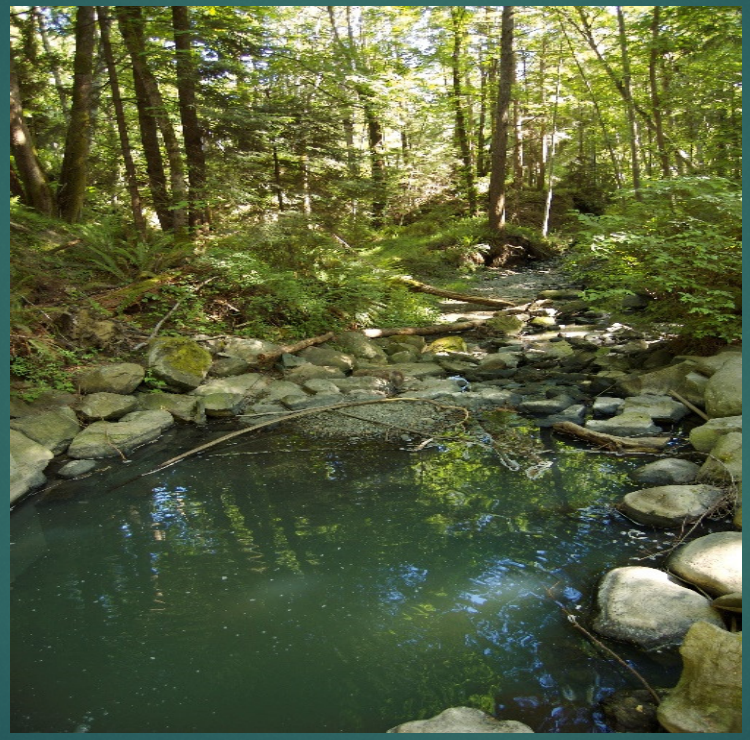
BROOKLYN CREEK
OUR STORY

THE POWER OF PARTNERSHIPS

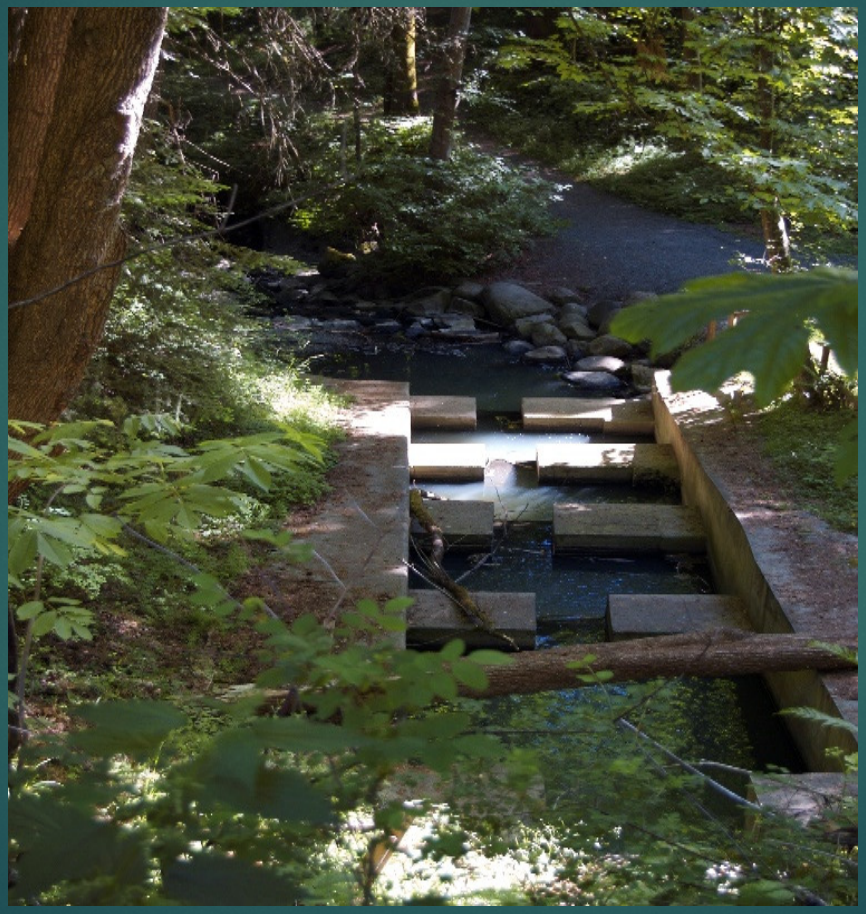
PARTNERSHIP BY DEFINITION

1. THE STATE OF BEING A PARTNER: PARTICIPATION
2. A LEGAL RELATION EXISTING BETWEEN TWO OR MORE PERSONS CONTRACTUALLY ASSOCIATED AS JOINT PRINCIPALS IN A BUSINESS
3. A RELATIONSHIP RESEMBLING A LEGAL PARTNERSHIP AND USUALLY INVOLVING CLOSE COOPERATION BETWEEN PARTIES HAVING SPECIFIED AND JOINT RIGHTS AND RESPONSIBILITIES

