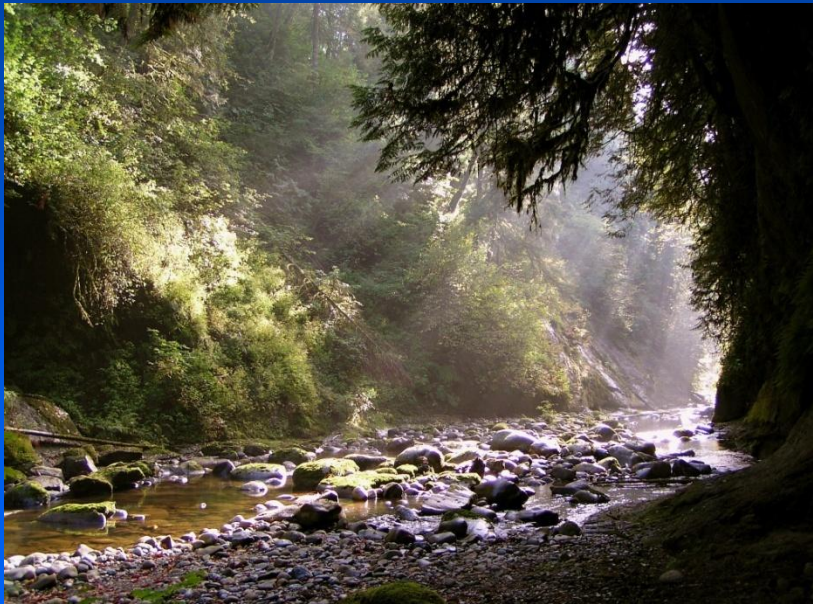


# An Ecological Management Strategy



Prepared For Maple Ridge



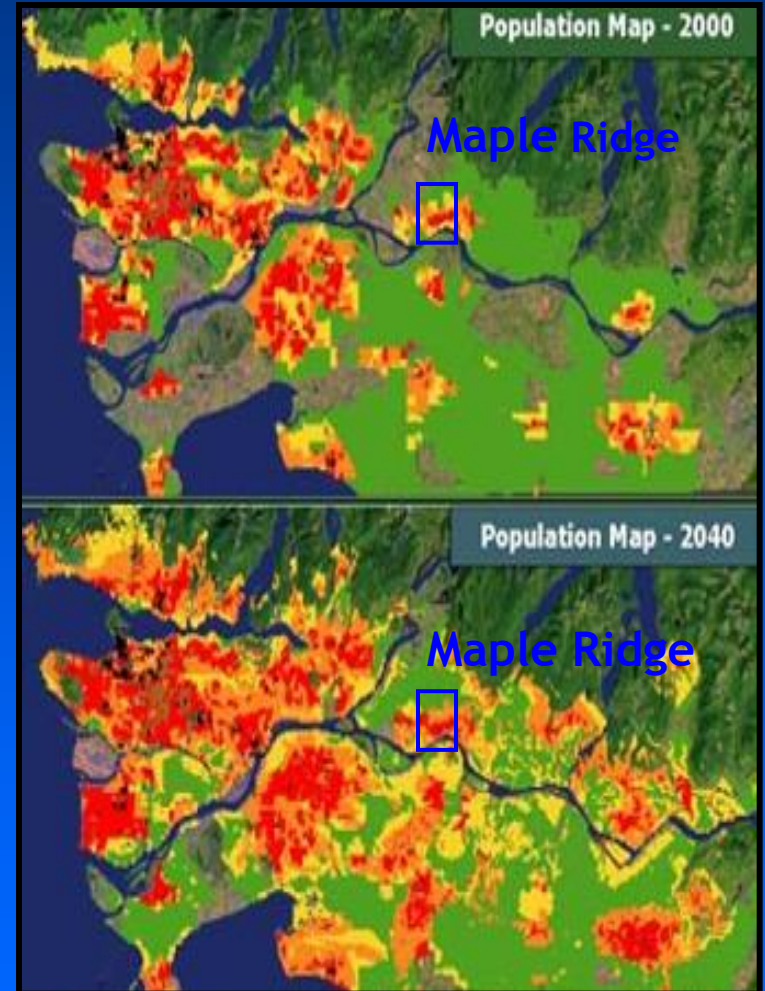
# Overview

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1. Existing Environmental Framework
2. Environmental Mapping Program
3. Integrated Environmental Solutions
4. Environmental Strategy: The Next Steps?

# Maple Ridge Context

- Population around 70,000 for Maple Ridge in 2006 reaching 148,000 by 2040
- Intend to absorb 50% of new dwelling units in town centre in response to public support for infill strategy
- Climate change influence and impacts on our community
- Increasing development pressure and fragmentation of the natural environment





# OCP Environmental Framework

## A Timeframe For Maple Ridge

---

- ✓ OCP. Environmental Background Report  
(2004) Review of Major Issues, Information Gaps, and Priorities for the Community
  
- ✓ OCP. Official Community Plan Adopted  
(2005) Integrated Approach with Focus on Ecological Planning For Land, Water, and Air Resources

### Principal Environmental Goals of OCP

- Protect significant ecosystems in the Municipality
- Anticipate and respond to impacts of climate change on land, water, and air resources;
- Determine guidelines and standards that are necessary to protect and manage in and around environmentally sensitive areas;
- Identify situations where additional environmental studies or assessments are required as part of the development process; and
- Maintain and improve ecosystem health and human safety.

# The Environmental Framework Process

---

- ✓ Phase I. Develop A Municipal Map and Inventory  
(2000) Of Watercourses, Wetlands, In Stream  
Infrastructure and Enhancement sites
- ✓ Phase II. Develop A Municipal Environmental  
(2004) Information Management System
- ✓ Phase III. Upgrade Mapping to Include Terrestrial  
(2005) Environmental Areas & Significant  
Natural Processes and Features
- Phase IV. Design and Implement an Ecological  
(2010) Management Strategy for the District

# ESA Mapping - A Resource Tool

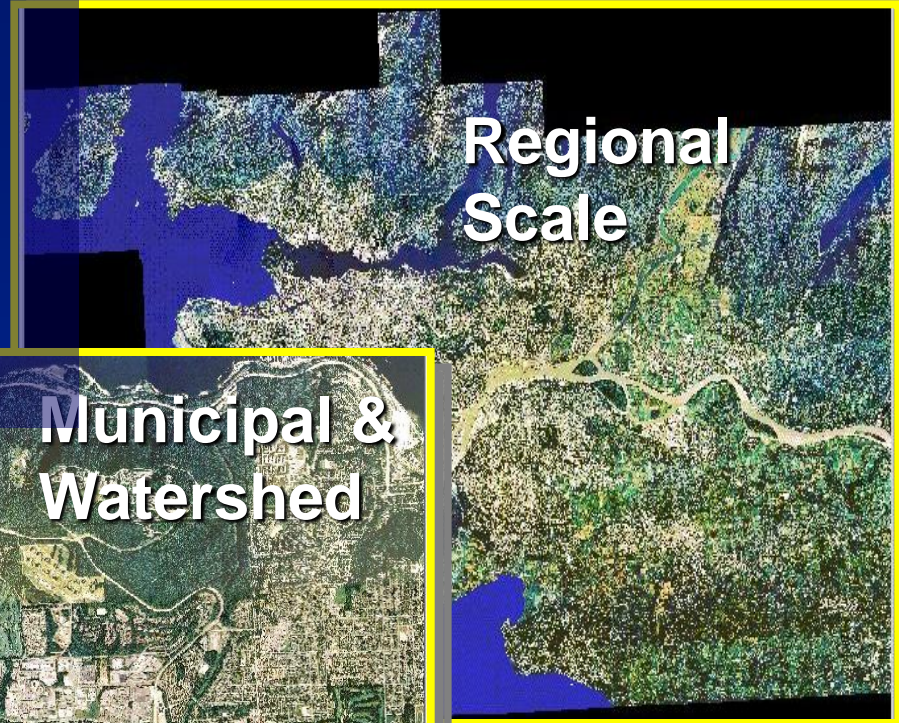
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## 1. Environmental Mapping System Provides Valuable Background Information on...

- Existing Protected Areas or Protected Features;
- Topography and Hydrology;
- Potential Hazards or Vulnerable areas;
- Unique or Significant Natural Features;
- Possible Trail Corridors and Connectivity;
- Broader Neighborhood or Watershed Management Landscape Management Perspectives.

# Appropriate Scales?

Environmental Mapping  
Provides Multi Level  
Perspective For Different  
Users and Issues



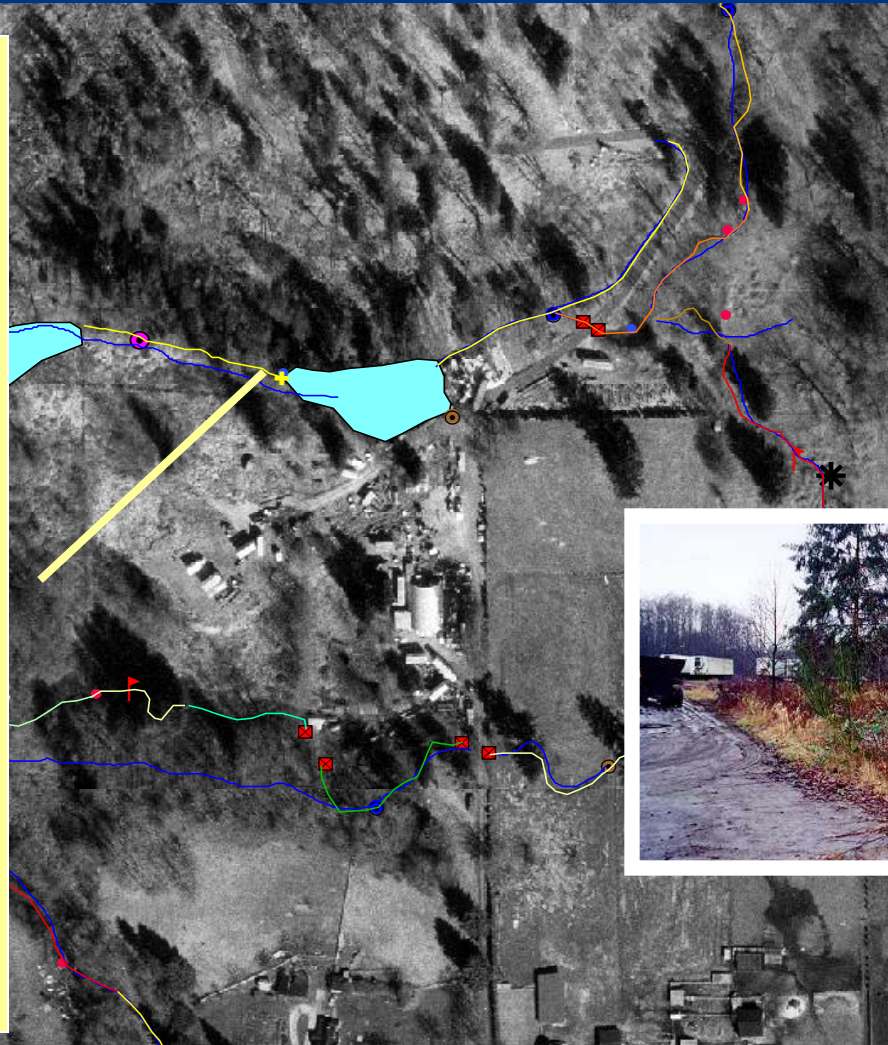
Variety of issues, users, priorities, relationships, and opportunities at a variety of scales



