

**PRIORITIZING INTEGRATED PLANNING INITIATIVES
UNDER THE WILD SALMON POLICY**

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Introduction:

The Wild Salmon Policy (WSP) released in 2005 calls for information on the abundance, habitat and ecosystem status of genetically distinct salmon populations (conservation units) to feed into the development of comprehensive integrated strategic plans for their management. These plans are envisaged as covering all stages of the salmon life cycle and as including harvest strategies as well as other habitat measures and population enhancement activities that may impact resource health. It is anticipated that this broad focus in planning will better integrate habitat and resource management activities with harvesting and result in improved decisions in all areas. More specifically, the plans are described as needing to “integrate information on conservation unit and habitat/ecosystem status and:

- Specify long term biological status (targets) for conservation units and groups of conservation units;
- Identify recommended resource management actions to protect or restore salmon, their habitat and ecosystems in order to achieve the targets, and;
- Establish time frames and priorities for action.”

While it is important for the credibility of the WSP to show progress in implementing this aspect of the policy, there are a number of significant implementation challenges:

1. Work by Holtby and Ciruna¹ has identified 420 genetically distinct Conservation Units (CU's) of Canada's Pacific wild salmon resource. Developing the comprehensive integrated plans called for in the WSP for each of these CU's individually dramatically exceeds both the short and the long term capacity of the Department, other government agencies and private sector groups to engage in planning around salmon.
2. There are numerous data and information gaps for many of the smaller and less productive CU's that have been identified. Also, the development of consistent methodologies' for identifying population, habitat and ecosystem status benchmarks called for in the WSP is still ongoing and these benchmarks are still largely absent for most of the CU's identified.
3. The local area multi-stakeholder planning committees and planning infrastructure called for in the policy to undertake this planning do not currently exist in most parts of the Pacific Region.

¹ “Conservation Units for Pacific Salmon under the Wild Salmon Policy”, Canadian Science Advisory Secretariat Research Document 2007/070, ISSN 1499-3848 (2008).

4. The Department lacks direct authority over many areas of land and water use that are important to the health of salmon and has no way of requiring or forcing other agencies and governments to engage in the planning processes.

Purpose of this Paper:

Addressing these various challenges requires a practical, efficient and incremental approach to implementing strategic planning under the WSP. Key aspects of this need to include the selection of manageable scales at which to develop plans; the selection of appropriate priorities for immediate planning and research efforts, and; building on established regional and more localized planning initiatives for salmon and other resources.

This paper is intended to assist in this by grouping together the Conservation Units of Pacific Salmon species identified by Holtby and Ciruna in suggested geographic aggregates that may be useful for individual planning efforts. Available current information on the status of individual salmon stocks is then used to identify and short list some specific geographic aggregates for more immediate planning initiatives. Finally, a number of comments are made on additional criteria for further ranking the short list and ways of linking these initiatives to established planning processes for salmon.

Conservation Units and Appropriate Aggregates of Conservation Units for Planning Purposes:

The Wild Salmon Policy calls for a new planning structure. The policy anticipates that this will eventually encompass local area planning committees for various geographic sub-regions of the province that bring together all local First Nations governments, harvesters, community interests, local and regional governments and other stakeholders. These committees would assess and analyze information and seek local consensus on such things as long term biological targets for conservation unit populations, habitat and ecosystem status and on initiatives and actions to achieve these targets. The policy then envisages the various local interests and local plans being brought together in a region-wide forum “to confirm overall support and resolve inconsistencies between local plans”.²

Achieving this vision requires consideration of appropriate geographic scales for planning and for the local area committees anticipated by the policy. This should obviously be guided by the geography of the Conservation Units of the resource as these are the ultimate target of the conservation efforts. At the same time, planning at the level of all 420 individual conservation units is impractical. There is a need to identify appropriate ways to group together

² “Canada’s Policy for the Conservation of Wild Pacific Salmon” – Page 27.

conservation units for planning purposes. A reasonable basis for this is provided in the work of Holtby and Ciruna.

The first step in the methodology used by Holtby and Ciruna to identify Conservation Units of Pacific salmon involved the identification of 32 freshwater and 12 marine ecologically similar adaptive zones (FAZ and MAZ). These were then merged to form a third set of 36 Joint Adaptive Zones (JAZ) in British Columbia. In effect, the JAZ encompass 36 discrete, ecologically similar geographic areas of British Columbia and its adjacent coast where at least one species of Pacific salmon is found.

The underlying hypothesis used in this work is that “Pacific salmon populations found within each adaptive zone, whether it is in fresh water or the ocean, are more likely to be interchangeable than with populations in different adaptive zones”.³ In effect, the Joint Adaptive Zones formed the foundation for the delineation of Conservation Units for most of the species of Pacific salmon (Chinook, Coho, Pink, Chum and river rearing Sockeye.)⁴

Each JAZ where a species is found was “considered to be a putative (ecotypic) conservation unit”⁵. Information on genetics was then used to “detect instances where the ecotypic classification subsumed significant genetic diversity, in which case the ecotypic CU might be partitioned”.⁶ In other cases the genetic information might indicate no evidence of reproductive isolation in which case two or more ecotypic CU’s from adjacent JAZ might be amalgamated. Finally, information on differences in spawning time, juvenile life history and so on was used for further partitioning of the CU’s within adaptive zones.

Of significance for Wild Salmon Policy planning purposes, most CU’s can be uniquely assigned to a discrete geographic area of the province and its adjacent ocean i.e. a Joint Adaptive Zone. Although there are some instances (particularly with Pink salmon) where CU’s are found in two or more adaptive zones, this is infrequent. Further, the terrestrial geography of the Joint Adaptive Zones coincides in most cases with the Freshwater Adaptive Zones identified. In effect, only 4 of the 32 FAZ in British Columbia are further partitioned geographically to create JAZ (S Coastal Streams, E Vancouver Island, W Vancouver Island and Queen Charlottes). As a consequence, the vast majority of CU’s can also be uniquely assigned to a discrete geographic Freshwater Adaptive Zone in the province.

The FAZ include watersheds, rivers and streams that are by definition ecologically similar, likely need to be managed in similar ways and contain salmon populations that are more likely to be

³“Conservation Units for Pacific Salmon under the Wild Salmon Policy” – Page 10.

