Southern BC
Chinook Strategic Planning Initiative

FRAFS FN Workshop

January 18, 2017

Fraser River
Aboriginal Fisheries
Secretariat

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Purpose of Presentation

Presentation is intended to provide update on progress to develop *draft* integrated strategic plan for Southern BC Chinook

- Background and scope of work;
- Planning process to develop plan;
- Key elements of the plan:
  - Status and Trends, Threats and Knowledge Gaps, Strategic Objectives, and Strategies Under Consideration;
- Technical Working Group activities; and,
- Next steps.

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Background – What are the issues?

- Broad pattern of decline affecting many Chinook populations from range of geographic areas (Fraser River, Strait of Georgia, WCVI) in southern B.C.; however, not all populations are affected (e.g. South Thompson).
- Populations face a number of potential challenges, including:
  - depressed and/or declining spawner abundance;
  - reduced and variable survival rates and high uncertainty about future production;
  - pressures on freshwater habitat;
  - ecosystem effects, including predation; and,
  - changing climatic conditions.
- First Nations and stakeholder concerns about conservation of chinook populations, fishery impacts, habitat and ecosystem threats and information required to support management.
- Strong interest in an integrated response, including harvest, hatchery/enhancement, habitat/ecosystem and improved understanding/learning.

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What is the scope of the planning?

- Scope of work is substantial and encompasses:
  - 35 Chinook conservation units in southern BC that enter ocean south of Cape Caution, including 419 Chinook bearing streams;
  - Numerous First Nations' traditional territories;
  - 13 DFO enhancement facilities and nine community-based enhancement facilities (all producing chinook);
  - broad range of freshwater habitats and pressures covering 2/3 of British Columbia;
  - massive and highly dynamic marine ecosystem – encompassing changes in ocean conditions and human stressors in marine environment; and
  - Chinook harvests in fisheries throughout coastal British Columbia and US (Oregon/Washington to Alaska). International obligations under the Pacific Salmon Treaty.

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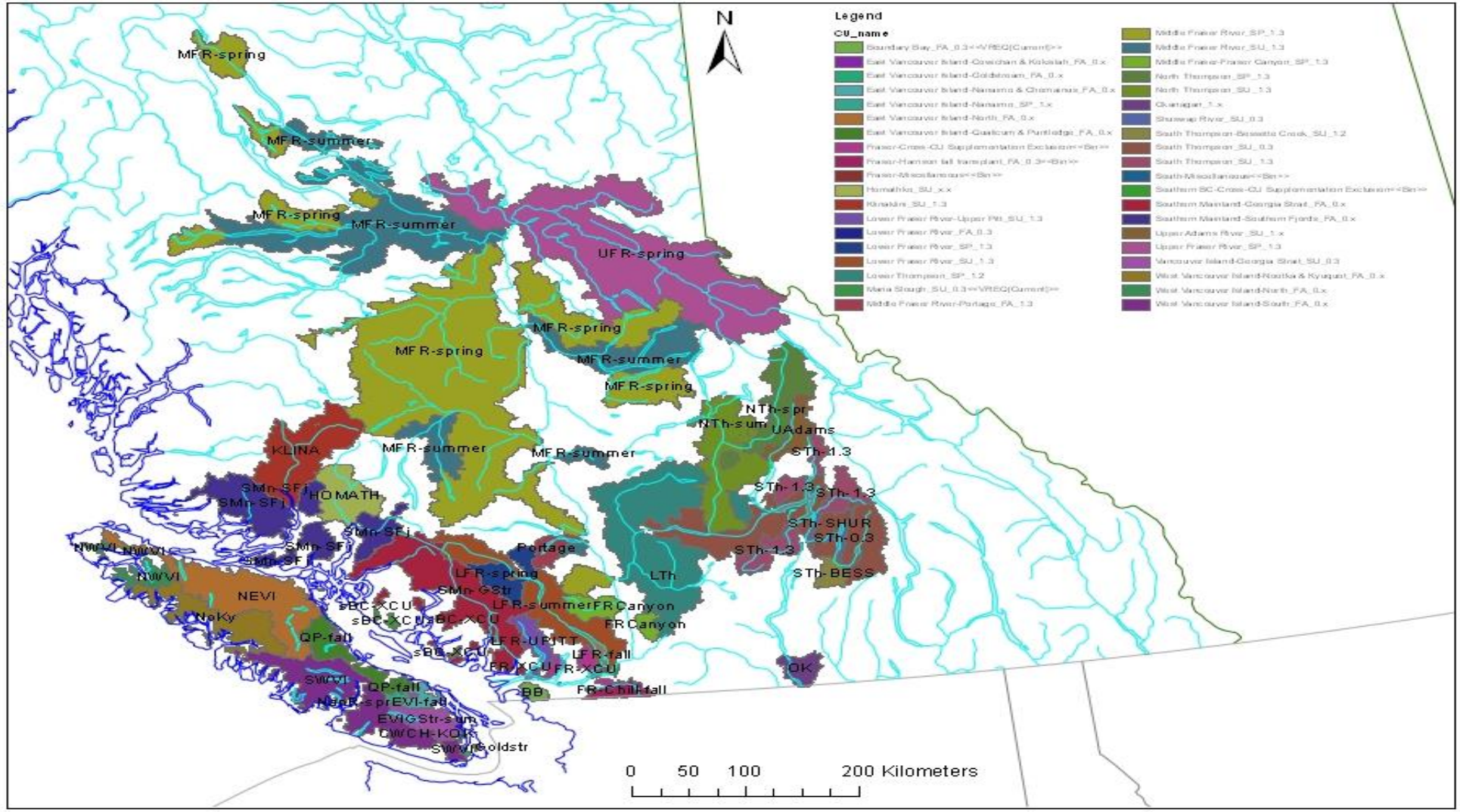
Southern British Columbia Chinook Conservation Units



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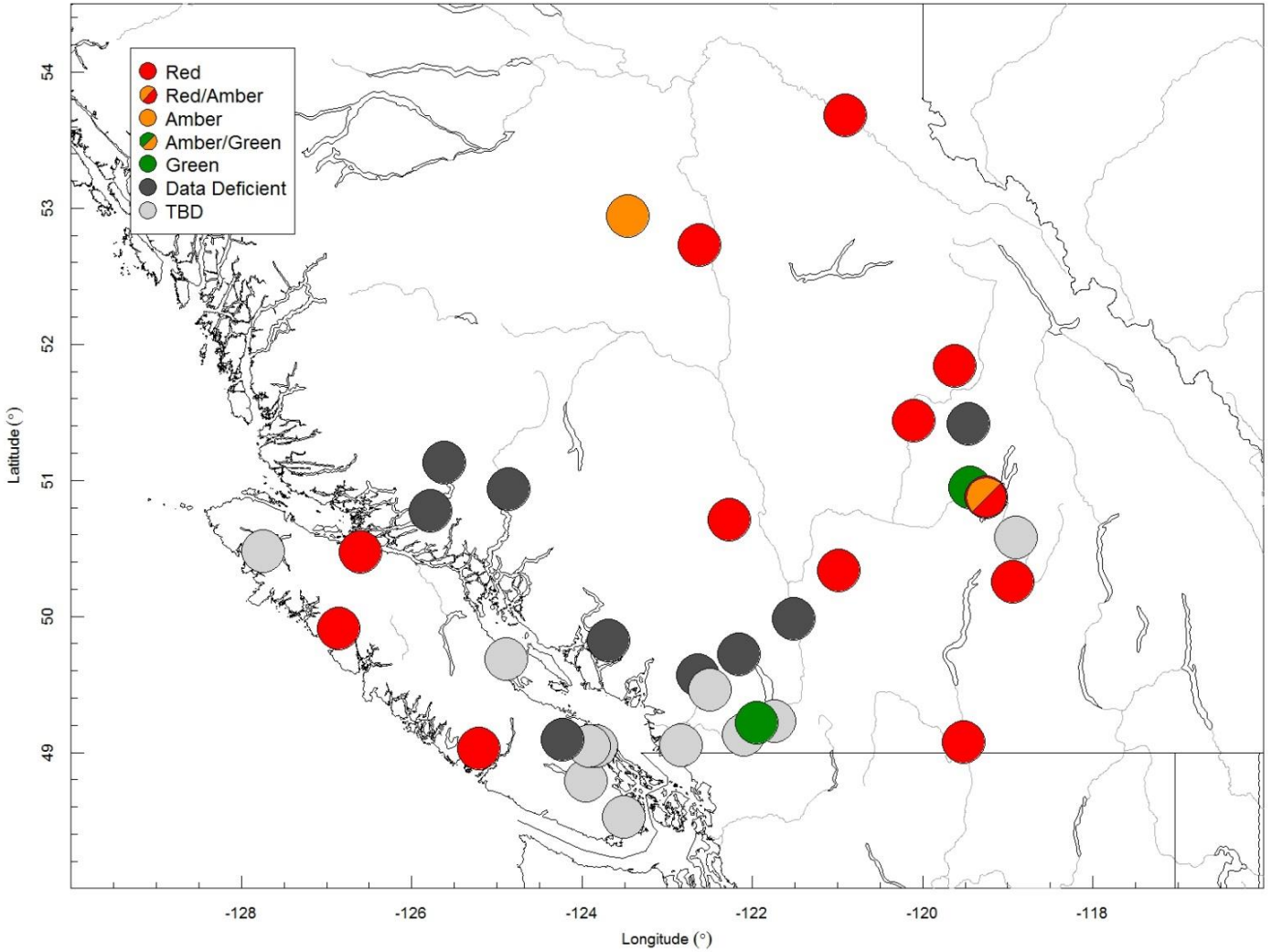
Results of WSP Status Assessment



