

8/25/2017

Ecological Inventory

Trent River Regional Park



Youth and Ecological Restoration Phase II participants surveying invertebrates in Trent River

Tim Ennis

LATITUDE CONSERVATION SOLUTIONS COMPANY

Wendy Kotilla

YOUTH AND ECOLOGICAL RESTORATION PROGRAM

Contents

LIST OF FIGURES.....	1
LIST OF TABLES.....	1
ACKNOWLEDGEMENTS.....	2
INTRODUCTION.....	2
Background.....	2
Purpose of the Study.....	2
Study Area.....	2
METHODS.....	3
RESULTS.....	4
Upland Forests.....	4
Canyon Wall Slopes.....	6
Floodplain Forests.....	8
Riparian Areas.....	11
Wildlife.....	13
DISCUSSION.....	13
YOUTH LEAD TOUR.....	14
SUMMARY AND RECOMMENDATIONS.....	15
REFERENCES.....	16
Appendix 1 – Photo-plates.....	i

LIST OF FIGURES

Figure 1. Ecological units within Trent River Regional Park.....	4
--	---

LIST OF TABLES

Table 1. Upland Forest site description data.....	5
Table 2. Upland forest vegetation data.....	6
Table 3. Canyon wall slope site description data.....	7
Table 4. Canyon wall slope vegetation data.....	8
Table 5. Floodplain forest site description data.....	9
Table 6. Floodplain forest vegetation data.....	10
Table 7. Riparian site description data.....	11
Table 8. Riparian vegetation data.....	12
Table 9. Wildlife observation data.....	13

ACKNOWLEDGEMENTS

This report could not have been possible without the consistent and enthusiastic efforts of youth field technicians Ashtyn Schow-Smith and one youth who wishes to remain anonymous. The Youth and Ecological Restoration Program (YER) was created by Wendy Kotilla who also provided leadership, program administration, management, coordination and technical field support. The YER Program is funded by the BC Ministry of Children and Family Development. The Comox Valley Regional District (CVRD) provided funding for this YER Phase II project to support a biologist (Tim Ennis) in leading the research and producing this report. Doug DeMarzo, CVRD Parks Manager, provided critical support for the program. Adjacent landowners Brian and Myrna Horley provided access to the park across their private land, and mowed the access trail to facilitate public access to and through the park.

INTRODUCTION

Background

This report summarizes data collected during an ecological inventory project in the Comox Valley Regional District's Trent River Regional Park from July 19th-21st, 2017. The inventory was conducted by participants of the Youth and Ecological Restoration Program including Ashtyn Schow-Smith (youth participant), an anonymous youth participant, Wendy Kotilla (YER Program) and Tim Ennis (Latitude Conservation Solutions Company).

The vision of the YER program is to engage vulnerable or at-risk youth in a wider circle of community relationships, in both the human and natural worlds. The program involves them with meaningful work and caring adults who support them in building self-esteem and who have the ability to transform their lives. In YER, youth travel a journey together with their community and experience a better relationship with the people and places of home (YER 2017).

The Trent River Regional Park was selected as a study site for the 2017 YER Phase II project. The park is private land that was acquired by the CVRD as parkland due to its exceptional natural values and recreational opportunities. The parkland was acquired in two separate parcels. The first parcel was acquired in 2005, and the second parcel in 2016 for a total of 13.85 hectares.

Purpose of the Study

1. To support vulnerable youth within the Comox Valley by providing them with hands-on opportunities to engage with nature and adult mentors through an ecological inventory project;
2. To provide baseline ecological information to support CVRD park management and decision making.

Study Area

The Trent River Regional Park (13.85 ha) is located along the Trent River in the Comox Valley Regional District south of the City of Courtenay. The park extends from the E&N Railway trestle across the Trent River, upstream (southwest) for a distance of approximately 900 meters. The study area has been identified by the CVRD and other groups such as the Comox Valley Land Trust as a priority for conservation based on the presence of sensitive ecosystems, its contributions to wildlife movement and landscape-scale connectivity and the habitat it provides to salmon, steelhead and species at risk (Ennis 2017).

The Trent River Regional Park occurs within the Nanaimo Area Lowlands Ecoregion (NAL) and the leeward variant of the very dry, maritime subzone of the Coastal Western Hemlock biogeoclimatic zone

(CWHxm1). This biogeoclimatic variant/subzone has warm, dry summers and moist, mild winters with little snowfall. The growing season is long, and moisture deficits are common during the summer months (Green and Klinka, 1994). The Trent River occurs within a deeply incised canyon for much of its length, including within the park. The canyon ranges from less than 100 m wide to over 350 m wide, with canyon walls from 50m to over 80 m high.