⁴ Because of known biological differences lake type Sockeye salmon is treated somewhat differently. However, each of the conservation units of lake type sockeye can still be associated with a specific freshwater adaptive zone.

⁵ “Conservation Units for Pacific Salmon under the Wild Salmon Policy” – Page 8.

⁶ “Conservation Units for Pacific Salmon under the Wild Salmon Policy” – Page 10

ecologically inter-changeable. In addition, the FAZ seem to align well with First Nations traditional territories and the current direction of the Province with respect to land and water use planning. Consequently, the conservation units associated with these zones would seem to represent appropriate aggregations of units particularly for habitat and ecosystem planning purposes.

In some instances, planning under the WSP may be appropriate at a broader geographic scale. Although there are cases where commercial, recreational and/or First Nations food, social and ceremonial salmon fishing is focussed on populations originating from within one adaptive zone, there are many instances where harvesting is focussed on aggregates of conservation units that originate from multiple adaptive zones. For example, the north coast net fisheries for sockeye from the Skeena River watershed impact on numerous conservation units originating from three FAZ within the watershed. Similarly, the principal Fraser River sockeye fisheries impact on populations from 7 FAZ within the Fraser watershed. The harvesting interests of fishers and others that are resident within each adaptive zone will not necessarily accord well with those with a broader interest in the aggregate harvest. Integrating these broader interests into plans developed at a FAZ scale will be problematic.

To address this issue, Fisheries Production Areas can be defined. These Production Areas would represent amalgamations of multiple FAZ within major river systems, watersheds and drainage areas along the coast. It is suggested that the aggregates of CU's from within these production areas may be the appropriate basis for many fisheries planning purposes.

Annex 1 summarizes all of the above discussion. Table 1 starts with seven suggested Fisheries Production Areas for the BC coast. These Production Areas are then linked to both the FAZ and JAZ identified by Holtby and Ciruna. Tables 2 through 7 then attempt to assign each of the 420 conservation units identified by Holtby and Ciruna to their appropriate FAZ and Fisheries Production Area. Taken together this identifies the different aggregates of Holtby and Ciruna's CU's that may be appropriate for different scales and types of planning. A summary of these different aggregates is provided in the following table for four of the species of Pacific salmon (Sockeye, Chinook, Coho and Chum).

Table 1
Linkages between Fisheries Production Areas, Freshwater Adaptive Zones and Conservation Units

Fisheries Production Areas	Freshwater Adaptive Zones	Number of Conservation Units				Totals
		Sox	Chin	Co	Ch	
Fraser River	Boundary Bay	0	1	1	0	2
	Lower Fraser	6	5	2	1	14
	Lillooet	1	0	1	0	2
	Fraser Canyon	2	1	1	1	5
	Mid Fraser	14	3	1	0	18
	Upper Fraser	2	1	0	0	3
	Lower Thompson	0	1	1	0	2
	South Thompson	3	4	1	0	8
	North Thompson	1	2	1	0	4
	Totals	29	18	9	2	
South Coast Inside	East Vancouver Island	8	8	3	2	21
	South Coastal Streams	10	3	3	6	22
	Homathko-Klinaklini Rivers	0	2	1	0	3
	Totals	18	13	7	8	
West Coast Vancouver Island	West Vancouver Island	24	4	4	2	34
	Totals	24	4	4	2	
Central Coast	Rivers-Smith Inlet	2	2	2	3	9
	Bella Coola-Dean Rivers	1	2	1	3	7
	Hecate Lowlands	68	0	1	1	70
	North Coastal Streams	12	2	4	2	20
	Totals	83	6	8	9	
Skeena River	Lower Skeena	8	7	2	2	19
	Middle Skeena	11	4	1	1	17
	Upper Skeena	12	1	1	1	15
	Totals	31	12	4	4	
Nass River	Lower Nass – Portland	2	1	2	3	8
	Upper Nass	6	1	1	0	8
	Totals	8	2	3	3	
Queen Charlotte Islands	Queen Charlottes	9	2	3	5	19
	Totals	9	2	3	5	

A Starting Point for Developing Short Term Planning Priorities:

The WSP recognizes that achieving the fully integrated planning called for in the policy will not be easy or quick. To address this issue, Strategy 4 of the policy calls for the establishment of an interim process that provides for more immediate progress.⁷ This interim process is described as involving a review of the biological status of CU's or groups of CU's to identify those in the "Red Zone and those that could significantly limit fishing and other activities".⁸ These are then to be identified as management priorities. It is anticipated that the planning for these priorities would be undertaken by specially established "response teams" brought together from existing salmon planning initiatives.

In effect, more immediate planning priorities are to be initially established on the basis of the current status of the various CU's of Pacific salmon. However, as noted in the introduction, there are numerous data and information gaps for many smaller and less productive CU's. Also, consistent methodologies for identifying the population, habitat and ecosystem benchmarks called for in the WSP are still under development and these benchmarks are still largely absent for most of the CU's identified. Filling these information gaps will require the determination of stock assessment priorities and extensive time.

In the interim, in the absence of this comprehensive information, it is suggested that the expedient of expert judgement could be used. Expert judgement of DFO Science already provides an annual Salmon Stock Outlook. This Outlook encompasses a high level overview assessment of the population status of 93 different salmon species/stock groupings throughout Pacific Region and places these into 4 categories (Stock of Concern; Low Abundance; Near Target Abundance, and; Abundant). Although this work does not presently align with WSP conservation units and status zones (Red, Amber and Green) the Stocks of Concern identified in the Outlook can all be presumed to lie within a WSP Red Zone. By realigning the Outlook effort to focus on the status of the aggregates of Conservation Units by Freshwater Adaptive Zone and Fisheries Production Area a short list of priorities for more immediate planning efforts could be identified.

In order to illustrate how this could be done, an attempt was made to associate 19 stocks of concern identified in the 2009 Outlook document with groupings of conservation units at a FAZ and Fisheries Production Area scale. These results are summarized in Annex 2. This information is then used to develop a short list of 12 potential planning initiatives for more

⁷ "Canada's Policy for Conservation of Wild Pacific Salmon" – Page 25.