- 2 **Green** CUs (although 1 is provisional and is flagged for closer monitoring)
- 1 **Amber** CU
- 1 **Amber/Red** CU
- 11 **Red** CUs
- 9 **Data Deficient** CUs (not enough data of sufficient quality to make an assessment)
- 11 **To Be Determined** CUs (pending clarification of enhanced contributions)

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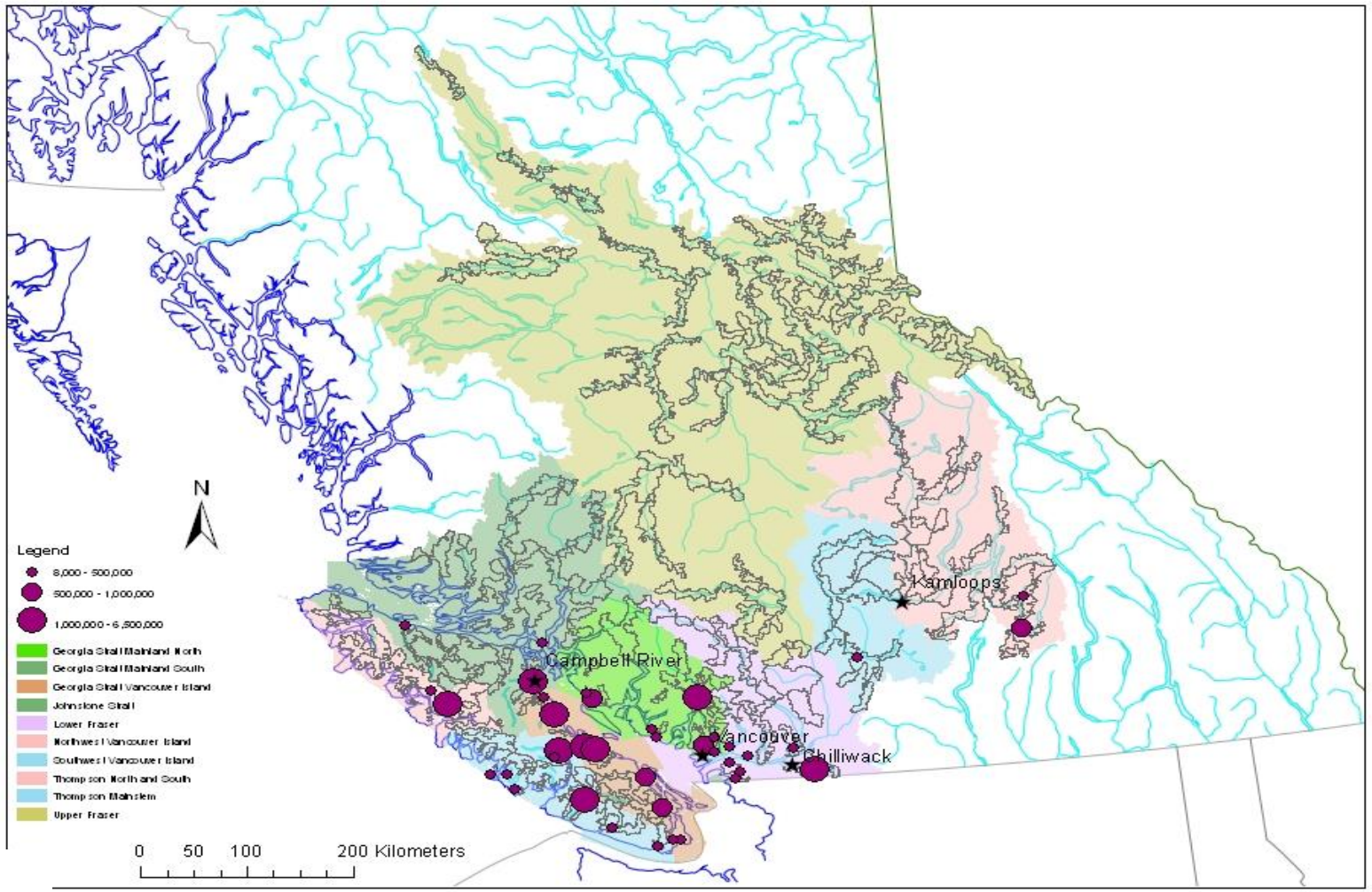
http://publications.gc.ca/collections/collection_2016/mpo-dfo/Fs70-6-2016-042-eng.pdf

