unfavorable marine and freshwater survival conditions and low productivity. The Bonaparte fishway failure and flash flooding in 2018 resulted in an extremely low escapement and will affect the 2022 escapement. Drought conditions in 2018 created unfavorable water levels and temperatures that will have negatively impacted spawning for most populations, based on past evidence. (2021 Outlook Category was 1)					
SPRING RUN 5_2 CHINOOK SALMON	**Aggregate SMU**	**24,219** (CTC ESC[8] 1975-2020)		**42,165** Escapement Target (S_{MSY})		**16,876 TR**
	CK-04 Lower Fraser	**456** (ESC 1975-2020) **214** (Last Gen)	1,000		COSEWIC – Special Concern	
	CK-08 Middle Fraser- Fraser Canyon	**61** (ESC 1975-2020) **37** (Last Gen)	1,000		WSP – Data D. COSEWIC – END	
	CK-10 Middle Fraser	**7,454** (ESC 1975-2020) **2,433** (Last Gen)	5,300		WSP – Red COSEWIC – Threat.	

[8] Average aggregate escapement is based on the set of systems used for analysis by the CTC which does not always include every system in each CU due to data standard requirements for consistent methodology and complete or near complete time series.

Stock Management Unit	Conservation Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
	CK-12 Upper Fraser	**17,867** (ESC 1975-2020) **7,345** (Last Gen	5,300		WSP – Red COSEWIC – END	
	CK-18 North Thompson	**701** (ESC 1975-2020) **245** (Last Gen)	1,000		WSP – Red COSEWIC – END	
	Estimates for 2021 indicate that on average they are near the parental brood escapement in 2016, but below the long-term average. However, there is considerable variation among these populations. Expectations are for continued low abundance in 2022 related to depressed parental escapements in both 2017 and 2018 and continuing unfavorable marine and freshwater survival conditions and low productivity. Additionally, drought conditions in 2018 created unfavorable water levels and temperatures, which may have impacted spawners and parr, hence returning 4 and 5 year olds in 2022. (2022 Outlook Category 1)					
SUMMER RUN 5_2 CHINOOK SALMON	**Aggregate SMU**	**19,534** (CTC ESC[8] 1975-2020)		**23,567** Escapement Target (S_{MSY})		**15,398 TR**
	CK-05 Lower Fraser – Upper Pitt	**251** (ESC 1975-2020) **72** (Last Gen)	1,000		WSP – Data D. COSEWIC – END	
	CK-06 Lower Fraser	**61** (ESC 1975-2020) **54** (Last Gen)	1,000		WSP – Data D. COSEWIC – Threat.	
	CK-09 Middle Fraser - Portage	**136** (ESC 1975-2020) **57** (Last Gen)	1,000		WSP – Red COSEWIC – END	
	CK-11 Middle Fraser	**14,732** (ESC 1975-2020) **6,126** (Last Gen)	5,800		WSP – Amber COSEWIC – Threat.	
	CK-14 South Thompson	**1,287** (ESC 1975-2020) **889** (Last Gen)	1,000		WSP – Amber	

Stock Management Unit	Conservation Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
	CK-19 North Thompson	**4,270** (ESC 1975-2020) **1,590** (Last Gen)	1,800		WSP – Red COSEWIC – END	
	The escapement estimates appear to indicate that on average they are near the parental brood escapement in 2016, but below the long-term average. However, there is considerable variation amongst the populations in the stock group. Expectations are for continued overall low abundance related to low parental escapements, low marine and freshwater survival, and low productivity. Drought conditions in 2018 created lower than average flow conditions, but the impacts to this MU are expected to be limited. (2022 Outlook Category 1)					
SUMMER RUN 4$_1$ CHINOOK SALMON		**64,777** (CTC ESC[8] 1975-2020)		**120,322** Escapement Target (S_{MSY})		**128,800 Esc**
	CK-13 South Thompson	**42,168** (ESC 1975-2020) **92,001** (Last Gen)	23,600		WSP – Green COSEWIC – Not at Risk	
	CK-15 Shuswap River	**25,894** (ESC 1975-2020) **23,181** (Last Gen)	2,100		COSEWIC – Not at Risk	
	CK-07 Maria Slough	**286** (ESC 1975-2020) **100** (Last Gen)	1,000		Not assessed.	**Outlook Category 1**
	The 2021 escapement estimatesindicate that the aggregate escapement will exceed the long-term average and parental brood from 2017. One exception is Maria Slough where abundance remained extremely low. This extremely low abundance at Maria is expected to continue in 2022, as there was zero escapement into Maria in 2018 due to low flows preventing access to the spawning grounds. The Lower Shuswap indicator will exceed the PST Management Objective of 12,300 spawners in 2021 and is the 5th consecutive year the target has been met, with only 2 of the last 10 years not meeting the target. Flow and temperature issues existed for all stocks in 2018 creating unfavorable water levels and temperatures which may have negatively affected some populations. Additionally, we saw low fecundities at both Lower and Middle Shuswap in 2018. Despite these issues it is expected that escapement					