⁸ "Canada's Policy for Conservation of Wild Pacific Salmon" – Page 26.

immediate consideration. These are summarized by species, fisheries production area and freshwater adaptive zone in Table 2 below.

Table 2
Short List of Priorities for more Immediate Planning Initiatives Based on
2009 Salmon Stock Outlook Document

Species	Fisheries Production Area	Freshwater Adaptive Zone(s)
Sockeye	1. Skeena River	LSK, MSK, USK
	2. South Coast Inside	SC, EVI
	3. Central Coast	RSI, BCD, HecLow, NC
	4. West Coast Vancouver Island	WVI
	5. Fraser River	LFR
Chum	6. Skeena River and Nass River	LSK,MSK,USK,LNRP
	7. Central Coast	HecLow,NC
Chinook	8. West Coast Vancouver Island	WVI
	9. Fraser River	MFR,UFR,NTHOM
	10. South Coast Inside	EVI
Coho	11. South Coast Inside	EVI,SC,HK
	12. Fraser River	MFR,LTHOM,STHOM,NTHOM

In effect, an overview assessment by identifying the scope and scale of areas of concern can help in designing appropriate planning responses. In some cases the aggregate of concern may be limited to a single freshwater adaptive zone (e.g. Fraser River Sockeye) while in other cases the concern may extend across multiple adaptive zones and even an entire watershed (e.g. Skeena River Sockeye). In the former case, a focus on localized planning at the level of a FAZ may be appropriate. In the latter case, broader based planning at the scale of a Fisheries Production Area or even multiple Fisheries Production Areas and across a number of adaptive zones may be appropriate.

For example, the present Outlook indicates that the status of Skeena River wild sockeye is of concern and that conservation units of concern are found in all freshwater adaptive zones within the watershed. A planning initiative to deal with this area of concern would be more efficiently designed at the scale of the Skeena River Fisheries Production Area and cover habitat/ecosystem issues in all three adaptive zones within the watershed. Similarly, the present outlook indicates that not only Sakinaw Lake but a number of other wild sockeye

conservation units within the South Coast Inside Fisheries Production Area are of concern. A planning initiative would be more efficiently designed to deal with all of these at the scale of the entire Production Area and both the South Coastal Stream and East Vancouver Island FAZ. Also, the present outlook indicates that Chum salmon conservation units from both the Skeena and the Nass Rivers are at risk. A planning initiative to address this concern would be more efficiently designed to jointly address the Nass and Skeena River Fisheries Production Areas and encompass habitat and ecosystem issues in four freshwater adaptive zones within the two watersheds (Lower, Mid, Upper Skeena and Lower Nass River – Portland FAZ).

Ordering the Short List:

Any short list of initiatives developed on the basis of current resource status will still likely exceed the capacity of the Department to immediately undertake integrated planning for salmon. Some means for further ranking the short list will be needed. Some possible criteria are implicitly and explicitly suggested in the WSP. For example, additional strategic objectives of the policy are to “maintain habitat and ecosystem integrity” and to “manage fisheries for sustainable benefits”. Also, the discussion of the interim planning process expresses the intent to select as priorities conservation units and groups of conservation units “that could significantly limit fishing and other activities”.

In light of this, ranking criteria for the short list could include the importance of the conservation units of concern within a planning initiative to First Nations, commercial and recreational fisheries and the current habitat or ecosystem status within the appropriate FAZ. However, ranking the various planning initiatives on these bases is not necessarily straight forward.

For example, quantitative measures of the contribution of conservation units of concern to fisheries could be developed based on recent harvests. However, this would inevitably focus on the current contributions of the conservation units and miss other important dimensions of the issue. For example, the current contributions of the conservation units to fisheries may be low, but the potential future contributions subsequent to re-building may be significant. In addition, the direct contribution of the conservation units to harvests may be small both under present and all potential future scenarios, but the current status of the conservation units may act as a significant constraint on the harvest of more productive and abundant conservation units and stocks.

Also, as with the population status of conservation units, information on their habitat and ecosystem status is still largely lacking.

To address these omissions, one approach may again be the expedient of expert opinion. Determining the potential fisheries contribution could involve a survey of fisheries managers and other parties with a broad knowledge and understanding of the fisheries with a request to rate the contribution as high, medium or low. For example, Fraser and Skeena sockeye would likely be rated as high while Central Coast and Skeena/Nass chum salmon might be rated as low. Similarly, scientists and other experts could be asked to rate the overall status of salmon habitat within the freshwater adaptive zones associated with each planning initiative as good, fair or poor. Taken together these ratings would help to order the short list of planning initiatives from those with high contribution to fisheries and poor habitat status to those with low contribution to fisheries and good habitat status.

However, of more practical significance this ordering will help to identify the specific geographic areas where directed effort is most immediately needed to develop improved local capacity to engage in integrated planning and to consolidate existing planning activities with respect to salmon.

Two integrated fisheries management plans are presently developed annually for the North Coast and the South Coast areas of the province. These are both developed with input and advice from an Integrated Harvest Planning Committee that includes elected representatives from the commercial fishing sector as well as nominated representatives from First Nations, the recreational fishing community, non-governmental environmental organizations and the Province of British Columbia. Each of these interests has some linkages with local structures including commercial gear and area licence committees, the Sports Fishing Advisory Board local area committees, First Nations Fisheries Commissions, individual First Nations, local stewardship groups and so on.

Although this is a useful starting point, the interests and individuals in more localized structures frequently do not communicate with each other or consider matters jointly at the scale of Fisheries Production Areas or Freshwater Adaptive Zones. Also, there are sometimes a number of ongoing planning initiatives at a variety of scales within the local areas such as local First Nations planning processes, Watershed Based Fisheries Sustainability Planning and Recovery Planning teams established under the Species at Risk Act (SARA) operating independently of one another. Much of this existing effort and time could often be more efficiently applied together in local venues that included all interests at appropriate scales.

Addressing this issue by establishing appropriate local planning task groups that include fishing, community, First Nation, coastal and watershed interests will require considerable effort by the Department. To achieve the integrated planning called for in the WSP local planning task groups will ultimately be needed for all Fisheries Production Areas and for all freshwater adaptive zones where there are habitat and ecosystem issues. Prioritization can help to

determine which Fisheries Production Areas and which Freshwater Adaptive Zones should be the initial focus for Departmental capacity building efforts and which species should be the initial focus for planning as and when these new task groups are established.