# Watercourse Mapping Information System

## Profile Of a Watercourse Section

<b>Section Number</b>	34
<b>Crew:</b>	Stott
<b>Date:</b>	01242000
<b>State:</b>	Natural
<b>Flow Type:</b>	Riffle/Pool
<b>Wetted Width:</b>	1.5m
<b>Wetted Depth:</b>	0.01 - 0.5m
<b>Bank Width:</b>	2.0m
<b>Bank Depth:</b>	2.0m
<b>Gradient:</b>	3 Percent
<b>Substrate:</b>	Clay 30% Sands 25% Gravel 30%, Cobbles 15%
<b>Vegetative Cover:</b>	50%
<b>LOD/LWD Level:</b>	Low
<b>Undercut Banks:</b>	Yes
<b>Riparian Extent:</b>	< 5m left bank > 15m right bank
<b>Riparian Type:</b>	Shrubs left bank Mixed Forest rt bank
<b>Invasive Species:</b>	> 75%
<b>Comment:</b>	None
<b>Photo:</b>	R10P23



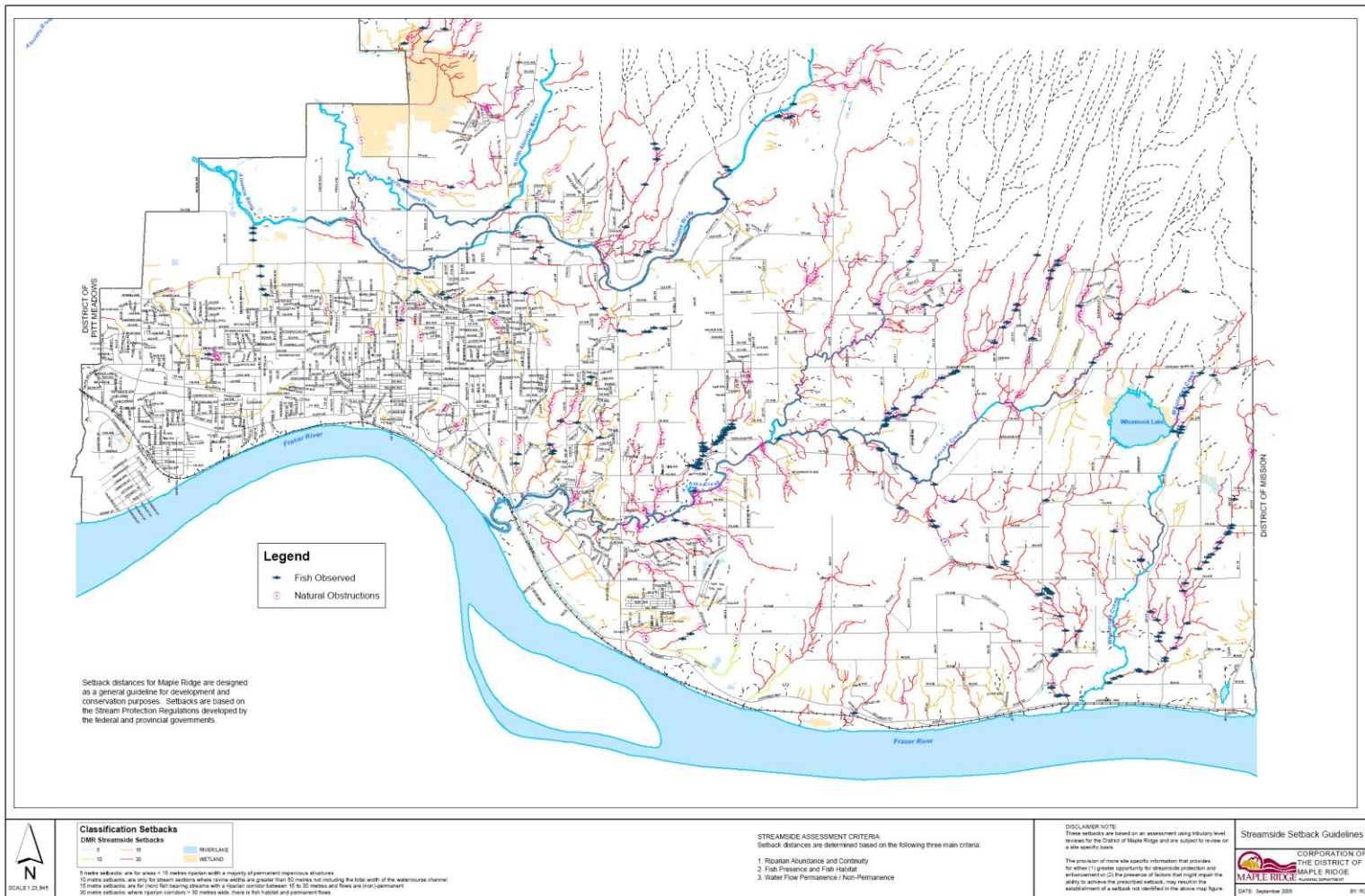
- DMR 1994 Streams
- Wildlife01.shp
- Fish01.shp
- Culverts02.shp
- Outlets01.shp
- Naturalobs01.shp
- Problemflag01.shp
- Pollution01.shp
- Waterbody02.shp
- Pools01.shp
- Bankinfra01.shp
- Streaminfra01.shp
- Ponds



70 0 70 140 210 280 Meters

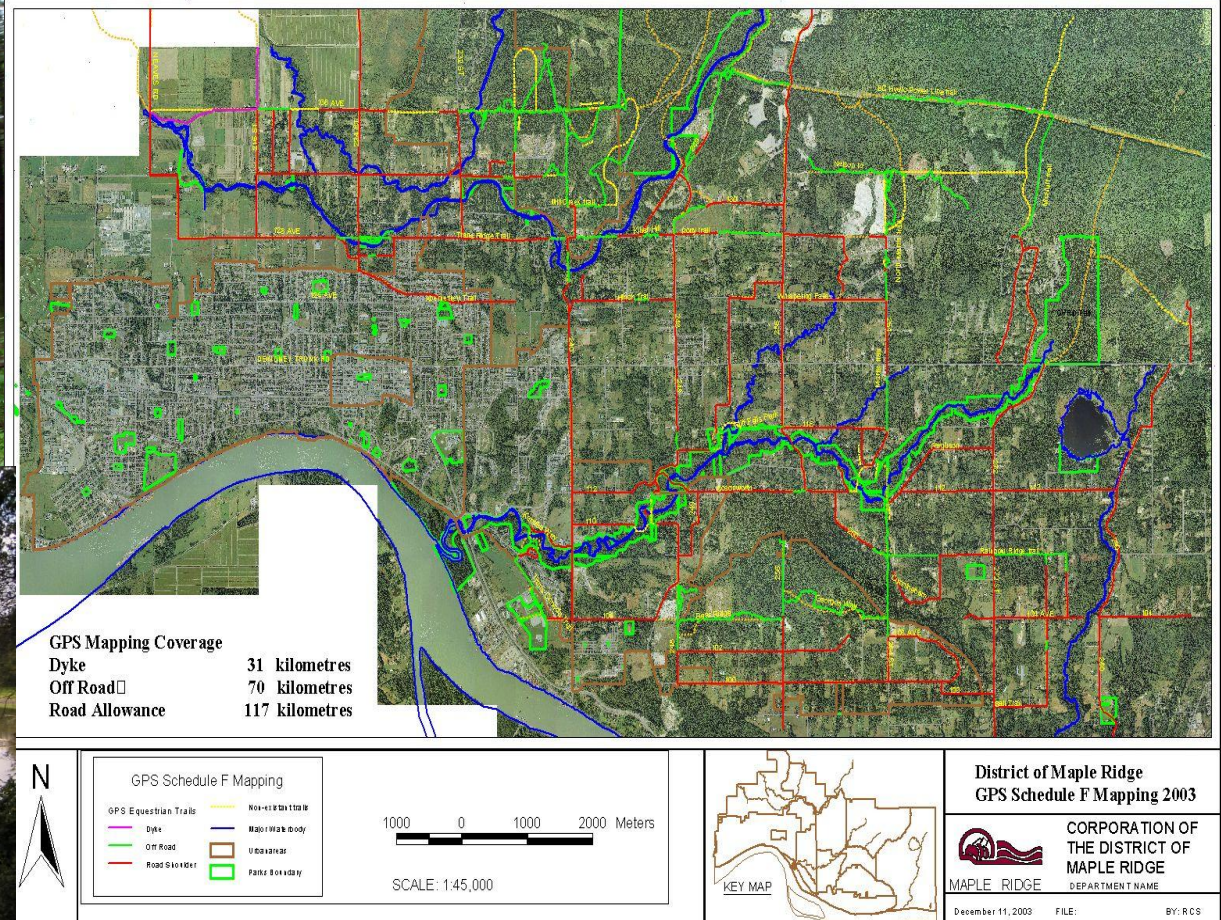


# Watercourse Protection Program (SPR)





# Community Greenway Corridors





# Community Stewardship - Education and Outreach

**SIS Viewer**

File Edit View Tools Window Help

Easting: 530,809.4 Northing: [blank]

