Status of Coastal Cutthroat Trout in British Columbia

Update from the 2005 Port Townsend (WA) CCT Symposium informed through Regional Fish Bio conversations

Authors

- Ron Ptolemy, BC Ministry of Environment and Climate Change
- Sue Pollard, BC Freshwater Fisheries Society
- Greg Wilson, BC Ministry of Environment and Climate Change

Methods

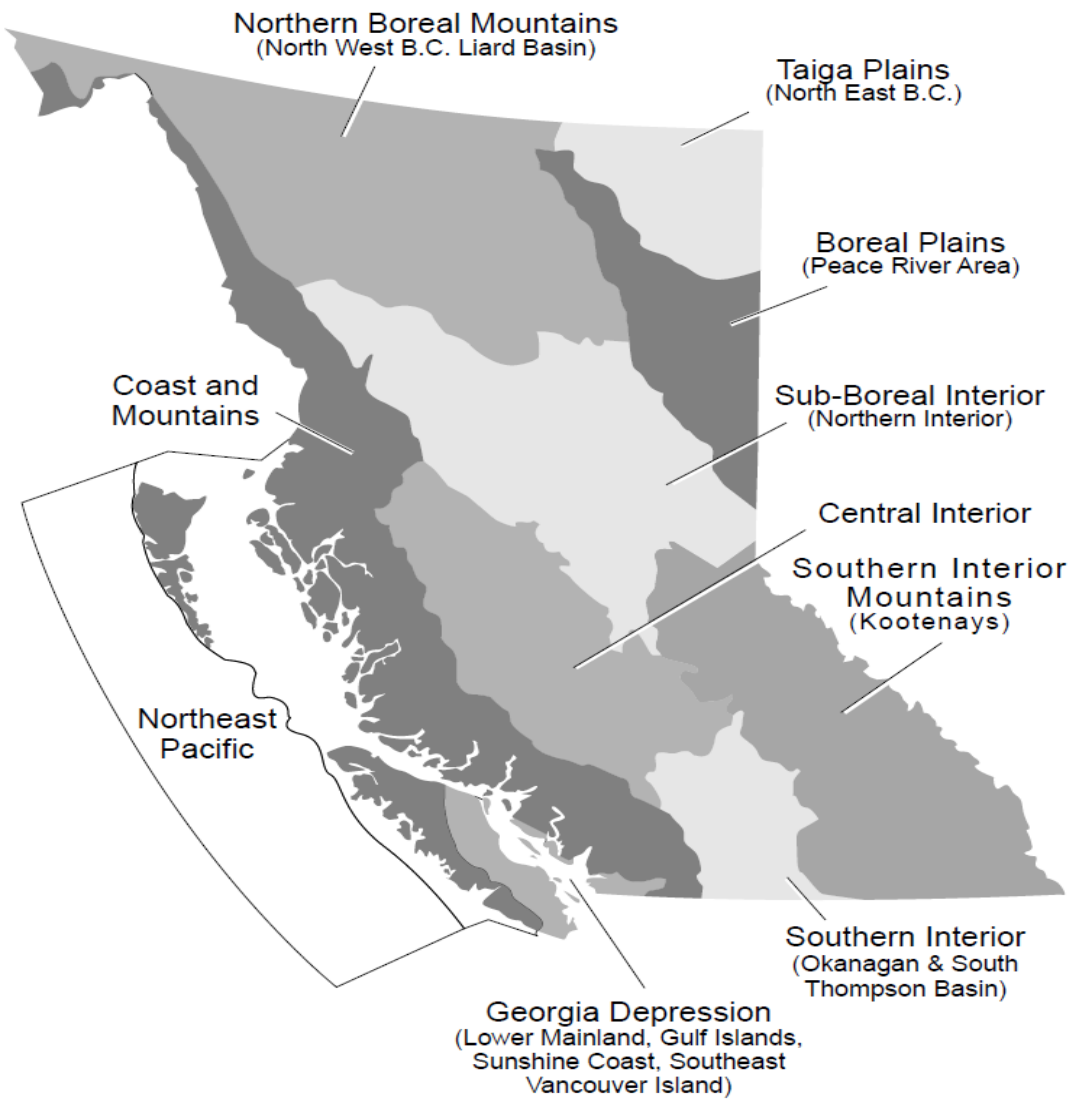
- Build on earlier species status reporting
- Describe CCT ecotypes
- Include recent findings in test cases stratified by ecotypes where CCT exist
- Include terrestrial ecoregion information that is the basis of British Columbia's State of the Environment Reporting as informed by human population and landscape stressors
- Identify which EcoProvinces house CCT
- Identify stressors and off-sets being used per EcoProvince
- Conclude what has happened since 2005
- Is there hope to sustain coastal cutthroat trout with climate change, increased water demands, lost streams?