Conclusion:

The Wild Salmon Policy calls for the development of comprehensive integrated plans for the management of the full range of genetically distinct salmon populations (conservation units) in Pacific Region. These plans are envisaged as covering all stages of the salmon life cycle and as including harvest strategies as well as habitat measures and population enhancement activities that may impact resource health.

There are a number of significant challenges in implementing this element of the policy. These include the large number of conservation units identified; data and information gaps that will not be filled for a considerable time; lack of local area planning infrastructure in many parts of the province, and; inability to force other agencies and governments to engage in planning around salmon.

Addressing these challenges requires a practical, efficient and incremental approach to implementing planning under the WSP.

First, this needs to include the grouping together of conservation units into a more manageable number of aggregates for planning purposes. It is specifically suggested that the conservation units should be aggregated geographically by Fresh water Adaptive Zone (FAZ) and further aggregated into seven Fisheries Production Areas (FPA's). FAZ include watersheds, rivers and streams that are by definition ecologically similar, likely need to be managed in similar ways and contain salmon populations that are more likely to be ecologically inter-changeable. FAZ also seem to align well with First Nations traditional territories and the direction of the Province with respect to land and water use planning. This scale seems particularly appropriate for engaging individual First Nations and provincial agencies in habitat and ecosystem planning around salmon. FPA's are amalgamations of multiple FAZ within major river systems, watersheds and drainage areas along the coast. This may be an appropriate scale for fisheries planning where commercial, recreational and /or First Nations food, social and ceremonial fishing is focussed on aggregates of conservation units that originate from multiple adaptive zones.

Second, addressing the challenges needs to include the selection of appropriate planning priorities. The WSP envisages this being initially based on the current population status of conservation units. However, comprehensive information on current status is largely lacking particularly for smaller or less productive salmon populations. It is suggested in the short term

that the expedient of expert opinion needs to be used building upon the present annual Salmon Stock Outlook. Realigning the Outlook from its present focus on “stock” groupings to aggregates of conservation units at a FAZ scale and using WSP status categories (Red/Amber/Green) should help to identify a short list of priority planning initiatives at both Fisheries Production Area and FAZ scales for consideration. Further prioritization of the short list according to the present or potential importance of the conservation aggregates to fisheries and the state of habitat within the contributing FAZ could also be attempted.

From a more practical perspective, these priority initiatives would help to identify where the Department needs to initiate its efforts in building more localized planning capacity. Where multi-interest task groups do not presently exist at an appropriate scale, they may need to be created. Where they do exist, they may need to be realigned and explicitly tasked with planning for appropriate aggregates of conservation units. Prioritization can help to determine where to begin in developing the comprehensive, geographic planning structure that will be ultimately needed to deliver integrated planning under the WSP.

Annex 1

Conservation Units and Appropriate Aggregates of Conservation Units for Planning Purposes

Notes

Table 1-1 in this annex identifies the linkages between seven suggested geographic “Production Areas” associated with the major fisheries on the BC coast and the Freshwater Adaptive Zones (FAZ) and Joint Adaptive Zones (JAZ) identified by Holtby and Ciruna. The subsequent tables in the Annex (Tables 1-2 through 1-7) attempt to identify for each species of Pacific salmon, the specific Conservation Units associated with each FAZ and each Fisheries Production Area. In some instances (particularly with Pink salmon) individual conservation units cross FAZ (and in some instances Production Area) boundaries. These instances are indicated in the Tables by an asterisk (*).

Conservation Units associated with trans-boundary River systems have not been dealt with.

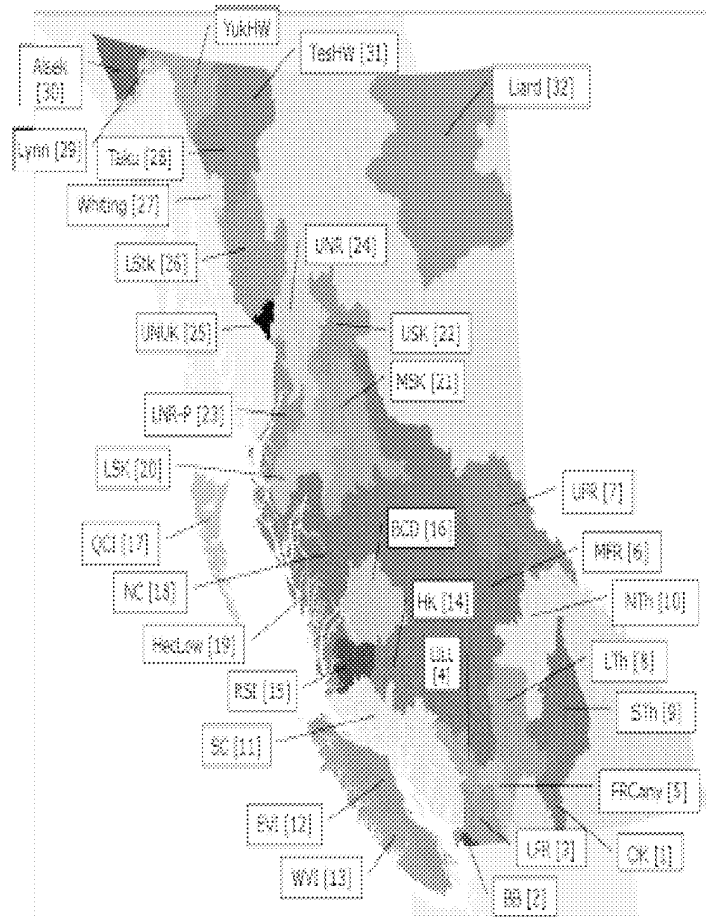


Figure 76 Map of British Columbia showing the Freshwater Adaptive Zones (FAZ) from Table 50.