Stock Management Unit	Conservation Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
	for CUs other than Maria will continue to be high and exceed brood in 2022 as in recent years. (2022 Outlook Category 1 (Maria) / 4)					
FALL RUN 4$_1$ CHINOOK SALMON	**Aggregate**	**131,822** (ESC 1984-2020)				
	(P) Chilliwack Hatchery Exclusion	**34,739** (ESC 1984-2020) **36,039** (Last Gen)	n/a (hatchery stock)		Not assessed.	**77,109 Esc**
	CK::Lower Fraser River-fall timing (white) - Harrison	**90,890** (ESC 1984-2020) **41,042** (Last Gen)	**15,300**	**75,100** Escapement Target (S_{MSY})	WSP – Green COSEWIC – Threat.	**68,388 Esc**
	The 2021 Harrison (natural) escapement estimate appears to be near the low parental brood escapement of 29,799 in 2017; and below both the long term average and PST escapement goal. Current marine conditions and stock productivity appear to be unfavorable, with the Harrison River escapement estimate not meeting the escapement goal in the last six years, and only once in the past ten years. Chilliwack hatchery production, marine survival, and recent fishery exploitation are expected to return sufficient abundance to achieve hatchery production objectives. (2022 Outlook Category 1 (Harrison) / 4 (Chilliwack))					

FRASER COHO

STOCK MANAGEMENT UNIT	Conservation Unit / Sub Unit	Average Return	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST /OUTLOOK
Interior Fraser Coho	**Aggregate**	**37,034 (ESC 1998 – 2020)**		**35,935**	COSEWIC - Threat	**83,600**
	Fraser Canyon	**3,313** (ESC 1998 – 2020)	**1,000**			
	Middle Fraser	**4,970** (ESC 1998 – 2020)	**1,800**			
	North Thompson	**12,928** (ESC 1998 – 2020)	**2,600**			

	Lower Thompson	**8,060** (ESC 1998 – 2020)	**1,400**			
	South Thompson	**7,763** (ESC 1998 – 2020)	**2,300**			
		A PST MU status will remain low, as the survival target of 3% has not been met since 1999 and three successive years of survival over 3% are required to move into a higher MU status. The 2017 brood year marine survival was 1.6%. (2022 Outlook Category 1)				
Lower Fraser Coho	**Aggregate – includes 3 CUs**	Not Available				**Outlook Category 1**
		A formal forecast for Inch Creek hatchery smolt-adult survival will be produced in the spring. The observed 2017 brood year survival was 7.5%, which was higher than 2016 and much higher than the forecast. The retrospective analysis showed that the best performing model has remained the NPGO climate index. The 2021 forecast for survival for this indicator was 2.3%. (2021 Outlook Category was 1)				

FRASER CHUM

Stock Management Unit	Conservation Unit	Average Return (all cycles)	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
Inner South Coast Chum - Fraser	Lower Fraser CU			There is a management goal of 800,000 wild spawners.		**Outlook Category 2**
		Fraser River Chum Salmon spawning escapement in 2017 fell below the 800,000 goal for the first time since 2010, and has failed to reach the escapement goal in each subsequent year (2017-2020). Spawning escapement in 2019 was estimated at 300,000 Chum; this is the lowest recorded escapement in over 20 years. Returns in 2022 will be dominated by 4 year old brood from the 2018 escapement (680,000 spawners). Spawning escapements for the past 4 years (2017-2020) have failed to outperform brood. The October 22, 2021 in-season estimate of the Fraser Chum terminal return was 481,000 fish with an 80% probability the terminal return would be between 400,000 and 570,000 Chum. Escapement assessments in 2021 are currently underway but early indications are the terminal return will be close to the lower end of the range and will likely be the 2nd lowest recorded escapement in over 20 years (with only 2019 escapement being lower). An estimate of the 2021 spawning escapement will be available by April 2022. (2021 Outlook Category was 2)				

