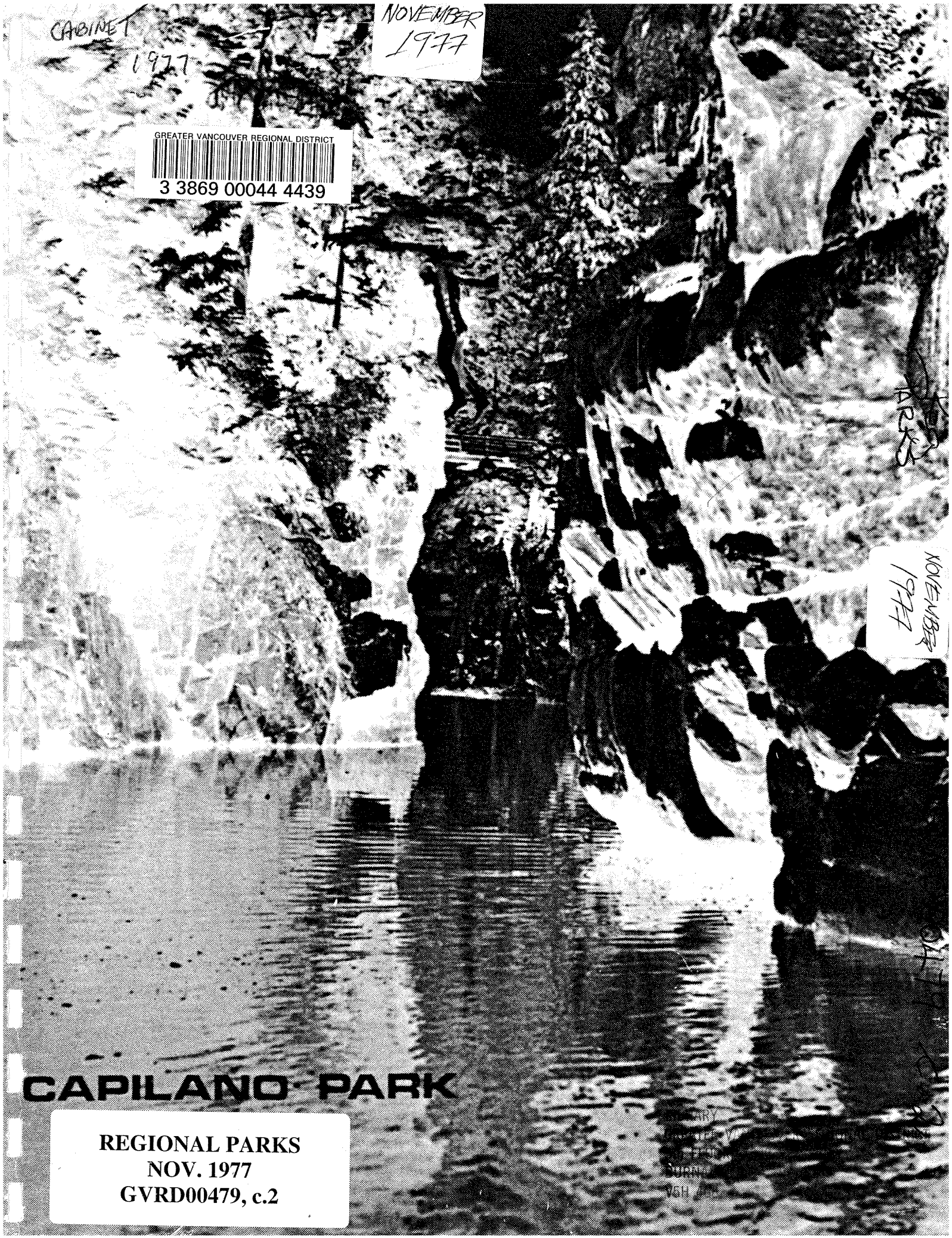

CAPILANO PARK

CAPILANO REGIONAL PARK STUDY

GREATER VANCOUVER REGIONAL DISTRICT
PARKS DEPARTMENT

EIKOS PLANNING AND ENVIRONMENTAL DESIGN GROUP LTD.

This Preliminary Study was Prepared by:

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Frank Ogden, Grouse Mountain Resorts
Heinz Berger, West Vancouver Parks
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Reg Bowman, IBI Group, North Shore Transportation Study

November 7, 1977

Mr. Art Penner
Regional Parks Officer
2294 West 10th Avenue
Vancouver, B.C.
V6K 2H9

Dear Mr. Penner:

RE: Capilano Regional Park Study

We are pleased to submit this report as per the enclosed terms of reference.

May we take this opportunity to express our appreciation to the Greater Vancouver Regional District for allowing us to contribute to the future of this Regional Recreation Area.

Sincerely yours,

Arthur Cowie

Arthur R. Cowie
Managing Director

ARC/ow

encl.

EIKOS PLANNING AND ENVIRONMENTAL DESIGN GROUP LTD.
201-993 W 8 Avenue • Vancouver, B.C. Canada V5Z 1E4 (604) 738-3124

