Lower Coquitlam River Watershed

Lower Coquitlam River Watershed Atlas

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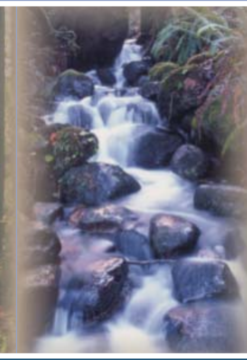
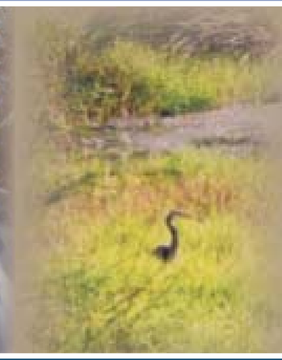

A Partnership Project between the Coquitlam River Watershed Society and the Cities of Coquitlam and Port Coquitlam.

Coquitlam / Port Coquitlam British Columbia

Version 1
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A Partnership Project between the Coquitlam River Watershed Society and the Cities of Coquitlam and Port Coquitlam.

Coquitlam River Watershed Society
QUADRA
COQUITLAM
CITY OF PORT COQUITLAM
Urban Salmon Habitat Program
COQUITLAM FOUNDATION

Lower Coquitlam River Watershed Atlas

Coquitlam and Port Coquitlam - British Columbia, Canada

A partnership project between the Coquitlam River Watershed Society and the Cities of Coquitlam and Port Coquitlam.

Version 1
June 2003

Preface

The Lower Coquitlam River Watershed Atlas is a joint project of the Coquitlam River Watershed Society (CRWS), the City of Coquitlam and the City of Port Coquitlam. Research for the atlas was undertaken by Michael McPhee, Lisa Zosiak, Hillary Rudd and Naomi Tabata of Quadra Planning Consultants Ltd. Mike Esovoloff, City of Coquitlam, carried out the GIS Mapping and Graphic Design work for the atlas. Sarah Dal Santo coordinated the City of Coquitlam's participation and Allen Jensen did the same for the City of Port Coquitlam. Tony Matahlija and Finbarr Donnelly represented the Coquitlam River Watershed Society. Janice Jarvis, Habitat Conservation and Stewardship Program, provided technical information and advice throughout the project.

Acknowledgments

The Lower Coquitlam River Watershed Atlas was made possible through the contributions of many people and organizations. Funding for the project was made available through the provincial Urban Salmon Habitat Program (USHP). The assistance of Rob Knight, USHP Coordinator, Ministry of Water, Land and Air Protection is gratefully acknowledged. The production of the atlas would not have been possible without the tireless commitment of Mike Esovoloff, GIS Technician, City of Coquitlam. We would also like to acknowledge staff from the Cities of Coquitlam and Port Coquitlam who provided information and advice. These individuals included Sarah Dal Santo, Joyce English, Allen Jensen, Sharon Folkes, Laura Tate and Emily Chu. We are also indebted to Janice Jarvis, Watershed Stewardship Coordinator, Habitat Conservation and Stewardship Program and Tony Matahlija and Finbarr Donnelly of the Coquitlam River Watershed Society for providing information, support and direction throughout the project. We are also very grateful to those persons who provided photographs for the atlas, particularly Eunice Hodge and Ian McArthur. For several years these two have had their "lenses" focused on the Lower Coquitlam River Watershed and their images have helped tremendously in enhancing the content and readability of the atlas. We also appreciate the funding provided for publishing the atlas by the Habitat Conservation and Stewardship Program and the Coquitlam Foundation. We would also like to acknowledge the assistance and information provided by many agencies and organizations including: BC Hydro, Ministry of Water, Land and Air Protection, Fisheries and Oceans Canada, and the Habitat Restoration Program and Institute of Urban Ecology - Douglas College.

Michael McPhee
Project Coordinator
Coquitlam, B.C.
June 2003

Contents

Introduction

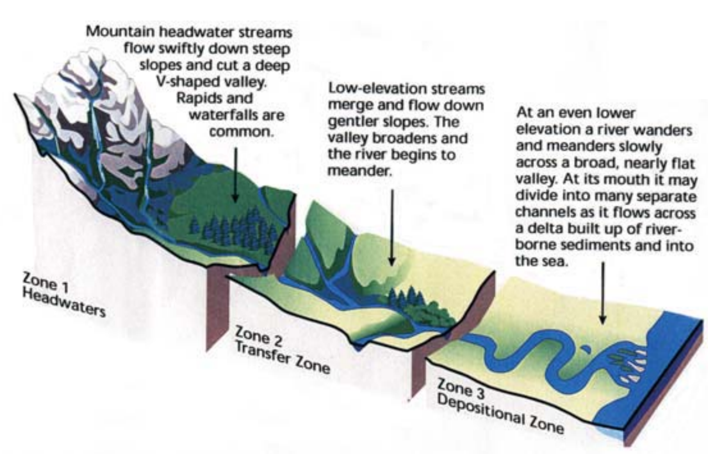
Why an Atlas for the Coquitlam River Watershed?

The Lower Coquitlam River Watershed Atlas evolved from the Coquitlam River Watershed Initiative, which has been an ongoing program of activities by the Coquitlam River Watershed Society (CRWS) over the past five years. With primary funding from the Urban Salmon Habitat Program and other sources, the CRWS embarked on a project to define a watershed planning process for the Lower Coquitlam River Watershed (Zosiak, 2001). A fundamental first step in such an approach is the creation of a solid information base. Over the past 20 years there has been a growing body of scientific and technical information on the watershed and our understanding of the watershed has improved considerably. The Lower Coquitlam River Watershed Atlas provides an opportunity to bring together and present some of this material that would otherwise not be very accessible to a majority of people. The atlas is a technical document that is meant to educate and inform persons interested in the Lower Coquitlam River Watershed in an informative and graphic format. The atlas is based on published information from a variety of sources including government reports, municipal land use and Statistics Canada data.

What is a Watershed?

A watershed is like a bathtub or basin. It includes all the watercourses (rivers, streams, creeks, and ditches) within a geographic area that drain from the highest point to the lowest point. The start of a watercourse is usually referred to as the headwaters. In the Coquitlam River Watershed the headwaters are situated at Disappointment Lake. Extending south from this point the watershed includes the mountains and creeks that drain into Coquitlam Lake which is now a reservoir, providing a source of drinking water and hydroelectric power to the Greater Vancouver area. The Coquitlam River and its tributaries which extend south of the Coquitlam Lake Reservoir is the geographic focus of this atlas. The watershed is quite narrow as the Coquitlam River passes through a narrow valley and then widens out in the vicinity of the Coquitlam Town Centre and River Springs areas. From here to where the Coquitlam River meets the Fraser River, is the floodplain.

Watershed Diagram



Three longitudinal profile zones. *Channel and floodplain characteristics Change as Rivers travel from headwaters to mouth..*

Source: Miller (1990)©1990 Wadsworth Publishing Co.

Why Are Watersheds Important?

Watersheds are increasingly being recognized for their important ecological functions. The Coquitlam River Watershed is an ecosystem. The watershed contains an intricate web of life consisting of a wide variety of species. A small bug is part of this ecosystem as are the humans, birds, bears and fish that inhabit the watershed. While these animals rely on each other for their long-term survival, they also depend on a suitable climate and vegetation to provide a liveable habitat. All of these elements work together in creating a balance of life that allows an ecosystem such as the Coquitlam River Watershed to flourish. In addition to its ecosystem functions, the Coquitlam River Watershed provides several human uses. It is important source of gravel needed for construction, roads and other uses. It supplies drinking water and hydroelectric power. Areas of the watershed have been settled and support neighbourhoods and shopping centres. People enjoy recreation activities such as walking, hiking, fishing and cycling in the many parks and open spaces in the watershed.

Organization of the Atlas

Although the entire Coquitlam River Watershed includes the drainage systems of the Coquitlam Lake Reservoir, this atlas covers the settled areas of the Coquitlam River Watershed, south of the Coquitlam Lake Dam. This area is often referred to as the Lower Coquitlam River Watershed as opposed to the Upper Watershed which includes the drainage system into Coquitlam Lake. The study area is identified on the inset map on the following page. It also includes the Or Creek watershed to the north.

The atlas provides descriptive information and graphics at an overview level. Individual map sheets and sections cover information on watercourses, sub-watersheds (also referred to as catchment areas), hydrology, fish resources, wildlife species, vegetation, environmentally sensitive areas, water quality, historical and present land use (zoning), demographics, stewardship and governance.

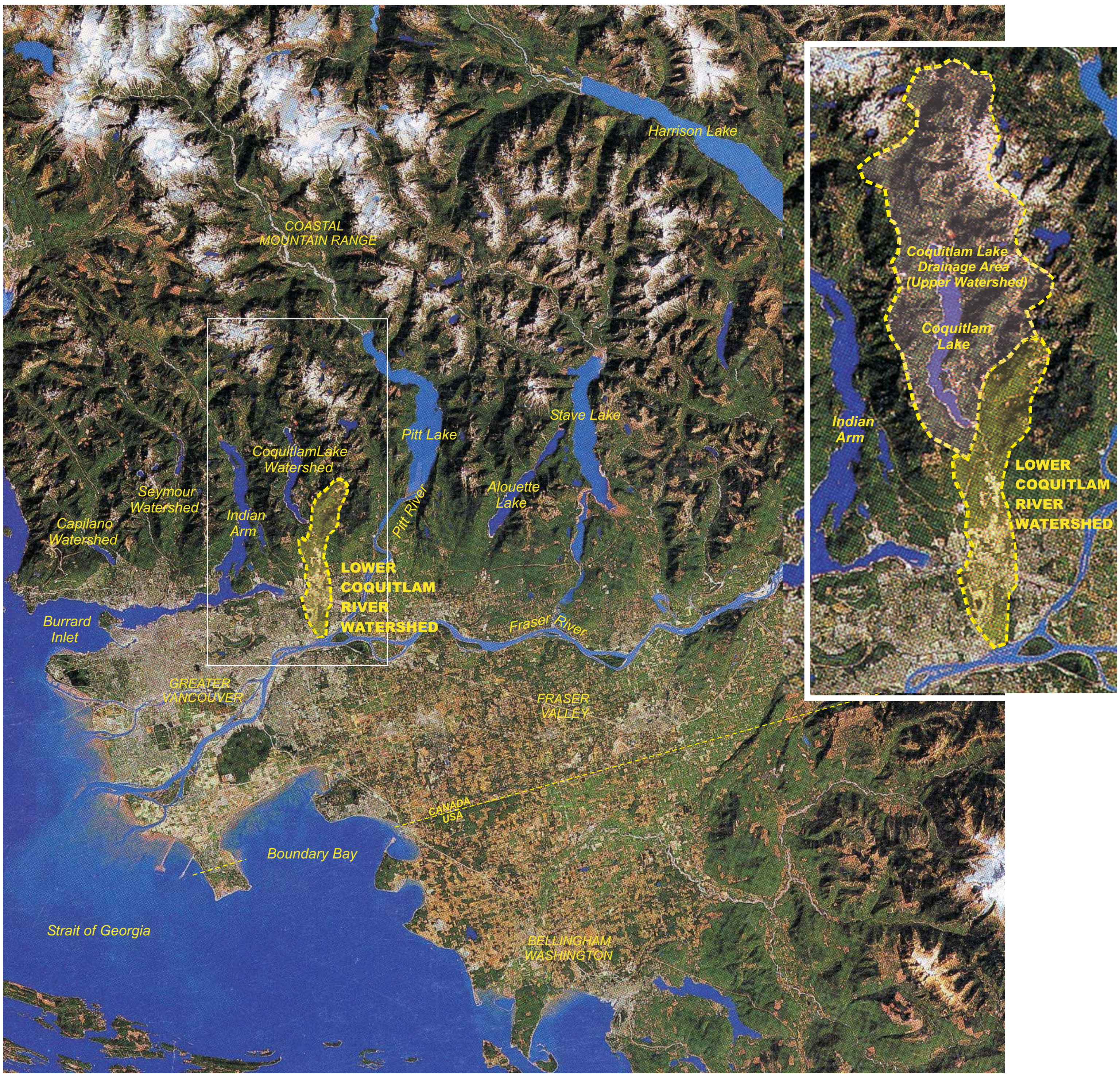
Regional Context

Physiography

The Coquitlam River Watershed is one of many watersheds found on the north shore of the Lower Mainland Region. These watersheds for the most part, run in a north-south direction, with their headwaters and much of their drainage area located in the rugged terrain of the Coast Mountains. This can be seen in the satellite image below

To the west of the Coquitlam River Watershed are the major drainages of the Capilano, Seymour, and Indian Rivers. To the east are the Pitt, Alouette, Stave and Harrison River watersheds and drainages. All these watersheds have large lakes associated with them, which show up on the satellite image as a dark blue colour. To the west of Indian Arm, the watercourses drain to Burrard Inlet, while to the east of Indian Arm, the watercourses drain to the Fraser River and are part of the largest watershed in the province - the Fraser River Watershed or Basin. The entire Coquitlam River Watershed (including the lake reservoir) is 261 km^2 compared to the Fraser River Basin at 238,000 km^2 - almost 1000 times larger. By comparison, the Pitt River Watershed is 422 km^2, the Alouette is 329 km^2, the Capilano is 212 km^2 and the Seymour is 185 km^2.

Lower Mainland Region



SOURCE OF AERIAL PHOTOGRAPH: MINISTRY OF ENVIRONMENT LANDS AND PARKS -REPORT No. 92-1 1992

Topography

Topography of the Coquitlam River Watershed

Topography refers to the characteristics of the surface of the earth including elevations and surface features. The topography of the Lower Coquitlam River Watershed includes both mountainous terrain and low level floodplain areas. The topography of the watershed is largely the result of glaciers that retreated about 10,000 years ago.

The highest point within the Lower Coquitlam River Watershed is Mount Coquitlam in upper Or Creek at 1,584 m. The lowest point of the watershed is 0.4 m which is located at the confluence of the Coquitlam and Fraser Rivers. These points are identified on the topography map (opposite page). The graph insert within the map, shows the longitudinal profile of the Coquitlam River south of the dam. At the dam, the river is about 130 metres above sea level. The elevation drops close to sea level at the Lougheed Highway, or at a rate of about 11.8 meters per km. The watershed downstream of the Coquitlam Lake reservoir is approximately 79 km^2 and the length of the Coquitlam River south from the Coquitlam Dam is approximately 18 km.

COQUITLAM LAKE

COQUITLAM RIVER AT COLONY FARM

COQUITLAM RIVER FROM THE FRASER RIVER TO THE MOUNTAINS

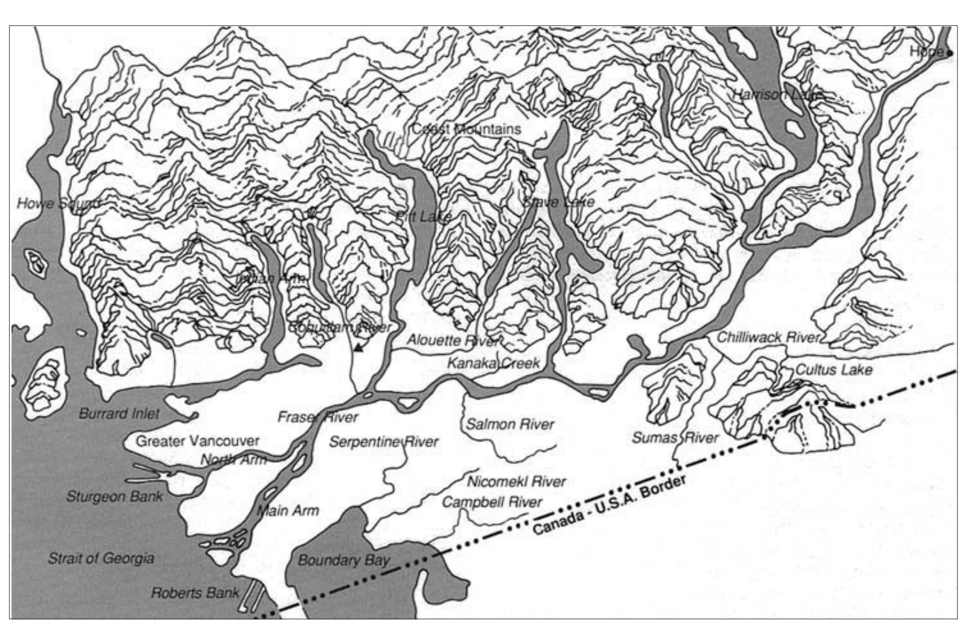
Watercourses and Sub-Watersheds

The Lower Coquitlam River Watershed (below the Coquitlam Lake Dam) includes at least 30 watercourses. These are of varying length (see table insert on watercourses map). In addition to the known watercourses there are many small creeks that are not visible during the dry months, but often drain slopes in the wetter, winter months. The two largest tributaries of the Coquitlam River are Or Creek with a catchment area of approximately 22 km^2 and the Hoy/ Scott/ Pinnacle Creek catchment area totaling approximately 17.5 km^2.

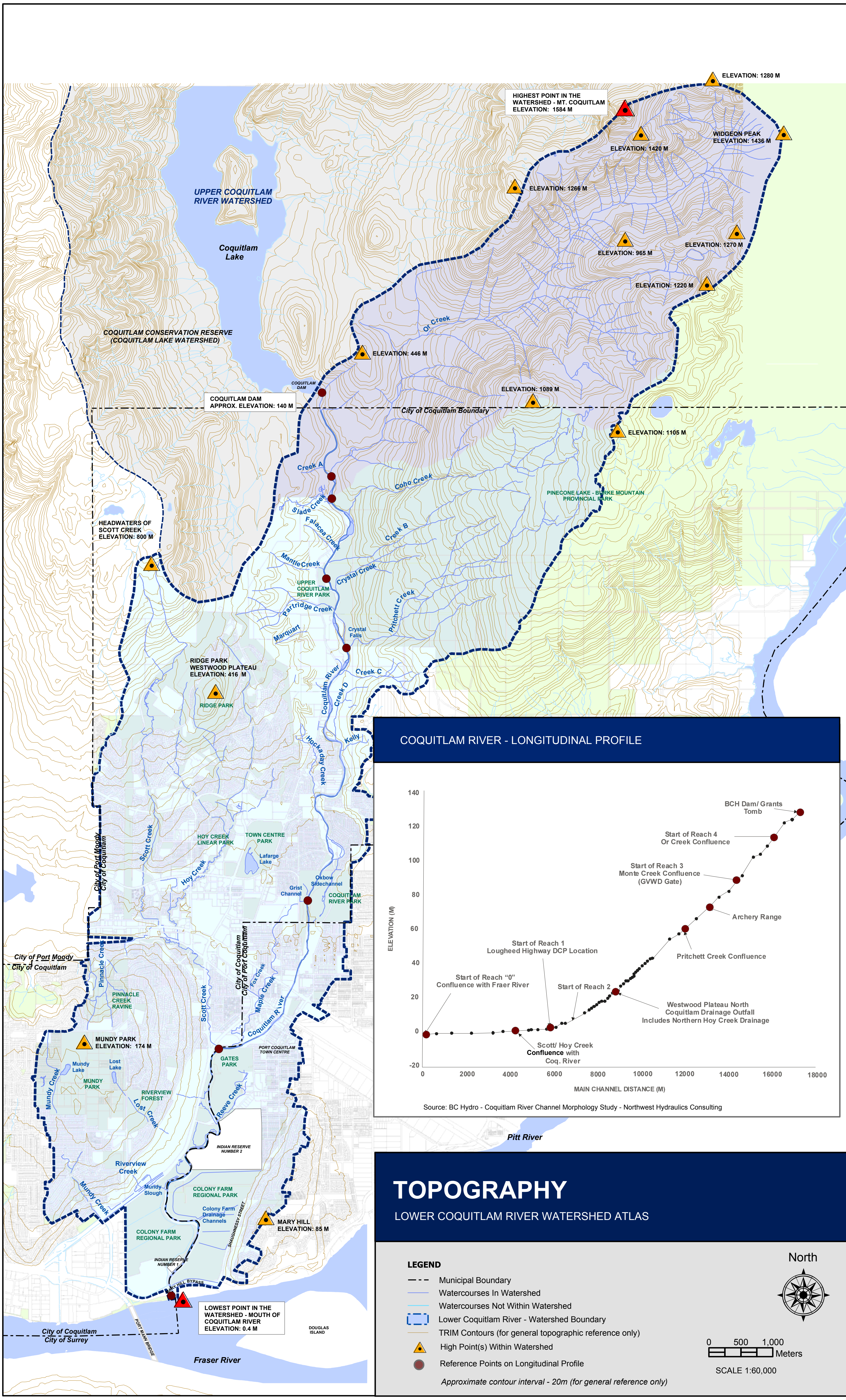
The Lower Coquitlam River Watershed is comprised of many smaller watersheds, also known as sub-watersheds or catchment areas. Only open channels are shown on the maps in this atlas. The natural drainage patterns of the lower watershed have been altered as urban development proceeded. A significant portion of the watershed's drainage is now carried in the storm drain system, which eventually empties into open watercourses. Although each watercourse within the watershed has its own catchment area, a number of smaller catchment areas have been combined into larger, more general catchment areas and are identified on the catchment areas map on the following pages.

General Topography of the Region

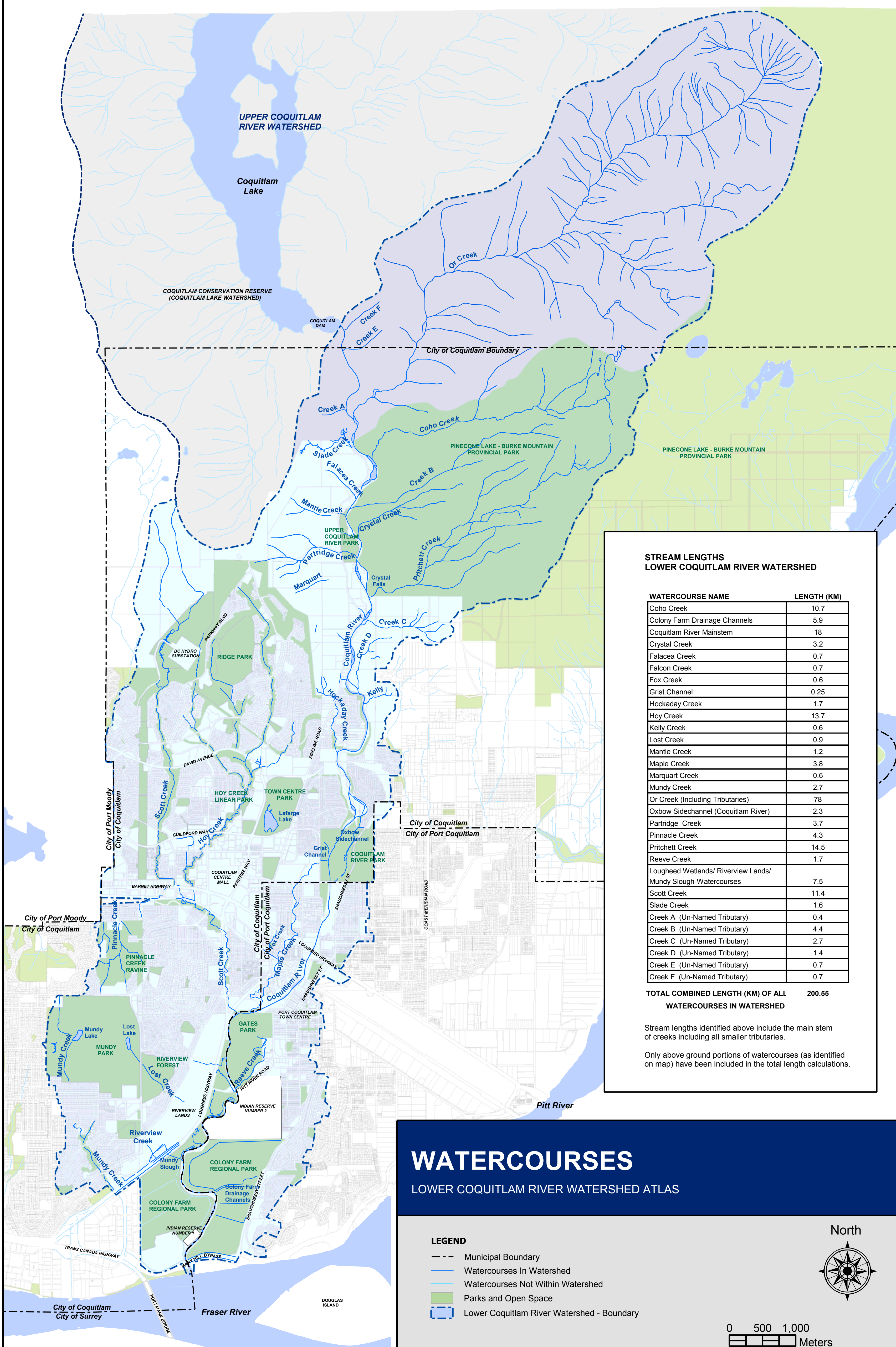
The diagram to the right provides a general overview of the topography of the region, which highlights the change from mountains to the lowlands along the lower Fraser River that was shaped by forces of glaciation 10,000 to 14,000 years ago. The Coquitlam River Watershed is a typical example of the watersheds in the region.