Active Visible

- ☐ Fish Release
- ☐ Fish Survey
- ☐ Invertebrate Survey
- ☒ Water Quality
- ☐ Wild Trees
- ☐ Wildlife
- ☐ Wetlands
- ☐ Stream Infrastructure
- ☐ Ponds
- ☐ Photo Points
- ☐ Outlets
- ☐ Natural Obstructions
- ☐ Fish Observations
- ☐ Areas of Erosion
- ☐ Enhancements
- ☐ Culverts
- ☐ Bank Structures
- ☐ Streams
- ☒ Roads
- ☒ Major Rivers/Lakes
- ☐ Aerial Photography
- ☐ Elevation


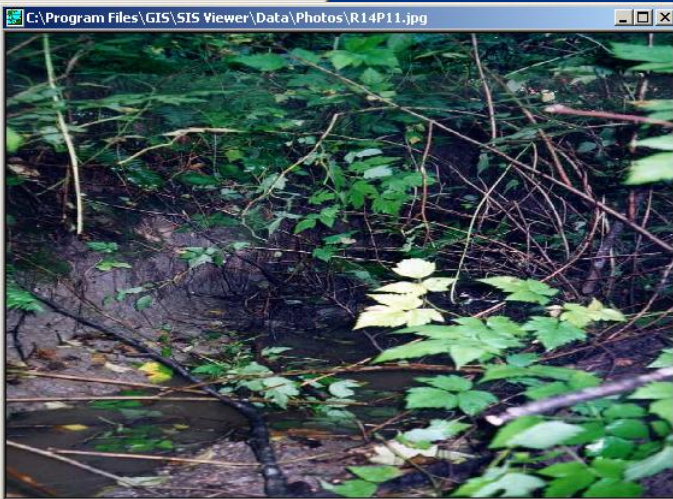

Ready

**Water Quality**

ID	Point Id	Stream Name	Ph Low	Ph High	Low Temp C	High Temp
5	KA040	Seigel Creek	6.5	7	4.6	10

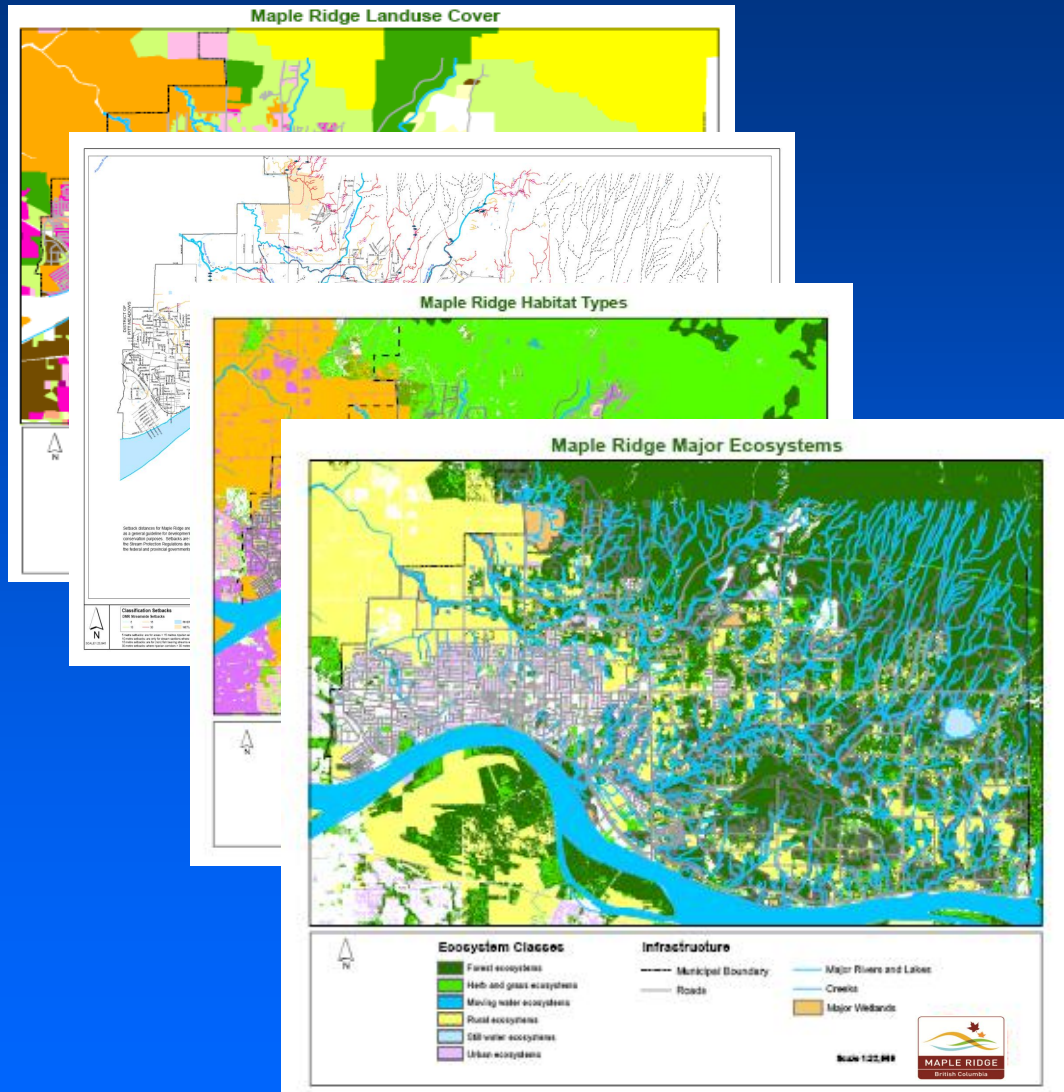
Print Save Close

Save Changes Close





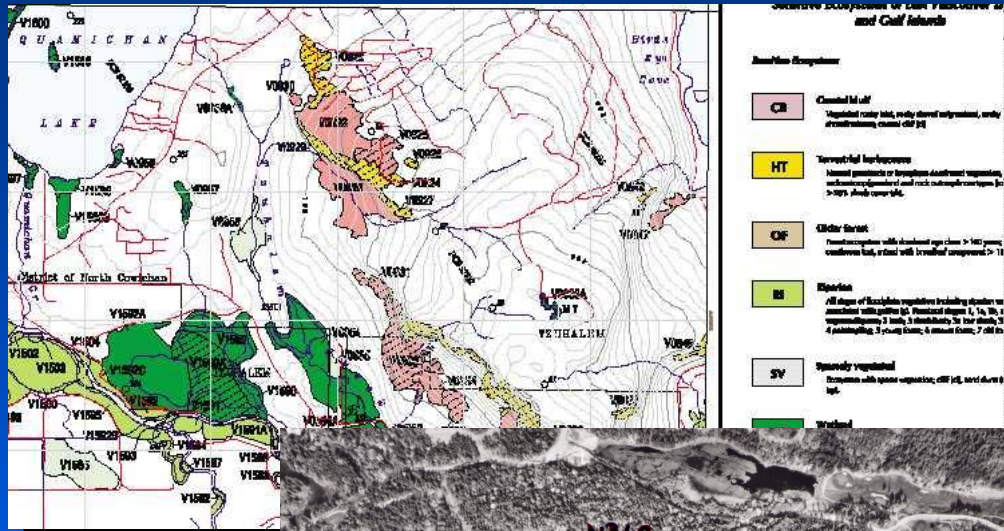
# Integrated Technology - GIS Mapping



GIS allows users to carry out ...

- Inventory of Information
- Queries and Info Access
- Analysis
- Simulation & Forecasting
- Monitoring
- Map Production

# Data Collection and Methodologies based on Federal, Provincial, & Regional Standards



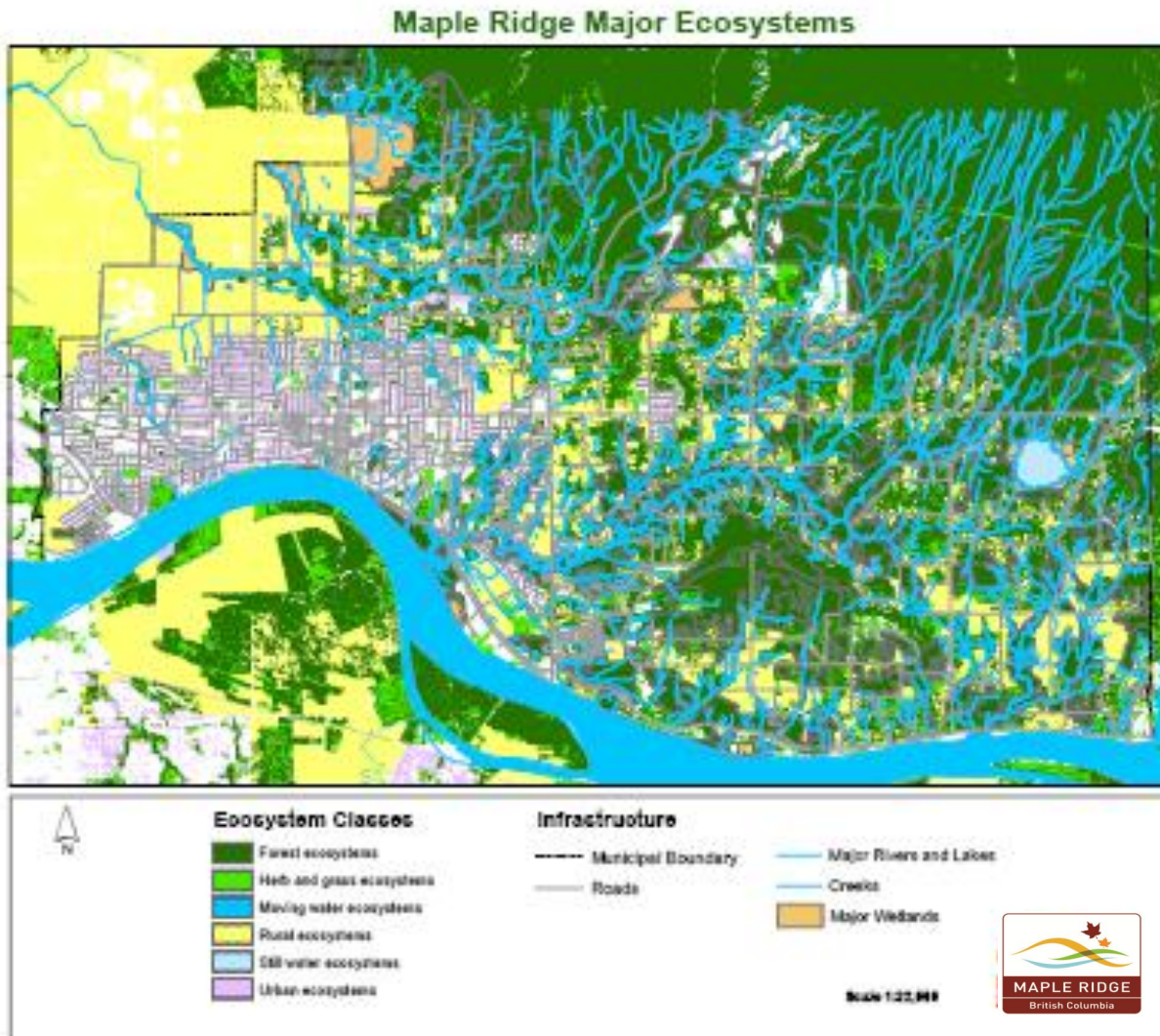


# Municipal Ecological Inventory

## IDENTIFY INFORMATION LAYERS TO HELP GUIDE USERS

### Major Map Layers

1. Protected Areas
2. Unique Habitat
3. Movement Corridors
4. Natural Features
5. Ecological Functional Systems
6. Potential Hazard or Risk Areas





