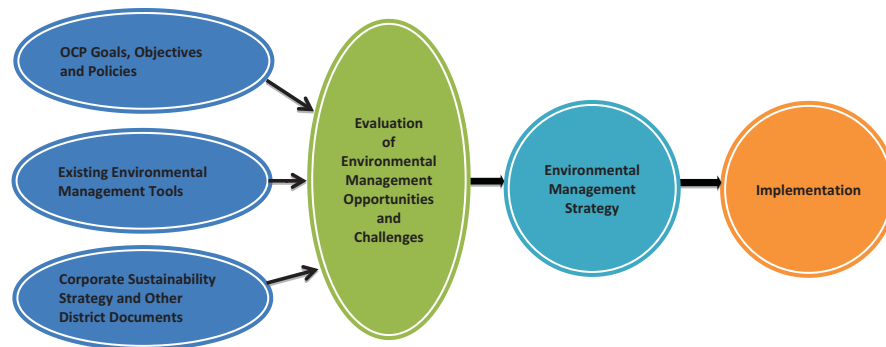


## INTRODUCTION TO THE ENVIRONMENTAL MANAGEMENT STRATEGY (EMS)

### *What is the EMS?*

- The Primary purpose of the EMS is to consolidate and fine tune environmental policies and practices, incorporating the OCP principles and values that draw people to Maple Ridge.

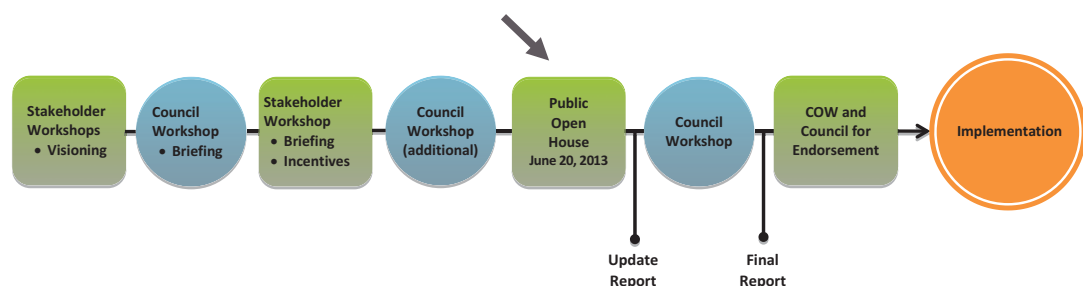


### *Top Reasons for the EMS → Planning for Change*

- Sustainable management of the natural resources that provide our community with social, economic, and ecological benefits
- Continue to attract and invest in sustainable growth
- Build a resilient community in the face of climate change
- Maximize efficiencies and cost savings associated with the services provided by the natural environment
- Reducing impacts to neighbouring properties from development-related activity  
→ Essentially it is for our long-term sustainability

### *EMS Process*

The purpose of this open house is to obtain your input on draft strategies.



## OFFICIAL COMMUNITY PLAN (OCP) CONTEXT

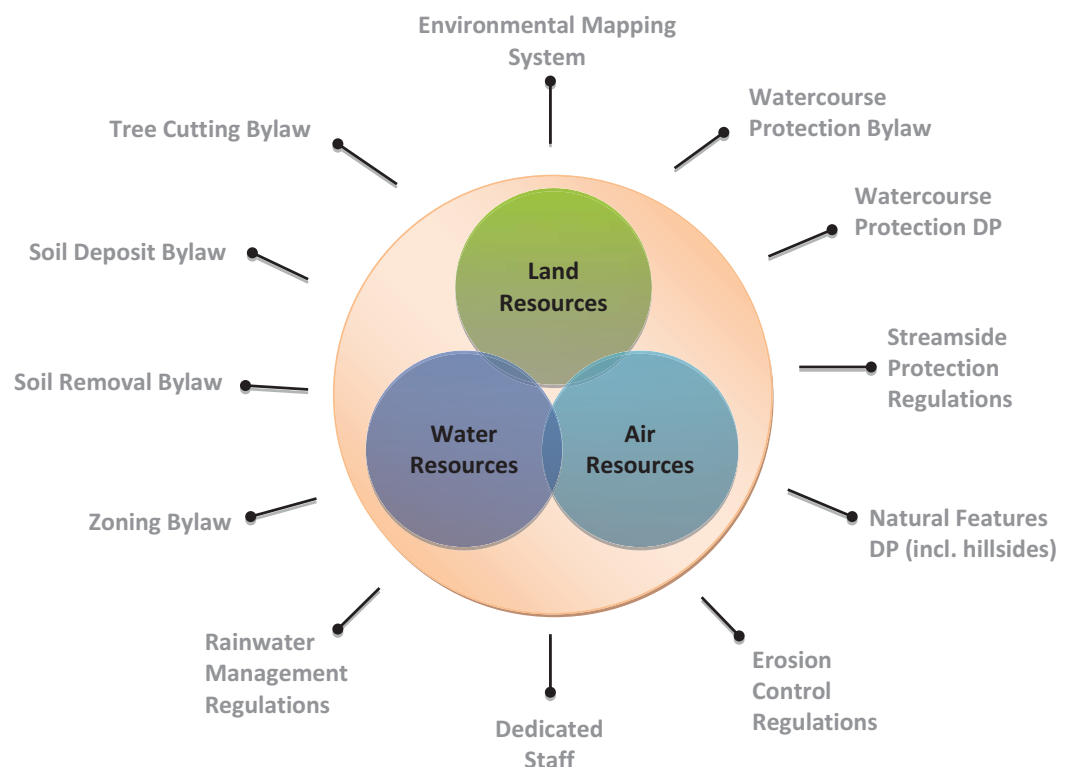
### *Environmental Management Model – Goals*

1. Protect significant ecosystems
2. Anticipate and respond to impacts of climate change
3. Determine appropriate DP guidelines and bylaws
4. Identify requirements for environmental studies or impact assessments
5. Maintain and improve ecosystem health and human safety

### *OCP Natural Features Section Objectives*

1. A comprehensive approach based on ecosystem principles incorporating land, water and air
2. A perspective that anticipates climate change and strives to reduce its causes while mitigating impacts
3. A balanced evaluation process incorporating economic, social, and environmental sustainability
4. The cultivation and strengthening of community partnerships to help enhance the success of policies and programs.

### *OCP and Other Existing Tools*





## KEY FINDINGS TO DATE

These key findings are based on consultation with stakeholders:

### *Identified Successes to Date*

- OCP Framework for Environmental Management
- Streamside Protection Regulations
- Environmental Mapping System
- Extensive Natural Areas Remaining
- Dedicated Knowledgeable Staff



### *Identified Challenges to Date*

- Appropriate Scale, Long Term Planning
- Habitat Fragmentation
- Public Desire for Input, Information and Awareness
- Tree Removal and Related Impacts (e.g., erosion, habitat loss, heat, aesthetics)
- Limited Municipal Environmental Resources



### *Identified Opportunities*

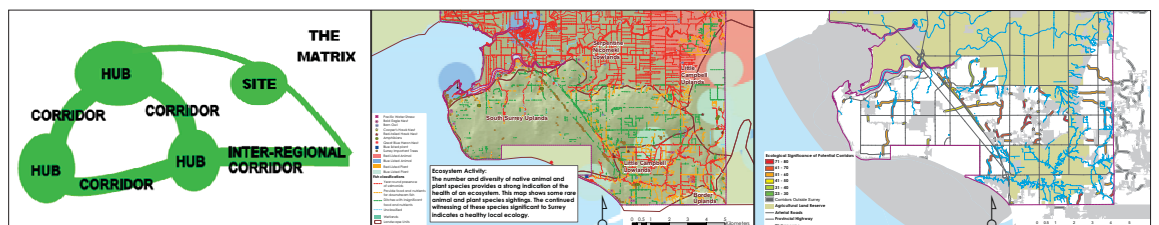
- Support and Motivation for a Strategy
- Extent of and Value Natural Environment
- Passionate Public
- Opportunities for Partnerships



## KEY TECHNICAL FINDINGS TO DATE

These findings are based on analysis by the consulting team:

The OCP provides a strong framework for environmental management	➔ BUT ➔	Some of the tools are confusing and do not fully cover the objectives
The Watercourse DP and Watercourse Protection Bylaw are successful	➔ BUT ➔	There are gaps in education, monitoring and long-term protection of riparian areas
The environmental mapping system is excellent	➔ BUT ➔	The environmentally significant areas identified by the District have not been fully incorporated into policy or OCP maps
There is a tree cutting bylaw	➔ BUT ➔	Tree management is not required in rural areas, it does not adequately address impacts or mitigation to neighbouring properties; it does not cover protection of significant sized or unique trees; nor does it require/ provide funds for replacement
Rainwater management on-site source controls are required under the Watercourse Protection Bylaw	➔ BUT ➔	Rainwater management design details, standards, and maintenance requirements are not clearly identified by the District
The Natural Features DP has served the District well as a “catch-all” for environmental best management practices	➔ BUT ➔	The requirements as written are confusing and the OCP Natural Features map does not include all important resources and ecosystems
Hazards are addressed through various bylaws	➔ BUT ➔	Hazards are not addressed in a clear and comprehensive manner



From the City of Surrey Ecosystem Management Study

HB Lanarc, 2011

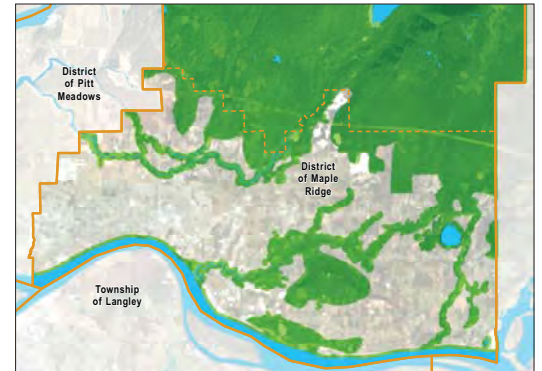


## THREE GOALS OF THE EMS

### *Goal A: Conserve and manage our natural assets*

The natural assets covered by this goal are the mostly undeveloped watercourses, forests, natural parks, fish and wildlife corridors and hubs, and significant groundwater recharge areas within the District's planning area as well as the extensive natural areas within and surrounding the District that are administered by others.