SOURCE OF DIAGRAM: MINISTRY OF ENVIRONMENT LANDS AND PARKS -REPORT No. 92-1 1992



TOPOGRAPHY
LOWER COQUITLAM RIVER WATERSHED ATLAS
COQUITLAM RIVER - LONGITUDINAL PROFILE
ELEVATION (M)
MAIN CHANNEL DISTANCE (M)
BCH Dam/ Grants Tomb
Start of Reach 4 Or Creek Confluence
Start of Reach 3 Monte Creek Confluence (GVWD Gate)
Archery Range
Pritchett Creek Confluence
Start of Reach 1 Lougheed Highway DCP Location
Start of Reach "0" Confluence with Fraer River
Start of Reach 2
Westwood Plateau North Coquitlam Drainage Outfall Includes Northern Hoy Creek Drainage
Scott/ Hoy Creek Confluence with Coq. River
Source: BC Hydro - Coquitlam River Channel Morphology Study - Northwest Hydraulics Consulting
LEGEND
Municipal Boundary
Watercourses In Watershed
Watercourses Not Within Watershed
Lower Coquitlam River - Watershed Boundary
TRIM Contours (for general topographic reference only)
High Point(s) Within Watershed
Reference Points on Longitudinal Profile
Approximate contour interval - 20m (for general reference only)
North
0 500 1,000 Meters
SCALE 1:60,000
HIGHEST POINT IN THE WATERSHED - MT. COQUITLAM ELEVATION: 1584 M
ELEVATION: 1280 M
ELEVATION: 1420 M
WIDGEON PEAK ELEVATION: 1436 M
ELEVATION: 1266 M
ELEVATION: 965 M
ELEVATION: 1270 M
ELEVATION: 1220 M
ELEVATION: 446 M
ELEVATION: 1089 M
ELEVATION: 1105 M
UPPER COQUITLAM RIVER WATERSHED
Coquitlam Lake
COQUITLAM CONSERVATION RESERVE (COQUITLAM LAKE WATERSHED)
COQUITLAM DAM APPROX. ELEVATION: 140 M
City of Coquitlam Boundary
PINECONE LAKE - BURKE MOUNTAIN PROVINCIAL PARK
HEADWATERS OF SCOTT CREEK ELEVATION: 800 M
RIDGE PARK WESTWOOD PLATEAU ELEVATION: 416 M
RIDGE PARK
UPPER COQUITLAM RIVER PARK
Or Creek
Creek A
Coho Creek
Slade Creek
Falacoa Creek
Creek B
Mantle Creek
Crystal Creek
Partridge Creek
Pritchett Creek
Marquart
Crystal Falls
Creek C
Coquitlam River
Creek D
Kelly
Hockaday Creek
HOY CREEK LINEAR PARK
TOWN CENTRE PARK
Lafarge Lake
Scott Creek
Hoy Creek
Oxbow Sidechannel
Grist Channel
COQUITLAM RIVER PARK
City of Port Moody
City of Coquitlam
City of Coquitlam
City of Port Coquitlam
Pinnacle Creek
PINNACLE CREEK RAVINE
Fox Creek
Maple Creek
MUNDY PARK ELEVATION: 174 M
Mundy Lake
Lost Lake
MUNDY PARK
Mundy Creek
RIVERVIEW FOREST
Lost Creek
GATES PARK
PORT COQUITLAM TOWN CENTRE
Reeve Creek
INDIAN RESERVE NUMBER 2
Riverview Creek
Mundy Slough
COLONY FARM REGIONAL PARK
Colony Farm Drainage Channels
COLONY FARM REGIONAL PARK
MARY HILL ELEVATION: 85 M
INDIAN RESERVE NUMBER 1
LOWEST POINT IN THE WATERSHED - MOUTH OF COQUITLAM RIVER ELEVATION: 0.4 M
DOUGLAS ISLAND
City of Coquitlam
City of Surrey
Fraser River
Pitt River
PORT MANN BRIDGE



STREAM LENGTHS
LOWER COQUITLAM RIVER WATERSHED

WATERCOURSE NAME	LENGTH (KM)
Coho Creek	10.7
Colony Farm Drainage Channels	5.9
Coquitlam River Mainstem	18
Crystal Creek	3.2
Falacea Creek	0.7
Falcon Creek	0.7
Fox Creek	0.6
Grist Channel	0.25
Hockaday Creek	1.7
Hoy Creek	13.7
Kelly Creek	0.6
Lost Creek	0.9
Mantle Creek	1.2
Maple Creek	3.8
Marquart Creek	0.6
Mundy Creek	2.7
Or Creek (Including Tributaries)	78
Oxbow Sidechannel (Coquitlam River)	2.3
Partridge Creek	3.7
Pinnacle Creek	4.3
Pritchett Creek	14.5
Reeve Creek	1.7
Lougheed Wetlands/ Riverview Lands/ Mundy Slough-Watercourses	7.5
Scott Creek	11.4
Slade Creek	1.6
Creek A (Un-Named Tributary)	0.4
Creek B (Un-Named Tributary)	4.4
Creek C (Un-Named Tributary)	2.7
Creek D (Un-Named Tributary)	1.4
Creek E (Un-Named Tributary)	0.7
Creek F (Un-Named Tributary)	0.7

TOTAL COMBINED LENGTH (KM) OF ALL WATERCOURSES IN WATERSHED 200.55

Stream lengths identified above include the main stem of creeks including all smaller tributaries.

Only above ground portions of watercourses (as identified on map) have been included in the total length calculations.

WATERCOURSES

LOWER COQUITLAM RIVER WATERSHED ATLAS

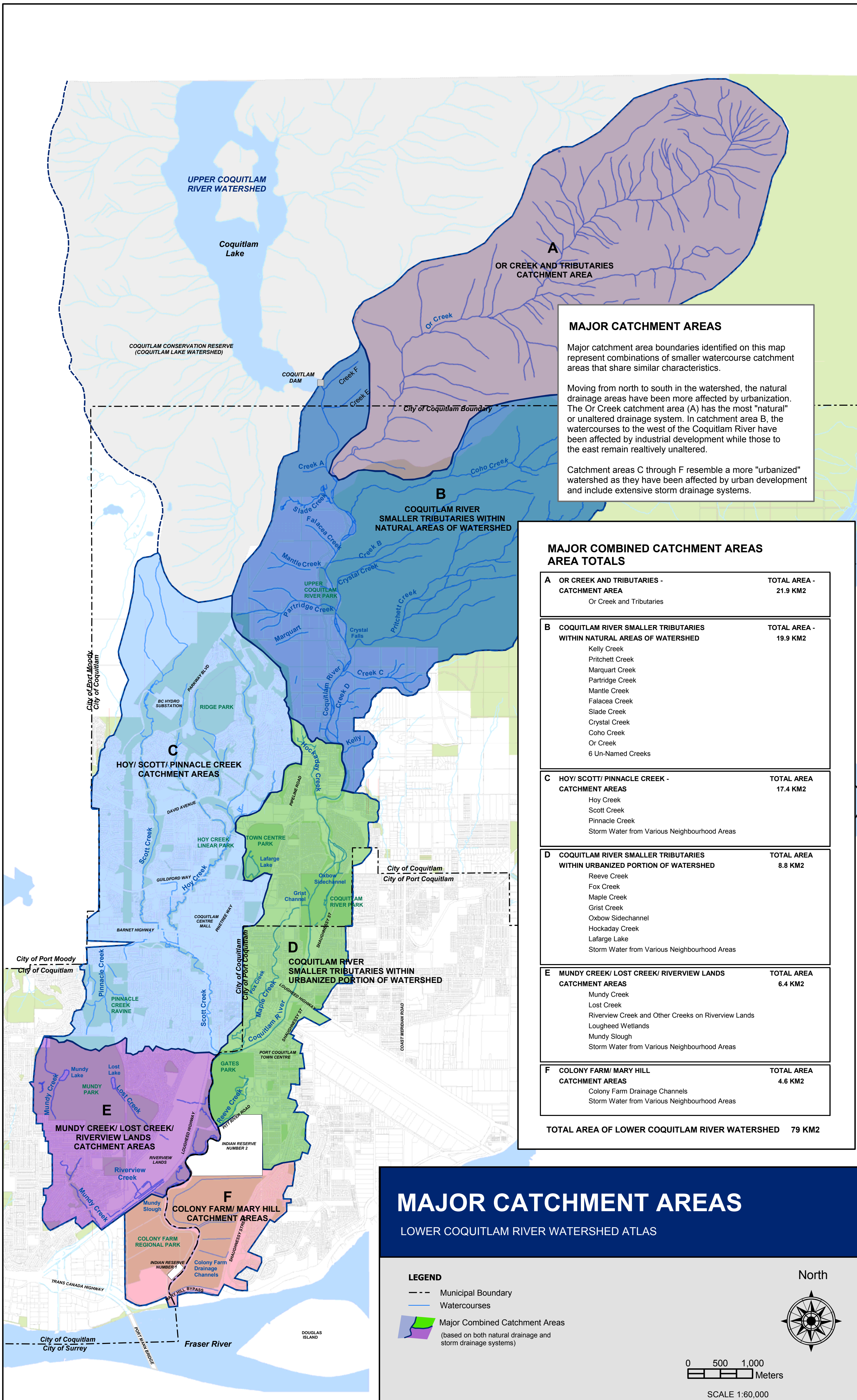
LEGEND

- Municipal Boundary
- Watercourses In Watershed
- Watercourses Not Within Watershed
- Parks and Open Space
- Lower Coquitlam River Watershed - Boundary

North

0 500 1,000 Meters

SCALE 1:60,000



MAJOR CATCHMENT AREAS

Major catchment area boundaries identified on this map represent combinations of smaller watercourse catchment areas that share similar characteristics.

Moving from north to south in the watershed, the natural drainage areas have been more affected by urbanization. The Or Creek catchment area (A) has the most "natural" or unaltered drainage system. In catchment area B, the watercourses to the west of the Coquitlam River have been affected by industrial development while those to the east remain realtively unaltered.

Catchment areas C through F resemble a more "urbanized" watershed as they have been affected by urban development and include extensive storm drainage systems.

MAJOR COMBINED CATCHMENT AREAS AREA TOTALS

A	OR CREEK AND TRIBUTARIES - CATCHMENT AREA Or Creek and Tributaries	TOTAL AREA - 21.9 KM2
B	COQUITLAM RIVER SMALLER TRIBUTARIES WITHIN NATURAL AREAS OF WATERSHED Kelly Creek Pritchett Creek Marquart Creek Partridge Creek Mantle Creek Falacea Creek Slade Creek Crystal Creek Coho Creek Or Creek 6 Un-Named Creeks	TOTAL AREA - 19.9 KM2
C	HOY/ SCOTT/ PINNACLE CREEK - CATCHMENT AREAS Hoy Creek Scott Creek Pinnacle Creek Storm Water from Various Neighbourhood Areas	TOTAL AREA 17.4 KM2
D	COQUITLAM RIVER SMALLER TRIBUTARIES WITHIN URBANIZED PORTION OF WATERSHED Reeve Creek Fox Creek Maple Creek Grist Creek Oxbow Sidechannel Hockaday Creek Lafarge Lake Storm Water from Various Neighbourhood Areas	TOTAL AREA 8.8 KM2
E	MUNDY CREEK/ LOST CREEK/ RIVERVIEW LANDS CATCHMENT AREAS Mundy Creek Lost Creek Riverview Creek and Other Creeks on Riverview Lands Lougheed Wetlands Mundy Slough Storm Water from Various Neighbourhood Areas	TOTAL AREA 6.4 KM2
F	COLONY FARM/ MARY HILL CATCHMENT AREAS Colony Farm Drainage Channels Storm Water from Various Neighbourhood Areas	TOTAL AREA 4.6 KM2

TOTAL AREA OF LOWER COQUITLAM RIVER WATERSHED 79 KM2

MAJOR CATCHMENT AREAS

LOWER COQUITLAM RIVER WATERSHED ATLAS

LEGEND

- Municipal Boundary
- Watercourses
- Major Combined Catchment Areas (based on both natural drainage and storm drainage systems)

Hydrology & Climate

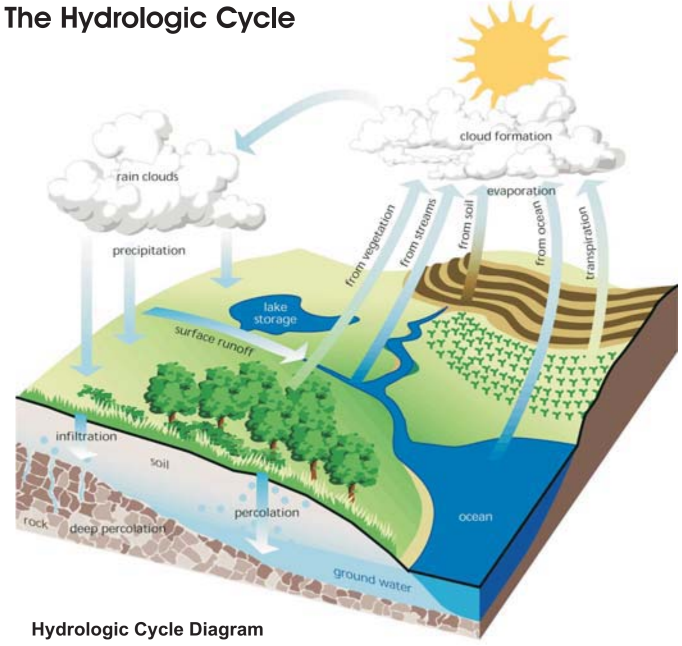
Hydrology

Understanding the hydrology of a watershed is important for several reasons. For example, knowing the behaviour of a river or stream such as the volume, rate and timing of flows, and the type of material carried downstream, are important for designing flood control works and for managing fish habitat.

The hydrology of the Lower Coquitlam River Watershed is influenced by precipitation, main river flow (released from the Coquitlam Lake reservoir), inflows from tributaries, runoff from surface flows, stormwater discharges, and subsurface flows. The majority of water coming into the system is from the tributaries (overland flows and surface runoff) and releases from the reservoir. Construction of the Coquitlam Lake dam in the early 1900's and urbanization have had the most dramatic effects on watershed hydrology.

The dam regulates the flow on the Coquitlam River while urbanization has led to floodproofing projects (e.g., dyking and channelization of the Coquitlam River and lower tributaries) and increased runoff from surface and stormwater flows. In the late 1990's, the provincial government introduced water use planning at BC Hydro Facilities, including the Coquitlam-Buntzen facility. This was in response to ever increasing competing demands for water at these facilities. The overall goal of water use planning is to find a better balance among the competing water uses that are socially, environmentally and economically acceptable to BC. Downstream of the Coquitlam Lake reservoir, the Coquitlam River flows through two distinct sections. Between the dam and Lougheed Highway the river flows through a broad bedrock canyon or valley. Glacial deposits exposed on the west side of the valley have been mined for gravel. Materials from the bed of the Coquitlam River between the CP Rail Bridge to about two km north of the Lougheed Highway Bridge were mined commercially in the 1950's (Northwest Hydraulic Consultants, 2001). Over the years the bed of the Coquitlam River in the lower sections has been rising as sediment builds up. Upstream of the Lougheed Highway the Coquitlam River flows out of its valley onto its fan and the Fraser River floodplain. The Coquitlam River is influenced by the tides passing up the Fraser River to about the Pitt River Road Bridge (Red Bridge). The Lower Coquitlam River Watershed receives inflow from several streams on both the west and east sides of the Coquitlam River. Surface water also flows directly into the Coquitlam River from adjacent slopes and subsurface flows seep into the river. The major streams and drainages include Or Creek, Hoy Creek, Scott Creek, Maple Creek, Mundy Creek, Reeve Creek, and Pinnacle Creek.

The Hydrologic Cycle



Hydrologic Cycle Diagram

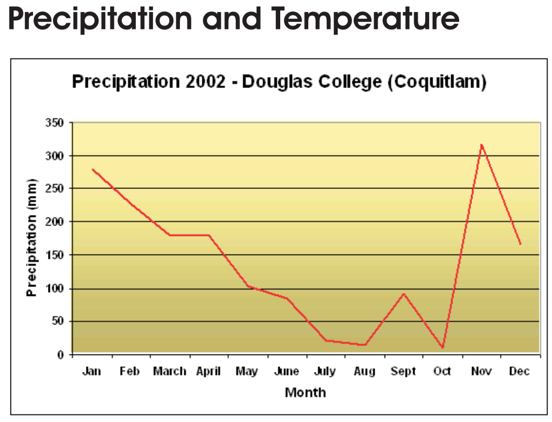
The transfer of water from precipitation to surface water and ground water to storage and runoff, and eventually back to the atmosphere is an ongoing cycle.

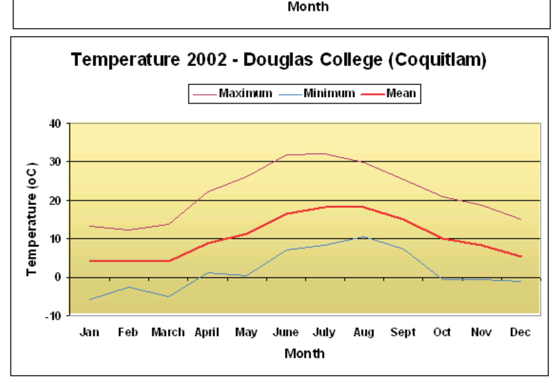
SOURCE: In Stream Corridor Restoration: Principles, Processes and Practices (10/98) Interagency Stream Restoration Working Group (15 Federal Agencies) (FISRWG).

Climate

The climate of the Lower Mainland is affected by maritime air masses and the high and low-pressure systems that travel in an easterly direction. Summer high-pressure systems result in warmer, drier periods. Low-pressure systems increase during fall and winter, creating more unsettled, wetter weather. The northern (upper) part of the Coquitlam River Watershed is in mountainous terrain, which receives more precipitation in the form of snow and rainfall. Precipitation levels double from the mouth of the river to the reservoir because of elevation changes. The average annual rainfall measured at the Port Coquitlam City Yard is 1,869 mm compared to 3,468 mm at the reservoir. Two thirds of the precipitation falls between November and March.

Precipitation and Temperature



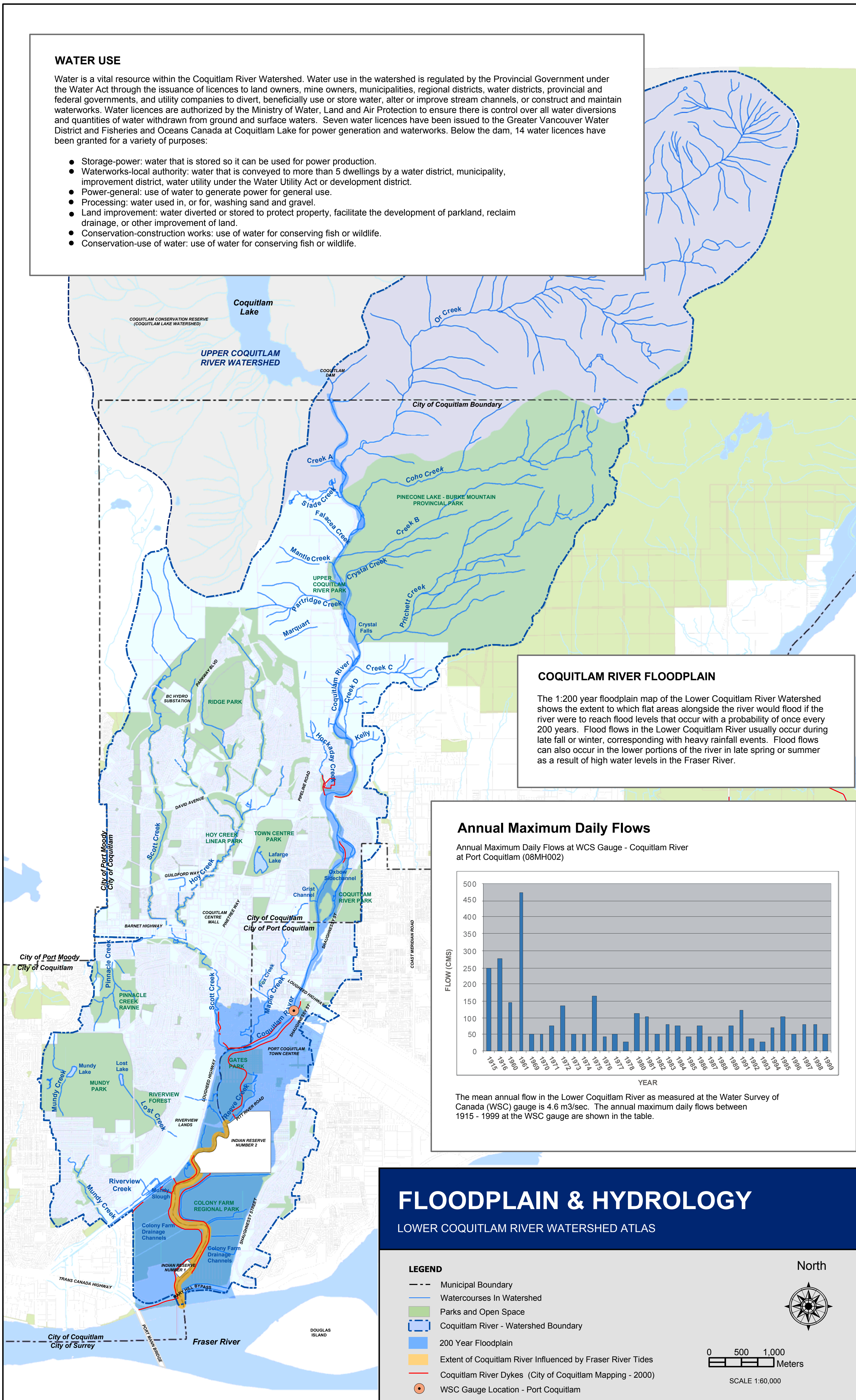


The Greater Vancouver Regional District, in conjunction with Douglas College's Geography Department maintain a station on the roof of the David Lam Campus that records temperature, precipitation and wind speed. Precipitation and temperature data for 2002 are included to the left.

WATER USE

Water is a vital resource within the Coquitlam River Watershed. Water use in the watershed is regulated by the Provincial Government under the Water Act through the issuance of licences to land owners, mine owners, municipalities, regional districts, water districts, provincial and federal governments, and utility companies to divert, beneficially use or store water, alter or improve stream channels, or construct and maintain waterworks. Water licences are authorized by the Ministry of Water, Land and Air Protection to ensure there is control over all water diversions and quantities of water withdrawn from ground and surface waters. Seven water licences have been issued to the Greater Vancouver Water District and Fisheries and Oceans Canada at Coquitlam Lake for power generation and waterworks. Below the dam, 14 water licences have been granted for a variety of purposes:

- Storage-power: water that is stored so it can be used for power production.
- Waterworks-local authority: water that is conveyed to more than 5 dwellings by a water district, municipality, improvement district, water utility under the Water Utility Act or development district.
- Power-general: use of water to generate power for general use.
- Processing: water used in, or for, washing sand and gravel.
- Land improvement: water diverted or stored to protect property, facilitate the development of parkland, reclaim drainage, or other improvement of land.
- Conservation-construction works: use of water for conserving fish or wildlife.
- Conservation-use of water: use of water for conserving fish or wildlife.



COQUITLAM RIVER FLOODPLAIN

The 1:200 year floodplain map of the Lower Coquitlam River Watershed shows the extent to which flat areas alongside the river would flood if the river were to reach flood levels that occur with a probability of once every 200 years. Flood flows in the Lower Coquitlam River usually occur during late fall or winter, corresponding with heavy rainfall events. Flood flows can also occur in the lower portions of the river in late spring or summer as a result of high water levels in the Fraser River.

Annual Maximum Daily Flows

Annual Maximum Daily Flows at WCS Gauge - Coquitlam River at Port Coquitlam (08MH002)

The mean annual flow in the Lower Coquitlam River as measured at the Water Survey of Canada (WSC) gauge is 4.6 m3/sec. The annual maximum daily flows between 1915 - 1999 at the WSC gauge are shown in the table.

FLOODPLAIN & HYDROLOGY

LOWER COQUITLAM RIVER WATERSHED ATLAS

LEGEND

- Municipal Boundary
- Watercourses In Watershed
- Parks and Open Space
- Coquitlam River - Watershed Boundary
- 200 Year Floodplain
- Extent of Coquitlam River Influenced by Fraser River Tides
- Coquitlam River Dykes (City of Coquitlam Mapping - 2000)
- WSC Gauge Location - Port Coquitlam

North

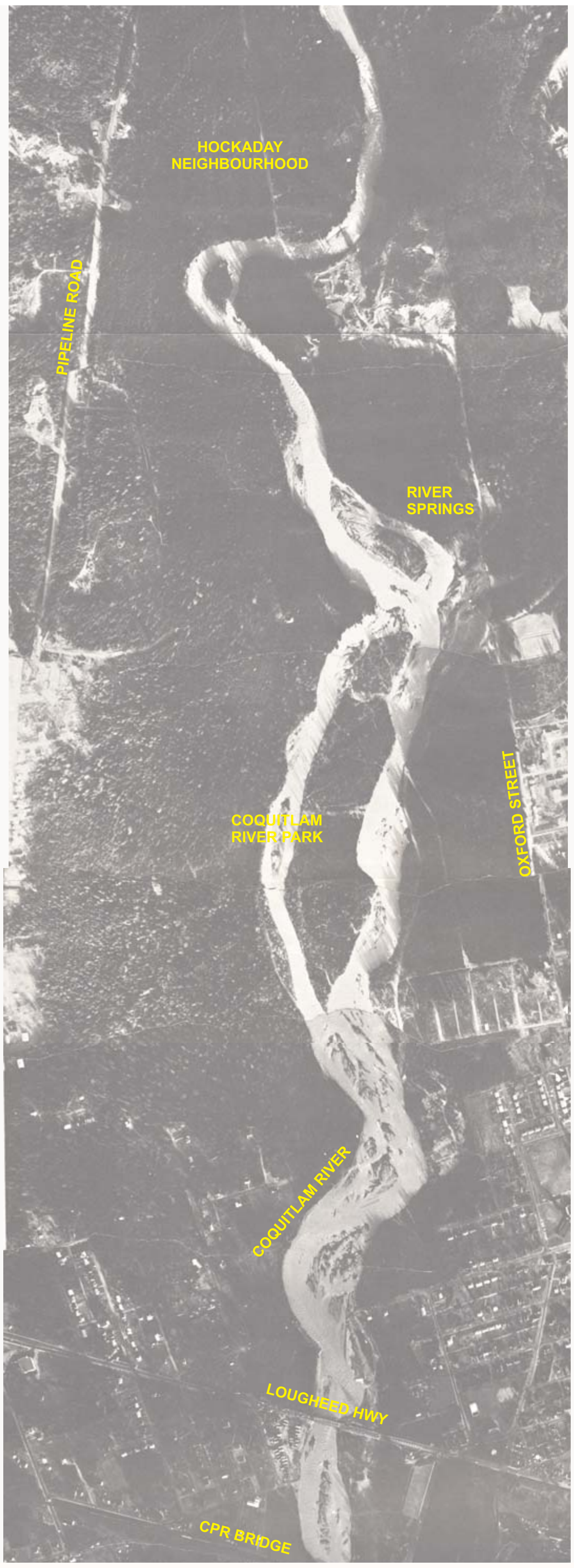
0 500 1,000 Meters

SCALE 1:60,000

1961 Coquitlam River Flood

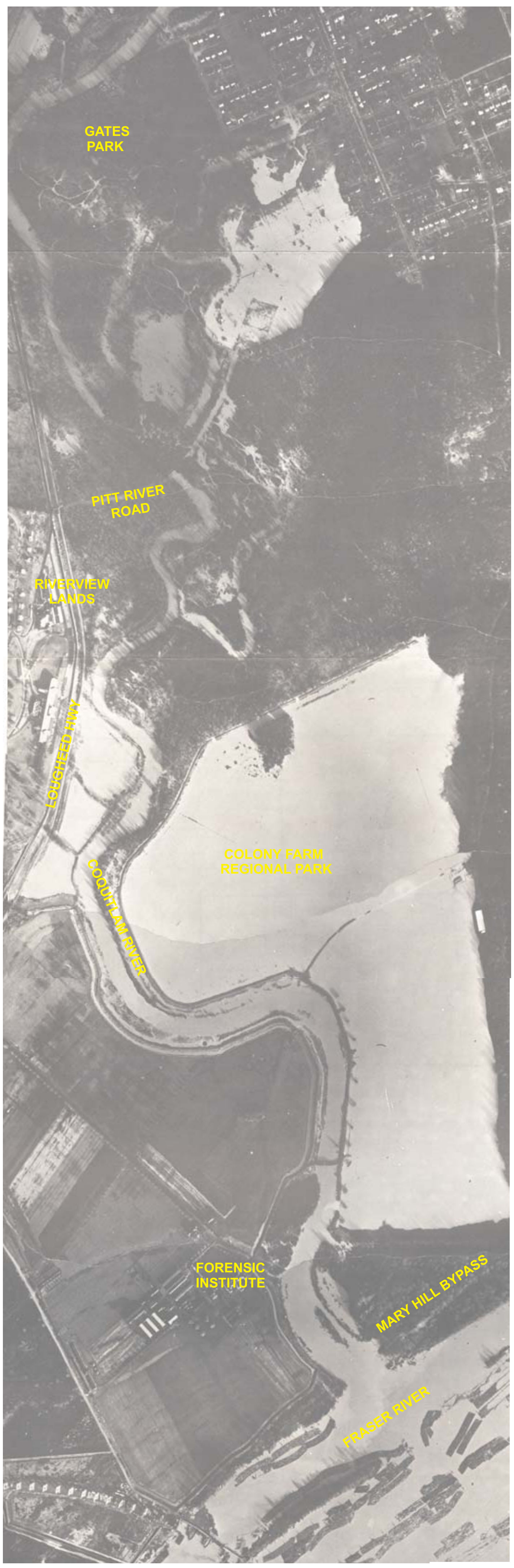
The Coquitlam River has flooded several times during recorded history. Floods have occurred in 1892, 1921, 1955 and 1961. The worst recorded flood occurred on October 28-29, 1921 when all of the downtown area of Port Coquitlam was flooded and the CPR bridge collapsed. The damage was in the $5-6 million range (in 1921 dollars). The January 15, 1961 Coquitlam River flood was also a large flood (1:23 years). As can be seen on these historical air photographs, Colony Farm was flooded along with other areas of Port Coquitlam and Oxbow Lake (now River Springs). While no bridges were destroyed, all three major crossings (Lougheed, CPR and Pitt River Road) were threatened. The flow was recorded at 476 m^3/sec, while the maximum instantaneous flow was estimated to be about 650 m^3/sec. Since 1969, annual maximum flows have averaged about 70 m^3/sec. The maps below and on the following pages are aerial photographs of the 1961 flood.

