Fisheries and Oceans Canada
Pêches et Océans Canada

PACIFIC SALMON OUTLOOK
PACIFIC REGION
2006

Canada

2006 SALMON STOCK OUTLOOK

DFO Stock Assessment has developed a categorical outlook for salmon stock status since 2002. It's intended to provide an objective and consistent context within which to initiate fisheries planning. In particular, the outlook provides a preliminary indication of potential fishing opportunities and the stocks of concern around which fisheries might be shaped.

For each stock group, a status outlook is provided on a categorical scale of 1 to 4 (please see the following Table). The category reflects interpretation of available quantitative and qualitative information and forecasts as well as expert opinion of status. In many cases, stock targets have not been formally described and for those cases targets were either historical levels or expert opinion.

Stock status implies consequences to fisheries where the 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 are identified in the following table. Stock groups forecast in category "2" are considered "sensitive" and in general, fisheries will be planned to reduce impacts on these groups where possible.

Status Category	Category Definition	Criteria	Fishery Consequences
1	Stock of concern	Stock is (or is forecast to be) less than 25% of target or is declining rapidly.	Directed fisheries are unlikely and there may be a requirement to avoid indirect catch of the stock.
2	Low	Stock is (or is forecast to be) well below target or below target and declining.	Directed fisheries are uncertain and likely to be small if permitted. Allocation policy will determine harvest opportunities.
3	Near Target	Stock is (or is forecast to be) within 25% of target and stable or increasing.	Directed fisheries subject to allocation policy.
4	Abundant	Stock is (or is forecast to be) well above target.	Directed fisheries subject to allocation policy.
ND	No Data	Insufficient data to determine an outlook category.	

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 for which there are no concerns. Where possible the comments associated with each stock identify such potential constraints. A range of status categories indicates significant geographic variation in status within the stock group and fisheries may be shaped in response to that variation.

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.

Salmon outlook for 2006

A total of **92** stock groups were considered and outlooks were provided for **88** of them. Forty-three stock groups are forecast to be at or above target abundance (category 3-4), while **18** (**4** Chinook, **3** coho, **3** chum stocks and **8** sockeye) are forecast to be of some conservation concern (category 1, 1/2, 1/3, 1/4). For clarity some adjacent stock groups have been grouped in the following table where their outlooks were similar.

Species/Stock	Outlook status	Comments
Sockeye		
Okanagan	1/2	The forecast is for a return of 10,850 sockeye, as result low brood year escapement, lower than average smolt production in 2004, and an expectation of marine survival rates similar to those observed since 2001.
Early Stuart	2	The 2005 return was less than forecast and such a return or lower is expected about 25% of the time. The 2006 forecast is for a return of 84,000 sockeye. Escapement during the brood year (2002) was below the long term average, but maintained the level of the previous two generations.
Early Summer – North Thompson	3	The 2005 return was less than forecast and such a return or lower is expected about 25% of the time. The 2006 forecast is for a return of 95,000 sockeye. Brood year escapement levels were strong and continue an increasing escapement trend.
Early Summer – South Thompson	4	The 2005 return was near forecasted levels and the 2006 forecast is for a return of 850,000 sockeye. Brood year escapements levels were near or at cycle year records for the main stocks (Scotch, Seymour, Eagle, Anstey).
Early summer – upper Fraser	3	The 2005 return was near forecasted levels and the 2006 forecast is for a return of 83,000 sockeye, including Gates, Nadina and Bowron. Brood year escapement levels were off in both the Gates and Nadina systems, but increased in the Bowron.
Early Summer – lower Fraser	3	The forecast is for a return of 124,000, with escapement exceeding 60,000 spawners annually since 2001.
Summer – Chilko	4	The 2005 return was less than forecast and such a return or lower is expected about 25% of the time. The 2006 forecast is a return of 1.67 million sockeye. Cycle year escapements trended downward over the last two generations and were only 70% of the long term average for the cycle in the brood.
Summer – Late Stuart	2/3	The 2005 return was less than forecast and such a return or lower is expected about 25% of the time. The 2006 forecast is a return of 288,000 sockeye. Cycle year escapement decreased considerably over the last two generations and was less than 40% of the long term cycle average, and off by over 80% relative to 1998.
Summer – Nechako	4	The 2005 return was less than forecast and such a return or lower is expected about 25% of the time. The 2006 forecast is a return of 568,000 sockeye. Cycle year escapement exhibited steady growth over the last two generations, with a brood year escapement 1.7 times greater than 1998 and almost 3 times the recent cycle year average.
Summer – Quesnel	4	The 2005 return was less than forecast and such a return or lower is expected about 25% of the time. The 2006 forecast is a return of 4.6 million sockeye. Returns in 2006 represent the subdominant cycle year which has seen remarkable growth over the past 5 generations. Forecast for Quesnel sockeye in 2006 are limited due to very limited spawning grounds assessment conducted in 2002.