Southern British Columbia Chinook
2011 Brood Year Hatchery Production



~40M juvenile chinook produced annually

Source: R. Withler et al. presentation at Independent Science Panel Workshop

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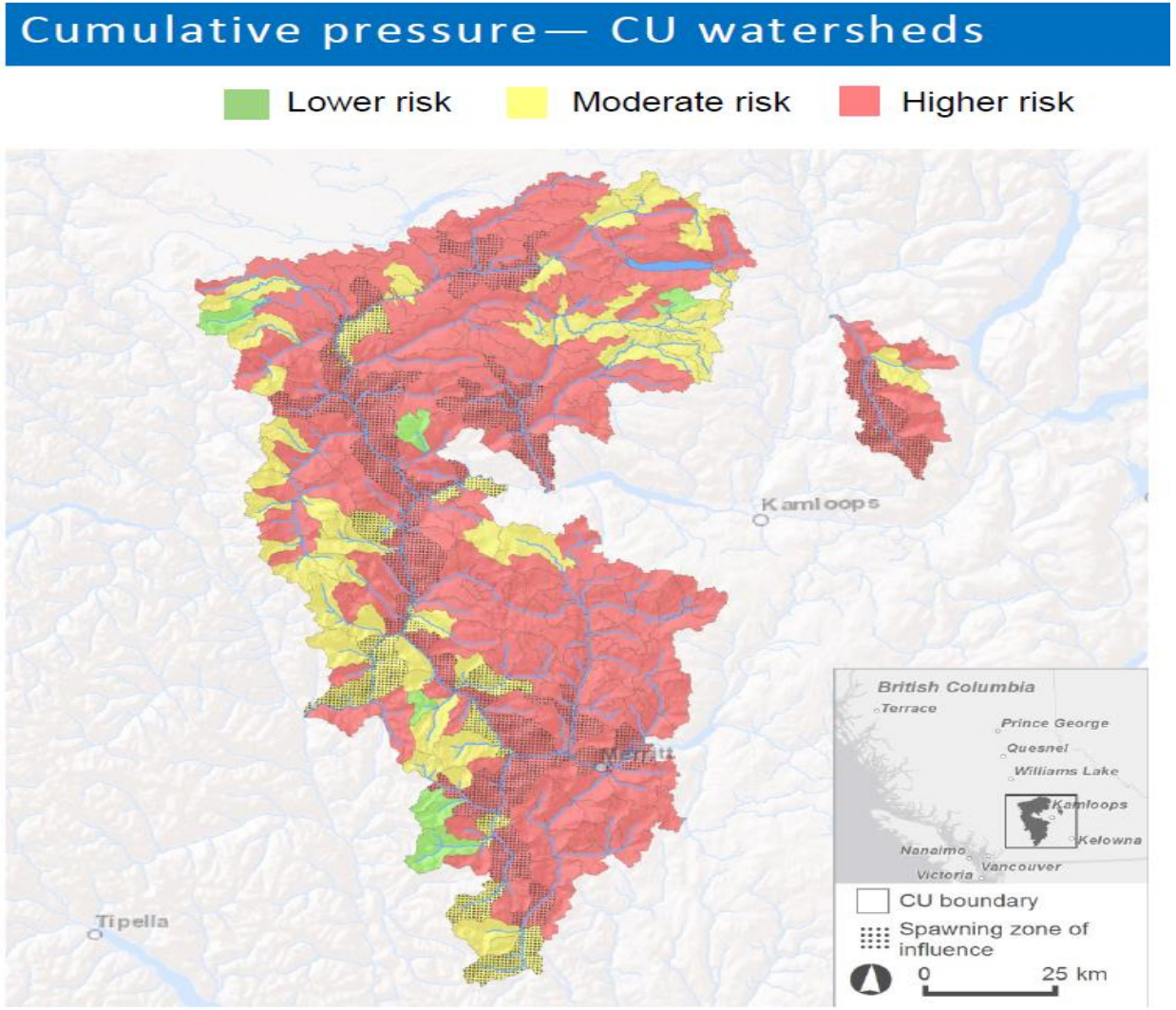
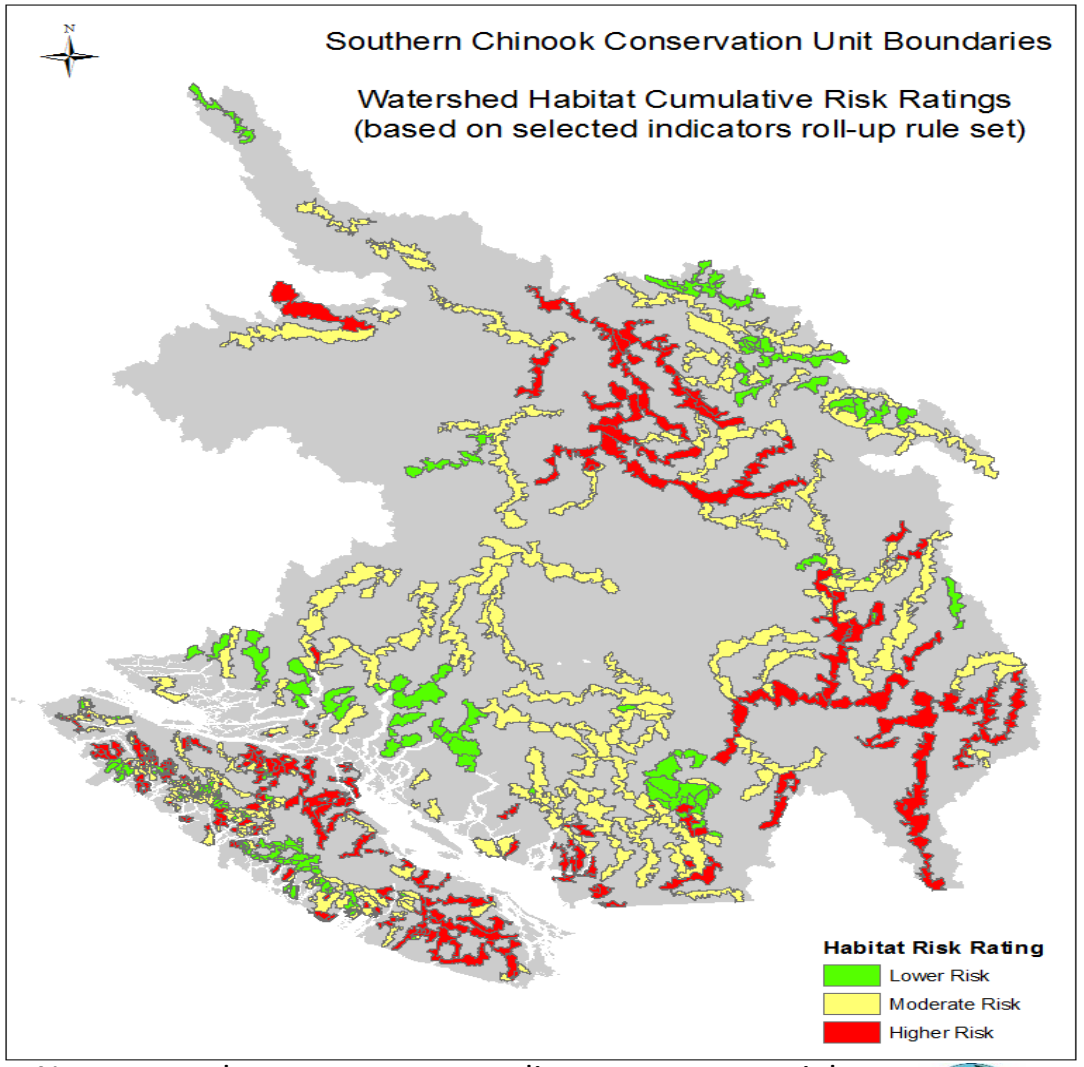
Freshwater Habitats and Pressures



Lower Thompson Sp 1.2 CU (Spring 4_2)



Note: map above represents earlier, narrower spatial definition of CUs; however, analyses re-run using current spatial definitions (as shown at left).

What was our goal?

To develop an Integrated Strategic Plan that accounts for the biological status of southern BC Chinook conservation units, their habitat and the ecosystem, that addresses the causes of any declines, and identifies the management actions necessary to remedy their status where possible.

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What was our approach?

- Commitment made to develop an ***integrated Strategic Plan for Southern BC Chinook*** following Wild Salmon Policy 5 step planning approach
- Collaborative planning process with First Nations and stakeholders supported by a multi-party technical working group
- Plan intended to account for the biological status of southern BC Chinook conservation units, their habitat and the ecosystem, address the causes of any declines, and identify strategic approaches necessary to remedy their status where possible.
- Terms of reference for the work was completed in 2013 and reflects broad scope of issues
- First draft of strategic plan completed in 2016

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Guiding Principles from our Terms of Reference

- This initiative will operate on the principles, process, and decision-making procedures outlined in DFO's Wild Salmon Policy and the Sustainable Fisheries Framework including:
- **Principle 1 Conservation:** Conservation of wild salmon and their habitat is the highest priority in resource management decision-making.
- **Principle 2 Honour obligations to First Nations:** Resource management processes and decisions will honour Canada's obligations to First Nations.
- **Principle 3 Sustainable Use:** Resource management decisions will consider biological, social, and economic consequences, reflect best science including Aboriginal Traditional Knowledge (ATK), and maintain the potential for future generations to meet their needs and aspirations.
- **Principle 4 Open Process:** Decisions will be made in an open, transparent and inclusive manner with clear and consistent rules and procedures. People will contribute to decisions reflecting society's values for wild salmon.