Coquitlam River Flood Photo
Hockaday to CPR Bridge (January 16, 1961)

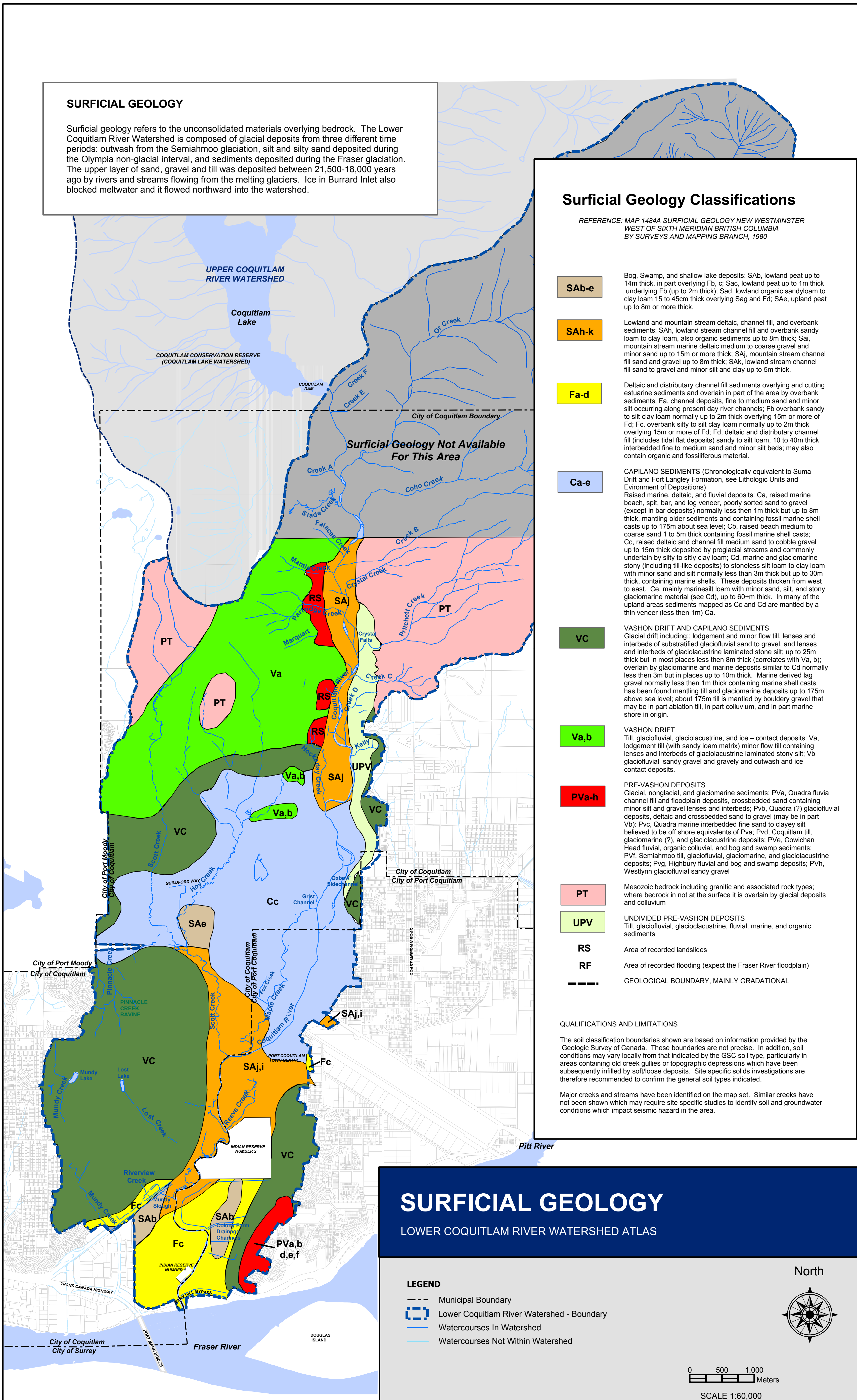


Present Day Photo
Hockaday to CPR Bridge (Summer 1999)

Coquitlam River Flood Photo
Gates Park to Fraser River (January 16, 1961)



Present Day Photo
Gates Park to Fraser River (Summer 1999)



SURFICIAL GEOLOGY

Surficial geology refers to the unconsolidated materials overlying bedrock. The Lower Coquitlam River Watershed is composed of glacial deposits from three different time periods: outwash from the Semiahmoo glaciation, silt and silty sand deposited during the Olympia non-glacial interval, and sediments deposited during the Fraser glaciation. The upper layer of sand, gravel and till was deposited between 21,500-18,000 years ago by rivers and streams flowing from the melting glaciers. Ice in Burrard Inlet also blocked meltwater and it flowed northward into the watershed.

Surficial Geology Classifications

REFERENCE: MAP 1484A SURFICIAL GEOLOGY NEW WESTMINSTER WEST OF SIXTH MERIDIAN BRITISH COLUMBIA BY SURVEYS AND MAPPING BRANCH, 1980

SAb-e	Bog, Swamp, and shallow lake deposits: SAb, lowland peat up to 14m thick, in part overlying Fb, c; Sac, lowland peat up to 1m thick underlying Fb (up to 2m thick); Sad, lowland organic sandyloam to clay loam 15 to 45cm thick overlying Sag and Fd; SAe, upland peat up to 8m or more thick.
SAh-k	Lowland and mountain stream deltaic, channel fill, and overbank sediments: SAh, lowland stream channel fill and overbank sandy loam to clay loam, also organic sediments up to 8m thick; Sai, mountain stream marine deltaic medium to coarse gravel and minor sand up to 15m or more thick; SAj, mountain stream channel fill sand and gravel up to 8m thick; SAk, lowland stream channel fill sand to gravel and minor silt and clay up to 5m thick.
Fa-d	Deltaic and distributary channel fill sediments overlying and cutting estuarine sediments and overlain in part of the area by overbank sediments; Fa, channel deposits, fine to medium sand and minor silt occurring along present day river channels; Fb overbank sandy to silt clay loam normally up to 2m thick overlying 15m or more of Fd; Fc, overbank silty to silt clay loam normally up to 2m thick overlying 15m or more of Fd; Fd, deltaic and distributary channel fill (includes tidal flat deposits) sandy to silt loam, 10 to 40m thick interbedded fine to medium sand and minor silt beds; may also contain organic and fossiliferous material.
Ca-e	CAPILANO SEDIMENTS (Chronologically equivalent to Suma Drift and Fort Langley Formation, see Lithologic Units and Evironment of Depositions) Raised marine, deltaic, and fluvial deposits: Ca, raised marine beach, spit, bar, and log veneer, poorly sorted sand to gravel (except in bar deposits) normally less then 1m thick but up to 8m thick, mantling older sediments and containing fossil marine shell casts up to 175m about sea level; Cb, raised beach medium to coarse sand 1 to 5m thick containing fossil marine shell casts; Cc, raised deltaic and channel fill medium sand to cobble gravel up to 15m thick deposited by proglacial streams and commonly underlain by silty to sitly clay loam; Cd, marine and glaciomarine stony (including till-like deposits) to stoneless silt loam to clay loam with minor sand and silt normally less than 3m thick but up to 30m thick, containing marine shells. These deposits thicken from west to east. Ce, mainly marinesilt loam with minor sand, silt, and stony glaciomarine material (see Cd), up to 60+m thick. In many of the upland areas sediments mapped as Cc and Cd are mantled by a thin veneer (less then 1m) Ca.
VC	VASHON DRIFT AND CAPILANO SEDIMENTS Glacial drift including;; lodgement and minor flow till, lenses and interbeds of substratified glaciofluvial sand to gravel, and lenses and interbeds of glaciolacustrine laminated stone silt; up to 25m thick but in most places less then 8m thick (correlates with Va, b); overlain by glaciomarine and marine deposits similar to Cd normally less then 3m but in places up to 10m thick. Marine derived lag gravel normally less then 1m thick containing marine shell casts has been found mantling till and glaciomarine deposits up to 175m above sea level; about 175m till is mantled by bouldery gravel that may be in part abiation till, in part colluvium, and in part marine shore in origin.
Va,b	VASHON DRIFT Till, glaciofluvial, glaciolacustrine, and ice – contact deposits: Va, lodgement till (with sandy loam matrix) minor flow till containing lenses and interbeds of glaciolacustrine laminated stony silt; Vb glaciofluvial sandy gravel and gravely and outwash and ice-contact deposits.
PVa-h	PRE-VASHON DEPOSITS Glacial, nonglacial, and glaciomarine sediments: PVa, Quadra fluvia channel fill and floodplain deposits, crossbedded sand containing minor silt and gravel lenses and interbeds; Pvb, Quadra (?) glaciofluvial deposits, deltaic and crossbedded sand to gravel (may be in part Vb): Pvc, Quadra marine interbedded fine sand to clayey silt believed to be off shore equivalents of Pva; Pvd, Coquitlam till, glaciomarine (?), and glaciolacustrine deposits; PVe, Cowichan Head fluvial, organic colluvial, and bog and swamp sediments; PVf, Semiahmoo till, glaciofluvial, glaciomarine, and glaciolacustrine deposits; Pvg, Highbury fluvial and bog and swamp deposits; PVh, Westlynn glaciofluvial sandy gravel
PT	Mesozoic bedrock including granitic and associated rock types; where bedrock in not at the surface it is overlain by glacial deposits and colluvium
UPV	UNDIVIDED PRE-VASHON DEPOSITS Till, glaciofluvial, glacioclacustrine, fluvial, marine, and organic sediments
RS	Area of recorded landslides
RF	Area of recorded flooding (expect the Fraser River floodplain)
▬▬▬▪	GEOLOGICAL BOUNDARY, MAINLY GRADATIONAL

QUALIFICATIONS AND LIMITATIONS

The soil classification boundaries shown are based on information provided by the Geologic Survey of Canada. These boundaries are not precise. In addition, soil conditions may vary locally from that indicated by the GSC soil type, particularly in areas containing old creek gullies or topographic depressions which have been subsequently infilled by soft/loose deposits. Site specific solids investigations are therefore recommended to confirm the general soil types indicated.

Major creeks and streams have been identified on the map set. Similar creeks have not been shown which may require site specific studies to identify soil and groundwater conditions which impact seismic hazard in the area.

SURFICIAL GEOLOGY

LOWER COQUITLAM RIVER WATERSHED ATLAS

LEGEND

- Municipal Boundary
- Lower Coquitlam River Watershed - Boundary
- Watercourses In Watershed
- Watercourses Not Within Watershed

North

0 500 1,000 Meters

SCALE 1:60,000

Fish Resources

Introduction

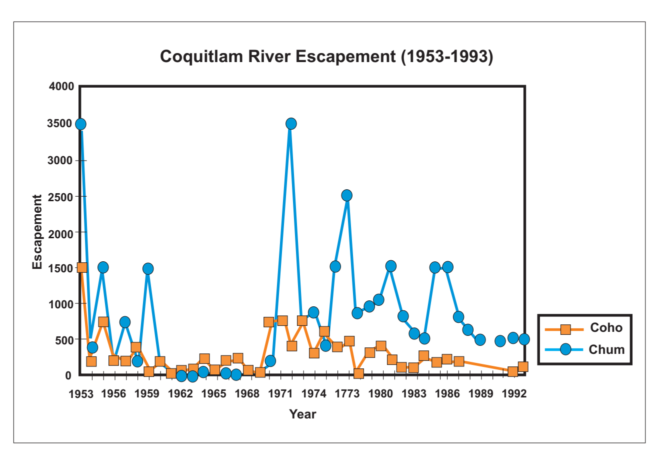
Various fish species make the Lower Coquitlam River Watershed their home, and have done so for hundreds of years. Currently, 24 fish species are known to inhabit streams within the watershed. Over the decades, several factors have contributed to lower salmon numbers - reduced habitat quality, construction of the Coquitlam dam, and over-fishing in the ocean. Throughout the coastal areas of the province, hatcheries were introduced by the federal government through the Salmon Enhancement Program, including community-based hatcheries in the Lower Coquitlam River Watershed, in an effort to boost fish stocks (salmon and trout) and to assist in educating the public about fish conservation. These hatcheries often hold annual events in celebration of the salmon, functioning to bring people together and raising awareness about the local fish resources.

Known Fish Species in the Coquitlam River

1. Coho salmon (*Oncorhynchus kisutch*)
2. Chum salmon (*Oncorhynchus keta*)
3. Chinook salmon (*Oncorhynchus tshawytscha*)
4. Pink salmon (*Oncorhynchus gorbuscha*)
5. Steelhead trout (*Oncorhynchus mykiss*)
6. Rainbow trout (*Oncorhynchus mykiss*)
7. Sea-run Coastal cutthroat trout (*Oncorhynchus clarki clarki*)
8. Resident Coastal cutthroat trout (*Oncorhyncus clarki clarki*)
9. Sea-run Dolly Varden/Bull trout (*Salvelinus malma/Salvelinus confluentus*)
10. Resident Dolly Varden/Bull trout (*Salvelinus malma/Salvelinus confluentus*)
11. Redside shiner (*Richardsonius balteatus*)
12. Mountain whitefish (*Prosopium williamsoni*)
13. Peamouth chub (*Mylocheilus caurinus*)
14. Longnose dace (*Rhinichthys cataractae*)
15. Northern squawfish (*Ptychoceilus oregonensis*)
16. Largescale sucker (*Catostomus macrocheilus*)
17. Slimy sculpin (*Cottus cagnatus*)
18. Longnose sucker (*Catostomus catostomus*)
19. Pacific lamprey (*Lampetra tridentata*)
20. River lamprey (*Lampreta ayresi*)
21. Brown catfish (*Ameiurus nebulosis*)
22. White sturgeon (*Acipenser transmontanus*)
23. Three spine stickleback (*Gasterosteus aculeatus*)
24. Prickly sculpin (*Cottus asper*)

Escapement

Escapement refers to the numbers of anadromous sea-going fish species such as salmon that return to the rivers, streams and creeks to spawn each fall. Amongst the many species in the watershed, several species of salmon spawn in the watershed and return as adults 2-5 years later, after spending a portion of their lives in the Pacific Ocean. The areas that they inhabit and the time of the year that they can be found in the watershed are shown on the map and chart on page 14. The graph depicts escapement records for chum and coho salmon. Sockeye, once numbering in the thousand spawners each year, are no longer found in the watershed. Due to the construction of the Coquitlam River Dam, pink salmon disappeared in the 1950's but are now being reintroduced via the Port Coquitlam and District Hunting and Fishing Club. Local hatcheries have also released chinook, coho, chum, and steelhead. A number of factors can affect how many fish return to spawn each year, including successful egg production, juvenile survival, water quality and quantity, commercial and recreational fisheries, predation, ocean conditions, distance to spawning grounds, and barriers to migration.



SOURCE: RILEY ET. AL. COQUITLAM RIVER STOCK ASSESSMENT 1997

Barriers to Salmon Migration

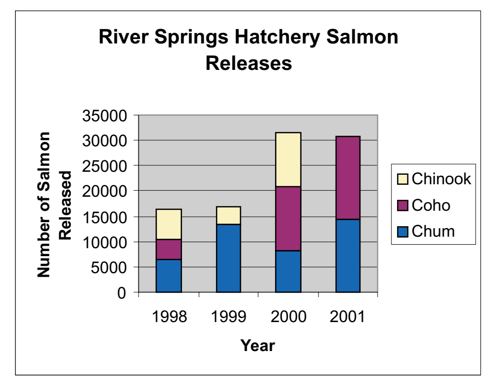
Natural obstructions may restrict or completely block upstream migration of salmonids. There are four common types of naturally occurring migration barriers. These include: falls and inclines; rock slides; log/debris jams; and beaver dams. There are also manmade barriers to fish migration. Insufficient flow, culverts and dams are some examples. These barriers may be temporary or permanent, and in some cases may be a barrier only for some species, while other species may continue upstream uninhibited. The Coquitlam River Dam is a barrier to salmon migration into the lake.

Fish Resources

Hatcheries

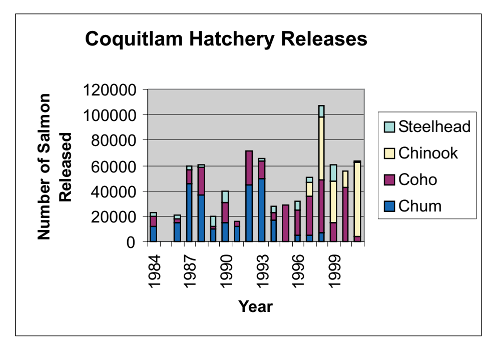
River Springs Hatchery

This small facility was constructed inside the caretaker's workshop for the River Springs subdivision on the Coquitlam River. It was assembled to reduce the dependance on the Coquitlam River Hatchery and to provide fry stocking capability for Oxbow/River Springs habitat improvement constructed by DFO's Resource Restoration Division. Chum, coho, and transplanted Chilliwack chinook are incubated and reared in nearby lake pens for a brief period prior to release.



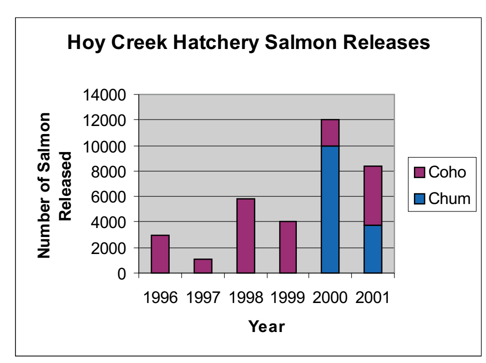
Coquitlam River Hatchery

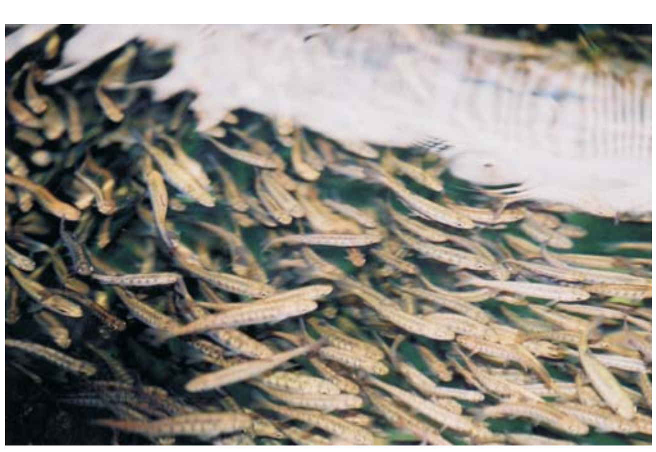
This hatchery has been operated by Port Coquitlam and District Hunting and Fishing Club volunteers since 1981. Coquitlam river coho fry and smolts from this facility have been used to help re-stock tributaries and several major habitat rehabilitation and restoration projects completed by the Resource Restoration Division. The hatchery has focused on coho and steelhead enhancement for years, and since 1997 have also stocked Chinook eggs.

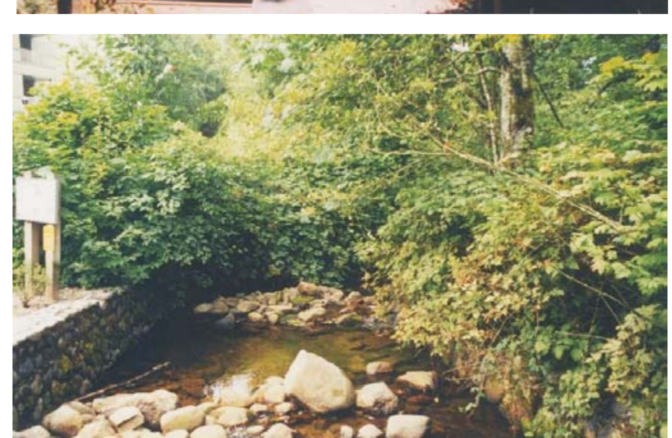


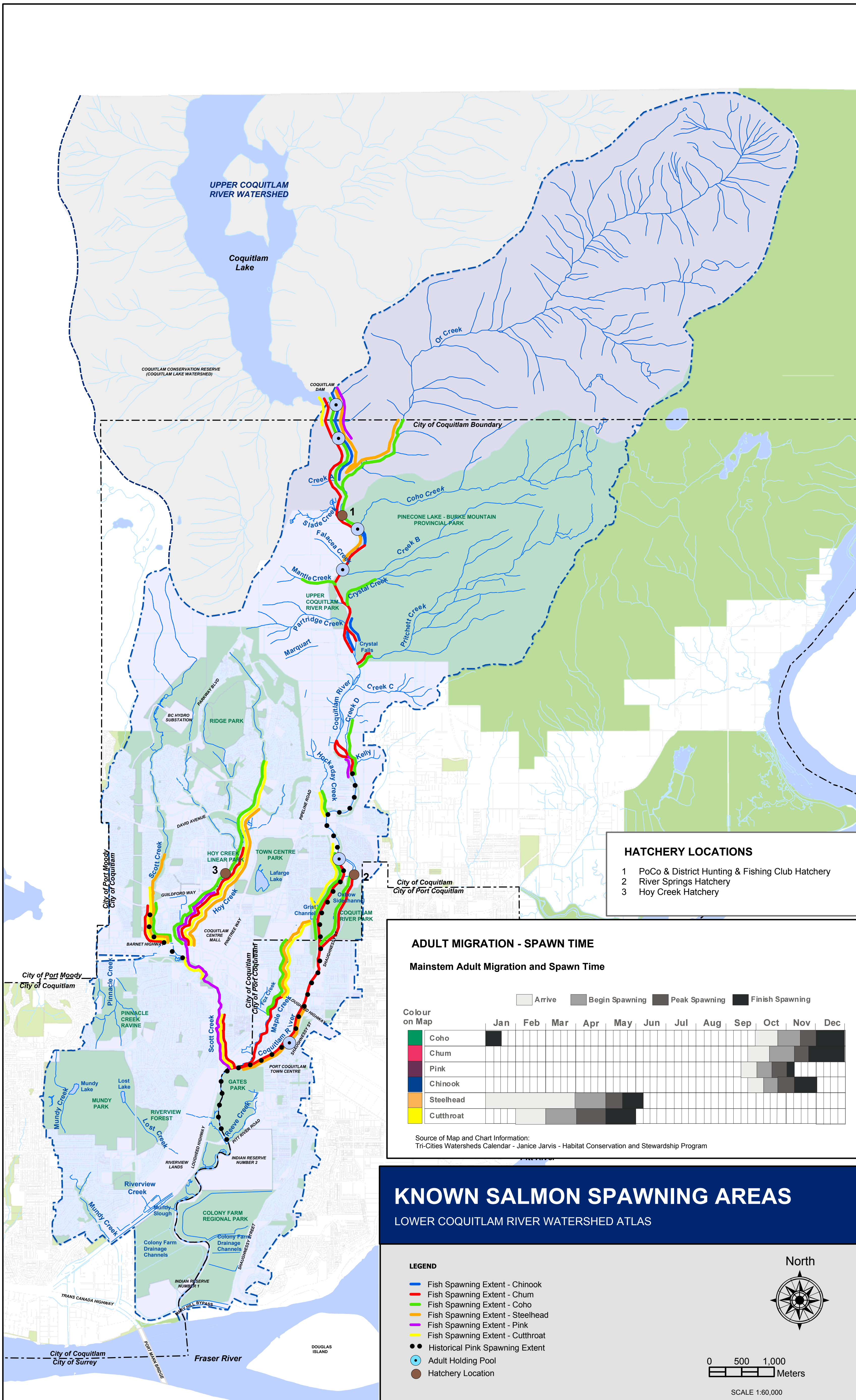
Hoy Creek Optimist Hatchery

Rebuilt at the site of an old commercial trout hatchery and nestled between a condominium complex and a Coquitlam linear park, this project began as an interpretive opportunity for park visitors. It has expanded to include an interpretive center, rearing ponds, a coho spawning and rearing channel, rearing trough, and mini-hatchery. Operated by volunteers from the Hoy/Scott Watershed Society, this project is trying to rehabilitate coho stocks adversely affected by urban development.









UPPER COQUITLAM RIVER WATERSHED
Coquitlam Lake
COQUITLAM CONSERVATION RESERVE (COQUITLAM LAKE WATERSHED)
COQUITLAM DAM
Or Creek
City of Coquitlam Boundary
Creek A
Coho Creek
PINECONE LAKE - BURKE MOUNTAIN PROVINCIAL PARK
Slade Creek
Falacea Creek
Creek B
Mantle Creek
Crystal Creek
UPPER COQUITLAM RIVER PARK
Partridge Creek
Pritchett Creek
Marquart
Crystal Falls
Creek C
Coquitlam River
Creek D
Kelly
Hockaday Creek
BC HYDRO SUBSTATION
RIDGE PARK
PIPELINE ROAD
DAVID AVENUE
Scott Creek
HOY CREEK LINEAR PARK
TOWN CENTRE PARK
Lafarge Lake
City of Port Moody
City of Coquitlam
GUILDFORD WAY
Hoy Creek
Oxbow Sidechannel
Grist Channel
COQUITLAM RIVER PARK
City of Coquitlam
City of Port Coquitlam
COQUITLAM CENTRE MALL
PINETREE WAY
BARNET HIGHWAY
Pinnacle Creek
PINNACLE CREEK RAVINE
Fox Creek
Maple Creek
Coquitlam River
SHAUGHNESSY ST
PORT COQUITLAM TOWN CENTRE
GATES PARK
Mundy Lake
Lost Lake
MUNDY PARK
Mundy Creek
RIVERVIEW FOREST
Lost Creek
Reeve Creek
PITT RIVER ROAD
LOUGHEED HIGHWAY
RIVERVIEW LANDS
INDIAN RESERVE NUMBER 2
Riverview Creek
Mundy Slough
COLONY FARM REGIONAL PARK
Colony Farm Drainage Channels
INDIAN RESERVE NUMBER 1
TRANS CANADA HIGHWAY
MARY HILL BYPASS
City of Coquitlam
City of Surrey
PORT MANN BRIDGE
Fraser River
DOUGLAS ISLAND
1
2
3

HATCHERY LOCATIONS
1 PoCo & District Hunting & Fishing Club Hatchery
2 River Springs Hatchery
3 Hoy Creek Hatchery

ADULT MIGRATION - SPAWN TIME
Mainstem Adult Migration and Spawn Time
Arrive
Begin Spawning
Peak Spawning
Finish Spawning
Colour on Map
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Coho
Chum
Pink
Chinook
Steelhead
Cutthroat
Source of Map and Chart Information:
Tri-Cities Watersheds Calendar - Janice Jarvis - Habitat Conservation and Stewardship Program

KNOWN SALMON SPAWNING AREAS
LOWER COQUITLAM RIVER WATERSHED ATLAS

LEGEND
Fish Spawning Extent - Chinook
Fish Spawning Extent - Chum
Fish Spawning Extent - Coho
Fish Spawning Extent - Steelhead
Fish Spawning Extent - Pink
Fish Spawning Extent - Cutthroat
Historical Pink Spawning Extent
Adult Holding Pool
Hatchery Location
North
0 500 1,000
Meters
SCALE 1:60,000

Stream Restoration and Enhancement

Introduction

As a result of various developments (e.g., dam, flood control, land development and other activities) natural drainage patterns were changed and sections of the Coquitlam River and its tributaries were dyked and channelized which resulted in removal of riparian vegetation and the cutting off of small tributaries and side channels that provided fish habitat. In an effort to restore or improve fish habitat several habitat restoration and enhancement projects have taken place. These projects have ranged in size and complexity, and have been completed by various groups including community streamkeepers and government agencies. The projects have involved riparian plantings, placement of large woody debris (logs) and construction of off-channel habitat, spawning beds and rearing ponds.