HOWE SOUND / BURRARD INLET

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
PINK	Part of the Southern Fjords odd and even CUs				**Data Deficient**
CHINOOK	Part of the South Coast –				

	Southern Fjords CU				**Data Deficient**
	Some years with good information for the Indian River.				
Strait of Georgia Coho	Howe Sound – Burrard Inlet CU				**Data Deficient**
INNER SOUTH COAST CHUM – Non-Fraser	Howe Sound – Burrard Inlet CU				**Data Deficient**

BOUNDARY BAY

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	2022 FORECAST/ OUTLOOK
CHINOOK	CK-01 Boundary Bay	**250** (Little Campbell ESC 1980-2017)	1,000	2,100	**Outlook Category 1**
	Data are available from the Little Campbell fence program (CK-01). 2020 escapement was about 660 fish. CK-01 is currently undergoing review for listing under the *Species at Risk Act*.				
COHO	Boundary Bay CU				**Data Deficient**
INNER SOUTH COAST CHUM – Non-Fraser	Boundary Bay CU				**Data Deficient**

OKANAGAN

Stock Management Unit	Conservation Unit / Sub-Unit	Average Run / Avg. Spawners	LRP / LBB	Management Target	WSP / COSEWIC STATUS	2022 FORECAST/ OUTLOOK
OKANAGAN SOCKEYE	Osoyoos			58,730 adults at Wells Dam or 29,365 as		

				peakcounts in the terminal index area		
	Returns of Okanagan Sockeye adults to the Columbia and Okanagan rivers in 2022 will be derived from smolt cohorts from brood years 2017-2019 that migrated seaward in spring 2019 (returning as 5-year-olds), 2020 (returning as 4-year-olds) and 2021 (returning as 3-year-olds). Although year-specific smolt-to-adult survival values for these specific cohorts are not available as yet, Okanagan Sockeye marine survival variations are known to be similar to Barkley Sound sockeye in that above- and below-average survivals occur in association with either cold-ocean (La Niña) or warm ocean (El Niño) events, respectively. Examination of the association between historic smolt-to-adult return (SAR) variations and NOAA Fisheries "stop-light" ocean condition indicators (including the Oceanic Niño Index (ONI)[9]) suggests that, starting in 2020 (brood year 2018), out-migrating smolts were likely to have experienced a modest improvement in survival rates during ocean entry, relative to a likely lower survival associated with El Niño conditions during 2019. Applying a 2% SAR to the 2019 sea-entry year, 3.6% to the 2020 sea-entry year, and 4% SAR to the 2021 sea-entry year, yields an estimate of approximately 166,000 age 3, 4, and 5 adults contributing to the 2022-2024 return years. Allocation of this production to specific return years based on average age-at-return values for Okanagan Sockeye suggests a total return in 2022 of 80,000 ± 5,000 Okanagan wild-origin fish. Production of hatchery-origin fish from Skaha Lake may increase these returns by 10-20% for an overall maximum return of 82,500 - 100,000 Sockeye of Okanagan/Skaha origin in 2022, of which, typically, 91% are age 4 or 5. 2022 Outlook Category 1.					75,000 - 85,000 (wild) 82,000 - 100,000 total returns (wild+hatch)
OKANAGAN CHINOOK	Okanagan Summer	**28** (ESC 2009- 2020)	1,000	**3,400**	COSEWIC - END	**Outlook Category 1**
	Escapement estimates for 2020 were produced by both index AUC (79) and from the new PIT tag total mark-recapture program (195). Calibrations between the two methods will occur after several years of concurrent estimates are available. Expectations for 2022 are for continued depressed abundance related to low parental escapements, low marine and freshwater survival, low productivity, and low hatchery production. (2021 Outlook Category was 1)					

[9] NOAA California Current System indicators for 2021 not yet available (21.12.10), though ONI 3.4 and other ENSO indices indicate the development of La Niña conditions since 2020, associated with higher marine survival for SY2021.