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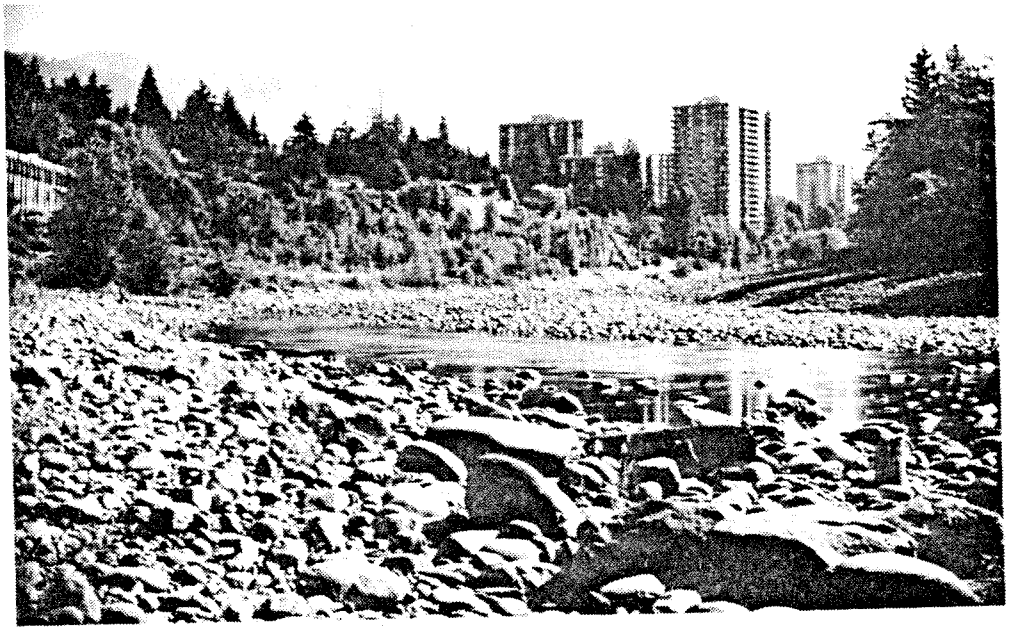
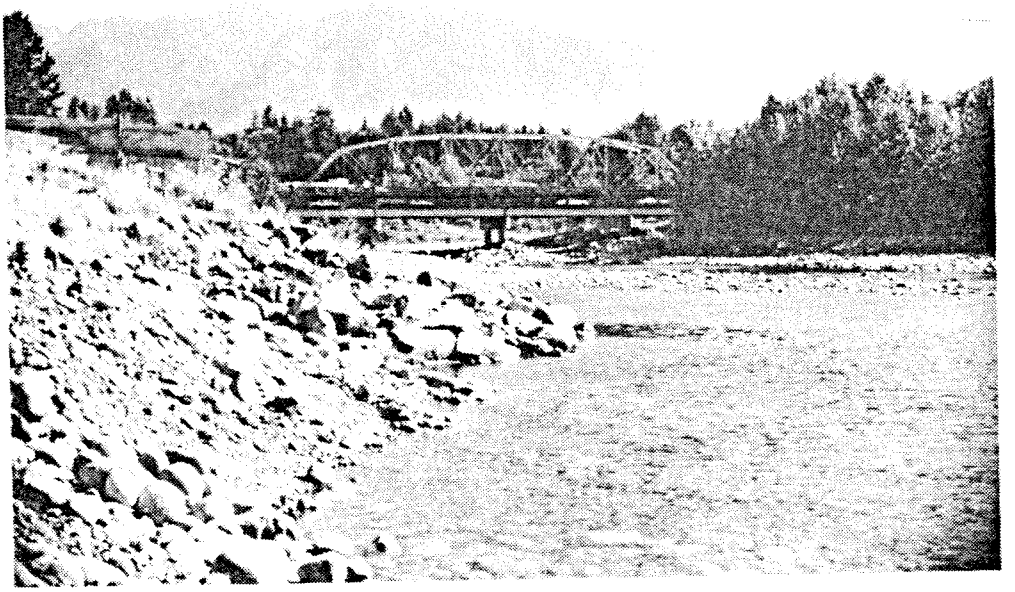




INTRODUCTION

Some look at Open Space, Park and Recreation and the issues of environmental qualities as luxuries which we can ill afford in light of persistent economic pressures and related priorities.

This report, while cognizant of these problems, is also of the opinion that open space consideration and recreational opportunities perform a significant social and environmental function, related to the physical and mental well-being of people, and the conservation of natural resources.

Given this premise, the Capilano River constitutes one of the most scenically significant and unique recreational opportunities in the Greater Vancouver Regional District because of its geographic location and near wilderness qualities in proximity to a population of over a million people.

It is therefore imperative that the river's environmental qualities are protected - - and enhanced through sensitive design in order to provide for the enjoyment of people and a range of regional recreation choices.

PURPOSE OF THE STUDY

The EIKOS Planning and Environmental Design Group was retained by the Greater Vancouver Regional District to undertake a Master Plan Study of the Capilano River Regional Park.

The Objectives of the Plan include:

1. An assessment of private lands near the Upper Levels Highway as to their regional recreation use potentials in order to justify their acquisition and inclusion into the existing park system;

2. The presentation of design alternatives for the selected site (s);

3. The identification and analysis of bio-physical parameters and recreational uses;

4. A Master Plan outlining recreation and access areas, and

5. Design and/or development guidelines appropriate for the Capilano River Regional Park.

NOTE: Due to a recent change in study priority, to include greater analyses for land acquisition and alternative development options - - and less emphasis on overall design, the terms of reference were modified as per verbal agreement between EIKOS and GVRD.

STUDY METHOD

The study approach involved the following steps:

1. An extensive field trip and photographic inventory along the entire Capilano River.

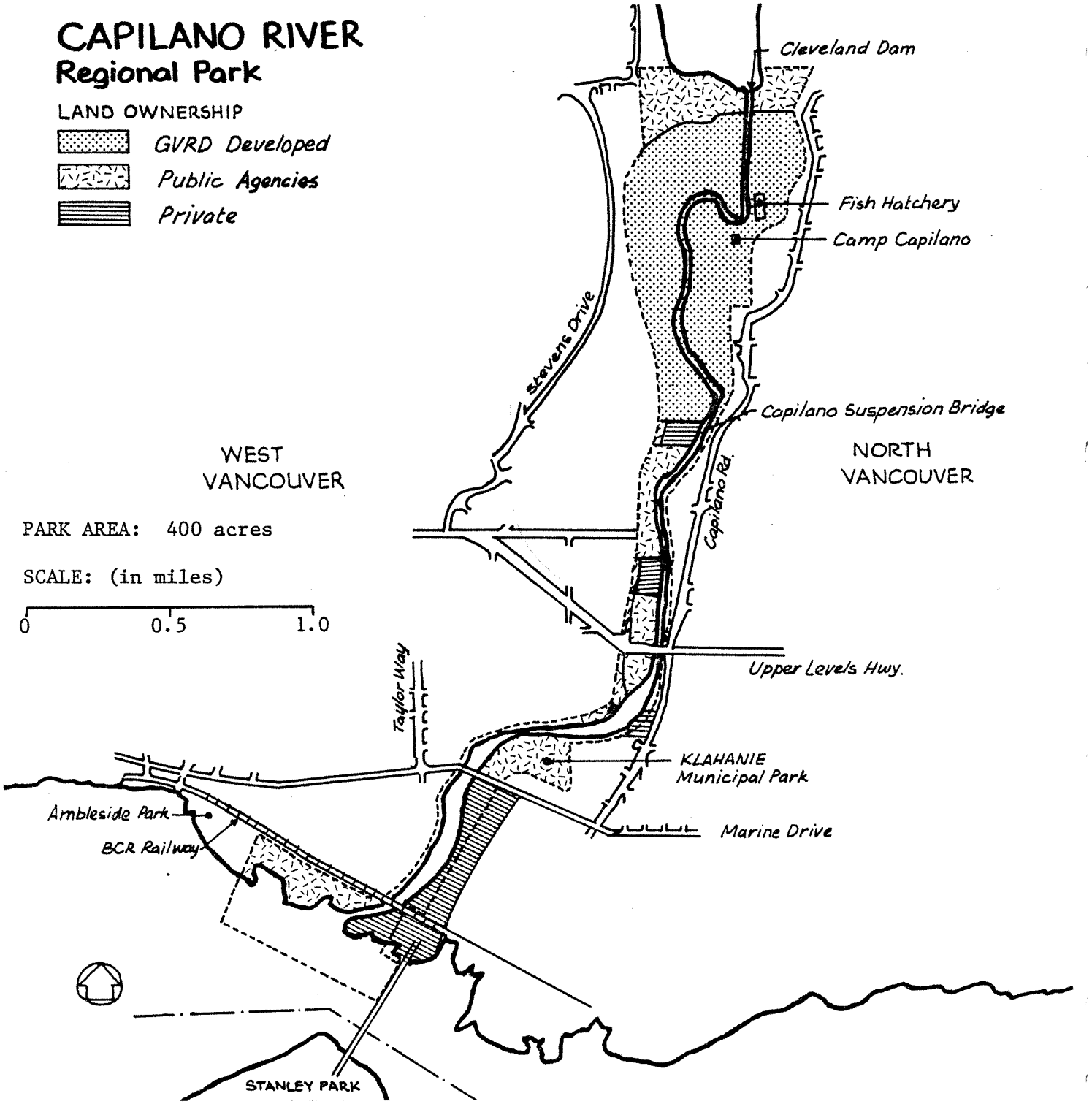
2. A basic inventory of water and land-based inventory, including hydrology, fish and wildlife resources, geology and slopes, landscape characteristics, vegetation and recreational uses.

3. The findings were then analyzed in terms of:

   a. Recreation potentials

   b. Off-site influences affecting the park, including access, surrounding land uses and ownership, municipally operated recreation sites, and potential land acquisition.

4. The results of the findings, together with the review of related reports, informal interviews, and discussions with consultants and public agencies form the basis of the Master Plan, Planning Objectives and Design Guidelines.


CAPILANO RIVER
Regional Park
LAND OWNERSHIP
GVRD Developed
Public Agencies
Private
Cleveland Dam
Fish Hatchery
Camp Capilano
Stevens Drive
Capilano Suspension Bridge
WEST VANCOUVER
NORTH VANCOUVER
Capilano Rd.
PARK AREA: 400 acres
SCALE: (in miles)
0
0.5
1.0
Upper Levels Hwy.
Taylor Way
KLAHANIE Municipal Park
Ambleside Park
BCR Railway
Marine Drive
STANLEY PARK

STUDY AREA

Capilano Park is located near the upper reaches of the Capilano River corridor which separates the municipalities of North and West Vancouver. In a regional sense, however, the entire river is considered in this study, extending from Cleveland Dam to the north and down-stream to Ambleside Park.

The corridor can be divided into three distinct river environments:

1. The near wilderness qualities of the rugged river canyon and the quiet, second growth coniferous forest flanking it;

2. The flood plain, extending from the southern end of the canyon near the Upper Levels Highway and to an area near Marine Drive, and

3. The flat reaches of the river's estuary through Indian Reserve lands and on the Ambleside Park along the north shore of Burrard Inlet.

Since the establishment of Capilano Park as a recreational facility, 235 acres of land have been transferred to the Regional Parks Agency by Vancouver, West Vancouver and the District of North Vancouver. Within the proposed boundaries of 400 acres, approximately 66 additional acres are owned by public agencies and 99 acres of privately owned lands are yet to be considered.

HISTORICAL HIGHLIGHTS surrounding the Capilano River

The River was named after Chief Ki-ap-a-la-no or Kah-pil-lah-no;