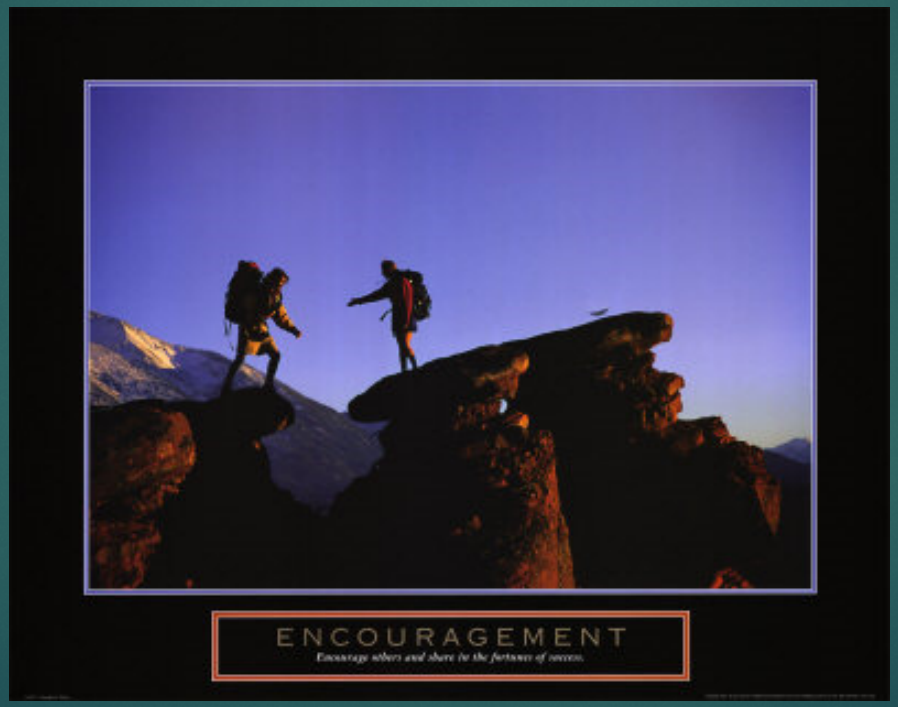
REFLECTION



PERCEPTION



ENCOURAGEMENT



MOMENTUM

APPROACH

PARTNERSHIPS COME IN MANY FORMS

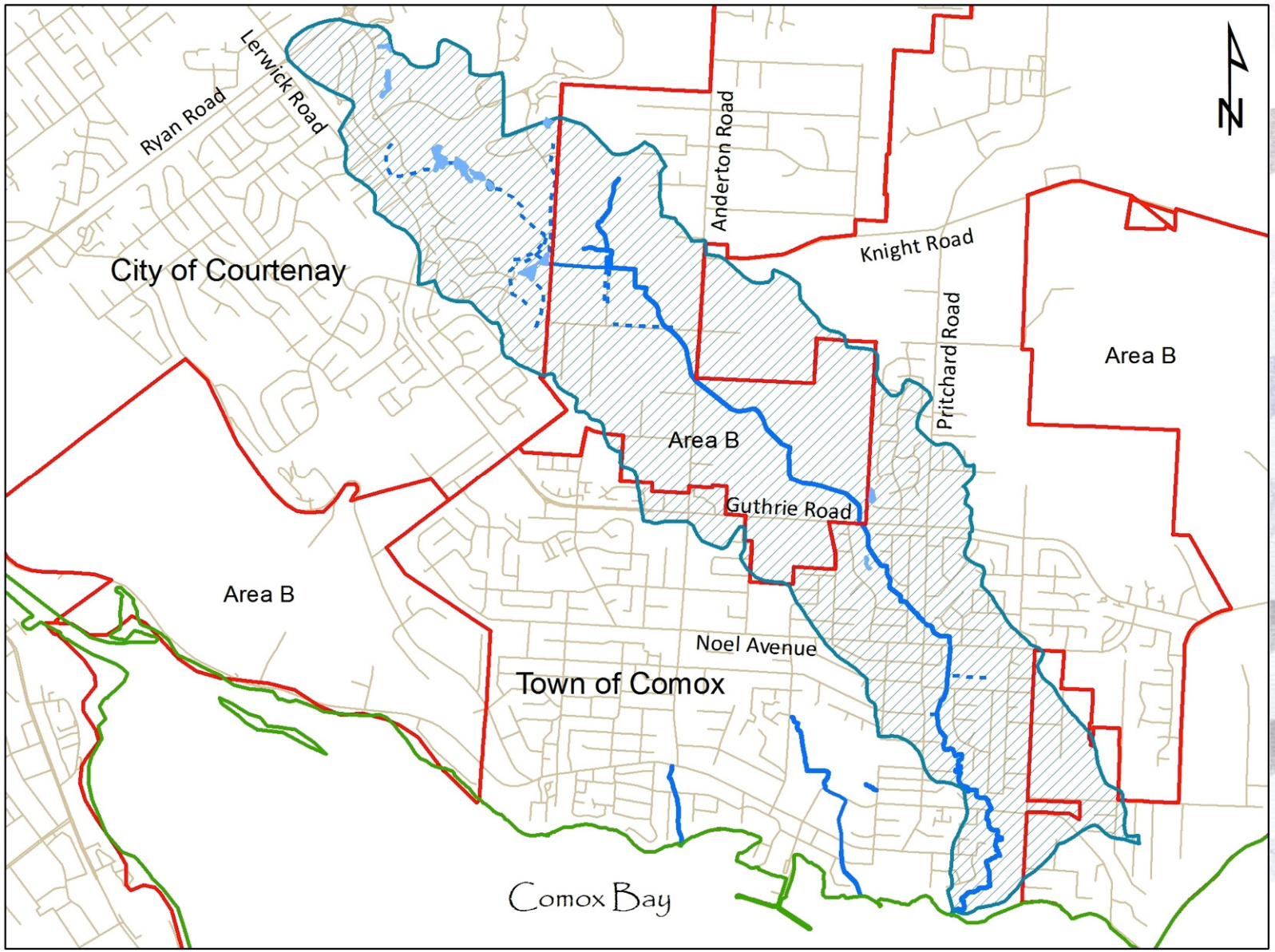
PROPAGATING NEW, AND MAINTAINING OLD PARTNERSHIPS

THANK YOU!

Next, over to….

Christine Hodgson


Brooklyn Creek Watershed Society
UNITING COMMUNITIES


Ryan Road
Lerwick Road
Anderton Road
Knight Road
Pritchard Road
City of Courtenay
Area B
Area B
Guthrie Road
Area B
Noel Avenue
Town of Comox
Comox Bay

Keeping It Living Award

Brooklyn Creek - Fish

Brooklyn Creek - Fish

Chum Salmon

Coho Salmon

Restoration Projects

Habitat Restoration Work
2005 - 2017

Restoration Projects

Restoration Projects

Restoration Projects

BCWS Fund-Raising

Between 2005 – 2018

- Over $300,000 funding

- Fisheries and Oceans Canada
- Pacific Salmon Foundation
- Habitat Conservation Trust Fund
- Western Economic Diversification
- Investors Group
- Royal Bank of Canada
- Pacific Western Brewing
- Many Local Businesses