METHODS

The methods employed by this ecological inventory were adapted from the Describing Ecosystems in the Field methodology for Site Description and Vegetation (MOE 1998). Only a subset of the Site Description data was recorded for this project. Decisions regarding which data to record or omit were made during a pre-project planning meeting based on the following considerations:

1. Maximizing the utility of the inventory data to park management and decision making;
2. Maximizing the engagement of the youth participants (both age 12) in the data collection process;
3. Logistical (time) constraints.

In some cases the methods of data collection were also modified. For example, vegetation data was recorded as categorical data not percent cover to reduce observer bias, and to speed up the data collection process.

Pre-typing of Ecological Units on the property was based on 2016 aerial photography and in consideration of both Google terrain data and CVRD iMap topographical data. Ecological Units were sampled with a site description/vegetation plot in the field. Potentially suitable plot locations were also pre-determined from aerial photography. Suitability was determined based on the objectives of:

1. Completing one plot in each Ecological Unit;
2. Locating the plots near the main access trail to facilitate subsequent visitation of the plots during a public tour at the end of the project.

The plots were 11.28 m radial plots (400 m²). The plot location was adapted as necessary in the field in order to ensure that the plot captured an area that was representative of the Ecological Unit and could be safely accessed. Plot data was recorded on July 19th, 20th and 21st. Youth participants were trained in the field on data collection methods while completing the first plot.

All wildlife seen, heard or for which sign was encountered was recorded on a property-scale data sheet regardless of whether the animal was identified in the plot or while the surveyors were moving between plots. Plants that were observed on the property but which did not occur in plot data were also recorded on the property-scale data sheet.

Field-based observations indicated that the portions of the Trent River Regional Park visited in this project had been historically logged. Field sampling methods were adapted in the field to include mapping and measuring four stumps to record the species and diameter at breast height. This data was used to estimate the age-class and species composition of the forest pre-disturbance, as well as the time since disturbance.

RESULTS

Five course-scale ecological units were identified and mapped on the property (Figure 1):

1. Aquatic habitats of the Trent River (blue);
2. Riparian ecosystems adjacent to the Trent River (yellow);
3. Floodplain forests along the high bench floodplains adjacent to the riparian areas (dark green);
4. Sloped canyon walls (orange);
5. Upland forests above the canyon walls (light green).