Stakeholders have expressed extremely strong support for protecting and managing the health, ecological integrity and diversity of terrestrial and aquatic ecosystems that support fish, wildlife and provide our citizens with valuable economic, social, and ecological benefits.

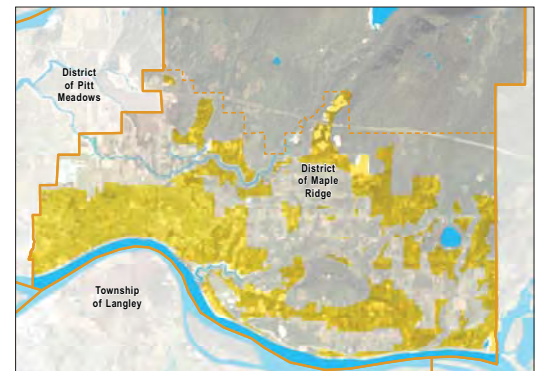


Natural Assets Map

### *Goal B: Design and build sustainable neighbourhoods*

This goal focuses on areas to be developed, and guiding them to achieve sustainable and smart growth principles. The work required to fulfil this goal involves refining bylaws for better protection of watercourses and habitats, existing trees, and soils, especially on steep slopes.

Stakeholders have extremely strong support for sustainable neighbourhoods, especially design and management that will result in a significant and healthy urban forest, safe and attractive neighbourhoods, and rainwater management that respects the water quality and quantity in urban watercourses in both urban and rural areas.



Sustainable Neighbourhoods Map

### *Goal C: Improve communications and environmental awareness*

This goal focuses on how all participants – Mayor and Council, staff, other organizations, stakeholder groups, business interests, and the public – will work together to understand and implement the EMS.

Stakeholders have a strong interest in better and more communication, and education programs that focus on environmental awareness and education.



## GOAL A: CONSERVE AND MANAGE OUR NATURAL ASSETS

### Potential Strategies Identified to Date

A1. Identify, protect and manage the terrestrial and aquatic ecosystems that support important habitats within the District's administrative boundaries.

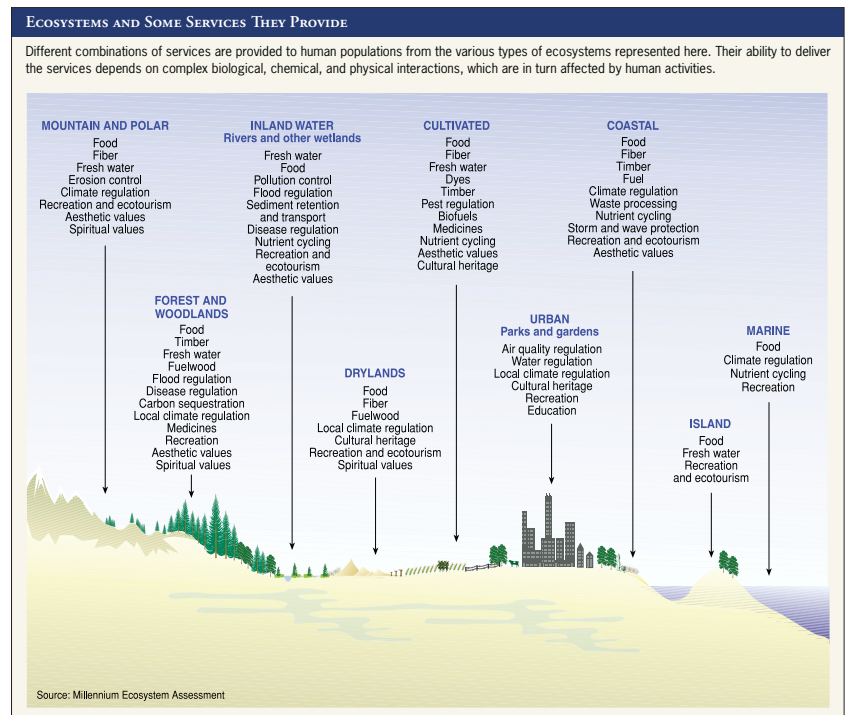
#### Potential Tools

- ESA mapping of ecosystems, wildlife corridors and hubs
- Ecological network management strategy to acquire land over time through purchase, compensation, development process, conservancies, trusts, partnerships
- Invasive Plant Management Strategy

A2. Identify, protect and manage Crown lands and watershed areas within and extending beyond the District's boundaries in collaboration with other jurisdictions.

#### Potential Tools

- Watershed Management Plans
- Groundwater/Recharge Area Management Plans
- Partner on Management Plans for Crown and Metro lands - address resource use, eco-tourism, recreation



From Living Beyond Our Means:  
Natural Assets and Human Well-being

Millennium Ecosystem Assessment, 2005



## GOAL A: CONSERVE AND MANAGE OUR NATURAL ASSETS (CONT'D)

A3. Evaluate the socio-economic values and benefits of natural assets.

### Potential Tools

- Quantitative and qualitative valuation studies
- Precautionary Principle to link short-term decisions and long-term gains or losses
- Performance targets and measurements of ecological health

A4. Prepare and implement incentives for land owners to conserve or preserve significant natural areas or features that are not protected under municipal regulations.

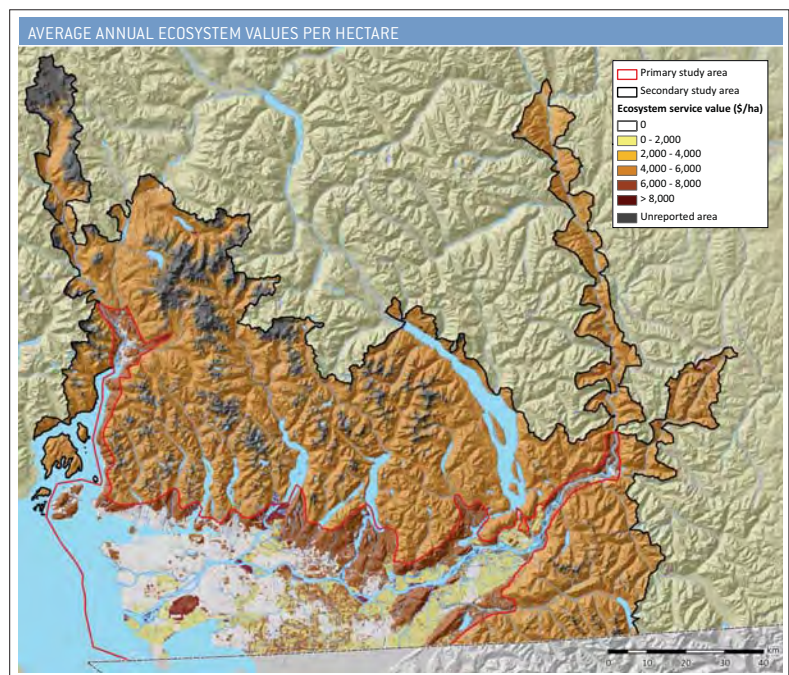
### Potential Tools

- Tax incentives
- Density bonus or density transfer incentives
- DCC reduction
- Conservation trusts

A5. Prepare policies related to filling and environmental practices on agricultural and rural lands.

### Potential Tools

- Consideration of tree clearing impacts on neighbouring properties - drainage, windfall impacts, groundwater disturbance
- Work with qualified agricultural and environmental professionals on soil quality, water management, invasive species, and contamination impacts in rural areas



From Natural Capital in BC's Lower Mainland:  
Valuing the Benefits from Nature

David Suzuki Foundation and Pacific Parklands Foundation, 2010

## GOAL B: DESIGN AND BUILD SUSTAINABLE NEIGHBOURHOODS

### Potential Strategies Identified to Date

B1. Protect, enhance and manage forests and mature and significant trees in developed and rural areas in recognition of the impacts of tree clearing and the multiple environmental, social and economic benefits provided by trees to surrounding properties and the public.

#### Potential Tools

- Tree Management Bylaw – to address tree clearing impacts in urban and rural areas, require replacement or cash in lieu, enforcement and monitoring
- Urban Forest Management Strategy – emphasize protection of existing trees and forests, tree canopy targets, incentives for tree planting, education

B2. In the Watercourse Protection Bylaw, provide more specific design guidelines and maintenance requirements for rainwater management and improve enforcement and monitoring.

B3. Refine and clarify the Development Permit (DP) structure.

Watercourse DP



Applies to



Watercourses, ponds and wetlands

Natural Features DP



Applies to



Other ecosystems (terrestrial), recharge areas, visible slopes, vulnerable aquifers, significant wildlife corridors and habitat

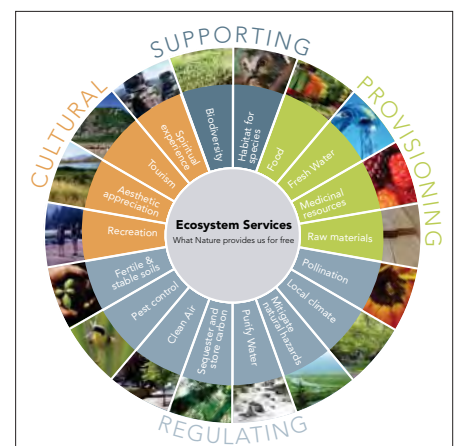
Hazards DP



Applies to



Steep slopes, provincial floodplain, and wildfire hazard areas



From Metro Vancouver's  
Ecological Health Action Plan

Metro Vancouver, 2011



## GOAL B: DESIGN AND BUILD SUSTAINABLE NEIGHBOURHOODS (CONT'D)

B4. Review and update the Soil Deposit/Removal Bylaws.

### Potential Contents

- Identify locations for placing future fill
- Address safety, potential contamination and risk management
- Improve information, accountability and clarity

B5. Establish incentives for sustainable development practices that capture the spirit of comprehensive “smart growth” principles.