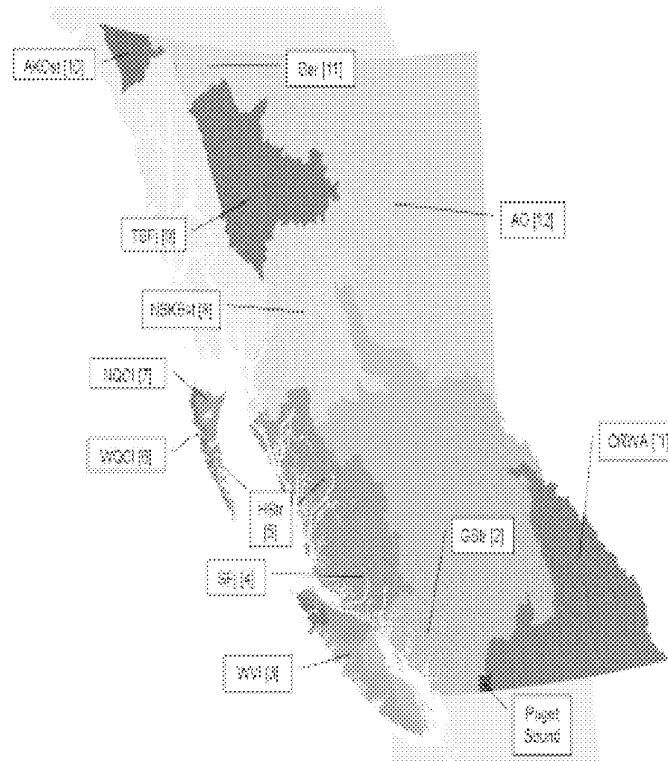


Figure 77. A map of the 12 Marine Adaptive Zones in British Columbia. What is actually shown are the watersheds that discharge into the MAZs.

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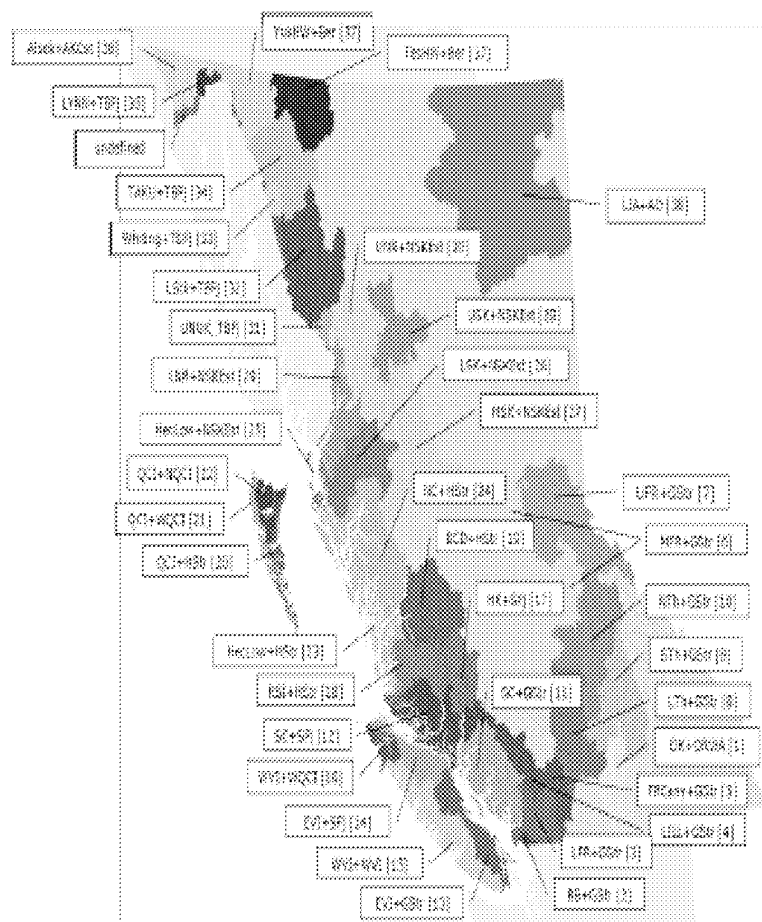


Figure 78. A map of the 39 Joint Adaptive Zones (JAZ) in British Columbia.

Table 1 - 1

**Linkages between Fisheries Production Areas, Freshwater Adaptive Zones and
Joint Adaptive Zones**

Suggested Fisheries Production Areas	Freshwater Adaptive Zones	Joint Adaptive Zones
1. Fraser River	1.1 Boundary Bay (BB)	1.1.1 BB+ Georgia Strait
	1.2 Lower Fraser (LFR)	1.2.1 LFR+Georgia Strait
	1.3 Lillooet (LILL)	1.3.1 LILL+ Georgia Strait
	1.4 Fraser Canyon (FRCany)	1.4.1 FRCany+ Georgia Strait
	1.5 Mid Fraser (MFR)	1.5.1 MFR+ Georgia Strait
	1.6 Upper Fraser (UFR)	1.6.1 UFR+ Georgia Strait
	1.7 Lower Thompson (LTh)	1.7.1 LTh+ Georgia Strait
	1.8 South Thompson (STh)	1.8.1 STh+ Georgia Strait
	1.9 North Thompson (NTh)	1.9.1 NTh+ Georgia Strait
2. South Coast Inside	2.1 East Vancouver Island (EVI)	2.1.1 EVI+ Georgia Strait
		2.1.2 EVI+SFj
	2.2 South Coastal Streams (SC)	2.2.1 SC+ Georgia Strait
		2.2.2 SC+SFj
	2.3 Homathko-Klinaklini Rivers (HK)	2.3.1 HK+SFj
3. West Coast of Vancouver Island	3.1 W Vancouver Island (WVI)	3.1.1 WVI+WVI
		3.1.2 WVI+WQCI
4. Central Coast	4.1 Rivers-Smith Inlet (RSI)	4.1.1 RSI+HStr
	4.2 Bella Coola –Dean Rivers (BCD)	4.2.1 BCD+HStr
	4.3 Hecate Lowlands (HecLow)	4.3.1 HecLow+HStr
	4.4 North Coastal Streams (NC)	4.4.1 NC+HStr
5. Skeena River	5.1 Lower Skeena (LSK)	5.1.1 LSK+NSKEst
	5.2 Middle Skeena (MSK)	5.2.1 MSK+NSKEst
	5.3 Upper Skeena (USK)	5.3.1 USK+NSKEst
6. Nass River	6.1 Lower Nass – Portland (LNRP)	6.1.1 LNRP+NSKEst
	6.2 Upper Nass (UNR)	6.2.1 UNR+NSKEst
7. Queen Charlotte Islands	7.1 Queen Charlottes (QCI)	7.1.1 QCI+HStr
		7.1.2 QCI+WQCI
		7.1.3 QCI+NQCI

