REGIONAL DISTRICT OF NANAIMO

SHAW HILL - DEEP BAY OFFICIAL COMMUNITY PLAN

BACKGROUND REPORT

Prepared by the
Regional District of Nanaimo Planning Department

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BACKGROUND REPORT

1. INTRODUCTION

1.1 Forward

The Shaw Hill-Deep Bay Background Report is intended to accompany the Shaw Hill-Deep Bay Official Community Plan. Whereas the Official Community Plan provides a summary of information and policies and objectives relating to the development of Shaw Hill-Deep Bay, this report provides detailed background information on history, natural resources, resource management, and population trends. Although not part of the Plan Bylaw, the background information in this report should be referred to by those using the Community Plan since it provides a more complete understanding of the Plan Area.[1]

The Community Plan will reflect the interests of local residents in the community as well as local, regional, provincial and in some cases federal goals and objectives and policies in order to guide the development of neighbourhoods, allow for proper land and water uses, improve on the well being of the community, and maximize opportunities for area residents. The plan outlines local, regional and provincial policies and objectives, indicates local aspirations and identifies a preferred pattern of land use and neighbourhood development within the Plan Area. The Background report provides the technical information which is necessary for developing the broad objectives of the community respecting the form and character of existing and proposed land use and servicing requirements within the Plan Area.[2] The Shaw Hill - Deep Bay Official Community Plan in turn is the basis for implementing the bylaws to regulate and control land use and development.[3] This will provide citizens and interest groups with a framework against

[1] For more detailed technical background on physical and environmental features please refer to the Shaw Hill-Deep Bay Technical Background Report 1989.

[2] The sequence of planning in the study area begins with the District 69 Regional Plan in 1975, which covered the area of School District No. 69 and set the role for various areas including Qualicum Beach and Parksville, as well as unorganized areas such as Shaw Hill-Deep Bay. The District 69 Plan was repealed under changes to the Municipal Act in 1984. In the early 1980's it became evident that policies which would guide the growth and development were required in the Shaw Hill-Deep Bay area as the population of the area climbed. Studies were initiated and a draft settlement plan and background report were prepared by consultants for the Regional District of Nanaimo. The first community plan, termed a settlement plan under past legislation, was adopted in July 1983, and amended in May 1986. It was reviewed in 1988, and the updated plan was adopted as Bylaw No. 747 in the fall of 1988.

[3] The Regional District has the mandate to adopt community plans and subdivision and land use bylaws for unincorporated areas of the Regional District. At the time of preparation of this plan the "Regional District of Nanaimo, Land Use and Subdivision Bylaw No. 500, 1987" was in effect as the implementing bylaw which regulated the location and use of buildings

which development proposals and actions will be considered, thereby reducing uncertainty as to what land uses will be permitted.

Official Community Plans are intended to be reviewed through a detailed public process on a periodic basis. The most recent in depth review was prior to 1986 when the original official settlement plan was prepared.[4] Planning legislation and Provincial Policy initiatives have undergone considerable changes since the original review.[5] This document will provide the background necessary to coordinate the Official Community Plan policies with provincial policy initiatives and update the plan with community input[6].

1.2 Public Consultation Process

The public consultation process in review of the Shaw Hill Deep Bay Official Community Plan was launched with extensive public input at a very early stage of plan preparation. In March 1995 the Regional District hosted an Issues and Concerns Forum for the Shaw Hill Deep Bay OCP review at the Lighthouse Community Centre. The purpose of the forum was to identify important issues and concerns within the community to address through the plan revision. The forum was well attended with a total participation of 135 persons. Thirteen workshop groups composed of approximately 10 to 20 persons each were asked to discuss and record issues and concerns of importance to the community. The issues, concerns and priorities identified by each workshop group were summarized in a preliminary issues and concerns paper . This preliminary report was made available in the community for further review and discussion.

Following the Issues and Concerns Forum, neighbourhood focus group meetings were held between April and May 1995 in the following neighbourhoods: Dashwood, Corcan-Fowler, Spider Lake, Dunsmuir, Qualicum Bay, Bowser and Deep Bay. The neighbourhood meetings focused on issues and concerns from a neighbourhood

and structures and the use of and subdivision of land including the surface of water within the planning jurisdiction of the Regional District exclusive of Electoral Area "F".

[4] The Shaw Hill Deep Bay Official Community Plan Bylaw No. 790 was adopted in 1990. This plan was an interim conversion of an earlier Official Settlement Plan which was adopted in 1988. The Shaw Hill - Deep Bay Official Community Plan was intended to be reviewed after 5 years in order to respond to changes in legislation and community needs).

[5] Major changes in Provincial Policy initiatives include the revisions to Municipal Act, Health Branch Guidelines, Environmental Protection Guidelines, Agricultural Forest Land Reserve legislation and Ministry of Transportation and Highways Plans. The Regional District has the mandate to adopt community plans and subdivision and land use bylaws in unincorporated areas of the Regional District pursuant to the Municipal Act. The Municipal Act now requires closer coordination with School District policies and plans with the preparation of the Official Community Plan. The Municipal Act also promotes new planning tools to local government for achieving community interests, including affordable housing and amenity provisions, school site acquisition provisions, development permit areas, social planning, heritage and cultural planning opportunities and environmental protection.

[6] Zoning bylaws have also followed a sequence related to the adoption of plans and changes in the Municipal Act. Subdivision and Zoning Bylaw No. 203 came into effect in 1985 for Electoral Area 'H', followed by Zoning Bylaw No. 395 in 1982 for Electoral Area 'G'. Since 1984, Land Use and Subdivision Bylaw No. 500 has been in effect in the area; this is a comprehensive regulatory bylaw.

perspective, helped establish neighbourhood priorities and ways of addressing the issues and concerns. Also, in order to encourage written comments on major issue areas, an opinion generating survey was conducted through bulk mailing of a questionnaire to all residents in the Plan Area. The responses to the questionnaire have been summarized to assist in identifying issues and concerns of individuals which may not have been expressed at the forum or at the neighbourhood meetings.

The issues, concerns, priorities and direction identified through the forum, neighbourhood focus group meetings and the survey have been summarized in a document entitled "Shaw Hill - Deep Bay Official Community Plan Review: Public Consultation". The information provided through this initial public consultation process provides guidance for the preparation of this Background Report. Combined with the technical review, workshop with the Community Plan Advisory Committee and government agency representatives, and further public input meetings, the background report serves as the basis for addressing issues and concerns in the revision of the Official Community Plan.

1.3 Location of Plan Area

Shaw Hill - Deep Bay Official Community Plan Area[7] is located in the Regional District of Nanaimo. The Plan Area comprises all of *Electoral Area "H"*, and the most westerly portion of *Electoral Area "G"*[8] adjoining *Town of Qualicum Beach.* Shaw Hill - Deep Bay includes the neighbourhoods of *Dashwood, Corcan - Fowler, Spider Lake, Horne Lake, Dunsmuir, Qualicum Bay, Bowser and Deep Bay.*

The following additional information related to the location of the Plan Area are noted:

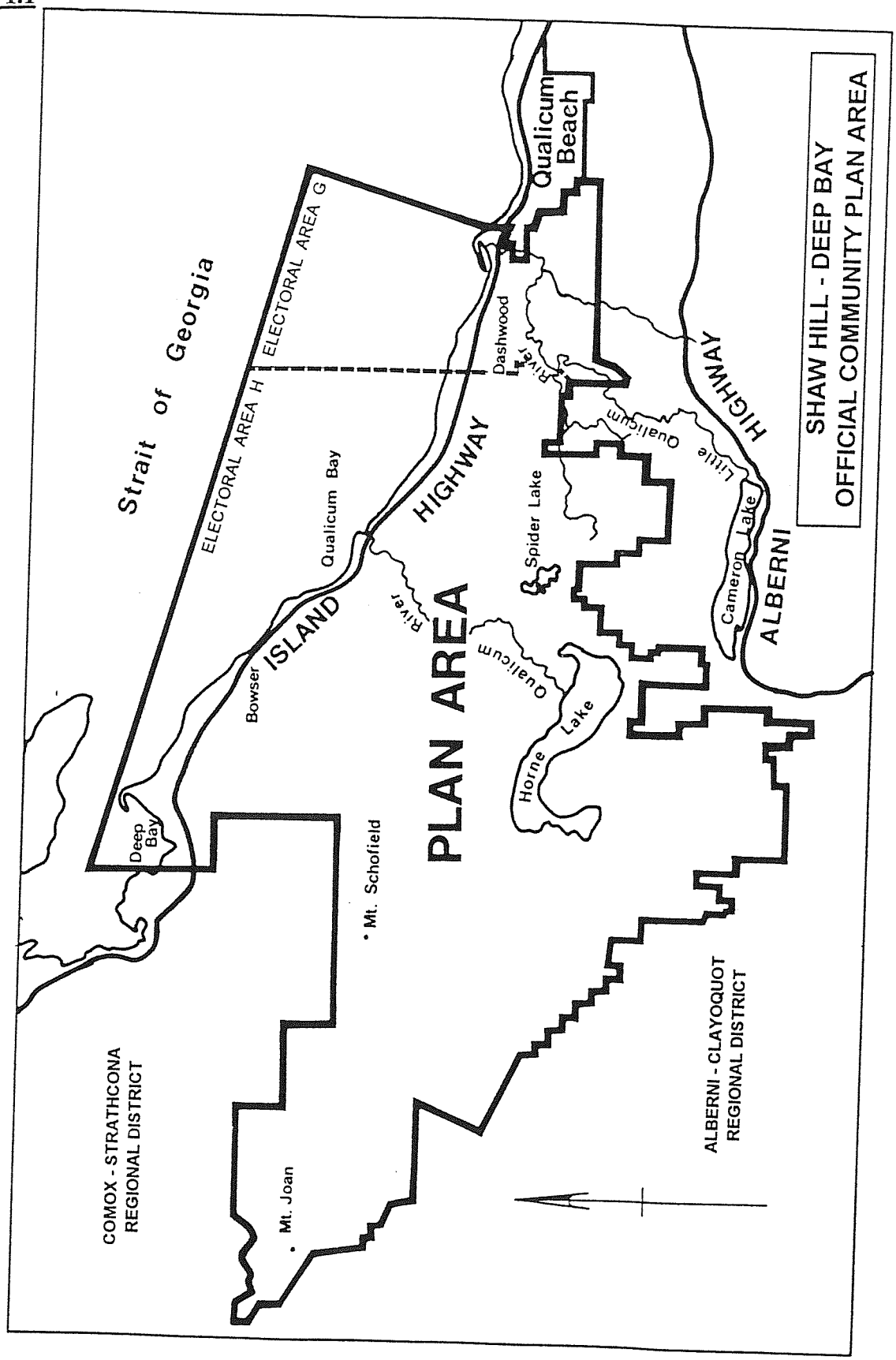
- Map 1.1 illustrates the location of the Plan Area boundaries;
- The Plan Area includes 306 square kilometers and stretches along the Strait of Georgia from westerly boundary of the Town of Qualicum Beach to Deep Bay;
- The Plan Area is northwest and adjoining Electoral Area "F" and the remainder of Electoral Area "G";
- The northwest boundary of the Plan Area borders on the Regional District of Comox Strathcona;
- The westerly boundary of the Plan Area borders on the Alberni Clayoquot Regional District;

[7] The Community Plan and Background Report will consider the terms "Shaw Hill - Deep Bay", "Shaw Hill Deep Bay Plan Area" and "Plan Area" to be synonymous with the location of the Plan Area described in this section.