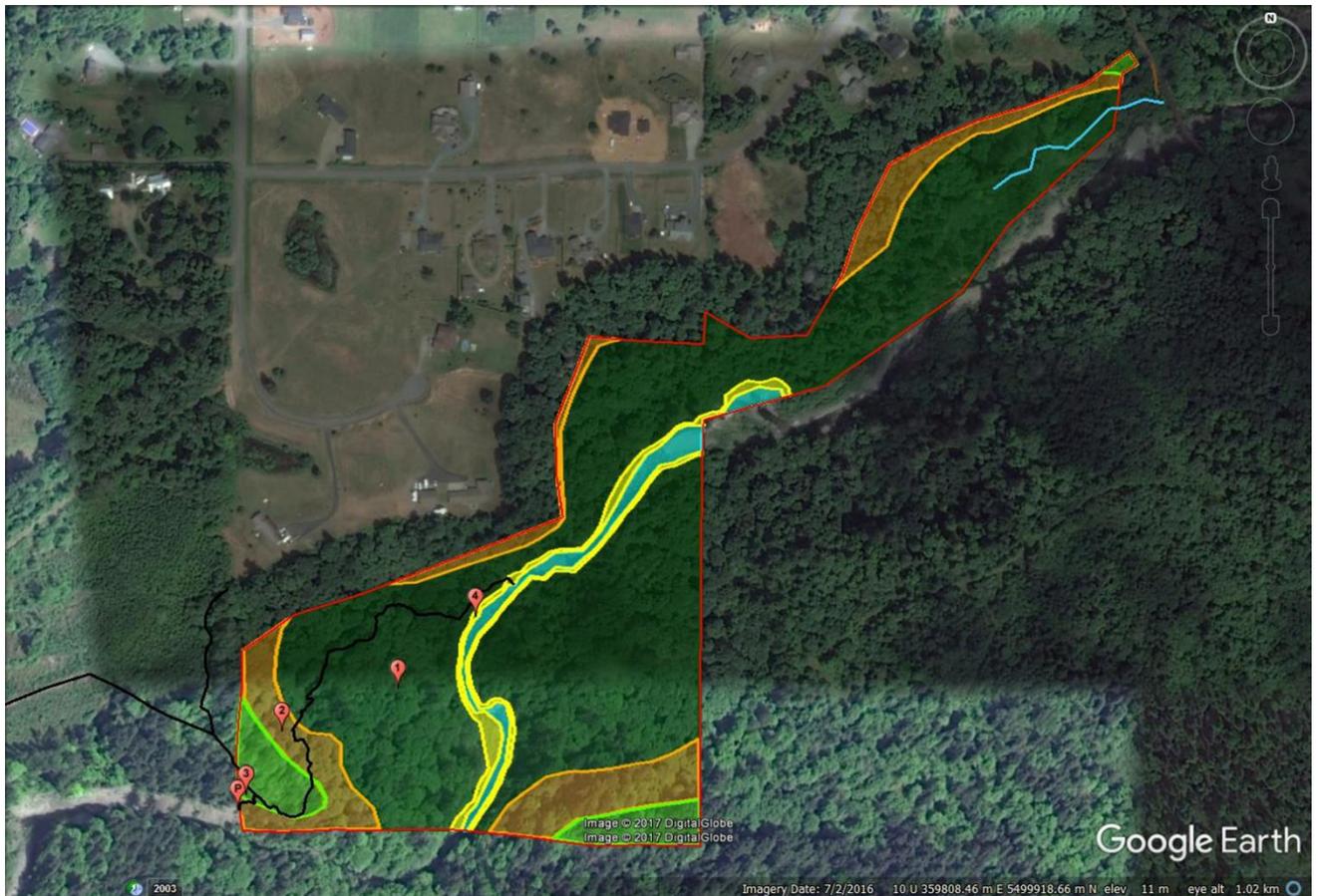


Figure 1. Ecological units within Trent River Regional Park

Of the five Ecological Units, only the four terrestrial units were sampled. Sample sites are located by red pins in Figure 1.

Upland Forests

Upland forests occur above the slope break of the Trent River canyon walls. Within the park, this occurs between 40-60 m above sea level (asl). Upland forests occupy 0.6 ha or 4% of the park area. One upland forest Ecological Unit was sampled. Site description and vegetation data for the upland forest plot is presented below in Tables 1 and 2 respectively.

YOUTH AND ECOLOGICAL RESTORATION PROGRAM					
ECOSYSTEM FIELD FORM - Site Description				Weather: <i>21C, partly cloudy, light breeze</i>	
Project: <i>Trent River Park - 2017</i>		Day: <i>19</i>	Month: <i>7</i>	Year: <i>2017</i>	
Surveyors: <i>Wendy Kotilla, Tim Ennis, Ashlyn Schow-Smith, Anonymous youth</i>					
Ecological Unit: <i>Upland Forest</i>		Plot Number: <i>1</i>	UTM Zone: <i>10 U</i>		
Slope: <i>31%</i>	Aspect: <i>70 degrees</i>	Elevation: <i>45m</i>	N: <i>359447</i>	E: <i>5499629</i>	
Structural Stage: <i>Pole/Sapling (67%), Mature Forest (33%)</i>			Disturbances: <i>Historic logging and logging road, mowing</i>		
Cover by Layer (%)					
Trees: <i>20</i>	Shrubs: <i>40</i>	Herbs: <i>18</i>	Moss: <i>55</i>	Bare Ground: <i>5</i>	
Ecological Unit Description:					
<i>This Ecological Unit contains the upland forests above the ancient river terrace. It includes the highest elevation portions of the property. These areas were logged approximately 80 years ago, and therefore are in transition between Young Forest (30-80 years) and Mature Forest (80-250 years).</i>					
Tree Species in Canopy:					
<i>Douglas-fir</i>					

Table 1. Upland Forest site description data

YOUTH AND ECOLOGICAL RESTORATION PROGRAM							
ECOSYSTEM FIELD FORM - Species Data			Weather: <i>21C, partly cloudy, light breeze</i>				
Project:	<i>Trent River Park - 2017</i>	Day:	<i>19</i>	Month:	<i>7</i>	Year:	<i>2017</i>
Surveyors:		<i>Wendy Kotilla, Tim Ennis, Ashtyn Schow-Smith, Anonymous youth</i>					
Ecological Unit:	<i>Upland Forest</i>	Plot Number:	<i>1</i>	Canopy Closure (%):		<i>0 (Pole Sapling) 45 (Mature Forest)</i>	
Cover by Species (Categorical) 1 = one or two; 2=a few; 3=many; 4=dominant							
Species	1	2	3	4	Dead/ Alive		
<i>Douglas-fir</i>				X	<i>A</i>		
<i>Western Redcedar</i>			X		<i>A</i>		
<i>Pacific Dogwood</i>	X				<i>A</i>		
<i>Grand Fir</i>	X				<i>A</i>		
<i>Western Hemlock</i>	X				<i>A</i>		
<i>Red Huckleberry</i>			X		<i>A</i>		
<i>Salal</i>				X	<i>A</i>		
<i>Dull Oregon Grape</i>		X			<i>A</i>		
<i>Saskatoon</i>	X				<i>A</i>		
<i>Baldhip Rose</i>		X			<i>A</i>		
<i>Common Snowberry</i>			X		<i>A</i>		
<i>Trailing Blackberry</i>		X			<i>A</i>		
<i>Thimbleberry</i>		X			<i>A</i>		
<i>Oceanspray</i>	X				<i>A</i>		
<i>Western Trumpet Honeysuckle</i>	X				<i>A</i>		
<i>Bracken Fern</i>			X		<i>A</i>		
<i>Self Heal</i>	X				<i>A</i>		
<i>Alaska Oniongrass</i>		X			<i>A</i>		
<i>Prince's Pine</i>		X			<i>A</i>		
<i>Twinflower</i>			X		<i>A</i>		
<i>Rattlesnake Plantain</i>	X				<i>A</i>		