# ESA Mapping Layers

## 1. Protected Areas and Features

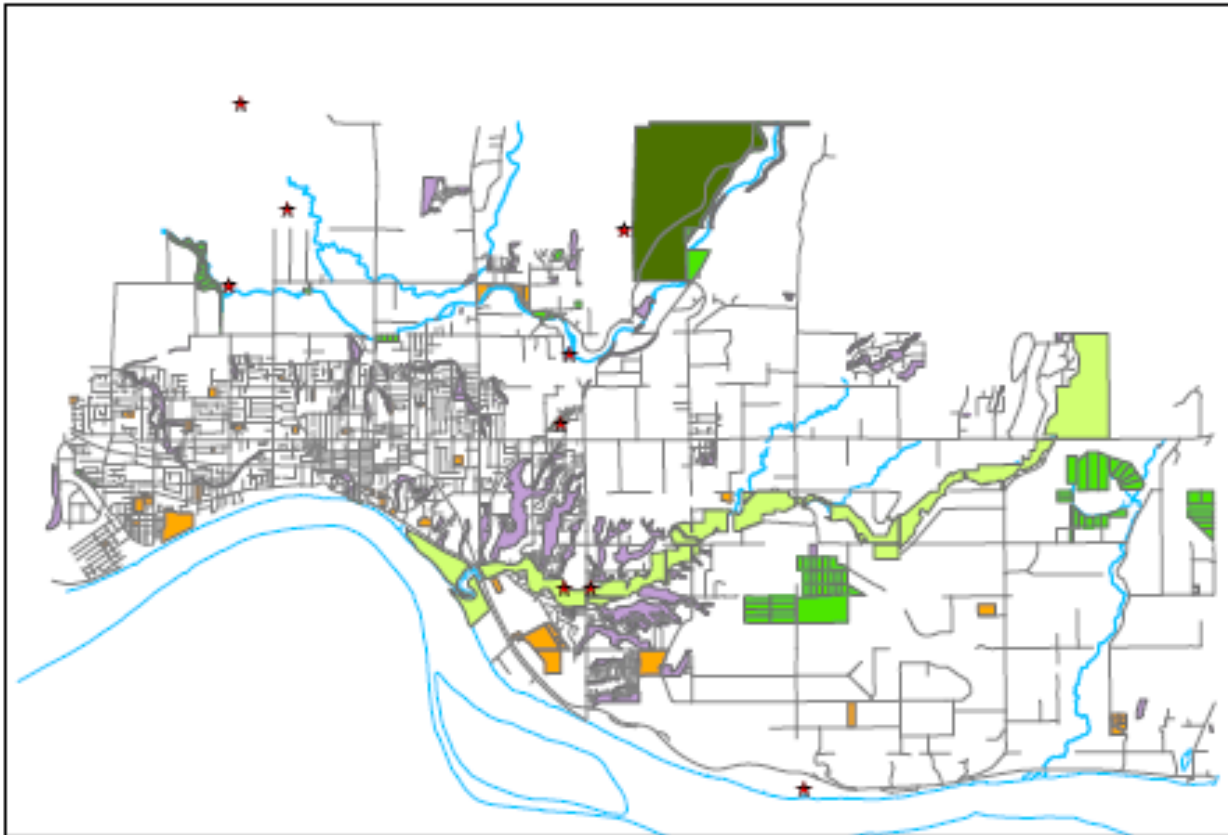
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Designated Conservation Areas, Natural  
Park Corridors, and Protected Features



# 1. Municipal Protected Areas Map

Maple Ridge Protected Areas



- ★ Protected Features
- GVRD Parks
- Queen Elizabeth Park
- Protected Parks
- Designated Conservation Areas
- Active Parks

Major Rivers and Lakes  
Roads

Scale 1:10,000

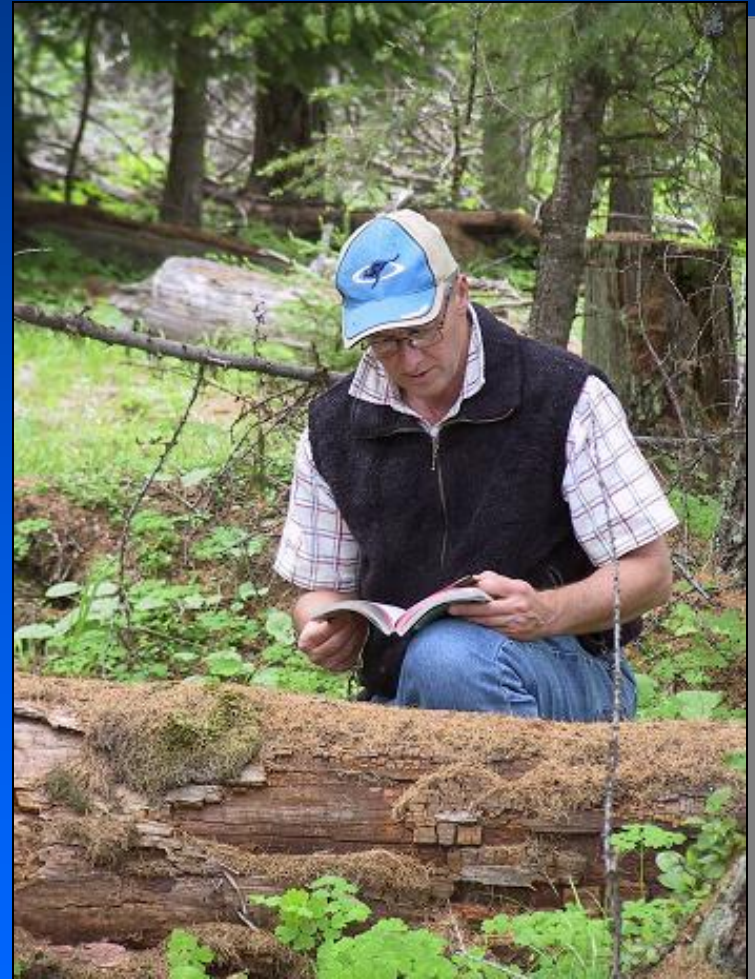


- Provincial Parks
- GVRD Parks
- Dedicated Conservation lands
- Covenanted Conservation Areas
- Protected federal and provincial features such as:  
raptor nests,  
heron rookeries,  
watercourses  
wetlands  
lakes

## 2. Significant or Unique Ecosystems: Based on Federal / Provincial Standards

---

- Habitat size;  
Connectivity; and  
Continuity.
- Diversity of structure,  
age, and species
- Disturbance &  
surrounding land use





# Unique or Threatened Ecosystem Types as defined by federal and provincial agencies

## Wetlands (WN)



## Riparian (RI)





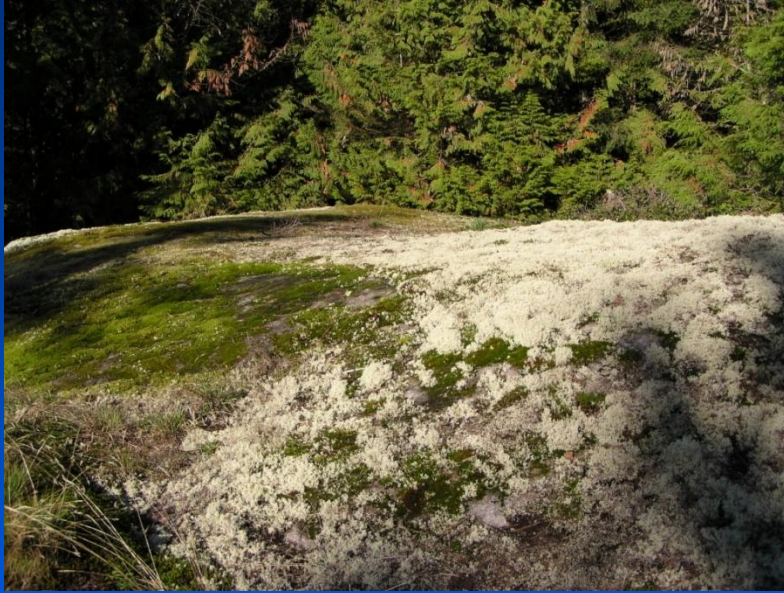
## Old Forest (OF)



## Deciduous Woodlands (WD)



## Inland Bluffs and Cliffs



Old Field  
Terrestrial Herbaceous

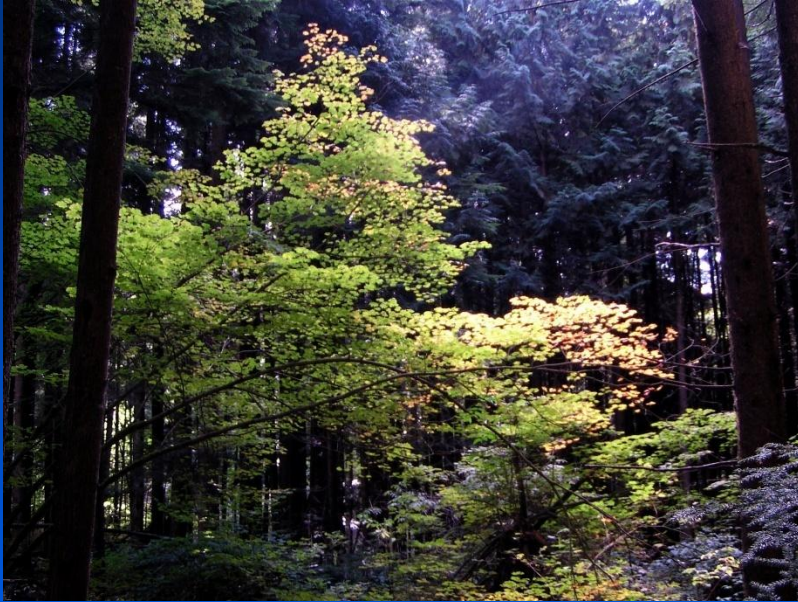


## Tidal Foreshore Areas



## Stillwater Ecosystems

## Mature Mixed Forest (MF)



Seasonal Flooded Fields



## 2. Major Ecosystems

Maple Ridge Unique Features



Old Forest

Mature  
Forests

Riparian  
Areas

Wetlands

Stillwater  
Ecosystems

Old Field  
Grasslands



### Unique Feature Types

* Unique Features	Riparian Areas
Old Forest	Wetlands
Mature Deciduous Forest	Still Water Ecosystem
Mature Mixed / Coniferous Forest	Seasonal Flooded Agricultural Lands