### Potential Tools

- Sustainability checklist
- Tax incentives, density bonus or transfer DCC reduction
- Sustainable design guidelines in all District bylaws

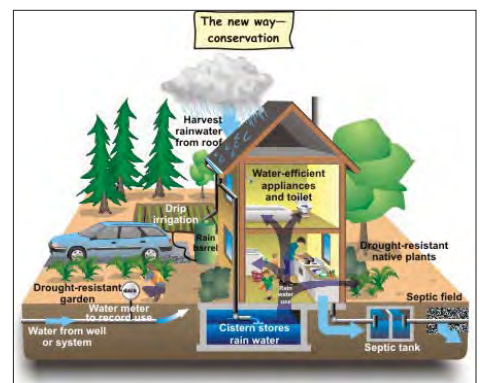
B6. Use adaptive management.

### Potential Tools

- Strengthen monitoring and enforcement
- Establish indicators and targets
- Use full-cost accounting for decision-making



<b>1 Organization, Communication and Collaboration</b> Identify a Municipal Sustainability Policy Task Force Identify goals, targets and programs across municipal departments	<b>2 Transportation and Mobility</b> Explore and expand alternative transportation options Understand and evaluate regional connectivity Measure equitable access to alternative transportation options Develop and implement a multi-modal plan that includes rail, bus, pedestrian paths, etc.
<b>3 Land Use</b> Increase land use efficiency, promoting density and infill development Promote walkable environments Coordinate land use plans with regional growth and transportation plans	<b>4 Green Building</b> Implement green building standards (e.g. LEED) for new construction and retrofitting Establish goals for green development (e.g. ratio of LEED buildings to traditional buildings) Develop incentives to encourage developers to exceed the baseline standards set Promote adaptive reuse of existing buildings
<b>5 Housing Accessibility, Diversity and Affordability</b> Availability of affordable housing, incl. demographic studies and distribution Evaluation of current housing stock, local and regional trends Examine and evaluate access to open space, mass transit, etc. Promote the rehabilitation of inner city areas	<b>6 Open Space, Parks &amp; Trails</b> Protect environmentally sensitive areas Expand parks and recreational opportunities, keeping equitable access in mind Examine potential linkages to regional trail systems Provide sufficient urban trail systems to meet the recreational and all-transport needs for bikes, walkers and runners
<b>7 Alternative Energy/Energy Conservation</b> Increase use of renewable energy Increase efficiency of existing facilities Support usage of alternative fuel vehicles (e.g. city fleets, etc.) Increase miles driven by City employees (e.g. incentives for miles transit use, modified work weeks, telework, etc.) Increase consideration for both technological and policy-based options	<b>8 Water Quality and Conservation</b> Increase efficiency (e.g. retrofitting, reuse, harvesting, etc.) Understanding the relationship between water supply/efficiency and land use/growth Water auditing Include consideration for both technological and policy-based options
<b>9 Climate Change and Air Quality</b> Emission reduction Pollution prevention Collaborative partnerships Incentives Outreach & education	<b>10 Urban Heat Island</b> Increase material usage for roofs, sidewalks, etc. to increase heat absorption Increase usage of indigenous vegetation
<b>11 Waste Reduction &amp; Recycling</b> Increase effectiveness of existing recycling programs Encourage waste reduction (e.g. building operations and construction)	<b>12 Infrastructure Efficiency</b> Coordinate infrastructure and land use plans to maximize infrastructure efficiency



Examples of Tools

Internet search, 2013

## GOAL C: IMPROVE COMMUNICATIONS AND ENVIRONMENTAL AWARENESS

Potential Strategies Identified to Date

C1. Improve communications among District staff and stakeholders in the community.

### Potential Tools

- Structure for better communications among departments and with community stakeholders
- Support an annual stakeholder meeting to facilitate networking and collaboration among stakeholder groups
- Marketing and communications – information hub, web page, social media, smart phone app, local Green Guide, brochures, maps, signs, etc.

C2. Expand environmental education and awareness.

### Potential Tools

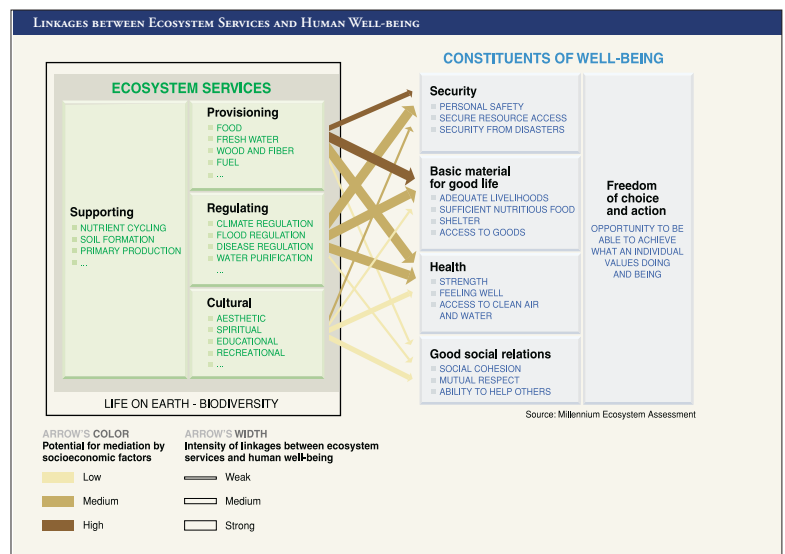
- Expand outreach and support for stewardship groups
- Expand nature experiences, eco-tourism opportunities
- Celebrate community assets

C3. Further explore the establishment of an Environmental Advisory Committee.

### Potential Tools

- Define Terms of Reference
- Select representatives
- Engage Environmental Advisory Committee in implementing the EMS

C4. Provide more environmental staff resources to reflect the need for broader programs as well as population growth.



From Living Beyond Our Means:  
Natural Assets and Human Well-being

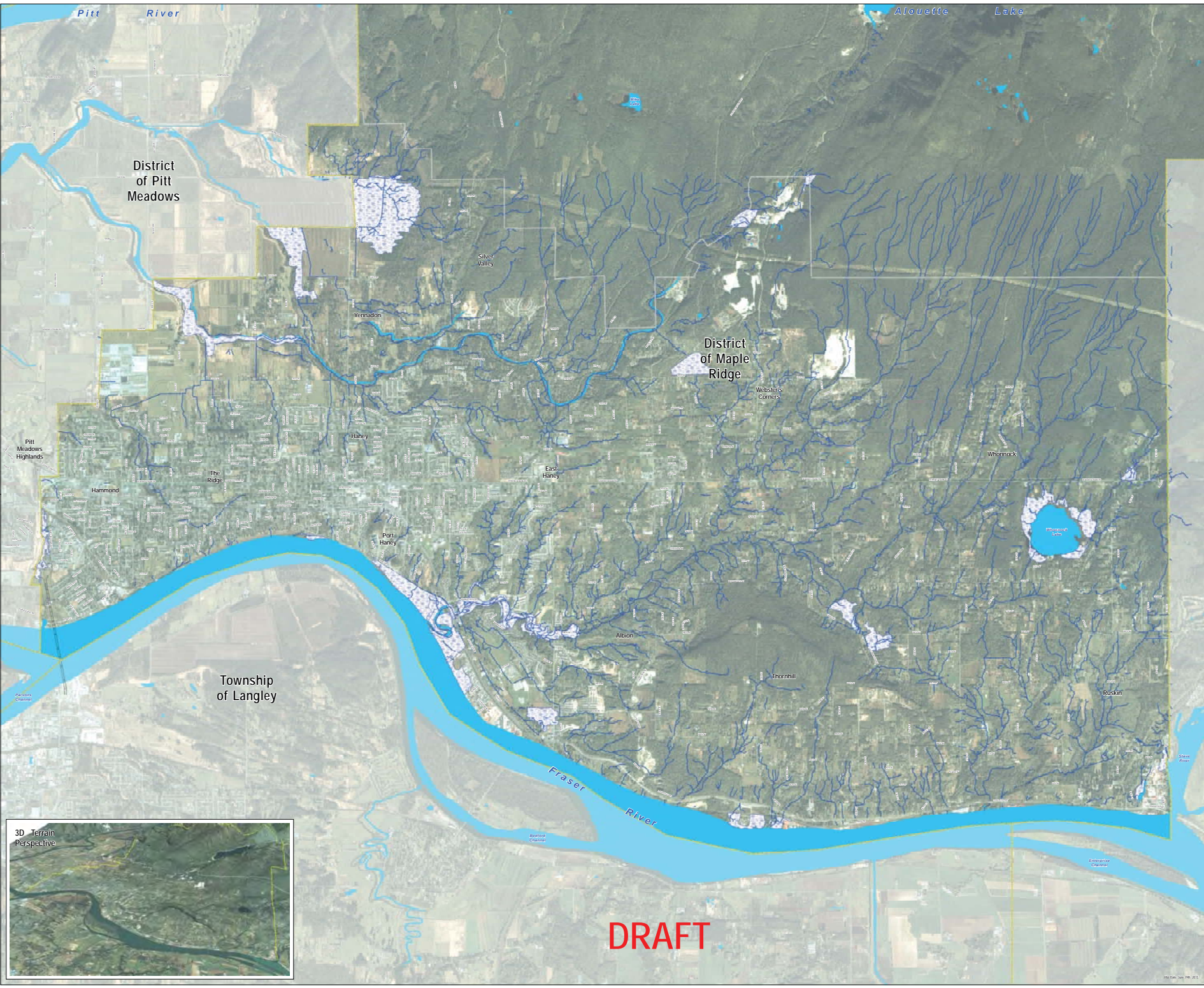
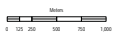
Millennium Ecosystem Assessment, 2005



**DRAFT**

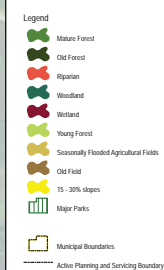
- Legend
- Watercourses
  - Wetlands
  - Municipal Boundaries
  - Active Planning and Servicing Boundary

