Fisheries and Oceans Canada | Pêches et Océans Canada

PACIFIC SALMON OUTLOOK
PACIFIC REGION
2020

Canada

2020 SALMON OUTLOOK - PACIFIC REGION

Purpose

The purpose of this document is to provide an 'Outlook' of expected abundance of salmon in 2020 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.

Introduction

The goal of this document is to inform 2020 season harvest planning by providing a categorical 'outlook' for the upcoming year's salmon returns across the Pacific Region. The assessment is based on an interpretation of quantitative and qualitative information using expert opinion when information is incomplete or insufficient to complete statistical forecasts. This preliminary version of the 2020 Outlook is subject to change as more information becomes available. For some stock management units, statistical forecasts will be completed in early 2020.

For 2020, changes have been made to the Outlook document in order to:

1. Standardize interpretation of stock status in relation to outlook categories – update criteria;
2. Align stock groupings with harvest management units to better inform decision-making that is consistent with C-68.
3. Remove language regarding fishery consequences.
4. Add information regarding leading indictors, previous year returns, and stock status.

Outlook Format

The Outlook document contains:

1. CU groupings with stock management units (SMUs) to better inform decision-making consistent with *Fishery Act* and IFMP requirements.
2. SMUs with statistical forecasts.
3. SMUs without statistical forecasts, have a standardized interpretation of SMU status in relation to Outlook categories.
4. Information on SMU biological benchmarks and management references (where defined) for additional context.

Stock Management Units

For the 2020 Outlook, 'stock management units' (SMUs) replace 'outlook units (OUs). This change has been made because many OUs did not correspond well with stock aggregates used to inform development of Integrated Fisheries Management Plans (IFMPs) for salmon.

The 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 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.

Background

For the 2020 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 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 for harvest managers to potentially adjust harvest plans according to the expected stock abundance. Ideally, 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 (red zone) 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. These benchmarks and reference points do not apply to enhanced populations.

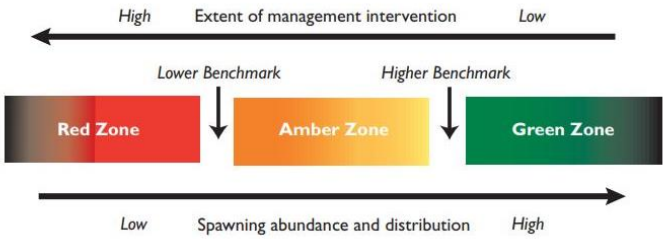

Figure 1. Benchmarks and biological status zones for CU assessments.

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.

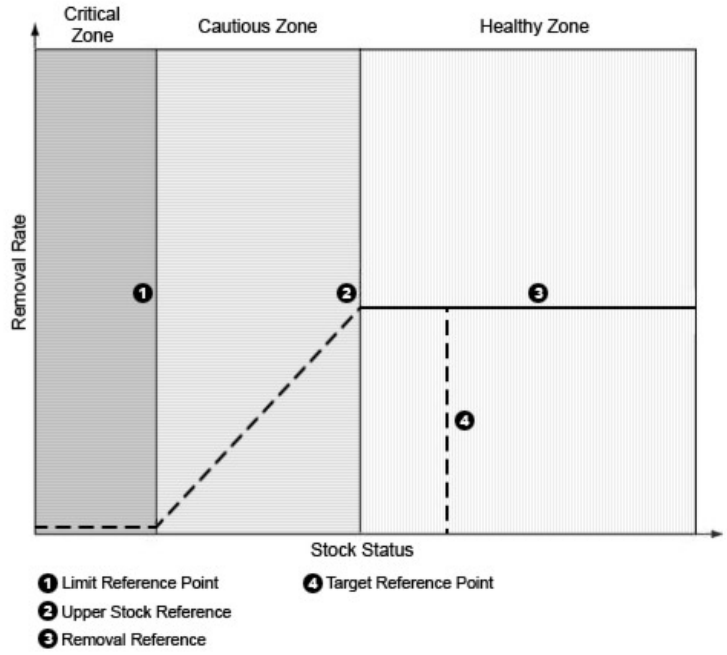

Figure 2. Schematic of a generalized harvest strategy under DFO's PA.

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 considered 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 consider 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, management targets and operational control points 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).

SUMMARY

- Overall, expectations for salmon returns are generally low and similar to 2019. (In many cases, expectations have declined. In very few cases, have expectations improved.)
- A key factor is the relatively poor conditions for ocean survival for the sea entry and freshwater rearing years for salmon returning in 2020.
- Major concerns are identified for Interior Fraser conservation units (all relevant species) that are negatively impacted by the Big Bar landslide.
- Further information will be developed over the next 6 to 8 weeks as more forecasts are completed.

OUTLOOK CLASSIFICATIONS AND CRITERIA

Each stock grouping an outlook of production for the coming year is assigned based on a scale of 1 to 4; with lower expectations for lower ranking groups. Since the purpose of the Outlook is to inform harvest management for the coming year, SMU categories are delimited by management targets that are described in the IFMP. That is, relative to 'operational control points' that trigger a change in harvest control rules or management measures. Where management targets for stocks have not been formally described, outlook categories are based on an evaluation of stock trends. For the 2020 Outlook, these criteria have been standardized (Table 1).

Table 1.