BCWS Fund-Raising

- Over $100,000 in-kind contributions

BCWS Volunteers

Planting

BCWS Volunteers

Gravel Nourishment

BCWS Volunteers

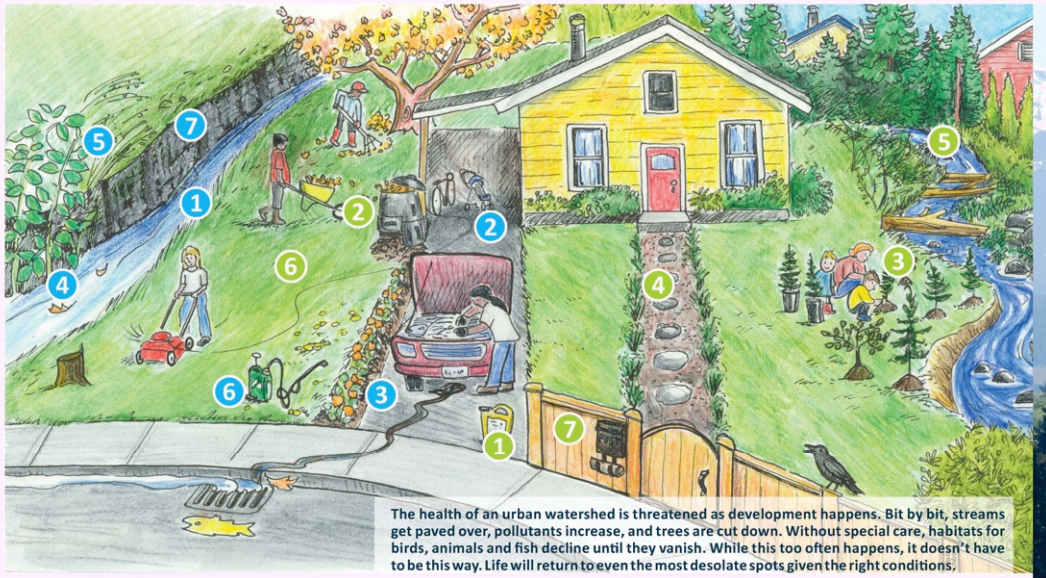
Invasive Species Removal

BCWS Volunteers

Smolt Fence

BCWS Volunteers

Public Education and Awareness



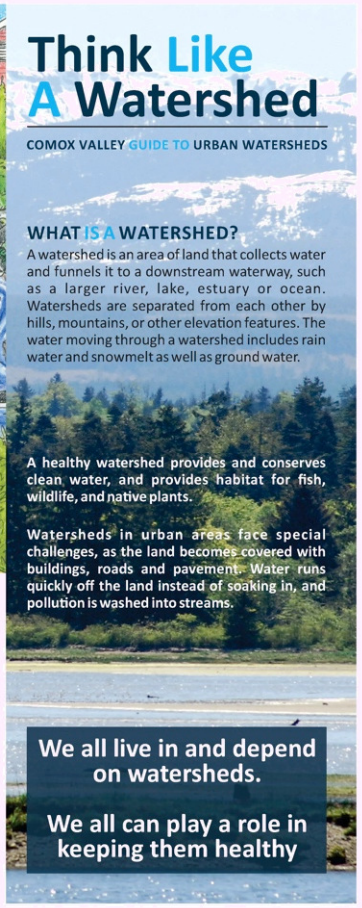
The health of an urban watershed is threatened as development happens. Bit by bit, streams get paved over, pollutants increase, and trees are cut down. Without special care, habitats for birds, animals and fish decline until they vanish. While this too often happens, it doesn't have to be this way. Life will return to even the most desolate spots given the right conditions.

Home Tips for Healthy Watersheds

1. **Dispose of all petroleum products and chemicals at recycling facilities** – this removes pollutants that run off private property and contaminate nearby creeks.
2. **Dispose of yard and lawn cuttings using curbside pick up, the landfill or compost them** – this reduces the spread of non-native plants, and keeps garden waste out of streams.
3. **Plant native trees and vegetation** – this provides cover and nutrients to fish and other creatures, stabilizes stream banks, reduces erosion and uses less water.
4. **Minimize paving and use gravel or permeable pavers instead** – this allows water to soak into the ground and slowly move to nearby waterways, thus maintaining summer flows and reducing flooding in rainy months.
5. **Keep creeks natural** – meandering creeks with deep pools, fallen trees and branches reduce erosion and provide improved fish habitat.
6. **Maintain septic systems** – this reduces pollution going into the watershed.
7. **Support and encourage your local government to protect and restore watersheds** – they can be a major force for watershed health.

Urban Watershed Challenges

1. **Grassy or bare stream banks** – are subject to erosion and provide no shade or protection for fish, or living space for plants and animals.
2. **Paved surfaces and loss of vegetation** – create flashy water runoff that causes erosion and delivers pollutants to streams.
3. **Disposal of pollutants into storm drains, perimeter drains or septic systems** – results in contamination of streams and death of aquatic life.
4. **Channeled, straight waterways without natural structures** – result in erosion, as well as providing little to no aquatic habitat, flooding and downstream silting.
5. **Invasive plants** – can change habitats, out-compete and overwhelm other species that are part of a healthy watershed (FMI beplantwise.ca).
6. **Use of pesticides, synthetic fertilizers and weed killers on lawns and gardens** – results in chemicals and excessive nutrients being flushed into the watershed.
7. **Concrete or rip-rap stream banks** – eliminate habitat and displace flow creating downstream erosion.