1792 Captain George Vancouver names Burrard Inlet,

1886 City of Vancouver incorporates,

1889 Completion of the first dam,

1919 Lumber mill processes Douglas Fir, Cedar and Hemlock,

1926 Greater Vancouver Water District is formed,

1954 Cleveland Dam is completed and the Indian food fishery ceases,

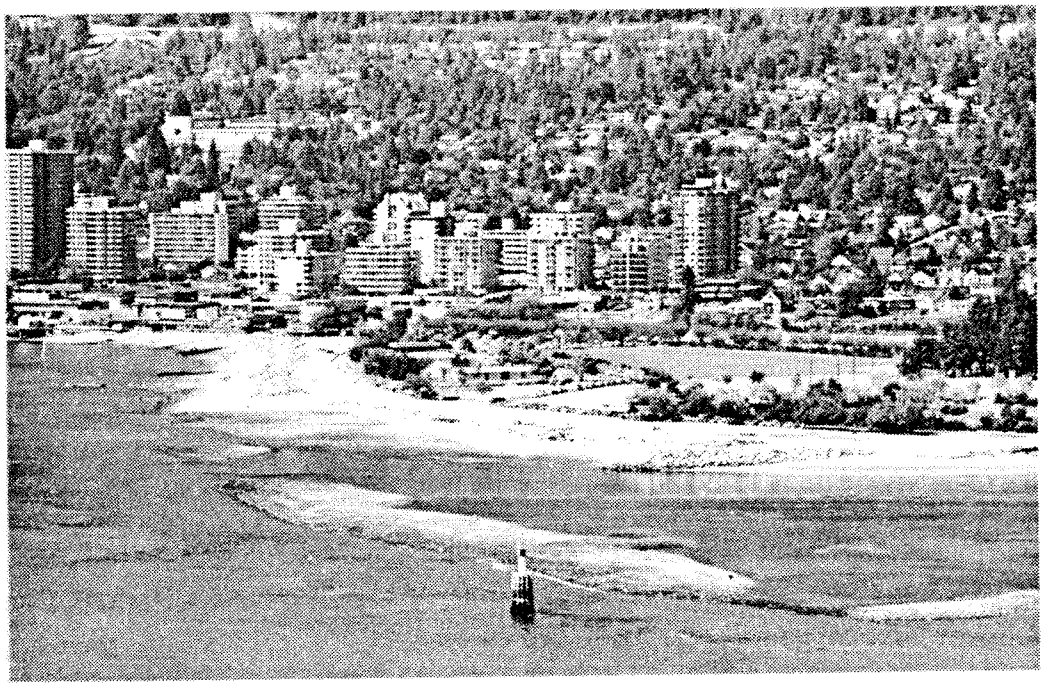
1955 Capilano Lake is formed,

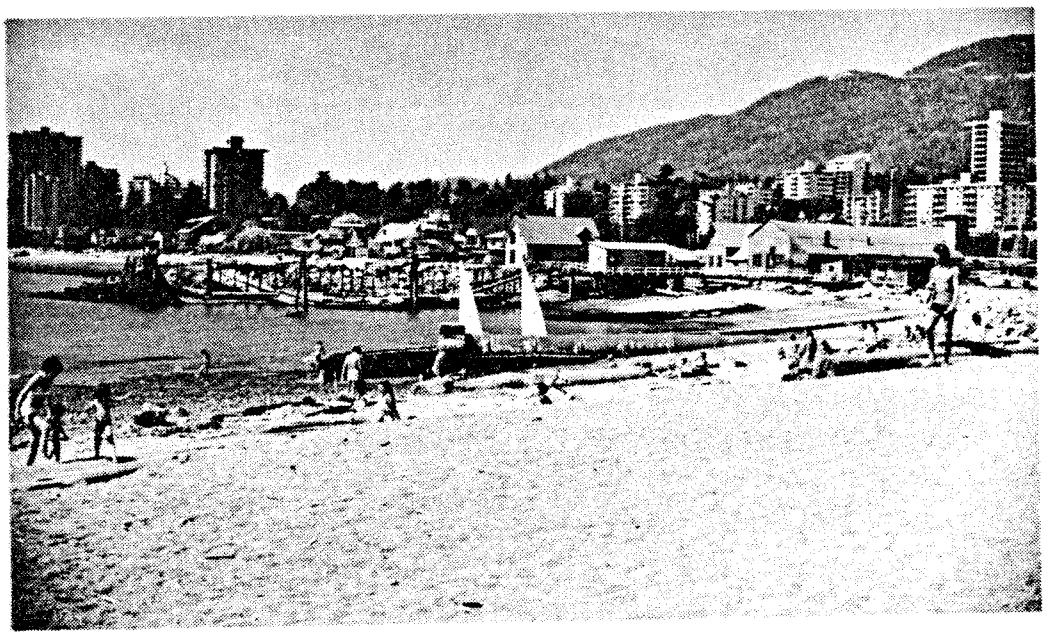
1965 The Provincial Government adopts the Regional Parks Act which offers a grant of one-third the annual cost of land purchase or development expenditures by a Regional Park District created under it,

