Fisheries and Oceans Canada
Pêches et Océans Canada

PACIFIC SALMON OUTLOOK
PACIFIC REGION
2003

Canada

2003 SALMON STOCK OUTLOOK

DFO Stock Assessment has developed a categorical outlook for salmon stock status in 2003. For each stock grouping an outlook is provided on a categorical scale of 1 to 4. The category assigned to a stock group reflects interpretation of available quantitative and qualitative forecasts as well as expert opinion of its status.

A variety of methods were used in preparing this outlook. The methods used have been grouped into six categories as follows:

- Quantitative methods approved by PSARC **[QP]** including stock-recruitment and sibling regression or other predictive model of survival.
- Quantitative methods not approved by PSARC **[QN]**.
- Time series models approved by PSARC **[TP]** including naïve models such as running averages but excluding the [E] category of models.
- Time series models not approved by PSARC **[TN]**.
- Predictions based on expert opinion using current year information **[E].**
- Predictions based on expert opinion without the benefit of current year information **[X]**.

Stock status implies consequences to fisheries where that stock group is caught directly or incidentally. In the context of this outlook the probable fishery consequences associated with each of the four status categories is identified in the following table.

The outlook should be regarded as very preliminary and is subject to change as more information becomes available and as statistical forecasts and assessments are completed and reviewed.

Outlook Scale:

Status Category	Category Definition	Fishery Consequences
1	Conservation concern	This is a stock of concern. No directed fisheries and possible requirement to avoid stock.
2	Poor – below average	Fisheries are uncertain and likely small. Allocation policy will determine harvest opportunities.
3	Normal – near average	Directed fisheries subject to allocation policy.
4	Abundant – above average	Directed fisheries subject to allocation policy.

It is important to note that the fishery consequences implied by any of the status categories do not include interactions with other stocks. Consequently, conservation requirements for stocks in status categories 1 and 2 may limit fishing opportunities for stock groups with a better outlook. Where possible the comments associated with each stock should identify such potential constraints. A range of status categories indicates significant geographic variation in status within a stock group. .

The intent of providing such an outlook is to provide an objective and consistent context within which to initiate fisheries planning. In particular, the broad outlook provides a preliminary indication of potential fishing opportunities and the stocks of concerns around which fisheries would have to be shaped. Annual provision of this outlook is part of ongoing development of an effective, objective and timely salmon fisheries planning process in the Pacific Region.

Stock/MU	Outlook	Comments
COHO		
Stikine coho	3-4	Above average return expected based on the higher than expected marine survivals observed in 2001-02
Alsek coho	3-4	Above average return based on above average escapement in 1999-00 in tandem with strong marine survival observed in 2001-02.
Taku coho	3-4	Above average return based on similar brood year escapements to those that produced the above average return observed in 2002.
QCI coho	2 to 4	Stocks continue to rebuild. High uncertainty on WQCI (Area 2W).
NC coho	2 to 4	Stocks continue to rebuild. Uncertainty remains for high-interior Skeena coho (e.g. Sustut).
CC coho	2 to 3	Areas 7-11: Returns are expected to vary considerably between systems. Expect escapements greater than the 2000 brood. Improving escapements suggest better ocean survival than in recent years. Areas 12-13: Coho smolt abundance in Keogh was average but ocean survival there continues very low (<3%). Brood year escapement for Klinaklini was above average while Heydon brood year escapement was well below average. Fry densities in this region have improved over last year, but the knowledge base in this area is poor and outlook is highly uncertain.
WCVI coho	3	Based on large numbers of Robertson Hatchery jacks seen so far this fall, the 2003 outlook (subject to large error) is for above average survivals (about 10%). Overall, wild coho are expected to survive at least as well. Based on smolt counts in only three SW Vancouver Island streams, returns should be good; perhaps 40% better than in 2000 and 2001 Outlook might change once 2002 returns are fully known. Late rains and low water might reduce spawn in 2002.
Strait of Georgia coho including lower Fraser	2 to 3	The outlook is highly uncertain since the dry fall has delayed river entry and no indications of survival from 2001 sea-entry are available. However, year-to-year changes in survival have usually been small (consistently decreasing until 1998 and slowly increasing since). If this has continued, survivals will be poor for the 2003 return, i.e. these stocks cannot be assumed to have significant harvestable surpluses. Test fishing catches of coho destined to return in 2003 were much less than in the last two years but there was a change in methods, so the reliability of this observation is unknown. Taken at face value the observation indicates that survival may have been near 2%, which is about the survival coho stocks need to replace themselves under negligible fishing. Adding to the uncertainty is the observation that monitored smolt abundances in 2002 (2003 return) were about 40% greater than average.
Thompson coho	1 to 2	In 2001, the improved marine survivals seen in many areas of the Georgia Basin led to improved escapements to the Thompson of approximately 3 to 4-times levels seen in the recent past. Early observations of escapements in 2002 indicate a similar trend, however continued caution is warranted to insure recovery. The apparent run strength for this year, and the expected continuation of better marine survival continue to offer optimism for recovery.