Please note:  
This map has been prepared by  
Catherine Berris Associates Inc.  
as part of the DP recommendations





**DRAFT**

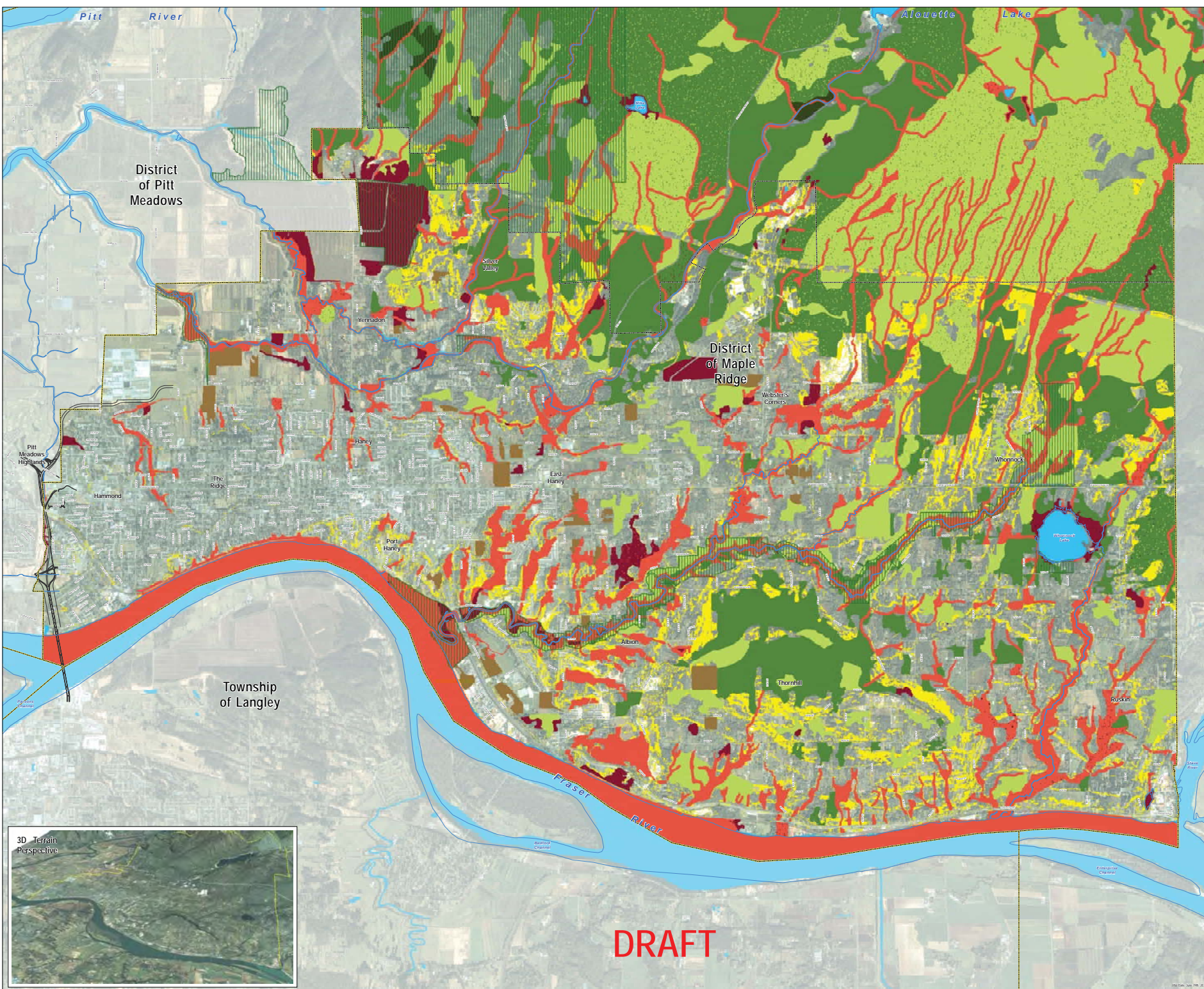


Please note:

This map has been prepared by Catherine Berris Associates Inc. as part of the DP recommendations



End Date: June 19th, 2011





DRAFT

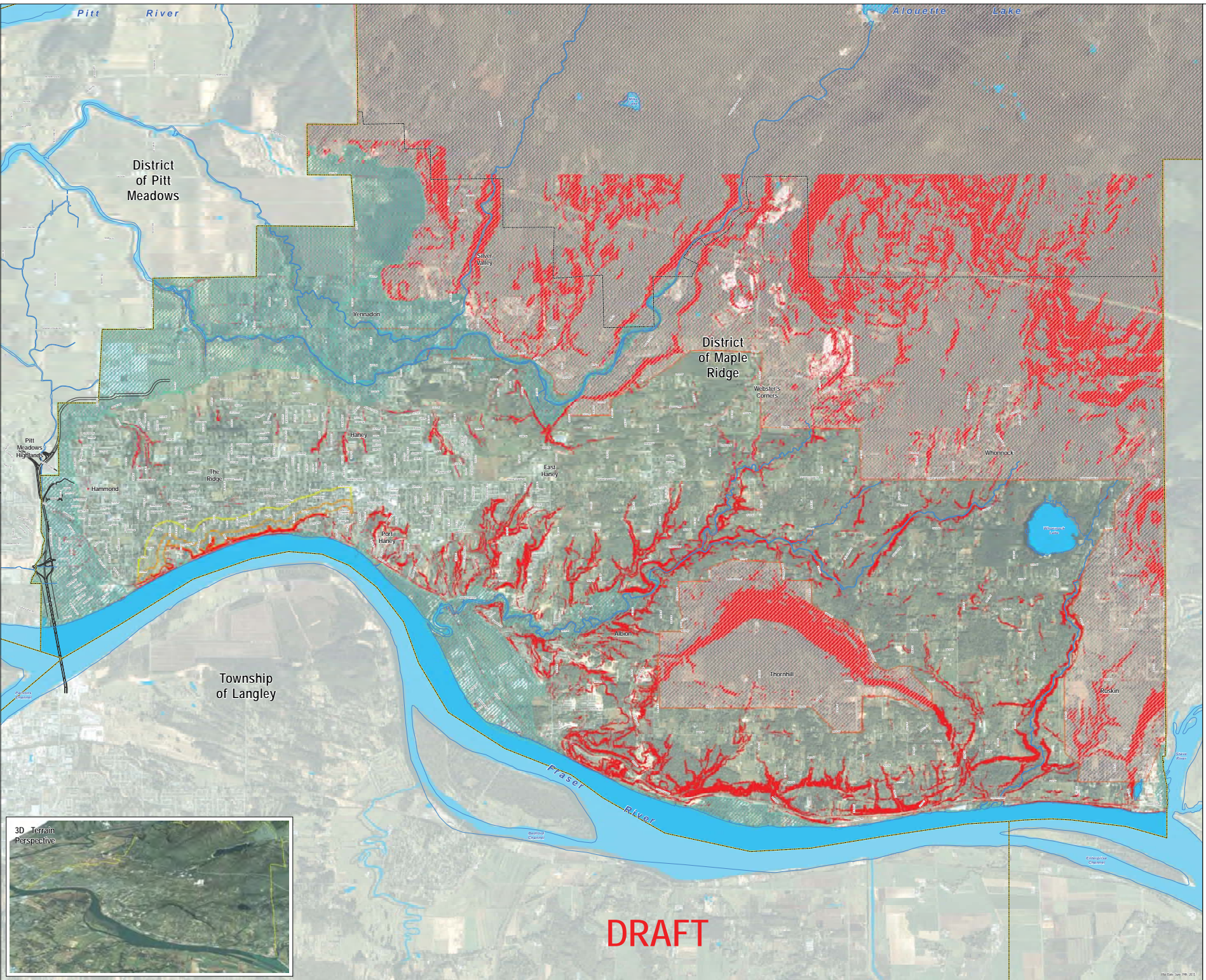
- Legend
- 25% slope
  - Escarpment Area (100m buffer)
  - Escarpment Area (300m buffer)
  - Provincial Floodplain Areas
  - Draft Wildlife DP Areas
  - Municipal Boundaries
  - Active Planning and Servicing Boundary

Please note:

This map has been prepared by  
Catherine Berris Associates Inc.  
as part of the DP recommendations



Scale  
0 100 200 300 400 500  
Metres



District of Pitt Meadows

District of Maple Ridge

Township of Langley

DRAFT





# DESIGNING WITH NATURE – Towards Sustainable Communities



**Low impact development site plan**

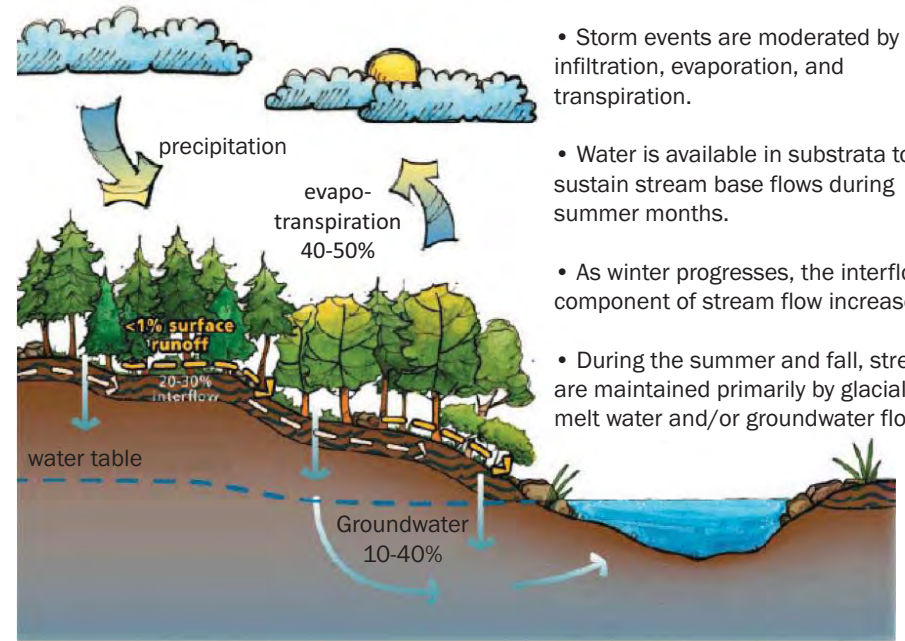


## How Can Nature Help Our Communities?

Risk Management  
Rainwater and Storm Water Management  
Community Greenways  
Carbon sequestration  
Energy and Water Conservation  
Eco Tourism and Recreation  
Health and Connectivity to Natural Places  
Higher Resale Values