Table 2. Upland forest vegetation data

Canyon Wall Slopes

The canyon wall slopes (Slope) Ecological Unit occurs from the toe of the canyon wall slope to the crest. Within the park this typically occurs from 20 m (asl) to 40 m (asl). Canyon wall slopes occupy 2.17 ha or 14% of the park area. In some places within the park, these canyon walls are extremely steep and actively eroding, therefore are not vegetated. However, within the park these conditions are atypical. More commonly the canyon wall slopes are forested. The scalloped shape of the landform results in a range of aspects. On the north side of the Trent River within the park, the slopes face south and east, while on the south side of the Trent, the aspect of the canyon walls is primarily north-facing. The north-facing slope was not sampled but likely contains different flora than the south-east facing slopes. Site description and vegetation data are presented in Tables 3 and 4 respectively.

YOUTH AND ECOLOGICAL RESTORATION PROGRAM					
ECOSYSTEM FIELD FORM - Site Description				Weather: <i>18C, Cloudy with showers, slight breeze</i>	
Project:	<i>Trent River Park - 2017</i>	Day:	<i>20</i>	Month:	<i>7</i>
		Year:	<i>2017</i>		
Surveyors: <i>Wendy Kotilla, Tim Ennis, Ashtyn Schow-Smith, Anonymous youth</i>					
Ecological Unit: <i>Slope</i>		Plot Number: <i>1</i>		UTM Zone: <i>10 U</i>	
Slope: <i>44%</i>	Aspect: <i>75 degrees</i>		Elevation: <i>32m</i>	N: <i>359448</i>	E: <i>5499702</i>
Structural Stage: <i>Mature Forest ~80 yrs.</i>			Disturbances: <i>Historic logging (old roads nearby)</i>		
Cover by Layer (%)					
Trees: <i>2.5</i>	Shrubs: <i>3</i>	Herbs: <i>60</i>	Moss: <i>5</i>	Bare Ground: <i>35</i>	
Ecological Unit Description: <i>This Ecological Unit contains the steep slopes of the ancient river terrace above the present Trent River. There was a moderate quantity of Coarse Woody Debris, primarily large diameter maple.</i>					
Tree Species in Canopy:					
<i>Bigleaf Maple</i>					
<i>Western Hemlock</i>					
<i>Grand Fir</i>					

Table 3. Canyon wall slope site description data

YOUTH AND ECOLOGICAL RESTORATION PROGRAM							
ECOSYSTEM FIELD FORM - Species Data			Weather: 18C, Cloudy with showers, slight breeze				
Project:	Trent River Park - 2017	Day:	20	Month:	7	Year:	2017
Surveyors:		Wendy Kotilla, Tim Ennis, Ashlyn Schow-Smith, Anonymous youth					
Ecological Unit:	Slope	Plot Number:	1	Canopy Closure (%):	70%		
Cover by Species (Categorical) 1 = one or two; 2=a few; 3=many; 4=dominant							
Species	1	2	3	4	Dead/ Alive		
<i>Bigleaf Maple</i>		X			A		
<i>Western Hemlock</i>			X		A		
<i>Grand Fir</i>	X				A		
<i>Red Huckleberry</i>			X		A		
<i>Salmonberry</i>		X			D		
<i>Salmonberry</i>	X				A		
<i>Black Gooseberry</i>		X			A		
<i>Swordfern</i>				X	A		
<i>Maidenhair Fern</i>			X		A		
<i>Lady Fern</i>		X			A		
<i>Licorice Fern</i>	X				A		
<i>Western Trillium</i>			X		A		
<i>Vanilla Leaf</i>			X		A		
<i>Broad-leaved Starflower</i>		X			A		
<i>Lungwort</i>	X				A		

Table 4. Canyon wall slope vegetation data

Floodplain Forests

Floodplain forests occupy 10.6 ha or 77% of the park area. They occur along the valley floor above the bank of the Trent River and extend to the toe of the canyon wall slopes (10 -20 m asl). Although the floodplain is typically flat, the surface is hummocky. Numerous historic backchannels and ephemeral ponds in low spots were noted throughout. Site description and vegetation data pertaining to the floodplain forest Ecological Unit are presented below in Tables 5 and 6 respectively.