CONTRIBUTORS / CONTACTS

Area	Contributors	Area Lead
Transboundary	Bill Waugh	Bill Waugh
Yukon	Oliver Barker	Steve Smith, Marc Ross
North Coast	Meagan Kindree, Charmaine Carr-Harris, Ryan Whitmore Chelsea May	Shaun Davies
South Coast	Pieter Van Will, Kevin Pellett, Matthew Clarke	Wilf Luedke, Erin Rechisky
Fraser	Chuck Parken, Nicole Trouton, Lauren Weir, Joe Tadey, Matthew Townsend, Scott Decker, Yi Xu, Kory Ryde	Mike Hawkshaw, Chuck Parken

REFERENCES

Grant, S.C.H., C.A. Holt, G. Pestal, B. M. Davis and B.L. MacDonald. 2020. The 2017 Fraser Sockeye Salmon (Oncorhynchus nerka) Integrated Biological Status Re-Assessments Under the Wild Salmon Policy Using Standardized Metrics and Expert Judgment. DFO Can. Sci. Advis. Sec. Res. Doc. 2020/035. vii + 211 p.

Brkic, D. and S. Latham. 2020. Age Composition Comparison in Sockeye Salmon. Pacific Salmon Commission. https://dejanbrkic.shinyapps.io/AgeComp/. Accessed 6-Nov-2020.

APPENDIX - SOCKEYE

When considering the term "target" used for defining outlook categories, we considered upper WSP benchmarks to be the target (not the lower benchmark).

- Outlook status 1: population/CU is below the lower WSP benchmark
- Outlook status 2: population/CU is above the lower benchmark, but less than 50% of the upper benchmark
- Outlook status 3: population/CU is between 50-75% of the upper benchmark
- Outlook status 4: population/CU is over 75% of the upper benchmark

Details on how each metric was calculated or obtained for comparison.

- Long-term average EFS was calculated from the start date identified in Grant et al (2020) up to and including the brood year of interest (for the 2022 outlook, that would be 2018). This obviously may not hold true for stocks with predominantly 3- or 5-year old cohorts, but it is not expected to change the outcome drastically.
  - For cyclical stocks, long-term average EFS was calculated based on the cycle line average EFS. For example, for Seymour River, the long-term average EFS is the average of the 2022 cycle line escapements from 1950-2018.
  - For non-cyclical stocks, long-term average EFS was calculated across all years in the time series. For example, Harrison River long term average EFS is the average of each year's EFS from 1948-2018.
- Short term average EFS is calculated from the most recent 4 years of escapements. The purpose is to capture brood year relative to recent trends in escapement.
  - For cyclical stocks, this is the most recent 4 years in that cycle line (e.g., for the 2022 outlook, the average is calculated from 2018, 2014, 2010 and 2006 EFS).
  - For non-cyclical stocks, this is the most recent 4 years available up to the brood year of interest (e.g., for the 2022 outlook, it is calculated from 2015-2018, inclusive. Note the most recent year, in this case 2021, is not available at the time the Outlook is calculated).
- Most systems compare the average EFS of the 4 year old component (2018) to the long term average EFS and benchmarks. However, it is prudent to consider 3- and 5-year old components for some stocks. These stocks were identified visually using the PSC Age Composition Comparison App online (Brkic 2020). Note that for some cyclical stocks, this will have to be revisited in future years depending on the cycle line. For example, Mitchell and Horsefly Rivers (Quesnel-Summer) have much lower 4 year old contribution on the 2019 cycle line.
- Escapement benchmarks were manually compiled from Grant et al 2020. Note that this deals with CUs; while Scotch and Seymour are reported separately here, they are part of the same CU and so have the same 4-year median and benchmarks. These need to be updated annually for cyclical stocks as each cycle line has its own benchmarks.
- Effective total spawners (ETS) was calculated to compare to the Wild Salmon Policy (WSP) benchmarks as those are calculated in terms of ETS (apples to apples). Grant et al 2020 outlines how ETS is calculated; briefly, ETS=(annual_male_escapement + annual_female_escapement)*annual_spawn_success, where spawn success is the spawn success of the females (based on egg retention in carcasses).
- Outlook status ranges from 1-4, with 1 being the poorest outlook/lowest return, and 4 being the highest. They are informed by the status definitions in FRAFS (2018) with slight modifications to this specific document. Note some populations/CUs may receive dual statuses to represent uncertainty in data and/or evidence for multiple status categories (including the potential for multiple age classes). Status designation is determined by

comparing brood-year effective total spawners (ETS) to the WSP benchmarks for ETS. If no benchmarks are available, it is manually/qualitatively assigned by comparing brood-year effective female spawners (EFS) to long-term and recent average EFS. In a case where benchmark rule is not consistent with brood-year EFS relative to the historical data, the outlook status conforms to the former one.