## Natural Rainwater Management



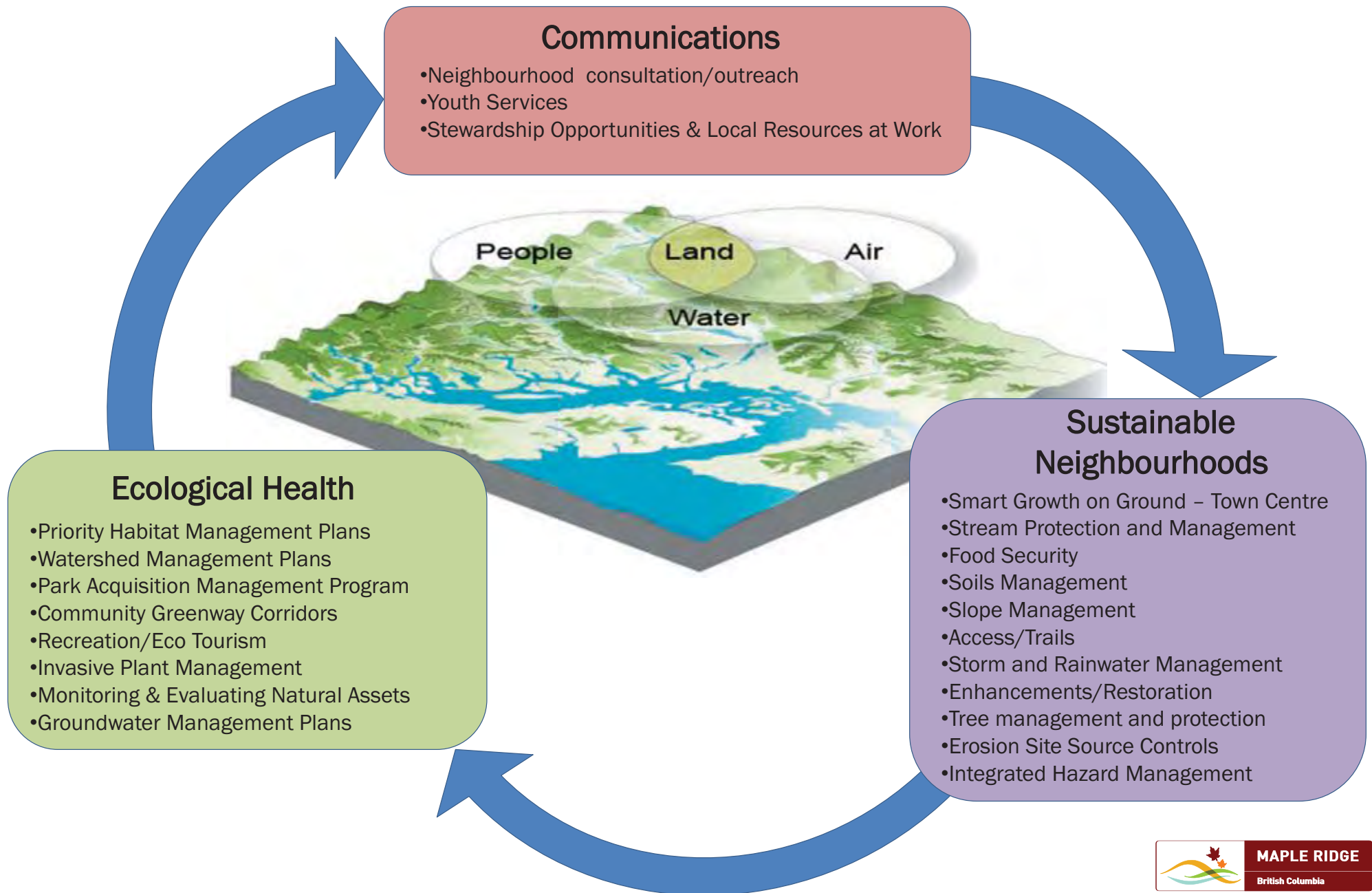
- During winter months, evaporation continues to be active while the transpiration component is minimal.
- Storm events are moderated by infiltration, evaporation, and transpiration.
- Water is available in substrata to sustain stream base flows during summer months.
- As winter progresses, the interflow component of stream flow increases.
- During the summer and fall, streams are maintained primarily by glacial melt water and/or groundwater flow.



Nature Often Provides Multiple Social, Economic, and Environmental Benefits To The Community



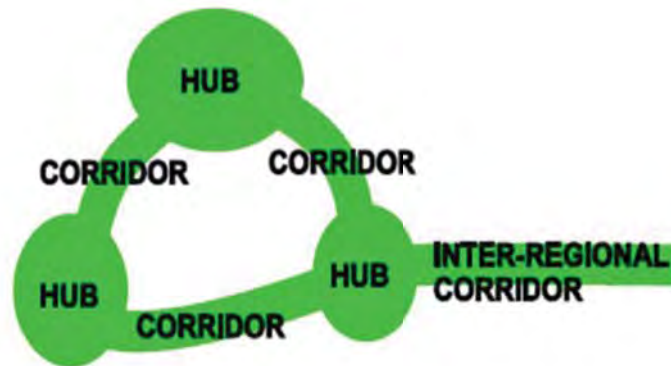
# Environmental Management Strategy Framework



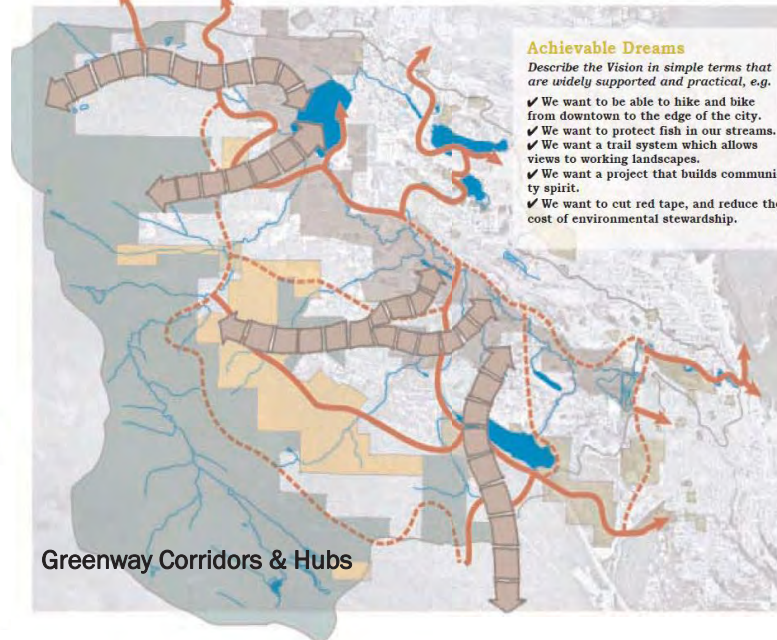
# Ecological Network Management Priorities

## Elements of an Ecological Network

- Regional Biodiversity Core Areas
- Biodiversity Core Areas
- Stepping Stones and linkages (natural & semi-natural)



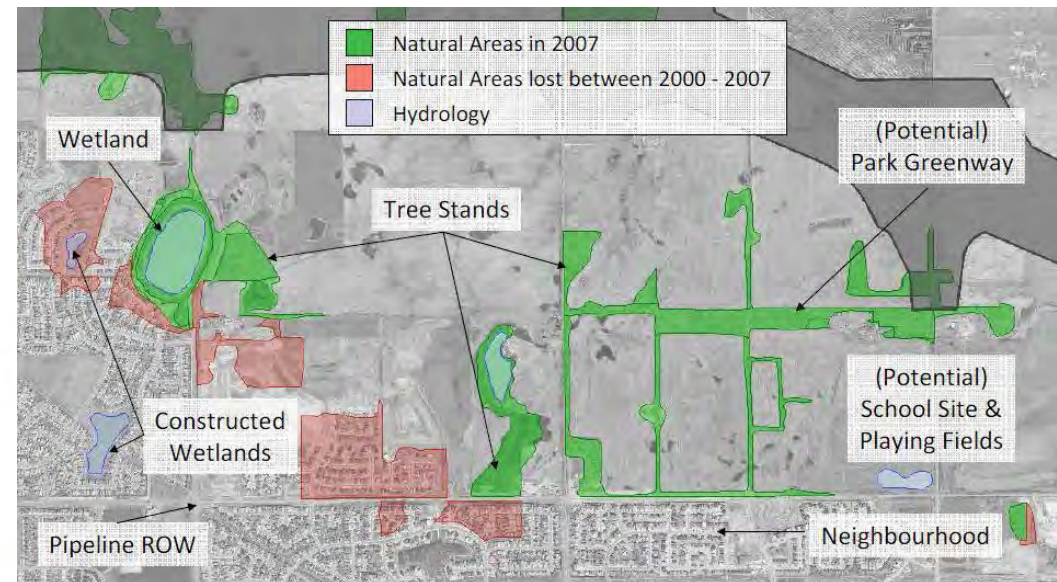
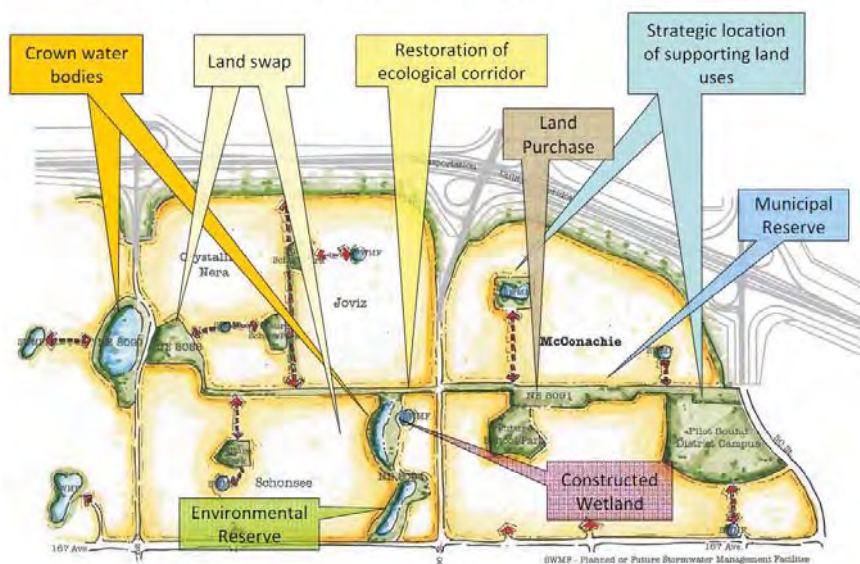
## A Functioning Ecological Network