[8] The Westerly most portion of Electoral Area "G" has been included in the Community Plan Area because of its location, physical and environmental characteristics are more closely aligned with Electoral Area "H" and the coastal setting between Town of Qualicum Beach and Deep Bay.

Shaw Hill - Deep Bay Plan Area includes *Horne Lake, Spider Lake,* and a large number of smaller lakes within its boundary. Two major rivers, *The Qualicum River* and a portion *of Little Qualicum River* are contained within the Plan Area.

Map 1.1


Strait of Georgia
ELECTORAL AREA H
ELECTORAL AREA G
Qualicum Beach
Dashwood
River
Little Qualicum
HIGHWAY
Spider Lake
Qualicum Bay
Bowser
ISLAND
River
Qualicum
Cameron Lake
ALBERNI
SHAW HILL - DEEP BAY
OFFICIAL COMMUNITY PLAN AREA
PLAN AREA
Deep Bay
Horne Lake
Mt. Schofield
COMOX - STRATHCONA
REGIONAL DISTRICT
Mt. Joan
ALBERNI - CLAYOQUOT
REGIONAL DISTRICT

2. HISTORY AND HERITAGE OF SHAW HILL - DEEP BAY

2.1 Overview of Local History

It is important that the history and culture of the community is well understood and appreciated to give full meaning to the Official Community Plan. It is for this reason that this report will devote attention to the history of the various communities within Shaw Hill - Deep Bay and upon the Qualicum Band of Indians. The historical information in this section is a compilation of information from various sources including input at neighbourhood focus group meetings and information provided by the Qualicum Band of Indians. It is hoped that this information will give insight and understanding into the history and culture of the Plan Area and ensure that the past is reflected upon when we plan for the future.

The history of Shaw Hill - Deep Bay should first be viewed from the overall historical perspective of human occupation of the east coast of Vancouver Island, which dates back thousands of years. The Plan Area was traditionally within the influence of the Coast Salish people, specifically, the Pentlatch Linqustic Group. These people were semi sedentary, concentrating during winter months in well protected settlements along the coast.

The Shaw Hill - Deep Bay area was a fishing and hunting destination for the Coast Salish people, who lived primarily at the mouths of well protected rivers in settlements. During the spring and summer months groups would fan out to localized encampments within the Plan Area as well as other hunting and fishing grounds on the southeastern coast of Vancouver Island and other smaller islands off the east coast. Evidence of shell middens and wood weirs at the mouths of the Big and Little Qualicum Rivers indicate that these were major salmon fishing areas during the summer periods. Shell middens have also been located at other areas along the coast.

2.2 The Qualicum Band

The following is a brief history of the Qualicum People as told by the Qualicum Band of Indians.

The Qualicum Band is a small Band situated on the main winter site of the original Pentlatch people which extended from the Cape Lazo/Kye Bay area to Craig Bay.

There are two families on the Qualicum Reserve today. The Recalma family traces its routes to the original Pentlatch people. The Reid family are descendants of the daughter of Qualicum Tom's second wife Annie, a Kwakewlth woman from Fort Rupert whose first husband was an Englishman named Joe Little.

The Pentlatch language is now extinct. As many as four subgroups of the Pentlatch have been identified. The last of the northernmost Pentlatch people joined the Comox people after the Comox people had been driven into Pentlatch territory from their Kelsey Bay/Quadra Island area by the more aggressive Lekwiltok (Southern Kwakewlth) people in the early 1800's. The last know Pentlatch person living on what is now known as the Comox Reserve, Joe Nimnim, died in the 1940's.

The Qualicum Reserve is located on the main winter site of the subgroup of the Pentlatch people to which Qualicum Tom's family belonged. The people from this area were called 'Salalhem' which means the Place of the Green Leaves.

Fishing has always been the mainstay of the Qualicum people. Qualicum Tom had a flourishing business as early as 1884. In a report by W. H. Lomas, Indian Agent, dated November 20, 1884, it was noted that Qualicum Tom had a general store which was a great benefit to both Indians and Whitemen traveling the Alberni Trail. In an ad in the May 19, 1886 Nanaimo Free Press Qualicum Tom offers a canoe for hire to either fish in Horne Lake or to transport 8 to 10 passengers across the Lake to the trail leading to Port Alberni. He was also well known for supplying salted and smoked fish and dogfish oil to passing ships.

The present Band members are still dependent on the fishery, although members of the Band can be found in many other professions.

The education level of the members of the Qualicum Band is on par with that of the surrounding community and dependence on welfare was virtually unheard of until very recently.

The Band is situated on Federal Crown land which is held In Trust for the members of this Band. Councils are elected every two years under provisions set out in the Indian Act.

Students from the Reserve attend Public Schools at the discretion of their parents. A large number of students belonging to the Band have attended Private Schools over the past 25 years.

Housing on the Reserve is on par with the surrounding community and is handled by the Band Council. More than half the members belonging to the Band live on the Reserve. The rest are scattered around the Island and the Lower Mainland.

The Band has complete authority over its economic development plans and has always tried to maintain a working relationship with the surrounding community. For instance, the Band Council has not allowed billboards on the reserve along the Island Highway in order to protect the character of the community. There has always been an attempt to harmonize the activities of the Band with those of its neighbours. For instance, when the Regional Board developed a house numbering system which stopped at one side of the Reserve and

began again on the other side, the Council of the day changed the numbering which had been developed on the Reserve and blended the new numbers with those of the Regional Board.

The Band intends to maintain its autonomy while endeavouring to harmonize development with the surrounding community.

2.3 *Early European Settlement*

Unlike other areas within the Regional District of Nanaimo which were experiencing extensive settlement well before the turn of the century, the Plan area had a relatively late start in terms of arrival of European settlers. A small number of settlers arrived in the area as early as 1886. Their initial settlements were temporary in nature, and located along the coast near river mouths. The earliest arriving settlers were searching for farmsteads of their own or employment in the forest industry. One of the earliest and legendary of these settlers was known as Kincaid. It is believed that Kincaid sailed around the Horn, and was one of the first settlers on the east of Vancouver Island. Around the turn of the century, the local Indians erected a log house and barn for Kincaid in Dashwood near the mouth of Little Qualicum River. Although the log house is still standing, and needs restoration. it now serves as a residence and office for the Canadian Wildlife Service naturalist. The Marshal Stevenson Wildlife Sanctuary now surrounds the home.

It wasn't until the 1890's that a horse trail along the shoreline of the east coast of Vancouver Island connected the small hamlets and villages which were evolving to the south of the Plan Area at Qualicum Beach and Parksville and to destinations north of the Plan Area. The richness of the forestry resource industry, opportunities for farmers and improved access by rail and road eventually increased the numbers of people that moved to this part of Vancouver Island. As the population increased, so too did the amount of traffic on the roads. Horses were eventually replaced by motorized vehicles as the main means of travel, and correspondingly the horse trails were upgraded to gravel highways. The roads were eventually paved between the years 1947 - 1954. The natural beauty of the coastal setting of the Plan Area coupled with major improvements to accessibility made the area very attractive for retirement and tourism activity.

The presence of the Island Highway may have been a very significant factor for population in Shaw Hill - Deep Bay. Historically, most of the growth in the Plan Area was along Highway 19 with more settlement on the ocean side to the Highway. The settlement pattern is based on the early subdivision activity by E&N between 1908 and 1947 and is described for various early settlement "neighbourhoods" below:

2.3.1 Vancouver Island Fruit Lands

Despite the arrival of the early exploratory settlers, the Plan Area did not experience significant increases in population (as compared to other parts of Southern Vancouver Island which may have experienced growth much earlier) until the completion of The E&N Railway in 1908. The construction of the railway and the subdivision of lands acquired by E&N through the ensuing E&N Land Grant created the first residential settlements in the Plan Area. The earliest subdivisions registered date back to 1912-1914 when the Vancouver Island Fruit lands were created from the E&N Lands and resulted in the first agricultural settlers arriving in relatively significant numbers to the area[9].

2.3.2 Corcan-Fowler

Corcan Fowler and areas to the west of Bowser were among the first areas within the Plan Area subdivided and made available for agricultural settlement between 1912 and 1917 by the E&N Land Company as part of the commitment for the E&N Land Grant. Many of the large lots created stayed vacant for many years before they were actually settled on by farmers or in some cases were returned to the Crown and remain vacant today.

2.3.3 Qualicum Bay

Signs of subdivision for coastal settlement were not experienced at Qualicum Bay until 1921 when six parcels were created in the vicinity of the existing commercial core of Qualicum Bay. The area transformed into a retirement and tourist commercial centre after the 1950's due to its beauty, coastal setting and improved accessibility with the paving of Vancouver Island Highway. In the past fifteen years the addition of Lions Community Hall, ballpark, seniors housing, firehall, local business and tourism have made Qualicum Bay a centre for community business, culture, recreation and pride for all residents of Shaw Hill Deep Bay.

2.3.4 Bowser

Bowser has evolved in the past 40 years as a tourist commercial and coastal rural retirement community with a concentration of the development on the east side (ocean side) of the Trans Canada Highway stretching north towards Deep Bay. The Legion and local grocery store and Post Office on Highway 19 provide a focus for the suburban residential neighbourhoods and tourist commercial resorts in the community.

[9] Between 1912 to 1928 there were 225 lots created by E&N Land Company which included the Vancouver Island Fruit Lands (96 agricultural lots created at Corcan Fowler in 1912 through 1914, 91 rural and waterfront residential parcels created at Bowser between 1913 to 1928).

2.3.5 Deep Bay

The driving force behind settlement of the Deep Bay neighbourhood was development of the fish processing industry in the area. A fish production (reduction) plant was built on the Deep Bay Spit in the mid 1930's as well as homes for approximately seventy-five families. The plant was torn down in 1951 when the lease held by B.C. Packers expired. However, the natural harbour of Deep Bay encouraged the development of the local fishing industry and fishing has continued in importance with the establishment of the government wharf. The wharf provides moorage and loading facilities to an active fishing fleet. The spit has been transformed into a suburban residential retirement community over the last twenty years.

2.3.6 Dunsmuir

Dunsmuir appeared on the map as a railway station shortly after E&N created a 28 lot residential subdivision in 1948. Although many lots were created in the early 1900's many stayed vacant until more massive migrations occurred in the 1940's, particularly when people arrived from the prairies in search of less draught stricken farmland. Many people also settled in the area to be close to work in the forestry industry. Gradually Dunsmuir grew with people employed in farming and logging. This area has more recently become more attractive for a retirement population as well as young families who are within commuting distance to their place of work.

