

Appendix 4

Dove Creek "Hydro Tributary" Mapping and Inventory Project

Sensitive Habitat Inventory and Mapping (SHIM) Surveys

Reports Prepared by:

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For:

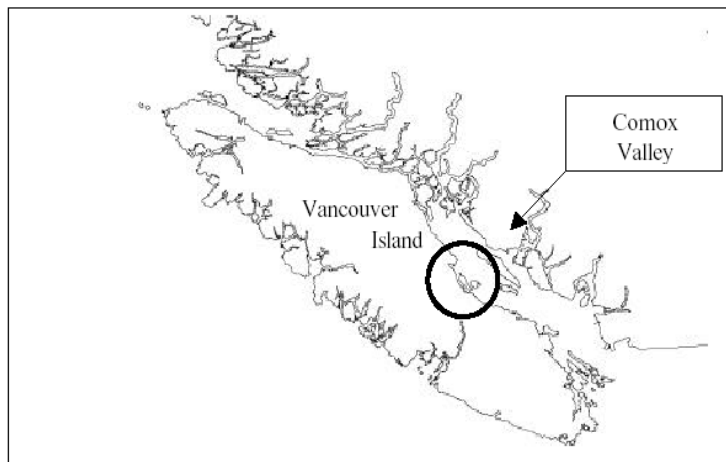
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January 2002

Introduction

The "Hydro Tributary" is a tributary of Dove Creek. Located in the Merville area of the Comox Valley. Dove Creek is a tributary of the Tsolum River which, in turn, flows into the Puntledge River.

The information presented in this report was gathered during the 2002 field season. Funded by BC Hydro, the Tsolum River Restoration Society contracted Comox Valley Project Watershed Society to conduct Sensitive Habitat & Inventory Mapping (SHIM). The primary focus of this survey was determining the hydrology of tributaries that are bisected by the BC Hydro's right of way, recording habitat conditions & opportunities for restoration.



Vancouver Island Map showing location of Comox Valley

Report Prepared by: Joanne Ellefson & Leslie Taylor, Comox Valley Project Watershed Society

Date of Report: January 25, 2002

Date of Survey: Jan. 8, 2002

Survey Summary

Stream Gazette Name:

Alias: Dove Creek Hydro Trib

Watershed Code: – 920-553200-94100-330

Map locations: – 92F 075-1, 92F 075 2

Start Date of Survey: Jan. 8, 2002

End Date of Survey: Jan. 18, 2002

Stream Length Surveyed: 3568m

List of Accompanying Documents: Maps and photos

Research

The "Hydro Tributary" was incorrectly represented on both TRIM & Sensitive Habitat Atlas maps. No existing FISS data was found. A USHP survey was conducted, prior to SHIM, however, this data hasn't been located. The Little River Enhancement Society conducted a habitat survey 200 m upstream & downstream of the new Inland Island Highway. It should be noted that the USHP may have been conducted prior to the construction of the Inland Island Highway & therefore may not be representative of current habitat or hydrological conditions.

Purpose of Survey

The streams inventoried were chosen because of a need to collect information for the following purposes:

- updates to the Regional District of Comox Strathcona's Sensitive Habitats Atlas
- initiation of, or additions to, a set of "Streamkeepers Data" for the watershed
- determining rehabilitation, restoration or protection opportunities for the watershed
- accurate depiction of hydrological conditions

Methods

The methodology used for this mapping/inventory project was "*Sensitive Habitat Inventory Mapping 2001*" developed by Fisheries & Oceans Canada. SHIM mapping was conducted using Trimble Pro XL Pathfinder GPS equipment. SHIM Version 24 data dictionary was utilized for data gathering. Appendix 1 contains meta data.

Overview

This tributary flows through land owned by Timber West, the Ministry of Transportation and BC Hydro. Although there are no residences on this tributary, it is stewarded by the Tsolum River Restoration Society. The Tsolum River Restoration Society has initiated this survey with the intention of doing some habitat restoration on the portion of the creek that crosses the hydro ROW

The Hydro Tributaries main water source is a 4.299-hectare wetland immediately west of the new inland island highway. Situated at the base of a natural drainage basin, this wetland drains into a 50.0m channel constructed by MOTH, flows through a 1.8m x 1.2m cement box culvert beneath the highway and exits east of the highway into 35.0m of constructed channel. At this point it flows through another 1.2m x 1.0m box culvert beneath Farnham road. The constructed channel continues for 292.645m adjacent to Farnham Road & ceases when the tributary enters a wetland between Farnham & the hydro ROW. This 0.172ha wetland provides additional flow. However no definite channel exists at the point where flow leaves the wetland & enters the hydro ROW. Water continues to travel across sedges & grass into a shrub wetland situated immediately beneath the hydro lines. This 3.19ha wetland holds water in low flow conditions, but during dry times is likely isolated from both upstream & downstream channel flow. During flood conditions the shrub wetland discharges water, mainly through overland flow, into a low gradient wetted forest east of the hydro ROW. Two 0.5 m diameter steel culverts do exist, but are inadequate to convey water during high flows. Wetlands east of the hydro ROW add to the flow, obscuring the channel during high flows. However flow continues southeast & a discernable channel is evident from the hydro ROW to the mouth of the tributary at Dove Creek, 300.0m downstream of the where Dove Creek crosses the hydro ROW.