Outlook Category	Category Definition	Expected spawning abundance
1	Stock of Concern	Stock is < 25% percentile
2	Low – below average	Stock is in the 25 to 40th percentile
3	Near Average	Stock is in the 40 – 60th percentile
4	Abundant – above average	Stock is > 60% percentile
Data Deficient	Insufficient data to determine an outlook category.	

SOCKEYE SALMON

Stock Management Unit (SMU)	Outlook Unit Sockeye	2020 Outlook Category	Comments
OKANAGAN SOCKEYE SALMON	1. Okanagan-Osoyoos	1/2	No comments
Fraser Sockeye	**Fraser Sockeye**	**Overview**	As an aggregate, 941,000 (274,000 to 3,881,000) salmon are forecast. The average return for the system as a whole for sockeye is 7,812,2000 (all cycles).
FRASER SOCKEYE SALMON - EARLY STUART	2. Early Stuart (CU: Takla-Trembleur-Early Stuart)	1	This CU's status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017). This CU was recommended for listing as endangered by COSEWIC. The forecast is for 13,000 (5,000 to 33,000) salmon with an average return (all cycles) of 286,600. The LRP or LBB is 86,700.
FRASER SOCKEYE SALMON - EARLY SUMMER	3. Early Summer – North Thompson (CU: North Barriere-ES)	2	This CU's status was determined to be AMBER in a recent WSP re-evaluation (Grant et al. 2017). This CU was recommended for listing as threatened by COSEWIC. The forecast is for 8,000 (3,000 to 25,000) salmon with an average return (all cycles) of 27,700. As am aggregate, this Early Summer SMU has a forecast of 218,000 (72,000 to 1,098,000) with an average return (all cycles) of 516,000.
FRASER SOCKEYE SALMON - EARLY SUMMER	4. Early Summer South Thompson (CU: Shuswap-ES)	2	This CU's status was determined to be AMBER in a recent WSP re-evaluation (Grant et al. 2017). This CU was recommended for listing as not at risk by COSEWIC. Two main populations make up this Outlook Unit: **Scotch (combined with Seymour for Shuswap-ES CU):** The forecast is for 4,000 (1,000 to 16,000) salmon. **Seymour (combined with Scotch for Shuswap-ES CU):** The forecast is for 3,000 (800 to 11,000) salmon. For other salmon CUs (Misc. ESHU), the forecast is for 7,000 (1,000 to 22,000) salmon.

Stock Management Unit (SMU)	Outlook Unit Sockeye	2020 Outlook Category	Comments
FRASER SOCKEYE SALMON - EARLY SUMMER	5. Early Summer – Mid & Upper Fraser (CUs: Anderson-Seton-ES; Nadina-Francois-ES (new mixed); Bowron-ES; Taseko-ES)	2/1/1/1	The Anderson-Seton CU's status was determined to be AMBER/GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Not at Risk* by COSEWIC. • The Nadina-Francois CU's status was determined to be AMBER/GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Not at Risk* by COSEWIC. • The Bowron CU's status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Endangered* by COSEWIC. • The Taseko CU's status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Endangered* by COSEWIC. Several populations make up this Outlook Unit: **Gates (Anderson-Seton-ES):** The forecast is for 15,000 (6,000 to 47,000) salmon. The LRP/LBB is 3,700. **Nadina (Nadina-Francois-ES):** The forecast is for 72,000 (26,000 to 245,000) salmon. The LRP/LBB is 21,694 and the average return is 77,500. **Bowron (Bowron-ES):** The forecast is for 2,000 (500 to 8,000) salmon. The LRP/LBB is 5,200. The average return (all cycles) is 68,700 **Taseko (Taseko-ES):** The forecast is for 900 (200 to 2,000) salmon. The average return (median escapement) is 250 (all cycles).
FRASER SOCKEYE SALMON - EARLY SUMMER	6. Early Summer – Lower Fraser (CU: Pitt-ES; Chilliwack-ES; Nahatlach-ES)	3/3/2	• The Pitt CU status was determined to be GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Not at Risk* by COSEWIC. • The Chilliwack CU status was determined to be AMBER/GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Not at Risk* by COSEWIC. • The Nahatlatch CU status was determined to be AMBER in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Special Concern* by COSEWIC. Several populations make up this Outlook Unit: **Pitt (Pitt-ES):** The forecast is for 41,000 (27,000 to 83,000) salmon. The average return is 83,900 (all cycles) and the LRP/LBB is 10,627. **Chilliwack Lake/Dolly Varden Creek (Chilliwack-ES):** The forecast is for 57,000 (5,000 to 611,000) salmon. **Nahatlatch Lake/River (Nahatlach-ES):** The forecast is for 8,000 (32,000 to 280,000) salmon. The average return (median escapement) is 1,400 (all cycles).