With the completion of the Inland Highway Project in 1996 the time required for commuting through Dunsmuir may once again be drastically reduced. As Horne Lake Road will be the only major intersection with the new Highway within the Plan Area, and Horne Lake Road will connect the New Highway with Highway 19 through Dunsmuir, this area is expected to be under considerable pressure for residential and commercial development in the near future.

2.3.7 Dashwood

This area was first chosen by Kincaid for his cabin, and later grew due to its proximity to employment in forestry industry with people. The Crump Hotel, (established in the early 1900's) in Dashwood was probably the earliest tourist commercial venture in the Plan Area. Dashwood also included the Women's Institute Hall which contributes significantly to the cultural history of the Plan Area and which is still an important facility in the community. Dashwood is currently a rural residential community at the fringe area of Town of Qualicum Beach.

2.3.8 Horne Lake

The Horne Lake land holdings (District 251 Alberni Land District) were acquired from E&N Land Company by Horne Lake Lumber Company which owned it from 1919 to 1946. With the construction of the first logging roads to Horne Lake it quickly became attractive for summer recreation. As early as 1928 employees and friends of the Lumber Company built cottages adjacent to the Lake. There was even a small post office and small schoolhouse built at the east end of the Lake which was called "The Bay". The practice of allowing these cabins continued with the BC Cement Company but the unregulated nature of the area also encouraged squatter activity. The Department of Fisheries purchased a part of the shoreline of Horne Lake where Big Qualicum exits in order to construct the dam and spillway for the Big Qualicum Fisheries Project. This dam and water diversion project accommodated controlled water flow levels for an artificial spawning channel[10]. The Fisheries Project began in 1960 with agreements between the owners of DL 252 for the Right of the Department of Public Works of Canada to raise and lower the level of water in Horne Lake. A conditional water licence sets the spillway level of the dam at 412.3 feet. This meant that most of the cabins and recreational sites would be at risk of flooding in extreme runoff situations.

Texada Logging Company purchased the Horne Lake land holdings in 1969. Today a public road traverses the property and provides access to Horne Lake Caves Provincial Park. In 1978 Texada Logging created a 37 lot campsite at the western end of the lake. The Campsite was intended to serve the traveling public. At the same time Texada Logging developed a concept of sixty foot wide "campsites" or recreational sites along the shores of Horne Lake available on an annual rental basis. There are now 350 recreational sites on Horne Lake, with cabins and improvements. Most of the cabins were constructed in contravention of Regional District Bylaws between 1976 and the present.

2.3.9 Spider Lake

The Spider Lake area was developed in the early 1980's with rural 8.0 hectare (20 acre) parcels on the east side of the lake. Spider Lake Provincial Park was established in 1980 on the south side of the lake and the rural subdivision of land in the area also designated a portion of the lakefront as parkland. Rural residential dwellings have been constructed on most of the Spider Lake area lots and are primarily occupied by retired or semi-retired people.

[10] The Federal Department of Fisheries and Oceans presently operates a salmon hatchery and spawning area in the lower reaches of Big Qualicum River. The Federal Government owns the land adjacent Big Qualicum River up to Horne Lake as part of the project. Water supply for the spawning/hatchery is from Horne Lake, with flows and temperature controlled by a series of intake valves feeding penstocks which direct water into the natural river channel, downstream from Horne Lake. The dam and spillway was completed in 1962 across the former Big Qualicum River outflow channel at the easterly end of the lake to control the water supply for this major fisheries program.

3. Shaw Hill-Deep Bay Today

3.1 Demographic Analysis: Population and Housing

3.1.1 Actual and Projected Population

The Population of Shaw Hill Deep Bay as determined by the 1991 census was 3,207 persons. The estimated 1996 population is 3,690 persons. Based on long term growth trends the population could exceed 4,500 persons by the year 2001.[11]

While recent population growth rates in all the incorporated areas of the Regional District of Nanaimo have bee high, they vary significantly among jurisdictions. The Shaw Hill-Deep Bay Plan Area experienced lower growth rates than other areas of the Regional District of Nanaimo, yet growth was steady if viewed over a longer period of time.

Based on relatively stable yet increasing growth rates in the Plan Area, the population will continue to follow an upward pattern. Using population projection methods, it is estimated that by the year 2001, the population of the Plan Area could increase to a low estimate of 4,000 to a high estimate 4,655 persons. The rate of growth however may increase even more rapidly through the influence of the following:

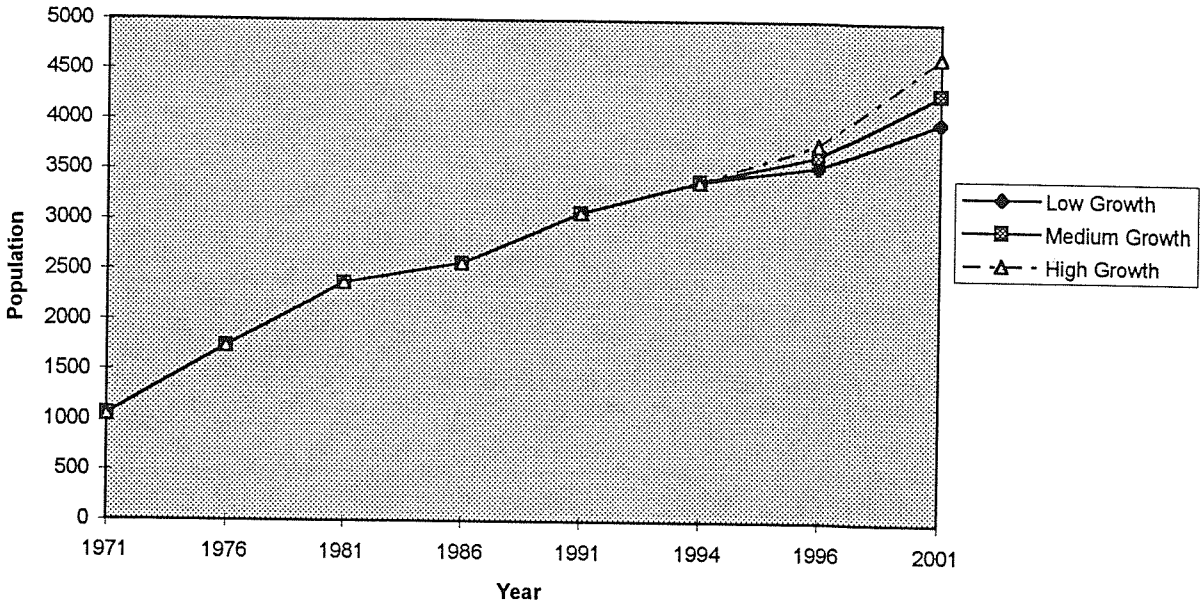
- improved accessibility to the Plan Area (completion of the Inland Island Highway and future transportation opportunities).
- increased migration to Vancouver Island;
- improvements to community infrastructure and amenities; and
- availability and affordability of housing units within the Plan Area and other areas of the Regional District.

Depending on the degree of these influences, the Plan Area will have a population between 4,500 and 7,000 persons by the year 2011 and between 5,000 and 8,000 persons by the year 2021.[12]

[11] Population growth rates for the Regional District of Nanaimo indicate that the population has not grown at a consistent or predictable rate. In the fifty three years from 1941 to 1994, the RDN's population has increased by more than 630%. Five year growth rates between census periods have varied from a low of 7% to a high of 29%.

[12] Also refer to "Population, Demographic, and Economic Forecasts for the Regional District of Nanaimo", March 1995, Regional Challenge and Choice, Regional District of Nanaimo.

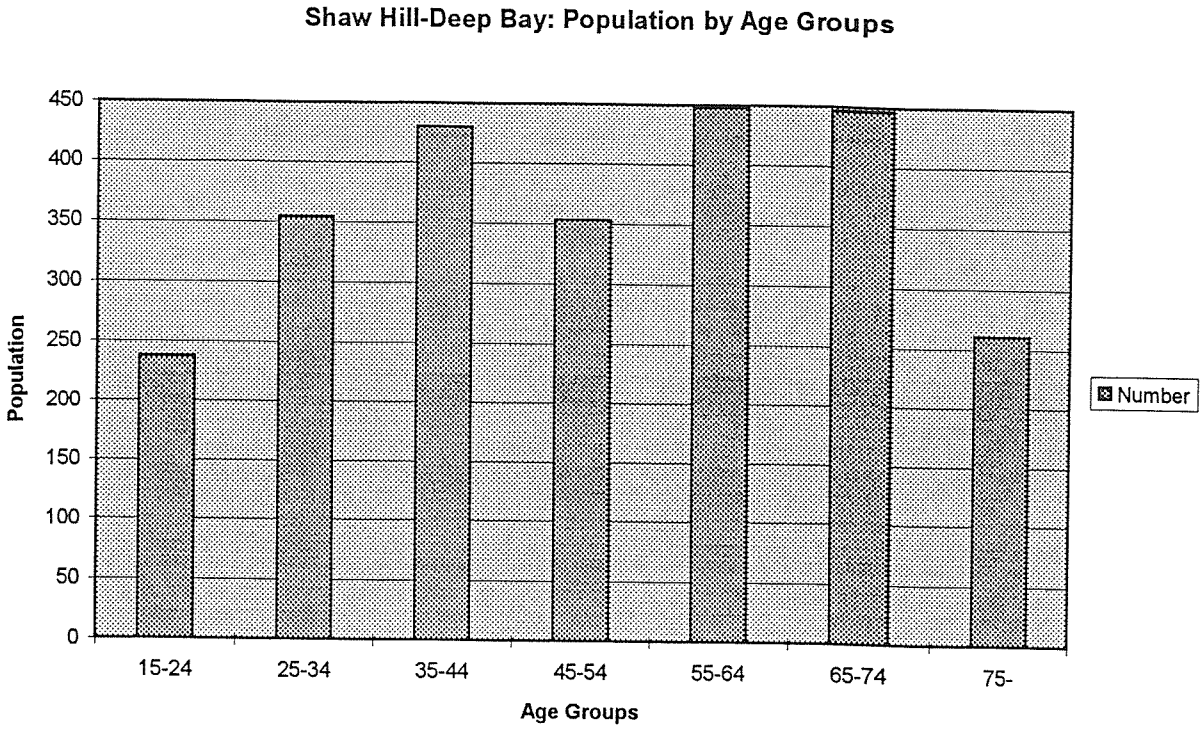
Shaw Hill-Deep Bay: Actual and Projected Population



3.1.2 Age Trends

The Regional District of Nanaimo is experiencing population increases in all age categories. Increases in the number and proportion of seniors, middle-aged people, and in the number of children, and decreases in the proportion of young adults in the 20-34 age category are noticeable trends.

Seniors represent one of the fastest growing groups in the Plan Area.