Anadromous CCT most in Peril

- Slaney, T.L., Hyatt, K.D., T.G. Northcote, and R.J. Fielden. 1996. Status of anadromous salmon and trout in British Columbia and Yukon. Fisheries: 21:20–35.
- Large Lake, Small Lake, Adfluvial, and Fluvial CCT ecotypes were not addressed

CCT found in 3 landscape units

Figure 1.2
The ecoprovinces of British Columbia



1. **Georgia Depression** contains sub-units, EcoSections
2. GD streams drain a dry landscape
3. Certain EcoSections have disproportionate high fish-flow conflicts and house mainly small, short-run CCT streams used by sea-runs which are most productive
4. Landscape has most of the habitat damage caused by economic development
5. There are many stream crossings that have fragmented CCT habitat and access in GD

Georgia Depression

This broad sheltered basin harbours the Strait of Georgia, and includes the Lower Fraser Valley, the Sunshine Coast up as far as Powell River, the Gulf Islands, and the eastern side of Vancouver Island.[1,2] An effective rainshadow appears in the lee of the Vancouver Island Range while more precipitation falls on the Lower Mainland side. The moderate climate and flat lowlands in the Georgia Depression have resulted in a variety of forest habitats. These include Douglas-fir forests, arbutus and Garry oak woodlands, as well as wetlands, agricultural lands, and large estuaries. These habitats support a rich diversity of wildlife species. About 9.4% of this ecoprovince is protected area.[3]

The Georgia Depression makes up only 2.7% of the area of B.C., but contains two-thirds of its people (Figure 3.25). The population density here is about 25 times the provincial average. People are attracted here by the mild climate, a spectacular natural environment, relatively abundant job opportunities, and world class cultural and educational facilities, all within close proximity. During the 1971-1986 period, this ecoprovince absorbed 69%

Cutthroat Trout Conservation Status In B.C.

Name	Status		
	Provincial (B.C.)	COSEWIC [1]	SARA [2]
clarkii subspecies	S3S4 (2004) - vulnerable to secure		
lewisi subspecies	S2S3 (2018) - imperiled to vulnerable	Special Concern (2016)	Special Concern (2010)

[1] COSEWIC = Committee on the Status of Endangered Wildlife in Canada

- provides independent, science advice on conservation status and threats

[2] SARA = Species at Risk Act (Federal legislation)

- legal requirement for protection, recovery actions
- do no harm

COSEWIC currently considering Coastal Cutthroat for assessment (2020+)

Juveniles usually reside in streams,

1. either for all of their lives, or
2. then go to a larger stream, or
3. lake
4. or the ocean

1 - Stream Resident
length: 13-20 cm
3-5+ years

2 – Fluvial
length: 40-55 cm
7-9+ years

4 – Sea-run
length: 40-55+ cm
7-10+ years

3 - Fluvial/Lacustrine
length: 40- 55+ cm
7-9+ years

Summary of CCT EcoTypes

EcoType	Life-history	EcoProvinces	Examples	Monitoring	Status
Large Lakes/Adfluvial	Spawning in inlets, fry-parr migrants maturing in lake	GD, C&M, CI	Cowichan, Sproat, Great Central, Comox, Buttle, Powell, Harrison, Capilano	Creel, stream spawner counts, hydro-acoustic, electronic tag detections in spawning tributaries	Healthy; large-bodied fish common (FL>50 cm)
Small Lakes	Spawning in inlets and outlets, fry-migrants maturing in lake similar to chum salmon life style	GD, C&M, CI	Maltby , Prospect, Elk-Beaver, Horne, Quamichan	Creel, Gill net CPUE	Variable with reduced CCT populations in Rb-stocked lakes (Elk-Beaver, Prospect)
Fluvial	Spawning, rearing, and maturation within a river system or headwaters with no evidence of marine occupation	GD, C&M, CI	Carnation C-trib, Lower Fraser River, Bella Coola, Kitimat	Electrofishing, creel, snorkel surveys	Healthy, mature adults < 50 cm FL
Anadromous	Spawning and rearing to smolt size in small, short-run streams, maturation in the ocean, time in ocean highly variable	GD, C&M	Colquitz, Sandhill, Fulford, Hunts, Oyster	Electrofishing, creel, snorkel surveys, habitat surveys, lost streams of Vancouver	At risk in GD, mature adults > 50 cm FL