Table 1-2

Lake Type Sockeye Conservation Units by Fisheries Production Area (FPA) and Freshwater Adaptive Zone (FAZ)

FPA	FAZ	CU's
Fraser River	Lower Fraser	Chehalis-L
		Chilliwack-ES
		Cultus-L
		Harrison(D/S)-L
		Harrison (D/S)-L
	Lillooet	Pitt-ES
		Lillooet-L
		Kawkawa-L
	Fraser Canyon	Nahatlatch-ES
		Anderson/Seton-ES
	Middle Fraser	Chilko-ES
		Chilko-S
		Francois-ES
		Francois-S
		Fraser-ES
		Fraser-S
		McKinley-S
		Nadina-ES
		Quesnel-S
		Seton-L
	Upper Fraser	Stuart-ESTU
		Stuart-S
		Takla/Trembleur-S
		Bowron-ES
		Indianpoint/Indian-ES
	South Thompson	Adams/Shuswap-ES
		Adams/Shuswap-L
		Kamloops-L
	North Thompson	Kamloops-ES
		Georgie/Songhees
South Coast Inside	East Vancouver Island	Ida/Bonanza
		Nahwitti
		Nimpkish
		Quatse
		Schoen
		Shushartie
		Woss
	South Coastal Stms	Sakinaw
		Tzoonie
		Fulmore
		Heydon

FPA	FAZ	CU's
		Kakweiken
		Loose
		Mackenzie
		Phillips
		Tom Browne
		Village Bay
West Vancouver Island	West Vancouver Island	Canoe Creek
		O'Connell
		William/Brink
		Cecilia
		Cheewat
		Clayoquot
		Deserted
		Fairy
		Great Central/Sproat
		Henderson
		Hesquiat
		Hobiton
		Jansen
		Kanim
		Kennedy
		Maggie
		Megin
		Muchalat
		Muriel
		Nitinat
		Owossita
		Park River
		Power
		Sooke
Central Coast	Rivers-Smith Inlets	Long
		Owikeno
	Bella Coola-Dean Rivers	South Atnarko Lakes
	Hecate Lowlands	Banks
		Bloomfield
		Bolton Creek
		Borrowman Creek
		Busey Creek
		Cartwright Creek
		Citeyats
		Curtis Inlet
		Dallain Creek
		Deer
		Devon
		Douglas Creek
		Elizabeth
		Elsie/Hoy
		End Hill Creek
		Evinrude Inlet

FPA	FAZ	CU's
		Freeda
		Hartley Bay
		Hevenor Inlet
		Higgins Lagoon
		Kakushdish Creek
		Kdelmashan Creek
		Keecha
		Kent Inlet Lagoon
		Kenzuwash Creeks
		Keswar Creek
		Kildidt Creek
		Kildidt Lagoon Creek
		Bonilla
		Kisameet
		Koeye
		Kooryet
		Kunsoot River
		Kwakwa Creek
		Roderick
		Lewis Creek
		Limestone Creek
		Lowe/Simpson/Weir
		Mary Cove Creek
		McDonald Creek
		Mcloughlin
		Mikado
		Monckton Inlet Creek
		Namu
		Port John
		Powles Creek
		Price Creek
		Ryan Creek
		Salter
		Scoular/Kilpatrick
		Sheneeza Inlet
		Ship Point Creek
		Spencer Creek
		Stannard Creek
		Talamoosa Creek
		Tankeeah River
		Treneman Creek
		Tsintack/Moore/Roger
		Tuno Creek East
		Tuno Creek West
		Tyler Creek
		Wale Creek
		Watt Bay
		West Creek
		Yaklele Lagoon

FPA	FAZ	CU's
		Yeo
		Prudhomme
		Shawatlan
	North Coastal Streams	Backland
		Canooka
		Dome
		Evelyn
		James Bay
		Kainet Creek
		Kimsquit
		Kitkiata
		Kitlope
		Quartcha Creek
		Soda Creek
		Whalen
Skeena River	Lower Skeena	Alastair
		Aldrich
		Dennis
		Ecstall/Lower
		Johnston
		Kitsumkalum
		Lakelse
		McDonnell
	Middle Skeena	Atna
		Babine
		Bulkley
		Club
		Kitwancool
		Maxan
		Morice
		Nilkitkwa
		Stephens
		Swan
		Tahlo/Morrison
	Upper Skeena	Asitika
		Azuklotz
		Bear
		Damshilgwit
		Johansen
		Kluatantan
		Kluayaz
		Motase
		Sicintine
		Slamgeesh
		Spawning
		Sustut
Nass River	Lower Nass -Portland	Clements
		Leverson
	Upper Nass	Bowser

FPA	FAZ	CU's
		Damdochax
		Fred Wright
		Kwinageese
		Meziadin
		Owegee
Queen Charlotte Islands	Queen Charlotte Islands	Mathers
		Skidegate
		Ain/Skunkdale/Ian
		Awun
		Jalun
		Marian
		Yakoun
		Fairfax
		Mercer

Table 1-3

Chinook Conservation Units by Fisheries Production Area (FPA) and Freshwater Adaptive Zone (FAZ)