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Governance Structure

1. **DFO-FN Bilateral Steering Committee -** to oversee the overall process
2. **Steering and Planning Committee (SPC) with DFO and FN co-chairs**
    - Includes DFO, First Nations, participating interest groups (CSAB, SFAB, Marine Conservation Caucus, SEHAB) and Province of BC.
    - Terms of Reference developed to guide the process.
    - SPC provides direction on development of the strategic plan.
3. **Technical Working Group (TWG) with DFO and FN co-chairs**
    - Includes Technical experts from DFO, First Nations and other groups.
    - Co-ordinates scientific analyses to evaluate the status of southern BC Chinook, examines potential causes for their decline and then will transition to supporting the strategic planning process – e.g. develop performance indicators, conduct analyses of options, etc.

Wild Salmon Policy (WSP) - 5-step Planning Process

Process intended to be consistent with structured 5 step planning procedure in WSP:

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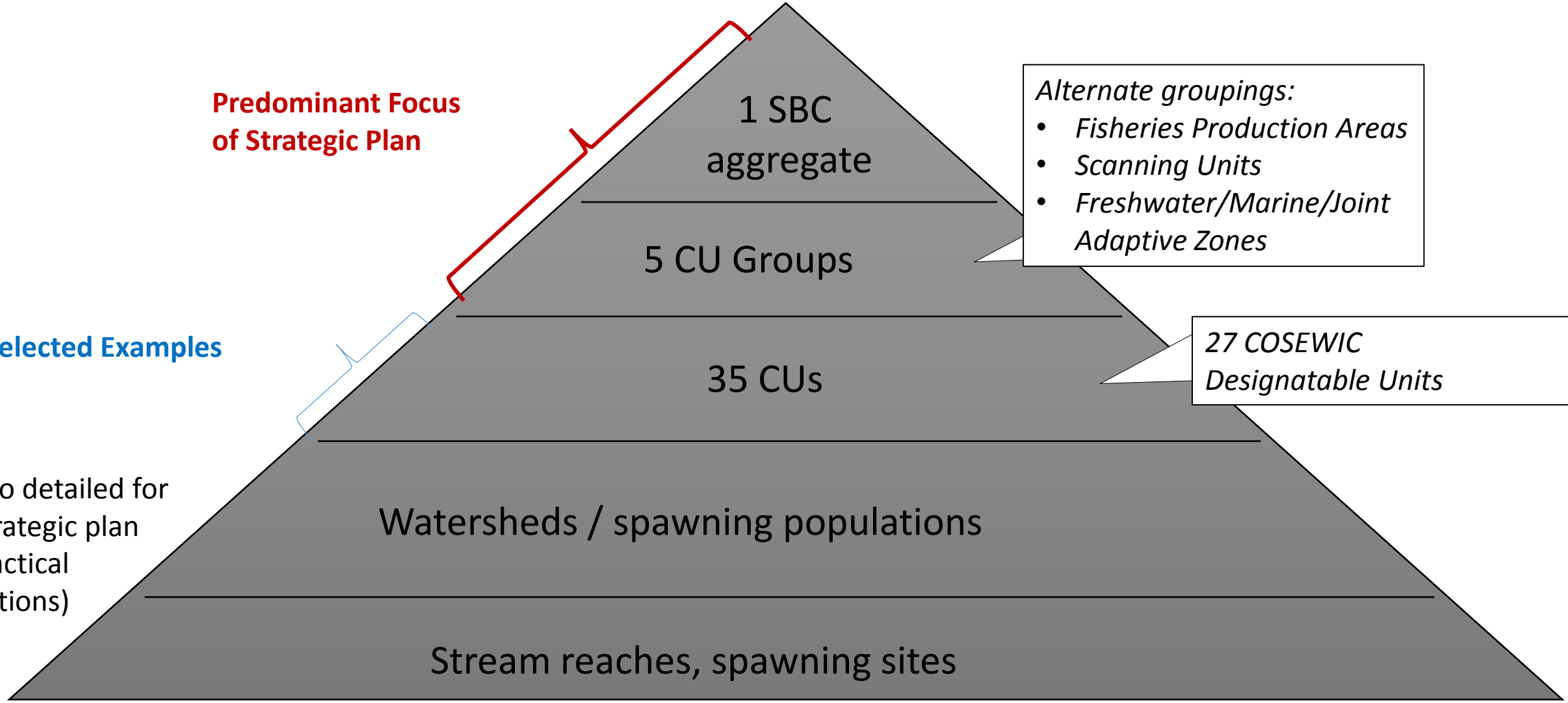
Multiple Planning Scales



What is in the draft Strategic Plan?

- A high level synopsis of work to date that summarizes:
  - Background
  - Status + trends;
  - Limiting factors, threats and knowledge gaps
  - Objectives
  - Strategies
- Some case studies and examples of approaches that have been taken and actions underway are identified.

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Core components of the strategic plan

- Status & Trends *(What is the situation?)*
- Threats and Gaps *(What are the problems?)*
- Objectives *(What do we want to achieve?)*
- Strategies *(How can we achieve objectives?)*

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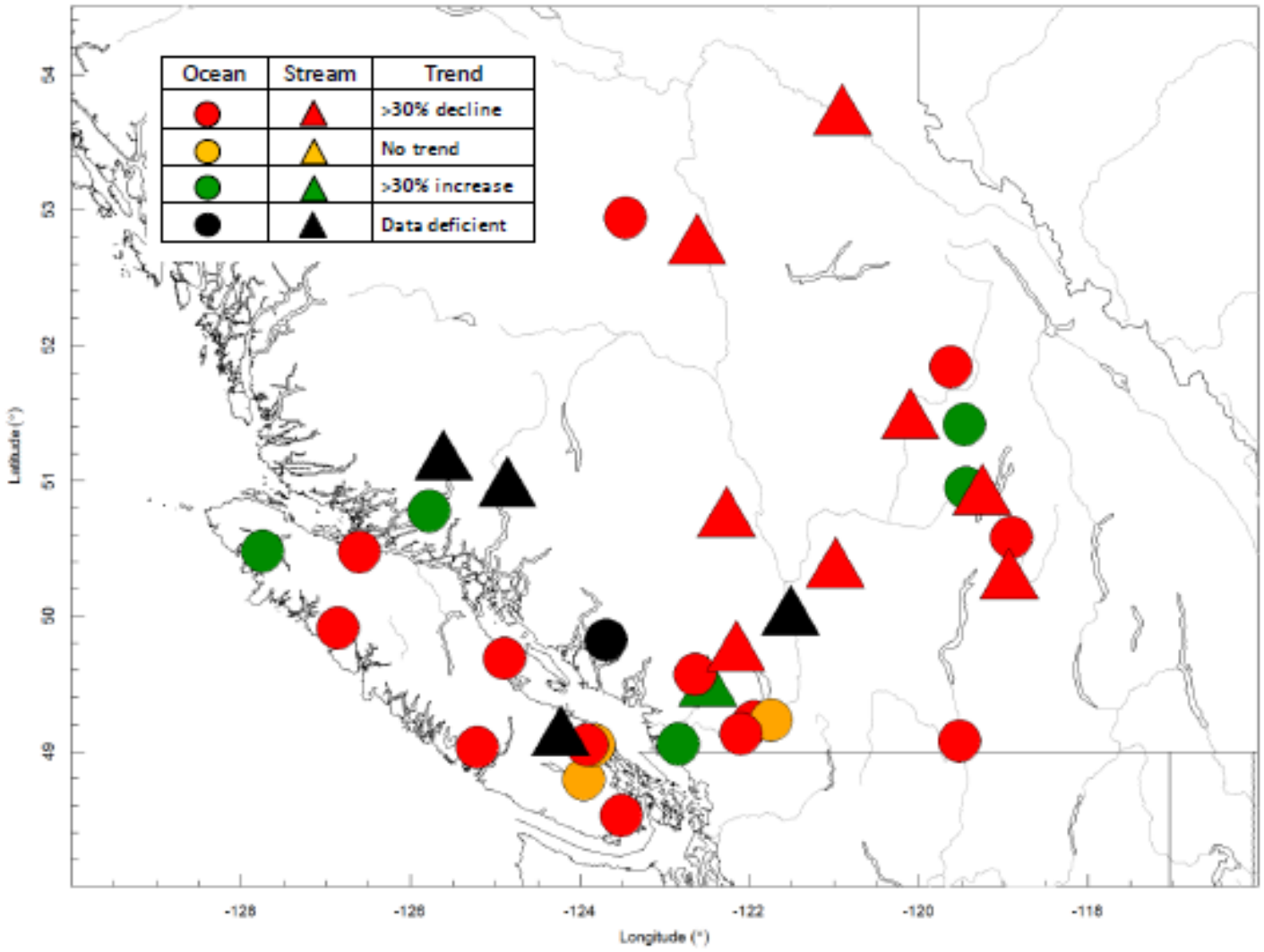
Status and Trends



Three generation trends in spawner abundance classified by *ocean* type and *stream* type juvenile life history.

