Status of Coastal Cutthroat Trout in British Columbia

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


• Large Lake, Small Lake, Adfluvial, and Fluvial CCT ecotypes were not addressed
CCT found in 3 landscape units
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.**

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provincial (B.C.)</strong></td>
<td><strong>COSEWIC</strong> ¹</td>
</tr>
<tr>
<td>clarkii subspecies</td>
<td>S3S4 (2004) - vulnerable to secure</td>
</tr>
<tr>
<td>lewisi subspecies</td>
<td>S2S3 (2018) - imperiled to vulnerable</td>
</tr>
</tbody>
</table>

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

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

4 - Sea-run
   length: 40-55+ cm
   7-10+ years
## Summary of CCT EcoTypes

<table>
<thead>
<tr>
<th>EcoType</th>
<th>Life-history</th>
<th>EcoProvinces</th>
<th>Examples</th>
<th>Monitoring</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Lakes/Adfluvial</td>
<td>Spawning in inlets, fry-parr migrants maturing in lake</td>
<td>GD, C&amp;M, CI</td>
<td>Cowichan, Sproat, Great Central, Comox, Buttle, Powell, Harrison, Capilano</td>
<td>Creel, stream spawner counts, hydro-acoustic, electronic tag detections in spawning tributaries</td>
<td>Healthy; large-bodied fish common (FL&gt;50 cm)</td>
</tr>
<tr>
<td>Small Lakes</td>
<td>Spawning in inlets and outlets, fry-migrants maturing in lake similar to chum salmon life style</td>
<td>GD, C&amp;M, CI</td>
<td>Maltby, Prospect, Elk-Beaver, Horne, Quamichan</td>
<td>Creel, Gill net CPUE</td>
<td>Variable with reduced CCT populations in Rb-stocked lakes (Elk-Beaver, Prospect)</td>
</tr>
<tr>
<td>Fluvial</td>
<td>Spawning, rearing, and maturation within a river system or headwaters with no evidence of marine occupation</td>
<td>GD, C&amp;M, CI</td>
<td>Carnation C-trib, Lower Fraser River, Bella Coola, Kitimat</td>
<td>Electrofishing, creel, snorkel surveys</td>
<td>Healthy, mature adults &lt; 50 cm FL</td>
</tr>
<tr>
<td>Anadromous</td>
<td>Spawning and rearing to smolt size in small, short-run streams, maturation in the ocean, time in ocean highly variable</td>
<td>GD, C&amp;M</td>
<td>Colquitz, Sandhill, Fulford, Hunts, Oyster</td>
<td>Electrofishing, creel, snorkel surveys, habitat surveys, lost streams of Vancouver</td>
<td>At risk in GD, mature adults &gt; 50 cm FL</td>
</tr>
</tbody>
</table>
CT Observations in BC unique waterbodies (FISS – Sept 2018)

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

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

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<th>Skeena/N Coast</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Lakes</td>
<td>15 (15 releases in 5 LL)</td>
<td>11 (44 releases in 4 LL)</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>43</td>
</tr>
<tr>
<td>Stream</td>
<td>1313 (460 releases in 50 streams)</td>
<td>811 (782 releases in 72 streams)</td>
<td>30</td>
<td>331</td>
<td>1111</td>
<td>3596</td>
</tr>
<tr>
<td>Small Lakes</td>
<td>361 (1934 releases in 152 SL)</td>
<td>172 (601 releases in 61 SL)</td>
<td>21</td>
<td>94</td>
<td>154</td>
<td>802</td>
</tr>
</tbody>
</table>

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

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