## Components of a functioning Ecological network...

- A wide vegetation corridor along major watercourses
- Several large natural areas known as core areas
- **Connectivity** for movement of species among the core habitat areas, either through wide, continuous corridors or a series of 'stepping stones'
- A diverse mixture of natural areas throughout the developed parts of the city that can serve as wildlife habitat or connect other, larger natural areas

## Tools for Consideration



## Integrated Ecological Design

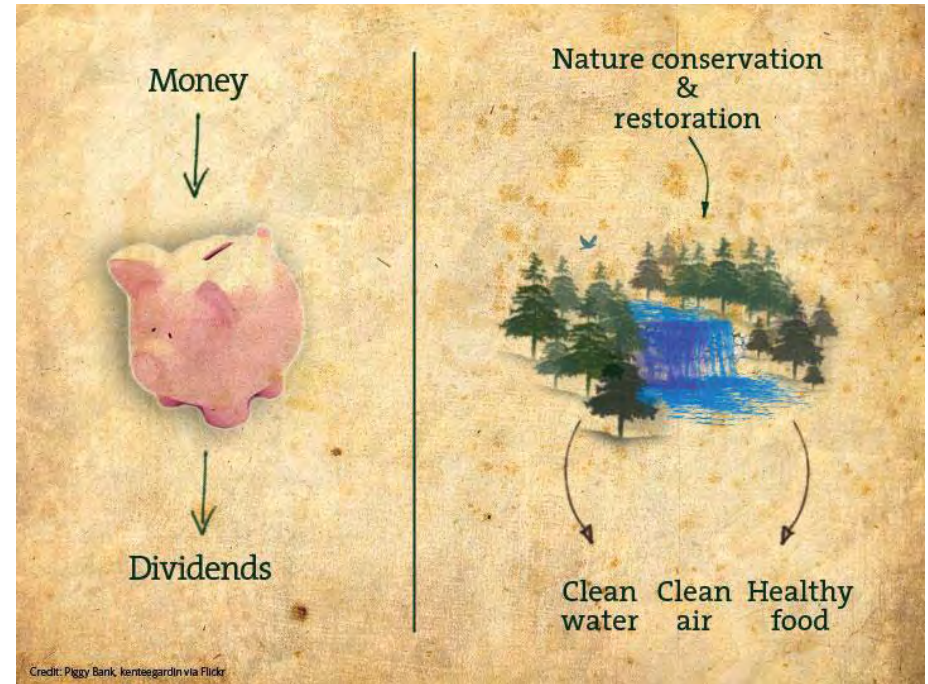


# Valuation of Natural Assets and Services

## Why do we undervalue nature?

Nature's benefits are worth trillions, but....

- Are not measured or monitored
- Treated as externalities



If we take care of nature,  
nature will take care of us.



# Maple Ridge Sustainable Development Strategy

## Ecological Planning Approach



**Environmental Planning using ecological design principles can provide various benefits/services:**

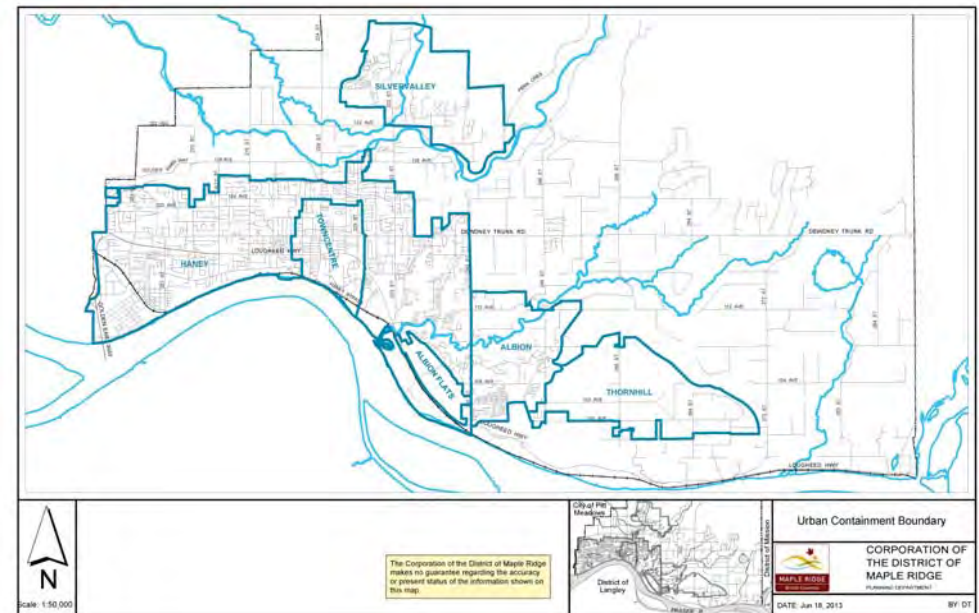
- Ecological resiliency for hazards
- Less stormwater infrastructure
- Recreation/parks/eco-tourism
- Micro-climate management
- Groundwater management
- Soils conservation
- Energy conservation
- Biodiversity conservation
- Increased value of property

## Smart Growth on the Ground for the Town Centre

- To promote open space and green infrastructure
- To reduce urban sprawl



## Urban Containment Boundary





# Environmental Review Process

## Enhancement and Restoration Opportunities

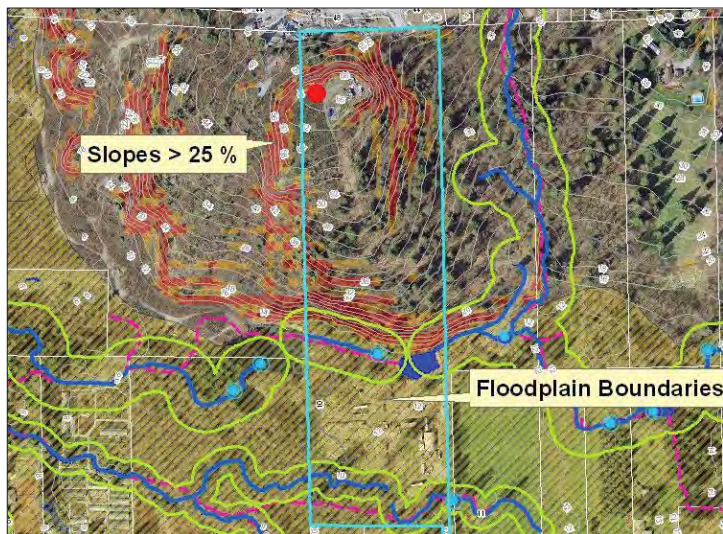


### Enhancement Potential

- Stewardship enhancement
- Invasive plant management
- Habitat enhancement and restoration
- Re-forestation program