3.1.3 Household Size

The average Regional District of Nanaimo household size declined gradually between 1981 and 1991. This is consistent with a Canada-wide trend towards smaller households. In general, people are marrying later and having smaller families. Single-person households are also more common due to increases in the number of unmarried and elderly single people.

The trend towards smaller household sizes is less evident in Shaw Hill - Deep Bay because household sizes in general have tended to be lower in this area of the Regional District of Nanaimo. Statistics reveal that the average household size was 2.4 persons per household in the 1981, 1986 and 1991 census counts

3.1.4 Dwelling Unit Projections

With the increase in population expected within the Plan Area, it is projected that between 900 and 2000 new dwelling units will be needed in the jurisdiction by the year 2021.

3.2 Economic Activity

3.2.1 General

Economic activity in the Plan Area focuses around primary resources (forestry, fishing and agriculture), tourism and support services for the population. Tourism and support services appear to be playing a larger role than in the past, with the number of persons reliant on forestry and the commercial fisheries for employment remaining constant and the number of persons employed in the service industry rising. The high proportion of retirement age persons has a strong influence on the development of the economy in the region, they provide a strong economic drive to the development of the community through their retirement incomes and also influence the types of services which develop.

3.2.2. Tourism

The outdoor resources and accessibility to fishing areas contribute to the appeal of the Plan Area as a tourism and outdoor recreation destination for non residents. The tourism draws include the provincial parks, fish hatcheries, beach access points, government wharf in Deep Bay and extensive forested areas.

The type of tourist accommodation generally offered consists of campsites, RV units and small motels. Most developments are dependent on their seaside or riverside location with beach activities, boat launches, boat rentals, fishing or charter boating available to the guests.

Most of the resorts and campgrounds are long established destination areas. The Ministry of Tourism, Recreation and Culture's accommodation guide lists 18 establishments in the Plan Area. Also, the Plan Area includes a number of campgrounds which have been converted from serving the traveling public (or short term visitor accommodation) into campgrounds with seasonal clientele who return to a designated campsite year after year. Texada Logging Company operates campsites for the traveler at the western end of Horne Lake, at the mouth of the Big Qualicum River.

The Plan Area also has a high number of privately owned seasonal residences. These include summer dwellings and cabins which may not be occupied all year. In particular, Horne Lake has a concentration of summer cabins but there is also seasonal occupation within rural residential areas as well. This seasonal population is not reflected in the census population projections but it contributes to the economy of the Plan Area while demanding some of the same services and outdoor recreation opportunities as permanent residents of the Plan Area.

The estimated overnight tourist accommodation for the Plan Area is between 3500 - 4000 persons during peak periods (not including wilderness camping or private forest land).

In addition to accommodation, there are several restaurants and combined cafe, grocery and service stations which serve both residents and tourists. Several handicraft and souvenir outlets also serve both markets.

Major Economic Activities in the Plan Area

(not in order of importance)

1. Forest companies (e.g. Macmillan Bloedel) and contractors
2. Tourist accommodations and resorts
3. Small construction companies and construction supply
4. Agriculture
5. Services (restaurant, realty, office automotive, bank, secretarial service)
6. Stores (grocery, craft, electric)
7. Small industries
8. Commercial fishing
9. Oyster leases
10. Fish hatcheries
11. Utilities (ie waterworks operations)
12. Qualicum Indian Band Fish Processing Plant

Tourist and Resort Accommodation

NAME OF ACCOMMODATION	LOCATION	RESORT	CAMPING	TOTAL
1. Qualicum Beach Trailer Park	Dashwood		23	23
2. Ocean Beach Resort	Dashwood	1	10	11
3. Riverside Resort	Dashwood	35	47	82
4. Cedar Grove Tent and Trailer Park	Dashwood	4	100	104
5. Costa Lotta Campground	Costa Lotta		70	70
6. Green Gables	Qualicum Bay	6		6
7. Lighthouse Motel	Bowser	4		4
8. Avorado Trailer Park	Qualicum Bay		66	66
9. Casa Del Mar Motel	Qualicum Bay	4	9	13
10. Wavecrest Cottages	Qualicum Bay	2		2
11. Sea Flame Beach Resort	Qualicum Bay	3		3
12. Shady Shore Fishing Resort	S/Bowser	7		7
13. La Bella Vista	Bowser	10	16	26
14. Bowser Bill's	Bowser	4	68	72
15. Seacroft Resort	Bowser	18		18
16. Mapleguard Resort Motel	Deep Bay	4		4
17. Deep Bay Fishing Resort	Deep Bay	3	85	88
18. Ship & Shore Marine Campground	Deep Bay		14	14
19. Horne Lake - Texada	Horne Lake	350	37	
20. Spider Lake Springs	Spider Lake		278	278
Total		455	823	1278

3.2.3 Industrial

Light industrial development occurs in a limited fashion in the Plan Area. Extensive industrial uses are more appropriately located on serviced land adjacent to larger market areas such as Parksville and Nanaimo. Some gravel extraction activities for forestry and highway road maintenance occur inland form the Island Highway.

3.2.4 Institutional

The major institutional uses in the Plan Area are the two community halls, two churches, school properties, firehalls and miscellaneous areas associated with the community water works (ie well locations). Federal and provincial regional ministry offices and hospital services are located in the more urban areas such as

Nanaimo, Parksville, Qualicum Beach and Comox, with the exception of the two federally owned fish hatcheries. These is also a lodge providing care for the elderly (Arranglen). Several duplexes near Lighthouse Country Community Centre are managed by the Qualicum Bay Lions Club for the elderly. Additional units are anticipated.

Resource Sector

3.2.5 Fisheries

Management of sport and commercial fisheries is carried out by federal (Fisheries and Oceans Canada) and provincial (Ministry of Environment, Fish and Wildlife Branch) agencies. The federal government regulates the number of licenses for fishing vessels and determines catch limits and/or permitted fishing days. It also funds the Salmonid Enhancement Program, which is a major investment designed to increase anadromous fish stocks to historic levels. The two major hatcheries within the Plan Area on the Big Qualicum and Little Qualicum Rivers are a part of this strategy.

The government wharf in Deep Bay, located in the only natural harbour in the Plan Area, offers moorage to both sport and commercial fishing vessels. However, moorage facilities are inadequate to meet demands in the spring herring season and periodically in the fall, with excess vessels anchoring in the bay. Approximately 60 vessels may overwinter at the wharf.

It is difficult to estimate the value of the resource to the economy of the Plan Area. Both catch numbers and the value of the catch vary yearly, and specific numbers attributable to the Plan Area only are not available.

3.2.6 Aquatic Resources

In terms of aquatic environments, the Plan Area is part of the eastern Vancouver Island stream and river system that is highly valued for its salmonid production capability. Compared to most other coastal areas of British Columbia where watersheds are in igneous rock zones that have low biological productivity, the eastern Island has streams that are productive and cumulatively very important for the commercial and recreational catch of salmon. The Regional District of Nanaimo contains some of the most productive anadromous fish streams in the province where virtually every permanent stream draining into the Strait of Georgia contain populations of one or more sea run fish. Of these streams, the Big and Little Qualicum Rivers are among the most highly valued for production of steelhead, coho, chinook, chum and pink salmon. The Federal Department of Fisheries and Oceans have developed substantial hatchery facilities on the Big and

Little Qualicum Rivers as part of the Salmonid Enhancement Program, designed to restore salmon and steelhead stocks to their historic (pre 1900) levels.

Both the Big and Little Qualicum Rivers have significant investments in hatcheries through the Salmonid Enhancement Program. The Big Qualicum hatchery offers a controlled river environment including flow volumes and temperatures, engineered rearing pools and settling basins, semi-natural rearing channels, artificial spawning channel, hatchery facilities and marking facilities. Little Qualicum has a spawning channel for chum and spawning and rearing facilities (recently doubled in size) for Chinook. Little Qualicum raises some incidental coho in addition to the chum and chinook and has a natural fishery outside of the hatchery which includes sockeye, coho, chum and chinook.

All of the small streams with permanent flows also support anadromous fishes, eg Fletcher Creek - coho and cutthroat trout; and, Nile Creek - coho, chum, steelhead and cutthroat trout. Most of these streams have problems with minimum flows due to the low summer rainfall. Number of fish returning to spawn are typically low, usually between 0 and 100 coho and chum. Some stream improvement such a fry plantings and incubation boxes could improve fish numbers. Horne Lake is one of the more significant fishery lakes on the east coast of the Island. As the main water source for the Big Qualicum hatchery, retention of the shore line in a relatively undeveloped state is preferable in order to maintain the high water quality required by the downstream hatchery facilities. The lake is also an important fish habitat in its own right supporting rainbow trout and natural populations of cutthroat trout and kokanee. The smaller, warm lakes in the Plan Area, Illusion and Spider, offer a different kind of sport fishing opportunity, namely small mouth bass.

4. NATURAL ENVIRONMENT

The major challenge for the Shaw Hill - Deep Bay Plan Area residents and the Regional District is finding an acceptable mix of natural environment features and community development which will retain the natural amenities valued by the people and at the same time allow controlled growth and development in appropriate locations.

The relatively small population of the Plan Area has in the past enjoyed the benefits of the natural environment with ample water, coastal rural setting with relatively undisturbed forests and natural resources. As more and more people move to Vancouver Island, Shaw Hill - Deep Bay will become more attractive for residential settlement. It will be necessary to take more care in evaluating the sustainability of the natural environment to guide land use planning in the Plan Area.

4.1 Environmentally Sensitive Areas

The Official Community Plan will identify Environmentally Sensitive Areas which require protection from inappropriate land use and environmental degradation. The plan will guide land use and management in a manner which identifies environmentally sensitive features of all watercourses, lakes, marshlands, and in some cases upland and forest areas possessing high biotic capability for flora and fauna. The plan will also identify hazard lands where topography, unstable soils or potential for flooding or erosion may cause loss of life, property or environmental damage due to inappropriate land use or vegetation removal.[13]

An area in which a human activity can detrimentally alter a habitat which is significant or critical to particular flora or fauna is considered environmentally sensitive. In some environments careful development and management policies can mitigate or minimize impacts of development, however, in other cases any human interference can result in significant alteration of the environment. Sensitive habitats within the Plan Area have been noted on Map No. 3 of Schedule 'A' of the Official Community Plan which designates these areas as environmentally sensitive.

The most critical areas are those which are non-replaceable habitat for a component of a species' lifecycle. Included in this category are estuarine and wetland areas for their productivity and their importance as overwintering areas for waterfowl. Also the Plan

[13] In many cases management policies must be designed for the specific characteristics of the environment and demands of a proposed development. The manuals include:

"Guidelines for Watershed Management of Crown Lands used as Community Water Supplies", B.C. Ministry of Environment;

"A Handbook for Forest and Roadside Erosion Control in British Columbia", B.C. Ministry of Forestry, Land Management Report No. 4;

"Guidelines for Land Development and Protection of the Aquatic Environment", Fisheries and Oceans Canada.