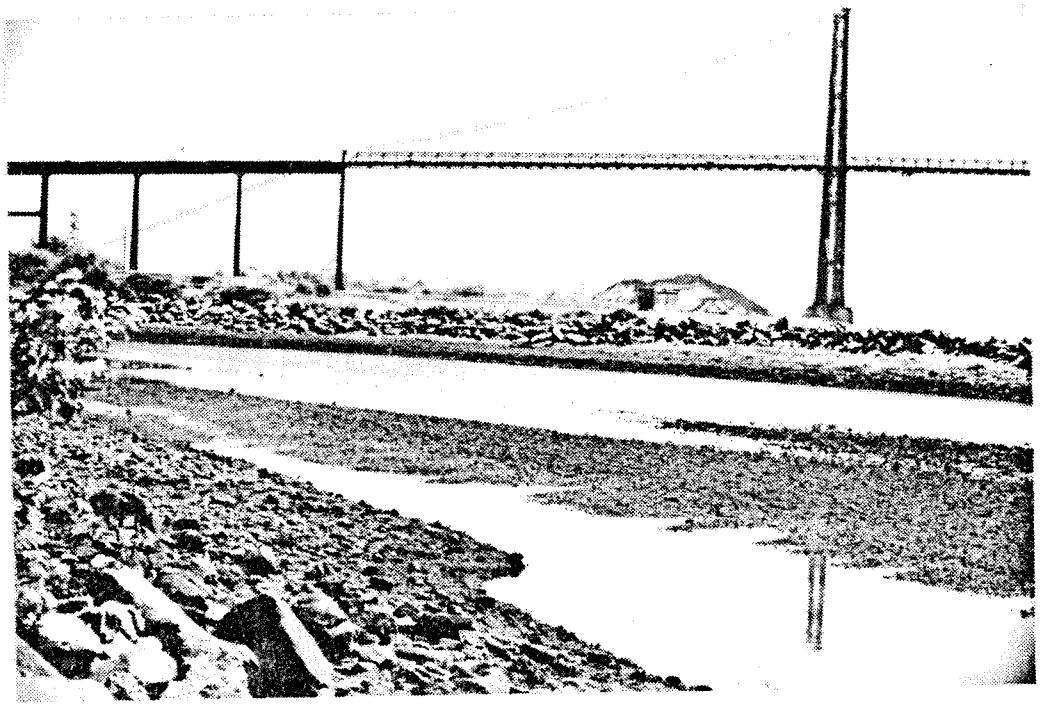
1972 Capilano Fish Hatchery opens,

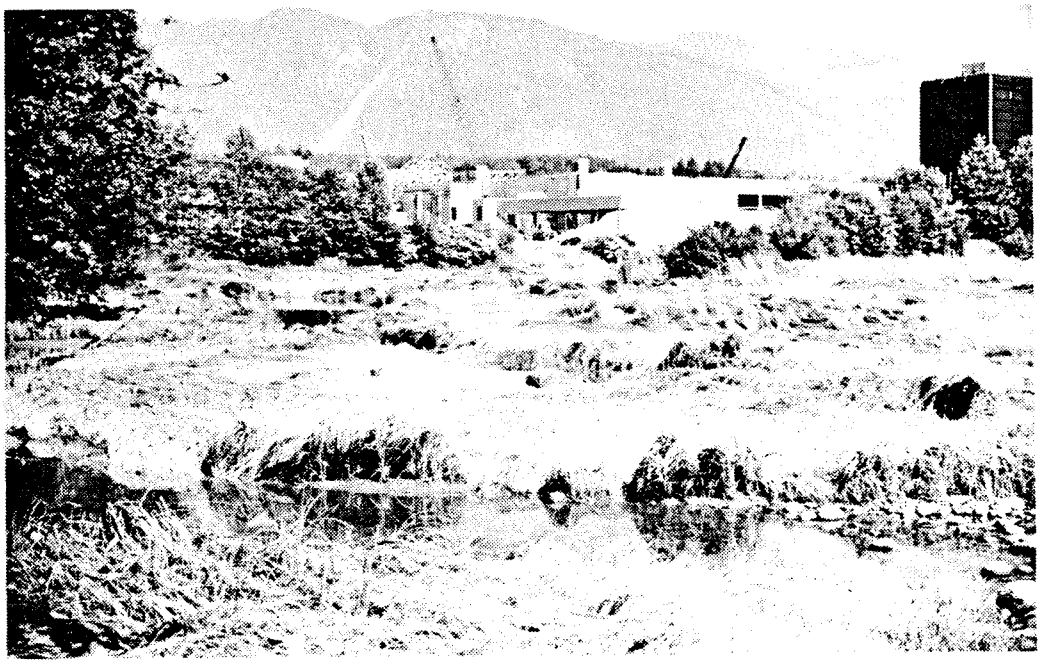
1974 First year return of adult coho salmon of hatching origin, and

1976 "The Livable Region, 1976/1986" identifies the Capilano River as one of twelve priorities for regional recreation development.









LAND USE

Capilano Park is bordered by Cleveland Dam at the beginning of the river canyon, and surrounded by predominantly single and multi-residential use areas. The exception in this basically wilderness area is the Capilano Suspension Bridge Park, a privately owned commercial venture. At the southern end of the canyon, the Park borders on several private lands, a cemetery and municipally operated recreation areas.

From this point on southward to Marine Drive, the river environment takes on an urban character including:

Bank stabilization projects, single family residences, a high density development (Woodcroft Place), and Beacon Hill, a hospital and retirement home facing the river. Open spaces in this flood plain include the River Side land near the Upper Levels Highway and Klahanie Park, both located on the east bank of the Capilano. Land ownerships include Crown, Provincial and Municipal land holdings and a privately owned river parcel about to be developed for single residential use.

Land uses on both sides of the river's estuary include a major commercial complex (Park Royal) and proposed residential/commercial and recreation facilities along the easterly river bank to Burrard Inlet. Ambleside Park, at the mouth of the Capilano, forms a major recreation area which is operated by the Municipality of West Vancouver.

In the context of this study, Ambleside Park, Klahanie Park, Klee Wyck Park, 3rd Street Park and related river path systems must be regarded as significant links to Capilano Park and the river corridor.

THE INCLUSION OF SOME PRIVATE LANDS ALONG THE RIVER WERE CHOSEN BECAUSE OF THEIR INFLUENCE ON THE VISUAL ASPECTS OF THE RIVER, AND THEIR POTENTIAL RECREATIONAL CONTRIBUTION TO THE CAPILANO PARK IN A REGIONAL SENSE.