Source: Figure 3 Draft Strategic Plan

Cumulative effects of different stressors on chinook

Greater Management Control

Less Management Control

Fresh-water habitat Stressors

Flow ↓

Estuary rearing habitat ↓

High temps; low flow

Open net-pen effects (aqua-culture)

Impacts on Chinook?

Hatchery effects

Impacts on wild stocks (e.g., SoG, WCVI)?

Straining marine carrying capacity?

Harvest

Harvest rates > produc-tivity?

Year 0

EGG *Incubation*

ALEVIN *Emergence*

FRY *Rearing*

PARR

Estuary migration

SMOLT

Estuary rearing (Year 0-1)

JUVENILE *inshore*

IMMATURE

ADULT *N. Pacific*

Migration back to Spawn (Year 2-7)

SPAWNING ADULT

Spawning

EGG *Incubation*

Years 2 to 9

Naturally acquired microbes

Pathogen levels in wild fish?

Marine Habitat

Reduced marine survival

Increased predation

Climate change

Changes in marine food, predators, competi-tors

High temps during return

Key Findings of Independent Science Panel Report

- Independent science panel (2013) evaluated relative importance of factors that may have affected abundance and productivity of southern BC Chinook salmon
- Panel reviewed evidence presented and provided recommendations for future research priorities
- Short summary of key findings:
  - Abundances of chinook spawning in many CUs in southern BC have declined substantially over the past 3 generations, but clearest indication of decline is within the Fraser River.
  - Panel could not attribute particular causes to declines other than inferring that low early marine survivals (based on recoveries from CWT indicator stocks) have been primary contributing factor; and,
  - have likely been contributions (to varying degrees across CUs but not quantified) from other factors considered at the workshop (harvests, freshwater habitats, hatcheries, pathogens, and climate change and variation).
- Numerous recommendations made to address critical information gaps.

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Objectives – What do we want to achieve?

- 3 Broad categories of objectives:
  - Biological
  - Social
  - Economic
- Indicators and performance criteria are identified to support reporting on progress towards achieving objectives.
- In addition, resource management processes and decisions will honour Canada's obligations to First Nations;
  - DFO will consult with Aboriginal groups when decisions may potentially affect Aboriginal fishery interests, in accordance with S. 35 of the Constitution Act (1982), relevant case law, and consistent with Departmental policies.

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What strategies are identified?

- Strategies outline broad approaches that should be considered to address limiting factors, threats and knowledge gaps in the following areas:
  - Marine and Estuarine Ecosystems
  - Freshwater Habitat
  - Hatcheries
  - Harvest
  - Monitoring programs to assess status and trends
  - Adaptive Management Approaches
  - Communication and partnerships
- However, strategies do not prescribe specific actions; further analysis and consultation is required on possible actions that follow from the strategies.

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Technical Working Group Activities

The technical working group has provided expert support to the planning process with various contributions to:

- Publications: support for evaluation of CU status and threats (See references in additional slides)
- Qualitative/Expert Assessments of expected outcomes from strategies
- Analytic/modelling work in support of quantitative assessments
    - Models expected to inform in-depth discussion and analysis of specific management actions to implement strategies.

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What work remains on the strategic plan?

- The *draft* plan provides synopsis of work to date and outlines broad strategic directions to address threats.
- In many cases, additional work required to identify specific actions and complete technical evaluation of expected outcomes;
  - however, we expect strategies will inform interim actions and assist with developing priorities for further work.
- Plan helps communicate on potential approaches to address concerns, coordinate activities and support collaborative approaches that optimize collective resources available.
- Plan is a draft document and NOT a final product. Further revisions on the draft plan will be incorporate feedback received.

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Next Steps

- Further feedback and input on the draft strategic plan is requested by February 8, 2017.
- SPC and TWG members will be meeting to review and consider feedback provided on the draft strategic plan
- Funding support (PICFI) to continue this work for 2016/17 has been provided to the Fraser River Aboriginal Fisheries Secretariat

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Process Support

Support for this planning process and technical work has come from a variety of organizations, individuals and funding sources:

- Existing DFO program funding and in-kind staff support
- First Nations steering committee members and technical support supported by First Nations agreements
- COSEWIC funding for pre-COSEWIC assessment
- Pacific Salmon Treaty – Southern Endowment Funding (Independent Science Workshop)
- Planning process support through Fraser River Aboriginal Fisheries Secretariat (FRAFS) with PICFI funding (collaborative management)
    - ESSA Technologies
    - Compass Resource Management and LGL limited (earlier in process)

Additional Background Materials

SPC Members

DFO:
Jeff Grout (co-chair)
John Holmes / Mark Saunders (Retired)
Ryan Galbraith

Other Participants:
Gerry Kristianson (SFAB)
Peter Sakich (CSAB)
Greg Taylor (MCC)
Ian Bruce (SEHAB)

ESSA Technologies:
Alex Hall
David Marmorek

First Nations:
Ken Malloway (co-chair)
Gord Sterritt
Howie Wright
Tony Roberts Jr.
Andy Olsen
Wanli Ou

Alternates:
Pat Matthew
Cheri Ayers
Lyle Billy

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TWG Participants

Co-chairs:

- Mike Staley
- Kendra/Holt/ Gayle Brown / Mary Thiess

Other participants:

- Andy Rosenberger
- Misty MacDuffee
- Bob Bocking
- Rupert Gale
- Jeremy Maynard
- Craig Orr
- Trevor Davies

First Nations:

- Pete Nicklin
- Aaron Gillespie
- Cheri Ayers
- Elinor McGrath
- Janvier Doire
- Katie Beach
- Kelsey Campbell
- Kim Charlie
- Michelle Walsh
- Pat Matthew
- Penny White
- Sabrina Crowley
- Teresa Ryan
- Wanli Ou

DFO:

- Richard Bailey
- Steve Baillie
- Chuck Parken
- Wilf Luedke
- Jason Mahoney
- David Willis
- Marla Maxwell
- Chrys Neville
- Marc Trudel
- Jamie Scroggie
- Arlene Tompkins
- Gisele Magnusson
- Mike Hawkshaw

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References

- *CSAS Special Science Response Process:* ***Review and update of SBC chinook conservation unit assignments*** *(February 2013)*
  http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2013/2013_022-eng.html
- *pre-COSEWIC CSAS processes (March & November 2013):* **Vancouver Island, Sunshine Coast and Fraser chinook Pre-COSEWIC Assessment Report**.
  http://www.dfo-mpo.gc.ca/csas-sccs/publications/pro-cr/2015/2015_058-eng.html
  http://www.dfo-mpo.gc.ca/csas-sccs/publications/pro-cr/2015/2015_059-eng.html
- ***Independent Science Workshop*** *(May 2013):* to identify bottlenecks to productivity of Southern BC chinook. (Independent Science Panel Report)
  http://www.psc.org/pubs/SBC_Chinook_Decline_Panel_Report.pdf
- ***Integrated Biological Status of Southern BC Chinook Salmon (Oncorhynchus tshawytscha) Under the Wild Salmon Policy:*** CSAS Science Advisory Report 2016/042
  http://publications.gc.ca/collections/collection_2016/mpo-dfo/Fs70-6-2016-042-eng.pdf