Stock Management Unit (SMU)	Outlook Unit Sockeye	2020 Outlook Category	Comments
FRASER SOCKEYE SALMON - SUMMER	7. Summer – Chilko (CUs: Chilko-S)	1	• This CU's status was determined to be GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Not at Risk* by COSEWIC. The forecast is for 256,000 (94,000 to 722,000) salmon. The average return is 1,435,000 (all cycles) and the LRP/LBB is 64,220.
FRASER SOCKEYE SALMON - SUMMER	8. Summer – Late Stuart (CUs: Takla-Trembleur-Stuart-S)	1	• This CU's status was determined to be RED/AMBER in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *endangered* by COSEWIC. The forecast is for 35,000 (6,000 to 178,000) salmon. The average return is 526,000 (all cycles) and the LRP/LBB is 103,300.
FRASER SOCKEYE SALMON - SUMMER	9. Summer – Nechako (CU: Francois-Fraser-S)	1	• This CU's status was determined to be AMBER/GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Special Concern* by COSEWIC. The forecast is for 93,000 (29,000 to 308,000) salmon. The average return is 463,300 (all cycles) and the LRP/LBB is 24,400.
FRASER SOCKEYE SALMON - SUMMER	10. Summer – Quesnel (CU: Quesnel-S)	1	• This CU's status was determined to be RED/AMBER in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Endangered* by COSEWIC The forecast is for 2,000 (800 to 7,000) salmon. The average return is 1,369,900 (all cycles) and the LRP/LBB is 172,300.
FRASER SOCKEYE SALMON - SUMMER	**94**. Summer-Harrison (CU: Harrison-River Type; Widgeon-River Type)	2/1	• The Harrison River Type CU's status was determined to be GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Not at Risk* by COSEWIC. • The Widgeon CU status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Threatened* by COSEWIC Two populations make up this Outlook Unit: **Harrison River:** The forecast is for 168,000 (26,000 to 924,000) salmon. The average return is 138,400 (all cycles) and the LRP/LBB is 39,900. **Widgeon Creek:** The forecast is for 700 (90 to 2,000) salmon.
FRASER SOCKEYE SALMON - SUMMER	**95**. Summer-Raft (CU: Kamloops-ES)	1	• This CU's status was determined to be AMBER in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Special Concern* by COSEWIC. The forecast is for 18,000 (5,000 to 53,000) salmon. The average return is 29,800 (all cycles) and the LRP/LBB is 5,000.
FRASER SOCKEYE SALMON - LATE	11. Fall – Cultus (CU: Cultus-L)	1	• This CU's status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Endangered* by COSEWIC. The forecast is for 1,000 (500 to 4,000) salmon. The average return is 31,600 (all cycles).

Stock Management Unit (SMU)	Outlook Unit Sockeye	2020 Outlook Category	Comments
FRASER SOCKEYE SALMON - LATE	12. Fall – Portage (CU: Seton-L)	1	• This CU's status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Endangered* by COSEWIC. The forecast is for 400 (80 to 2,000) salmon. The average return is 39,600 (all cycles) and the LRP/LBB is 2,200.
FRASER SOCKEYE SALMON - LATE	13. Fall – South Thompson (CU: Shuswap-L)	1	• This CU's status was determined to be AMBER/GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Not at Risk* by COSEWIC. The forecast is for 600 (200 to 2,000) salmon. The average return is 2,320,200 (all cycles) and the LRP/LBB is 429,400.
FRASER SOCKEYE SALMON - LATE	14. Fall – Birkenhead (CU: Lillooet-Harrison-L)	1	• This CU's status was determined to be AMBER in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Special Concern* by COSEWIC. The forecast is for 68,000 (23,000 to 266,000) salmon. The average return is 335,000 (all cycles) and the LRP/LBB is 15,700.
FRASER SOCKEYE SALMON - LATE	15. Fall – Lower Fraser CUs: Harrison (U/S)-L; Harrison (D/S)-L)	1/3	• The Harrison (U/S) CU status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Endangered* by COSEWIC. • The Harrison (D/S) CU status was determined to be Amber/Green in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Special Concern* by COSEWIC. Two populations make up this Outlook Unit: **Weaver** (Harrison (U/S)): The forecast is for 1,000 (400 to 6,000) salmon. The average return is 329,700 (all cycles) and the LRP/LBB is 10,700. **Miscellaneous Harrison Lake rearing stocks** (Harrison (D/S)): The forecast is for 28,000 (4,000 to 94,000) salmon.
WCVI - BARKLEY SOCKEYE SALMON	16. Somass	3/4	Overall, the forecast (including Henderson) is expected to be less than 200,000 with average spawners of 700,000 (1992+). 200,000 is the lower operational control value.
WCVI - BARKLEY SOCKEYE SALMON	17. Henderson	2	Forecast is for less than 15,000 salmon with a management target of 9% maximum harvest rate
WCVI -OTHER SOCKEYE SALMON	18. WCVI - Other	Data Deficient	No comments
ECVI/MAINLAND SOCKEYE SALMON	19. Areas 11 to 13	Data deficient	No comments
ECVI/MAINLAND SOCKEYE SALMON	20. Sakinaw	Data Deficient	No comments