Restoration and Enhancement Sites

The following projects are highlights of some of the major restoration and enhancement projects completed in the Lower Coquitlam River Watershed by Fisheries and Oceans Canada, BC Hydro, the municipalities and other groups There are projects being implemented on a regular basis, some of which are compensation works for impacts to fish habitat within the watershed.

Grant's Tomb Restoration Project

In 1993 and 1994, the Grant's Tomb project was built immediately downstream of the Coquitlam River Dam. It consists of a 3300 m^2 rearing pond and an outlet channel fed by a water diversion from the GVRD water main. In 1995 a short spawning channel was added to the project. Coho fry rear year-round in the ponds and channels of this restoration initiative.

Swoboda Channel

Swoboda Channel was constructed in 1998 to provide spawning habitat for pink salmon. Pinks were eradicated in the 1950's, likely as a result of the mining of riverbed gravels. Swoboda Channel seems to have contributed successfully to the reintroduction of pink salmon.

Grist Channel

Named in honour of his contribution to the Coquitlam River Watershed, the Allan E. Grist Channel was built in 1997 to provide off-channel habitat in the watershed. Located directly across from Oxbow Lake, this site consists of a series of pools and spawning riffles, an 1159m^2 pond and an interpretive trail alongside the creek. In 1999 the habitat was further enhanced with the addition of another 1000 m^2 rearing pond immediately downstream of the first pond. Well water that feeds Maple Creek also supplements flows in Grist Channel.

Or Creek

Located on the east bank of the river immediately downstream of Or Creek, this project consists of a series of five rearing ponds connected by spawning and rearing channels. The total habitat created in this project is approximately 1500 m^2.

Archery Pond

This site consists of a small spawning channel and a 5800 m^2 rearing pond. It is located on the west bank 2 km downstream of the Or Creek site, adjacent to the Upper Coquitlam River Park.

Oxbow Channel

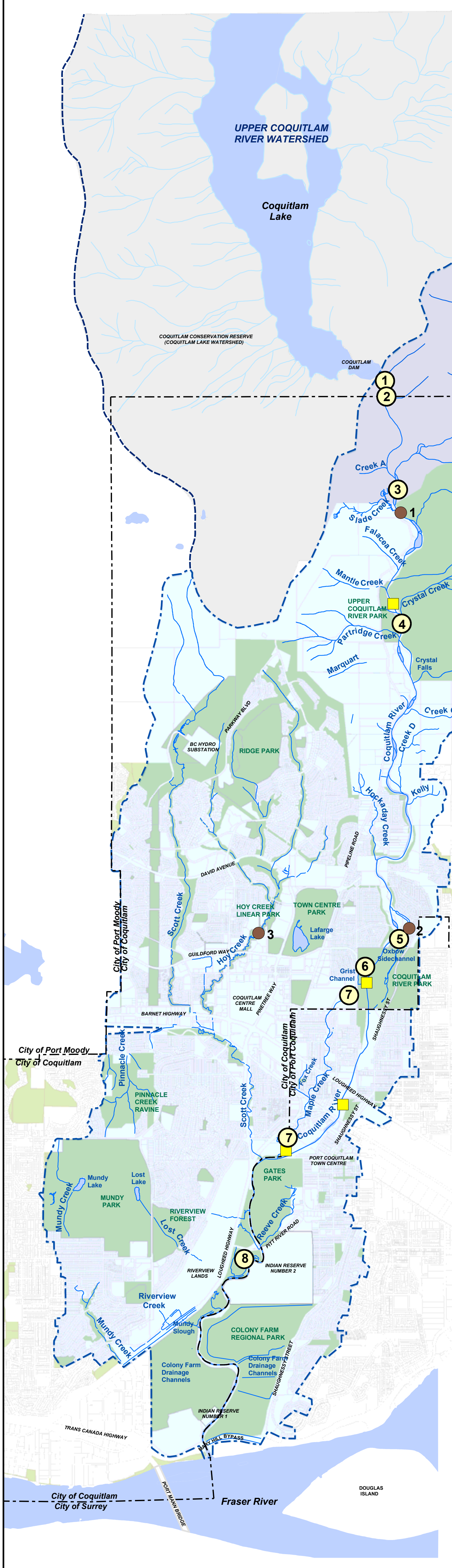
Oxbow Lake is a series of off-channel ponds and channels (17,300 m^2), and is situated on the east bank 1 km upstream of the Lougheed Highway Bridge.

Maple Creek

Several restoration and enhancement projects have taken place on Maple Creek since 1997. The first of these projects was the installation of a well water supply to supplement the creek during periods of low water flows. In 1999, further work was completed, including the creation of a 1000 m^2 rearing pond and 30 m^2 of spawning habitat in upper Maple Creek. In 2001, additional ponds were built in the lower section to compensate for the loss of rearing habitat and two small spawning areas were constructed to replace the loss of natural gravel recruitment.

Pitt River Road Bridge (Red Bridge) Compensation Ponds

This site consists of a series of over-wintering back channel ponds aimed primarily at coho, and totals over 7000 m^2 including a large area of riparian planting. This project was carried out in partnership between the Cities of Port Coquitlam, Coquitlam and School District 43 in 1995.



MAJOR STREAM RESTORATION AND ENHANCEMENT SITES

1 Grant's Tomb Restoration Project
2 Swoboda Channel
3 Or Creek
4 Archery Pond
5 Oxbow Sidechannel
6 Grist Creek
7 Maple Creek Rearing Ponds
8 Pitt River Road Bridge (Red Bridge) Compensation Ponds

HATCHERY LOCATIONS

1 PoCo & District Hunting & Fishing Club Hatchery
2 River Springs Hatchery
3 Hoy Creek Hatchery

RIPARIAN PLANTING

Riparian ecosystems are an integral part of fish habitat. The riparian zone is the vegetated area on each bank of the river or stream. This vegetation provides valuable cover to protect fish from predators, shade for temperature control, leaves and insects that provide food and nutrients to the water, and helps to stabilize stream banks and control erosion. The trees alongside a river or creek provide a source of woody debris for the stream, which helps to moderate flow and reduce flooding, and creates ponds and cover for fish and other aquatic life. In addition, a healthy riparian area provides excellent habitat for birds and other wildlife and often function as wildlife corridors. Riparian areas provide open space in urbanized areas. Riparian planting is a simple and effective means of improving fish habitat. Many local streamkeeper groups have planting sessions and always welcome volunteers. These groups can be found in the stewardship section of this atlas.

LARGE WOODY DEBRIS

One of the most critical components of salmonid habitat is cover, particularly for rearing juveniles. Rearing fish tend to occupy covered habitats for extended periods of time. Salmonid streams, especially those like the Coquitlam River, that supports more than one species, should contain a diversity of cover types. Submerged cover such as large organic debris, boulders, rubble and aquatic vegetation afford protection from predators. Large woody debris (LWD) has been placed in the Coquitlam River mainstem downstream from the Port Coquitlam Hatchery, and downstream from the archery ponds. In addition, LWD has also been placed in Grist Channel and Maple Creek.

STREAM RESTORATION AND ENHANCEMENT

LOWER COQUITLAM RIVER WATERSHED ATLAS

Water Quality

Water Quality

Water quality is an important component of the ecology of a watershed. Good water quality is critical for aquatic life, drinking water, and for water contact recreation. In the Coquitlam River Watershed, the quality of the drinking water is monitored on a regular basis by the Greater Vancouver Regional District. Below the Coquitlam Lake Reservoir, water quality has been monitored for the past 30 years by a variety of government agencies and organizations. The tables and maps in this section highlight variables that are important for stream health and summarize monitoring results.

Water Quality Monitoring

Forty-six different water quality variables have been measured at 31 sites since the 1970's in the Lower Coquitlam River Watershed as part of various monitoring programs. Monitoring was carried out consistently on six sites in the watershed by the provincial government between 1990 and 1993 as part of a province wide monitoring program to assess the water quality status of waterbodies in the province and to determine whether or not water quality objectives were being met. Prior to the Coquitlam River Water Management Study (1978), 10 sites were monitored. More recently, the Douglas College Habitat Restoration Program monitored water quality in Hoy and Scott Creeks (1999 to 2000) and Maple Creek (2000 to 2001). The Douglas College Centre for Environmental Studies and Urban Ecology monitored seven sites throughout the watershed as part of the Clear Water Initiative from January to December 2001. Water quality has also been monitored by other organizations, including streamkeepers groups. Detailed results from the 31 sites can be found in Appendix 1.

Factors Affecting Water Quality

Turbidity

Excessive turbidity can be harmful to aquatic life and sediment can smother fish eggs, clog fish gills, and reduce visibility for successful feeding. Following heavy rainfall, turbidity and suspended sediment levels increase in the Coquitlam River and many of its tributaries. In some cases this turbidity is caused naturally by soil erosion within the stream. Other sources of turbidity include non-point source pollution from urban runoff, and point source pollution from industry.

Heavy Metals

Metals such as aluminium, boron, iron, magnesium, manganese, molybdenum, titanium, and oil and grease have been monitored in some of the tributaries in the Lougheed Highway area of the watershed, such as Maple and Scott Creeks. In some cases, where these contaminants have been high, fish kills have occurred. While not all these variables have guidelines, all levels were very high and the variables with guidelines were often double acceptable limits. Since 1999, measures have been set in place to reduce the contaminants entering these tributaries.

Coquitlam River Iron Oxide Staining

People walking along Coquitlam River near the Patricia Street walking bridge often raise aesthetic concerns about the origin of iron oxide staining along the river and its effect on aquatic life. The iron staining results from naturally occurring leachate. Provincial government studies in 1989 and 1998 have shown that the leachate quality is within acceptable limits for the protection of aquatic life and is not expected to be toxic to fish.

Waste Discharge Permits

Waste discharge permits granted by the Provincial Government through BC's Waste Management Act specify conditions for discharging waste into the environment, such as allowable surface water discharge volumes and maximum concentrations of selected parameters. A waste discharge permit holder must monitor effluent and water quality for temperature, pH, suspended sediments, and other variables at predetermined intervals and submit data and reports to the Ministry of Water, Land and Air Protection. In the Coquitlam River Watershed, there are two permitted discharges to surface water.

The Greater Vancouver Regional District permits other industries to discharge waste into the sewer system. This effluent is moved directly to the Annacis Island Sewage Treatment Plant and discharges do not affect the water quality in the Coquitlam River Watershed.

WATER QUALITY

LOWER COQUITLAM RIVER WATERSHED ATLAS

Selected Water Quality Monitoring Sites Results

Identified on map as points - ●

The following six sites were monitored by the provincial government consistently between 1990 and 1993 and reflect the water quality in the watershed. Detailed results from water quality monitoring that has been carried out on the 31 sites listed in the atlas can be found in Appendix 1.

Site No.	2			3			9			23			26			31		
Dates Monitored	September-October 1990 October-November 1991 October-November 1992 October-November 1993			September-October 1990 October-November 1993			September-October 1990 October-November 1991 October-November 1992 October-November 1993			October-November 1991 October-November 1992 October-November 1993			September-October 1990 October-November 1991 October-November 1992 October-November 1993			September-October 1990 October-November 1991 October-November 1992 October-November 1993		
	n	Min	Max	n	Min	Max	n	Min	Max	n	Min	Max	n	Min	Max	n	Min	Max
Dissolved Oxygen (mg/L)	19	8.4	13.3	9	10.8	12.7	14	10.8	13.3	14	9.8	12.2	19	7.8	12.2	20	7.8	12.4
pH	14	6.1	7.3	8	6.4	7.4	10	6.2	7.4	10	6.7	7.3	15	6.9	7.6	15	6.9	7.7
Suspended Solids (mg/L)	15	<1	40	8	<1	4	11	<4	88	11	<1	65	16	<1	63	16	>4	>119
Turbidity (NTU)	15	<0.1	9.4	8	0.1	1	9	0.1	48	11	0.7	50	16	1.5	32	16	1.6	32
Fecal Coliform Bacteria (MPN/100 mL)	19	<1	109	8	<1	13	14	4	218	15	18	1120	20	22	5000	20	20	710

Water Quality Monitoring Sites

(Sites that have been monitored at least once in the Coquitlam River Watershed - Mid 1970's to the Present)

1. Coquitlam River at Coquitlam Dam
2. Or Creek at Coquitlam River
3. Coquitlam River downstream from Or Creek
4. Coquitlam River at Watershed Gate (at hatchery for CW)
5. Falacae Creek at Pipeline Road
6. Goodyear Creek at Hamton Gate / Goodyear Creek Preservation Area
7. Coquitlam River at Galette Road
8. Coquitlam River at Hockaday Creek
9. Coquitlam River upstream from Coquitlam River Park
10. Maple Creek at footbridge to Ozada Tot Lot
11. Grist Creek at inflow
12. Grist Creek at 2nd footbridge
13. Oxbow Sidechannel at Coquitlam River
14. Maple Creek at Maple Creek Middle School
15. Coquitlam River at CPR Bridge
16. Maple Creek at Bedford Street
17. Maple Creek at Coquitlam River Dyke
18. Hoy Creek at Hampton Park on Paddock Drive
19. Hoy Creek 150m upsstream from hatchery
20. Hoy Creek 250m downstream from hatchery
21. Hoy Creek tributary north of Barnet Highway at footbridge
22. Hoy Creek just north of Barnet Highway
23. Hoy Creek near mouth (confluence with Scott Creek)
24. Scott Creek at Glen Drive
25. Scott Creek at Railway
26. Scott Creek downstream from Hoy Creek
27. Scott Creek at Highway 7
28. Scott Creek at Coquitlam River
29. Coquitlam River at Red Bridge
30. Coquitlam River at Colony Farm Bridge
31. Coquitlam River near mouth (Confluence with Fraser River)

Water Quality in Or Creek and Upper Reaches Tributaries (Un-Disturbed Drainage Areas)

The upper reaches of the Coquitlam River Watershed are not affected by urban development. The southern portion of this area is affected by inputs from the gravel mines. Overall, water quality in this sub-watershed is good. Provincial water quality objectives were often met. Objectives that were not met were only slightly outside acceptable ranges for the protection of aquatic life. Water at and downstream from the dam is slightly acidic (min pH = 5.66 and 6.1). Fecal coliforms and other microbiological guidelines were not met at the mouth of Or Creek during two years of sampling (1991 and 1992). Turbidity is the largest water quality concern in this area. Unstable and eroding shoreline banks along Or and Falacea Creeks contribute sediments to the river during heavy rainfall. Sediment is also added to the Coquitlam River from surface runoff in the vicinity of the gravel operations.

Water Quality in the Hoy/Scott/ Pinnacle Creek Catchment Areas

This area of the watershed is highly developed and continues to grow. There is no water quality information for Pinnacle Creek and other creeks in the south side of this watershed area. The major source of water quality contamination is urban stormwater runoff. Many water quality objectives were not met at times. Fecal coliforms and other microbiological contaminants were often high in both Scott and Hoy Creeks. pH was slightly more acidic than in other areas of the watershed. Suspended solids and turbidity was high at times likely due to increased rainfall.

Water Quality in the Smaller Tributaries in the Urbanized Portions of the Watershed

Although the watershed becomes more developed, water quality often remains within acceptable levels for the protection of aquatic life. Major sources of water contamination include gravel mining and urban runoff. As in the upper reaches most water quality guidelines were met. Fecal coliform levels were consistently good and rarely fell outside guidelines. Turbidity was often high in the mainstem of the river and in Maple Creek. Sediment inputs to the Coquitlam River in this sub-watershed are primarily from surface runoff in the vicinity of the gravel mines and urban runoff. Dissolved oxygen levels fell below guidelines at times in tributaries. Low dissolved oxygen levels can be attributed to low summer flows. pH in the mainstem becomes slightly less acidic from the upper reaches. Maple Creek also becomes less acidic moving downstream. Water to Oxbow sidechannel is from the Coquitlam River, so water quality in the channel mimics the mainstem (although effects are less).

Water Quality in Mundy Creek, Reeve Creek and Colony Farm

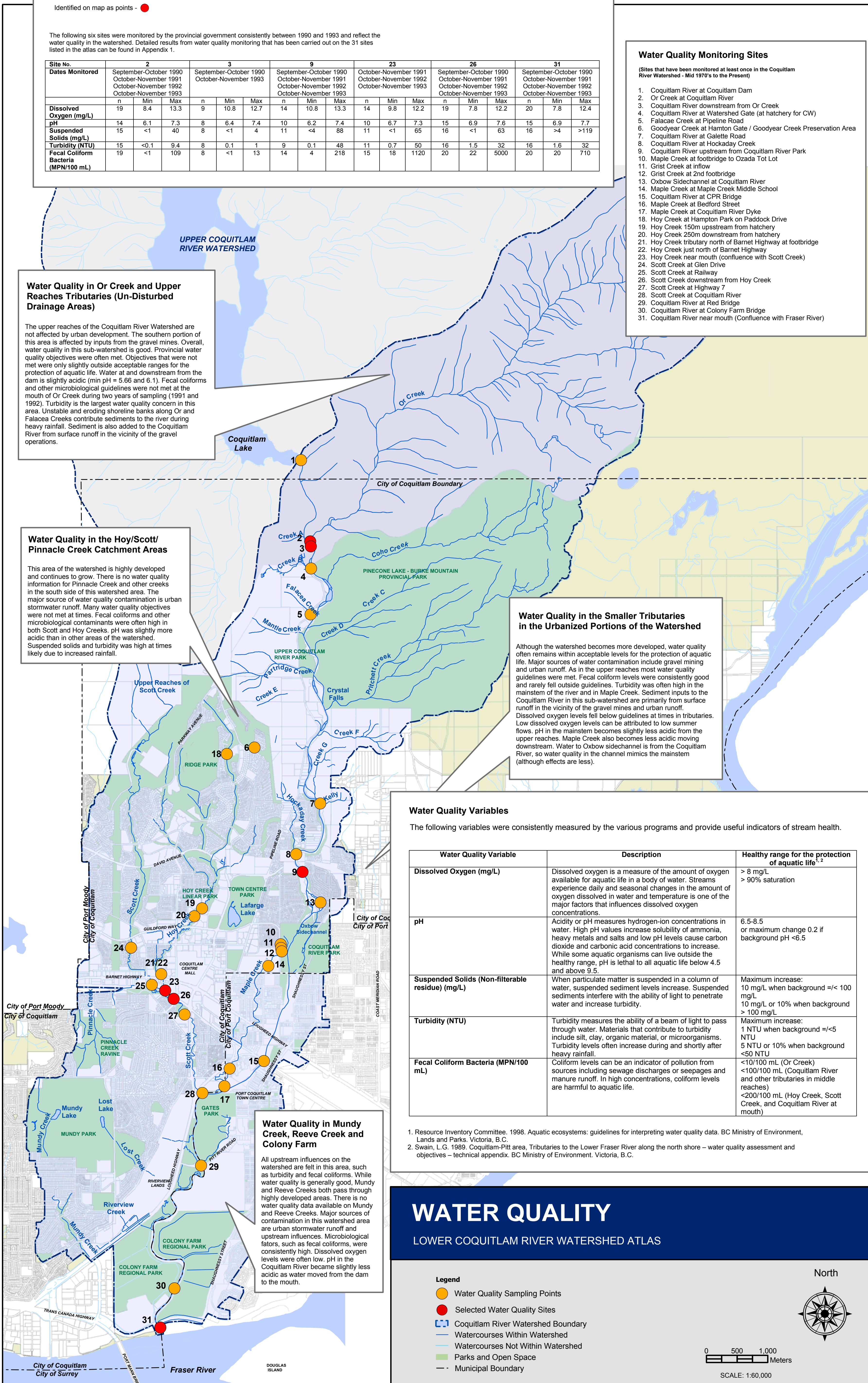
All upstream influences on the watershed are felt in this area, such as turbidity and fecal coliforms. While water quality is generally good, Mundy and Reeve Creeks both pass through highly developed areas. There is no water quality data available on Mundy and Reeve Creeks. Major sources of contamination in this watershed area are urban stormwater runoff and upstream influences. Microbiological fators, such as fecal coliforms, were consistently high. Dissolved oxygen levels were often low. pH in the Coquitlam River became slightly less acidic as water moved from the dam to the mouth.

Water Quality Variables

The following variables were consistently measured by the various programs and provide useful indicators of stream health.

Water Quality Variable	Description	Healthy range for the protection of aquatic life[1, 2]
Dissolved Oxygen (mg/L)	Dissolved oxygen is a measure of the amount of oxygen available for aquatic life in a body of water. Streams experience daily and seasonal changes in the amount of oxygen dissolved in water and temperature is one of the major factors that influences dissolved oxygen concentrations.	> 8 mg/L > 90% saturation
pH	Acidity or pH measures hydrogen-ion concentrations in water. High pH values increase solubility of ammonia, heavy metals and salts and low pH levels cause carbon dioxide and carbonic acid concentrations to increase. While some aquatic organisms can live outside the healthy range, pH is lethal to all aquatic life below 4.5 and above 9.5.	6.5-8.5 or maximum change 0.2 if background pH <6.5
Suspended Solids (Non-filterable residue) (mg/L)	When particulate matter is suspended in a column of water, suspended sediment levels increase. Suspended sediments interfere with the ability of light to penetrate water and increase turbidity.	Maximum increase: 10 mg/L when background =/< 100 mg/L 10 mg/L or 10% when background > 100 mg/L
Turbidity (NTU)	Turbidity measures the ability of a beam of light to pass through water. Materials that contribute to turbidity include silt, clay, organic material, or microorganisms. Turbidity levels often increase during and shortly after heavy rainfall.	Maximum increase: 1 NTU when background =/<5 NTU 5 NTU or 10% when background <50 NTU
Fecal Coliform Bacteria (MPN/100 mL)	Coliform levels can be an indicator of pollution from sources including sewage discharges or seepages and manure runoff. In high concentrations, coliform levels are harmful to aquatic life.	<10/100 mL (Or Creek) <100/100 mL (Coquitlam River and other tributaries in middle reaches) <200/100 mL (Hoy Creek, Scott Creek, and Coquitlam River at mouth)

1. Resource Inventory Committee. 1998. Aquatic ecosystems: guidelines for interpreting water quality data. BC Ministry of Environment, Lands and Parks. Victoria, B.C.
2. Swain, L.G. 1989. Coquitlam-Pitt area, Tributaries to the Lower Fraser River along the north shore – water quality assessment and objectives – technical appendix. BC Ministry of Environment. Victoria, B.C.



Vegetation and Wildlife

Introduction

Vegetation in the watershed ranges from mature coniferous forest in the upper reaches to old field grass, wetlands, forested swamp and floodplain deciduous forest in the lower portions of the Coquitlam River Watershed. This variety provides a wealth of habitat types to support wildlife populations and contributes to the overall bio-diversity of the watershed. Several studies have documented wildlife in the watershed, especially in Colony Farm Regional Park. Many species of birds, amphibians, and mammals have been recorded, including some that are considered rare, threatened or endangered. The Lower Coquitlam River Watershed contains a wide variety of vegetation types. This vegetation can be grouped into broad categories listed below.

Vegetation Types in the Watershed

Riparian Forest
These streamside areas contain a border of trees greater than 5 metres high, within 30 metres of the edge of the watercourse. Canopy cover from these trees shades the entire river or stream. Riparian areas provide shade, food, and a source of organic debris for productive fish habitat.

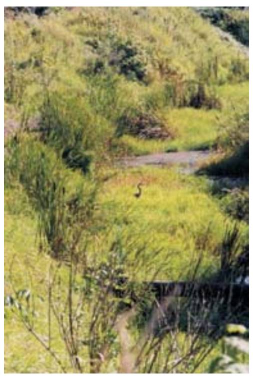
Riparian Shrub
These areas contain unmaintained grass or shrub dominated areas within 30 metres of the edge of the watercourse.

Riparian Ravine
These areas include forested ravines to the top-of-bank. This habitat is generally steeply sloped and may extend further than 30 metres from the waterway.

Sedge-Grass Wetlands
These are backchannel areas where there is persistent flooding or standing water. They are found near the Pitt River Road crossing of the Coquitlam River and are characterized by water-loving or water-tolerant plants species and soils that show indication of permanent or seasonal flooding.

Forested Swamps
These areas are found in the lower reaches of the watershed between dykes and upland areas where there are poorly drained soils within depressions of the floodplain. These areas are dominated by black cottonwood with some paper birch. Shrubs include red-osier dogwood, Sitka willow, hardhack and snowberry. Skunk cabbage is common in these areas as well.

Old Field Grass
Old fields are abandoned or un-maintained agricultural fields that support native and non-native grass, forb and shrub growth. In the Lower Coquitlam River Watershed old field grasses are found in Colony Farm. These old-fields support a rich small mammal community that in turn supports a high density of raptors such as northern harrier, red-tailed hawk and short-eared owl. Great blue herons also use old fields extensively to hunt frogs and small mammals.



Old Field Shrub
Shrub-dominated old fields are a mix of grassy areas and shrub species such as red-osier dogwood, snowberry and others. Similar species that are common in old field grass can be found here, in addition to a variety of songbird populations, which utilize the patchy shrub areas and thickets for nesting.

Forest Cover
The forested areas found within the watershed are composed of mixed conifer and broad-leaved trees in lower areas of the watershed, and older coniferous forest in the northern, unpopulated areas.