FPA	FAZ	CU's
Fraser River	Boundary Bay	Boundary Bay
	Lower Fraser	LFR fall white
		LFR spring
		LFR Upper Pitt
		LFR summer
		Maria Slough
	Fraser Canyon	FR Canyon –Nahatlach
	Mid Fraser	MFR Portage
		MFR spring
		MFR summer
	Upper Fraser	UFR spring
	South Thompson	STh summer age 0.3
		STh summer age 1.3
		Shuswap River age 0.3
		STh Bessette Creek
South Coast Inside	Lower Thompson	LTHOM spring age 1.2
	North Thompson	NTHOM spring age 1.3
		NTHOM summer age 1.3
	South Coastal Streams	South Coast-Georgia Strait
		South Coast – Southern Fjords
	East Vancouver Island	Docee
		EVI – Goldstream
		EVI – Cowichan and Koksilah
		EVI – Nanaimo spring
		EVI – Nanaimo summer
		EVI – Nanaimo and Chemainus fall
		EVI – Puntledge summer
		EVI – Qualicum Puntledge fall
		NE Vancouver Island
		Homathko-Klinaklini Rivers
		Homathko
		Klinaklini
		Port San Juan
West Coast Vancouver Island	West Coast Vancouver Island	SW Vancouver Island
		Nootka and Kyuquot
		NW Vancouver Island
Central Coast	Rivers-Smith Inlets	Rivers Inlet
		Wannock
	Bella Coola – Dean Rivers	Bella Coola – Bentinck
		Dean River
	North Coastal Streams	NCC – late timing
		NCC – early timing

FPA	FAZ	CU's
Skeena River	Lower Skeena	Skeena Estuary
		Ecstall
		Lower Skeena
		Gitnadoix
		Kalum-Early
		Kalum-Late
		Lakelse
	Middle Skeena	Middle Skeena
		Middle Skeena – large lakes
		Middles Skeena – mainstem tributaries
		Upper Bulkley River
	Upper Skeena	Upper Skeena
Nass River	Lower Nass - Portland	Portland Sound – Observatory Inlet –Lower Nass
	Upper Nass	Upper Nass
Queen Charlotte Islands	Queen Charlotte Islands	QCI – North
		QCI - East

Table 1-4
Coho Conservation Units by Fisheries Production Area (FPA) and Freshwater
Adaptive Zone (FAZ)

FPA	FAZ	CU's
Fraser River	Boundary Bay	Boundary Bay
	Lower Fraser	Lower Fraser A
		Lower Fraser B
	Lillooet	Lillooet
	Fraser Canyon	Fraser Canyon
	Middle Fraser	Middle Fraser
	Lower Thompson	Lower Thompson
	South Thompson	South Thompson
	North Thompson	North Thompson
South Coast Inside	South Coastal Streams	Howe Sound - Burrard Inlet
		Georgia Strait Mainland
		South Coastal Streams/QCStr-JStr-SFjords
	East Vancouver Island	Georgia Strait – EVI
		East Vancouver Island/JStr-SFjords
		Nawitti Lowland*
	Homathco-Klinaklini Rivers	Homathco-Klinaklini Rivers
	West Coast Vancouver Island	Juan de Fuca – Pachena
		West Vancouver Island
		Clayoquot
		Nawitti Lowland*
Central Coast	Rivers-Smith Inlets	Smith Inlet
		Rivers Inlet
	Bella Coola – Dean Rivers	Bella Coola – Dean Rivers
	Hecate Lowlands	Hecate Strait Mainland
	North Coastal Streams	North Coastal Streams
		Douglas Channel – Kitimat Arm
Skeena River		Mussel - Kynoch
		Brim - Wahoo
	Lower Skeena	Skeena Estuary
		Lower Skeena
	Middle Skeena	Middle Skeena
	Upper Skeena	Upper Skeena
	Lower Nass - Portland	Portland Sound – Observatory Inlet – Portland Canal
		Lower Nass
	Upper Nass	Upper Nass
Queen Charlotte Islands	Queen Charlotte Islands	Queen Charlottes/Hecate Strait – QC Sound
		Queen Charlottes/Outer Graham Island
		QCI – Graham Island Lowlands

Table 1-5

Chum Conservation Units by Fisheries Production Area (FPA) and Freshwater Adaptive Zone (FAZ)

FPA	FAZ	CU's
Fraser River	Lower Fraser	Lower Fraser
	Fraser Canyon	Fraser Canyon
South Coast Inside	East Vancouver Island	East Vancouver Island
		Georgia Strait*
	South Coastal Streams	Georgia Strait*
		Howe Sound – Burrard Inlet
		Loughborough
		Bute Inlet
		Upper Knight
West Coast Vancouver Island		South Coastal Streams
	West Coast Vancouver Island	Southwest Vancouver Island
		Northwest Vancouver Island
Central Coast	Rivers-Smith Inlets	Smith Inlet
		Rivers Inlet
		Wannock
	Bella Coola – Dean Rivers	Spiller – Fitz Hugh - Burke
		Bella Coola – Dean Rivers
		Bella Coola River - Late
	Hecate Lowlands	Hecate Lowlands
	North Coastal Streams	Mussell - Kynoch
Skeena River		Douglas - Gardner
	Lower Skeena	Skeena Estuary
		Lower Skeena
	Middle Skeena	Middle Skeena
	Upper Skeena	Upper Skeena
Nass River	Lower Nass - Portland	Portland Inlet
		Lower Nass
		Portland Canal - Observatory
Queen Charlotte Islands	Queen Charlotte Islands	East QCI
		Skidegate
		West QCI
		North QCI
		North QCI – Stanley Creek

Table 1-6

**Odd Year Pink Conservation Units by Fisheries Production Area (FPA) and
Freshwater Adaptive Zone (FAZ)**

FPA	FAZ	CU's
Fraser River	All FAZ	Fraser River
South Coast Inside	East Vancouver Island	EVI – Johnstone Strait
		Georgia Strait*
		Nahwitti*
	South Coastal Streams	Georgia Strait*
		East Howe Sound – Burrard Inlet
		Southern Fjords
	Homathko – Klinaklini Rivers	Homathco-Klinaklini- Rivers-Smith- Bella Coola Dean*
West Coast Vancouver Island	West Coast Vancouver Island	W Vancouver Island
		Nahwitti*
Central Coast	River – Smith Inlets	Homathco-Klinaklini- Rivers-Smith- Bella Coola Dean*
	Bella Coola – Dean Rivers	Homathco-Klinaklini- Rivers-Smith- Bella Coola Dean*
	Hecate Lowlands	Hecate Strait - Lowlands
	North Coastal Streams	Hecate Strait - Fjords
Skeena River	Lower Skeena	Nass - Skeena Estuary*
		Lower Skeena River
	Middle Skeena	Middle and Upper Skeena River*
	Upper Skeena	Middle and Upper Skeena River*
Nass River	Lower Nass - Portland	Nass - Skeena Estuary*
		Nass – Portland - Observatory
	Upper Nass	Upper Nass
Queen Charlotte Islands	Queen Charlotte Islands	East Queen Charlotte Islands
		North Queen Charlotte Islands
		West Queen Charlotte Islands