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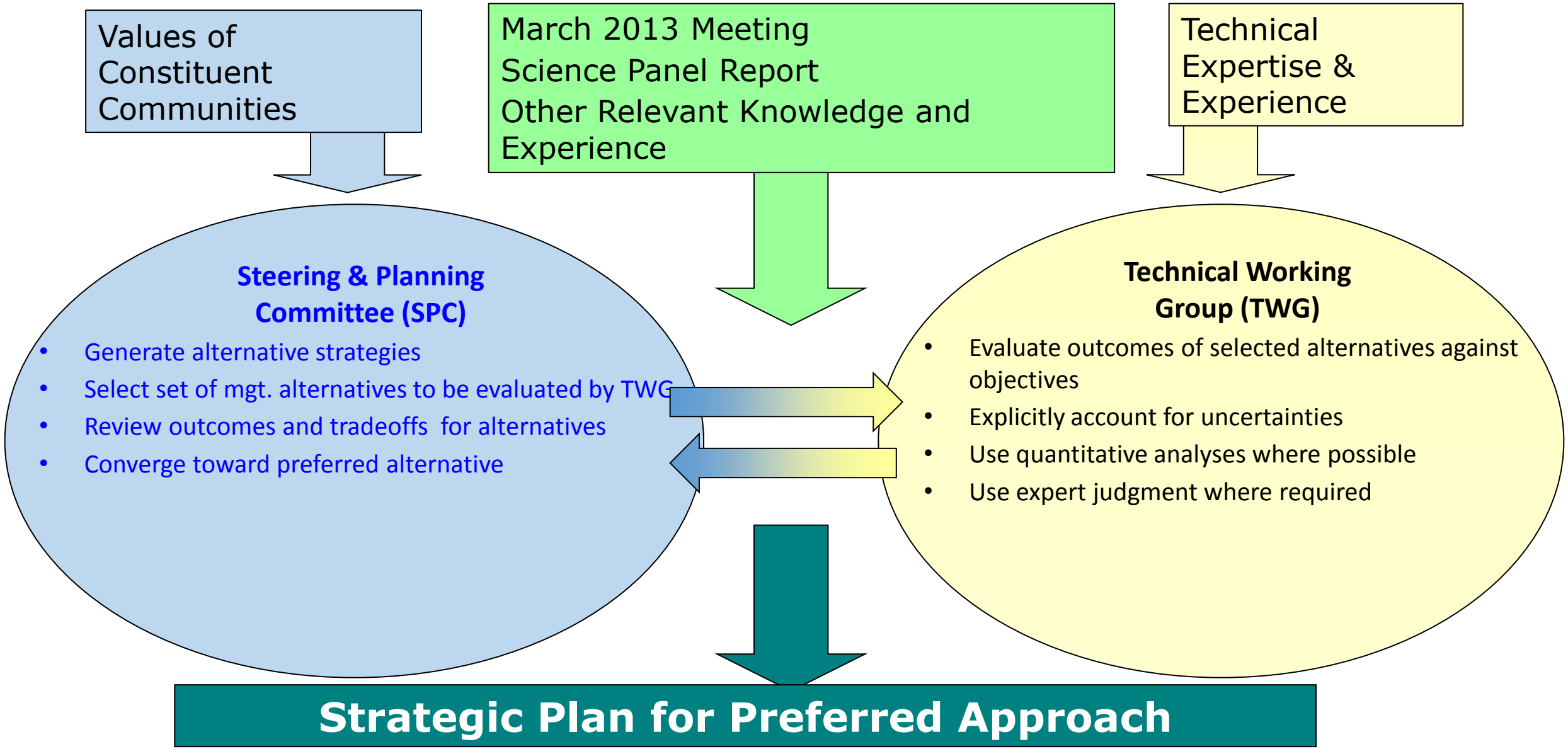
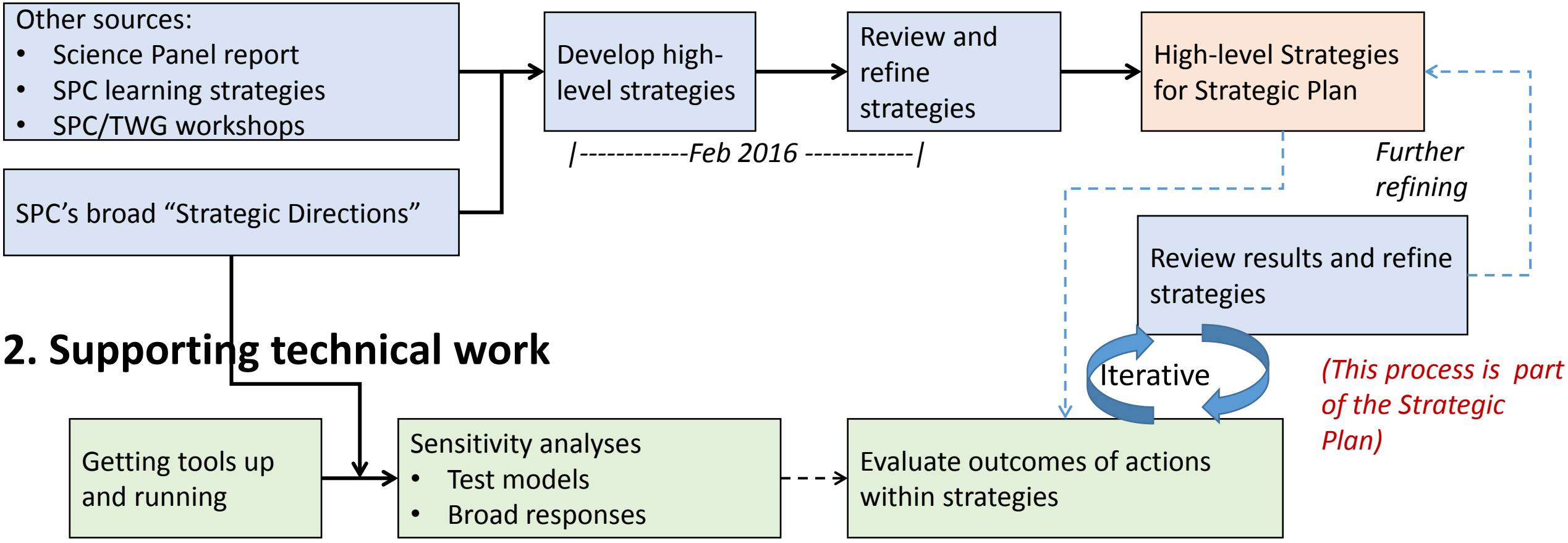
Relationship between SPC and TWG



Two Parallel Streams of work

1. Integrated Strategic Planning Process



The Salmonid Enhancement Program

SEP Program Components

- **Salmon Production**:
  - ~330M juvenile fish produced annually, of which ~40M are chinook
  - 23 major SEP operated hatcheries and spawning channels
  - 21 contracted community and First Nation hatcheries
- **Resource Restoration**:
  - 60+ restoration projects annually,
  - leveraging ~ $3M/year from partnerships
- **Community Involvement**:
  - 18 Community Advisors support ~ 350 volunteer projects
  - Education and Awareness programs

- SEP hatcheries and spawning channels produce 10-15% of BC First Nation, recreational and commercial harvest across all fisheries
- SEP assessment provides key stock information for Fisheries Management and to meet Canadian obligations under the Pacific Salmon Treaty
- Stock Rebuilding– rehabilitation of depressed stocks for conservation and to allow major commercial fisheries to continue
- Over 10,000 volunteers assist in restoration and enhancement activities
- A half million B.C. school children educated about salmon and environment

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Location of DFO Major Enhancement and contract Community Economic Development facilities

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Southern BC Conservation Units