Stock Management Unit (SMU)	Outlook Unit Sockeye	2020 Outlook Category	Comments
RIVERS/SMITH SOCKEYE SALMON	21. Areas 7 to 10	An aggregate of 5 CUs. 2 are data deficient and the remaining 3 have an outlook category of 2	Long, Owikeno (late) are Data Deficient
CENTRAL COAST SOCKEYE SALMON	22. Coastal Areas 3 to 6	2	An aggregate of 81 CUs. Most are data deficient; with SEL::Koeye having an outlook category of 3
SKEENA SOCKEYE SALMON	23. Babine Lake - Enhanced	2 (CU:: Kitsumkalum is 3)	No comments
SKEENA SOCKEYE SALMON	24. Skeena - Wild	Aggregate of 32 CUs. 9 CUs are Data Deficient, 1 CUs have an outlook category of 1 and 1 CU has an outlook category of 3. The remaining 21 CUs have an outlook category of 2.	Total return is forecasted to be 1,333,232 (668,344 to 2,659,571) using Model 1 and 875, 990 (411,243 to 1,865,952) using Model 2. The average return is 2,584,000 (from 1973+) and the lower reference point/lower biological benchmark is 400,000 with a management target (escapement) of 1,050,000.
NASS SOCKEYE SALMON	25. Nass	Aggregate of 7 CUs. 2 CUs are Data Deficient, The remaining 5 CUs have an outlook category of 2.	No comments
HAIDA GWAII SOCKEYE SALMON	26. Haida Gwaii	Aggregate of 10 CUs. All 10 CUs have an outlook category of 3.	No comments

Stock Management Unit (SMU)	Outlook Unit Sockeye	2020 Outlook Category	Comments
ALSEK SOCKEYE SALMON	27. Alsek	3	The 2020 overall Alsek River drainage sockeye salmon run is expected to be approximately 65,200 fish; this is slightly below the recent 10-year average (2010-2019) run size of approximately 72,000 sockeye salmon. The outlook for 2020 is based on a predicted run of 15,004 Klukshu River sockeye salmon derived from a Klukshu River stock-recruitment model (2011 Eggers et al.) and an assumed Klukshu River contribution to the total run of approximately 23%, which is based on mark-recapture results (2000- 2004) and run size estimates using GSI (2005-2006, 2011-2014). The model output was corrected with the recent 3-year model error of 21% to reflect recent variability in marine survival of sockeye salmon. Principal contributing brood years were 2015 (Klukshu River escapement of 11,163 sockeye salmon) and 2016 (Klukshu River escapement of 7,391 sockeye salmon); the previous 10 - year average (2005- 2014) Klukshu River sockeye salmon escapement was approximately 10,500 fish. Based on the current stock-recruitment model, the range of Klukshu River escapements that appears most likely to produce optimum yields is 7,500 to 11,000 sockeye salmon.
STIKINE SOCKEYE SALMON	28. Stikine - Wild	2	The 2020 terminal Stikine River sockeye run outlook is approximately 103,000 fish which is below the recent ten-year average (2010-2019) run size of approximately 115,000 fish. The components of this forecast are summarized below. Tahltan Lake Sockeye The total run outlook for Tahltan Lake sockeye is approximately 64,500 fish of which 34,500 are expected from the enhancement project and 30,000 are expected from natural spawners. For comparison, the ten year average (2010-2019) run size of Tahltan Lake sockeye salmon is approximately 71,000 fish. The outlook is based on a smolt model which uses the number of smolts emigrating from Tahltan Lake in 2017 (1,189,134 natural, 1,272,541 enhanced) and 2018 (378,732 natural, 636,242 enhanced) combined with the recent 3-year average survival rates. Mainstem Sockeye The outlook of 39,000 mainstem sockeye salmon is based on a stock-recruitment forecast and below the ten year average (2010-2019) run size of approximately 44,000 fish. Typically a sibling model is used, in conjunction with a stock recruitment model, to generate forecasts. A sibling model uses returns from a given year to predict the following year's return. However, due to very limited fishing of mainstem stocks in 2019, it was not possible to reliably determine abundance of specific age classes.

Stock Management Unit (SMU)	Outlook Unit Sockeye	2020 Outlook Category	Comments
TAKU SOCKEYE SALMON	29. Taku - Wild	3	The 2020 pre-season forecast for the terminal run of wild Taku River sockeye salmon (composite of all stocks) is approximately 139,000 fish. This forecast is based on a stock-recruitment model; as with the Chinook forecast, this was adjusted downwards based on the recent 5-year model error (5.5%). The forecast run size is below the recent ten-year average (2010-2019) of 147,900 wild fish. Note that as a result of a recent review of the assessment program, adjustments have been made to in-river run (and by extension, terminal run) size estimates. These were made to address bias in mark-recapture estimates and have resulted a lower estimate for each year dating back to the beginning of the assessment program. Consequently, the estimated 1984-2018 average terminal run size has changed from 213,000 to approximately 171,000 fish. Tatsamenie Sockeye The outlook for the terminal Tatsamenie sockeye salmon run is 30,000 wild and 10,000 enhanced fish (40,000 total) which is well above the ten-year average (2010-2019) run size of 17,000. The wild component is forecasted using a smolt model based on estimates of out-migrating wild smolt in 2017 (151,844) and 2018 (1,058,500), and recent 5-year average smolt to adult survival rate of 6.0%. The enhanced component is forecasted by averaging a smolt model based on estimates of out-migrating enhanced smolt in 2017 (178,349) and 2018 (329,000) with recent odd and even 5-year average smolt to adult survival rates of 1.4% and 6.6%, respectively.