Stock/MU	Outlook	Comments
CHINOOK		
Yukon Chinook	1	Below average returns based on a recent trend in declining returns since 1998. This trend is thought to be the result of poor marine survival.
Stikine chinook	3-4	Expect an above average run based on above average brood year escapements and strong marine survival observed in 2001-2202
Alsek chinook	3-4	Above average return based on optimum brood year escapements.
Taku chinook	3	Average return based on escapements within and well above optimum escapement goal range. No directed commercial fishery permitted under PST.
Nass chinook	4	Strong returns expected to continue.
NC chinook	4	Strong returns expected to continue.
CC chinook	4 & 3	Bella Coola River returns are at target. Expected returns from Snootli Hatchery production are expected to be below average. Other stocks (Wannock) have very high uncertainty.
WCVI chinook	2 (wild); 3 to 4 (hatchery)	Returns of age 2 jacks (from the weak 2000 brood) are poor in some wild WCVI systems giving concern for age 3 returns in 2003. Improved returns of Age 3 and 4 adults in 2002 suggest a positive outlook for age 4 and 5 returns in 2003 with a good female representation. Some restrictions still likely to ensure escapement in wild systems. Outlook for hatchery systems is positive for all all age classes (rated 3 / 4).
Lower Fraser – early springs	1-2	Early run chinook (Birkenhead River) escapement in 2002 was no greater than 4-year average, and down from 2001. No trend for increasing escapements.
Lower Fraser - summers	2	Lower Fraser summer run chinook do not have a reliable time series of escapement information; extensive visual spawner surveys began in 2002. Possible conservation concern with the Chilliwack wild stock.
Lower Fraser – lates (Harrison & Chilliwack)	3	The run size forecast for Fraser lates in 2002 was below escapements in previous years and there is no expectation for improved returns in 2003. Reduction in 2001-brood Chilliwack River hatchery production by greater than fifty percent is expected to reduce the return of age-3 chinook in 2003. This may be offset by the strong 1999 naturally spawning escapement that will return as age 4 in 2003.
Strait of Georgia chinook	2 to 3	Most East Coast of Vancouver Island stocks escapement levels in 2002 were somewhat less than in 2001 but remain relatively stable overall. However, returns to Cowichan continue to decline. No change is expected from current status which has seen escapements that are relatively stable at below average to average levels
Upper Fraser chinook – early springs	2	Earliest timed springs (mostly 4_2) (into lower Fraser by May) expected to be fair again. Apparent increases in marine survival resulted in better escapements in 2002, and provide optimism for similar result in 2003
Upper Fraser chinook - springs	3	Upper Fraser springs (mostly 5_2) fair. Thompson springs fair to good. Apparent increases in marine survival observed for 4yr-old returns in 2002, provide some reason for optimism for the 5yr-old returns in 2003
Upper Fraser chinook - summers	3	Upper Fraser Summers were patchy but generally good. Returns to Chilko and Quesnel remained strong, and parental brood numbers and marine survival trends provide expectations of continued run strength.
Upper Fraser chinook – late summers	4	Thompson late summers (41) were very good, with near record escapements again for the stock complex. Continued strong returns are expected.