YOUTH AND ECOLOGICAL RESTORATION PROGRAM				
ECOSYSTEM FIELD FORM - Site Description			Weather: <i>16.8C, light rain, overcast</i>	
Project:	<i>Trent River Park - 2017</i>	Day:	<i>20</i>	Month: <i>7</i> Year: <i>2017</i>
Surveyors: <i>Wendy Kotilla, Tim Ennis, Ashlyn Schow-Smith, Anonymous youth</i>				
Ecological Unit:	<i>Floodplain Forest</i>	Plot Number:	<i>1</i>	UTM Zone: <i>10 U</i>
Slope: <i>0%</i>	Aspect: <i>/</i>	Elevation: <i>24m</i>	N: <i>359543</i>	E: <i>5499751</i>
Structural Stage: <i>Mature Forest ~80 yrs.</i>		Disturbances: <i>Historic logging (old roads nearby), periodic flooding</i>		
Cover by Layer (%)				
Trees: <i>15</i>	Shrubs: <i>25</i>	Herbs: <i>40</i>	Moss: <i>15</i>	Bare Ground: <i>20</i>
Ecological Unit Description:				
<i>This Ecological Unit contains numerous large, wide-spaced stumps of coniferous trees. The age of these trees was estimated at 300 years, and the time since logging was estimated at 80 years. The ecological unit is dominated by mature bigleaf maple, but historically was dominated by Douglas-fir and Western Hemlock. Likely a component of Sitka Spruce was historically present. Currently, there are young (<80 year old) conifers either in the main canopy (Douglas-fir) or as sub-canopy regeneration (W. hemlock and S. Spruce). The land is level overall, but extremely hummocky with areas of small ephemeral wetlands and floodwater channels.</i>				
Tree Species in Canopy:				
<i>Bigleaf Maple</i>				
<i>Western Hemlock</i>				
<i>Sitka Spruce</i>				

Table 5. Floodplain forest site description data

YOUTH AND ECOLOGICAL RESTORATION PROGRAM							
ECOSYSTEM FIELD FORM - Species Data			Weather: 16.8C, light rain, overcast				
Project:	Trent River Park - 2017	Day:	20	Month:	7	Year:	2017
Surveyors:		Wendy Kotilla, Tim Ennis, Ashtyn Schow-Smith, Anonymous youth					
Ecological Unit:	Floodplain Forest	Plot Number:	1	Canopy Closure (%):	60%		
Cover by Species (Categorical) 1 = one or two; 2=a few; 3=many; 4=dominant							
Species	1	2	3	4	Dead/ Alive		
<i>Bigleaf Maple</i>				X	A		
<i>Western Hemlock</i>	X				A		
<i>Sitka Spruce</i>	X				A		
<i>Western Redcedar</i>	X				A		
<i>Grand Fir</i>	X				A		
<i>Oceanspray</i>		X			A		
<i>Red Huckleberry</i>		X			A		
<i>Salmonberry (1 dead)</i>			X		A		
<i>Black Gooseberry</i>	X				A		
<i>Red Elderberry (heavily browsed)</i>	X				A		
<i>Swordfern</i>				X	A		
<i>Vanilla Leaf</i>				X	A		
<i>Palmate Coltsfoot</i>			X		A		
<i>Pacific Bleeding-heart</i>	X				A		
<i>Broad-leaved Starflower</i>		X			A		
<i>Bigleaf Maple seedlings</i>				X	A		
<i>Western Trillium</i>		X			A		
<i>Sweet-scented Bedstraw</i>		X			A		
<i>Wall Lettuce</i>		X			A		
<i>False Lily-of-the-Valley</i>		X			A		
<i>Maidenhair Fern</i>			X		A		
<i>Giant Horsetail</i>	X				A		
<i>Spiny Woodfern</i>		X			A		
<i>Grasses</i>		X			A		
<i>Sedge #1</i>		X			A		
<i>Slough Sedge</i>		X			A		
<i>Juniper Haircap Moss</i>		X			A		
<i>Electrified Cat's-tail Moss</i>		X			A		
<i>Oregon Beaked Moss</i>		X			A		
<i>Lanky Moss</i>		X			A		
<i>Douglas' Neckera</i>		X			A		
<i>Lungwort</i>	X				D		

Table 6. Floodplain forest vegetation data

Riparian Areas

The Riparian Ecological Unit is arranged as a narrow, linear corridor immediately adjacent to the Trent River along both banks. It occupies 0.43 ha or 3% of the park area. The Ecological Unit is a complex of vegetated islands within the river, as well as the vegetated banks of the river. The vegetated islands are surrounded by bare riverbed bedrock in the dry season which becomes instream habitat during wetter times of the year. During peak flows, these islands along with the vegetated banks of the river may be fully submerged for brief periods. Due to the fluctuating water levels and high velocity flood waters, there is very little tree growth. The majority of the vegetation is comprised of shrubs and herbs, or tree species that fail to survive long enough to reach the tree canopy. Site description and vegetation plot data is presented in Tables 7 and 8 respectively.

