



COWICHAN WATERSHED BOARD

Fish Sustainability Target

Draft Target Backgrounder for Discussion by CWB

Target Focus:

Watershed (river) health reflected by sustainable salmon and steelhead stocks.

Draft Target:

Cowichan winter steelhead fry abundance is consistently measured at greater than 30% of estimated stream carrying capacity (or >300 grams/100m²), based on late summer standing stock monitoring results.¹

CBWMP Supported Goals:

Goal 3. Ensure sufficient water is available to sustain aquatic and riparian ecosystems throughout the year.

Technical Considerations:

- Cowichan winter steelhead are not subject to Canadian commercial fishery interception due to run timing (i.e., return to the river as maiden and repeat spawners from December through early April).
- Based on current understanding, only a low-level FN fishery harvest takes place in the river, adjacent to Cowichan Tribes' Reserve No. 1 at Duncan.

¹ Consistent fry densities $>30\%$ of estimated capacity (in "Routine Management Zone") imply a generally healthy stock of wild steelhead (Johnston *et al* 2002).

- No legal sport fishing harvest of wild steelhead has been permitted on Vancouver Island since the mid 1980's. The current Cowichan sport fishery is managed for wild steelhead "catch and release."
- There is no hatchery steelhead program on the Cowichan River (the former program was cancelled in 2007).
- Steelhead spawn and rear throughout much of the length of the mainstem river and in several Cowichan Lake tributaries.
- Steelhead are the most rearing-dependent anadromous species in the watershed, with most smolts (>80%) entering the ocean at age 2.
- Steelhead stock monitoring has been conducted on the Cowichan over several decades through a combination of creel surveys, annual mail-out Steelhead Harvest Questionnaire, snorkel surveys and juvenile population census.

Regulatory Considerations:

- Steelhead management falls under jurisdiction of the provincial government (BC Ministry of Environment and Ministry of Forests, Lands and Natural Resource Operations).
- Lill (2002) classified Cowichan winter steelhead in the "Conservation Concern Zone" (i.e., 10-30% of estimated capacity), during a period of extremely low ocean survival for the species in southern BC waters, bracketing 1997 - 2001, inclusive.
- More recent evidence suggests the stock has now recovered sufficiently to be classified in the "Routine Management Zone."

Impacting Factors:

- Variable marine survival of steelhead, based on prevailing ocean climate and productivity (i.e., food web) cycles.
- Late winter floods may impact steelhead egg-fry survival and severe droughts may impact steelhead parr (i.e., yearlings and two-year-old juveniles) survivals.
- Ad hoc flood control measures involving LWD and gravel removal can impact rearing habitat quality for steelhead and other species (particularly Chinook and coho).
- Spring ramping of flows below the Catalyst Paper Corp. weir (i.e., to <20cms in April-early May) has the potential to dewater steelhead redds at some spawning sites in the upper river before full hatch and fry emergence.
- Unseasonably high September flows with the onset of early rains might compromise electrofishing operations temporarily, but the "window" for such work in the Cowichan practically extends into early October of most years.

Action Plan for 2011 and Beyond:

- Conduct annual steelhead fry stock monitoring at 10 river index sites consistent with past years' practices. This is done by closed-site, multiple pass electrofishing in early-mid September.
- Present results in a standard graph superimposed with provincial limit reference points for steelhead conservation (Fig. 1).

- Include results of annual Cowichan trout snorkel surveys (typically in late July under base flows) to steelhead fry abundance results to broaden the “snapshot” of river health, as reflected by trends in native fish populations. The latter will include anecdotal comments on river habitat conditions over the reach snorkeled by highly experienced crews (i.e., from Stanley Creek below Greendale Trestle to Sandy Pool Regional Park, or a distance of almost 30km).

Potential Partners:

- Ministry of Forests, Lands and Natural Resource Operations (Nanaimo)
- Fisheries and Oceans Canada
- Cowichan Tribes
- Cowichan Stewardship Roundtable

Time Line & Costs:

Collectively, these tasks will take place annually between July 15 and October 30. Reporting to the Cowichan Watershed Board will be by December 31st each year.

Estimated cost for the steelhead fry monitoring and annual trout snorkel survey is approximately \$10,000, shared between BCCF/Living Rivers and the Ministry of Forests, Lands and Natural Resource Operations.