Species/Stock	Outlook status	Comments
Fall – Cultus	1	In 2006, the peak abundance cycle, the forecast is for a return of 5,800 fish, which is less than the critical level (7,000 spawners) identified in the recovery plan. Identified threats to this population are harvest, habitat alteration in Cultus Lake, environmental fluctuations, and impacts related to parasites (early migration) and predators (freshwater predation). Recovery activities planned for 2006 include captive brood stock, pikeminow removal, milfoil control, and biophysical studies to assess the quality of spawning habitat.
Fall – Portage	1/2	Portage escapement has been trending downwards over the last two generations. In 2002 it was the only Fraser Late Run that failed to surpass brood year levels, and it exhibited a 40% decrease in abundance relative to 1998. Portage sockeye continue to be a concern as they are impacted by early Fraser River entry mortality exhibited by Late Run stocks since 1995. Concern over early entry mortality continues in 2006. The forecast is for a return of 67,000 sockeye.
Fall – South Thompson	4	Late Run South Thompson stocks are in their dominant cycle year in 2006, and produced from record escapement levels (>5.2 million spawners). The forecast return is 6.73 million, however concerns continue with entry timing related mortality, as with all Fraser Late Run sockeye stocks,.
Fall – Birkenhead	3	The forecast is for a return of 433,000 sockeye and brood year escapement was 309,000.
Fall – lower Fraser	4	The forecast is for a return of 41,000 sockeye for Harrison River and 411,000 sockeye for Weaver Creek.
Sakinaw	1	Three fish entered the lake in 2003, 100 in 2004 and 27 in 2005. Virtually none are expected in 2006 and 2007.
Area 11-13	1/2	For these and many other smaller Johnstone strait stocks (except for Nimpkish) assessment data are sparse, but some stocks are of concern (Village Bay) while others appear low.
Somass	3	Expected returns, about 570,000 adults, are below average but near target. The higher return expected in 2006 relative to 2005 is supported by three of four forecast methods, the high brood abundance in 2001 and 2002, and observations of un-favorable marine conditions for 2003 smolt entry year, but average for the 2004 smolt entry year of which corresponds to age-4 fish.
Henderson	1	Recent escapements were low even though smolt production has been average. 2005 returns indicate three years of poor escapement (< 5000 spawners) despite enhancement efforts.
WCVI-other	1/2	Assessment data are not available for Hobiton and others, however Kennedy and Jantzen Lake stocks are depressed.
Area 7-10	2	Returns for 2005 were higher than forecast and suggest a continued improvement in marine survival and the trend is expected to continue for 2006 at Rivers Inlet (Area 9) and Smith Inlet (Area 10). Returns to Areas 7 and 8 were variable with some stocks showing improvement while others continue to be depressed. The 2005 Atnarko return was considerably below the forecast.
Coastal 3/6	2/4	Forecast is very uncertain. Very limited assessment base for evaluation.
Babine Lake enhanced	4	Modest return forecast for 4 year olds based on moderate jack returns. Low 5 year old return expected, for a below average Babine sockeye return.
Skeena wild	1/4	PSARC review in 2003 indicated broad range in the status of wild sockeye.
Nass	2/4	Concerns for non-Meziadin sockeye, only partial coverage. Average Meziadin Lake return expected again.
QCI	2/4	Poor escapement coverage and intermittent juvenile lake surveys.
Alsek	2	Below average run expected. Both early and late run declining in recent years.