## Natural Hazard Abatement



### ID Potential Hazards:

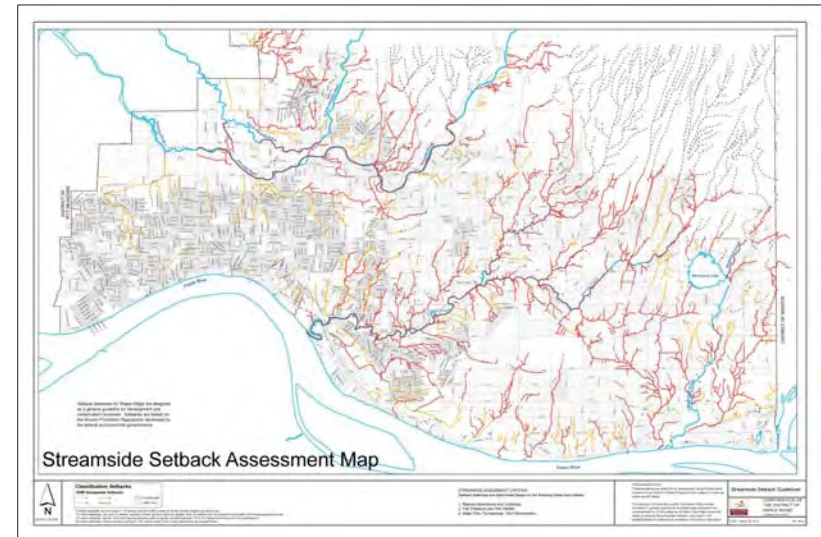
- A. Slopes
- B. Floodplains

### Studies Required & Action Taken:

- Geotechnical Studies
- Flood mitigation study
- Tree hazard mitigation study

Case Study: Nelson Peaks

## Environmental Protection

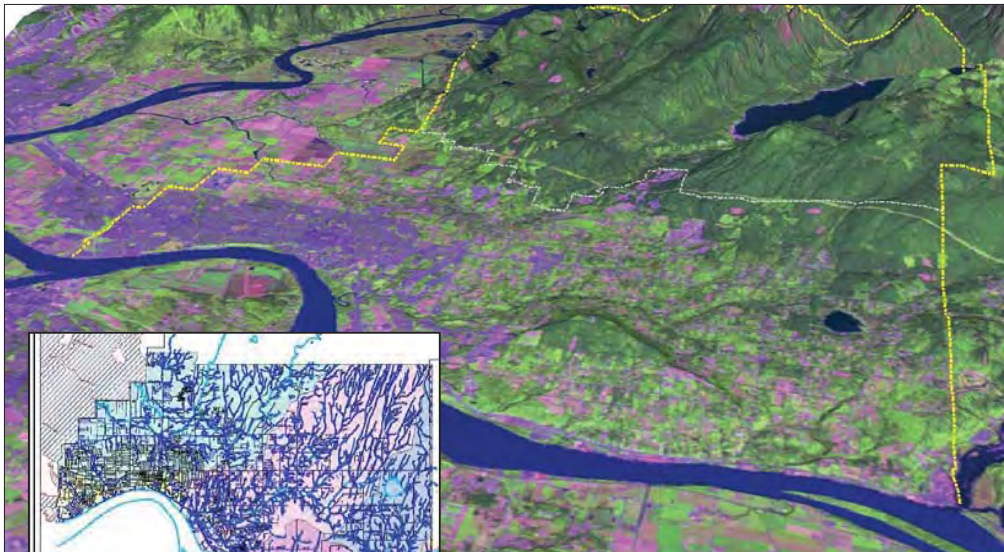


## Environmental Assessment

- Protected Features
- Drainage
- Risk Management
- Enhancement Opportunities
- Trail Networks
- Natural Heritage Features
- Impact Mitigation
- ALR Lands
- Hillside Management



# Watershed Level Planning and Management



Watershed Planning Strategy  
Bio-Regional Conservation Strategy

## Appropriate Scales

Environmental mapping provides multi-level perspectives for different users and issues.



Regional Scale



Municipal & Watershed



Neighbourhood & Site levels

## Partnerships for Protection



## Identify Watershed Management Priorities

- Conservation areas
- Recreation areas
- Resource extraction areas
- Cultural Education areas
- Water & hillside management areas





# Planning for Change

## Large Scale Clearing Impacts



- Erosion control
- Drainage and Groundwater
- Slope stability
- Visual Impacts
- Wind Fall Hazard

## Ecosystem Impacts



- Habitat Fragmentation
- Deforestation
- Contamination
- Difficult to predict impacts in advance



## Population Growth

- Population around 70,000 for Maple Ridge in 2006 reaching 118,000 by 2040
- Intend to absorb 50% of new dwelling units in town centre in response to public support for infill strategy

## Challenges & Goals of Sustainability

### Key Challenges

Climate Change / Air Quality  
Fossil Fuel & Energy Supply  
Waste / Resource Scarcity  
Water Quantity/Quality Supply  
Ecosystem Damage  
Food Supply / Quality / Security  
Economic Prosperity / Viability

### Sustainability Goals

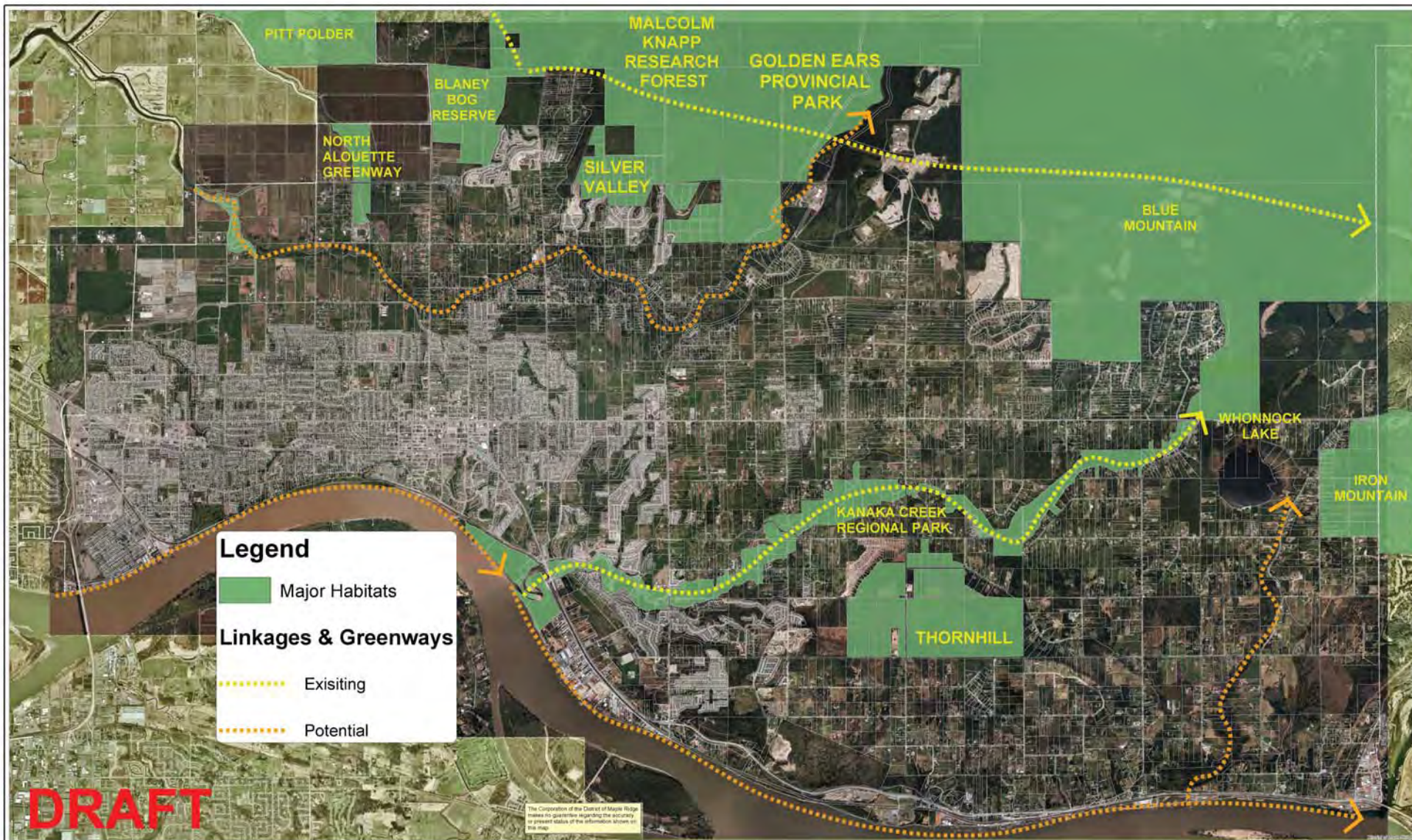
Reduce Emissions  
Renewable Energy / Efficiency  
Reducing Waste / Recycling  
Better Water Management  
Ecological Design / Protection  
Organic / Local Supply  
Diverse / Local Systems

## Climate Change



- The District of Maple Ridge has a goal to reduce community greenhouse gas emissions by 33% below 2007 levels by 2020 and 80% by 2050
- Atmospheric Carbon (20 yrs)  
Under 550 ppm = 1% GDP  
Over 550 ppm (10-20 %GDP)  
Stern Report - 06 UK
- Rise of sea levels worldwide
- Species extinction
- Negative impacts on communities and ecosystems:  
Floodings  
Forest fires  
Droughts
- Significant economic impacts:  
Unpredictable and extreme weather





# Major Habitat Management Areas



Major Habitat Areas

CORPORATION OF  
THE DISTRICT OF  
MAPLE RIDGE

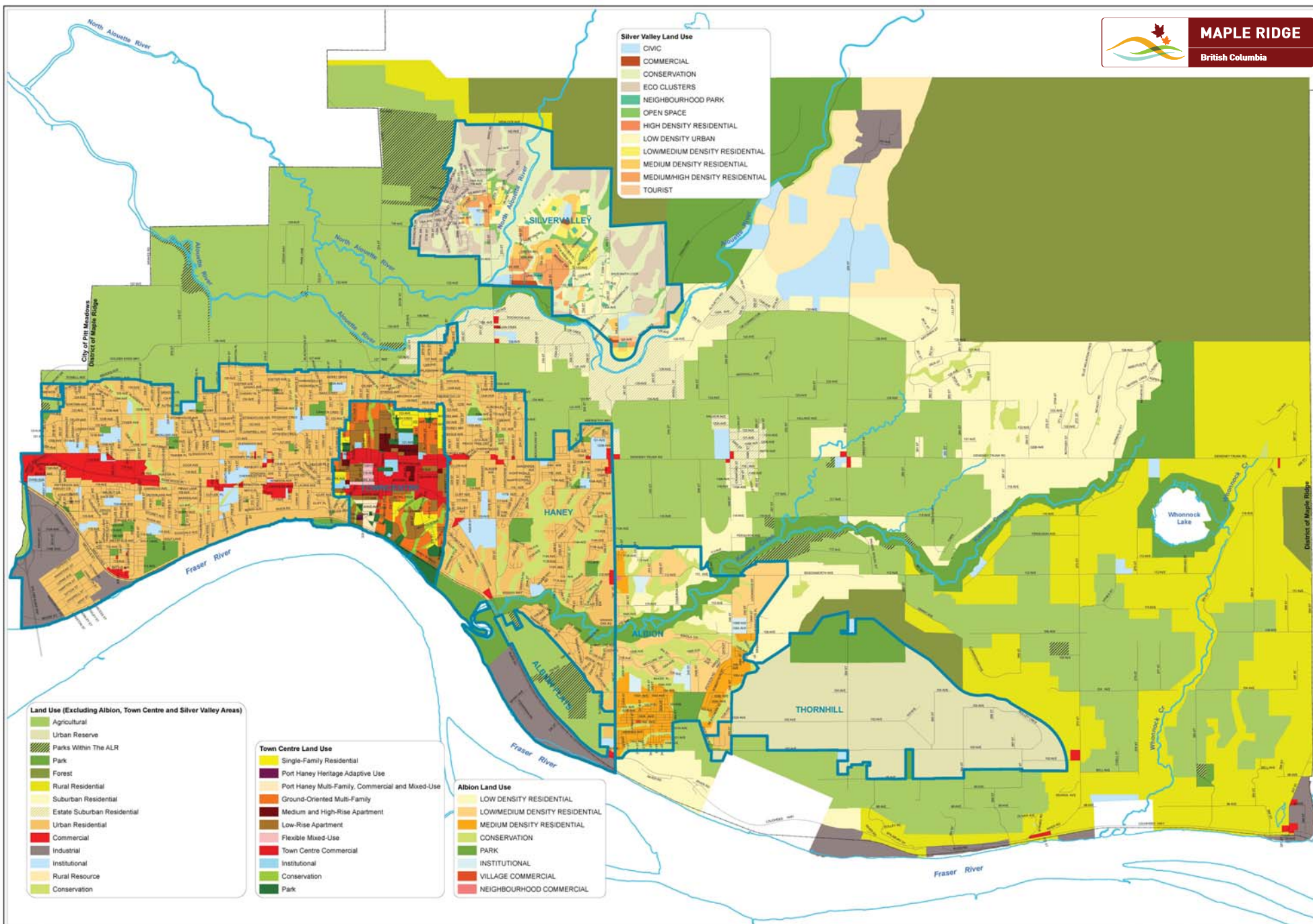
DATE: Jun 18, 2013  
FILE: MapHabitatAreas.mxd  
BY: DT