CHINOOK SALMON

Stock Management Unit (SMU)	Outlook Unit Chinook	2020 Outlook Category	Comments
OKANAGAN CHINOOK SALMON	101. Okanagan (NEW)	No Outlook Available	No comments
FRASER SPRING RUN 42 CHINOOK SALMON	96. Fraser River Spring Run 4_2	Aggregate of 2 CUs with an outlook category of 1	As an aggregate, the forecast is for 6,220 (escapement) returns. Average spawners are 16,511 (terminal run, 1979+) and the management target is 22,146 (escapement target (S_{MSY})). • Lower Thompson CU status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended for listing as *Endangered* by COSEWIC. • South Thompson-Bessette Creek CU status was determined to be Amber/Green in a recent WSP re-evaluation (Grant et al. 2017). Two populations make up this Outlook Unit: **Lower Thompson:** No forecast values are available. The average return is 6,360 (escapement, 5 year average) and the LRP/LBB is 4,613. **South Thompson-Bessette Creek:**: No forecast values are available. The average return is 66 (escapement, 5 year average) and the LRP/LBB is 222.

Stock Management Unit (SMU)	Outlook Unit Chinook	2020 Outlook Category	Comments
FRASER SPRING RUN 52 CHINOOK SALMON	97. Fraser River Spring Run 5_2	Aggregate of 6 CUs with an outlook category of 1	As an aggregate, the forecast is for 23,332 (escapement) returns. Average spawners are 36,985 (terminal run, 1979+) and the management target is 42,165 (escapement target (S_{MSY})). • Lower Fraser CU status was recommended for listing as *Special Concern* by COSEWIC. • Middle Fraser-Fraser Canyon CU status was determined to be Data Deficient in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Endangered* by COSEWIC. • Middle Fraser CU status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Threatened* by COSEWIC. • Upper Fraser CU status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Endangered* by COSEWIC. • South Thompson CU status was determined to be AMBER in a recent WSP re-evaluation (Grant et al. 2017). • North Thompson CU status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Endangered* by COSEWIC. Six populations make up this Outlook Unit: **Lower Fraser:** No forecast values are available. The average return is 278 (escapement, 5 year average) and the LRP/LBB is 347. **Middle Fraser-Fraser Canyon:** No forecast values are available. The average return is 24 (escapement, 5 year average) and the LRP/LBB is 230. **Middle Fraser:** No forecast values are available. The average return is 2,339 (escapement, 5 year average) and the LRP/LBB is 5,327. **Upper Fraser:** No forecast values are available. The average return is 162 (escapement, 5 year average) and the LRP/LBB is 5,277. **South Thompson:** No forecast values are available. The average return is 875 (escapement, 5 year average) and the LRP/LBB is 964. **North Thompson:** No forecast values are available. The average return is 8,387 (escapement, 5 year average) and the LRP/LBB is 935.

Stock Management Unit (SMU)	Outlook Unit Chinook	2020 Outlook Category	Comments
FRASER SUMMER RUN 52 CHINOOK SALMON	98. Fraser River Summer Run 5$_2$	Aggregate of 5 CUs with an outlook category of 1	As an aggregate, the forecast is for 10,737 (escapement) returns. Average spawners are 36,732 (terminal run, 1979+) and the management target is 23,567 (escapement target (S_{MSY})). • Lower Fraser-Upper Pitt CU status was determined to be Data Deficient in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Endangered* by COSEWIC. • Lower Fraser CU status was determined to be Data Deficient in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Threatened* by COSEWIC. • Middle Fraser-Portage CU status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Endangered* by COSEWIC. • Middle Fraser CU status was determined to be AMBER in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Threatened* by COSEWIC. • North Thompson CU status was determined to be RED in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Endangered* by COSEWIC. Five populations make up this Outlook Unit: **Lower Fraser – Upper Pitt:** No forecast values are available. The average return is 60 (escapement, 5 year average) and the LRP/LBB is 256. **Lower Fraser:** No forecast values are available. The average return is 63 (escapement, 5 year average) and the LRP/LBB is 325. **Middle Fraser - Portage:** No forecast values are available. The average return is 68 (escapement, 5 year average) and the LRP/LBB is 346. **Middle Fraser:** No forecast values are available. The average return is 9,147 (escapement, 5 year average) and the LRP/LBB is 5,871. **North Thompson:** No forecast values are available. The average return is 1,907 (escapement, 5 year average) and the LRP/LBB is 1,829.