Species/Stock	Outlook status	Comments
Stikine-wild	4	Stikine sockeye had been declining since 1995, however a major improvement in production occurred in 2003-05, possibly indicating improved marine survival. Overall this stock is predicted to return in healthy numbers in 2006. Both the Tahltan and mainstem components are expected to return in above average numbers. There may be some fishing restrictions implemented during the overlap with the latter part of the Tahltan run and early segment of the mainstem run.
Taku-wild	4	Brood year escapement was above target. Fishing opportunities are expected within the confines of conservation and PST requirements. Special measures may be needed to achieve egg-take goal for Tatsamenie enhancement.
Chinook		
Early spring – upper & mid-Fraser, North Thompson	1	Populations of concern are upper Chilcotin, Westroad, Cottonwood, and Chilako rivers. Sharp declines in escapements were observed in 2005 with escapements less than 50% of brood year escapements. Escapement to the upper Chilcotin was less than 100 spawners. No indicator stock.
Late summer – South Thompson	3	Indicator is Lower Shuswap. Returns in 2004 and 2005 were down compared to brood year escapements but still greater than escapements 10 years previous. Concern will increase if the declining trend continues.
Spring – upper & mid-Fraser, North Thompson	2	Indicator is Dome Creek. Patchy returns throughout range in 2005. Many stocks failed to reach brood escapement levels. Returns uncertain for 2006.
Summer – upper & mid-Fraser, North Thompson	2/3	No indicator. Lower than average returns in 2005, but near brood year abundance at some locations. Similar returns are expected in 2006.
Spring – lower Thompson	1/2	Indicator is Nicola. Very poor returns in 2004. Major decline in escapements from brood year. Spius, Coldwater and Louis had less than 200 spawners while the Nicola and Bonaparte had less than 3,500 spawners.
Fall – lower Fraser natural	3	2005 adult spawning escapement (90,000) was within the escapement goal range and expectations in 2006 are for a near target spawning escapement (64,000) after considering harvest rates associated with recent fisheries.
Fall – lower Fraser hatchery	3	Although there are significant hatchery releases of Harrison fall-run chinook stock into the Harrison & Stave Rivers, lower Fraser River fall-run hatchery chinook consists mainly of Chilliwack Hatchery releases. 2005 adult spawning escapements (36,000) were less than forecast (50,000) and the expected 2006 spawning escapement (53,000), after considering harvest rates associated with recent fisheries, is near the recent five year average.
Early spring – lower Fraser	2	Birkenhead River escapement (1,400 adults) is significantly greater than brood year 2000 (400 adults) and much greater than the previous 10-year average. Previous to this year, the trend in escapement was down. Returns in 2006 will be predominately from the 2001 escapement of about 600 adults.
Summer – lower Fraser	3	Maria Creek escapements in 2005 (341 adults) were lower than the brood years (1,053 for 2002; 752 in 2003). Escapements in those high abundance years were largely the result of high marine survival for hatchery releases. Expectations are for near target abundance levels.
Georgia Strait – Fall run timing	1/2	Natural stocks on the mainland remain at very low levels. Exploitation reductions have maintained escapements to enhanced stocks north of Nanaimo as their total abundances have generally declined. Chinook south of Nanaimo are different in terms of marine distribution and abundance. Cowichan escapements have been declining since 1995 and the 2005 spawning escapement in natural areas (outside of the hatchery) is the lowest on record (about 1500 spawners). The expectation is for continued declining returns based on a poor jack returns in 2005 and no