Area includes sites which exhibit unique vegetation characteristics. For example, west of Deep Bay along the northerly most portion of the Plan Area is a representative stand of first growth Douglas Fir/Grand Fir and Red Cedar. This ecologically sensitive site is part of a unique ecosystem which is coincidentally over a major aquifer in the north end of the Regional District.

This area, without protection will become more accessible to competing forestry or agricultural uses as it is in the vicinity of a major highway intersection with the new Island Highway. For this reason it should be a high priority to retain this area as representative of the original forest cover in the Regional District. This sensitive area extends into Gainsburg Swamp and has been identified by the Province as a candidate protected area under the Protected Areas Strategy.

The vegetation along the shores of estuarine environments also has a particular importance for its role in anadromous fish lifecycles (rearing and transportation route to spawning areas). Ramifications from loss of habitat would effect commercial and sport fishing activities.

In the marine environment, the subtidal zone and in particular, areas of marine vegetation and salt marshes (in addition to estuarine habitats) are considered sensitive and usually require specific management practices to maintain their viability.

On the landward side, stream protection areas have been delineated to indicate zones in which attention must be paid to water quality concerns and protection of fish habitat. A broad zone has been defined based on the extent of flood prone soils and bluffs paralleling the watercourses. Careless development and land clearing in these zones may destroy shoreline vegetation along creeks and rivers, weaken slopes, increase runoff and increase the threat of flash flooding, erosion and stream sedimentation[14]. Luckily the Plan Area is blessed with considerable Federal Fisheries ownership along the shores of Big Qualicum and Little Qualicum Rivers, however stream protection should be a high priority on all watercourses in the Plan Area on privately owned land which may be subject to land clearing or development.[15]

The Integrated Management and Habitat Management Divisions of the Ministry of Environment, Lands and Parks and the Department of Fisheries and Oceans recently

[14] Streamside clearing either from agricultural activities, forestry operations or urban development can affect stream water quality, aquatic habitat and fish population it supports. Vegetation removal leads to loss of shading, causing increased summer water temperatures, decreased dissolved oxygen levels and aquatic food production, a severe reduction in stream bank stability leading to increased erosion and sediment loading, and accelerated overland runoff causing more pollutants to enter the watercourse. (Source: Land Development Guidelines for the Protection of the Habitat, May 1992, Ministry of Environment Lands and Parks and Department of Fisheries and Oceans).

[15] Only a low level of toxicity from various agricultural chemicals, wood debris, nutrients, chlorine, or other substances is required to impair a river's quality for fish rearing. In the same manner excessive sediment loading can suffocate salmon eggs during incubation or cause excessive gill irritation to maturing fish. In many regards, these problems can be overcome and satisfactory aquatic environments maintained if careful land use practices are followed on shorelands and creekside properties.

produced "Land Development Guidelines for the Protection of the Aquatic Habitat" (May 1992). This document provides land owners, developers and government agencies with some fundamental guidelines to protect fish habitat from the damaging effects of land development activities. The Regional District, in cooperation with senior government agencies, is in the process of using these and other guidelines to develop planning strategies to protect greenways, natural vegetation along stream banks, bluffs and watercourses. Strategies include implementing setbacks and establishing development permit areas in Official Community Plans.[16]

4.2 Fresh Water

One of the primary concerns of residents of Shaw Hill - Deep Bay is the protection and distribution of water resources and new development in the Plan Area. Some areas in the Plan Area have surplus water, whereas other areas appear to be more susceptible to supply deficits. Surface water and groundwater are also not totally independent of one another. For instance, during periods of low rainfall, groundwater flows are essential for recharging rivers and streams. In other cases, surface water charges aquifers. This inter-relationship suggests that both sources should be managed conjunctively, when possible, since problems may arise when they are not.

The location of major aquifers corresponds to the distribution of *quadra sands*[17] in the Plan Area. Springs and seepage are found wherever quadra sands are exposed to cutbanks and seacliffs, and the groundwater discharged by them contributes substantially to the flow of rivers and streams during the summer months. Since the Quadra Sands and aquifers are not continuous within the Plan Area, the quality and quantity of water resources must be carefully managed.

The nature of future development and infrastructure must be considered in light of potential impacts on domestic water supplies. Rural and suburban densities should be contained within areas where existing community water systems and infrastructure are available, and future water systems should be more centralized and only provided in areas where sewage disposal and drainage infrastructure are provided in a manner which does not degrade environmentally sensitive areas or the supply of water. Land which had historically been developed with suburban residential lots have relied upon on-site septic

[16] The retention of a leave strip of sufficient width would isolate a stream from direct physical disturbance plus provide a dense canopy of vegetation along a stream; binding the stream band and soil (preventing erosion), moderating water temperatures and providing food nutrients. The ideal green strip would be preserved in a naturally vegetated , totally undisturbed state. However, under certain circumstances, where it is believed stream water quality will not be adversely affected, the green strip may be utilized for the construction of minor hiking trails and landscaping to increase the quantity of trees and shrubs in the leave strip or for permanent detention ponds.

[17] Coastal Survey of Canada, Bulletin 144, "Ground water Resources of the Coastal Lowland and Adjacent Islands, Nanoose Bay to Campbell River, East Coast of Vancouver Island". Department of Mines and Technical Surveys, Canada, 1966.

disposal connected to small private community water systems[18]. Continuation of unplanned rural development and land clearing, particularly over the aquifers, may endanger the very source of water which existing residents rely upon. If the source of water for a proposed development is to be from a groundwater source, the long term reliability of the source of supply should be certified by a qualified professional engineer or geoscientist with proven knowledge and experience in groundwater development. Also BC Environment recommends the preparation of a hydrogeologic impact assessment of the water source development on the water supplies of existing residential areas and any nearby surface water resources. Planning for community water must also go hand in hand with the planning and long-term maintenance of drainage and sewage disposal, otherwise the community may increasingly be faced with the risk of contamination.[19]

The availability of sufficient quality quantities of fresh water to supply existing rural development and Water Improvement District needs has been expressed as a major concern in the Dashwood Area. Dashwood Improvement District may be forced to drill deeper and deeper wells due to the increased demands on the Little Qualicum acquifer. The implications of residential development on the Dashwood Water System as well as private rural wells in unincorporated areas, which may share the same aquifer, needs to be considered for future land use and infrastructure decisions at Little Qualicum. A solution to this may be the establishment of a regional system on the Englishman River to supply the Lantzville to Qualicum Corridor thereby limiting the impacts to the existing ground water source. This would also allow the management activities in the Little Qualicum Watershed to focus on fisheries, recreation and forestry values.

All land uses including residential development, industrial, agricultural, forestry and mining have an impact on the quantity and quality of surface and ground water. It is essential to direct land development for residential or commercial purposes is to those areas which have an adequate supply of fresh water, where resource use does not impact on the water quality, and where protected agricultural areas have adequate clean water to be fully productive. Both domestic and agricultural water sources must be planned and managed with assurances that there will be no groundwater or surface water contamination.[20] The Plan Area has considerable capability for agricultural and forestry

[18] The pattern of residential development in Shaw Hill Deep Bay was largely focused along the coastal area east of the Island Highway. Fortunately most of the coastal suburban residential community has easy access to large reserves of water on quadra sands aquifers and are serviced by Community Water Improvement Districts at Deep Bay, Bowser, Qualicum Bay, and Dashwood.

[19] BC Environment is responsible for licensing the use of surface water in the Plan Area. The Water Protection Act which was recently adopted (Bill 9 - 1995) is intended to foster sustainable use of water resources and for conserving and protecting the environment. BC Environment requires that if the water supply to a proposed subdivision is to be provided from a surface water source such as a creek, lake or spring, then the long term reliability of that supply must be certified by a qualified professional with the proven knowledge and experience of surface water hydrology. The hydrological report should also confirm that there will be no detrimental effect on the water supply of adjacent properties or other users of the water resource which includes instream fisheries requirements.

[20] Farmers are able to make a significant contribution towards managing the aquatic resource. Since the over application of fertilizers, whether natural stock wastes or commercial products, usually end up in nearby watercourses resulting in reduced

development as well as residential and commercial development. These uses must be accommodated in a compatible manner and not through competition for or depletion of the water source.

A report entitled Water Management in the Regional District of Nanaimo, Regional Issues and Enhanced Management Opportunities[21] advocates a regional approach to water resource planning which would provide a framework for addressing existing and potential water management issues. The report suggests that there is an urgent need to clarify agency roles and responsibilities with regard to water resources planning system. Without clarity of role or purpose, the existing inefficient deployment between municipalities, water utilities and individual users over finite water supplies will worsen. Cooperation, collaboration, and the development of partnerships between all four levels of government are required to maintain the long-term security of water quantity and quality in the Regional District.

4.3 Drainage Management

Another issue which the community expressed concern for is the need to provide adequate drainage management to all areas, and in particular, to those areas which are developed at small lot densities. As the density of development increases, there is potential for the storm water runoff to increase as a result of the development. Increased storm water run off may impact fish habitat and increase the risk of downstream flooding or erosion. Exacerbating the problem, the reliance on septic tile fields in the Plan Area means that there is a long term risk of contamination of the drainage network, groundwater and watercourses through septic system failure.

Steps need to be taken to ensure that sewage disposal systems would be constructed and maintained in a manner which precludes sewage from reaching the drainage network. This will require coordination with provincial agencies, including Ministry of Health, BC Environment and the Ministry of Transportation and Highways. The approval of drainage for land development has traditionally been the responsibility of Ministry of Transportation and Highways, and approvals are based on incremental evaluation of subdivision applications without comprehensive drainage planning or management. For the most part the Approving Officer considers subdivision based on the efficiency of roadway drainage for each subdivision application and not the probability or implications of future failures of

dissolved oxygen content and aquatic food production, the use of these substances should be closely tied to the assimilative capacity of the soil. Another cause of watercourse contamination is the leaching of animal wastes from storage areas or stock impoundments, where such wastes are concentrated. Efforts should be made to contain these wastes and prevent their entering the drainage network. Likewise, feedlot operations should be well removed from fish bearing streams. Furthermore, livestock should not be permitted unrestricted access to streams for watering purposes since this results in the direct introduction into the watercourse of stock wastes, as well as accelerating erosion and downstream sediment loading through streamband trampling.

[21] Water Management in the Regional District, Regional Issues and Enhanced Management Opportunities, Regional Challenge and Choice, consultant report conducted for the Regional District of Nanaimo, Westland Resource Group, Brian Szuster, July 1995.

septic tile fields or contamination. BC Environment has been encouraging the Regional District to consider more comprehensive storm water management planning and facilities prior to designating land for further development.

4.4 Natural Hazards

Natural hazard areas include mapping units prone to flooding and steep slopes subject to mass movement. The following is a summary of the issues related to natural hazards which may exist in the Plan Area and must be considered in future land use decisions. Potential hazard areas will be identified in the environmentally sensitive areas and hazard land map, (Map #3) in the Official Community Plan:

A number of Suburban Residential parcels along the waterfront in the Bowser and Dashwood are straddling steep wave-cut bluffs (30% to 60% slopes) composed of unconsolidated sand. The combination of terrestrial landform and marine erosion processes has created zones that are prone to erosion and sudden mass movement. The community has expressed concern about the probability of landslide, and a concern that without building permit approval, illegally sited structures may have been constructed in hazard prone areas.