APPENDIX 10: LONGER TERM COMMERCIAL CLOSURES OR MITIGATION

In 2021, as part of immediate conservation measures under the **Pacific Salmon Strategy Initiative (PSSI)**, the Minister announced several new commercial fishery closures to protect stocks of conservation concern. These closures were implemented on an interim basis in 2021 with a commitment to review longer term closures for 2022 and beyond after additional consultation with affected groups.

For 2022 and beyond, the Department is continuing to take a more precautionary approach to managing fisheries that interact with stocks of conservation concern to help stabilize and support rebuilding of these depressed populations. The Department identified commercial fisheries where there is a high risk of interception of stocks of conservation concern in targeted fisheries and/or by-catch. For these fisheries, the Department sought feedback from February through May of 2022 on the approach for managing the identified stocks of concern including:

1. Longer term closure; or,
2. No longer term closure and implementation of additional mitigation measures.

Beginning in 2022, the Department will be implementing longer term closures for fisheries identified in Table 0-1. These closures are expected to remain in place for at least 1 salmon generation (4-5 years) or until there is clear evidence of stock growth and abundance is above levels associated with the critical zone or Wild Salmon Policy red zone. Where feasible, Table 0-2 outlines additional mitigation measures that will be implemented in the identified fisheries in lieu of a longer term closure.

For any commercial fisheries that are closed, the allocations will remain with the original fleet and fish will be allowed to pass to spawning grounds. Opportunities for additional commercial harvest may be considered in locations where stocks of concern will not be encountered.

All other commercial fisheries not identified as longer term closures will remain closed unless conditions are met for an opening based on harvest decision rules and conservation criteria identified in this Integrated Fisheries Management Plan.

The impacts from the long-term closures will be mitigated by a commercial licence retirement program and a First Nations communal commercial licence alternation program, that are both expected to run from 2022-2025. As well, additional initiatives to support transformation of the fishery will help to mitigate impacts of reduced harvest opportunities.

Table 0-3: Longer Term Commercial Closures

Fishery	Area	Group
Skeena Chinook	4	Area C Gill net
Central Coast Chum	8	Area A Seine*
Central Coast Chum	8	Area C Gill net*
Central Coast Chum	8	Nuxalk Demo*
Central Coast Coho Demo	6-8	Area F Troll
Directed Mixed Stock Coho	1-3, 101-106, 142	Area F Troll
Rivers Inlet Sockeye	9	Area C Gill net
Smith Inlet Sockeye	10	Area C Gill net

*Closed until substantial mitigation measures can be developed

Table 0-4: Additional Mitigation Measures Beginning in 2022

Fishery	Area	Group	Additional Mitigation Measures
Nass Chinook	3	Nisga'a Treaty	Alternative gear types, such as fishwheels. Further management triggers could be developed.
Nass Coho	3	Nisga'a Treaty	Alternative gear types, such as fishwheels. Further management triggers could be developed.
Nass Sockeye	3	Nisga'a Treaty	Alternative gear types, such as fishwheels. Further management triggers could be developed.
Nass Sockeye	3	Area C Gill net	Implement delayed fishing date (June 27), dependent of abundance, when in-season escapement estimates become more accurate and to avoid weak Meziadin Sockeye stocks and Northern Chinook Implement season end date in late July to avoid wild Area 3 Chum.
Skeena Sockeye	4	NCSFNSS Demo	Implement season end date in early-August to avoid later timed wild stocks.

			Implement August gill net selective fishing practices for the whole season to reduce bycatch mortalities (Steelhead, Coho, Chum) and support fisheries monitoring with option for enhanced at-sea observer coverage.
Skeena Sockeye	4	Metlakatla/Lax Kw'alaams Demo	Implement season end date in early-August to avoid later timed wild stocks. Implement August gill net selective fishing practices for the whole season to reduce bycatch mortalities (Steelhead, Coho, Chum) and support fisheries monitoring with option for enhanced at-sea observer coverage.
Skeena Sockeye	4	Area A Seine	Implement season end date in early-August to avoid later timed wild stocks. Implement season end date in early-August to avoid later timed wild stocks. Maintain ITQ approach in Area 4.
Skeena Sockeye	4	Area C Gill net	Implement season end date in early-August to avoid later timed wild stocks. Implement August gill net selective fishing practices for the whole season to reduce bycatch mortalities (Steelhead, Coho, Chum) and support fisheries monitoring with option for enhanced at-sea observer coverage.
Haida Gwaii Chum	2	Area C	Harvest only on identified surplus, more precautionary application of current management measures.
Haida Gwaii Pink	1 & 2	Area C	Harvest only on identified surplus, more precautionary application of current management measures.