YOUTH AND ECOLOGICAL RESTORATION PROGRAM					
ECOSYSTEM FIELD FORM - Site Description				Weather: <i>17C, moderate rain, overcast</i>	
Project: <i>Trent River Park - 2017</i>		Day: <i>21</i>	Month: <i>7</i>	Year: <i>2017</i>	
Surveyors: <i>Wendy Kotilla, Tim Ennis, Ashtyn Schow-Smith, Anonymous youth</i>					
Ecological Unit: <i>Riparian</i>		Plot Number: <i>1</i>		UTM Zone: <i>10 U</i>	
Slope: <i>6% River shelf</i> <i>85% Riverbank</i>	Aspect: <i>133 degrees</i>		Elevation: <i>20m</i>	N: <i>359669</i>	E: <i>5499807</i>
Structural Stage: <i>Shrub-Herb (50%) Young Forest (50%)</i>			Disturbances: <i>Flooding, sewage effluent</i>		
Cover by Layer (%)					
Trees: <i>5</i>	Shrubs: <i>60</i>	Herbs: <i>10</i>	Moss: <i>10</i>	Bare Ground: <i>48</i>	
Ecological Unit Description:					
<i>This Ecological Unit is a complex of shrub-dominated areas along the top of bank flanked by young forest and shrub-herb or herb dominated "islands" of vegetation within a dominant matrix of riverbed shale. The shrub-herb islands include tree species (Black Cottonwood), but frequent flooding disturbances restricts the development of forests. Water temperature was measured as 16C.</i>					
Tree Species in Canopy:					
<i>Bigleaf Maple</i>					

Table 7. Riparian site description data

YOUTH AND ECOLOGICAL RESTORATION PROGRAM							
ECOSYSTEM FIELD FORM - Species Data				Weather: 17C, moderate rain, overcast			
Project:	Trent River Park - 2017	Day:	21	Month:	7	Year:	2017
Surveyors:	Wendy Kotilla, Tim Ennis, Ashtyn Schow-Smith, Anonymous youth						
Ecological Unit:	Riparian	Plot Number:	1	Canopy Closure (%):	20%		
Cover by Species (Categorical) 1 = one or two; 2=a few; 3=many; 4=dominant							
Species	1	2	3	4	Dead/Alive		
<i>Bigleaf Maple</i>	X				A		
<i>Douglas-fir</i>		X			A		
<i>Western Redcedar</i>		X			A		
<i>Red Alder</i>		X			A		
<i>Black Cottonwood</i>		X			A		
<i>Grand Fir</i>	X				A		
<i>Oceanspray</i>				X	A		
<i>Common Snowberry</i>				X	A		
<i>Pacific Ninebark</i>			X		A		
<i>Saskatoon</i>	X				A		
<i>Pink Spirea</i>	X				A		
<i>Red Osier Dogwood</i>	X				A		
<i>Goat's Beard</i>	X				A		
<i>Willow sp.</i>	X				A		
<i>Salmonberry</i>	X				A		
<i>Trailing Blackberry</i>	X				A		
<i>Forget me not</i>	X				A		
<i>Dandelion</i>		X			A		
<i>Swordfern</i>		X			A		
<i>Common Plantain</i>		X			A		
<i>Oxeye Daisy</i>	X				A		
<i>Common Horsetail</i>			X		A		
<i>Douglas' Aster</i>		X			A		
<i>Field Mint</i>	X				A		
<i>Western Dock</i>	X				A		
<i>Meadow Buttercup</i>	X				A		
<i>Philadelphia Fleabane</i>	X				A		
<i>Woodland Strawberry</i>	X				A		
<i>Reed Canarygrass</i>		X			A		
<i>Orchard Grass</i>	X				A		
<i>Blue Wildrye</i>	X				A		
<i>Sweet Vernal Grass</i>	X				A		
<i>Sedge #2</i>			X		A		
<i>Baltic Rush</i>		X			A		
<i>Canada Bluejoint</i>		X			A		

Table 8. Riparian vegetation data

Wildlife

Trent River Regional Park provides habitat for a wide variety of wildlife species across many taxonomic groups. This includes wide-ranging migratory birds and salmon who rely on the park for habitat during a specific portion of the year, to resident species with large home ranges that may be periodically present (e.g., Cougar and American Black Bear) to resident species that rely exclusively on the park for habitat. Wildlife encountered during the survey are summarized in Table 9 below.