The open coast and the dynamic balance of erosion and deposition processes of the drift sectors in the marine environment also pose limitations to major developments such as large scale marinas between Qualicum Beach and Mapleguard Point. Beaches and raised beaches are noted on Map No. 3 of the Official Community Plan as they are natural hazard areas.

A major limitation to development occurs in locations where a combination of soil characteristics, such as poor drainage and fine texture, lead to low suitability for septic tanks. Areas within the lowlands with a low suitability for septic tanks are available through Maps B.C. or for viewing at the Regional District[22]. Specific mapping for the highland areas is not available, but excessive slope and shallow soils over bedrock generally result in low suitabilities.

The river mouths and estuaries of all the major rivers and creeks flowing into the Strait of Georgia are prone to flooding. A combination of high incoming tides and heavy run-off may cause flooding of the adjacent low lying shoreline and the delta areas. In addition, the valley bottom of the Little Qualicum River is also an area of flood hazard as is the upper Big Qualicum River delta at the west end of Horne Lake. Further inland two areas on the Big Qualicum River and Nile Creek are considered hazardous due to the steepness of the

[22]Map sheets entitled "Soils Affected by Flooding and/or Watertable" and "Soils" (for slope classes) Additional information on soil characteristics which may affect suitability for development is available in the map series noted earlier (from Maps B.C.). Soil drainage, watertable levels and soil surface erosion potential are included.

slopes (up to 60%) cut into unconsolidated sand by the water courses. Gullies are evident and the slopes and brow are prone to erosion and sudden mass movement.

The highlands and mountains also have numerous areas of potential hazard. The steep slopes and the veneer of colluvial material over bedrock makes these areas sources of rockfalls and avalanches. An example of such an occurrence is clearly visible at the west end of Horne Lake adjacent to the delta of the upper Qualicum River. Caution should be exercised, especially at the northwest end of Horne Lake where seasonal residences may be in danger from avalanches or flooding.

Seismic activity is a potential hazard to the Plan Area. Vancouver Island is located within Zone 3 of the Seismic Zoning Map. Zone 3 indicates the greatest risk of earthquake in Canada. The June 23, 1946 quake, which was the most damaging in the history of Western Canada with a magnitude of 7.3 on the Richter scale, had its epicenter in the vicinity of Comox, about 70 km from Qualicum Beach. An event of this magnitude is projected to occur every 300 years.[23]

The Provincial Building Code provides minimum standards which assure an acceptable level of public safety by designing buildings to prevent major failure and loss of life. Structures designed in accordance with the earth quake load provisions of the code should resist moderate earthquakes without significant damage and major earthquakes without collapse, although there may be some structural damage. However, this code is not enforced within Electoral Area 'H' in the past due to the absence of building inspection authority

4.5 *Local Government Tools for Protecting the Environment*

The Municipal Act and other legislation provide important regulating mechanisms which could be used by the Regional District and Provincial Agencies to protect the Environment. Although these tools are available, not all of them are widely used. The following summary of some of these tools is provided to increase community awareness and to encourage their consideration where appropriate.

- **Restrictive Covenants**

  Restrictive covenants are an agreement or a form of contract, whereby the landowner (and successors) agree to abide by certain provisions or to contact an agency (Usually both BC Environment and the Regional District) for approval before carrying out

[23] Estimates of earthquake probability are based on a statistical analysis of the historical earthquake data (1899 to the present). An accurate prediction of tectonic activity is not possible with such a short period of record. Therefore, the data has been processed to estimate possible levels of seismic activity in the near future assuming a continuation of the statistical pattern of past years. Based on an empirical relationship between intensity and ground acceleration, an intensity VIII earthquake is derived for the Plan Area. That is, an earthquake of about 6.2 on the Richter scale has a probable return period of 200 years. Even higher intensities may be anticipated on ground that is somewhat unstable. The 100 year return period earthquake has an acceleration amplitude of 9%, thus possibility of a moderate to a strong earthquake should be considered.

works. The advantage of restrictive covenants is that they are registered on the property title, and theoretically, mandated on future owners of land. In practice, restrictive covenants are difficult to enforce. Civil litigation may be required to enact the terms of the covenant and it becomes difficult to pursue litigation as the damage to the environment caused by removal of natural materials is often completed and irreversible (although the Province may take more stringent enforcement action in cases of serious contravention). Covenants are, however, valuable for advising and informing the future owners on the environmental restrictions on a parcel with the hope that most people (through awareness) will comply. Covenants may be added when lands are subdivided, rezoned, developed pursuant to a development permit, or at the initiation of the landowner.

- **Tree Cutting Bylaws**

  The Regional District may consider adopting tree cutting permit bylaws to protect areas susceptible to erosion or hazardous terrain, or to protect property from flooding conditions. This option has not been considered within the Plan Area since the Municipal Act introduced the Tree Cutting Permit provisions in 1986. Implementation by the Regional District would require administrative and political support for identifying and designating tree cutting permit areas through bylaw.

- **Development Permit Areas**

  A greater degree of control of development may be possible with designation of development permit areas in the Official Community Plan. Through development permits provisions can be enacted to protect specific shores and rivers, streams and other unique sensitive habitats and hazardous lands. However, this may be limited to control of new development and may be difficult to apply retroactively to existing residential lands. Development Permit Area designations in the Official Community Plan may be a very effective way of establishing the justification and guidelines for more specific conditions which would have to be met prior to development permit being issued for construction on, or alteration of land which may include environmentally sensitive or hazardous lands.

- **Building Inspection**

  Building inspection is intended to regulate the construction, alteration or repair of buildings and structures for the health, safety, and protection of persons or property. The authority for building inspection is an effective tool to assure buildings are built to the standards of the National Building Code of Canada, the Health Act, the Fire Services Act, and with zoning regulations.

  Where there is building inspection authority, the building inspector has the discretion to require an owner of land which is subject to flooding, mud flows, erosion, land slip, rockfalls and other hazards to provide a report certified by a geotechnical engineer that

the land may be used safely for the use intended. At the time of preparing this plan, only the portion of the Plan Area within Electoral Area "G" is included in a building inspection area. There is no building inspection in Electoral Area "H" and this area faces a greater problem of enforcement when buildings do not comply with the zoning bylaw since illegal construction is not detected due to a lack of mandatory inspection. In fact without building inspection authority, a "stop work order" cannot be issued by an the Regional District and the community ends up paying more when enforcement is pursued through costly legal court actions..

Residents who participated in the focus group meetings for Qualicum Bay, Bowser and Deep Bay indicated general support for building inspection especially in more concentrated residential areas and along the coastline and watercourses that include hazardous shoreline bluffs and erosion features. There were also suggestions to make building inspection more convenient and accessible to the community. One suggestion was to locate a sub-office in the Plan Area where a building inspector would be available part time to receive applications. (An unfounded but common perception in the community, expressed at the focus groups by residents who oppose building inspection, is the notion that building inspection would prevent temporary accommodation on a property in a building or trailer while constructing a principal residence. The Regional District in fact provides temporary occupancy permits to allow an owner to occupy a building while construction of the principal dwelling is carried on site). The greatest advantage of building inspection is that it assures that construction is conducted in accordance with the building code and in compliance with zoning regulations. Without building inspection, buildings are often constructed in a manner which may be illegal pursuant to the zoning bylaw or which is susceptible to property damage. It is therefore highly recommended that the building inspection function be considered for the entire Plan Area provided there is support from the community..

- **Amenity Bonusing - Section 963.1 Municipal Act**

  A relatively new clause in the Municipal Act allows local governments to provide for density bonuses to a landowner in circumstances where the owner dedicates or protects a natural feature that the community considers as an "amenity". Such a system of bonusing has the potential of encouraging land owners proposing development to set aside amenities (which may include important natural areas) with minimal public expenditure.

- **Return to Crown**

  Larger developments could be susceptible to provisions of the Municipal Act regarding return of portions of the land to the Crown for park, conservation, roadway, or other purposes. Inclusion of the bank of creeks and rivers (and creek beds and the bottom of lakes and rivers where applicable) could provide greater protection. The

Regional District has the jurisdiction to require return to crown parkland for community park purposes. Return to crown to protect greenways along watercourses requires initiative from Ministry of Environment, Lands and Parks through the subdivision review process.

- **Outright Purchase or Title Acquisition**

  Purchase of sensitive lands by regional, provincial or federal governments, as well as non-government organizations (or private donation of lands for environment protection purposes) may in some cases be the only way of protecting an environmentally sensitive feature on private lands where acquisition would be in public interest.

- **Education**

  The role of education in informing landowners of the impact of their activities should not be underestimated. In the current climate of environmental awareness and activism, a higher profile for wildlife, fish habitat and riparian areas could be generated by Schools, local fish and game and/or naturalist societies and other organizations in association local government, fisheries staff and other organizations such as the Canadian Wildlife Service.

5. Resource Uses

This section will review the major resource uses within Shaw Hill - Deep Bay, including: Agriculture, Forestry, Mining and Fisheries. Each of these uses contribute significantly to the economy of the Region and requires careful management to assure compatibility with surrounding land uses and the environment and where applicable, sustainability.

5.1 Agriculture

Although agriculture played a role in the early settlement pattern of the Plan Area (See section 2.3 which discusses early European Settlement and Vancouver Island Fruitlands) and has been an important activity on the east coast of Vancouver Island, it has not played a dominant role in Shaw Hill-Deep Bay. Most farm holdings are small, partly because of the scattered distribution of productive soils in the coastal lowlands and the trend toward smaller holdings more suitable for retirement and hobby farming

Most lands with high capability for agricultural use have been designated Agricultural Land Reserve (A.L.R.)[24]. They are subject to the provisions of the Agricultural Land Commission Act which is regulated by the British Columbia Agricultural Land Commission. The Commission is the principal agency responsible for regulating both the use and subdivision of A.L.R. lands. The Regional District continues to support the mandate of the B.C. Agricultural Land Commission for preservation of agricultural land and its development for food production and recognizes A.L.R. Lands as environmentally constrained and not appropriate for non-farm development.

The Agricultural Land Reserve (A.L.R.) has and will continue to have an important bearing on land use patterns within the Plan Area for several reasons. First, approximately 20 % of the total Plan Area is classified as A.L.R. Second, a large proportion of the A.L.R. Lands are protected for future agricultural use and remain undeveloped. Third, agriculture is both a primary and secondary source of income for some residents.