Access

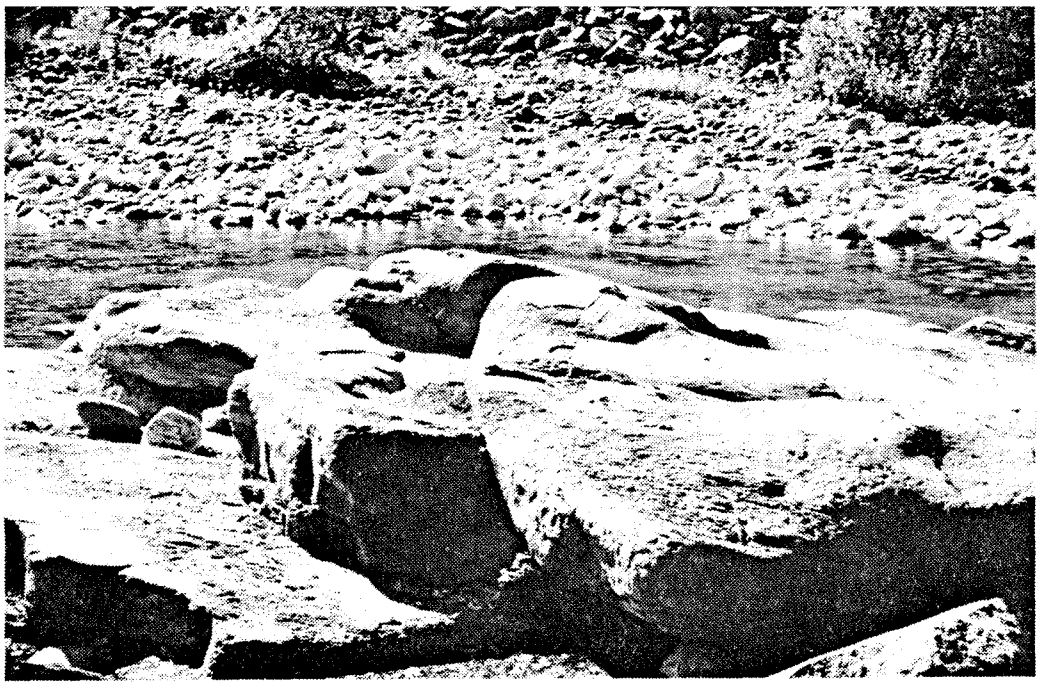
Capilano Park is located near the upper reaches of Capilano Road. This major regional park facility is easily accessible from anywhere within the greater metropolitan area. Capilano Road connects directly with Upper Levels Highway and Marine Drive, both major east/west arterials. Marine Drive, in turn, connects to Lions Gate Bridge.

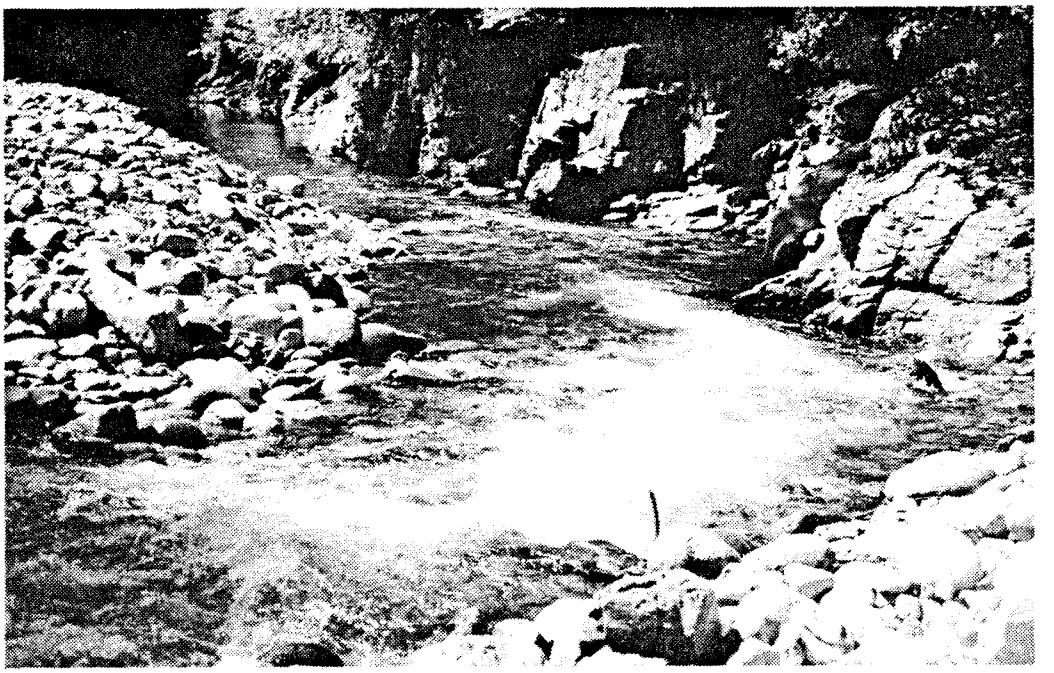
Local access to Capilano Regional Park from within the municipalities of

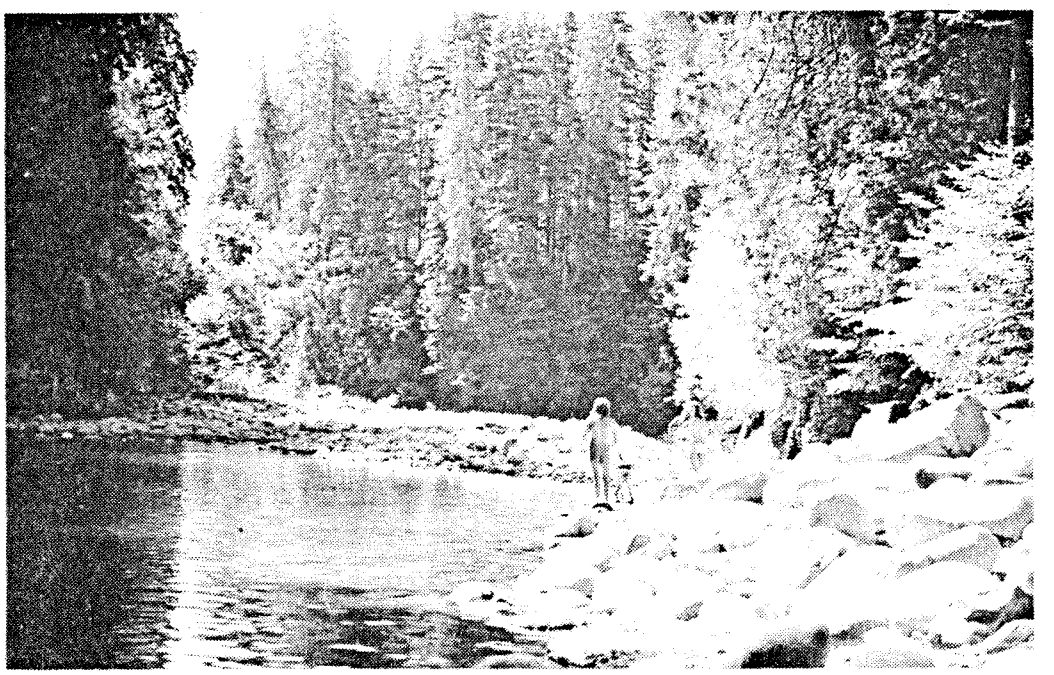
North and West Vancouver flows via Capilano Road. At the present no access is provided into the Park through the residential area bordering the site in West Vancouver, and previous investigations indicate that regional access via Taylor Way and Stevens Drive is not considered in the future.