YOUTH AND ECOLOGICAL RESTORATION PROGRAM			
WILDLIFE OBSERVATIONS			
Project:	<i>Trent River Park - 2017</i>	Day:	<i>19-21</i>
		Month:	<i>7</i>
		Year:	<i>2017</i>
Surveyors:	<i>Wendy Kotilla, Tim Ennis, Ashtyn Schow-Smith, Anonymous youth</i>		
Project Area (Ha):	<i>13.85</i>	BEC Zone:	<i>CWHxm1</i>
		Ecosection:	<i>Nanaimo Lowlands</i>
Species:	Evidence:	Species:	Evidence:
<i>Cougar</i>	<i>photo taken by neighbour</i>	<i>Coho Salmon</i>	<i>seen</i>
<i>American Black Bear</i>	<i>hair, scat</i>	<i>Red-legged Frog</i>	<i>seen</i>
<i>Columbian Black-tailed deer</i>	<i>tracks</i>	<i>salamander sp.</i>	<i>seen by other visitor to park</i>
<i>Red squirrel</i>	<i>seen</i>	<i>Banana Slug</i>	<i>seen</i>
<i>Common Raven</i>	<i>seen</i>	<i>Pacific Sideband Snail</i>	<i>seen</i>
<i>American Robin</i>	<i>seen</i>	<i>Other snail sp.</i>	<i>seen</i>
<i>Pacific-slope Flycatcher</i>	<i>heard</i>	<i>Ant sp.</i>	<i>seen</i>
<i>Swainson's Thrush</i>	<i>heard</i>	<i>Cyanide Millipied</i>	<i>seen</i>
<i>Bald Eagle</i>	<i>seen</i>	<i>Spider spp.</i>	<i>seen</i>
<i>Red-shafted Flicker</i>	<i>heard</i>	<i>Mosquito sp.</i>	<i>seen</i>
<i>Red-breasted Sapsucker</i>	<i>seen</i>	<i>Bumble Bee sp.</i>	<i>seen</i>
<i>Pileated Woodpecker</i>	<i>heard</i>	<i>Dance Fly sp.</i>	<i>seen</i>
<i>Belted Kingfisher</i>	<i>seen</i>	<i>Caddis Fly</i>	<i>seen</i>
<i>Turkey Vulture</i>	<i>seen</i>	<i>Black Fly</i>	<i>seen</i>
<i>Eurasian Collared Dove</i>	<i>heard</i>		

Table 9. Wildlife observation data

DISCUSSION

Trent River Regional Park protects excellent examples of high bench floodplain forests flanking the lower reaches of an important salmon river in the Comox Valley. The property provides high-quality habitat for many species, including species at risk, as well as regionally significant populations of Coho, Chum, anadromous Rainbow Trout (Steelhead), Bald Eagles and others. The park plays a key role in linking estuarine habitats downstream to the upper portions of the watershed through a zone that is typically at high risk of residential development.

Although we did not assess the moisture and nutrient regimes of the soil, indicator species (vegetation) suggests that the majority of the park should be classified as CWHxm1/07 (western redcedar / three-leaved foamflower Very Dry Maritime) with small patch occurrences of CWHxm1/12 (western redcedar

– Sitka spruce / skunk cabbage). These ecological communities occur on soils which are moist to wet and rich to very rich. Both are considered globally vulnerable to extirpation or extinction and are therefore classified as ecosystems at risk in BC (CDC 2017).

Our field work indicates that the ecology of these forests has changed significantly as a result of historic logging and logging-related disturbances (e.g., roads and landings) which took place in the early part of the 20th century. An analysis of a subset (n=4) of the stumps left behind following historic logging indicates that the park was previously dominated by large-diameter Douglas-fir and Western Hemlock in excess of 300 years old (diameter at breast height = 88 cm, 155 cm, 167 cm and 200 cm). Scattered old-growth/veteran trees also support this assertion. Currently these forests are dominated by mature Bigleaf Maple, with young Douglas-fir in the canopy and Western Hemlock, Sitka Spruce and Western Redcedar in the sub-canopy. Given time, it is reasonable to expect that these forests will gradually shift to conifer dominance in the absence of disturbance over the course of the next 150 years. BC Conservation Data Centre reports for this ecosystem indicate that, “In the event of major disturbances such as catastrophic windthrow and forest fires, this highly productive community may take a long time to return to a coniferous tree-dominated ecosystem, similar to the original forest, after vigorous and prolonged shrub and deciduous-tree successional stages.” (CDC 2014).

The historic logging roads and landings are focal areas of non-native species including grasses such as Orchard Grass and herbs such as Herb Robert. In general, however, no invasive, non-native species of concern were noted anywhere in the park other than low densities of Reed Canarygrass on riparian islands. These old roads and clearings make an excellent choice for the location of park trails, kiosks or other infrastructure.