The major blocks of A.L.R. lands are in the southeastern part of the lowlands, between the Little and Big Qualicum Rivers. Three other large blocks are located in Qualicum, Bowser and Deep Bay. Much of the land in the A.L.R and other lands with capability for agriculture are located within Provincial Forest Reserves or parcels privately held by major logging companies. This overlapping of forestry uses on lands with agricultural potential partially accounts for the relatively low acreage in actual agricultural use and the restricted

[24] The distribution of high capability agricultural lands is shown on Constituent Map Nos. 1, 2, 3, 4 and 5 through ALR boundaries available at the Regional District. The soils developed on marine parent materials or the finer textured fluvial and fluvial-glacial materials have the highest improved capability ratings. Many of the fluvial and fluvial-glacial soils are too coarse textured for extensive agricultural use. While areas of high capability (C.L.I. Classes 1 and 2) are not common, there are large areas with improved ratings of Classes 3 and 4. Classes improvable to 1 to 4 are generally included within the A.L.R.; Classes 5 to 7 have too many limitations to sustain most agricultural uses.

use of the A.L.R. designation in marginal lands (i.e., Class 5 improvable to Class 4). Although the intent of the plan is that farm units be retained at their present size or expanded through lot consolidation (thus making them more economically viable), it is also recognized that existing small scale farm operations play an important role in society. Not only do these operations provide a country lifestyle, but holdings could in turn be utilized for greenhouse operations, market gardening, orchards and other labor intensive farm activities which are less likely to occur on larger farm holdings. However, due to the high frequency of small acreages which already exist in the Shaw Hill-Deep Bay Area (5 - 20 acres), future subdivision of land for small scale farms should only be permitted on isolated pockets of unimproved land well removed from active farming areas. The provision for small size farm parcels within the Agricultural Land Reserve is conditional upon the consent of the Agricultural Land Commission.

While the regulations governing the A.L.R. largely ensure the protection of arable soils, problems still develop on the interface between urbanizing areas and agricultural communities. These problems are usually associated with possible unreasonable odours, noise or other nuisances. In many cases problems may be minimized by proper farm management techniques. In other cases there needs to be protection for farmers and their investments while at the same time considering the needs of non-farm residents.

Recently the Provincial Government adopted the *Farm Practices Protection (Right to Farm Act)* which provides legislative protection to farm operations and provides exemptions for farm operations to certain local restrictions (such as a nuisance bylaw) but at the same time establishes a panel for hearing and resolving complaints related to the use of agricultural land. The *Municipal Act* has also been amended to provide Development Permit Area provisions for protection of farming and also now requires approval from the minister under the *Farm Practices Protection (Right to Farm) Act* for any prohibitions or restrictions related to the use of land for a farm business in a farming area.

5.2 Forestry

A major portion of the land base in the Plan Area is managed for forestry purposes. However, given the multiplicity of private forest land ownership in the Plan Area, a *sustained yield* has historically been difficult to achieve[25]. As the coastal lowland within

[25] Sustained yield is achieved when "the same volume being harvested as the forest is capable of producing in any given time period" (BC Forests). It should be noted that the Ministry of Forests is the principal agency responsible for administering the Forestry Practices Code which also applies to private forest lands. The Regional District supports the F.L.R. and the Forestry Practices Code which together encourage sustainable management of the forest resources within Shaw Hill - Deep Bay. All land in the F.L.R. have been recognized as environmentally constrained by the Regional District. A legacy of the E. & N. Railroad land grant is the high proportion of privately held forest lands compared to Crown lands under Forest Reserve, which had to be re-acquired by the Crown. Under Section 943(2) of the Municipal Act a local government cannot enact any policies which would restrict forestry management and harvesting activities on land classified as managed forest land under the Assessment Act or land located in a license area under the Forest Act so long as the land continues to be used only for forestry purposes.

the Plan Area was developed for suburban residential and farming purposes, loggers turned their attention to the more mountainous upland slopes and other forest lands. These lands have a high capability for forestry and are particularly valuable because they support the more desirable tree species (Douglas-Fir, Cedar, Hemlock). Over the last eighty years the Plan Area has been extensively logged and the area is now characterized by 20-30 year old second growth forests. Although initially exploited with little thought given to the future, today new energies have been directed towards integrated resource use and sound environmental practices so as to ensure the forest will still be producing for future generations.

The Provincial Government has recently introduced the Forest Land Reserve (F.L.R.) pursuant to the Forest Land Commission Act and the Forest Practices Code. The B.C. Land Commission is responsible for administering applications for exclusion, non-forestry use, or subdivision of F.L.R. Lands. This F.L.R. designation applies to managed private and public forest lands (interim F.L.R. boundary maps are available at the Regional District for viewing.) The F.L.R. designation generally include lands classified Class 7 Managed Forests in the Assessment Rolls.

5.3 Mineral, Aggregate and Hydrocarbon Resources

It is appropriate to separate mineral, coal and energy resources from aggregate resources such as sand and gravel, as the Ministry of Energy, Mines and Petroleum Resources mandate is different for these two broad categories. The Ministry's powers for both tenure and operation standards are more comprehensive when dealing with mining issues than it is with aggregate resources.

5.3.1 Aggregate Resources

Government authority with respect to aggregate resources is divided between two agencies:

- The tenuring of aggregate resources on Crown lands is the responsibility of BC Lands under the Land Act.

- The technical management of aggregate development is the responsibility of the Ministry of Energy, Mines and Petroleum Resources pursuant to the Mines Act.

The Ministry of Energy, Mines and Resources mandate with respect to sand and gravel resources on Crown land and private land is limited to permitting for public/worker safety, environmental considerations and reclamation. In other words, for sand and gravel, the Ministry deals with the "how to operate" question, not "whether to operate".

Gravel and sand suitable for concrete aggregate and road building is abundant in many parts of the Plan Area. Substantial areas of moderately high potential for aggregate resources have been identified on reconnaissance scale mapping (1:50,000) and are available for viewing through the Ministry of Energy, Mines and Petroleum Resources. These maps are available through the Ministry. Generally, the locations with high potential for aggregate resources are from Cameron Lake along Little Qualicum River, from the eastern end of Horne Lake to the area surrounding Spider and Illusion Lakes and scattered deposits in the uplands along the Big Qualicum River and large deposits between the 90 and 150 metre contours north of Thames Creek.

5.3.2 Mineral Resources

Mineral Resources are regulated, managed and tenured by the Ministry of Energy, Mines and Petroleum Resources under the Mineral Tenure Act (for tenure) and Mines Act (for exploring and mining).

There are a number of mineral occurrences within the Plan Area, concentrated in the area south of Mount Mark. This area and others within the Plan Area can expect to be subject to mineral exploration activity well into the future. Information on mineral tenures can be obtained from the Gold Commissioner's Office in Nanaimo. Limestone and clay deposits are also found within the Plan Area. The Ministry of Petroleum, Mines and Resources has suggested that these sources may become viable for cement operations in the future.

5.3.3 Coal Resources

Coal resources are managed and tenured by Ministry of Energy, Mines and Petroleum Resources under the Coal Act (for tenure) and Mines Act (for exploration and mining).

Generally, coal potential in the Shaw Hill - Deep Bay Plan Area is considered poor. Although coal-bearing formations extend considerable lengths along the east coast of Vancouver Island, from Duncan to Campbell River. The Plan Area is just south of an area underlain by higher concentrations of Cretaceous units that is coal bearing strata. This coal bearing strata extends from Cowie and Winfred Creeks (located northwest of the Plan Area) to Courtenay and Cumberland.[26]

[26] There were no licenses for coal exploration or mining in the Plan Area at the time this report was prepared.

6 Technical Reference to Background

6.2 Physical Features

This section describes the geologic processes and physical conditions of the Plan Area and provides a brief description of the origins of the landforms.

6.2.1 Terrestrial

Physiographically, the most accessible and developed part of the Plan Area is part of the Nanaimo Coastal Lowland which extends along the east side of Vancouver Island from Jordan River to Sayward. To the east lies the Strait of Georgia and to the west, approximately at the 212 m contour, lies the eastern flank of the Beaufort Range, part of the Vancouver Island Mountains. The Lowland is underlain by sedimentary rock surfaces which were stripped of weathered material and shaped by several episodes of glaciation during the Pleistocene period. The overriding sheets of ice further reduced the low relief by the deposition of a mantle of glacial and fluvio-glacial materials varying between 10 m and 90 m in depth. The weight of the ice also depressed the land below sea level which resulted in some deposition of marine-modified materials as well. When the glaciers began to recede over 12,000 years ago the land surface rebounded leaving marine and shoreline features, such as beach deposits, at considerable distances from existing sea level. Watercourses were also rejuvenated resulting in the cutting of steep narrow-sided valleys along the courses of streams and the Big and Little Qualicum Rivers.

Further inland, the part of the Plan Area above the 240 m contour is composed of sedimentary, volcanic and granitic rock surfaces which have been maturely dissected by valley glaciers and streams. These form a broad highland reaching a maximum height of 1548 m at Mount Joan, although general summit levels are more commonly at the 910 m to 1060 m level. The mountains are actually high points on ridge crests or the upper part of broad topped ridges, with the encroachment by former cirques and river valleys carving some steep slopes and peaks. The valleys are typically narrow, steep-walled troughs shaped by glacial erosion while the steeper tributary valleys are V-shaped. The valley occupied by Horne Lake is part of a larger structural depression although it also owes its form to ice movement.

The present topography of the coastal lowland band, 5-13 km wide, is characterized by a gently undulating surface with local relief generally less than 30 m. The major topographic variations occur in the river and stream valleys where water has eroded the thick mantle of overburden into valleys which become progressively shallower as they near the sea. There are several low lying areas such as the headwaters marsh of Fletcher Creek.

An intriguing geological feature that occurs in the mountainous part of the Plan Area is the limestone solution caves that are contained within Horne Lake Caves Provincial Park. These types of caverns and other features of Karst topography are found in several places on Vancouver island (e.g. west of Campbell River, Gold River area) that have limestone as the bedrock.

The recent geological history described above has resulted in a complex of soils developed on glacial, fluvio-glacial and marine parent materials. The fine textured marine soils can be found up to the 136 m contour, the approximate limit of the marine inundation. Above the marine soils in elevation, and also underlying the marine deposits are the glacial deposits. Fluvial and fluvial-glacial deposits, associated with the river systems and often overlying both the marine and glacial deposits, are generally coarser textured and better drained. Minor areas of organic soils have developed in low lying areas with restricted drainage.

6.2.2 Marine

While inland physiography is generally viewed as essentially static, the coastal zone in contrast is an area of constant, dynamic visible change where physical and biological processes are powered by lunar, solar and gravitational energies. Waves, tides, currents and inflowing rivers alter the water-land interaction zone through the processes of erosion, transport and deposition.

The shoreline of the Plan Area is part of a beach belt that stretches 203 km from Madrona Point (Nanoose) north to Duncan Bay. There are no outcrops of bedrock as there are along the coast south of Madrona Point. It is a long shore drift belt in which the currents flow from the southeast to the northwest. It is broken into three drift sectors, each comprised of interdependent areas of erosion, intermediate accretion and terminal accretion shoreforms. The mouth of the Little Qualicum River is at the western end of a drift sector which starts at Craig Bay. The strong westward drift of beach material has deflected the course of the river at its mouth parallel to the shoreline. The depositional forces have combined to form a barrier spit modified by deltaic deposits and estuarine processes. There are flood hazards in the delta and along the river bottom (floodplain). Limitations include poor drainage and a high water table in the old alluvial terraces, fans and morainal deposits. There is some shoreline erosion west of the spit tip.