Challenges

Water Flows

Challenges


Dogwood Avenue
Cedar Avenue
Cortez Crescent
Denman Street
Torrence Road
Hanging Culvert
Balmoral Road

Challenges

Private Lands

Challenges

Headwaters


Brooklyn Creek Watershed Society
UNITING COMMUNITIES
https://BrooklynCreek.ca

Next, over to….

Marvin Kamenz

Lower Brooklyn Creek
Queens Ditch
Middle Brooklyn Creek

Symposium on Water Stewardship
in a Changing Climate

Presentation Outline

- **Lower Brooklyn Creek**
- **Queens Ditch**
- **Middle Brooklyn Creek Urban Design Concept Plan**

Environmental Protection

⇩

Rainwater Management

⇩

Package of Ecological Services

Lower Brooklyn Creek HAPPY DAYS

The Gift of Something to Left to Protect

- Channel
  - well defined
  - one third in a ravine
- Result
  - development occurred around the creek leaving key environmental features intact

Lower Brooklyn Creek

Town Priorities

- **Storm Water Management**

and

- **Environmental Protection**
  - **Protection** of slope stability
  - **Protection** of fish habitat
  - Enhancement of fish habitat
  - **Protection** of nature corridor

Queens Ditch

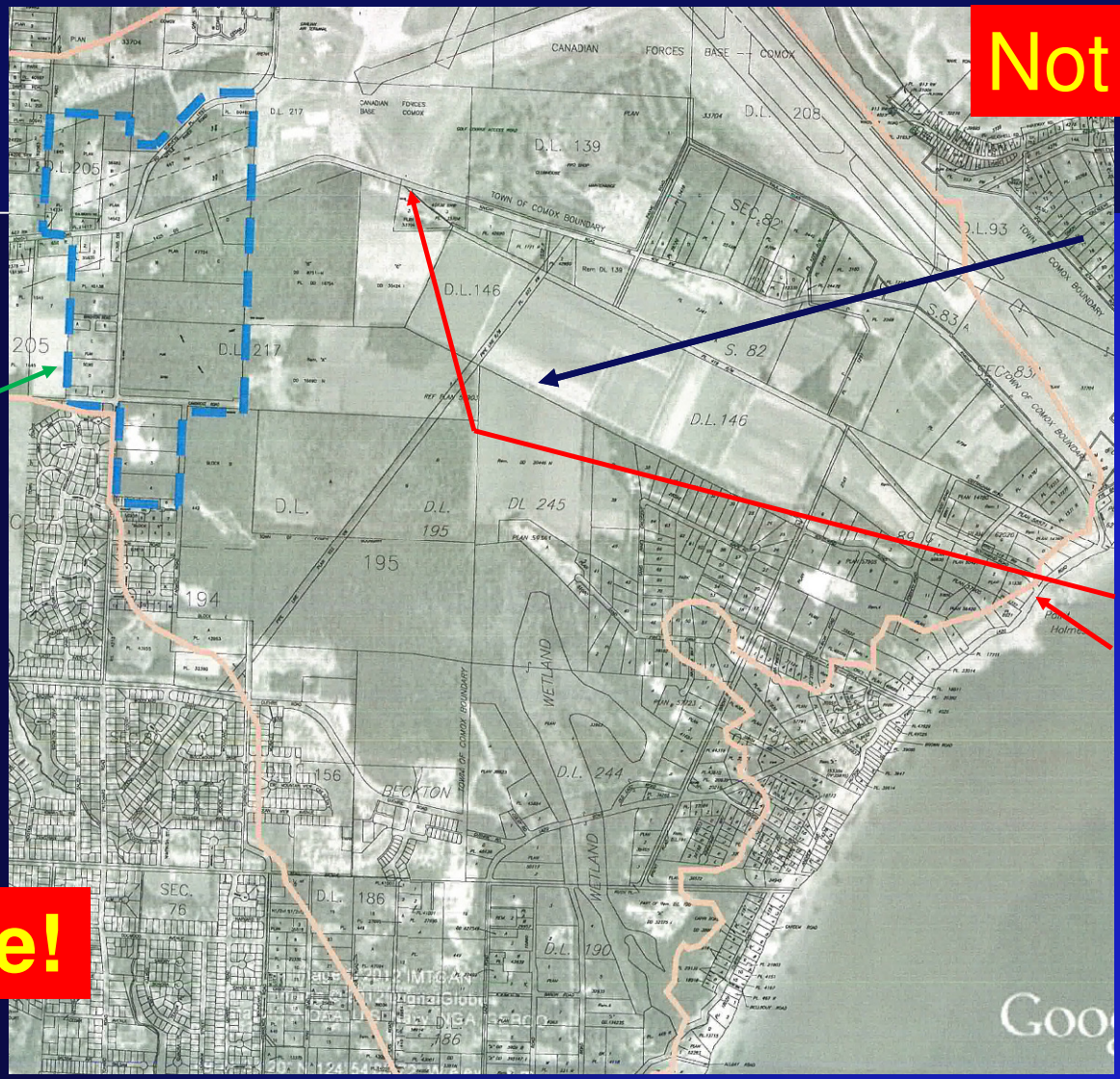
&

NE Comox SWMP

NE Comox

- 80 hectares
- Identified for development
- Drains into Queens Ditch

We Will Sue!



Not So Happy

- Former Marsh
- Flat
- Low Lying

High Tide + Winter Storms + Wide Spread Flooding

Queens Ditch 1946

- Inlet
- Outfall

- MOTI, private ditches, DND

Court action 1997

- DND 50%

Queens Ditch & NE Comox

- Local Government BMP is to minimize the liability risk of the services provided
- Town Subdivision and Development Servicing Bylaw:
  - where downstream drainage facilities / natural channels are inadequate to handle increase flow, a special design is required

Queen's Ditch & NE Comox

- Development Engineer's Proposal:
  - detention pond connected to Knight Road ditch which is connected into Queens ditch
- Town
  - Queens Ditch has capacity to handle discharge from proposed pond without increasing flood damage?
- Development Engineer's Response: didn't determine Queen's Ditch capacity

Town
P.Eng. Stamp = all Town requirements are met and everything will work

P.Eng.
Design to meet Local Government determined quantitative service specifications

- **Engineering methodology to date focused on using detention ponds to ensure design storm discharge rates not exceeded.**

NE Comox SWMP

- Town created detailed terms of reference for study and developer group hired a consulting engineer to undertake the study

- Terms of Reference – as a result of development
  - No increase in downstream flood damage
  - No significant change to downslope ground water
  - No negative impact on downslope environmentally sensitive areas, fish habitat or existing agricultural potential

NE Comox SWMP

- Phase 1 Report – how much rain is falling and where does it go
  - Continuous hourly rainfall data over a 42 year period from local watershed similar to Queens Ditch in terms of topography and rainfall not a aggregate design storm
  - 100% forest cover with the exception of existing roads