Segment descriptions

Segment 1. Segment 1 is situated in a wide band of mature mixed forest. It is in a natural state and has both spawning and rearing habitat. There is an overall lack of complexity, however the riparian area should provide large woody debris in the future. Salmon remains, redds & one live adult salmon of unknown species (probably coho) were observed.

Segment 2. Segment 2 is also in a mature mixed forest. The substrate consists mainly of fines and there is a lack of cover and complexity. Some redds were observed.

Segment 3. Segment 3 is situated in an alder swamp. This could be good juvenile habitat, should water levels be sufficient during low flow. Redds were observed although the spawning habitat is not ideal due to a predominance of fines.

Wetland 1. An abandoned beaver dam has formed a wetland, 0.48 hectares. No obstruction to fish. Good rearing habitat.

Segment 4. Segment 4 is situated in an alder swamp. Good juvenile habitat. Substrate is mostly fines.

Segment 5. Segment 5 is situated in a deciduous forest. Good juvenile habitat. Well-defined channel. Good instream cover. This section of stream has two large span logs which may be an impediment to fish passage, however, fish skeletons were found upstream of this point.

Wetland 2. Channel diffuses into wetland, 1.29 hectares. Good instream cover. Good juvenile habitat.

Segment 6. Segment 6 is situated in a deciduous forest and runs roughly parallel to the hydro ROW.. Good juvenile habitat. Wetland plants are in evidence. Substrate is predominantly fines.

Segment 7. Segment 7 is situated in a wetland. No defined channel. Water flowing over a width of 35.0 at varying depths. Good winter juvenile habitat. Evidence of drying in summer. Substrate is predominantly fines.

Wetland 3. 0.930 ha Shrub carr wetland, evidence of drought in summer.

Wetland 4. Hardhack swamp under the hydro lines. Has inflow & outflow during high water. Upper, very wet section, 2.5 hectares. Deep water, good refuge habitat, good juvenile habitat. Potential summer rearing. Channels evident throughout this area (see map). No crown cover. Lower portion is dryer and covers 0.69 hectares.

Wetland 5. Shrub carr wetland controls most of the flow of this tributary. Good cover, good juvenile habitat.

Segment 8. Segment 8 has formed as a result of the highways restoration channel (segment 9). The channel makes a 90 degree turn southeast away from Farnham Road and heads toward the hydro ROW. It is poorly defined and full of fines.

Segment 9. Segment 9 is a linear, constructed ditch running along Farnham Road. Instream cover is poor and crown cover non-existent. Span logs and small woody debris are the only cover. Gradient is 3 degrees so it is not a barrier but lack of cover leaves any fish open to predation. This segment crosses under Farnham Rd. The section between Farnham Road and the new highway is short (35m)but evidence of spawning salmon was found. Lack of cover in this section leaves spawners subject to predation.

Wetland 6 – Headwaters. This 4.299ha wetland has inflow from one main tributary and appears to be a natural drainage basin receiving runoff from the steep surrounding hillside. Steady flow issues from the wetland, flowing into a constructed channel skirting the wetland for 50m, before connecting with the upstream end of the Inland Island Highway culvert. This

stream survey stopped at the edge of the wetland. However, the upper watershed was ground truthed for inflow.

Features of Interest and Rehabilitation/Protection Opportunities for Dove Creek Hydro Tributary

- F 1.** Good spawning habitat: Redds and adult salmon were observed in this segment.
- F 2.** End of spawning habitat. Stream channel from this point upstream generally lacks cover and fines predominate.
- F 3.** Adult salmon carcass found
- F 4.** Healthy refuge habitat. Stream is briefly complexed with large woody debris, meandering channel & deep pools.
- F 5.** Riparian alder swamp habitat begins. Cover here is reasonable & this area could be potential juvenile habitat.
- F 6.** Wetland begins. Signs of Beaver activity, though none recent. Channel is not evident. Relic beaver dam has created pool and wetland upstream. Excellent habitat.
- F 7.** Channel resumes
- F 8.** Old Dove Creek Road crossing. Constructed channel lacks complexing and cover. Some planting has been done.
- F 9.** Box culvert excellent fish passage. Willow planted to provide cover at inlet and outlet. Redds observed upstream of upper side of culvert. Habitat pool created at u/s end of culvert, possible fish trap.
- F 10.** Potential obstruction. Large log across stream embedded instream bed.
- F 11.** Channel issuing from wetland. Channel definition ceases through wetland
- F 12.** Channel resumes though entire area is low gradient with wetland characteristics. Sedges, salmonberry & rose growing throughout.
- F 13.** Standing water throughout riparian. Steady flow many braided channels. Sedges, alder & crab apple are plentiful.
- F 14.** Overflow from this wetland drains southeast along this wetted area. No channel is evident until logging road.
- F 15.** 0.5 m diameter culvert. Primary flow from Hydro ROW wetland to wetland east of hydro ROW. Culverts in features 15 & 16 only function during low flows. At high flows the entire road & span between these culverts floods & drains overland to the southeast.
- F 16.** 0.5 m diameter culvert. Secondary flow from hydro ROW wetland to wetland east of hydro ROW
- F 17.** 0.5 m diameter culvert. This culvert exchanges water with a small wetland, separated from the main flow/wetland by a road/culvert. No flow at the time of this survey.
- F 18 .** No channel exists here though this is the discharge for the main flow of this system. Approximately 50 m of wetland diffuses water onto the hydro ROW. This then drains into the hydro wetland.
- F 19.** High point on ground creates drainage division within hydro wetland.
- F 20.** Flow from low lying alder forest between Farnham & hydro ROW.
- F 21.** Flow from low lying alder forest between Farnham & hydro ROW.
- F 22.** Constructed channel created by Inland Island Highway Project begins here & extends to the new inland island highway. Poor cover leaves fish open to predation.