Fraser River Conservation Units

Area	CU Index	CU Name	Adult Run Timing	Major Juvenile Type	Total Spawning Sites[1]	Total Spawning Sites[2]	Time Series in Analysis[3]
Fraser-Lower	CK-03	LFR-fall	FA	ocean	1	1	1
	CK-04	LFR-spring	SP	stream	7	5	1
	CK-05	LFR-UPITT	SU	stream	2	1	1
	CK-06	LFR-summer	SU	stream	9	7	1
	CK-07	Maria	SU	ocean	1	1	1
	CK-9000	(P)HatchX-LFR	FA	ocean	1	1	1
Fraser-THOM	CK-13	STh-0.3	SU	ocean	4	5	4
	CK-14	STh-1.3	SU	stream	4	4	2
	CK-15	STh-SHUR	SU	ocean	3	3	2
	CK-16	STh-BESS	SU	stream	4	4	4
	CK-17	LTh	SP	stream	12	9	6
	CK-18	NTh-spr	SP	stream	8	5	2
	CK-19	NTh-sum	SU	stream	7	7	5
	CK-82	Adams-upper	SU	ocean	1	1	1
Fraser-Upper	CK-08	NAHAT	SP	stream	2	2	1
	CK-09	Portage	FA	stream	1	1	1
	CK-10	MFR-spring	SP	stream	42	24	12
	CK-11	MFR-summer	SU	stream	24	17	6
	CK-12	UFR-spring	SP	stream	40	38	27

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Southern BC Conservation Units

Coastal Conservation Units							
Columbia R	CK-01	OK[4]	SU	stream	1	1	1
GS+OK	CK-02	BB	FA	ocean	3	3	1
	CK-20	SC+GStr	FA	ocean	45	30	6
	CK-21	Goldstr	FA	ocean	2	2	1
	CK-22	CWCH-KOK	FA	ocean	7	7	1
	CK-23	NanR-spr	SP	stream	2	1	1
	CK-24	midEVI-sum	SU	ocean	3	3	2
	CK-25	midEVI-fall	FA	ocean	4	4	2
	CK-27	QP-fall	FA	ocean	10	10	4
WCVI/NEVI/USC	CK-28	SC+SFj	FA	ocean	15	16	10
	CK-29	NEVI	FA	ocean	14	14	5
	CK-31	SWVI	FA	ocean	53	54	20
	CK-32	NoKy	FA	ocean	44	44	21
	CK-33	NWVI	FA	ocean	10	10	2
	CK-34	HOMATH	SU	stream	2	2	1
	CK-35	KLINA	SU	stream	2	2	1

1. This column contains the total spawning sites identified in DFO 2013. This list includes systems believed to either historically have contained or currently do contain Chinook salmon but for which no numerical estimates are available or present in the NUSEDS database.
2. Total Chinook salmon spawning sites present in the DFO NUSEDS database. For a variety of reasons, the total in this column does not necessarily match, nor is expected to match the total associated with footnote 1 above.
3. Out of the total NUSEDS spawning sites (see footnote 2 above), this column contains the number of time series of escapement estimates defined as persistent (i.e., estimates of sufficient quality are available for 50% or more of years between 1995-2011) or extirpated (i.e., numbers of fish have dwindled to the extent that no fish are observed within the spawning period or are so sparse that the site is no longer inspected).
4. CK-01 (Okanagan) is grouped with the Coastal CUs for convenience even though the fish in this CU are geographically distinct from either the Fraser River or Coastal CUs.

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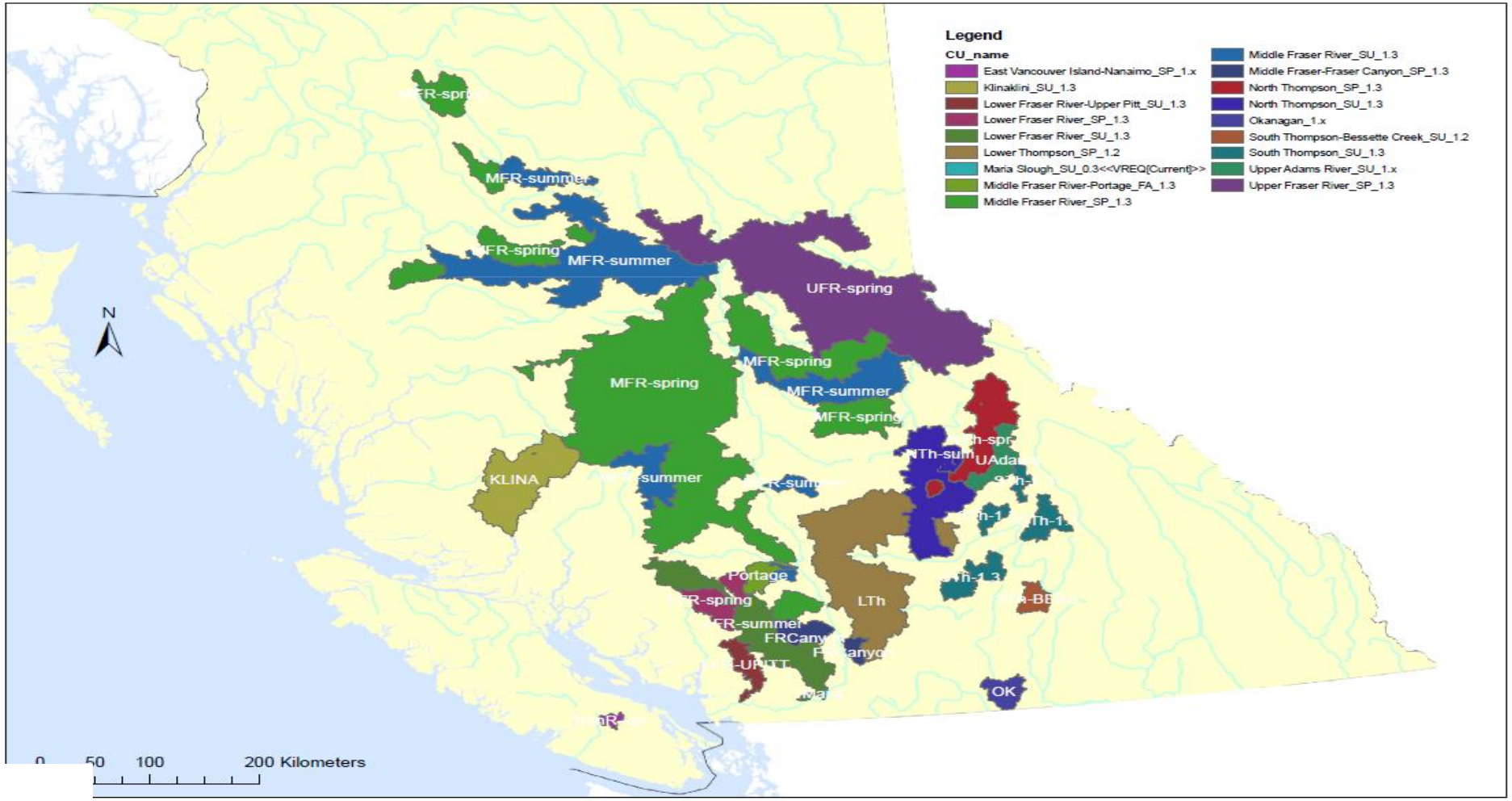
Southern British Columbia Chinook Conservation Units
Stream Type Life History