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		improvement in the 2003 brood escapement over 2002. The entire Cowichan hatchery fish production from the 2004 brood year died during a power failure, which will affect returns beginning in 2007.
Georgia Strait–Spring/summer	1	Nanaimo remains at about 400. With intensive enhancement, Puntledge escapements have been at 1980's levels since 2000. Status is not expected to change in 2006. Puntledge status likely to deteriorate in 2007 due to high hatchery brood stock mortalities (2004).
Johnstone Strait area including mainland inlets	2/3	At Quinsam River spawning escapement increased between 2001 and 2003 and has returned to average numbers (6,000-7,000) in 2004 and 2005. Nimpkish River returns remain low, yet Nimpkish may not be indicative of other wild stocks.
WCVI-hatchery	4	Returns are expected to be about 40% less than 2005 returns, which were about 25% less than forecasted. Marine survivals have decreased to less than 2% for age-3 and -4 brood years. Most returns are expected to be age-5 (45%), followed age-4 (28%), and age-3 (26%). After considering harvest rates associated with recent fisheries, expected returns are considerably above egg deposition targets.
WCVI-wild	2	Escapement in 2005 declined relative to 2004, and expectations are for lower returns in 2006. For 2006, return of age-5 fish (relatively largely female component relative to other age classes) will likely remain low. Marine survivals appear to have decreased for age-3 and -4 brood years.
Area 7-8	3/4	2005 escapement to Dean River was slightly below average, however an average return is expected in 2006. 2005 escapements to the Bella Coola and Atnarko were slightly higher than 2004. Continued terminal fisheries are expected.
Area 9-10	2	The spring-run Chinook stocks including the Owikeno tributary stocks and Chuckwalla/Kilbella remain below average. The Wannock River Chinook stock remains low, but the 2005 Wannock escapement was about 4,500 fish, which increased from recent years.
Coastal Areas 3 to 6	2/3	Poor assessments except for Kwinamass escapement indicator. Stocks generally depressed but stable.
Nass	3/4	No specific comments at this time.
QCI	3/4	Stock shows recent increasing trend.
Skeena	3/4	Moderate return expected based brood year abundance and sibling strength.
Alsek	2/3	Brood year escapements were average to below average and similar to what produced the 2005 run, which was below average. Average to below run expected.
Stikine	4	This stock experienced a new commercial fishery in 2005 as sanctioned by the Pacific Salmon Commission. Under the new fishing regime, Canadian and US commercial fisheries will occur in 2006 and above average production is expected.
Taku	4	Brood year escapements were within the target range. Directed fishing opportunities expected within confines of the new PST arrangement, with forecast abundance (64,000) exceeding the escapement target (42,500).
Yukon	3	In the Canadian section of the Yukon River, status information is lacking for most of the identified 100 spawning populations. Overall, system-wide upper Yukon brood year escapement estimates for age-6&7 fish were some of the lowest on record; whereas, the age-5 component was produced from a near record high escapement. There has been a trend towards improved run strength for the 2002 to 2005 returns. For example, although brood year escapements for 2005 were well below average, above average escapement occurred in 2005 due to improved run strength attributed to increased marine survival as well as precautionary fisheries management in both Alaska and Canada.
Coho		
Mid/upper-Fraser	1	2005 returns were much lower than forecast and much below the brood year

Species/Stock	Outlook status	Comments
		escapement. Rebuilding is affected by marine survival, which continues to be poor-fair and is not expected to improve in near future.
Thompson	1	2005 returns were much lower than forecast and were 21% of the brood year escapement. Rebuilding is affected by marine survival, which continues to be poor-fair and is not expected to improve in the near future.
Lower Fraser	2	2005 returns were less than forecast and the forecast marine survival is similar to 2005 (1.5%). In 2005 Salmon River smolt output was near average (13% below) and only slightly less than 2004, suggesting average smolt production from freshwater habitats.
Area-12	2/3	Keogh River marine survivals have increased. Mainland systems have also demonstrated stable abundance levels compared to recent years. In 2005, Keogh smolt production was higher than 2004 (above average), indicating above average production from freshwater habitats. Expectations are for levels similar to the last 3 years.
Area-13 North	2	Abundance remains low and expectations are for levels similar to the past 3 years.
Georgia Strait	1	2005 escapements indicate marine survival was much less than forecast and expectations are for continuing low survivals in 2006. This is supported by poor catches of sub-adult coho in trawl surveys in the Strait of Georgia. Since smolt production in 2005 was also near average (20% below) and marine survival is expected to decrease, very poor adult returns are expected.
WCVI	2	For indicator stocks, smolt production for brood year about half the long term average. Information from data associated with marine survival rate in coho (e.g. euphausiid abundance off the WCVI) suggests ocean conditions were less favorable for survival than previous years. Expectations are for lower abundance in 2006 relative to 2005.
Area-7-11	3/4	Returns to Smith Inlet (Docee River) continue to increase (above average returns) while Atnarko River returns are average to slightly below average. The outlook for 2006 is for average to above average returns.
Area 5/6	2/4	Stocks continue to rebuild in Area 6, Area 5 not assessed.
Area-3	3/4	Area 3 stocks continue to be strong.
QCI-E	3/4	Assessments poor since 2002, status based on previous assessments.
QCI-N	3/4	Assessments poor since 2002, status based on previous assessments.
QCI-W	3/4	Assessments poor since 2002, status based on previous assessments.
Skeena	3/4	Middle and upper Skeena stocks continue to rebuild. Lower Skeena tributaries poorer, based on poor assessments.
Skeena – high Interior	2/3	Stocks rebuilding slowly, assessments poor.
Alsek	3	Above average run expected.
Stikine	4	An ABM regime has not yet been developed for this stock. Under the current PST arrangements Canada is permitted to harvest 5,000 coho and above average return expected.
Taku	4	Favorable marine survival in last 3-4 years combined with low exploitation has resulted in large in-river run sizes.
Yukon	ND	Little is known about stock status. Harvest data from the US portion of the drainage indicates utilization has been decreasing over the past 3 cycles. The general sense in Alaska is that coho exploitation is low and was reduced recently due to conservation actions to protect fall chum salmon. Monitoring programs in Alaska suggest spawning escapements have been above average recently.
Pink		
Lower Fraser-even	ND	No qualitative assessment information is available.

