

# Twinned Watersheds Project

#### **Riparian Vegetation Assessment**

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#### Key messages from the "Flows" piece...

#### 1. The water table drops when there is...

- Lack of structure
  - Rocks, logs, root wads
- Lack of complexity
  - Side channels, off channels, side pools
- 77% of the Koksilah study area lacks structure and complexity
- 2. Slowing down the water in winter/spring allows aquifers to recharge
  - Requires **structure** and **complexity**

# What do we mean by "riparian ecosystems"?

- Transition zones between aquatic and terrestrial upland ecosystems
  - Structures and ecological processes change along a gradient
  - Connect surface and subsurface water with adjacent upland areas
- Sources of stream structure and complexity



Riparian ecosystems are 3-dimensional

Riparian zones extend:

- Along the perimeter of the water
- Outward to the limits of flooding
- Upward into the canopy

Highly variable in width!



### Important functions:

- Part of healthy fish habitat
- Ensure cleanest water possible
- Influence water quantity and timing of flow
- Reduce flooding impacts
- Provide important wildlife habitat



Chemainus River



Koksilah River

#### **Riparian Vegetation Assessment**

#### Objective 1:

To assess current riparian condition along important fish-bearing reaches



#### Objective 2:

# To assess prevalence of culturally significant plants



Objective 3: To identify riparian restoration sites





#### Objective 4:

To conduct restoration activities at selected sites



# Our Approach:

- Desktop
  - Mapping
  - Literature review
- Field work
- Restoration activities



# Mapping

Various analyses:

- Land ownership
- Land use
- Disturbance



**Mature Coniferous Forest** 

## Three measurement zones

(mapping and field plots)

- 0-30 m
- 30-50 m
- 50-100 m



#### What does science say about riparian ecosystem widths?

Riparian Function	Range
Bank stabilization	9 – 30 m
Sediment control	9 – 100 m
Reduce flood risk	Entire floodplain
Filter Nitrogen and Phosphorus	5 – 70 m
Stream temperature	10 – 70 m

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Invertebrates	30 – 100 m	
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Large Wood Deposits	15-50 m
Mammals	5 – 500+ m
Birds	20 – 500 m
Amphibians and reptiles	120 – 290 m
Microclimate	45 – 100 m

In conclusion: Riparian ecosystem widths are highly variable!

#### What riparian protection is provided in legislation?

Land Designation	Legislation	Maximum No harvesting Zone	Maximum No road Building Zone
Crown Forest	Forest and Range Practices Act	50 m	70 m
Private Managed Forest	Private Managed Forest Land Act	Varies up to 30 m	30 m
Private Residential, Commercial, and Industrial	Riparian Areas Protection Act	30 m	30 m
Agricultural	Fisheries Act (federal)	Not established	Not established
Reserve Lands	Fisheries Act (federal)	Not established	Not established

# Inventory plots – what did we measure?

- Trees
- Shrubs and herbs
- Dead and downed wood
- Wildlife observations and their habitat features
- Old stumps
- Disturbances (e.g., invasive plants)



- Historic riparian forests were old growth
- Current riparian ecosystems are mostly young 2<sup>nd</sup> growth forests and agricultural fields
- Riparian ecosystems are in "relatively good" shape
  - i.e., 75% of the 100 m areas has recovering vegetation



- There is usually at least 30 m of riparian buffer regardless of land use/ownership
- Agriculture has the narrowest riparian buffers
- In Koksilah, most rural properties have a 100 m forested buffer
- Riparian areas in parks are being loved to death



Koksilah Provincial Park

- The MNC forest has "functional" riparian buffers along the Chemainus River
- Crown and private land logging have smaller riparian buffers



- All plants are culturally significant!
- Cedar became our focus
  - There are very few old cedar
  - Few cedar are present in the new forests



- Riparian areas contain the highest wildlife species diversity of all ecosystems
- Riparian wildlife has been declining and at least 15 vertebrate species are now at risk
  - e.g., toads, frogs, cavity-nesting owls, elk



#### Primary keystone species of riparian areas:

• beaver, salmon, cottonwood







- Another keystone forest species is the Pileated Woodpecker
- No beaver and very little evidence of Pileated Woodpecker cavities found during fieldwork



• Increasing river complexity will benefit beavers and, in turn, salmon, other wildlife, aquifer recharge, flood control, etc.



#### Mukw' stem 'i' utunu tumuhw 'o' slhiilhukw'ul

#### The wildlife and fish communities, riparian habitat, condition of the rivers and aquifers, flood control, all are interconnected.

- Riparian areas are *recovering functionality* but are not *recovered*
- Legislation permits further loss of recovering riparian forest



#### How does the riparian project link up with the "Flows" piece?

#### • Structure:

 Recovering riparian forests will some day contribute the large logs and root wads

#### • Complexity:

• Riparian areas must be wide enough to let the river move



#### How does the riparian project link up with the "Flows" piece?

A whole of watershed approach is needed.

- We need to understand the <u>whole</u> watershed
  - Upper reaches of the mainstems
  - Major and minor tributaries
- Restoration efforts need to be a partnership of all landowners



## Other recommendations:

- Conservation Property Tax Incentive
- Create consistency in riparian protection
  - For **structure**, 1 maximum tree height often recommended (i.e., 50 m)
  - For complexity, ...???
- Identify and protect existing healthy cedar ecosystems



# **Restoration Efforts**

- Chemainus estuary Scotch broom removal
- Chemainus River / Halalt IR English ivy removal
- Koksilah River nearly 2000 new riparian plants and stakes
- Bright Angel Regional Park





# Cedar Project



photo: Jacqueline Ronson/The Discourse

# Thank-you Project Partners!

- Khowutzun Forestry Services
- Farmland Advantage
- Quw'utsun Cultural Connections
- Cowichan Estuary Nature Center
- CVRD