Wildlife in the Watershed

The wide diversity of vegetation types in the Lower Coquitlam River Watershed provides important habitat for a number of wildlife species including large and small mammals (e.g., black bears, deer, cougars, coyotes, racoons, squirrels, moles, mice, etc.), birds (passerines, raptors, shorebirds, etc.), amphibians (salamanders, frogs) and reptiles (e.g turtles and garter snakes). Many species of insects are also found throughout the watershed. The length of the Coquitlam River and utility corridors (e.g., electrical power transmission lines) serve as corridors for wildlife to travel throughout the watershed and connect several open spaces such as Colony Farm Regional Park, Gates Park, Ridge Park, Riverview Lands, Lions Park, and Upper Coquitlam River Park. Wildlife viewing is an important recreational activity and Colony Farm Regional Park is designated as a Wildlife Viewing Site by the provincial government. The Coquitlam River mouth has been designated a Wildlife Management Area, primarily for the protection of a large Great Blue Heron nesting site.

The BC Conservation Data Centre (CDC) tracks rare occurrences of animal and plant species and ecosystems. The Pacific water shrew and three plant species, (small-flowered bitter-cress, stream-bank lupine and northern water-meal) have been identified by the CDC as red-listed species that are located within the watershed. The CDC has also identified several other species of conservation concern located within the Coquitlam River Watershed (see tables below).

Species of Conservation Concern in the Lower Coquitlam River Watershed

Red-Listed Species

Birds	Location	Rank
Aechmophorus occidentalis Western grebe	Colony Farm Uncommon in fall and winter only	G5 S1B S3N
Phalucrocorax auritus Double-crested cormorant	Colony Farm Casually observed in spring, uncommon in fall and winter	G5 S2B SZN
Grus Canadensis Sandhill crane popn 1:Georgia Depression	Colony Farm	G5T1Q S1
Falco pergrinus anatum Peregrine falcon anatum ssp.	Colony Farm Rare in summer and fall	G4T3 S2B SZN
Mammals		
Sorex bendirii Pacific water shrew	Along tributary of Hoy Creek - 500 m north of Guilford Avenue	G4 S1S2
Vascular Plants		
Cardamine parviflora var arenicola Small-flowered bitter-cress	Mary Hill	G5T5 S1
Lupinus rivularis Streambank lupine	Coquitlam River at Lougheed Highway	G4G5 S1
Wolffia borealis Northern water-meal	Colony Farm	G5 S2
Plant Associations		
Picea sitchensis/Rubus spectabilis Sitka spruce/salmonberry (dry maritime)	Coquitlam River High bench floodplain	S1S2

Blue-Listed Species

Freshwater Fish	Location	Rank
Oncorhynchus clarki clarki Cutthroat trout *clarki* ssp.	Coquitlam River	G4T4 S3S4
Amphibians		
Ascaphus truei Tailed frog, coastal population	Pinnacle Creek and Coquitlam River tributaries north of Town Centre	G4T4 S3S4
Rana aurora Red-legged frog	Colony Farm	G4 S3S4
Dragonflies		
Epitheca canis Beaverpond baskettail	Colony Farm	G5 S3
Sympetrum vicinum Yellow-legged meadowhawk	Mundy Lake	G5 S3S4
Birds		
Botaurus lentiginosus American bittern	Colony Farm	G4 S3B SZN
Ardea herodias fannini Great blue heron, fannini ssp.	Colony Farm	G5T4 S3B S5N
Butorides virescens Green heron	Colony Farm	G5 S2S4B SZN
Cygnus buccinator Trumpeter swan	Colony Farm	G4 S3S4B
Numenius americanus Long-billed curlew	Colony Farm Casually observed in spring	G5 S3B SZN
Larus californicus California gull	Colony Farm Casually observed in winter	G5 S3B SZN
Sterna caspia Caspian tern	Colony Farm Casually observed in spring	G5 S3B SZN
Columba fasciata Band-tailed pigeon	Colony Farm Common in summer	G5 S3S4B SZN
Tyto alba Barn owl	Colony Farm	G5 S3
Asio flammeus Short-eared owl	Colony Farm	G5 S3B S2N
Picoides villosus picoideus Hairy woodpecker *picoideus* ssp.	Colony Farm Uncommon all year	G5T3 S3
Vascular Plants		
Elodea nuttallii Nuttalls waterweed	Colony Farm	G5 S2S3
Glyceria occidentalis Western mannagrass	Coquitlam River, north of Pitt River Road bridge	G5 S2S3
Hypericum majus Large Canadian St. Johns wort	East of Mundy Park, west of Mariner Way, under power lines	G5 S2S3
Lilaea scilloides Flowering quillwort	Coquitlam River	G5? S2S3
Myriophyllum ussuriense Ussurian water-milfoil	Coquitlam river near Port Mann Bridge east side of mouth	G3 S3
Polygonum punctatum Water pepper	Coquitlam River	G5 S2S3
Salix sessilifolia Soft-leaved sandbar willow	Near Riverview lands	G4 S2S3
Plant Associations		
Pinus controta/Sphagnum spp. Lodgepole pine/Sphagnum	East shore of Lost Lake in Mundy Park	S3
Populus balsamifera ssp. *trichocarpa/Cornus stolonifera* Black cottonwood/red-osier dogwood	Coquitlam River Medium bench floodplain	S3
Thuja plicata/Polystichum munitum Western redcedar/sword fern (dry maritime)	Coquitlam River Fresh fluvial terrace	S2S3
Thuja plicata/Tiarella trifoliata Western redcedar/three-leaved foamflower (dry maritime)	Coquitlam River Moist fluvial terrace	S2S3

Yellow-Listed Species

Birds	Occurrence/Abundance @ CF	Rank
Chen caerulescens Snow goose	Colony Farm Casually observed (<3 records) in fall and winter	G5 S2N
Haliaeetus leucocephalus Bald Eagle	Throughout the watershed	G4 S4
Buteo lagopus Rough-legged hawk	Colony Farm Casually observed in spring, uncommon in fall and winter	G5 S2S3N

Other species of concern	Location	Rank
Sundew	East of Mundy Park, west of Mariner Way, under power lines	n/a
The sundew is rare within the Coquitlam River Watershed, but is not on the provincial tracking lists		

Sources:
Conservation Data Centre. January 2002
Coquitlam ESA Study
British Columbia Wildlife Watch. 1996. Bird Checklist: Colony Farm Regional Park, Coquitlam/Port Coquitlam.
Conservation Data Centre tracking lists - http://srmwww.gov.bc.ca/cdc/tracking.htm
Robertson Environmental Services. 2001. BC Hydro Coquitlam/Buntzen water use plan wildlife information review.
Mewhort, S. Personal communication. March 28, 2002.

Province of BC Rankings

Red List: indigenous species or subspecies that have, or are candidates for extirpated, endangered, or threatened status in British Columbia.
Blue List: indigenous species or subspecies that are considered to be vulnerable provincially. Vulnerable species are of special concern because of sensitivity to human activities or natural events. These species are at risk, but are not extirpated endangered, or threatened.
Yellow List: indigenous species that are not at risk in British Columbia. Some yellow listed species are tracked since they may be seasonally vulnerable.

Status of Rare and Endangered Species

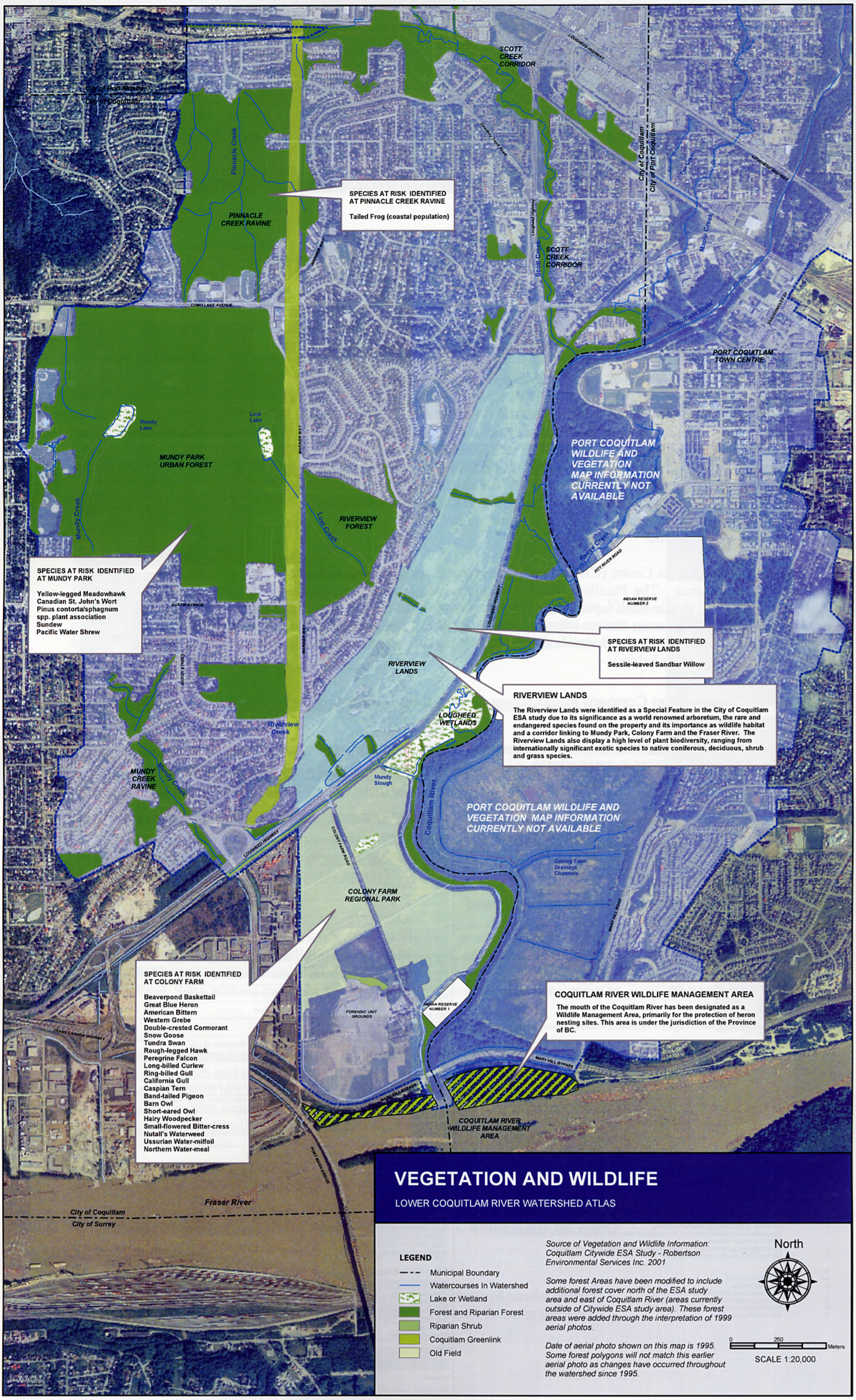
Following standards developed by The Nature Conservancy of Canada and the Association for Biodiversity Information (ABI), the Conservation Data Centre assigns, reviews, revises ranks to rare species in British Columbia. The conservation status of an element or species includes a regional rank (e.g. G, N, S) followed by a number (between 1 and 5).

Regional Rank
G. Global - applies across element or species entire range
N. National - for each nation in element or species range
S. Subnational - solely on element or species status in BC

Number
1. Critically imperilled, either because of known threats or declining trend, or because of extremely restricted breeding or non-breeding range that make the element vulnerable to unpredictable events; a candidate for endangered status
2. Imperilled; a candidate for threatened status
3. Vulnerable; usually more abundant or widespread than elements defined above, but sensitive to Threats; perhaps declining
4. Apparently secure, but may have restricted range or possible long-term concerns
5. Demonstrably secure; usually widespread and abundant

Rank Qualifiers
N/A Currently unranked
Z. Migratory species
T. Rank associated with a subspecies or variety
Q. Taxonomic validity of the element is in question
B. Breeding population
N. Non-breeding population


WILDLIFE CORRIDORS
The Lower Coquitlam River Watershed provides important corridors for wildlife movement. These corridors are particularly significant in urban areas, where much of the original forested habitat has been fragmented. Most wildlife will use the riparian forested edges along watercourses and also hydro powerline rights-of-way to move between larger forest patches and other habitat areas. These linkages help to connect larger habitat areas such as Colony Farm, Mundy Park, and the forested portions of the watershed. The corridors also provide a number of habitat functions themselves: cover from predators; breeding, nesting and rearing sites; and a food source for a variety of wildlife species. Wildlife corridors also promote genetic diversity as populations move and mix between habitat areas.
Creek A
Coho Creek
Slade Creek
Falacea Creek
Creek B
Munro Creek
Crystal Creek
UPPER COQUITLAM RIVER PARK
PINECONE LAKE - BURKE MOUNTAIN PROVINCIAL PARK
Partridge Creek
SCOTT CREEK HEADWATERS/ CROWN PARK
Marquart
Crystal Falls
Pritchett Creek
Creek C
BC HYDRO SUBSTATION
RIDGE PARK
Coquitlam River
Creek D
HOY CREEK CORRIDOR
Hockaday Creek
Kelly
HOCKADAY CREEK
COQUITLAM GREENLINK
DAVID AVENUE
COQUITLAM RIVER CORRIDOR
SPECIES AT RISK IDENTIFIED AT HOY CREEK
Pacific Water Shrew
SCOTT CREEK CORRIDOR
Scott Creek
HOY CREEK CORRIDOR
LAFARGE LAKE (TOWN CENTRE PARK)
City of Coquitlam
City of Port Coquitlam
City of Port Moody
City of Coquitlam
GUILDFORD WAY
Hoy Creek
COQUITLAM RIVER PARK
COQUITLAM CENTRE MALL
PINETREE WAY
BARNET HIGHWAY
LOUGHEED HIGHWAY
SCOTT CREEK CORRIDOR
Pinnacle Creek
SPECIES AT RISK IDENTIFIED AT PINNACLE CREEK RAVINE
Tailed Frog (coastal population)
PINNACLE CREEK RAVINE
Scott Creek
SCOTT CREEK CORRIDOR
COMO LAKE AVENUE
VEGETATION AND WILDLIFE
LOWER COQUITLAM RIVER WATERSHED ATLAS
LEGEND
Municipal Boundary
Watercourses In Watershed
Lake or Wetland
Forest and Riparian Forest
Riparian Shrub
Coquitlam Greenlink
Old Field
Source of Vegetation and Wildlife Information: Coquitlam Citywide ESA Study - Robertson Environmental Services Inc. 2001
Some forest Areas have been modified to include additional forest cover north of the ESA study area and east of Coquitlam River (areas currently outside of Citywide ESA study area). These forest areas were added through the interpretation of 1999 aerial photos.
Date of aerial photo shown on this map is 1995. Some forest polygons will not match this earlier aerial photo as changes have occurred throughout the watershed since 1995.
North
0 250 500 Meters
SCALE 1:25,000



VEGETATION AND WILDLIFE
LOWER COQUITLAM RIVER WATERSHED ATLAS
SCOTT CREEK CORRIDOR
SPECIES AT RISK IDENTIFIED AT PINNACLE CREEK RAVINE
Tailed Frog (coastal population)
Pinnacle Creek
PINNACLE CREEK RAVINE
SCOTT CREEK CORRIDOR
Scott Creek
City of Coquitlam
City of Port Coquitlam
Maple Creek
Coquitlam River
COMO LAKE AVENUE
PORT COQUITLAM TOWN CENTRE
Mundy Lake
Lost Lake
MUNDY PARK URBAN FOREST
PORT COQUITLAM WILDLIFE AND VEGETATION MAP INFORMATION CURRENTLY NOT AVAILABLE
RIVERVIEW FOREST
Lost Creek
Mundy Creek
SPECIES AT RISK IDENTIFIED AT MUNDY PARK
Yellow-legged Meadowhawk
Canadian St. John's Wort
Pinus contorta/sphagnum spp. plant association
Sundew
Pacific Water Shrew
AUSTIN AVENUE
INDIAN RESERVE NUMBER 2
SPECIES AT RISK IDENTIFIED AT RIVERVIEW LANDS
Sessile-leaved Sandbar Willow
RIVERVIEW LANDS
RIVERVIEW LANDS
The Riverview Lands were identified as a Special Feature in the City of Coquitlam ESA study due to its significance as a world renowned arboretum, the rare and endangered species found on the property and its importance as wildlife habitat and a corridor linking to Mundy Park, Colony Farm and the Fraser River. The Riverview Lands also display a high level of plant biodiversity, ranging from internationally significant exotic species to native coniferous, deciduous, shrub and grass species.
LOUGHEED WETLANDS
Riverview Creek
MUNDY CREEK RAVINE
Mundy Slough
Coquitlam River
PORT COQUITLAM WILDLIFE AND VEGETATION MAP INFORMATION CURRENTLY NOT AVAILABLE
LOUGHEED HIGHWAY
COLONY FARM ROAD
Colony Farm Drainage Channels
COLONY FARM REGIONAL PARK
SPECIES AT RISK IDENTIFIED AT COLONY FARM
Beaverpond Baskettail
Great Blue Heron
American Bittern
Western Grebe
Double-crested Cormorant
Snow Goose
Tundra Swan
Rough-legged Hawk
Peregrine Falcon
Long-billed Curlew
Ring-billed Gull
California Gull
Caspian Tern
Band-tailed Pigeon
Barn Owl
Short-eared Owl
Hairy Woodpecker
Small-flowered Bitter-cress
Nutall's Waterweed
Ussurian Water-milfoil
Northern Water-meal
TRANS CANADA HIGHWAY
FORENSIC UNIT GROUNDS
INDIAN RESERVE NUMBER 1
COQUITLAM RIVER WILDLIFE MANAGEMENT AREA
The mouth of the Coquitlam River has been designated as a Wildlife Management Area, primarily for the protection of heron nesting sites. This area is under the jurisdiction of the Province of BC.
MARY HILL BYPASS
COQUITLAM RIVER WILDLIFE MANAGEMENT AREA
Fraser River
City of Coquitlam
City of Surrey
LEGEND
Municipal Boundary
Watercourses In Watershed
Lake or Wetland
Forest and Riparian Forest
Riparian Shrub
Coquitlam Greenlink
Old Field
Source of Vegetation and Wildlife Information: Coquitlam Citywide ESA Study - Robertson Environmental Services Inc. 2001
Some forest Areas have been modified to include additional forest cover north of the ESA study area and east of Coquitlam River (areas currently outside of Citywide ESA study area). These forest areas were added through the interpretation of 1999 aerial photos.
Date of aerial photo shown on this map is 1995. Some forest polygons will not match this earlier aerial photo as changes have occurred throughout the watershed since 1995.
North
0
250
Meters
SCALE 1:20,000

Environmentally Sensitive Areas

Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are ecological or environmental features such as watercourses, riparian areas, old field habitat, forested areas, lakes and wetlands, wildlife corridors and areas that support rare, endangered or threatened plants and animals. These areas provide a number of ecological functions or processes (e.g. wildlife habitat, migration corridors, spawning, nesting and denning areas, and resting and feeding areas).

ESAs within the Coquitlam River Watershed have been mapped by the Cities of Coquitlam and Port Coquitlam in three separate studies (See Catherine Berris Associates, Northeast Coquitlam Environmental Assessment, 1995; Robertson Environmental Services Ltd. et. al., City of Coquitlam Environmentally Sensitive Area Inventory and Management Guidelines, 2001; Gartner Lee Limited, Environmental Assessment of Port Coquitlam, 1992). These areas are identified on the map on the following page. Readers should be aware that the methods in assessing and mapping ESAs were different for each of the three studies and readers are encouraged to consult the individual studies for more details.

Examples of ESA's within the Lower Coquitlam River Watershed

Riparian Areas

Riparian areas are vegetated areas next to watercourses that support plant communities adapted to high soil moisture and more frequent disturbance. Riparian areas are recognized for their high biodiversity and structural complexity (i.e. Snags and downed logs). As well, riparian areas function as corridors for some species such as small mammals and amphibians, particularily in urban areas.

COQUITLAM RIVER

HOY CREEK

Lakes and Wetlands

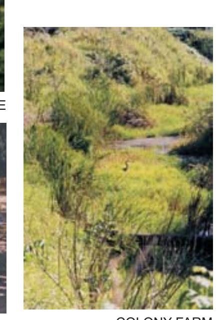
Lakes and wetlands are aquatic or transitionary aquatic-terrestrial ecosystems that were grouped together because they have similar ecological characteristics and sensitivities. Typically, lakes are surrounded by a band of wetland.

Wetlands are characterised by water-loving or water-tolerant plant species and soils that show indications of permanent or seasonal flooding. Wetlands may have surface water present on a daily (tidal marshes), seasonal (swamps flooded in winter) or permanent basis (shallow lakes). Common wetland classes in the watershed include marsh, swamp and shallow open water.

Lakes are separated from open water wetlands by the presence of surface water greater than two metres deep during the growing season of plants. This generally prevents emergent vegetation such as rushes and pondweeds from establishing.

MUNDY LAKE

LOST LAKE



COLONY FARM

Forested Areas

Forests are terrestrial communities consisting of a tree overstorey, a shrub/herb understorey, snags (standing dead trees) and coarse woody debris (woody material laying on the forest floor). Forests can be characterized based on age and/or the type leading tree species. Coniferous forests are those in which the tree component is dominated by conifers (e.g. Douglas-fir, western red-cedar). Deciduous forests are those in which the tree component is dominated by decidous trees (e.g. maple, alder). Mixed forests are forests in which the tree canopy is composed of an equal mix of coniferous and deciduous species. Most forests in the watershed are mixed.

MUNDY PARK

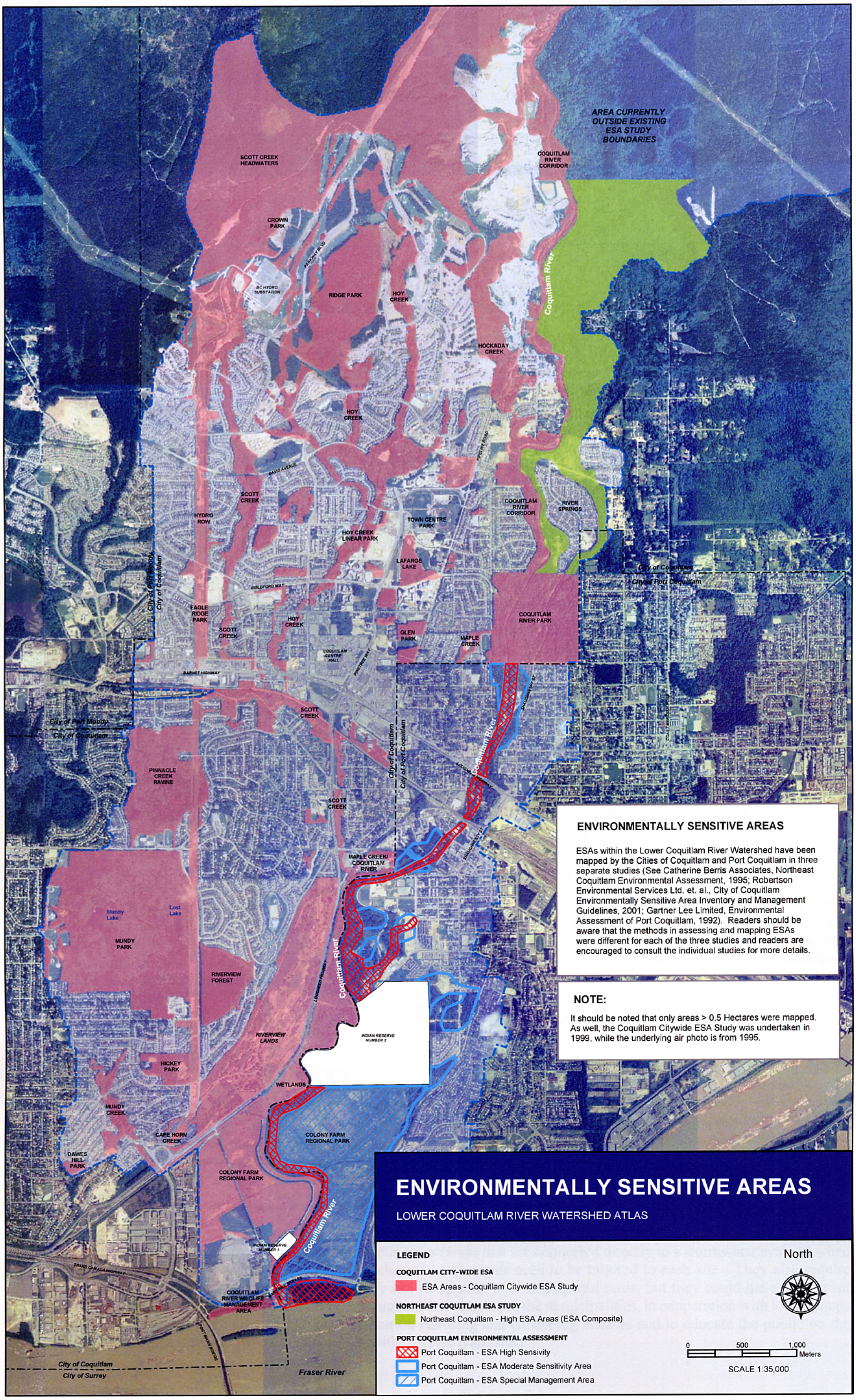
BURKE MOUNTAIN

Old Field Habitat

Old field is a man-made ecosystem element and develops where agricultural land is abandoned. Old fields are of critical importance to wildlife species, particularly for raptors that feed on their rich small mammal communities. Old fields require some maintenance such as mowing or brush cutting to prevent establishment of dense trees and shrubs.

Old fields are variable in composition. Wet old fields found in the watershed are typically dominated by reed canary grass interspersed with lower growing areas of colonial bentgrass, common rush, couchgrass, velvet grass, and spike bentgrass. Forbs, including Douglas' aster, Canada goldenrod, yarrow, common plantain, western dock, slender rush, white clover, and red clover are common. Isolated thickets, copses or hedgerows of black cottonwood, English hawthorn, Himalayan blackberry, red-osier dogwood, hardhack and American bittersweet are present in some areas. Older old fields have dense shrub growth including red-osier dogwood, English hawthorn and red alder.