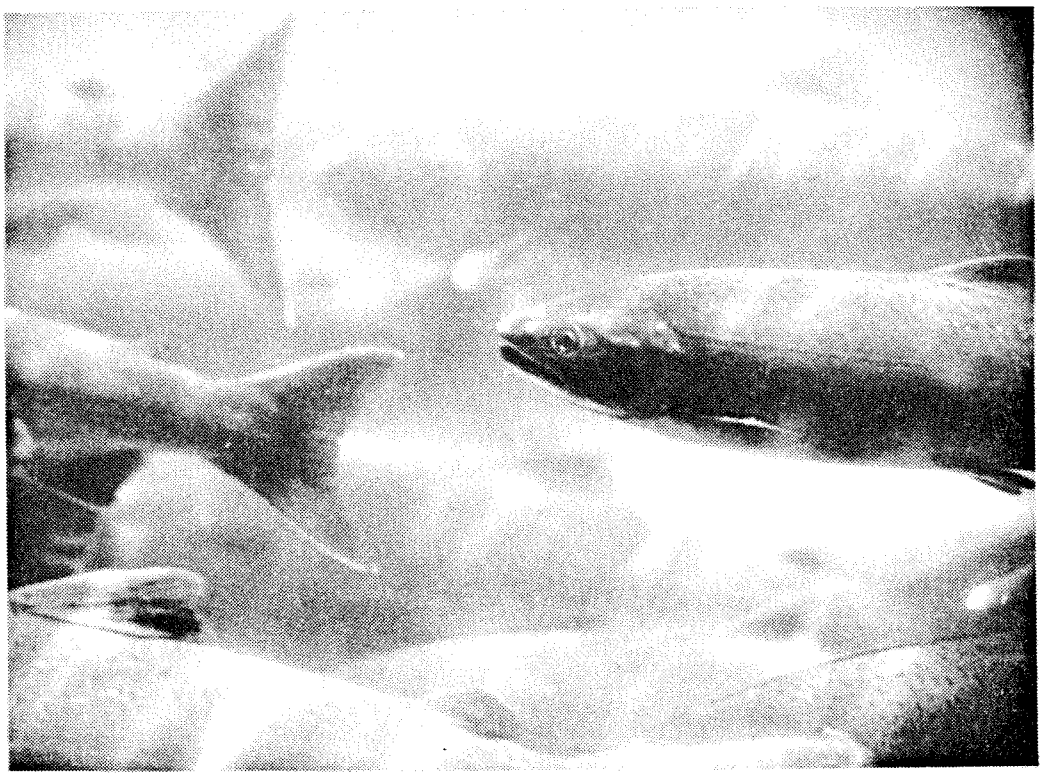
Parking

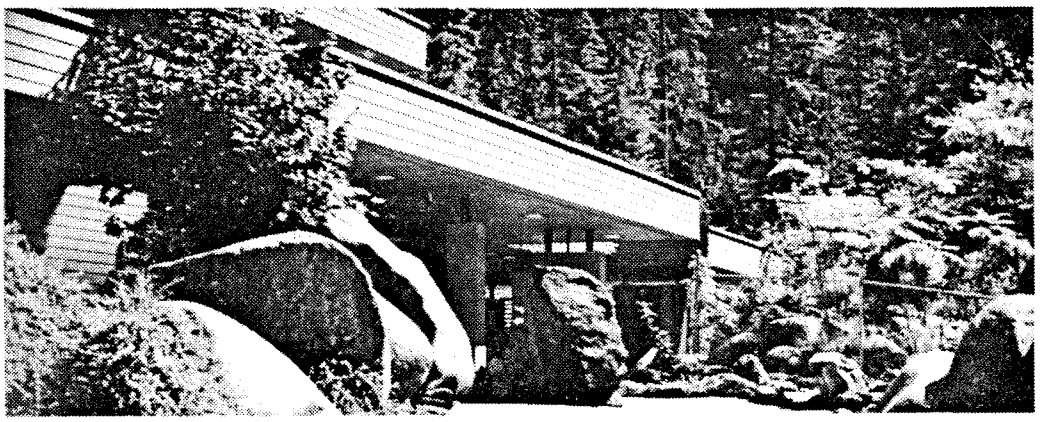
Park visitors now use the only available public parking area near the Capilano Fish Hatchery off Capilano Road. Based on the present crowded conditions, it can be assumed that additional parking facilities are required as recreational opportunities are expanded or developed and more people visit the park. Under no conditions, however, should access and parking needs conflict with the unique natural characteristics of the upper canyon.