Stock Management Unit (SMU)	Outlook Unit Chinook	2020 Outlook Category	Comments
FRASER SUMMER RUN 41 CHINOOK SALMON	99. Fraser River Summer Run 4_1	Aggregate of 4 CUs with an outlook category of 1-2	As an aggregate, the forecast is for 114,566 (escapement) returns. Average spawners are 93,242 (terminal run, 1977+) and the management target is 120,322 (escapement target (S_{MSY})). • South Thompson CU status was determined to be GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Not at Risk* by COSEWIC. • Shuswap River CU status was determined to be Data Deficient in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Threatened* by COSEWIC. • Maria Slough CU and Upper Adams River CU was not assessed. Four populations make up this Outlook Unit: **South Thompson:** No forecast values are available. The average return is 162 (escapement, 5 year average) and the LRP/LBB is 23,469. **Shuswap River:** No forecast values are available. The average return is 162 (escapement, 5 year average) and the LRP/LBB is 2,096. **Maria Slough:** No forecast values are available. The average return is 162 (escapement, 5 year average) and the LRP/LBB is 15. **Upper Adams River:** No forecast values are available.
FRASER FALL RUN 41 CHINOOK SALMON	100. Fraser River Fall Run 4_1	Aggregate of 2 CUs with an outlook category of 2	As an aggregate, the forecast is for 90,792 (escapement) returns. Average spawners are 131,822 (terminal run, 1977+). • Hatchery Exclusion – Lower Fraser River CU was not assessed for WSP or COSEWIC status. • Lower Fraser River – fall timing (white) - Harrison CU status was determined to be GREEN in a recent WSP re-evaluation (Grant et al. 2017) and was recommended to be *Threatened* by COSEWIC. Two populations make up this Outlook Unit: **Hatchery Exclusion – Lower Fraser River:** Escapement forecast is 31,077 salmon with an average return of 26,600 (escapement, 1975+) and the LRP/LBB is not available (hatchery stock). **Lower Fraser River – fall timing (white) - Harrison:** Escapement forecast is 59,715 salmon with an average return of 83,600 (escapement, 1975+) and the LRP/LBB is 15,318. The management target is 75,100 (escapement target (S_{MSY})).
WCVI CHINOOK SALMON	39. WCVI - Hatchery	3	Somass/Robertson hatchery: Forecast is for 91,000 salmon with 39 million eggs (20,900 spawners) as the limit reference point or lower biological benchmark. Egg target is adjusted for age composition. Conuma forecast is for 29,000 salmon. Nitinat forecast is for 18,000 salmon and forecast for Other returns in 22,000 salmon.

Stock Management Unit (SMU)	Outlook Unit Chinook	2020 Outlook Category	Comments
WCVI CHINOOK SALMON	40. WCVI-Wild	Aggregate of 3 CUs with an outlook category of 1	As an aggregate, 160,000 (including Somass/Robertson) salmon are forecast to return. The average return is 155,000 (1980+)
MAINLAND INLET CHINOOK SALMON	41. Johnstone Strait Area (including mainland inlets)	Data deficient	No comments
MIDDLE GEORGIA STRAIT	42. Georgia Strait Fall (wild and small hatchery operations)	2/3	Forecast is expected to be 22,595 salmon with an average return of 14,900 (Index 1979+)
MIDDLE GEORGIA STRAIT	43. Georgia Strait Fall (large hatchery operations)	No Outlook Available	No comments
MIDDLE GEORGIA STRAIT	44. Georgia Strait Spring and Summer	No Outlook Available	No comments
CENTRAL COAST CHINOOK SALMON	45, 46 and 47: Areas 3 -10	An aggregate of 8 CUs. Most are data deficient; with CK::Bella Coola-Bentinck having an outlook category of 3	12,600 salmon are expected from Atnarko with an average return of 13,000 (index, 1979+). 5,000 salmon is the management target for escapement (S_{MSY}).
NASS CHINOOK SALMON	48. Nass	2	Forecast is for 23,000 to return to Canada.
HAIDA GWAII CHINOOK SALMON	49. Haida Gwaii	Aggregate of 2 CUs with an outlook category of Data Deficient	No comments
SKEENA CHINOOK SALMON	50. Skeena	Aggregate of 11 CUs. 9 CUs are Data Deficient while the remaining 2 have an outlook category of 2	For Skeena Chinook Salmon, 45,651 (total run) and 30,551 (terminal run) are expected with an average return of 85,000 (1979+)

Stock Management Unit (SMU)	Outlook Unit Chinook	2020 Outlook Category	Comments
ALSEK CHINOOK SALMON	51. Alsek	3	The Klukshu River Chinook escapements in 2014 and 2015, the two principal brood years that will contribute to the 2020 run, were 832 and 1,388 Chinook salmon, respectively. These were below and above, respectively, the previous 10-year average (2004-2013) of approximately 1,242 Chinook salmon. Likewise, they were within and above, respectively, the escapement goal range of 800 to 1,200 Chinook salmon as determined by the Transboundary Technical Committee. Based on these primary brood year escapements, the traditional pre-season stock-recruit outlook for Klukshu River Chinook salmon in 2020 is 1,170 fish. This includes a 49% reduction to account for the 5 MANAGEMENT ISSUES 2020/21 Salmon Integrated Fisheries Management Plan – Transboundary Rivers 82 recent 5-year forecast model error. The 2020 forecast is close to the recent 10-year average (2010-2019) run size of approximately 1,200 Chinook salmon and within the escapement goal range
STIKINE CHINOOK SALMON	52. Stikine	No Outlook category available (13,400 (95% CI: 5500 - 21,200) expected for a 14,000-28,000 escapement target)	The 2020 outlook for the terminal run of Stikine River Chinook salmon is 13,400 large fish, which is 32% below the recent ten-year average run size of approximately 19,700 large Chinook salmon, and below the target escapement goal range of 14,000 to 28,000 fish. This outlook is based on a sibling forecast model that was adjusted downward by the recent 5-year model error as the model has tended to overestimate the run size in recent years. The sibling return data indicates that productivity is well below average and well below what would otherwise be expected based on historical spawner-recruitment relationships.
TAKU CHINOOK SALMON	53. Taku	No Outlook category available (12,400 (95% CI: 5200 - 19600) expected for a 19,000-36,000 escapement target)	The 2020 pre-season terminal run forecast for large Taku River Chinook salmon (Chinook ≥660 mm mid-eye-to-fork length) is 12,400 fish, which is 43% below the ten-year average terminal run of approximately 19,400 fish, and well below the target escapement goal range of 19,000 to 36,000 fish. This outlook is based on a sibling forecast model that was adjusted downward by the recent 5-year model error as the model has tended to overestimate the run size in recent years. The sibling return data indicates that productivity is well below average and what would otherwise be expected based on historical spawner-recruitment relationships.
YUKON CHINOOK SALMON	54. Yukon	No Outlook Available	75,000 expected for a 42,500-55,000 escapement target