COLONY FARM REGIONAL PARK


ENVIRONMENTALLY SENSITIVE AREAS
LOWER COQUITLAM RIVER WATERSHED ATLAS
ENVIRONMENTALLY SENSITIVE AREAS
ESAs within the Lower Coquitlam River Watershed have been mapped by the Cities of Coquitlam and Port Coquitlam in three separate studies (See Catherine Berris Associates, Northeast Coquitlam Environmental Assessment, 1995; Robertson Environmental Services Ltd. et. al., City of Coquitlam Environmentally Sensitive Area Inventory and Management Guidelines, 2001; Gartner Lee Limited, Environmental Assessment of Port Coquitlam, 1992). Readers should be aware that the methods in assessing and mapping ESAs were different for each of the three studies and readers are encouraged to consult the individual studies for more details.
NOTE:
It should be noted that only areas > 0.5 Hectares were mapped. As well, the Coquitlam Citywide ESA Study was undertaken in 1999, while the underlying air photo is from 1995.
LEGEND
COQUITLAM CITY-WIDE ESA
ESA Areas - Coquitlam Citywide ESA Study
NORTHEAST COQUITLAM ESA STUDY
Northeast Coquitlam - High ESA Areas (ESA Composite)
PORT COQUITLAM ENVIRONMENTAL ASSESSMENT
Port Coquitlam - ESA High Sensivity
Port Coquitlam - ESA Moderate Sensitivity Area
Port Coquitlam - ESA Special Management Area
North
0 500 1,000 Meters
SCALE 1:35,000
AREA CURRENTLY OUTSIDE EXISTING ESA STUDY BOUNDARIES
SCOTT CREEK HEADWATERS
COQUITLAM RIVER CORRIDOR
CROWN PARK
BC HYDRO SUBSTATION
RIDGE PARK
HOY CREEK
Coquitlam River
HOCKADAY CREEK
HOY CREEK
SCOTT CREEK
HYDRO ROW
COQUITLAM RIVER CORRIDOR
RIVER SPRINGS
TOWN CENTRE PARK
HOY CREEK LINEAR PARK
LAFARGE LAKE
City of Port Moody
City of Coquitlam
City of Coquitlam
City of Port Coquitlam
EAGLE RIDGE PARK
HOY CREEK
SCOTT CREEK
GLEN PARK
MAPLE CREEK
COQUITLAM RIVER PARK
COQUITLAM CENTRE MALL
City of Port Moody
City of Coquitlam
SCOTT CREEK
City of Coquitlam
City of Port Coquitlam
Coquitlam River
PINNACLE CREEK RAVINE
SCOTT CREEK
MAPLE CREEK/ COQUITLAM RIVER
Mundy Lake
Lost Lake
MUNDY PARK
RIVERVIEW FOREST
Coquitlam River
INDIAN RESERVE NUMBER 2
RIVERVIEW LANDS
HICKEY PARK
WETLANDS
MUNDY CREEK
COLONY FARM REGIONAL PARK
CAPE HORN CREEK
DAWES HILL PARK
COLONY FARM REGIONAL PARK
Coquitlam River
INDIAN RESERVE NUMBER 1
COQUITLAM RIVER WILDLIFE MANAGEMENT AREA
City of Coquitlam
City of Surrey
Fraser River

Impervious Cover

Impervious Cover

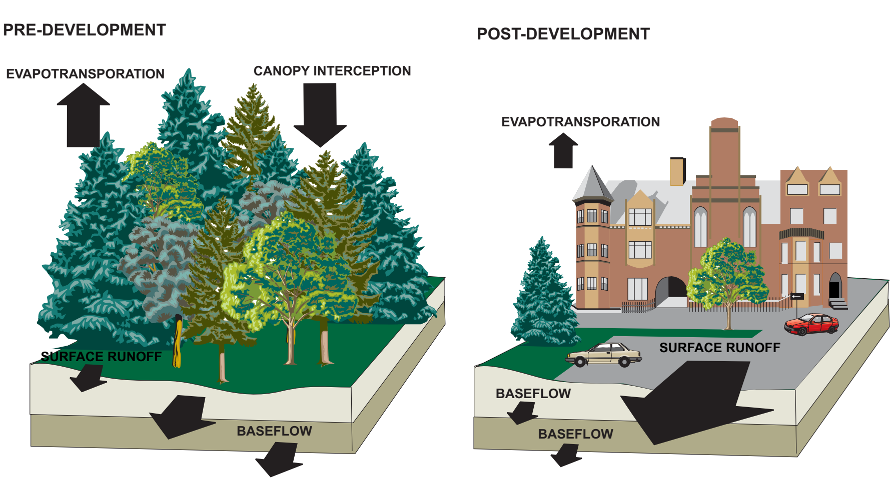
In a forested watershed there is often a relatively small amount of surface runoff. With urban development, hard surfaces (often referred to as impervious cover) such as roads, sidewalks, driveways, parking lots and buildings are added to the landscape, which tend to cause surface runoff to increase when water cannot penetrate through these surfaces into the ground. Usually, in urban areas the excess surface water is conveyed to storm drains, which are piped to creeks or rivers. This can have a significant effect on the hydrology of the area. Impervious cover has a direct effect on urban streams by increasing surface runoff during heavy rainfall events. As the amount of impervious cover increases, there is less infiltration and more surface runoff. For example, in a forested area, about 50% of the rainfall would infiltrate into the soil, 40% would be evapo-transpired into the atmosphere and 10% would be surface runoff. When the impervious cover in a watershed reaches a level of 75-100% about 15% would infiltrate into the soil, 30% would be evapo-transpired and 55% would be runoff. The runoff also occurs more frequently and at higher amounts. Less water is available to streams and waterbodies during dry periods and there is more flow during storms.

The diagram to the right shows how development and it's corresponding increase in impervious cover disrupts the natural water balance. In the post-development setting, the amount of water running off the site is dramatically increased.

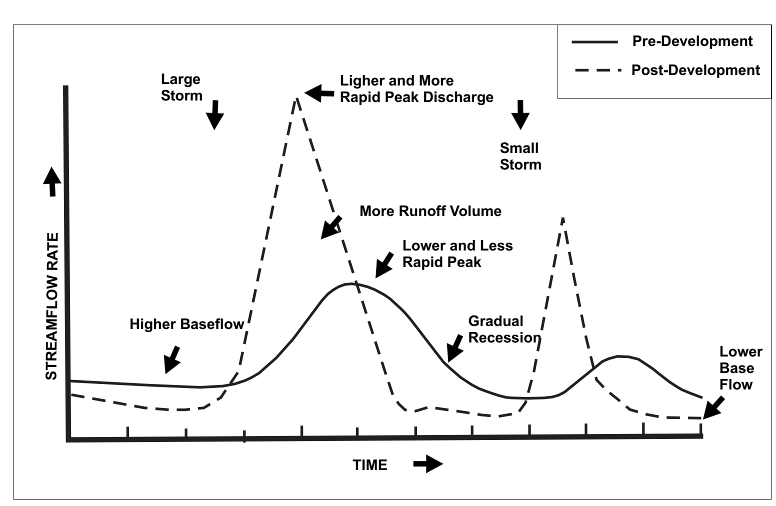
As imperviousness increases there is often a noticeable effect on the watercourses and aquatic life. With increased storm events, erosion of streambanks can occur resulting in loss of riparian vegetation and more sediment and in extreme cases, there may be flooding of property adjacent to the stream. In these instances, there may be a need for human interventions such as bank protection, dyking, and sometimes channeling or deepening of streams to handle increased flows. In dry weather, there may be less water filtering to the stream. Groundwater is unable to recharge because the water that would have penetrated into the soils has been carried away over impervious surfaces or into storm drains. For this reason, many urbanized watersheds have lower base flows compared to streams in forested areas.

The graph to the right illustrates the effects of urbanization on hydrograph peak discharge. In pre-developed conditions, flow gradually increases to a relatively flat peak and gradually descends to a low flow condition. In the urbanized condition, flow rapidly increases to a peak and just as sharply descends, often to a lower flow condition than pre-development.

Water Balance



Urbanization and Peak Discharge



Source: Approaches to the Impacts of Urbanization, Center for Watershed Protection, Inc.1999

Impervious Cover in the Lower Coquitlam River Watershed

Alterations to natural watershed drainage patterns can also affect aquatic life. There is often a decrease in the number and diversity of insects and fish species that are sensitive to habitat and water quality changes. Many recent studies have shown a direct relationship between stream quality and health, and urbanization and imperviousness (Center for Watershed Protection, 1999). Closely related to this is the condition of the riparian forest that is adjacent to streams. A wider riparian forest helps to lessen the impacts of urbanization by intercepting some of the surface flow, helping to filter out pollutants, stabilizing the streambanks and providing a source of large woody debris.

At about 10% impervious cover, small streams begin to experience the impacts of urbanization and usually by about 25% impervious cover, small streams are experiencing a host of impacts as discussed above (Center for Watershed Protection, 1999). As part of its Liquid Waste Management Plan for the Greater Vancouver Region, the Greater Vancouver Regional District (GVRD) has estimated the impervious cover for watersheds throughout the region (GVSDD, Assessment of Current and Future GVS&DD Area Watershed and Catchment Conditions, 1999). Using this approach, impervious cover in the Coquitlam River Watershed varies considerably. The Lower Coquitlam River Watershed as a whole had a total impervious area of 32% in 1996. The Scott-Hoy Creek Watershed had a total impervious area of 33% in 1996 and this is forecasted to increase to 54% by 2036 (GVS&DD, 1999).

Along most of the Coquitlam River some riparian vegetation has been retained alongside its edges. The Cities of Coquitlam and Port Coquitlam have obtained portions of the riparian area as public space (parkland) alongside the Coquitlam River and its tributaries. Setback provisions required by both the municipalities and the federal and provincial governments for new or re-development adjacent to streams also help to protect the riparian areas.

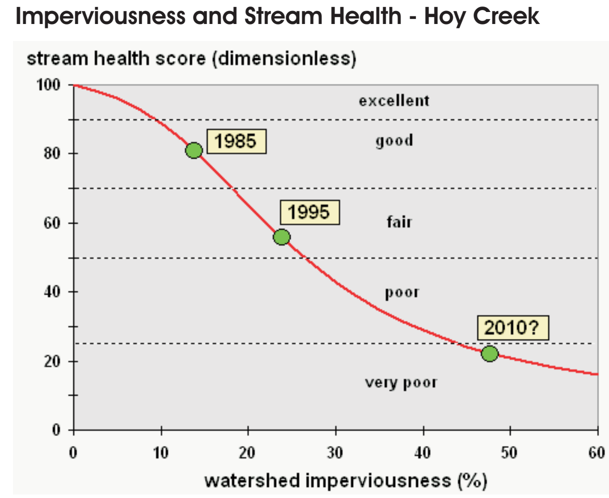
In addition to setbacks, local governments are adopting a range of tools and best management practices to assist with minimizing the impacts of urban development on streams and watersheds. These can include bylaws (regulations) which require that post-development runoff rates must be the same as pre-development rates, tree cutting restrictions, neighbourhood designs to reduce the number of roads and stream crossings, creation of stormwater retention or detention ponds, biofiltration wetlands, green roofs on buildings to allow for water storage and oil-water separators and filter systems in parking lot storm drains. During construction, the municipalities require that property owners and developers take appropriate steps to avoid erosion and runoff of sediment into local streams.

Some recent work has been underway by municipalities in the Lower Mainland to develop and implement new approaches and techniques to help reduce effective impervious areas (areas that are connected directly to a stormwater system) when planning for new development. These approaches and techniques need to be tailored to each site. They also require ongoing monitoring and assessment before they can be applied on a widespread basis, but they could have significant potential for impervious surface reduction. Throughout the watershed, the municipalities, in cooperation with local groups and federal and provincial agencies, are working on restoring and enhancing streams and to educate the public on the importance of maintaining a healthy Lower Coquitlam River Watershed.

A Study of the Hoy Creek Watershed

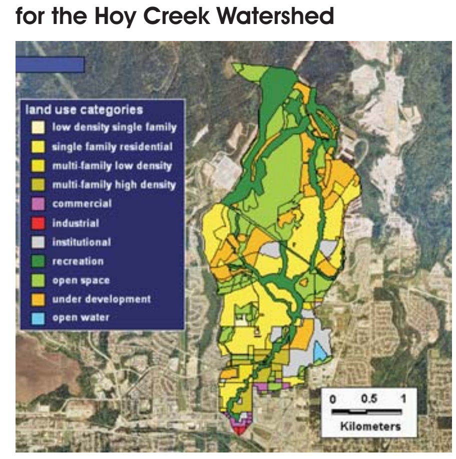
Researchers at the University of British Columbia have compared the levels of imperviousness in Hoy Creek over time. Because detailed information is more difficult to obtain for a large watershed, sub-watersheds can provide an example of how changes in imperviousness can affect a watershed over time.

Imperviousness and Stream Health - Hoy Creek



Source: Institute for Resources and Environment, University of British Columbia

Land Use as an Impervious Cover Indicator for the Hoy Creek Watershed



Researchers at UBC used existing land use mapping of Coquitlam to determine impervious cover, by assigning impervious values to different land use types. Impervious cover values are consistent with other values used throughout the Georgia Basin and the results indicate that Hoy Creek is typical of an urban watershed.

Land Use and Urban Development Patterns

Regional Land Use and Development Patterns

Land use and urban development patterns have evolved over time, responding to the needs of residents, businesses and others in the community. Human settlement is an important component of the watershed, which must be considered in future stewardship, planning, and management activities, from the local, regional and broader perspectives.

The Provincial Government has a major influence over settlement patterns, even at the local level, exerted through legislation relating to land use, such as the Local Government Act, the Land Title Act, the Strata Properties Act, the Agricultural Land Reserve Act, and others (see also the Governance section). The Province's involvement also extends to investment decisions and the use of Crown lands within local jurisdictions.

The GVRD's Livable Region Strategic Plan (LRSP) also affects human settlement within the watershed. The LRSP contains four broad goals for maintaining and enhancing quality of life within Greater Vancouver, all of which have important implications for the Lower Coquitlam River Watershed. These four goals provide for:

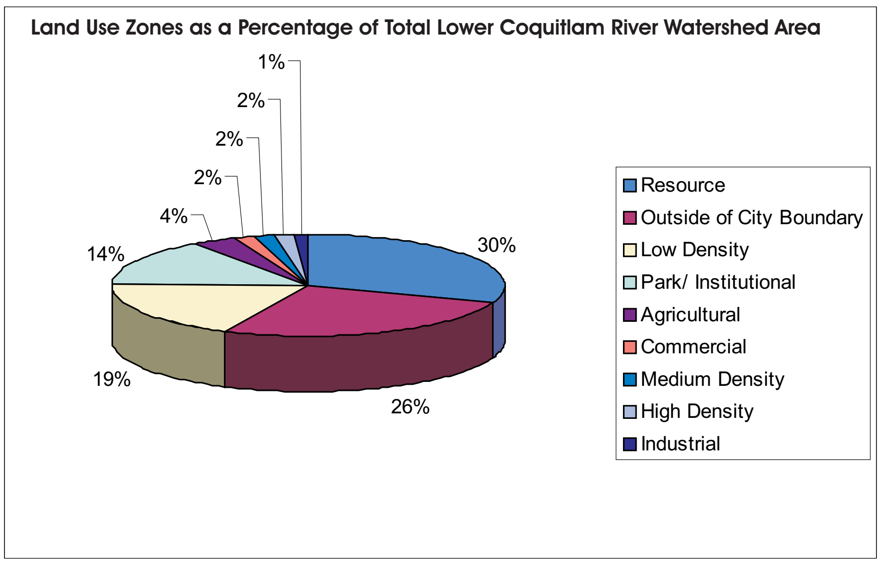
- A compact metropolitan region, which discourages urban sprawl;
- Complete communities throughout the region;
- Transportation choice; and
- Preservation of a green zone.

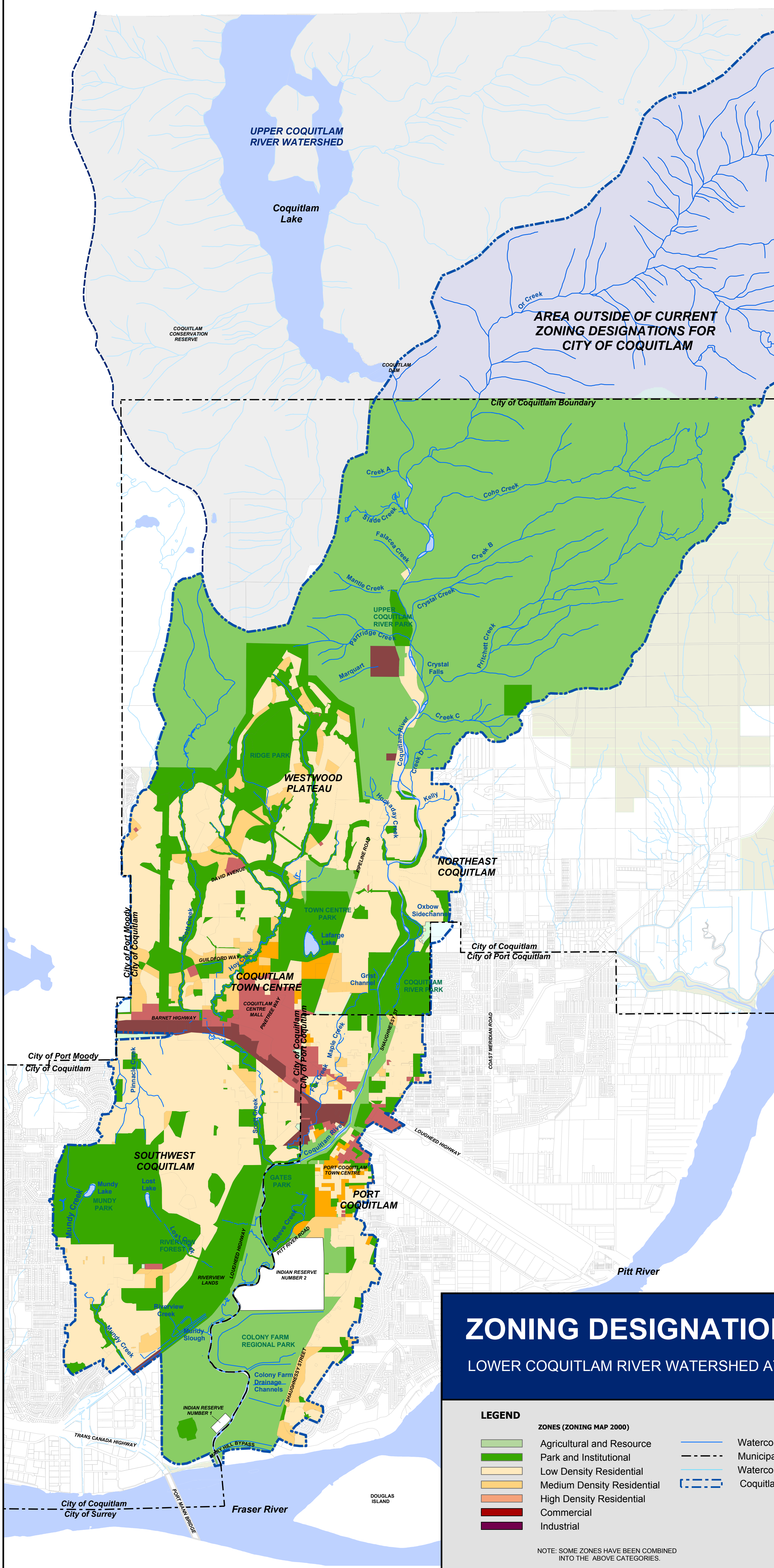
Coquitlam and Port Coquitlam have accepted these goals within local Official Community Plan policy, in both citywide and more detailed area or neighbourhood plans. As part of the Growth Concentration Area, both cities play important roles in striving to achieve a compact metropolitan region. Human settlement within the Lower Coquitlam River Watershed will continue to occur within the context of a regional growth management strategy, based on the current approved land use designations represented through the Official Community Plans of both Coquitlam and Port Coquitlam, as well as currently permitted zoning.

Current Zoning

All the land in the Cities of Coquitlam and Port Coquitlam is categorized into zones, which stipulate the type of land uses that can take place. The zoning map and pie chart illustrate the current land use zones (2002) in the Lower Coquitlam River Watershed. As noted in the chart below, 26% of the Lower Coquitlam River Watershed area (2,080 ha of 7,900 ha) lies outside the cities' boundaries. 30% of the watershed area is currently zoned for Resource extraction, such as sand and gravel. 19% is zoned for low density residential use. 14% is zoned for park and institutional uses such as the Riverview lands. The agricultural zone, at 4% is concentrated at Colony Farm. Higher density residential and commercial at 4% and 3% respectively, are largely concentrated in the Coquitlam Town Centre area. The industrial zone is located near the railway line and only accounts for 1% of the Lower Coquitlam River Watershed area.

The Current Zoning Map may differ, in some areas, from the Official Community Plans (OCP) of Coquitlam and Port Coquitlam. An OCP is a document prepared by a municipality and reflects the desired development pattern of that municipality based on community input and regional-level plans such as the Livable Region Strategic Plan. The OCP designates land use according to community input and regional objectives, which results in some areas that do not match their current zoning designation. The OCP is updated on a regular basis, whereas the zoning on a piece of property remains in place until a rezoning occurs. Whenever a property owner is contemplating development of their land, they will need to know the current zoning and the designated use in the OCP.

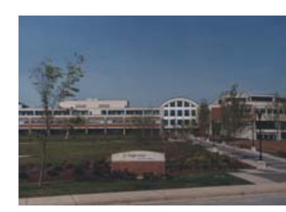




Agriculture and Resource Extraction

Low-Medium-High Residential

Park and Institutional



Commercial

Industrial

ZONING DESIGNATIONS

LOWER COQUITLAM RIVER WATERSHED ATLAS

LEGEND

ZONES (ZONING MAP 2000)

- Agricultural and Resource
- Park and Institutional
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial

- Watercourses In Watershed
- Municipal Boundary
- Watercourses Not Within Watershed
- Coquitlam River Watershed Boundary

NOTE: SOME ZONES HAVE BEEN COMBINED INTO THE ABOVE CATEGORIES.

North

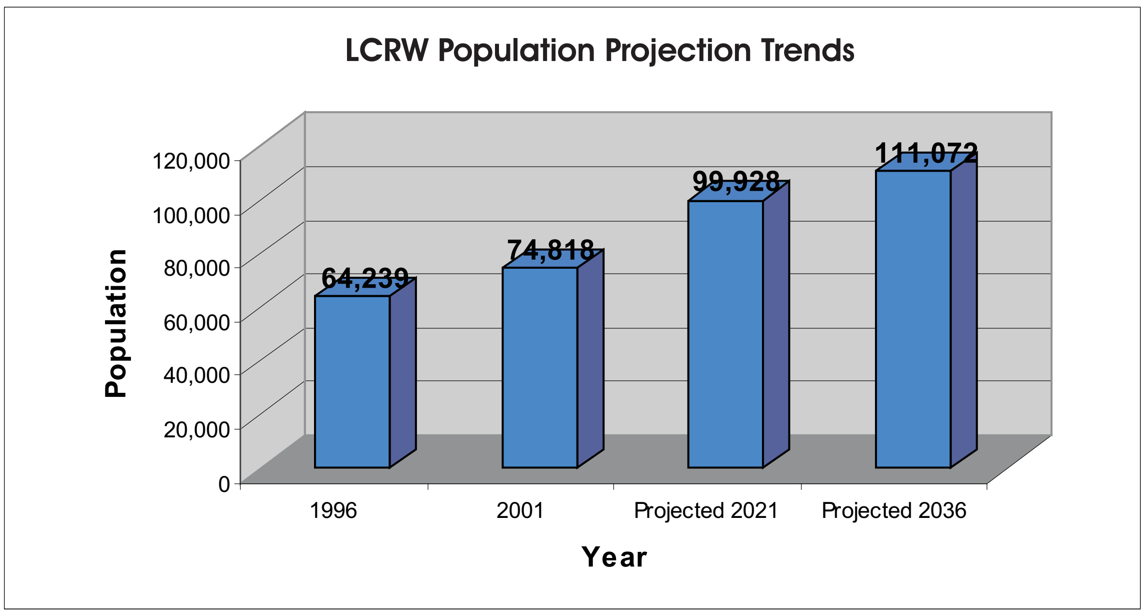
0 500 1,000 Meters

SCALE 1:60,000

Population, Demographics and Language

Population

The Lower Coquitlam River Watershed is a fast growing and culturally diverse area as the following graphs depict. In 1996 there were approximately 63,000 people living within the watershed. By 2001, about 74,800 resided in the watershed, a 13% increase. Between 1996 and 2001, the Lower Coquitlam River Watershed population grew at a rate of 3%. Over the next 20 years to 2021, the Lower Coquitlam River Watershed population is estimated to grow at a 1% rate to 99,928 people. By 2036, the Lower Coquitlam River Watershed population is estimated to increase to 111,072 people at a growth rate of less than 1%.



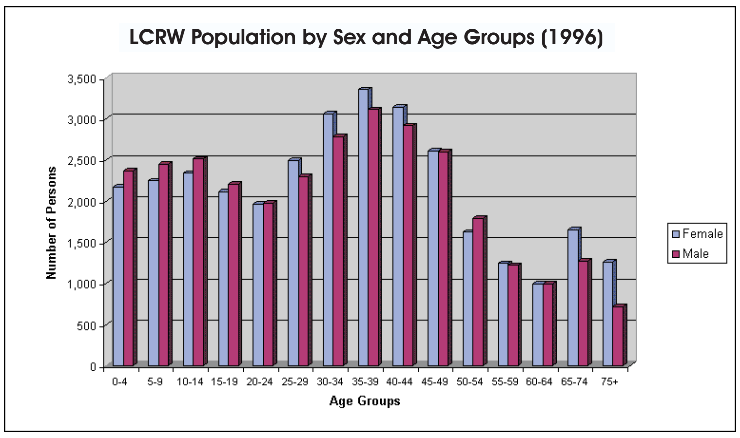
1996 and 2001 population statistics source: Census (Copyright material reproduced with the permission of Statistics Canada)

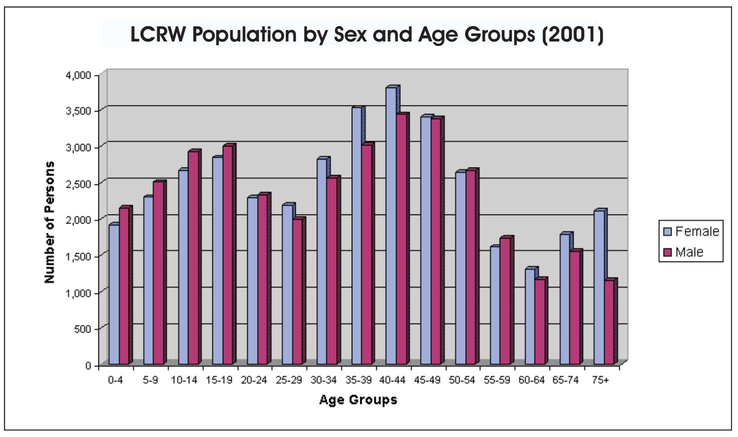
Projected 2021 and 2036 population statistics source: Greater Vancouver Regional District (2002)

Demographics

In 1996 it was estimated that the Lower Coquitlam River Watershed had approximately 32,000 females and 31,000 males. The 1996 graph breaks these down into age categories. The 35-39 age group had the greatest proportion of females (3,354) and males (3,113) compared to other age categories. Following close behind was the 40-44 age group with 3,137 females and 2,916 males. The 30-34 age group had the third highest number of females and males at 3,059 and 2,781 respectively. The 60-64 age category had the least number of females (990) and the 75+ category had the least number of males (715).

By 2001 the Lower Coquitlam River Watershed had approximately 37,000 females and 35,500 males. Overall, the 2001 census shows that the population is aging compared to 1996. The 2001 graph shows that the 40-44 age group had the greatest proportion of females (3,809) and males (3,437). The next category with highest number of females is the 35-39 age group with a population of 3,527. For males, the second highest category is the 45-49 age group with a population of 3,382. The age categories with the lowest population for females is 60-64 (1,308) and for males it is the 75+ group with (1,149).