Species/Stock	Outlook status	Comments
Georgia Strait - east	2	Lang and Sliammon, enhanced systems, appear stable at low abundances (<1,000).
Squamish-even	ND	No qualitative assessment information is available.
Area-11/13-even	2/3	2005 appear similar to brood returns in 2003, except for Kingcome/Wakeman. Kingcome and Wakeman have been declining since the late 1980's and there is high variability among pink salmon returns over relatively small geographic regions. 2006 will be the second cycle return year after the significant decline in escapements that occurred in 2002, which subsequently encountered a significant improvement in stock survival for the 2004 return. Information from Area 13 Mainland Inlets indicates some improvement but still in a declining trend since the late 80's. Historically, pink populations in the mainland inlets have been highly variable.
Georgia Strait - west	2	All stocks are enhanced, except for Big Qualicum and Tsable rivers and efforts continue to re-build Tsolum. The largest populations are in the Puntledge area.
WCVI-even	ND	No quantitative assessment information is available for this stock.
Area-7/10-even	3	Pink Escapements to Areas 7 and 8 are expected to exceed escapement targets with continued directed fisheries. Pink returns to Area 9 and 10 are expected to remain strong though no directed fisheries are expected in these areas.
North Coast - Areas-3/6-even	3/4	No formal forecasts, stocks have been strong but variable over the last decade.
QCI-even	2/4	Little qualitative assessment information is available for this stock.
Chum		
Fraser River	3	2006 returns were produced from large brood year escapements for age 3 and 4 fish. Quantitative forecasts are not prepared for this stock as management is based on in-season run-sizes.
Johnstone Strait area and mainland inlets (Area-11-13)	3/4	2005 returns were average. Combining the average to above average brood returns encountered in 2001, 2002 and 2003, expectations are for average to above average returns in 2006. Summer chum returns continue to vary with extremely poor returns to Bute Inlet in 2005, yet expectations are for near target abundance.
Georgia Strait	3	Brood year (2002) escapements were good. Survival rates appear above average, but forecasting remains highly un-predictable. Fishing opportunities are expected.
WCVI	3	Brood year (2002) escapements were good. Survival rates appear above average in most areas. Good returns are expected to Nitinat, however returns to Nootka maybe average to below average. Forecasting remains highly un-predictable. Fishing opportunities are expected. More forecasting information will be available following analysis of 2005 assessment data.
Coastal Areas 5/6	1/3	Long term broadly base decline among small and medium wild stocks. Brood year escapements relatively poor. Good return of enhanced fish expected at Kitimat.
QCI	2/4	No specific comments available at this time.
Skeena-Nass	1/3	Long term broadly based decline among wild stocks. Brood year escapements relatively poor.
Area-7-10	3	Areas 7 returns are expected to be at or near target while returns to Area 8 were near target levels. For Areas 9 and 10, there are indications that runs remained strong for Chuckwalla and Kilbella, while returns to the Nekite River were below average. Outlook for 2006 continues to be average to above average with fishing opportunities expected.
Taku	1	The stock has been depressed since 1991, although little information is available.

Species/Stock	Outlook status	Comments
Yukon	4	The stock group includes the upper Yukon River populations (except Porcupine). Since 2002, spawning escapements exceeded targets, buoyed by reduced in-river exploitation and apparently much improved marine survival. The 2005 run was one of the highest on record; indications of a potentially strong run were suggested from the well above average marine by-catch of chum in the Bering Sea in 2004. Early reports are that the chum by-catch in 2005 was larger than 2004.
Porcupine (Yukon)	2/3	The stock group includes stocks of the Porcupine River drainage, a major tributary of the Yukon River. The main indicator stock, Fishing Branch River, was depressed from 1997 to 2003; however both the 2004 and 2005 runs exceeded the preseason outlooks. The 2005 run involved remarkable improvement in escapement due to improvement in run strength attributed to increased marine survival. The 2006 run will originate primarily from the 2002 brood year escapement which was one of the lowest on record. However, if the trend in increased marine survival continues, fishing opportunities may occur.

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