Table 1-7

**Even Year Pink Conservation Units by Fisheries Production Area (FPA) and
Freshwater Adaptive Zone (FAZ)**

FPA	FAZ	CU's
South Coast Inside	East Vancouver Island	Georgia Strait*
		Southern Fjords*
	South Coastal Streams	Georgia Strait*
		Southern Fjords*
West Coast Vancouver Island	West Coast Vancouver Island	West Vancouver Island
		Northwest Vancouver Island
Central Coast	Hecate Lowlands	Hecate Lowlands
	North Coastal Streams	Hecate Strait - Fjords
Skeena River	Lower Skeena	Nass – Skeena Estuary*
	Middle Skeena	Middle – Upper Skeena*
	Upper Skeena	Middle – Upper Skeena*
Nass River	Lower Nass - Portland	Nass – Skeena Estuary*
	Upper Nass	Upper Nass
Queen Charlotte Islands	Queen Charlotte Islands	North Queen Charlotte Islands
		East Queen Charlotte Islands
		West Queen Charlotte Islands

Annex 2

Conservation Units and Aggregates of Conservation Units Of Concern from the 2009 Salmon Stock Outlook

Table 2-1

Species	Stock of Concern from Outlook	Conservation Unit(s)	Freshwater Adaptive Zone(s)	Fisheries Production Area
Sockeye	Fall – Cultus Lake	Cultus – L (1)	Lower Fraser	Fraser River
	WCVI - Other	Hobiton, Kennedy and Jansen(3)	West Vancouver Island	West Vancouver Island
	Sakinaw Lake	Sakinaw Lake(1)	South Coastal Streams	South Coast Inside
	Area 11-13	Mackenzie, Loose, Kakweiken, Heydon, Fulmore, Phillips, Tom Browne, Village Bay, (8)	South Coastal Streams	
		Georgie/Songhees, Ida/Bonanza, Nimpkish, Quatse, Shushartie, Woss (6)	East Vancouver Island	
	Area 7-10	Long, Owikeeno, South Atnarko Lakes (3)	Rivers-Smith Inlets	Central Coast
		Elizabeth, Elsie/Hoy, Higgins Lagoon, Kakushdish Creek, Kildidt Creek, Kildidt Lagoon Creek, Kisameet, Koeye, Kunsoot River, Kwakwa Creek, Roderick, Mary Cove Creek, Mcloughlin, Namu, Port John, Price Creek, Ship Point Creek, Tankeeah River, Tuno Creek East, Tuno Creek West, Watt Bay, Yaaklele Lagoon, Yeo (24)	Hecate Lowlands	
		James Bay, Kainet Creek, Kitlope, Quartcha Creek (4)	North Coastal Streams	

Species	Stock of Concern	Conservation Unit(s)	Freshwater Adaptive Zone(s)	Fisheries Production Area
Sockeye (cont.)	Skeena Wild	Alistair, Aldrich, Dennis, Ecstall/Lower, Johnston, Kitsumkalum, Lakelse, McDonnell (8)	Lower Skeena	Skeena River
		Atna, Babine, Bulkley, Club, Kitwancool, Maxan, Morice, Nilkitkwa, Stephens, Swan, Tahlo/Morrison (11)	Middle Skeena	
		Asitika, Azuklotz, Bear, Damshilgwit, Johansen, Kluatantan, Kluayaz, Motase, Sicintine, Slamgeesh, Spawning, Sustut (12)	Upper Skeena	
Chinook	Early Spring – upper and mid Fraser and North Thompson	UFR – spring, MFR – spring, NTHOM – spring age 1.3	UFR, MFR, NTHOM	Fraser River
	Spring – upper and mid Fraser and North Thompson	UFR – spring, MFR – spring, NTHOM – spring age 1.3	UFR, MFR, NTHOM	
	Summer – upper and mid Fraser and North Thompson	MFR summer, NTHOM summer age 1.3	MFR, NTHOM	
	Spring – Lower Thompson	LTHOM spring age 1.2	LTHOM	
	Early Spring – Lower Fraser	LFR spring	LFR	
	WCVI Wild	Port San Juan, SW Vancouver Island, Nootka and Kyoquot, NW Vancouver Island	West Vancouver Island	West Vancouver Island
	Georgia Strait Fall – wild and small hatchery operations including Cowichan, Chemainus and Nanaimo Rivers	EVI – Cowichan and Koksilah, EVI – Nanaimo and Chemainus fall	East Vancouver Island	South Coast Inside

Species	Stock of Concern	Conservation Unit(s)	Freshwater Adaptive Zone(s)	Fisheries Production Area
Coho	Mid and Upper Fraser	Middle Fraser	Middle Fraser	Fraser River
	Thompson	Lower Thompson	Lower Thompson	
		South Thompson	South Thompson	
		North Thompson	North Thompson	
	Georgia Strait	Howe Sound – Burrard Inlet, Georgia Strait Mainland, South Coastal Streams/QCStr-JStr-SFjords (3)	South Coastal Streams	South Coast Inside
		Georgia Strait – EVI, East Vancouver Island/JStr-SFjords, Nawitti Lowland (3)	East Vancouver Island	
		Homathko-Klinaklini Rivers (1)	Homathko-Klinaklini Rivers	
Chum	Coastal Areas 5 and 6	Hecate Lowlands	Hecate Lowlands	Central Coast
		Mussell - Kynoch, Douglas - Gardner	North Coastal Streams	
	Skeena-Nass	Skeena Estuary, Lower Skeena, (2)	Lower Skeena	Skeena River
		Middle Skeena	Middle Skeena	
		Upper Skeena	Upper Skeena	
		Portland Inlet, Lower Nass, Portland Canal – Observatory (3)	Lower Nass - Portland	Nass River