Language

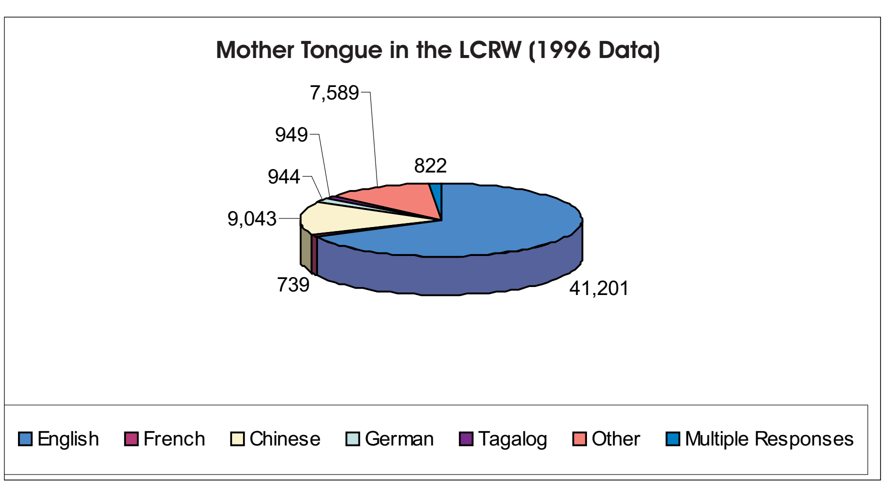
The Lower Coquitlam River Watershed is predominantly made up of people with an English speaking background. 1996 data shows that 41,201 people in the watershed reported English as their first language. Chinese is the second most predominant first language reported by 9,043 Lower Coquitlam River Watershed residents. There were only 739 people in the Lower Coquitlam River Watershed who reported French as their first language.

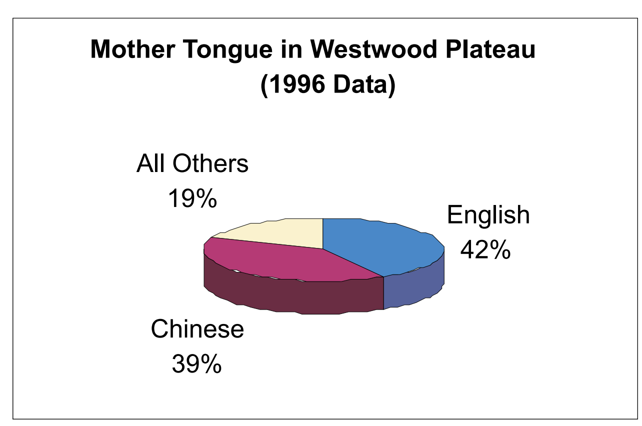
Mother tongue refers to the first language learned at home in childhood and still understood by the individual at the time of the census (Statistics Canada 1996).

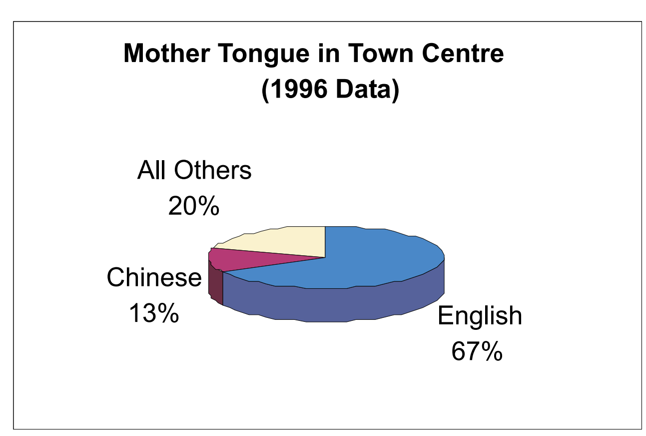
Chinese is consistently the second most predominant mother tongue in each community area in the Lower Coquitlam River Watershed behind English. However, the predominance varies significantly between areas. In Westwood Plateau, the number of people reporting a Chinese mother tongue is close behind English at approximately 39% and 42% respectively. In Town Centre, people reporting a Chinese mother tongue drops to approximately 13%, behind English at 67%. Chinese as mother tongue is a less significant secondary predominent language in Southwest Coquitlam, Northeast Coquitlam, and Port Coquitlam at approximately 11%, 4%, and 5% respectively, behind English at approximately 71%, 79%, and 80% respectively.

Home language refers to the language spoken most often at home by the individual at the time of the census (Statistics Canada 1996). English is the language spoken at home by most Lower Coquitlam River Watershed residents (approximately 47,933). 7,509 Lower Coquitlam River Watershed residents reported that Chinese is the language spoken most often at home, making it the second highest home language. French is spoken most often at home by approximately 223 Lower Coquitlam River Watershed residents. French and English are Canada's two official languages.

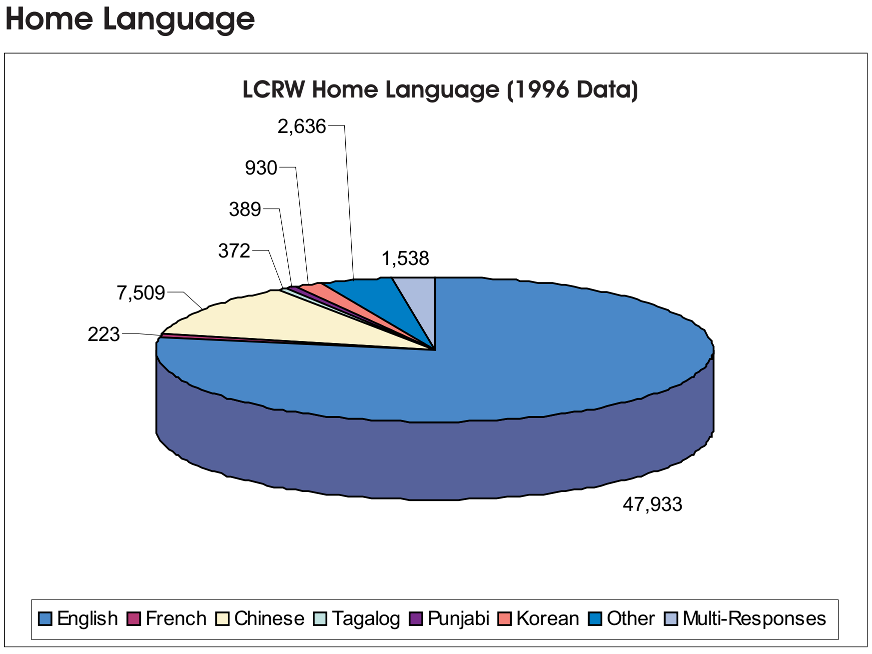
Mother Tongue







Home Language



Historical Overview

Settlement Origins

First Nations people were the only human inhabitants in the Lower Coquitlam River Watershed and areas beyond until post-contact times when European settlers came to live here as well. The first European to pass through the Lower Coquitlam River Watershed was Simon Fraser. In 1808, Fraser and his group traveled down the Fraser River past the mouth of the Coquitlam River (Monk and Stewart, 1967). Post-contact settlement in Coquitlam and Port Coquitlam began in the mid-1800's. The City of Coquitlam was incorporated in 1891 as the District Municipality of Coquitlam. The name "Coquitlam" is believed to have come from the First Nations word "Kwayquitlam" which, it is believed, was derived from "Kokanee" or "Kickininee", meaning a little red fish (Monk and Stewart, 1967). Kokanee are similar to sockeye but are smaller land-locked salmon that inhabit lakes throughout British Columbia. Historical reports of the spawning period for these salmon describe the Coquitlam River as a "seething mass of red fish" (Chambers, 1973).

Until 1913, Coquitlam's boundaries included what is now known as Port Coquitlam and what used to be known as the Municipality of Fraser Mills. Port Coquitlam seceded in 1913 and Fraser Mills seceded 18 days later. Coquitlam grew out of the Fraser Mills town, which supported a growing population from its sawmill operation. The mill operation first started in 1890 and by 1910 was employing 850 men. The population was made up of predominantly French Canadians, but there were also Europeans, Japanese, Chinese, and East Indians (Monk and Stewart, 1967). Logging, sawmilling, gravel mining and farming were the predominant land use activities in the Lower Coquitlam River Watershed until urbanization began in the 1960's. The area was sparsely settled as can be seen in the historical photographs on the adjacent page.

Riverview Hospital

1,000 acres of Colony Farm land was purchased by the provincial government to create a facility for mental health care. It was opened in 1913. Patients helped construct many of the buildings. It was originally called "The Provincial Hospital at Essondale". The hospital was named for Dr. Henry Esson Young, a provincial education and health minister, who was responsible for its construction. Dr. Young was the inspiration behind the botanical garden on the site, which was intended for the enjoyment of patients. Two acres of the hospital site was set aside for Canada's first authentic botanical garden. John Davidson, or "Botany John" as he became known as, was responsible for identifying and collecting native flora for the site. He managed to plant over 600 species of native flora in the garden. Most of the work at the botanical garden was carried out by hospital patients (under staff guidance). The lower portion of Colony Farm was used for growing food for patients. Many patients helped work on the farm. The hospital name was changed to Riverview Psychiatric Hospital in 1966 and the patients continued to remain involved in the maintenance of the site until 1985 (Adolph and Guild-Gillespie, 1994; District of Coquitlam, 1990)

RIVERVIEW LANDS

Colony Farm

The farm was bought in 1910 and provided food for Woodlands and Essondale hospitals. The farm had dairy and beef cows and pigs. They grew vegetables for animal feed and also for the hospitals (District of Coquitlam, 1990). In 1996 Colony Farm was turned over to the GVRD for park use with the exception of the Forensic Psychiatric Institute which occupies the southwest portion of the farm. Today, the Colony Farm Park Association works in partnership with the GVRD to manage the park. Together this partnership has set up a community garden, improved the trail system to provide greater access to people who use mobility aids, and organized community events. The partners also successfully fundraised to build a pedestrian bridge over the Coquitlam River (Colony Farm Park Association, 2000).

COLONY FARM

COLONY FARM

Coquitlam Lake Reservoir

In 1887, the Coquitlam Water Works Company secured water rights for Coquitlam Lake to provide drinking water to New Westminster and surrounding area. New Westminster bought the company in 1889 to supply water to people living in New Westminster Junction, which was the name given to Coquitlam, Port Coquitlam, and parts of Maple Ridge (Monk and Stewart, 1967; Caron, et. al., 1988). Today, the Coquitlam Lake Reservoir continues to be one of three sources for drinking water in the Greater Vancouver Regional District (the others include the Capilano and Seymour Watersheds).

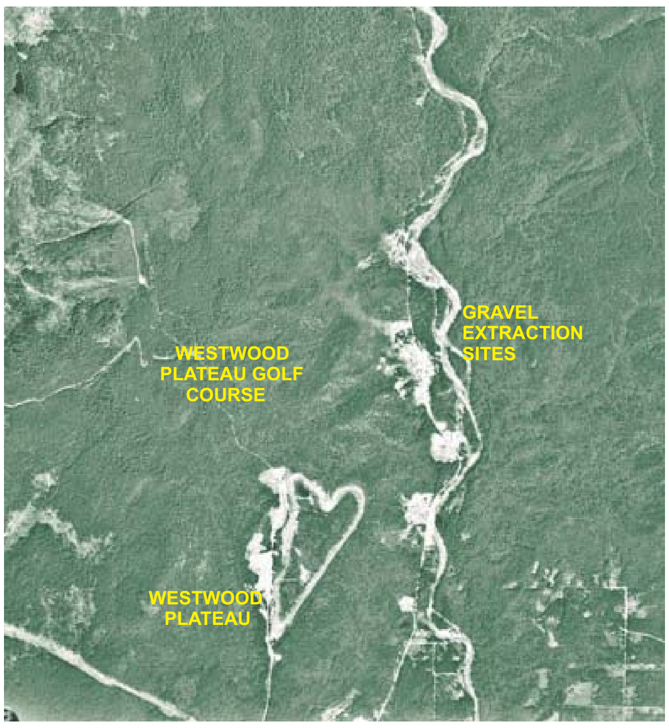
COQUITLAM DAM

Coquitlam Dam

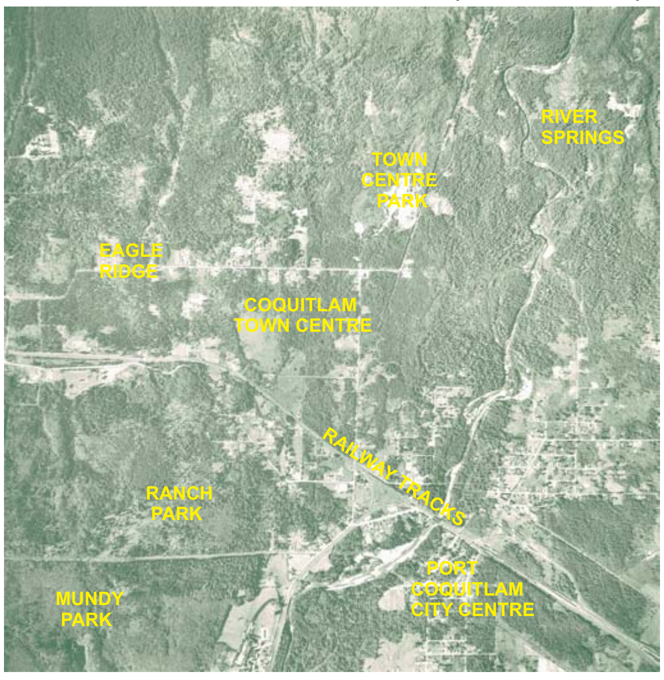
In 1902, construction began on a tunnel from Buntzen Lake (earlier known as Beautiful Lake) to Coquitlam Lake for the purpose of hydroelectric power generation. Dam construction began in 1904 at the lower end of Coquitlam Lake and was completed, along with the tunnel, by 1905 (Koop, 1994). A larger dam was constructed from 1911 to 1914. The 1914 dam was rehabilitated in 1985 and remains in place today and the power generated is supplied by BC Hydro throughout BC and beyond (Bridge-Coastal, 2002).

Historical Air Photos

AREA 1 - WESTWOOD PLATEAU (PRIOR TO 1960)

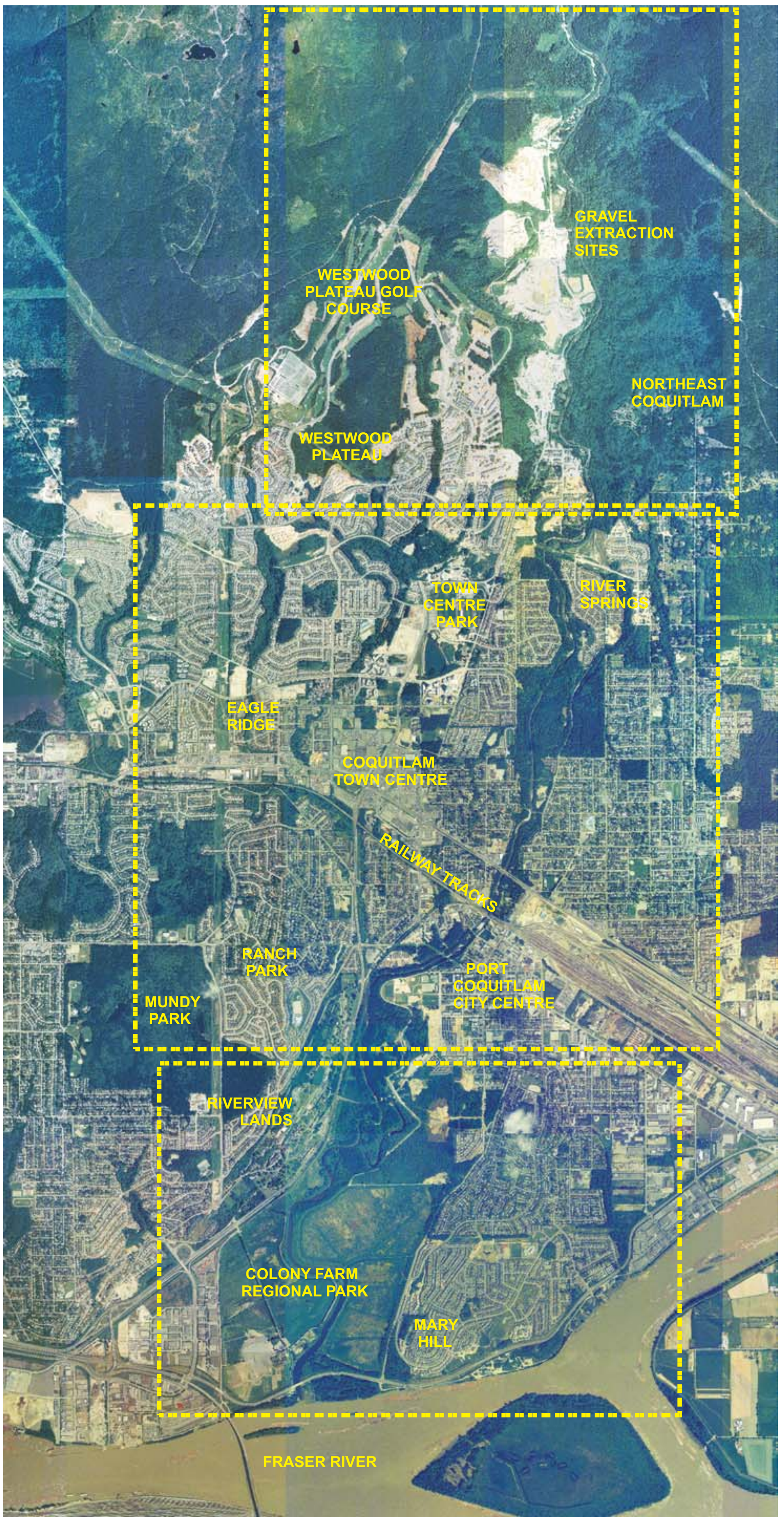


AREA 2 - COQUITLAM TOWN CENTRE (PRIOR TO 1960)



AREA 3 - COLONY FARM/ MARY HILL (PRIOR TO 1960)

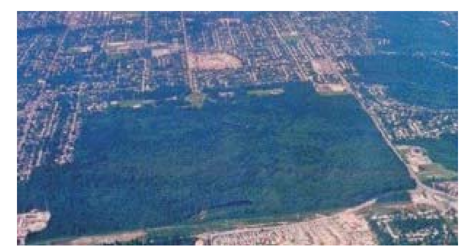
COQUITLAM 1995



Parks and Recreation

Introduction

The Lower Coquitlam River Watershed contains a variety of parks and open spaces that are used for a variety of recreational activities. The Trans Canada Trail, which spans the length of Canada, runs through the watershed. The watershed also contains several large parks such as Coquitlam River Park, Town Centre Park, Ridge Park, Gates Park, Mundy Park and Colony Farm Regional Park. The watershed provides hiking, walking, jogging, cycling, photography, nature viewing, bird watching, and fishing opportunities. Parks within the watershed are used for sports, swimming, skate boarding, festival events, and family picnics.



Parks and Open Space

Parks and open space are used by the community for various types of recreational pursuits. Parks are usually a combination of natural areas with areas developed for recreational purposes. There are a total of over 2200 hectares of parks and open space in the watershed taking the form of neighbourhood parks and playgrounds to larger community sized parks and city parks to regional parks that are destinations for residents of the entire region.

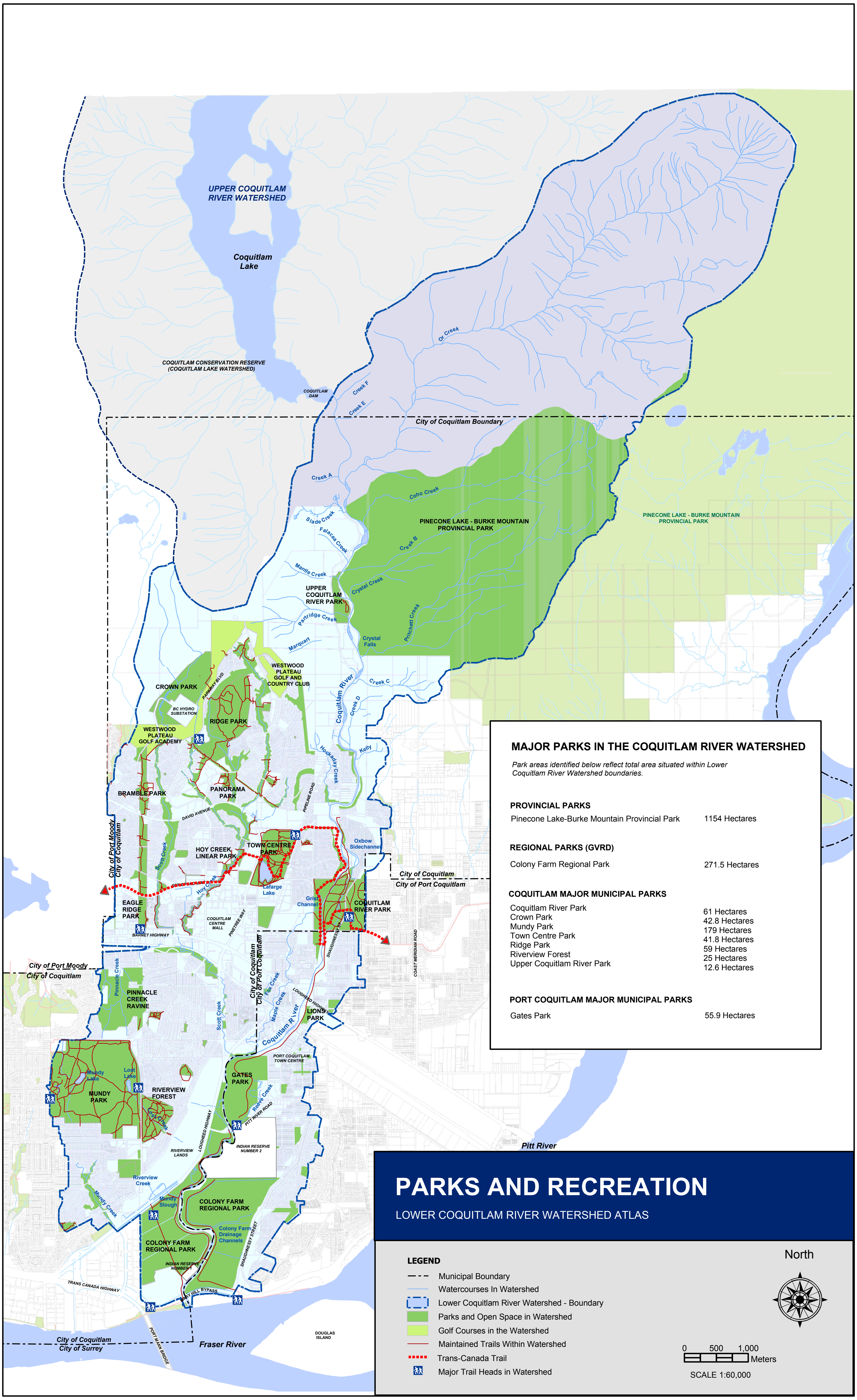
The protection of natural areas is a vital component to a healthy watershed. There are a number of areas that are protected within the two municipalities and have very little or no development within them. These areas take the form of watercourse riparian areas, ravines, wetlands and forested slopes that have high environmental values and are essentially left in their natural state. These open space areas provide high ecological value to fish, wildlife, and an abundance of diverse plant species that are important components of the ecological system. These protected areas are also important to people, as we are closely linked to our environment and the natural world around us. Natural areas clean our water and air, and provide aesthetic values that are increasingly important in our urban way of life.

Trails

Recreational trails are an important component of a healthy community, and are one the most requested recreation facilities in the municipalities. Walking has been Canada's number one recreational activity for almost two decades, with 63% of adult Canadians walking regularly (at least 100 times annually). The Lower Coquitlam River Watershed offers a wide variety of trails for both the adventurous hiker and the casual walker to enjoy. There are over 100 km of trails within the watershed.

Trails within the Lower Coquitlam River Watershed are set amongst a variety of landscapes including urban parks, forests, lakes and wetlands, linear greenways, and utility corridors. Greenways such as Hoy Creek Linear Park play an important dual role as a protected area for watercourses and a setting for nature trails and viewing areas. These areas provide a location for the community to both enjoy and develop an appreciation for nature. Some of the more popular trail destinations within the Lower Coquitlam River Watershed include:

- Hoy Creek Linear Park Trails
- Mundy Park Trails
- Len Traboulay- Poco Trail
- Colony Farm Trails
- Westwood Plateau/ Ridge Park Trails
- Trans Canada Trail


UPPER COQUITLAM RIVER WATERSHED
Coquitlam Lake
COQUITLAM CONSERVATION RESERVE (COQUITLAM LAKE WATERSHED)
COQUITLAM DAM
City of Coquitlam Boundary
PINECONE LAKE - BURKE MOUNTAIN PROVINCIAL PARK
PINECONE LAKE - BURKE MOUNTAIN PROVINCIAL PARK
UPPER COQUITLAM RIVER PARK
Crystal Falls
WESTWOOD PLATEAU GOLF AND COUNTRY CLUB
CROWN PARK
BC HYDRO SUBSTATION
RIDGE PARK
WESTWOOD PLATEAU GOLF ACADEMY
BRAMBLE PARK
PANORAMA PARK
HOY CREEK LINEAR PARK
TOWN CENTRE PARK
Lafarge Lake
Oxbow Sidechannel
City of Coquitlam
City of Port Coquitlam
COQUITLAM RIVER PARK
EAGLE RIDGE PARK
COQUITLAM CENTRE MALL
City of Port Moody
City of Coquitlam
PINNACLE CREEK RAVINE
LIONS PARK
PORT COQUITLAM TOWN CENTRE
GATES PARK
MUNDY PARK
RIVERVIEW FOREST
RIVERVIEW LANDS
INDIAN RESERVE NUMBER 2
COLONY FARM REGIONAL PARK
Colony Farm Drainage Channels
INDIAN RESERVE NUMBER 1
TRANS CANADA HIGHWAY
City of Coquitlam
City of Surrey
Fraser River
DOUGLAS ISLAND
Pitt River
Coquitlam River
MAJOR PARKS IN THE COQUITLAM RIVER WATERSHED
Park areas identified below reflect total area situated within Lower Coquitlam River Watershed boundaries.
PROVINCIAL PARKS
Pinecone Lake-Burke Mountain Provincial Park 1154 Hectares
REGIONAL PARKS (GVRD)
Colony Farm Regional Park 271.5 Hectares
COQUITLAM MAJOR MUNICIPAL PARKS
Coquitlam River Park 61 Hectares
Crown Park 42.8 Hectares
Mundy Park 179 Hectares
Town Centre Park 41.8 Hectares
Ridge Park 59 Hectares
Riverview Forest 25 Hectares
Upper Coquitlam River Park 12.6 Hectares
PORT COQUITLAM MAJOR MUNICIPAL PARKS
Gates Park 55.9 Hectares
PARKS AND RECREATION
LOWER COQUITLAM RIVER WATERSHED ATLAS
LEGEND
Municipal Boundary
Watercourses In Watershed
Lower Coquitlam River Watershed - Boundary
Parks and Open Space in Watershed
Golf Courses in the Watershed
Maintained Trails Within Watershed
Trans-Canada Trail
Major Trail Heads in Watershed
North
0 500 1,000 Meters
SCALE 1:60,000

Stewardship

Stewardship in the Lower Coquitlam River Watershed

Stewardship activities benefit the watershed and community in three important ways. Firstly, stewardship activities help protect and enhance the sensitive ecology that is continuously being challenged by negative impacts of human activities. Secondly, stewardship groups provide information to the general public on watershed issues, encourage people to get involved in volunteer work, and invite the community to socialize at the many public events organized by these groups throughout the year. Thirdly, the necessary work done by stewardship volunteers, such as stream clean-ups, tree-plantings, stream and wetland monitoring, water quality research, and public education, reduces the financial burden incurred by governments for these activities. The people involved in stewardship activities dedicate a significant amount of personal time in helping to make the watershed a healthy place to live, but there is immense personal satisfaction from knowing your efforts are making a difference.