The shoreline from the mouth of the Little Qualicum to the Big Qualicum River comprises another drift sector composed largely of intermediate accretion beach shores of gravel and sand. The beach berms along a broad area of D.L. 89 and adjacent D.L. 80 and 81 are backed by 18 to 30 m high gullied banks of sandy fluvio-glacial terrace and gravelly banks and bluffs that are erosion prone. At the accretion terminal, near Qualicum River, the beach becomes broader and sandier.

The mouth of the Qualicum River cuts through the confines of the heavy gravel accretion berms of the drift sector to the east. The channel gradient and heavy gravel bed load has prevented the development of estuarine marshes and the formation of a more physically and biologically complex estuary. The delta area and the floodplain along the river may be prone to flooding at occurrences of storm tides and high river floods. High water table problems occur during winter months on adjacent alluvial terraces and old fans.

The coast from the Qualicum River to the tip of the Mapleguard Point forms a single, lengthy (12.2 km) drift sector. The shore material of this sector is high in coarse gravels, cobbles and boulders although sandier sections are present near Nile Creek. Nile and Thames Creeks are too small to create significant drift barriers. Their mouths can be temporarily blocked during extreme high tide and storm wave occurrences. Gullying along the creek banks, seepage and possible flooding are limitations around the creek mouths. There are several areas where foreshore trenches have been dug to create boat access in front of private residences and beach protection works (bulkheading) have also been attempted in several places. These measures are meant to impede the slow intermediate accretion/erosion process and will likely initiate localized beach disturbances that will lead to further erosion problems. Some areas of the backshore in D.L. 36, 40 and 85 are composed of actively gullying morainal bluffs.

6.3 *Hydrology*

The Plan Area has two major rivers, the Big and Little Qualicum Rivers. Part of the Little Qualicum River (10.2 km) and its two major downstream tributaries, Whiskey and Kincade Creeks, drain the southeastern part of the Plan Area. All of the Big Qualicum River is within the Plan Area, draining much of the mountains and the central part of the coastal lowlands. Together with its tributaries and Horne Lake, the river forms the largest watershed in the Plan Area. Other permanent watercourses draining the lowland are Nile (11 km) and Thames (8 km) Creeks with source areas in the highlands, Fletcher Creek with its source in a large marsh and Cook (Chef) Creek which drains into Deep Bay. All other streams are intermittent.

Maximum stream flows occur during winter and spring with many of the smaller creeks (e.g. Thames) experiencing low summer flows due to the small local rainfall. Basal flows are often dependent on groundwater or on run-off from the precipitation of the highlands. The Big Qualicum has outflow controls on Horne Lake in order to regulate water volumes and temperatures for the large hatchery facility downstream.

Spider and Illusion Lakes are part of an enclosed drainage system with no surface outflow streams. Groundwater flows are the major source of water exchanges in the small shallow lakes. They are very sensitive to contamination and pollution which would cause

accelerated eutrophication (the natural aging process of lakes which results in high levels of aquatic vegetation) and loss of their recreational capability and appeal.

Groundwater resources sufficient for community water supplies are known to exist in the Quadra sands.[27] Other materials of direct or indirect glacial origin also have some capabilities, although they are largely unknown at present. Fractured rock in the upper elevations also offers some opportunities for domestic water supply.

6.4 *Terrestrial Habitat*

The Plan Area is part of a highly productive biotic region that extends along the eastern Vancouver Island Coastal Lowland. The mild climate, especially the long, warm dry summers has enabled the development of the dry Douglas-fir sub-zone near the coast while most of the inland portions are part of the Coastal Douglas-fir biogeo-climatic zone (CDF). The dominant association below the 485 m elevation is Douglas-fir with salal and oregon grape in the under-story. Above this elevation the Coastal Western Hemlock biogeo-climatic zone (WH) dominates, often in association with amabilis fir. Western red cedar is common on wetter sites. The coniferous associations are quite dense being largely composed of second growth forests with a thick shrub layer as large areas along the coast were logged within the last 50 years. Major logging operations, part of long range forest management programs, are still being carried on further inland as the forests are among the most productive in B.C.

This part of the east coast of Vancouver Island is also a high capability deer habitat (C.L.I. Class 3 for ungulates). The cut areas can support large deer populations due to ample browse although adequate cover is often a limiting factor in large clear cuts. The intermediate slopes between the 750 m and 150 m elevations, and especially the south-facing slopes with well established forest cover, are the preferred winter ranges (C.L.I. Class 2 and 3; see Map No. 1). Intensive forest management practices, e.g., stand thinning, often produce very good results in terms of deer habitat, thus wildlife management activity and forest management will likely take place in similar areas. The east central part of the Island provided excellent deer range and was popular with hunters until logging occurred in the late 1960's and early 1970's. The objective of provincial wildlife biologists is to increase the number of deer hunting opportunities in the region to 1960's levels using intensive forest management activities throughout the area. The appearance of deer in settled areas is not uncommon with gardeners regularly resorting to use of deer fences.

A variety of other animals and birds are also found throughout the inland area, e.g., black bear, cougar, wolf and small furbearers although they are seen relatively infrequently.

[27] Springs and seepage are found wherever quadra sands are exposed in cutbanks and sea lifts and the groundwater discharged by them contributes substantially to the flow of rivers and streams during the summer months. Quadra sands are not continuous within the Plan Area.

Little background data or management information is available for these species although it has been noted that wolves are becoming more numerous in the northern and central portions of the Island.

6.5 Coastal Wildlife

As part of a dynamic and diverse shore-process corridor, the Plan Area's physical elements are matched by equally diverse biological components. The long drift sectors, the erosion and accretion forms, estuaries and marshes support a wide variety of marine life forms including those that use the land and water transition zones. The more prominent and visible members of the coastal biotic community are discussed below.

The entire offshore habitat of the Plan Area is extensively used by overwintering and migratory waterfowl (C.L.I. Class 3m). Certain small productive areas such as estuaries and marshes are very important for feeding and resting, e.g., Deep Bay, Big and Little Qualicum estuaries, and the Fanny Creek marsh. The Little Qualicum is an extremely diverse habitat representative of a typical small delta/estuary complex. The Canadian Wildlife Service has established the Marshall-Stevenson Unit, part of the Qualicum National Wildlife Area, on a 54 ha section of the north part of the Big Qualicum estuary spit. Geese and diving ducks are present year round with dabbling ducks and a few trumpeter swans present during the winter.

At the north end of the Plan Area, Deep Bay supports several species of dabbling and diving ducks, divers and gulls and trumpeter swans. Dabbling and diving ducks and divers utilize the lengthy intervening coastal area. Normally species include: dabbling ducks - mallards, pintail, widgeon, teal; diving ducks - scaup, golden eye, buffle head, harlequin; and divers - loons, grebes, mergansers. Shorebirds (sandpipers, plovers, dowitchers), herons and raptors such as the bald eagle and osprey are also frequently seen in the area.

The inter-tidal and sub-tidal areas of the coast support a variety of shellfish, such as clams, oysters and crabs. There are considerable variations in the availability of shellfish along the coast between the Little Qualicum estuary and Mapleguard Point as most of the near shore portions of this long drift sector are intermediate erosion/accretion forms, not all of which are suited to abundant shellfish growth. Qualicum Bay is a reasonably productive and popular recreational shellfish area; the Nile and Thames Creek areas are also relatively productive with smaller pockets of shellfish beds occurring along the coast. Little detailed survey work has yet been done. In contrast, the Deep Bay area is highly productive for shellfish because of the sheltered waters and abundant nutrients.

The offshore areas are frequented by both harbour seals, especially around Deep Bay, and overwintering sea lions. Some productive herring spawning areas lie about 1 km offshore. This is part of a long, almost continuous bed of eelgrass that extends from Northwest Bay

into Baynes Sound. It is an extremely important habitat area for the commercial herring fishery even though the use varies by year and by location along the coast.

The coastal waters also provide habitat for one of the most significant resources of the east coast of the Island - anadromous fishes. As well as the important estuary habitats described below, it has been shown that the near shore areas of the coast are critical for juvenile migrating salmon because of the food, cover and protection from predators afforded by the relatively more productive near- shore waters.

Five species of salmon and steelhead produced in the Plan Area's rivers and streams spend most of their adult lives in the Strait of Georgia where they provide the livelihoods for commercial fishermen and tourist operators through commercial and sport fishery. Salmon fishing has long been one of the major recreational activities of both visitors and residents and is one of the aspects that contributes to the quality of life in the Plan Area.

7. Appendix I - Climate

The Plan Area has a maritime climate which is strongly influenced by its position in the rain shadow of the Vancouver Island Mountains. The result along the coastal strip is a temperate climate, which is relatively dry for its maritime location, with gradual seasonal changes from mild, wet winters to warm, dry summers. Further inland, as the elevation and proximity to the Island Mountains increase, the climate is cooler and wetter.

For coastal areas, the warm season usually starts at the end of April, when daily maximum temperatures are over 18°C, and extends into October, providing a long growing season and a long outdoor activity season. A typical summer day will reach temperatures over 23°C. During occasional hot spells, 30°C temperatures are reached. Rainfall is usually less than 4.5 cm per month in the summer.

Winter conditions are mild by most Canadian standards. Mean daily temperatures are a few degrees above zero, and the majority of total precipitation is rain, with some cold spells and snow likely in December, January and February.

8. Appendix II'

Table 6.1
Summary of Services and Protection

Service	Name	Location
Community Hall	Royal Canadian Legion	Bowser
	Lighthouse Community Centre	Qualicum Bay
Churches	Wildwood Community Church	Bowser
	Island Gospel Centre	Bowser
Library	Vancouver Island Regional Library	Qualicum Beach
		Union Bay
Education	Bowser Elementary	Bowser
Health Care:		
Medical Clinic	Bowser Medical Clinic	Bowser
Hospitals	St. Josephs General	Comox
	Nanaimo Regional General	Nanaimo
Extension Health	Central Vancouver Island Health Unit	Parksville
Ambulance	Station at Qualicum Bay Fire Hall	Qualicum Bay
Elderly Care and Housing	Arranglen Lodge	Corcan-Fowler
	Arrowsmith	Parksville
	Trillium	Parksville
	Lions Club; 5 duplexes	Qualicum Bay
Poison Control Centre	None in Plan Area	Nanaimo
911	911 Service expected to be available in 1996	Plan Area

9. Appendix III

Shaw Hill - Deep Bay Plan Area
Vacancy and Population Estimates

	September 1989	September 1995
# of Residential Parcels	1726	1774
# of Vacant Parcels	437	315
% of Parcels Vacant	24%	17%
Estimated Census Population	3207 (1991 Census)	3690 (Estimated 1996)