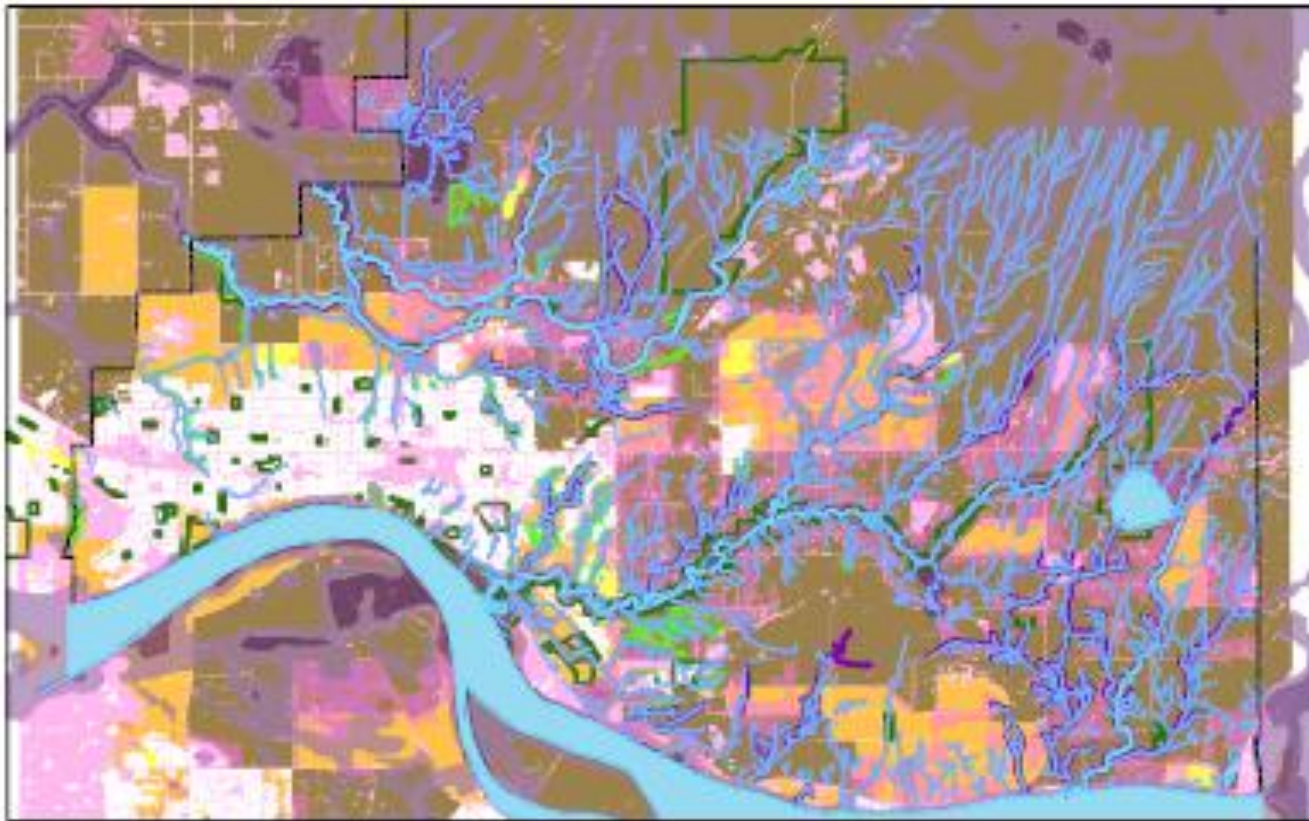
— Municipal Boundary  
— Roads  
— Major Rivers and Lakes

Scale 1:100,000



# 3. Major Movement Corridors and Habitat Hubs

Habitat Patch Size and Movement Corridors



## Movement Corridors

- moderate significance
- high significance

## Habitat Patch Size

- habitat refuge
- major habitat refuge
- habitat reservoir
- major habitat reservoir

- Municipal boundary
- Equestrian trails
- Major rivers and lakes
- Creeks

- Conservation area
- Active parks
- Build up areas



Scale 1:35,000

## Habitat Patch Size ranges:

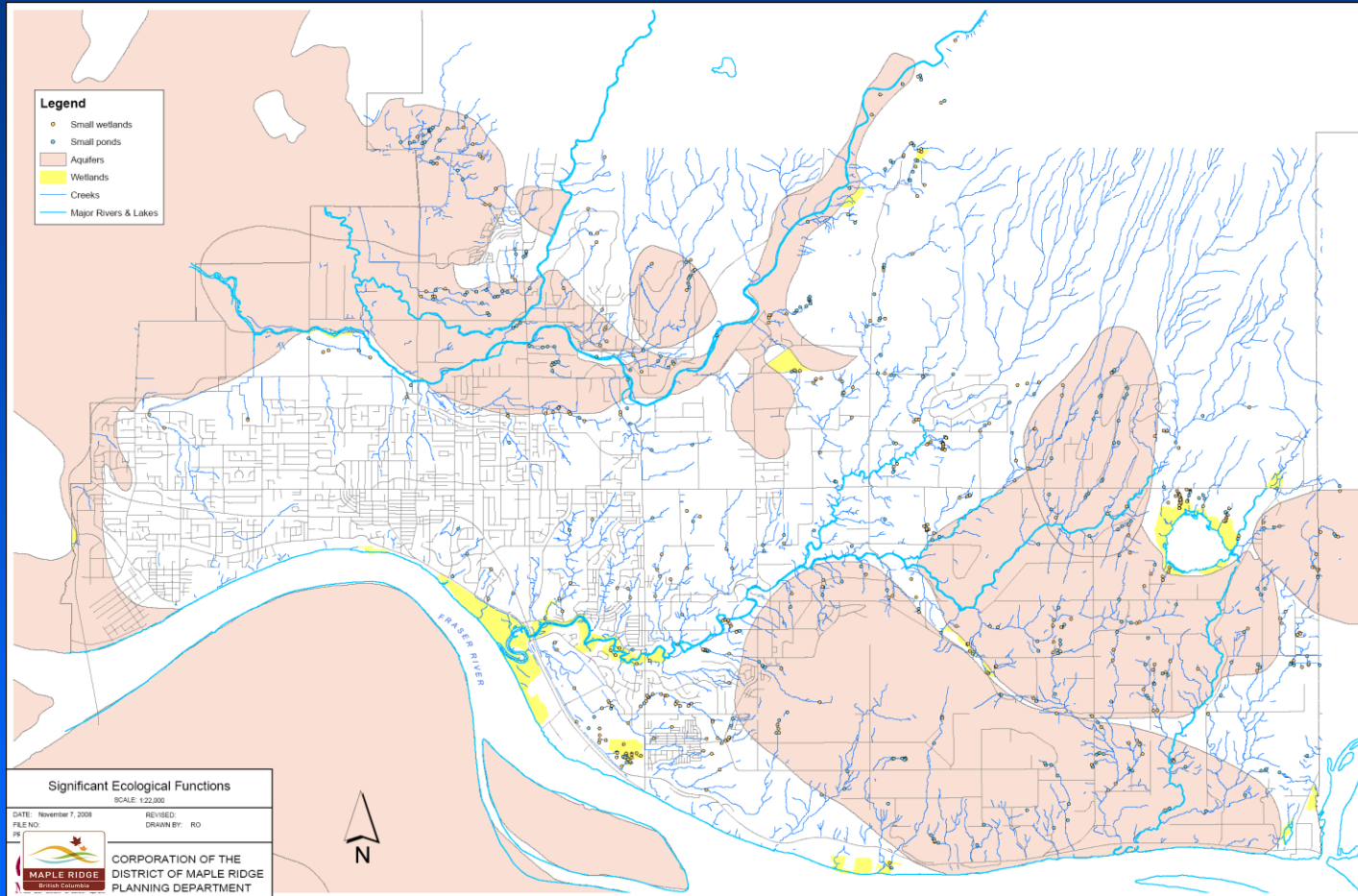
- 2 - 200 hectares

## Movement Corridors:

- Riparian corridors
- Utility corridor
- Naturalized ROWs & trails
- Historic Fields and grasslands