- F 23** – Fish habitat pool, 1.5m deep with large woody debris placement. Lack of crown cover may cause water quality problems in the summer.
- F 24.** Channel flows beneath new inland island highway. Baffled concrete box culvert 1.8m x 1.2m, allows fish passage.
- F 25.** Constructed channel ends. Point where stream enters wetland. Seemingly excellent water containment and cover in wetland should be preserved and promoted as rearing habitat.
- F 26.** Tributary crosses disused logging road & drains into wetland.
- F 27.** Approximate location of drainage divide. This wetland may feed both Hydro & Joshua Creek.
- F 28.** Culvert. Drainage from hydro ROW into wetted forest. Flow here minimal.

Conclusions

Due to excessive rains, flows were high at the time of the survey. However, these conditions may not have been truly representative of the system. The channel characteristics & its tendency to become "lost" in wetlands may be indicative of low summer flows. The hydrology of this stream has been altered due to the bisection of upland, wetlands by the hydro ROW & recently constructed Inland Island Highway. The channel is wide, shallow & essentially linear, though not entrenched. Banks are low & riparian mixed or broadleaf forest with water tolerant species. This system is low gradient & the riparian is predominately wetted. Throughout the survey it was difficult to distinguish "wetlands" from "riparian", as most of the system is of a "wetland" nature. Essentially the entire riparian could have been considered "wetland". However, only those areas with distinctive wetland characteristics were classified as wetlands.

Dove Creek Hydro tributary is in a relatively natural condition from the mouth to the hydro ROW. It has very little good spawning habitat, but may contain abundant rearing habitat. Overall the channel lacks complexity, with minimal meander, almost no large woody debris & few deep pools or cutbanks. Spawning gravel is minimal, fines predominating. The presence of wetlands & patches of instream vegetation indicate that it may serve as juvenile rearing habitat provided water levels maintain through summer. This area is owned by Timber West and may have been left due to the predominate wetted & deciduous nature of the vegetation. However, Timberwest has marked trees for removal in the lower portion of the watershed apparently leaving a minimal buffer on the southwest side of the tributary.

The section through the hydro ROW to the new highway has been recently constructed & lacks natural stream characteristics therefore providing little spawning or refuge habitat. Access to this area is complicated by the lack of a channel across the hydro ROW. Salmonids and resident trout may have access to the entire length of Dove Creek Hydro Tributary at high flows; however, they likely become trapped during periods of low flow.

This tributary has been recently impacted by the construction of the Inland Island Highway; therefore any past data on water flows would be unreliable. Salmon skeletons and redds were observed throughout the system during this survey providing evidence of salmon spawning. One adult salmon (possibly coho) was observed just upstream of the mouth.

Recommendations/Priority Issues

Further study of hydrological conditions during low flow months

- Lack of water during dry months may be a limiting factor for fish. The bisecting of upland wetlands by the construction of the Inland Island Highway may have altered the hydrology of the area. Determination of water levels in the summer would be essential before any restoration projects are initiated.

Construction of a connective channel linking the wetland area on the hydro ROW with the upper & lower channel.

- The creation of a channel linking the newly constructed Farnham channel through the hydro ROW, to the channel east of the hydro ROW would ensure consistent flow and allow fish year round access to upstream habitat. However, flow would have to be regulated at the downstream outlet to ensure that "wetland" integrity was maintained & that flow alteration doesn't create a progressively terrestrial habitat.

Enhancement of the disturbed wetland on the hydro ROW.

- If water levels indicate that this tributary has potential for rearing, enhancement of the hardhack wetland under the hydro lines could contribute to summer rearing habitat. Continuous flow would be essential to the success of this habitat to maintain water quality. Monitoring of water quality would also be essential as the area is exposed with no crown cover.

Riparian planting along the constructed channel adjacent to Farnham Road.

- The Farnham road constructed ditch/channel is in need of some cover to protect fish from predation & to contribute to temperature regulation.