CT Observations in BC unique waterbodies (FISS – Sept 2018)

Type of waterbody	VI/Knights Inlet	Lower Mainland	Thompson	Cariboo/Central Coast	Skeena/N Coast	TOTAL
Large Lakes	14	11	3	4	10	42
Stream	1313	811	30	331	1111	3596
Small Lakes	361	172	21	94	154	802

Things to note:

- assume CCT based on occurrence (not in interior regions, Thompson unlikely?)
- Large lake populations are least common in the province (i.e. >1,000 ha)
- Fluvial populations are most common; includes anadromous
- Suspect most Thompson/mid-Fraser observations are either stocked or mis-id'd
- Does not take into consideration stocking records (see next slide); many small lakes have been repeatedly stocked; unknown what original state was

CT Release records for waterbodies

Type of waterbody	VI/Knights Inlet	Lower Mainland	Thompson	Cariboo/Central Coast	Skeena/N Coast	TOTAL
Large Lakes	15 (15 releases in 5 LL)	11 (44 releases in 4 LL)	3	4	10	43
Stream	1313 (460 releases in 50 streams)	811 (782 releases in 72 streams)	30 (7 releases in 4 streams)	331 (12 releases in 2 streams)	1111 (28 releases in 3 streams)	3596
Small Lakes	361 (1934 releases in 152 SL)	172 (601 releases in 61 SL)	21 (20 releases in 11 SL)	94 (5 releases in 3 SL)	154 (110 releases in 7 SL)	802

Comments:

- This includes all stocking records through history
- Biggest concerns are for Lower Mainland streams
- Small lakes have significant stocking records – for Van Isl and Lower Mainland – most of these lakes likely either highly compromised or do not contain wild populations

Research focusing on CCT since 2005

- Kitimat River seasonal movement study and adult over-wintering by-catch issues (Vogt MSc 2017)
- Landscape modelling of CCT smolt production (Burns MSc 2016)
- Comox Lake exploitation study (Govt recently completed 2 year initiative)
- Carnation Creek long-term trend information (ongoing)
- Bella Coola—long-term juvenile abundance trends (tributaries), aerial surveys and adult catch success in mainstem river

Recent Initiatives relevant to CCT

- Water Sustainability Act – implications for fish flows through first-time consideration of environmental flow needs
- RIPARIAN AREAS PROTECTION ACT--to establish directives to protect riparian areas from development so that the areas can provide natural features, functions and conditions that support fish life processes
- Land Based Investment Strategy – Fish Passage Funding. Our current funding is 1 million dollars.
- 2018 review of Lower Mainland anadromous hatchery programs – seeking to cancel 2 CCT stocking programs due to risk to wild populations and unclear benefits to fishery; no anadromous programs left on mainland; only two continue in BC (Oyster and Quinsam)
- COSEWIC is revisiting CCT as a possible candidate for National Conservation Status assessment – clearly two big issues are – lack of quantitative data and challenge with addressing life history diversity
- Various stream stewardship groups in West Coast and South Coast Regions adopting CCT monitoring, flow monitoring and habitat restoration activities in select streams (Colquitz, Nile, Little Campbell,…)
- Freshwater Fisheries Society of BC Announces Pilot Stewardship Grants Initiative for Native Trout Conservation

Comox Lake tagged CCT

Conclusions – 2018 Perspective on Status of BC CCT

Life history	Concerns	Status
Large Lakes	Few, exploitation a consideration but not great	Good – no indication of issues
Small Lakes	Mostly stocked -	Unknown – where they do persist, likely part of larger metapopulation
Fluvial	Depends on location	Good- issues with lower Fraser River
Anadromous	Climate change especially for south coast streams	Gone, at risk or healthy

In all cases, there is very little to no quantitative assessment to confirm status with the exception of a handful of populations

Is there hope for the Future?

CUT-THROAT TROUT

WALLY HARRINGTON HOLDS UP FOR INSPECTION A 3-POUND CUT-THROAT, TAKEN ON A TRIP TO ONE OF THE BARS OF THE FRASER RIVER.