# 4. Vulnerable Ecological Systems



Wetlands

Aquifers

Creeks

Foreshore  
Tidal Areas

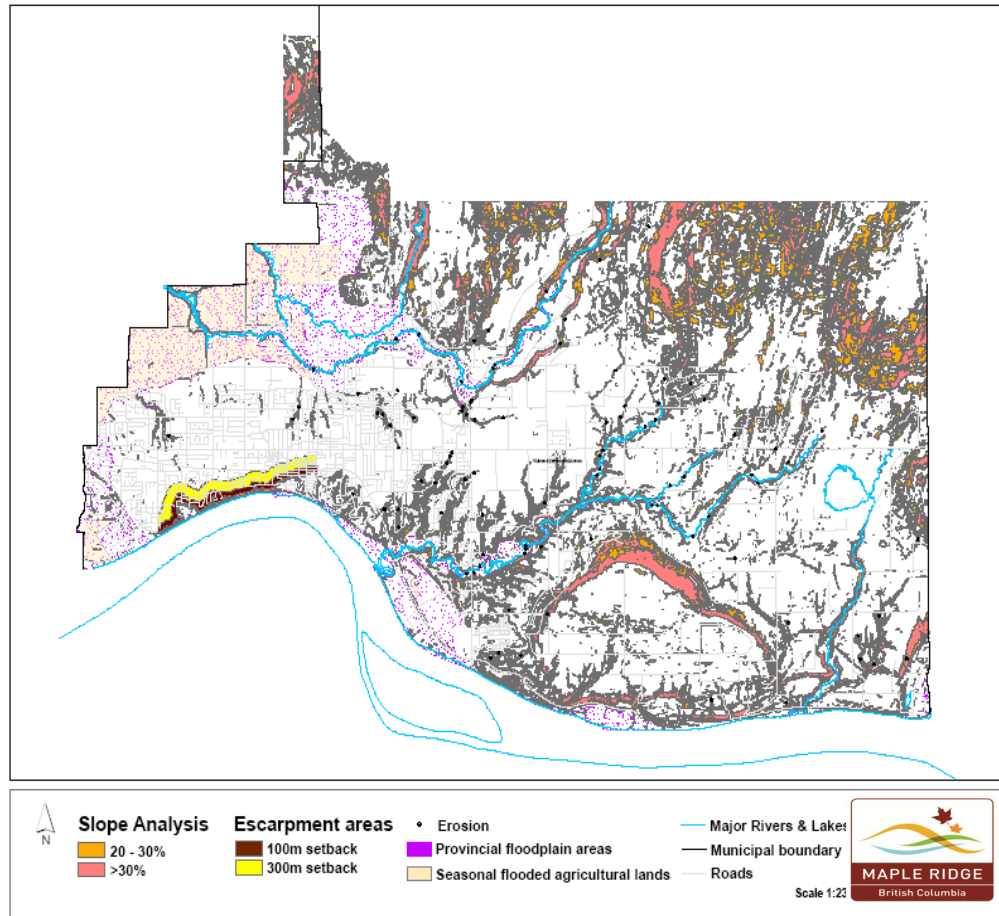
Lakes

Ponds

Floodplains

# 5. Potential Hazard Management Areas

Terrestrial Hazard Areas



## Potential Risk Areas

- Steep Slopes
- Floodplain Areas
- Major Erosion Sites
- Wildfire Interface
- Geotechnical Zones



# How Does The Mapping Help Stakeholders?

## Case Study: Nelson Peaks



### Information Resource Tool –

Preliminary information on site & area conditions

Integrated solutions working with the natural environment

Hazard Risk abatement

Facilitate neighborhood movement corridor linkages for fish, wildlife and humans

Enhancement and Restoration improvements for fish and wildlife habitat

# What Is The Vision?

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## OCP Environmental Principles and Objectives

- Goal 1. Value the essential services that nature provides us with;
- Goal 2. Protect ecological networks, species, and their habitat to promote biodiversity;
- Goal 3. Build ecological resilience;
- Goal 4. Connect people and Nature;
- Goal 5. Foster ecological innovation and integration



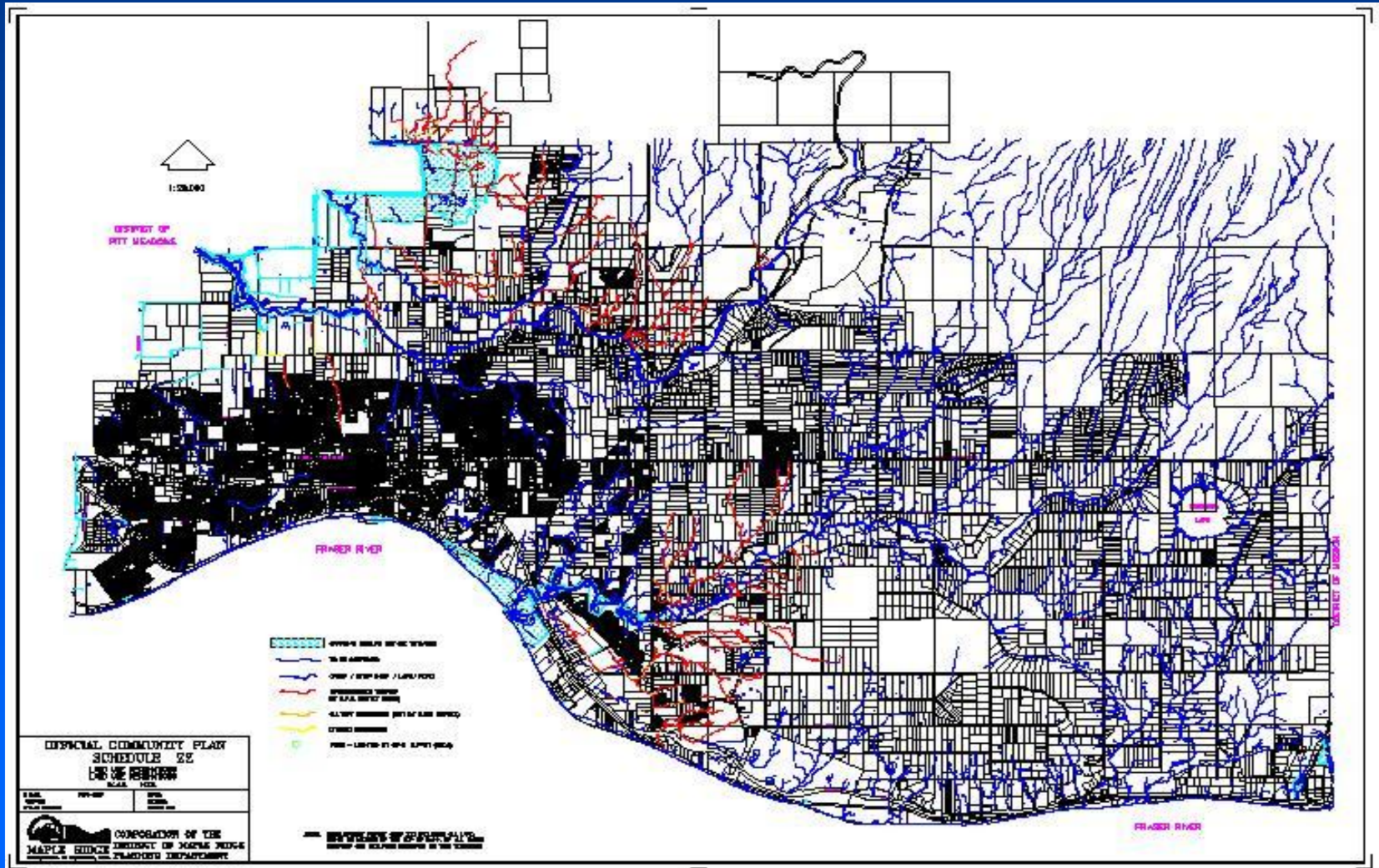
# Potential EMS Goals

---

1. Evaluation of existing Environmental Bylaws: with respect to clarity, consistency, effectiveness.
  - Watercourse Protection Bylaw
  - Tree Protection Bylaw
  - Soil Deposit and Fill Bylaw
  - Streamside Protection Regulations

# Ecological Planning Approach

## Preserve Significant Natural Features





# Potential EMS Goals

---

## 2. Evaluate the effectiveness and clarity of Development Permits including the following:

- WPDP - Watercourses and Riparian Areas
- NFDP - Hillside Management and Hazards

## How Can We Improve Our Review Process & Tools?

- ✓ Safe, Integrated, Cost Effective Solutions?
- ✓ Sustainable Design Considerations?

# Ecological Planning Principles

## Innovative Design Solutions



Integrated Stormwater Plans  
Rainwater Site Source Solutions  
Green Building Standards  
Eco Cluster Concepts  
Hillside Protection DPA  
Greenway corridor networks  
Street Tree Program  
Riparian Protection Zones (SPR)  
Open Space



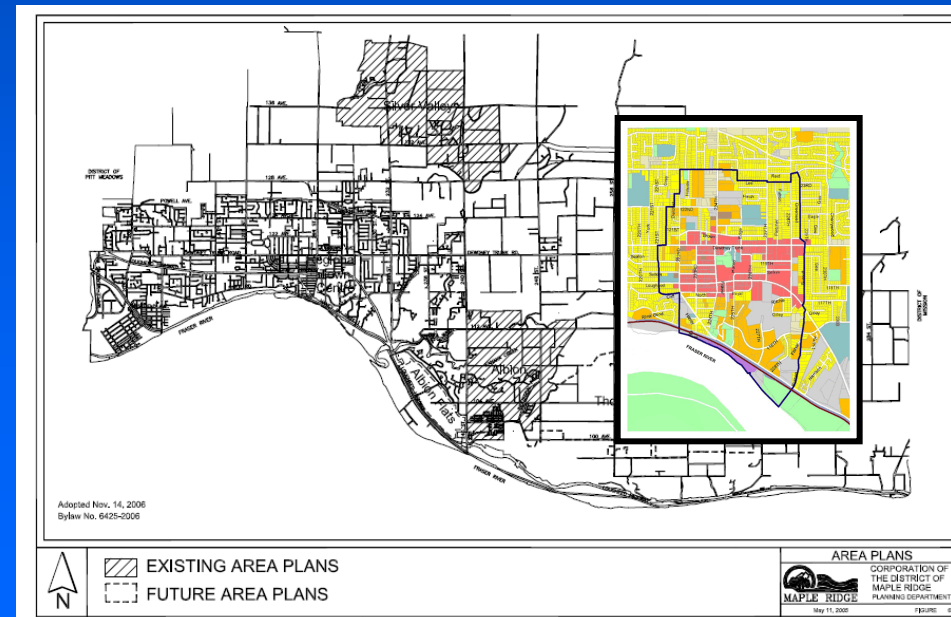
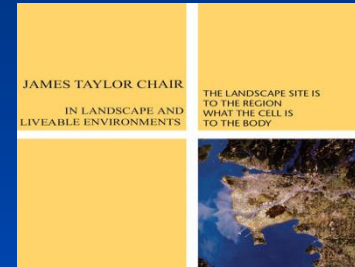


# Ecological Planning Principles

## Promote 'Smart Growth' on The Ground

### TOWN CENTRE PLAN

- Vehicle to pursue innovative design in town centre and focus on containment boundaries to reduce sprawl.
- Promote and encourage green infrastructure as well as foster urban ecology opportunities in town centre.