Stock/MU	Outlook	Comments
SOCKEYE		
Stikine sockeye	2	Smolt production from Tahltan Lake in 2000 was below average and therefore the expected return is projected to be below average and weak. Mainstem escapement in primary brood year (1998) was below the escapement goal suggesting this run will be weak in 2003. Management actions to address conservation concerns are a strong possibility this season.
Alsek sockeye	2	Average run expected based on brood year production. A weak return of age four fish is expected.
Taku sockeye	3	Average return based on principal brood year escapements falling in/ slightly above optimum range; high r/p observed in 2001 not evident in 2002.
Nass sockeye	3	Average returns are expected.
Babine Lake enhanced sockeye (Pinkut & Fulton)	2	Poor 5-year old returns, and poor to average 4-year old return forecast.
Skeena wild sockeye	1 to 3	Highly variable returns among stocks with poor returns expected in several stocks including the Kitwanga, Nanika and Sustut.
WCVI sockeye	3	Excellent returns of most age classes to GCL and Sproat in 2002 should result in fishable surpluses. The only caution is the lower than expected return of age 4 fish to GCL and the continued poor returns to Henderson Lake. Management actions will continue to be required to conserve Henderson stock. . Overall expect average to above average returns in 2003.
CC sockeye	1 to 2	Area 7 & 8 brood-year escapements to the Kimsquit and Atnarko Rivers are below targets. There is a continued conservation concern for Smith and Rivers Inlet sockeye due to low brood year escapements although there have been good indications that marine survival is improving.
Fraser sockeye – Early Stuart	2	50% forecast (89,000) is 41% lower than the cycle line mean (1980-1999) of 216,000. The forecast return at the 75% probability level is 57,000 sockeye. Forecast is highly uncertain in part because of unfavorable migration conditions in 1999.
Fraser sockeye – Early Summer	2	The total forecast for the Early Summer group is 412,000 sockeye at the 50% level, or 94% of the mean cycle-year return of 440,000. The forecast at the 75% probability level is 225,000 fish.
Fraser sockeye – summer	3	Chilko and Quesnel sockeye account for 74% of total Summer run forecast. Chilko escapement in 1999 were the fourth highest on record but survival to the smolt stage was lower than average and the Chilko forecast return of 1.3 million sockeye (75% forecast = 849,000) is 70% of the mean cycle-year return of 1.9 million. Quesnel escapement on the 2003 cycle line has increased steadily from 2,000 adult spawners in 1983 to 214,000 adults in 1995 and 187,000 adults in 1999. The 2003 forecast of 1.2 million (75% forecast = 624,000) is 4.8-times the mean cycle-year return. The forecasts for the smaller Late Stuart and Stellako components are also above their mean cycle-year returns.
Fraser sockeye – fall	1 to 2	The forecasts at the 50% probability level for individual Late run stocks are all below their 1980-2000 mean cycle-year returns. High in-river mortality, based on differences between Mission acoustic estimates and estimates of spawning escapement plus catches up-river of Mission, has been implicated as the cause of the decline in escapement to the Late Shuswap stock and other Late run stocks in 1999. High pre-spawn mortality has also negatively impacted this timing group. The late-run Shuswap is the most abundant stock in this group.

Stock/MU	Outlook	Comments
		The forecast for this stock is 991,000 sockeye at the 50% level 75% forecast = 527,000) or 52% of the mean cycle-year return of 1.9 million. Both the Weaver Creek and Birkenhead River sockeye forecasts of 322,000 and 191,000 sockeye are below the 20-yr cycle line mean but the Portage Creek forecast at the 50% probability level of 41,000 sockeye is near the 20-yr mean of 47,000 sockeye.
Fraser sockeye – special concerns	1	Cultus Lake stock continues very depressed and has received an emergence 'endangered' designation from COSEWIC. Cultus Lake sockeye returns and escapement have undergone a pronounced decline since the 1960s. Escapements to Cultus Lake are counted at the Sweltzer Creek fence. Based on survival to the smolt stage, losses of reproductive potential of 90% or more occurred in 1999 after sockeye migrate past the counting fence. With this loss rate applied to the 1999 escapement estimate the forecast of Cultus Lake sockeye at the 50% level is 6,000 sockeye, which is well below the 1980-2000 cycle line mean of 28,000. sockeye/yr (Table 1).
Strait of Georgia – special concerns	1	Sakinaw Lake sockeye are extremely depressed and has received an emergency 'endangered' designation from COSEWIC.
PINK		
NC pinks	3 to 4	Strong returns expected for Areas 3 to 6.
QCI pinks	N/A	Off cycle year for QCI pink.
CC pinks	3 to 4	Brood year escapements to Area 7 & 8 are above normal in 2002. Returns in 2003 are expected to be average to above average.
CC Mainland Inlets pinks	2	2003 is an off-year for Mainland Inlet pinks with small escapements expected. Survival trends maybe poor based on 2002 returns. Glendale escapements were above average and may yield a modest return. There are localized concerns about the potential for poor marine survival of pinks in the Broughton Archipelago.
Fraser pink	4	Based on large escapement in 2000, above average returns are expected in 2003.
CHUM		
Yukon Chum	1	Below average returns based on a recent trend towards decreased production and continued uncertainty with respect to marine survival.
NC chum	1 to 4	Returns are highly variable but there has been a general, long-term decline in abundance. Conservation concerns persist in particular for Area 5 and possibly outside Area 6. Surplus anticipated for Kitimat River hatchery returns.
QCI chum	2 to 4	Brood year escapements variable but generally below average for Areas 1 and 2E. Average to above average returns to 2W.
CC chum	3	Areas 7 & 8 brood year escapements were strong and returns in 2003 are expected to be average.
Johnstone Strait and Georgia Basin chum	2	Poor spawning in brood year (1999), and moderate to good survival rates (trend) suggest below average returns in 2003.
WCVI chum	2 to 3	Medium to poor spawning in brood year (1999) and moderate to good survival rates (trend) may result in average to below average returns.

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