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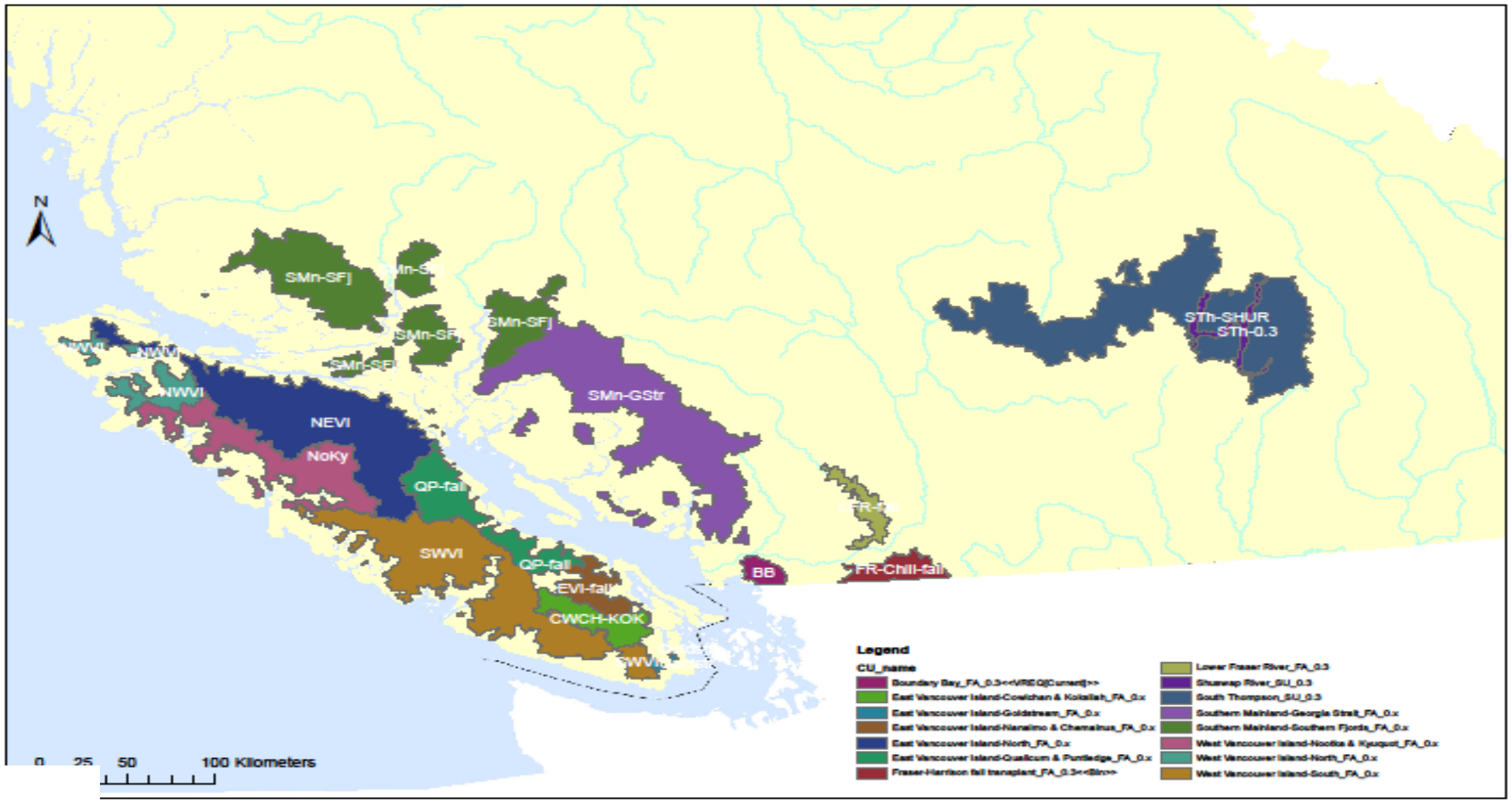
Created May 17,

Southern British Columbia Chinook Conservation Units
Ocean Type Life History



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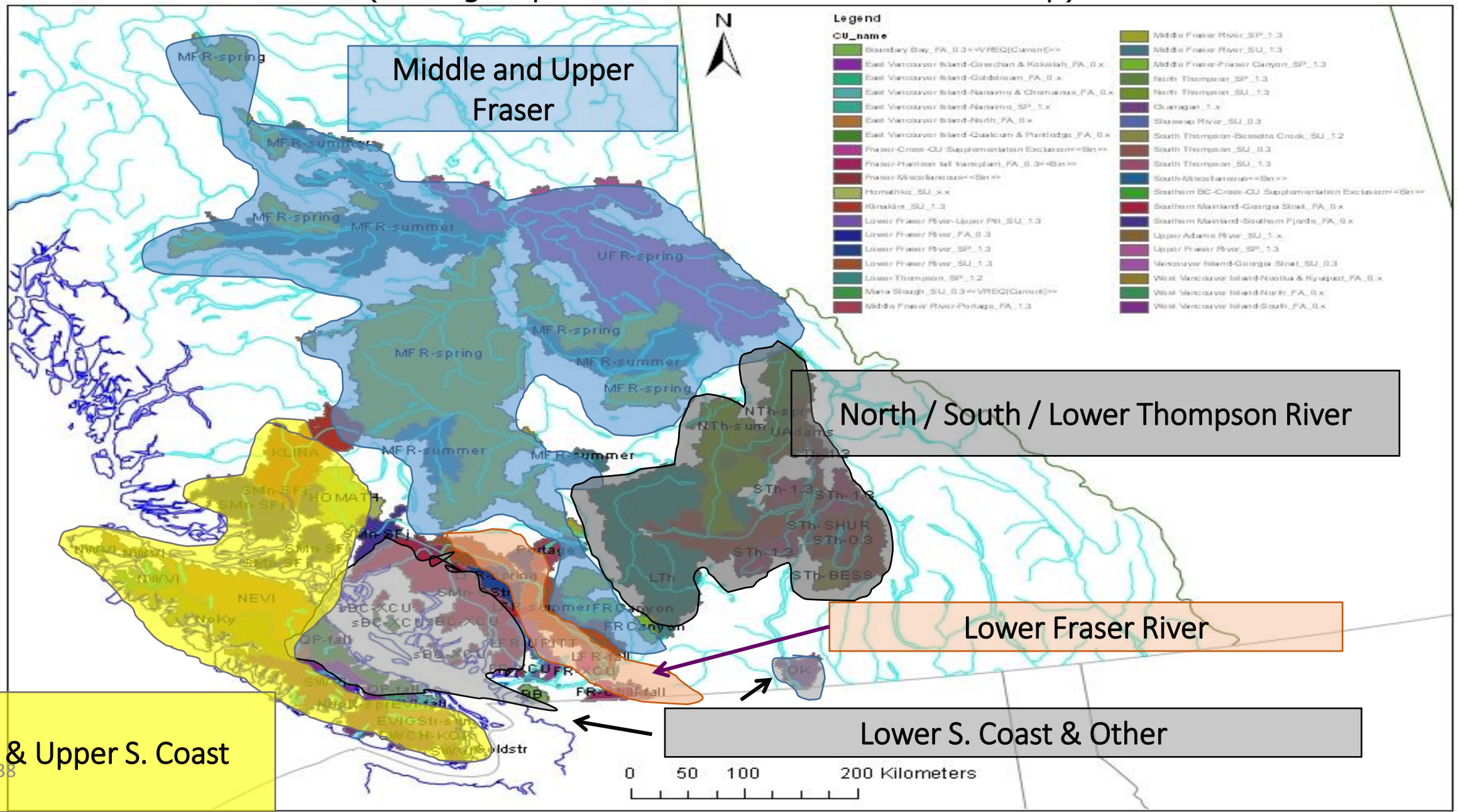
Southern British Columbia Chinook Conservation Units

(5 subgroups used in Science Panel Workshop)



What is the Data Generation Model (DGM)?

- Modelling tool developed by the PSC Joint Chinook Technical Committee (CTC) to evaluate potential effects of different harvest management strategies on Chinook populations.
- Model can account for Chinook production dynamics for any number of Chinook populations and fisheries (user-defined) and range of different fishery regulations over time to explore potential effects on Chinook recovery, harvest, etc..
- Still in development stages. Some preliminary testing has been completed.
- TWG members will be working to develop work plan in 2017 to support further evaluation of alternative harvest management approaches.

What is the Hatchery-Harvest Analysis Tool?

Hatchery-Harvest Analysis Tool (HHAT) is for strategic hatchery production planning.

Quantitative evaluation of the effects on fisheries of alternative production scenarios is one key output.

The HHAT could address two key recommendations of the Southern BC Chinook Strategic Planning process (Hall et al. 2014)

> *"Using CWT indicators to represent all production, develop an updated hatchery production model based on recent years CWT-derived survival and catch distribution data (2009-2012) to be able to quantitatively assess the potential impacts of increases, decreases and shifts in hatchery production to the contributions to specific fisheries"*
>
> *Assess how changes in hatchery production affect changes in harvest levels in different stocks and fisheries. [SPC priority learning strategy]*

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