**Eco-Clusters**  
650 Units in West

Blaney Bog GVEP Park

Blaney Bog Hamlet  
460 Units

UBC Research Forest  
Eco-Clusters  
180 Units in North

Forest Hamlet  
370 Units

UBC Research Forest  
Eco-Clusters  
150 Units in East

Golden Ears Park

River Village Units

**LEGEND**

- Residential Use:
  - Single-Family (1-2 Units)
  - Single-Family (3-4 Units)
  - Single-Family (5-6 Units)
  - Single-Family (7-8 Units)
  - Single-Family (9-10 Units)
  - Single-Family (11-12 Units)
  - Single-Family (13-14 Units)
  - Single-Family (15-16 Units)
  - Single-Family (17-18 Units)
  - Single-Family (19-20 Units)
  - Single-Family (21-22 Units)
  - Single-Family (23-24 Units)
  - Single-Family (25-26 Units)
  - Single-Family (27-28 Units)
  - Single-Family (29-30 Units)
  - Single-Family (31-32 Units)
  - Single-Family (33-34 Units)
  - Single-Family (35-36 Units)
  - Single-Family (37-38 Units)
  - Single-Family (39-40 Units)
  - Single-Family (41-42 Units)
  - Single-Family (43-44 Units)
  - Single-Family (45-46 Units)
  - Single-Family (47-48 Units)
  - Single-Family (49-50 Units)
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  - Single-Family (69-70 Units)
  - Single-Family (71-72 Units)
  - Single-Family (73-74 Units)
  - Single-Family (75-76 Units)
  - Single-Family (77-78 Units)
  - Single-Family (79-80 Units)
  - Single-Family (81-82 Units)
  - Single-Family (83-84 Units)
  - Single-Family (85-86 Units)
  - Single-Family (87-88 Units)
  - Single-Family (89-90 Units)
  - Single-Family (91-92 Units)
  - Single-Family (93-94 Units)
  - Single-Family (95-96 Units)
  - Single-Family (97-98 Units)
  - Single-Family (99-100 Units)
- Commercial Use:
  - Office
  - Retail
  - Industrial
  - Warehouse
  - Manufacturing
  - Research & Development
  - Healthcare
  - Education
  - Government
  - Community
  - Recreation
  - Arts & Culture
  - Religious
  - Public Services
  - Utilities
  - Transportation
  - Infrastructure
  - Landmarks
  - Historic Sites
  - Monuments
  - Statues
  - Fountains
  - Gardens
  - Parks
  - Playgrounds
  - Sports Fields
  - Stadiums
  - Arenas
  - Theaters
  - Concert Halls
  - Cinemas
  - Casinos
  - Golf Courses
  - Hockey Rinks
  - Swimming Pools
  - Spas
  - Hotels
  - Restaurants
  - Cafes
  - Bars
  - Clubs
  - Gyms
  - Yogas
  - Day Spas
  - Salons
  - Beauty Shops
  - Laundries
  - Dry Cleaners
  - Car Washes
  - Gas Stations
  - Convenience Stores
  - Supermarkets
  - Big Box Stores
  - Home Improvement
  - Electronics
  - Bookstores
  - Record Stores
  - Gift Shops
  - Antique Stores
  - Art Galleries
  - Museums
  - Libraries
  - Community Centers
  - Senior Centers
  - Daycare
  - Preschools
  - Elementary Schools
  - High Schools
  - Colleges
  - Universities
  - Research Centers
  - Think Tanks
  - Consulting Firms
  - Law Firms
  - Accounting Firms
  - Insurance Companies
  - Financial Services
  - Real Estate
  - Construction
  - Engineering
  - Architecture
  - Design
  - Advertising
  - Media
  - Telecommunications
  - IT Services
  - Software Development
  - Web Design
  - Digital Marketing
  - Public Relations
  - Event Planning
  - Wedding Planning
  - Party Planning
  - Travel Agencies
  - Rentals
  - Storage
  - Movers
  - Cleaners
  - Landscaping
  - Handyman Services
  - Auto Repair
  - Tire Shops
  - Car Washes
  - Detailing
  - Carpet Cleaning
  - Window Cleaning
  - Pressure Washing
  - Tree Services
  - Land Clearing
  - Grading
  - Drainage
  - Foundation
  - Basement Waterproofing
  - Roofing
  - Siding
  - Painting
  - Interior Design
  - Exterior Design
  - Architectural
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  - Land Clearing
  - Grading
  - Drainage
  - Foundation
  - Basement Waterproofing
  - Roofing
  - Siding
  - Painting
  - Interior Design
  - Exterior Design
  - Architectural
  - Engineering
  - Construction



# Potential EMS Goals

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## 3. Explore municipal ecological network strategy

- Explore conservation and management priorities for greenway corridors, ecological hubs, and for significant ecological features that promote health & biodiversity;
- Identify incentives for landowners and developers to help achieve a municipal wide ecological network management strategy (density bonusing, density transfer, tax incentives, DCC reductions etc) for areas that are not protected by legislation or regulations

# Ecological Planning Principles

## Prioritize Preservation of Significant Features

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### Watercourses, Wetlands, Lakes, & Major Corridors



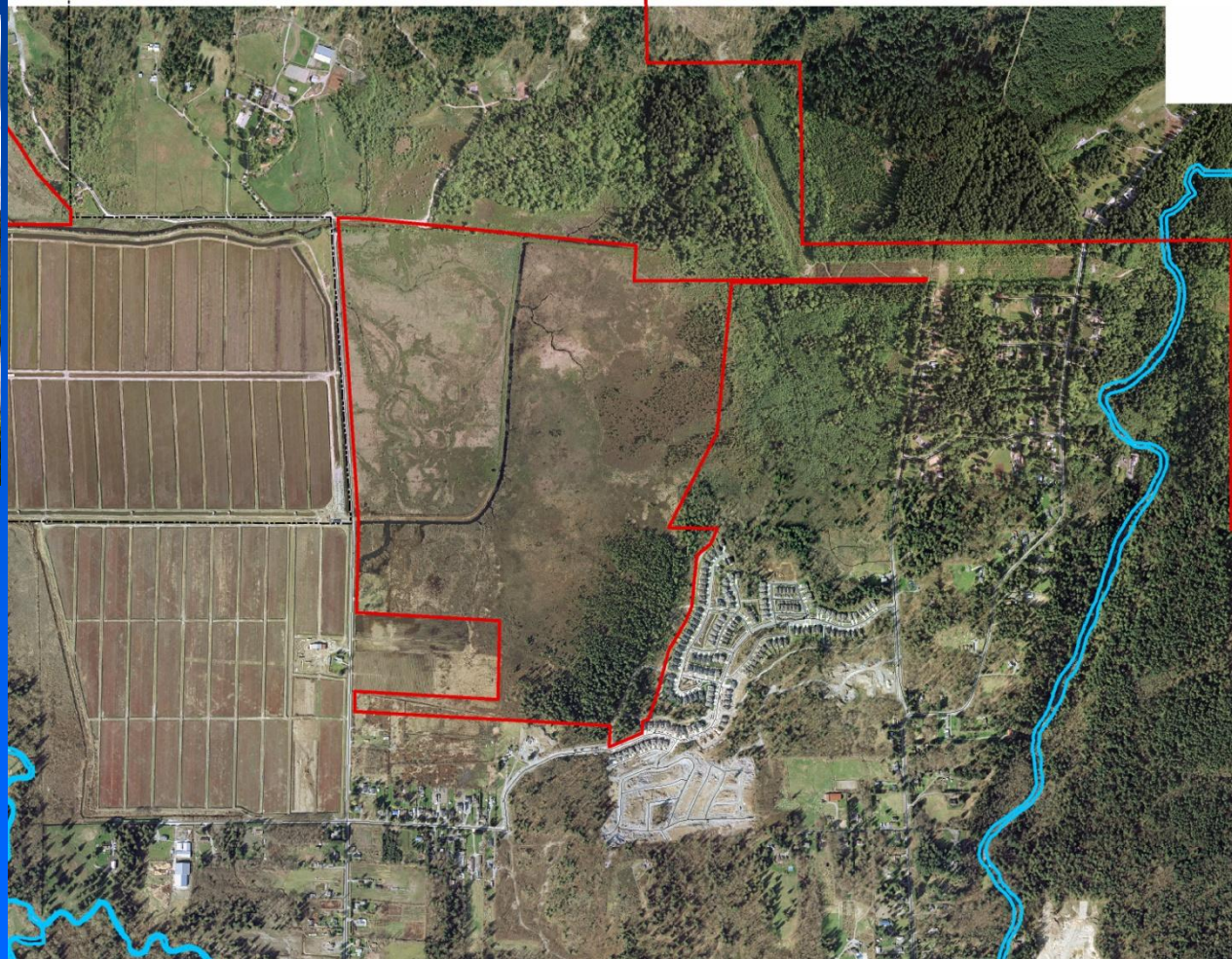
### PARTNERSHIPS

GVRD/METRO

District Maple Ridge

Land Trusts

Private Owners

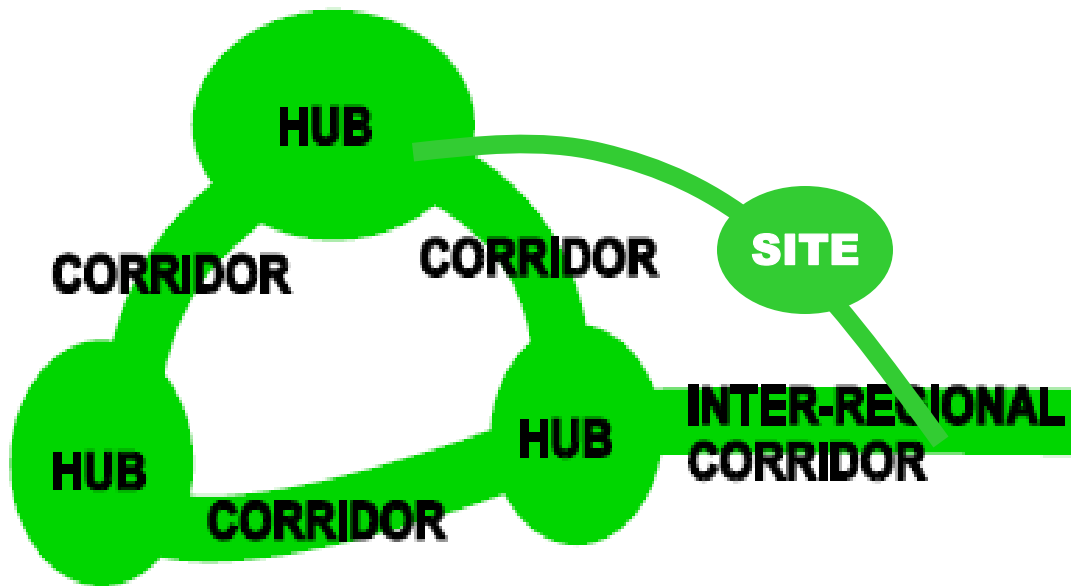




# Ecological Network Strategy

## Network Designation

Larger and more natural areas form the **hubs** of the Network; sites are smaller but important natural areas; **corridors** connect hubs and sites.