There are many stewardship groups that work hard to make a difference to the environmental quality of the Lower Coquitlam River Watershed. A description of each is provided below. While many groups are involved in conservation of the Lower Coquitlam River Watershed's natural resources, there are also actions that individuals can take to keep the watershed healthy. For example, planting a garden with native plants that attract birds, bees and butterflies, contributes to the watershed's biodiversity. The need for mowing grass can be reduced by planting a lawn area with native shrubs and ground cover. Reducing and eliminating the use of herbicides, pesticides and fertilizers will benefit wildlife and water quality. For homes that back onto riparian areas, it is important that these areas remain in a natural state. Grass clippings and garbage should never be disposed of in riparian areas. Ornamental plants such as ivy should never be allowed to spread from gardens into riparian areas. Substances such as oil, paint, antifreeze or soapy water should never be put down a storm drain. These can end up in a stream with disastrous consequences for fish and other aquatic life. Contact your municipality for more ways on how to reduce your ecological footprint and keep the Lower Coquitlam River Watershed healthy.

Stewardship Groups and Environmental Organizations

Burke Mountain Naturalists

BMN is a registered society of approximately 350 members, mainly from the Tri-Cities, who enjoy many aspects of nature including bird-watching, nature walks, botany, hiking, etc. BMN members also work as volunteers to preserve and enhance local natural areas and provide public education. Members take the BMN display and children's activities to several community events throughout the year. BMN holds monthly public meetings with guest speakers on natural history topics and is affiliated with the Federation of BC Naturalists.

Colony Farm Park Association

The Colony Farm Park Association works in partnership with GVRD Parks to manage Colony Farm Regional Park in a manner which respects the environment, the wishes of the community and the principles of the Land Use Plan which recognizes wildlife values, passive recreation, and agriculture.

Coquitlam River Watershed Society

CRWS is a registered non-profit society dedicated to achieving an environmentally healthy Coquitlam River Watershed. CRWS' main goals include: uniting individuals and groups; coordinating information, activities, and resources; education; advocacy; and promoting a watershed-wide problem-solving initiative. The society is working on a strategy for an inclusive watershed planning process in the CRW.

Coquitlam Riverwatch

The goal of this group is to protect and preserve the Coquitlam River Watershed by providing education and encouraging awareness. Volunteers commit to walking a section of the Coquitlam River at least once a month. Their findings and impressions of the River conditions are recorded on data sheets and presented in a monthly newsletter .

Friends of Mundy Park Heritage Society

A group of dedicated volunteers focussing their energy on the maintenance and preservation of Mundy Park. Current and Ongoing projects include: Spring Clean Up, Christmas Tree Chipping Event, Educational Interpretive Signage Development, Trail Building, Tree and Shrub Plantings, Educational Tours, and Fencing development at Mundy Lake and Lost Lake.

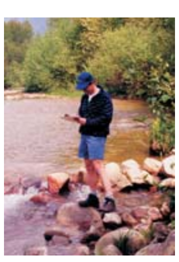
Institute of Urban Ecology, Douglas College

The Institute of Urban Ecology (IUE) is dedicated to preserving nature in the city. Its mission is to sustain the quality of life in urban areas by preserving and enhancing the natural environment. This is achieved through research, public awareness, educational programs, and community action plans, especially the Green Links Project. The IUE undertook the Clean Water Initiative on the Coquitlam River and is involved with the College-Pit Operators Partnership.

Habitat Restoration Program, Douglas College
Students and staff of the Habitat Restoration Program have monitored the water quality in local creeks and streams including Hoy, Scott, Hyde and Maple Creeks. The Habitat Restoration Program and the IUE have sponsored workshops and symposiums concerned with Ecosystem Health Monitoring and Greening the Gravel in the Coquitlam River Watershed.

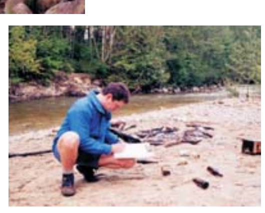
Hoy Scott Watershed Society
This group formed in early 1990s with an objective to help increase the coho population in Hoy Creek. Since then the organization has grown along with their responsibilities towards the Salmonid Enhancement Program. A hatchery and rearing pond are home to coho and chum fry, and the occasional very plump cutthroat trout.

Maple Creek Streamkeepers
We are an environmental stewardship group dedicated to the protection and rehabilitation of the Maple Creek Watershed. Short-terms plans include re-establishing natural water flow regimes, improving water quality through the identification of point and non-point pollution and a watershed education program. Activities include: watershed stewardship and advocacy; Streamkeeper training activities; instream works, riparian works; and community and public education.



North Fraser Salmon Assistance Project
The purpose of our society is to promote and effect conservation of wild fish stocks. We also work to create, maintain and restore fish habitats and assess fish stocks.

Port Coquitlam and District Hunting & Fishing Club
A conservation minded and progressive hunting, fishing, and shooting club. Group volunteers operate a hatchery for the purpose of increasing salmonid fish. Coquitlam River coho fry and smolts from this facility have been used to help re-stock tributaries and several major habitat rehabilitation and restoration projects completed by the Resource Restoration Division of DFO.



River Springs Streamkeepers
We are a community group working in partnership with the City of Coquitlam and Fisheries and Oceans Canada. A small hatchery and rearing facility is located near Oxbow Lake and the Oxbow Lake Side Channel. The hatchery rears chum, chinook, coho, and pink salmon.

Rivershed Society of BC
The Rivershed Society of BC (RSBC) was founded in 1996 to prepare people to live sustainably within healthy riversheds. We have a vision of nature, society and economy in balance within healthy riversheds. We believe respect for riversheds begins with individual awareness. Our community-based programs urge people to live within the carrying capacity of riversheds by focusing on human attitudes, values, and behaviours. Through innovative initiatives, like the Spirit of the Salmon Paddle and Feast, the Riversheds of the Fraser Forum and Environmental Career Options Workshops we advocate cooperation and collaboration as we move towards sustainable living.

Riverview Horticultural Centre Society
The society was founded in 1992 to preserve and protect the lands and trees of the Riverview Hospital site, as a community oriented, financially viable center for horticultural, educational, and therapeutic activities. We have focused on making people aware of the lands and opening the lands to the public, promoting awareness of the history and value of the trees and generating support from the public, horticultural community, environmental groups, and government representatives. Activities include: guided walks, Treefest community event, weeding and cleaning up rock stairs and walls, gardening at Finnie's Garden, and assisting at community events.

School District 43 Environmental Initiatives
Several secondary schools in District 43 offer environmental studies, and/or environmental clubs. Pinetree Secondary and Gleneagle Secondary students work with the Hoy Scott Watershed Society. Students get involved in planting trees, removing trash from stream and riparian areas, cleaning up at the hatchery, storm drain marking, or fencing recently planted areas. Students also participate in various community events.

Governance

Governance in the Lower Coquitlam River Watershed

Governance in the Lower Coquitlam River Watershed falls under the jurisdiction of various levels of government. Government jurisdiction is divided among federal, provincial, regional (GVRD), and municipal agencies. Each level of government has authority over certain matters, however, the various governments will often collaborate on issues to support common goals.

Federal Government

The federal government has little direct authority over land uses, except land that is owned and/or managed by it. The federal government, under the Fisheries Act, has a legislated responsibility for Canada's fisheries. A key component of this is protection of fish and fish habitat. Fish habitat is defined as "spawning grounds and nursery, rearing, food supply and migration areas on which fish depend either directly or indirectly in order to carry out their life processes." The Fisheries Act is administrated by Fisheries & Oceans Canada (DFO). Therefore, in the Lower Coquitlam River Watershed, DFO is responsible for protecting the fish that spend part of their lives in the tributaries and mainstem of the Coquitlam River.

Other Federal Acts that are important in the watershed are:

- Migratory Birds Convention Act
- Species at Risk Act
- Canadian Environmental Assessment Act
- Navigable Waters Protection Act
- Canada Water Act
- Canada Wildlife Act
- Indian Act
- Canada Transportation Act

Provincial Government

The Provincial Government has powers over property and civil rights throughout BC. This includes water rights, waste management, and fish habitat, including substrate and riparian land and vegetation. There are various Provincial statutes that govern these: Water Act, Waste Management Act, Wildlife Act, Fish Protection Act, and BC Environmental Assessment Act. The province regulates recreational fishing on the Coquitlam River and its tributaries. It also regulates works in and about a stream. These activities are administered by the Ministry of Water, Land and Air Protection.

Gravel extraction activities have been occurring in the northern portion of the lower watershed, along the west side of the Coquitlam River, since the 1950s. These activities are authorized by the Mining Act and administered by the Ministry of Energy & Mines.

The BC Parks Act is integral to the protection of large tracts of wilderness areas for recreation and wildlife habitat protection. Pinecone Burke Provincial Park is a 38,000 hectare park that has many hiking trails and provides habitat for black-tailed deer, mountain goats, black bears, and grizzly bears, along with sensitive or vulnerable species including the tailed frog, great blue heron, Vaux's swift, Huttons' vireo, shrew mole, and the Pacific jumping mouse. The southwest tip of Pinecone Lake- Burke Mountain Provincial Park is within the boundaries of the Lower Coquitlam River Watershed.

The Provincial Government delegates much of its responsibility over the administration of private land use to the municipal governments through the Local Government Act. Through this Act, each municipal government is recognized as "an independent, responsible and accountable order of government". However, the Act also spells out limits to municipal powers, and provides numerous requirements that local governments must meet in carrying out their duties.

Greater Vancouver Regional District

The Greater Vancouver Regional District (GVRD) is a local level of government that is a working partnership of 21 municipalities and one electoral area. Within the Coquitlam River Watershed, the GVRD supplies drinking water, sewage, and regional park services. The GVRD has also been delegated authority from the provincial government for the regulation of air quality.

The Greater Vancouver Sewage and Drainage District (GVS&DD) is responsible for the operation and maintenance of drinking water facilities within the Coquitlam River Watershed, including the Coquitlam Lake Reservoir. Sewage, which is also a GVS&DD responsibility, is collected and conveyed by pipes to the Annacis Island Sewage Treatment Plant where it is treated and discharged under permit to the Fraser River. The GVS&DD also administers the Sewage Use Bylaw, which puts limits on the amount and type of non-domestic waste discharged into the sewage system. A Liquid Waste Management Plan, mandated by the provincial government, sets out the District's plans and policies for managing liquid wastes, including sewage and stormwater.

Colony Farm, located in the CRW, is a GVRD park that is managed by GVRD Parks with the Colony Farm Park Association. This park provides valuable wildlife habitat that includes old-field, wetlands, and extensive riparian along the mouth of the Coquitlam River. The park is home to numerous wildlife species including coyotes, muskrats, mule deer, beaver, black bear, river otter, great blue heron, mallard, and hawk.

The GVRD also manages an important regional growth strategy through its Livable Region Strategic Plan (LRSP). The strategy has legal status under the Local Government Act, which contains a number of requirements for municipalities within a region that has adopted a growth management strategy. These municipalities must include a regional context statement within their Official Community Plans, which outlines how the local plan contributes to implementing the regional strategy.

In 1998, the Provincial Government created an agency, Translink to plan and finance a regional transportation system that moves people and goods efficiently and supports the Regional Growth Strategy, air quality objectives, and economic development of the GVRD. Translink's Strategic Transportation Plan, released in 2000, provides the blueprint for actions to meet the transportation needs in the GVRD for the next 5 years. This plan will have implications for how roads and transit networks are planned in the Lower Coquitlam River Watershed.

Municipal Government

Municipal government has the most direct responsibility for local land management but is still subject to senior government legislation. These local governments have the most influence on the layout and character of a community. The laws that govern community development are called bylaws and these are created and adopted in each municipality by City Councils. Some of the services provided by municipal governments include:

- Long-term planning
- Permits for proposed development
- Transportation planning for local roadways
- Local roadway construction and maintenance
- Stormwater and sewage infrastructure and maintenance
- Environmental protection (watercourses, tree protection)
- Fire protection
- Police protection
- Recreation facilities, programs, and parks
- Local library services, and
- Bylaw adoption and enforcement

Within the Lower Coquitlam River Watershed, the Cities of Coquitlam and Port Coquitlam are the two municipalities that have responsibility for local land use planning.

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APPENDIX 1 - WATER QUALITY MONITORING AVERAGES

LOWER COQUITLAM RIVER WATERSHED SITE RESULTS AVERAGES

The following table displays average (mean) and range results for 31 monitoring sites in the Lower Coquitlam River Watershed from the Coquitlam Dam (Site 1) to the confluence of the Fraser River (Site 31) sampled from the 1970's to 2001.

Water Quality Averages

Variable	1	2		3	4		5		6		7		8	9
	mean	mean	range	range	mean	range	mean	range	mean	tsnge	mean	range	mean	range
Ammonia-N (mg/L)			<0.005-0.007 n=19	<0.005-0.007 n=8	0.011						0.01			<0.005-0.021 n=14
Chloride (mg/L)					<0.6						0.91			
Chlorophyll-a (mg/m3)			10.323 n=9											
Conductivity (uS/cm)					13.1	9.9-15.97 n=18	31.07	16.17-54.83 n=18	95.49	59.47-189.33 n=14				
Dissolved Ammonia Nitrogen (mg/L)		0.005	0.005-0.005 n=4		0.006	0.005-0.016 n=24					0.006	0.005-0.016 n=27		
Dissolved Calcium (mg/L)	1.08	1.32			1.4								1.9	
Dissolved Iron (mg/L)	<0.1	<0.1			<0.1						0.148		<0.1	
Dissolved Magnesium (mg/L)	0.17	0.23				0.25-0.29 n=2					0.45		0.46	
Dissolved Manganese (mg/L)	<0.02	<0.02				<0.024-0.02 n=2					0.05		<0.02	
Dissolved Oxygen (% sat)					111.16	77.33-149.33 n=15	119.67	91-149.67 n=15	111.11	86-153.67 n=12				
Dissolved Oxygen (mg/L)			8.4-13.3 n=19	10.8-12.7 n=9		7.97-16.77 n=23	13.28	9.17-16.9 n=16	12.39	8.6-19.4 n=14	12	10.6-15.4 n=12		10.8-13.3 n=14
Dissolved Phosphorus (mg/L)					<0.003						0.003			
Dissolved Solids (mg/L)	12.9	16.2				16.7-25 n=2					140		22.7	
E. Coli (MPN/100 mL)			<1-21 n=19	<1-12 n=8										1-164 n=14
Enterococci (MPN/100 mL)			1-3200 n=18	1-10 n=8										1-2100 n=14
Fecal Coliform Bacteria (MPN/100 mL)	3.3		<1-109 n=19	<1-13 n=8		1-94 n=22						2-218 n=24	12.3	4-218 n=14
Hardness (mg/L)	3.38	4.25				4.67-4.8 n=2					7.2		6.6	
Nitrate-N (mg/L)			<0.005-0.006 n=18	<0.005-0.006 n=7	0.1						0.12			<0.005-0.007 n=14
Nitrite-N (mg/L)					<0.005						<0.005			
Nonfilterable Residue (mg/L)											50	0-293 n=26		
Organic-N (mg/L)					0.037						0.1			
pH	6.1		6.1-7.3 n=14	6.4-7.4 n=8		5.27-7.57 n=47	6.47	5.667.28 n=22	6.66	5.8-7.12 n=20		6.1-7.8 n=27	6.5	6.2-7.4 n=10
Potassium (mg/L)											0.52			
Pseudomonas aeruginosa (MPN/100 mL)														
Silica (mg/L)											5.1			
Sodium (mg/L)											1.5			
Specific Conductance (uhmo/cm)	17.3	20.5				20.5-22 n=2					31		25.5	
Substrate Sedimentation (mm: kg)														<3mm:0.6kg
Sulphate (mg/L)											<5			
Suspended Solids (mg/L)	15		<1-40 n=15	<1-4 n=8		15-49.2 n=2					74.1		74.2	<4-88 n=11
Total Dissolved Solids (ppm)					10	10-10 n=20	23.06	10-40 n=24	81.75	10-190 n=19				
Temperature (oC)					8.02	2.6-15 n=24	7.36	1.57-13 n=25	8.96	3.03-16 n=21				
Total Alkalinity (mg/L)					4.9						7.1			
Total Calcium (mg/L)					1.5						2.1			
Total Chromium (mg/L)						0.02-0.18 n=3					0.05			
Total Coliform Bacteria (MPN/100 mL)	4.9	3.3				2-13.8 n=3					84.6		24	
Total Copper (mg/L)					<0.002							0.004-0.1 n=3		
Total Iron (mg/L)					0.41						3.4			
Total Lead (mg/L)					<0.001						<0.003			
Total Phosphorus (mg/L)						0.009-0.014 n=4						0.01-0.53 n=4		
Total Solids (mg/L)	27.8	94				40-91.5 n=2					165		137	
Total Zinc (mg/L)					0.238	0.06-0.82 n=5					0.052	0.01-0.11 n=5		
True Colour											21			
Turbidity (JTU)	5.45	20.5				5.9-19.4 n=2					21.3		33.3	
Turbidity (NTU)			<0.1-9.4 n=15	0.1-1 n=8	1.24	0.14-11.31 n=25	7.64	0.29-64 n=25	2.47	0.92-5.76 n=21				0.1-48 n=9
Zinc (mg/L)					<0.006						0.006			

Variable	10		11		12		13		14		15	16		17		18	
	mean	range	mean	range	mean	range	mean	range	mean	range	mean	mean	range	mean	range	mean	range
Ammonia-N (mg/L)																	
Chloride (mg/L)																	
Chlorophyll-a (mg/m3)																	
Conductivity (uS/cm)	138.6			219.33-325 n=17	267.87	223.67-312.33 n=16	28.21	16.87-38.5 n=16	233.8			142.2		145.4		88.35	68-106.4 n=4
Dissolved Ammonia Nitrogen (mg/L)																	
Dissolved Calcium (mg/L)											2.61						
Dissolved Iron (mg/L)											<0.1						
Dissolved Magnesium (mg/L)											0.54						
Dissolved Manganese (mg/L)											<0.02						
Dissolved Oxygen (% sat)	88.02	60109.61 n=13		64-145.33 n=28	105.92	81-149 n=16	109.78	88.33-134.67 n=15	92.45	84.8-102.28 n=13		87.95	80-98.94 n=13	83.8	68.8-95 n=10		
Dissolved Oxygen (mg/L)			10.23	6.63-15.53 n=19	11.67	6.43-18.68 n=19	12.05	9.63-16.97 n=17								9.13	6.14-13.43 n=16
Dissolved Phosphorus (mg/L)																	
Dissolved Solids (mg/L)											26.3						
E. Coli (MPN/100 mL)																	
Enterococci (MPN/100 mL)																	
Fecal Coliform Bacteria (MPN/100 mL)											33.2						
Hardness (mg/L)											8.8						
Nitrate-N (mg/L)																	
Nitrite-N (mg/L)																	
Nonfilterable Residue (mg/L)																	
Organic-N (mg/L)																	
pH	6.01	4.8-6.8 n=15		5.8-7.22 n=37	6.91	6.29-7.48 n=23	6.43	5.15-7.13 n=23	6.5	5.2-7.3 n=15	6.5	6.49	5.3-7.2 n=15	6.48	5.5-7.1 n=13	7.16	6.22-8.1 n=36
Potassium (mg/L)																	
Pseudomonas aeruginosa (MPN/100 mL)																	
Silica (mg/L)																	
Sodium (mg/L)																	
Specific Conductance (uhmo/cm)											33.5						
Substrate Sedimentation (mm: kg)																	
Sulphate (mg/L)																	
Suspended Solids (mg/L)											26.2						
Total Dissolved Solids (ppm)	107.03	54-216 n=17		10-350 n=37	225.45	10-330 n=21	25.76	20-40 n=22	209.1	70-300 n=17		162.04	38-690 n=17	179.09	60-774 n=14	131.71	0-820 n=14
Temperature (oC)	10.96	6.7-16.1 n=17		4.2-14.5 n=39	9.31	5.9-12.33 n=23	10.03	2.3-19.33 n=23	9.8	6.1-13 n=17		9.74	3.1-16 n=17	9.5	2.9-16.8 n=15	8.89	4-15 n=35
Total Alkalinity (mg/L)																	
Total Calcium (mg/L)																	
Total Chromium (mg/L)																	
Total Coliform Bacteria (MPN/100 mL)											62.9						
Total Copper (mg/L)																	
Total Iron (mg/L)																	
Total Lead (mg/L)																	
Total Phosphorus (mg/L)																	
Total Solids (mg/L)											83.3	2.21	0.6-5.8 n=16				
Total Zinc (mg/L)																	
True Colour																	
Turbidity (JTU)											17.5						
Turbidity (NTU)	1.28	0.26-6.1 n=17		0.08-4.28 n=38	0.8	0.16-2.04 n=22	2.48	0.58-12.17 n=22	1.13	0.04-2.9 n=17				3.23	0.7-7.1 n=13		
Zinc (mg/L)																	

Variable	19		20		21		22		23		24	25	26		27		28		29	30	31	
	mean	range	mean	range	mean	range	mean	range	mean	range	mean	mean	mean	range	mean	range	mean	range	mean	mean	mean	range
Ammonia-N (mg/L)										max value 0.063 n=15				0.097 n=20						0.05		max value 0.063 n=20
Chloride (mg/L)																				3.8		
Chlorophyll-a (mg/m3)										<0.3-22.1 n=11			75.4	36.1-127 n=6							13.4	4.1-115 n=6
Conductivity (uS/cm)	7.88	1.27-49 n=13	77.11	40.33-99.4 n=3	470.53	14.57-662 n=9	81.3	35-114.2 n=4									113.9	105.6-132.6 n=3				
Dissolved Ammonia Nitrogen (mg/L)															0.059	0.024-0.097 n=5					0.045	0.005-0.45 n=24
Dissolved Calcium (mg/L)											2.33	4.39							3.85			
Dissolved Iron (mg/L)											0.13	0.14							0.4	0.29		
Dissolved Magnesium (mg/L)											0.56	0.82							0.69	0.83		
Dissolved Manganese (mg/L)											0.02	0.04							0.05	0.05		
Dissolved Oxygen (% sat)					49.79	10-166 n=14																
Dissolved Oxygen (mg/L)	9.06	6.42-12.9 n=15	8.76	5.4-12.93 n=16	4.76	0.07-11.63 n=16	8.9	6-12.53 n=17		9.8-12.2 n=14				7.8-12.2 n=19	10.3	7.8-11.6 n=9	9.075	5.9-12.6 n=16				7.8-13.2 n=29
Dissolved Phosphorus (mg/L)																				0.004		
Dissolved Solids (mg/L)											28	48.7							38.9	38.8		
E. Coli (MPN/100 mL)										6-1120 n=15				16-4900 n=20								14-715 n=20
Enterococci (MPN/100 mL)										28-1800 n=15				18-5400 n=15								3-2600 n=20
Fecal Coliform Bacteria (MPN/100 mL)										18-1120 n=15	5.1	382		22-5000 n=20	2080	180-5000 n=5			71.9	913		2-710 n=44
Hardness (mg/L)											8.4	14.3							12.5	14		
Nitrate-N (mg/L)										<0.005-0.008 n=15				<0.005-0.008 n=19						0.22		<0.005-0.017 n=19
Nitrite-N (mg/L)																				<0.005		
Nonfilterable Residue (mg/L)															6	4-9 n=4					35	3-207 n=20
Organic-N (mg/L)																				0.18		
pH	6.95	6-8 n=35	6.8	5.8-7.8 n=34	6.29	5.71-7 n=17	6.75	5.6-7.68 n=36		6.7-7.3 n=10				6.9-7.6 n=15	7.1	6.4-7.5 n=10	6.77	5.54-7.6 n=35	6.4	6.84		6.9-7.7 n=15
Potassium (mg/L)																				0.63		
Pseudomonas aeruginosa (MPN/100 mL)									31**	<2-415 n=5			27**	<2-1500 n=5								
Silica (mg/L)																				7.13		
Sodium (mg/L)																				3.1		
Specific Conductance (uhmo/cm)											31.5	70.7							49.6	52		
Substrate Sedimentation (mm: kg)																						
Sulphate (mg/L)																				<5		
Suspended Solids (mg/L)										<1-65 n=11	3.8	18		<1-63 n=16					20.5	49.5		<4->119 n=16
Total Dissolved Solids (ppm)	44	0-100 n=11	49.75	0-106 n=10	343.56	10-680 n=15	51.64	0-128 n=11									59.6	0-130 n=10				
Temperature (oC)	9.7	5-16 n=34	10.11	5-16 n=33	11.92	4.43-17 n=17	10.07	5-16 n=34									10.22	6-16.8 n=34				
Total Alkalinity (mg/L)																				12.5		
Total Calcium (mg/L)																				4.2		
Total Chromium (mg/L)																					0.01	
Total Coliform Bacteria (MPN/100 mL)											14.6	2155							455	1218	7.8	
Total Copper (mg/L)																				0.004	0.01	
Total Iron (mg/L)																				1.38		
Total Lead (mg/L)																				0.0018		
Total Phosphorus (mg/L)																				0.041		
Total Solids (mg/L)											33.2	71.6							90.3	82.1		
Total Zinc (mg/L)																					0.084	0.03-0.13 n=5
True Colour																				18		
Turbidity (JTU)											2.7	8.9							14.1	19		
Turbidity (NTU)	7.8	1.27-49 n=13	4.95	1.2-15.2 n=18	2.95	0.4-17.62 n=17	4.75	0.4-14.87 n=17		0.7-50 n=11				1.5-32 n=16			7.66	1.5-37.5 n=18				1.6-32 n=16
Zinc (mg/L)																				0.007		

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Note: Not all data is collected in a consistent basis over an extended time period. Sampling measures could vary between sites.

Water Quality Monitoring Sites

1. Coquitlam River at Coquitlam Dam
2. Or Creek at Coquitlam River
3. Coquitlam River downstream from Or Creek
4. Coquitlam River at Watershed Gate (at hatchery for CW)
5. Falacos Creek at Pipeline Road
6. Goodyear Creek at Hamton Gate / Goodyear Creek Preservation Area
7. Coquitlam River at Galette Road
8. Coquitlam River at Hockaday Creek
9. Coquitlam River upstream from Coquitlam River Park
10. Maple Creek at footbridge to Ozada Tot Lot
11. Grist Creek at inflow
12. Grist Creek at 2nd footbridge
13. Oxbow Sidechannel at Coquitlam River
14. Maple Creek at Maple Creek Middle School
15. Coquitlam River at CPR Bridge
16. Maple Creek at Bedford Street
17. Maple Creek at Coquitlam River Dyke
18. Hoy Creek at Hampton Park on Paddock Drive
19. Hoy Creek 150m upstream from hatchery
20. Hoy Creek 250m downstream from hatchery
21. Hoy Creek tributary north of Barnet Highway at footbridge
22. Hoy Creek just north of Barnet Highway
23. Hoy Creek near mouth (confluence with Scott Creek)
24. Scott Creek at Glen Drive
25. Scott Creek at Railway
26. Scott Creek downstream from Hoy Creek
27. Scott Creek at Highway 7
28. Scott Creek at Coquitlam River
29. Coquitlam River at Red Bridge
30. Coquitlam River at Colony Farm Bridge
31. Coquitlam River near mouth (Confluence with Fraser River)