Ongoing threats to the ecology of the park, and the Trent River ecosystem as a whole, include private land logging and road building in the headwater systems and canyon wall slopes upstream of the park, as well as sewage effluent discharge into the Trent River from the Village of Cumberland (pop. ~3,700). During low-flow periods in July and August, as much as 50% of the water in the Trent River is comprised of sewage effluent (Kotilla 2017). During low summer flows, the water quality in the Trent at times exceeds the Provincial standards for recreational use by as much as four times (Kotilla 2017). Park managers should be aware of the health risks posed to the public in the short term from body-contact recreation in the Trent River downstream from the sewage outfall (Maple Creek). The Village of Cumberland has plans to improve wastewater treatment, but it is not yet clear which of several options will be pursued or what effect improved treatment will have on water quality from a recreational perspective.

YOUTH LEAD TOUR

On the fourth day of the program (July 22nd) the youth participants designed and practiced for a public tour of the park, which they lead on the fifth day (July 23rd). The tour had seven stops and included introductory/closing remarks, ecological and historical information, information on watershed impacts and a discussion on ongoing impacts to the Trent system. Forty-three members of the public attended the tour, which was the largest group to date for a YER tour event. At each stop the youth shared with the public the knowledge they had learned throughout the course of the program. This included wildlife observations, plot data, inventory techniques, ecological information and anecdotes or stories of notable things that happened during the field work days. During the tour, there were many questions

from the public, and the youth had no problem answering the questions. At the end of the tour, the youth were presented with a certificate, a reference letter, a YER program hoodie, and \$50 honorarium. It was clear from the engagement of the public in attendance and the response they received from the public, that the youth had done an excellent job of providing an informative and entertaining nature interpretation program for the tour participants.

SUMMARY AND RECOMMENDATIONS

The purpose of the YER Phase II study of the Trent River Regional Park was twofold:

1. To support vulnerable youth within the Comox Valley by providing them with hands-on opportunities to engage with nature and adult mentors through an ecological inventory project;
2. To provide baseline ecological information to support CVRD park management and decision making.

With respect to the first objective, it is clear that this project was a success. The youth participants were immersed in a program which paired them with adult mentors in a natural setting. The youth thrived under these circumstances, learning both significant nature-based curriculum and important life skills in a supportive and nurturing social context. The importance and effectiveness of team work, positive communications, focus, listening and consistent effort were clearly reinforced and understood. The confidence-building associated with learning advanced topics in ecology and then teaching that material to a much older audience of community members was profound.

This project was the first ecological inventory project to be completed in this area since the Trent River Regional Park was acquired by the CVRD. The project provides a high-level overview of the ecosystems and species which occur in the park. This information will be extremely useful to park managers as they turn their attention to park management issues. Despite the utility of this document, additional inventory work would provide additional value. We offer the following recommendations:

1. The CVRD should continue to support the YER project in 2018 in order to expand the number of plots in the northern and southeast portions of the park, and to improve mapping of these areas.
 - a. A rapid assessment of the northern floodplain forest indicates that backchannel and side-channel features in this area may be more pronounced than in the area surveyed in 2017. Improved mapping and description of these features will bring clarity to the challenges and opportunities associated with providing low-impact public access.
 - b. The north-facing canyon walls, riparian areas and upland forests in the southeast likely contain numerous additional species and perhaps structural stages that were not encountered in this study. Understanding these areas will provide further clarity on the values, opportunities and sensitivities this area of the park may have.
2. The CVRD should continue to play a leadership role in support of expanding protection of the Trent River for conservation purposes, and to support initiatives which aim to improve the health of the aquatic environment in the Trent River.

REFERENCES

- BC Conservation Data Centre (CDC). 2017. Species and Ecosystem Explorer. Accessed online July 25th, 2017 at: <http://a100.gov.bc.ca/pub/eswp/>
- BC Ministry of Environment, Lands and Parks (MOE). 1998. Field Manual for Describing Terrestrial Ecosystems. Land Management Handbook No. 25. Province of British Columbia. Victoria, BC.
- Ennis, T. Executive Director, Comox Valley Land Trust. pers. comm., July 2017.
- Green, R. N. and Klinka, K. 1994. A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region. Land Management Handbook No. 28. BC Ministry of Forests. Victoria, BC.
- Kotilla, W. Youth and Ecological Restoration Program. pers. comm., July 2017.
- Youth and Ecological Restoration Program (YER). 2017. Accessed online July 25th, 2017 at: <http://youthecology.ca/>

Appendix 1 – Photo-plates



Photo 1. Upland Forest Plot



Photo 2. Slope Plot



Photo 3. Floodplain Forest Plot



Photo 4. Riparian Plot



Photo 5. Trent River



Photo 6. Red-legged Frog



Photo 7. Youth measure stump diameter



Photo 8. Youth collecting data



Photo 9. Doug DeMarzo assisting with fieldwork



Photo 10. Public tour participants