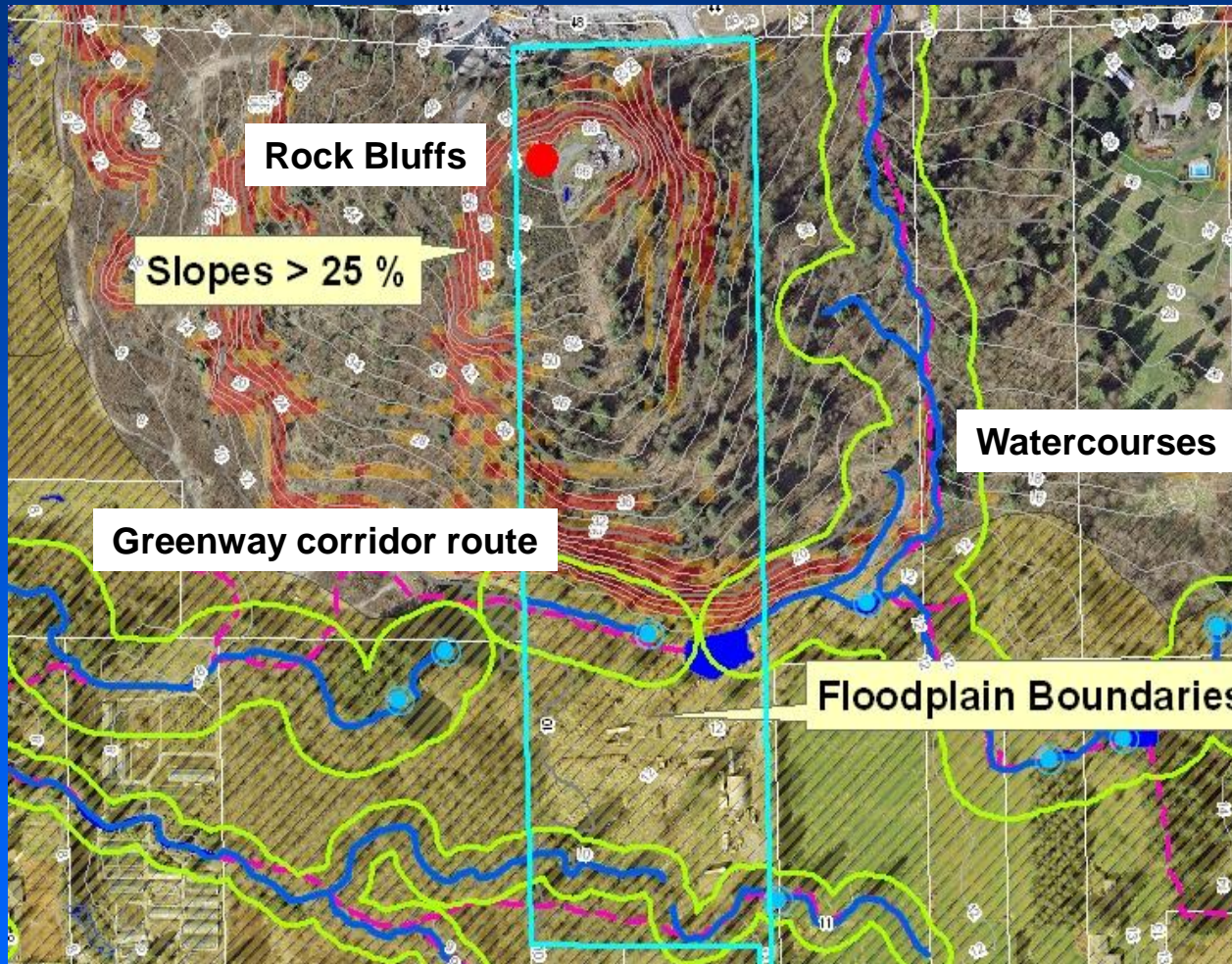
# Potential EMS Goals

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## 4. Develop ecological resiliency within the community and adapt to Climate Change impacts

Mitigate and adapt to climate change impacts and extreme weather patterns - storms, drought, floods using what nature has to offer at various scales.

# ESA Mapping Helps Guide Sustainable Development



## Mitigation Options

- a) Topography  
Hydrology
- b) Potential Hazards
- c) Public Trail  
Corridors
- d) Stormwater Mgmt
- e) Enhancement &  
Restoration

“Helps promote comprehensive planning and design to avoid a piecemeal approach to development”



# Potential EMS Goals

---

**5. Identify and evaluate the economic, social, and environmental benefits that ecological services provide our community with.**

- Analysis of Natural Capital and how the Natural Environment Benefits Our Community

# Integrate And Value The Services That Nature Provide Us With



Assess, Plan, & Design For Multiple Social, Economic, and Environmental Benefits At The Various Levels

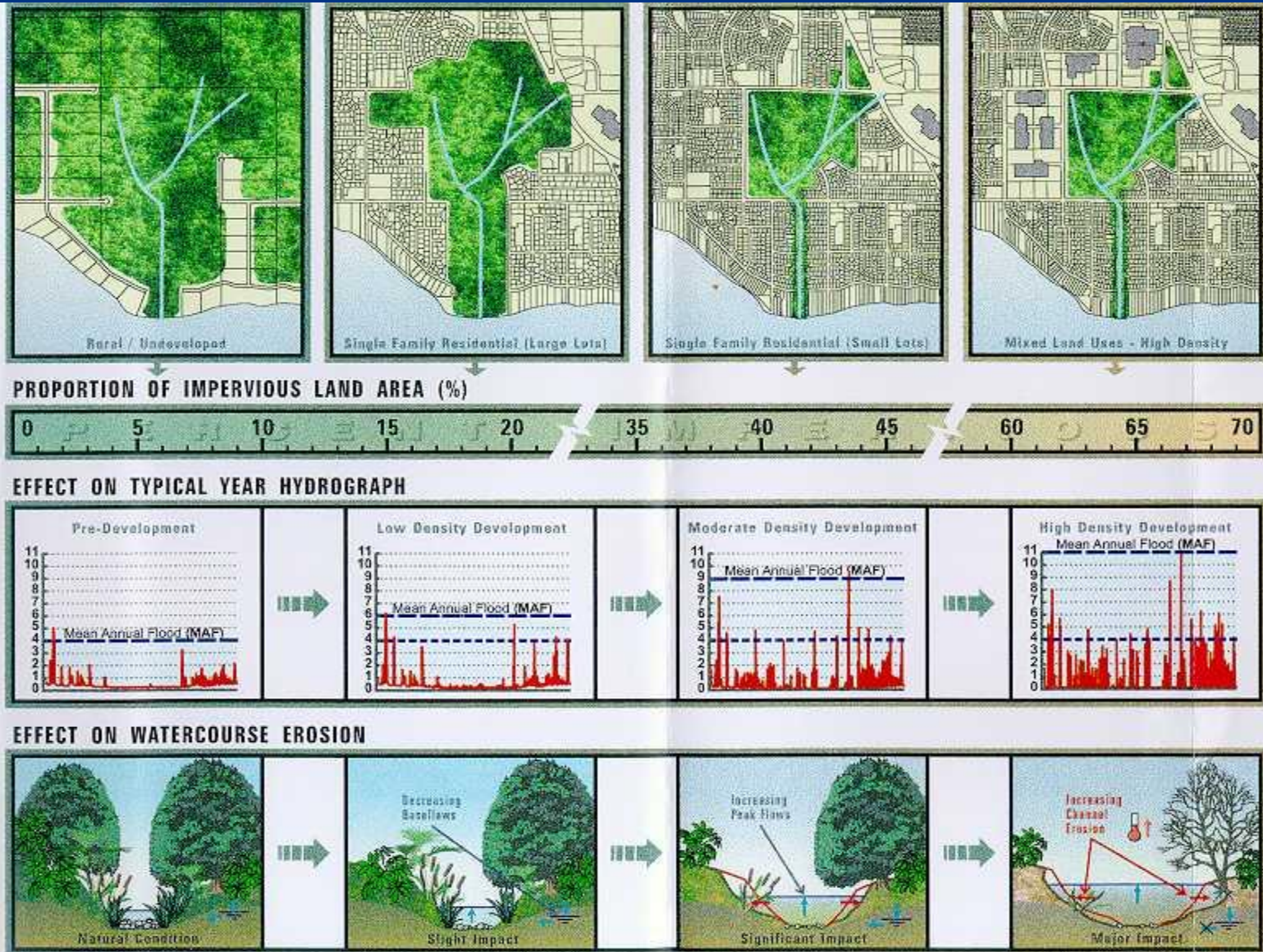


Risk Management  
Rainwater and Storm Water Management  
Community Greenways  
Carbon sequestration  
Energy and Water Conservation  
Eco Tourism and Recreation  
Health and Connectivity to Natural Places



# Ecological Planning Principles

## Value and Integrate Natural Services



# Ecological Strategy Deliverables

## 6. EDUCATION, TRAINING, OUTREACH

How can we continue to invest and improve our education and outreach programs for the community?.



# Ecological Planning Principles

## Enhancement and Restoration Opportunities

### Enhancement Potential

Outreach & education programs

Invasive vegetative species removal

Encourage a strong stewardship ethic

Re-forestation program and possible tree replacement program



# EMS Process

- Review objectives and scope of work
- Establish consultation process framework to determine priorities and receive input
- Review findings, establish strategies, and explore opportunities to implement these strategies
- Develop implementation / action plan
- Recommendations To Community and Council

# Community Consultation

- Encourage interactive and collaborative process (staff, decision makers, neighbourhoods, stewardship groups, business community) to generate ideas and provide input into the study
- Focused around citizen involvement workshops and open house sessions
- Consultation follows through to approval and implementation





# The Next Steps

## Consultation Framework

- Public Consultation
  - Open House sessions
  - Website information
  - Focus Group Workshops
  - Public Workshops
- Inter-Departmental Consultation and Presentations
  - Inter-Departmental Project Review
- Council
  - Workshop Presentations along with Reports

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**“We don’t just inherit this world from  
our ancestors, we borrow it from our  
children”** Native American Proverb