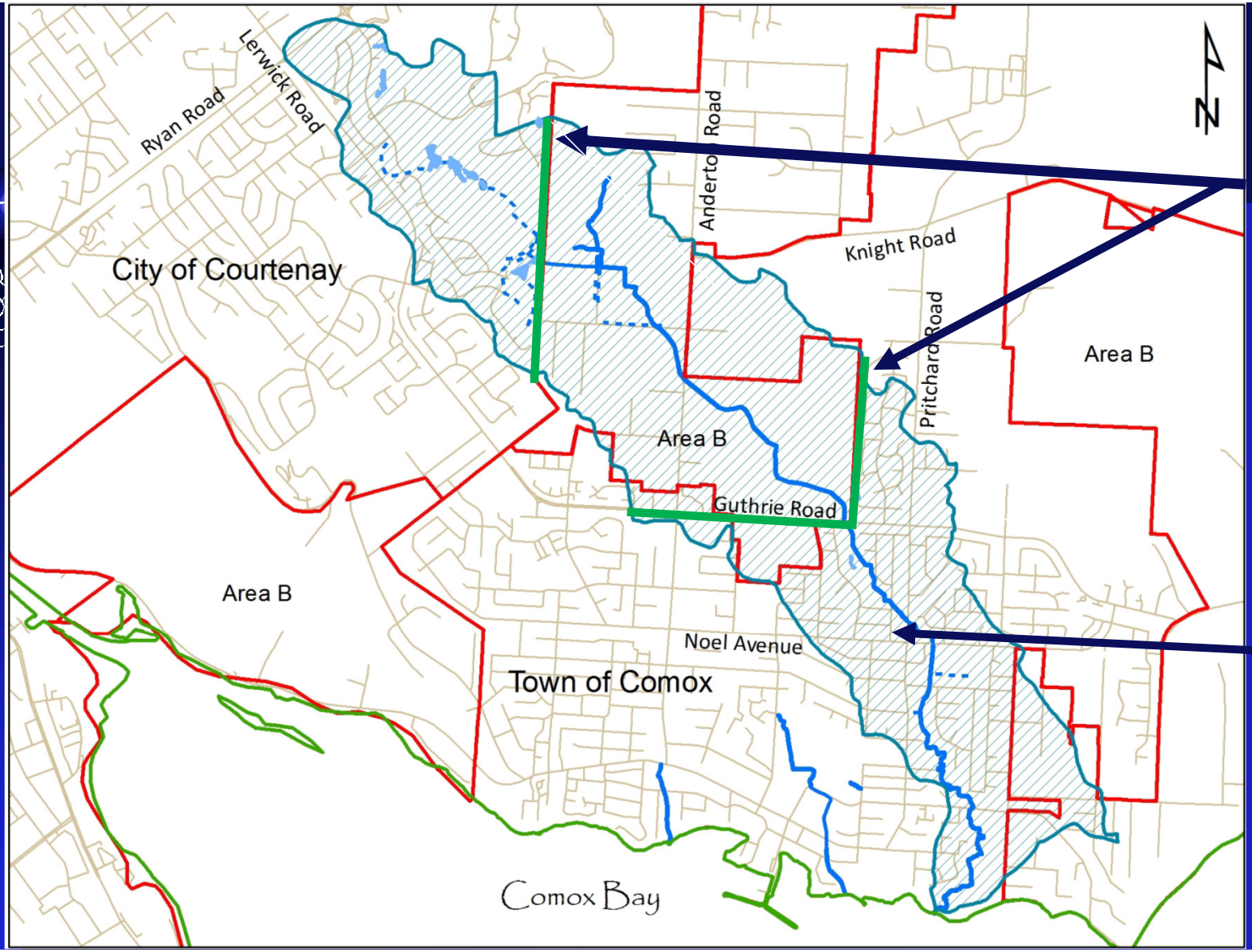
Phase 2 Report – what would be the impact of land development, what are the targets for infiltration and detention to mitigate the impact on down slope lands

- hourly modeling of post vs pre up to and including 1 in 100 year event
- includes climate change

Phase 3 Report – engineering specifications for infiltration galleries and detention ponds