MAPLE RIDGE

British Columbia



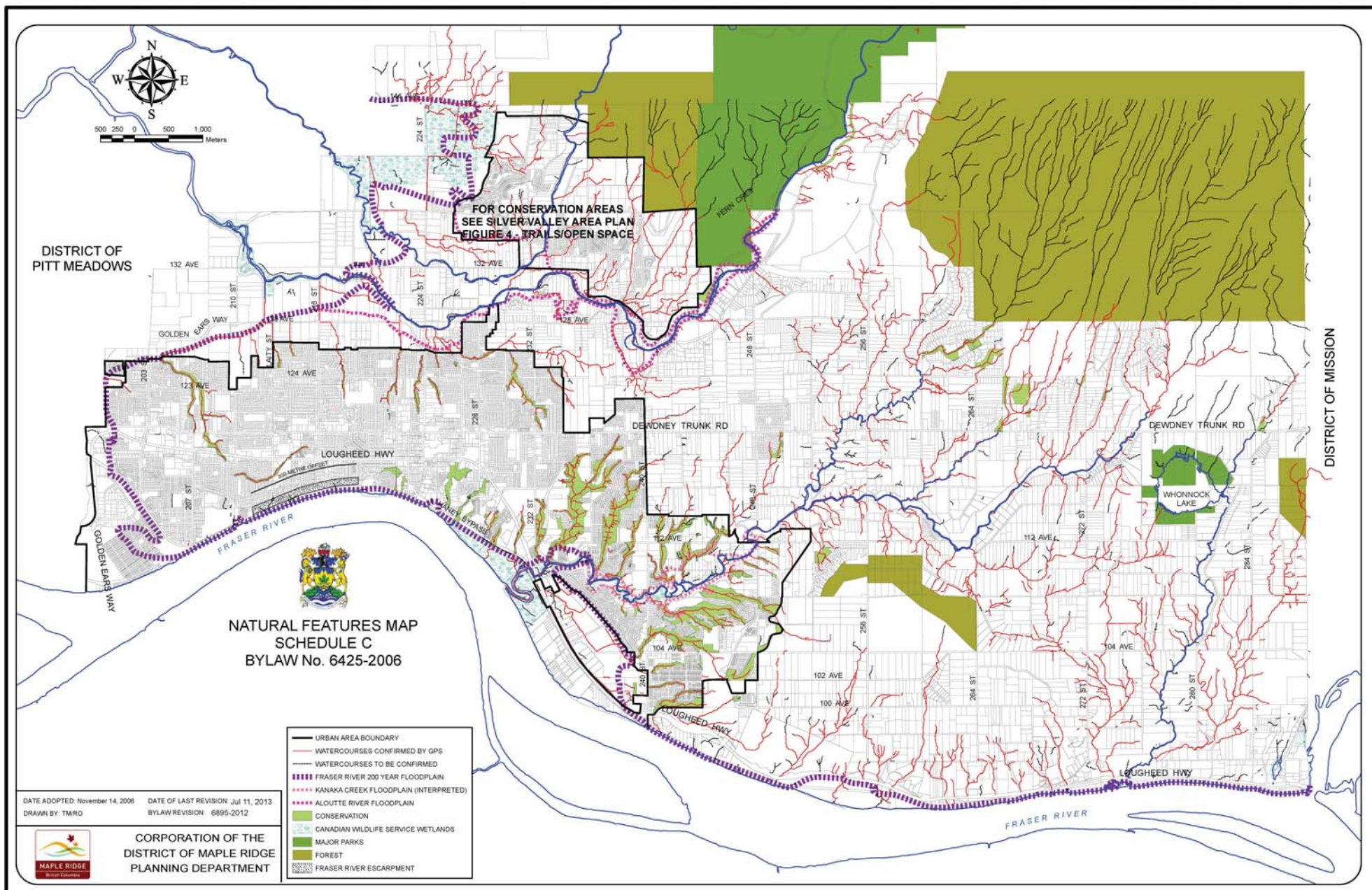
# Maple Ridge Official Community Plan Landuse

The Corporation of the District of Maple Ridge  
respects its commitment to the environment  
and the use of the information shown on  
this map.

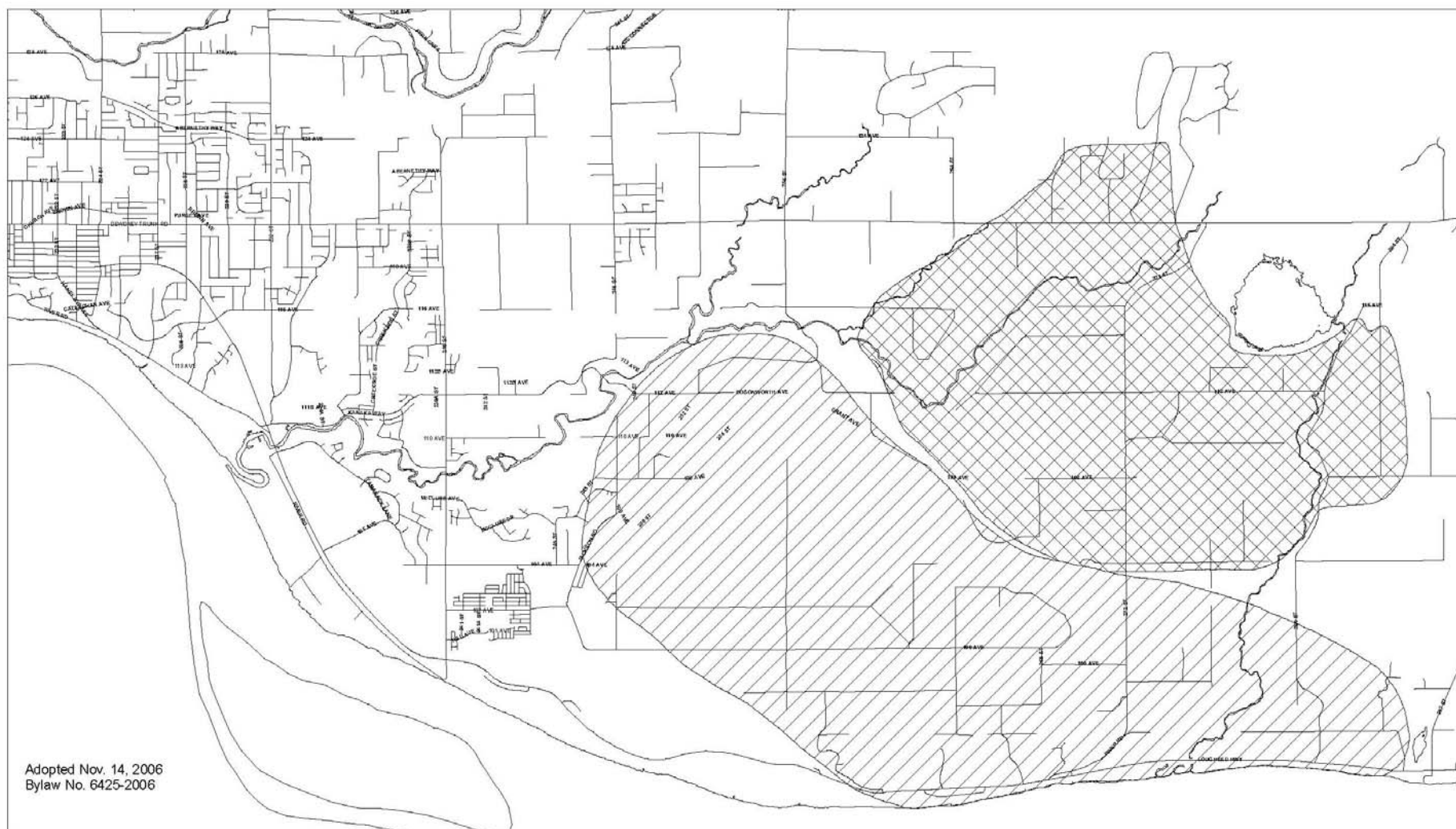


CORPORATION OF  
THE DISTRICT OF  
MAPLE RIDGE  
2010, JAN 20, 2012, P102, L1000, 1000, 1000











Adopted Nov. 14, 2006  
Bylaw No. 6425-2006



## Legend

-  Grant Hill Aquifer
-  Whonnock Aquifer

## NOTE:

The vulnerability and demand for use of an aquifer varies. For further information refer to the Ministry of Land, Water and Air Protection, Guide to Using BC Aquifer Classification Maps for the Protection and Management of Groundwater.

## AQUIFERS



CORPORATION OF  
THE DISTRICT OF  
MAPLE RIDGE  
PLANNING DEPARTMENT

October 20, 2006

Figure 8