COHO SALMON

Stock Management Unit (SMU)	Outlook Unit Coho	2020 Outlook Category	Comments
INTERIOR FRASER COHO SALMON	102. Interior Fraser (NEW)	Aggregate of 5 CUs with an outlook category of 1	39,223 salmon are expected with an average return of 36,000 (escapement, 1979+). 20,000 salmon is the management target for escapement (S_{MSY}).
LOWER FRASER COHO SALMON	57. Lower Fraser	Aggregate of 3 CUs with an outlook category of 1	No comments
WCVI COHO SALMON	58. WCVI	Aggregate of 3 CUs with an outlook category of 1	No comments
JOHNSTONE STRAIT/MAINLAND INLET COHO SALMON	59. Area 12	2/3	No comments
JOHNSTONE STRAIT/MAINLAND INLET COHO SALMON	60. Area 13 - North	Data deficient	No comments
STRAIT OF GEORGIA COHO SALMON	61. Georgia Straight	2	No comments
CENTRAL COAST COHO SALMON	62. Areas 7 to 10; 63. Areas 5 and 6; 64. Area 3	Data deficient	No comments
HAIDA GWAII COHO SALMON	65. Haida Gwaii - E (Area 2 East)	Data Deficient	No comments
HAIDA GWAII COHO SALMON	66. Haida Gwaii - N (Area 1)	Data Deficient	No comments
HAIDA GWAII COHO SALMON	67. Haida Gwaii - W (Area 2 West)	Data Deficient	No comments
SKEENA COHO SALMON	68. Skeena	Aggregate of 3 CUs with an outlook category of 2-3	No comments

Stock Management Unit (SMU)	Outlook Unit Coho	2020 Outlook Category	Comments
SKEENA COHO SALMON	69. Skeena – High Interior	CU: Upper Skeena has an outlook category of 2/3	No comments
ALSEK COHO SALMON	70. Alsek	Data Deficient	The coho salmon primary brood year escapements through the Klukshu River weir in 2016 (2,141 fish) and 2017 (966 fish) compared with the preceding 10-year average of 2,079 suggest that the 2020 run will be below average. The recent 10-year average (2010-2019) weir count is approximately 2,138 coho salmon.
STIKINE COHO SALMON	71. Stikine	Data Deficient	The lack of reliable escapement and marine survival data for Stikine River coho salmon precludes the development of a reliable outlook for this stock in 2020. Aerial surveys are conducted once annually and are subject to various surveying and run timing variables. Work is underway to enable development of outlooks in the near future.
TAKU COHO SALMON	72. Taku	No Outlook category available (158,000 expected for a 50,000-90,000 escapement target)	The outlook for the terminal run of Taku River coho salmon in 2020 is approximately 122,000 fish, slightly above the ten-year average (2010-2019) terminal run of 111,000. The forecast is developed using a smolt model which applies the five-year average smolt to adult marine survival rate (8.6%) to the 2019 estimated Taku River smolt emigration (~1.1 million) and reduced by the average non-terminal marine harvest rate of (23%).
PORCUPINE COHO SALMON	73. Yukon	Data deficient	No comments

PINK SALMON

Stock Management Unit (SMU)	Outlook Unit Pink	2020 Outlook Category	Comments
FRASER PINK SALMON - ODD	74. Fraser - Odd only (CU: Fraser River)	No Outlook Available, as was an even year	No comments
75. Squamish - Odd only (CUs: East Howe Sound-Burrard Inlet; and, Georgia Strait)	75. Squamish - Odd only (CUs: East Howe Sound-Burrard Inlet; and, Georgia Strait)	ND	Squamish Pink salmon are rebuilding; however, no target run size has been developed and available quantitative assessment information has not been reviewed. *(2017 Outlook Category was ND.)*
WCVI PINK SALMON	76. WCVI - Odd & Even	Data Deficient	No comments