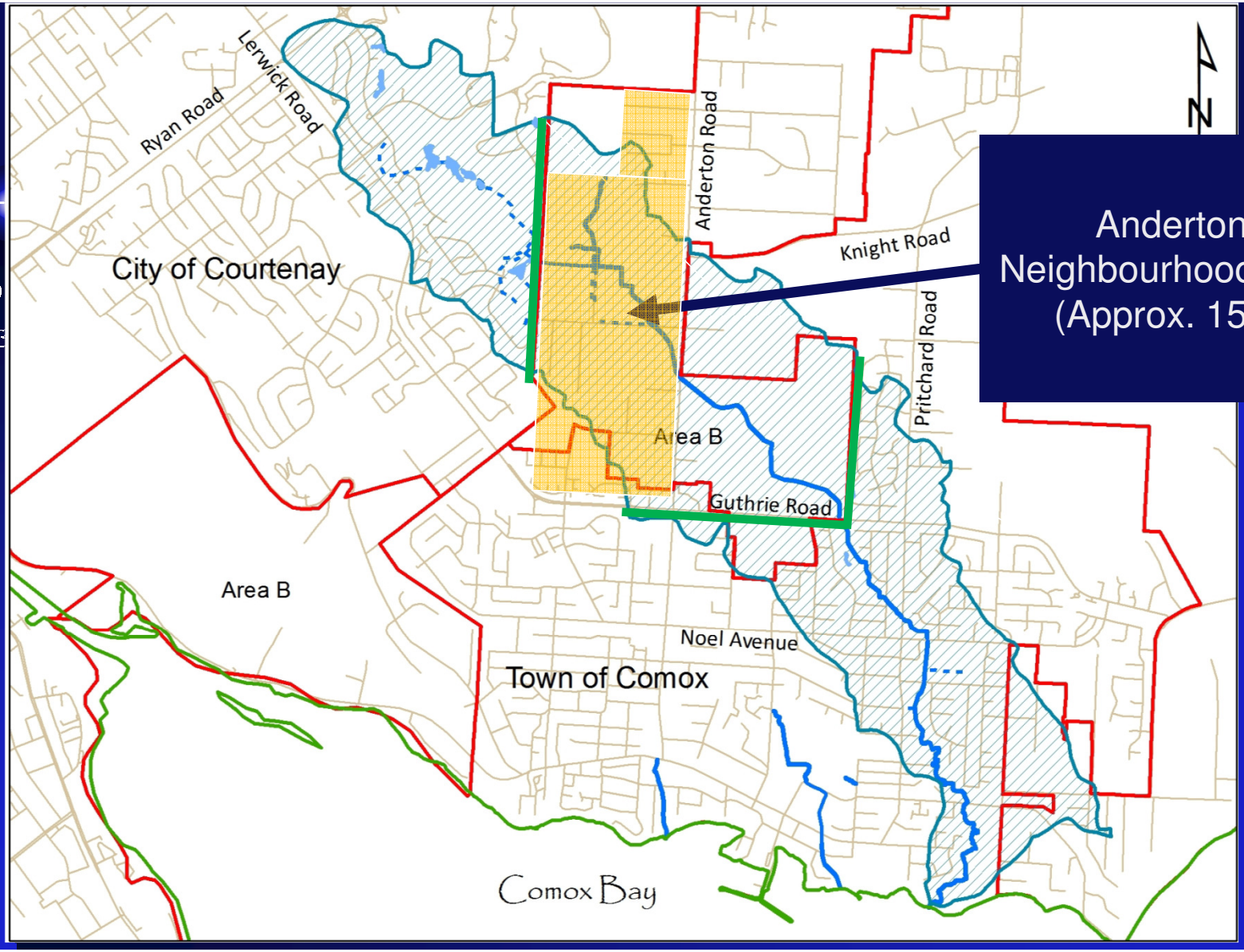
- All infiltration galleries and detention ponds to be owned and operated by the Town and located on Town lands
  - No big pipe alternative
- Adaptive Management Plan
  - Pond and infiltration galleries designed to be easily modified increase or decrease detention/infiltration
  - Town climate station to provide Queens Ditch Watershed specific data
  - recording of detention pond and infiltration gallery discharge

Middle Brooklyn Creek
&
Anderton Corridor Urban Design



Middle Brooklyn Creek

Lower Brooklyn Creek



Anderton Corridor
Neighbourhood Concept Plan
(Approx. 150 hectares)

Urban Design & Package of Ecological Services

Time to Rethink

Anderton Corridor Neighbourhood Concept Plan

- Rain water management plan based on NE Comox SWMP
- Initial approach - storm water detention ponds and infiltration galleries to avoid increased flood damage from development, no significant change to downslope ground water, no negative impact on fish habitat existing agricultural potential
- Land Use based on CVRD RGS for sustainable density of development would then be overlaid on the infrastructure servicing constraints (roads, water sewer and storm)

Urban Design & Package of Ecological Services

Tim Pringle, Partnership for Water Sustainability Report on Assessing the Worth of the Package of Ecological Services of Lower Brooklyn Creek.

"The package of ecological services concept refers to the combined range of uses desired by the community. Thus a strategic plan that supports this diversity will appear worthwhile to the greatest number of interested parties."

Urban Design & Package of Ecological Services

Ecological services supported by and interrelated to hydrology of the creek shed

Ecological Services = Municipal Core Services

- Environmental Protection: fish habitat
- Active and Passive Recreation
- Storm water drainage

Creek Hydrology

- Rainwater retention,
- Drainage conveyance,
- Infiltration

Urban Design & Package of Ecological Services

"The package of ecological services concept refers to the combined range of uses desired by the community. Thus a strategic plan that supports this diversity will appear worthwhile to the greatest number of interested parties."

Changed the approach for the Concept Plan to focus on the protection and enhancement of the Package of Ecological Services of this section of Brooklyn Creek

- Parkland and school site location
- Greenway alignment
- Riparian habit enhancement works
- Stormwater detention pond location and design
- Concentration of residential density to maximize public access

Town-Hall Interaction

Now that you have listened to Al, Christine and Marvin share their Comox Valley experience on the long-term value of collaboration guided by a shared vision for creekshed restoration, what do you wonder?