There is a possibility the BCCF share of these annual costs might be lost with termination of the Living Rivers Trust Fund in 2012. At this juncture (mid June 2011) it is too early to know conclusively, and there are other avenues which might be pursued to make up any future funding shortfall.

Bottom Line:

Steelhead fry abundance monitoring is one of the most cost-effective means of assessing the health of this species in a river as large as the Cowichan.

In this case, fry abundance serves as a surrogate measure of the contributing parental brood year strength, recognizing that accurately counting adult steelhead in the Cowichan is both problematic and highly expensive.

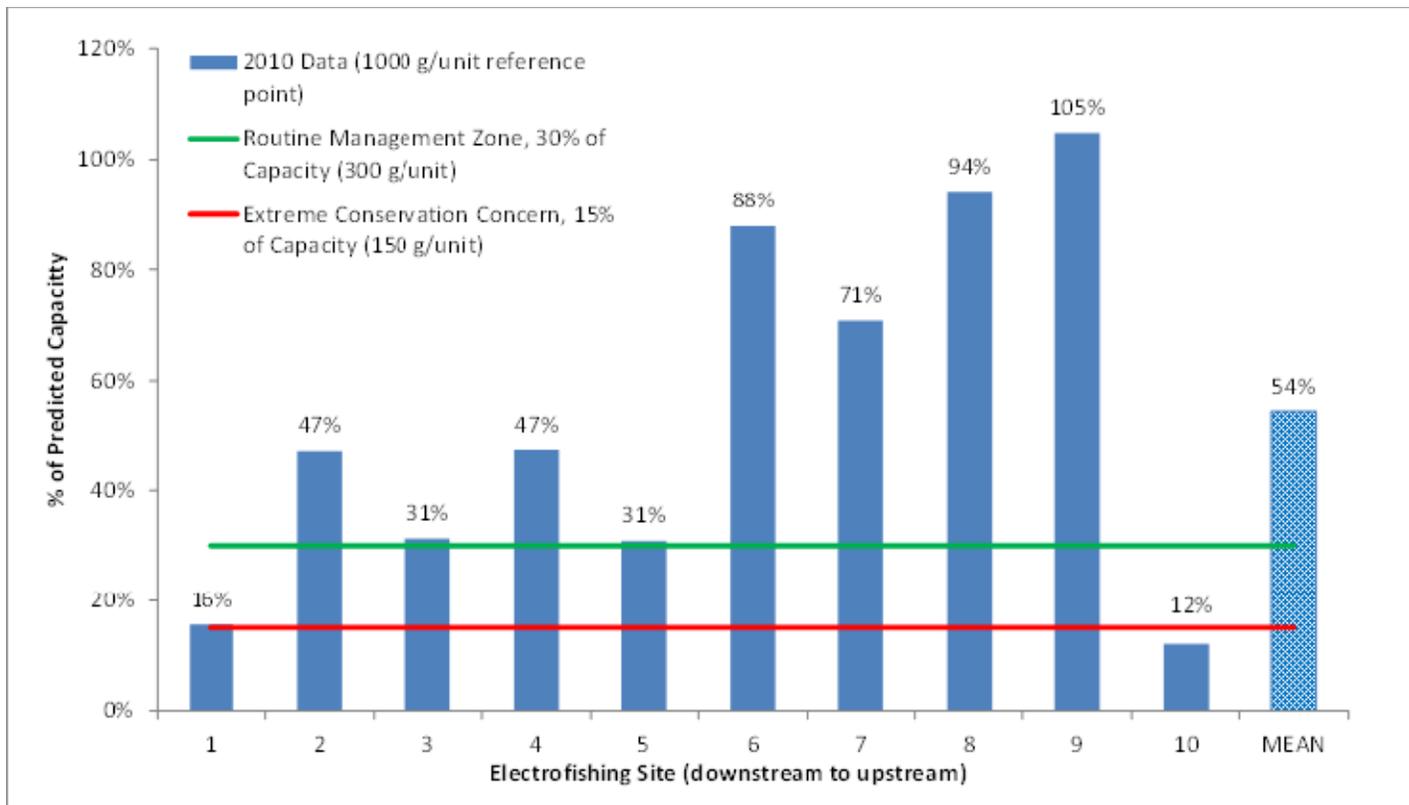


Figure 1. An example of arraying site-specific (2010) steelhead fry abundance in the Cowichan River against a conservation-based target density (i.e., green line represents 30% of estimated habitat carrying capacity).