Stock Management Unit (SMU)	Outlook Unit Pink	2020 Outlook Category	Comments
ECVI/MAINLAND PINK SALMON – ODD; ECVI/MAINLAND PINK SALMON - EVEN	77. Areas 11 to 13 - Odd & Even	An aggregate of 6 CUs. PKE::Georgia Straight has an outlook category of 3 while PKE:Southern Fjords has a category of 2. The remaining CUs do not have any outlook available.	Since 2015, there has been only limited assessment of Pink Salmon in Areas 12 and 13 and no assessment in Area 11. In 2019 observations of some key Area 12 Mainland Inlet system were reinstated. Even Year: Returns in 2018 were low in most systems monitored and below the even year 3 generational averages except Amor De Cosmos. Preliminary returns in Area 12-13 were varied with some systems showing an improvement over the 2016 brood including Amor De Cosmos, Ahta, Phillips, Quinsam and Salmon Rivers. Odd Year: In 2019, preliminary returns to the main indicators in Area 12 fell well below their parental brood returns of 2017 and 3 generational averages. In Area 13, 2019 pink returns were varied showing improvements relative to brood in Vancouver Island Systems (Adam and Quinsam Rivers) and well below average to monitored systems on the mainland. Historically, Pink returns to this area have been highly variable and expectations continue to be highly uncertain. Based on recent returns, the outlook for 2020 is for below to near target returns. (2019 Outlook Category was 2/3; 2018 Outlook Category was 2/3)
ECVI/MAINLAND PINK SALMON - ODD	78. Georgia Strait - West - Odd & Even	No Outlook Available; same SMU as above???	These are primarily odd year dominant pink stocks. Returns in 2017 were average to below average and generally lower than brood returns in 2015 with the exception of Nanaimo River. Assuming similar marine survival, the outlook for 2019 is for below target returns. Due to the high variability of Pink Salmon, these expectations are highly uncertain. *(2017 Outlook Category was 2/3; 2018 Outlook Category was 2)*

Stock Management Unit (SMU)	Outlook Unit Pink	2020 Outlook Category	Comments
ECVI/MAINLAND PINK SALMON - EVEN	79. Georgia Strait - East - Odd & Even	Aggregate of 3 CUs. Category 2-3	These are primarily odd year dominant stocks. Assessment information on Pink Salmon in this area is limited. Returns in 2019 were 1 to 2 orders of magnitude lower than the odd-year 3 generation average and much lower than brood returns in 2017 with the exception of Sechelt Creek. Assuming continuation of poor marine survival, results for 2020 returns are expected to be below target. Due to the high variability of Pink Salmon, these expectations are highly uncertain. (2019 Outlook Category was 2/3; 2018 Outlook Category was 2)
CENTRAL COAST PINK SALMON	80. Areas 7 to 10 - Odd & Even; 81. North Coast Areas 3 to 6 - Odd & Even	An aggregate of 5 CUs. PKE::Hecate Lowlands has an outlook category of 3 while PKE:Hecate Strait – Fjords has a category of 1. The remaining CUs do not have any outlook available.	Variable expectations
HAIDA GWAII PINK SALMON	82. Haida Gwaii - Even	Aggregate of 6 CUs. 3 CUs do not have any data; 1 CU has an outlook category of 1 while the remaining 2 CUs have an outlook category of 3.	Concern for West Haida Gwaii

CHUM SALMON

Stock Management Unit (SMU)	Outlook Unit Chum	2020 Outlook Category	Comments
FRASER CHUM SALMON	83. Fraser River (CUs: Fraser Canyon and Lower Fraser)	2	No comments
WCVI CHUM SALMON	84. WCVI	2	No comments
INNER SOUTH COAST CHUM SALMON	85. Johnstone Strait Area and Mainland Inlets (Areas 11 to 13)	2	No comments
INNER SOUTH COAST CHUM SALMON	86. Georgia Strait	No Outlook Available	Chum enumerations in this area are currently underway. Preliminary escapement data for 2018 suggest below target escapements for systems in mid to northern Georgia Strait. Returns in Nanaimo, Cowichan and Goldstream were above target. For 2019, abundance is expected to follow a similar pattern with stocks in the southern part of Georgia Strait such as Cowichan, Nanaimo, and Goldstream forecast above target escapement. Mid-Island systems (Puntledge, Little Qualicum, Big Qualicum) are expected to show improvement to near target escapement levels. Jervis Inlet stocks are forecast to be well below target in 2019. *(2018 Outlook Category was 3)*
CENTRAL COAST CHUM SALMON	87. Coastal Areas 5 & 6; 90. Areas 7 to 10	Aggregate of 9 CUs. 1 CU with an outlook category of 1, 2 CUs each with an outlook category of 2 and 3; the remaining CU is data deficient.	Bella Coola about average, low expectations elsewhere
HAIDA GWAII CHUM SALMON	88. Haida Gwaii	Aggregate of 5 CUs. 2 CUs with an outlook category of 1, 2 CUs with an outlook category of 2 and the remaining CU is data deficient.	Concern for East Haida Gwaii CU
SKEENA-NASS CHUM SALMON	89. Skeena-Nass	Aggregate of 3 CUs. 1 CU with an outlook category of 1, 1 CU with an outlook category of 3 and the remaining CU is data deficient.	Concern for Lower Skeena

Stock Management Unit (SMU)	Outlook Unit Chum	2020 Outlook Category	Comments
YUKON CHUM SALMON	91. Yukon (mainstem)	3	No comments
PORCUPINE CHUM SALMON	92. Yukon (Porcupine)	2	No comments
TRANSBOUNDARY CHUM SALMON		Data Deficient	Based on the 2020 primary brood year catches of chum salmon in the Canyon Island traditional fish wheels, 2015 (95) and 2016 (66), which were well below the previous ten year (2005-2014) average Canyon Island fish wheel catch of 287 fish, the 2020 fall chum salmon run is expected to be below average.

CITATION

Fisheries and Oceans Canada. 2024. Pacific Salmon Outlook, Pacific Region, 2020. 1-26 pp.

Fisheries and Oceans Canada
3190 Hammond Bay Road
Nanaimo, BC V9T 6N7

Cat. No. Fs141-9E-PDF
ISSN 2817-2426