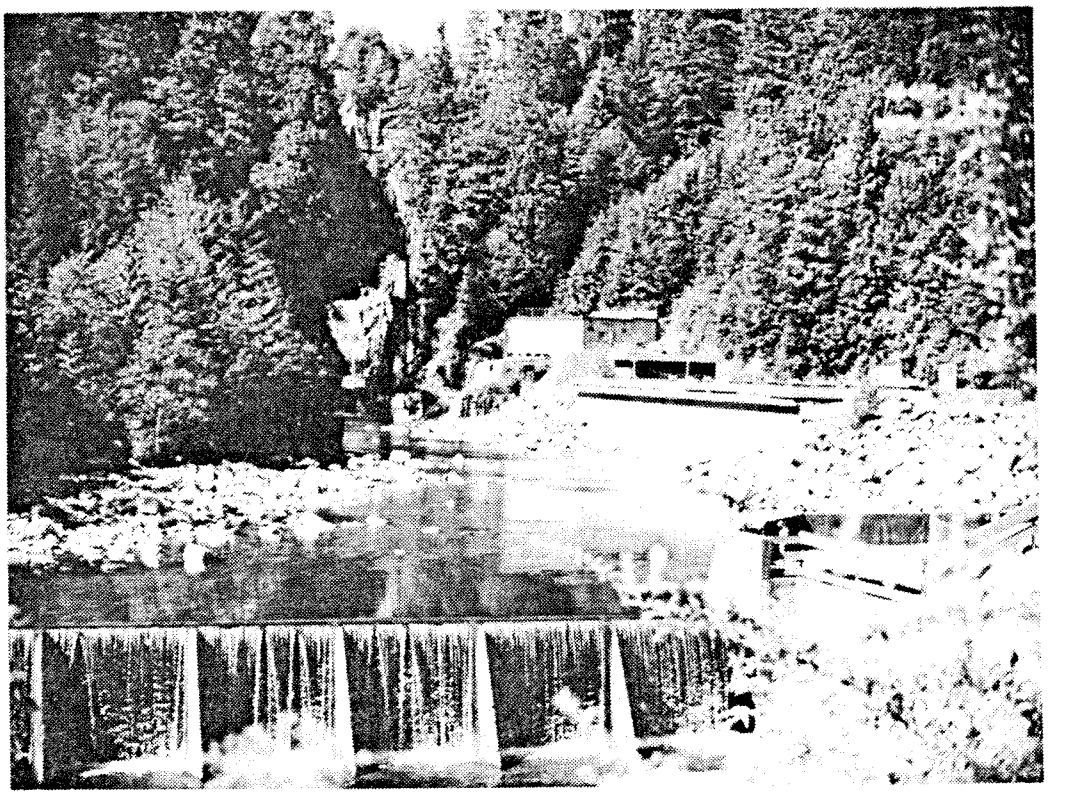












NATURAL RESOURCES

Natural resources and management concerns along the Capilano River corridor have been well documented in various publications (see bibliography). The following are some of the highlights of these reports, together with the information obtained during field trips and investigations of consultants.

FISH RESOURCES AND HYDROLOGY

Prior to the completion of Cleveland Dam in 1954, the Capilano was a 22-mile long river which drained a 68 square mile watershed to the north of Burrard Inlet. Following the construction of the dam and the increasing encroachment of incompatible land uses, fish stocks were reduced to very low levels and the Indian food fishery had ceased. Since the operation of the hatchery below the dam, the Capilano is once again a high producer of salmon and trout.

The primary fish runs in the Capilano River include:

- Summer Steelhead, between May and September
- Winter Steelhead between December and April
- Coho between May and November, and
- Pink and Chum salmon have traditionally spawned in the lower 1½ miles of the River and in Brothers Creek.

In recent years much of the riparian vegetation along the river's banks has been removed, thereby reducing shade cover and affecting bank stability at river bends. Bank erosion and urban development led to channelling and diking of the lower river thereby resulting in the loss of previous holding pools between the canyon and the mouth of the river. The loss of these traditional pools and the blockage of normal spawning areas above Cleveland Dam contributed to greatly reduced fish populations. Today, fish enter the river more quickly through the estuary and flood plain to utilize the pools in the canyon section.

Hatchery Production

Under full operating capacity the annual hatchery releases will include approximately one million Coho smolts, 325,000 Chinook salmon, and 65,000 Steelhead smolts. Exepected adult returns to the river are 17,000 Coho, 750 Chinook and 3,200 Steelheads. Only about 5% of these returns will be used for egg-takes for hatchery production.

Since the construction of the dam, Steelhead and Coho have been trapped at the weir of the present hatchery and trucked around the dam for release in the headwater areas.

As stated earlier, The Capilano Lake above Cleveland Dam is a major domestic water reservoir administrated by the Greater Vancouver Water District. Since the reservoir lies at a lower elevation than some residential areas surrounding it, domestic water must be pumped to these homes. The waste water generated by the turbines represents the minimum flow of 20 cubic feet per second that is discharged into the river during the dry summer months. These volumes are supplemented by various tributaries down stream, however, even in very dry summers these flows, estimated at approximately 30 cfs, are inadequate to permit fish migration through areas near Marine Drive and the Upper Levels Highway. According to information obtained from the Capilano Fish Hatchery, a desirable minimum water flow is considered between 75 and 100 cubic feet per second. In brief, present water flows are considered inadequate for fish migration through the Capilano River.

WILDLIFE

The study area lies adjacent to the near wilderness area of the Vancouver Watershed and offers habitats for a variety of animals, including deer, black bear and occasional coyote. The movement of these animals from the higher elevations and through the park causes periodic problems to nearby residential areas. The river itself attracts racoons, other small mammals and ducks; mergansers are a popular attraction near the pools and the weir below the hatchery during the rearing of the young. The esturay offers feeding grounds for a wide range of waterfowl, particularly mallards, seagulls, scooters grebes, herons and geese.

VEGETATION

Prior to the logging activities in the early 1900's, the Capilano Park area was covered with large coniferous trees as is evident by the many remaining stumps in the upper canyon. Today, Douglas fir, cedar and hemlock form the canopy of this park-like, second-growth forest. As the canyon gives way to the flood plain, the forest composition changes into a mixed tree cover consisting primarily of riparian vegetation, including red alder and cotton-wood.

The following are representative species along the Capilano River:

Trees

Acer macrophyllum	- Broadleaf Maple
Alnus rubra	- Red Alder
Cornus canadensis	- Pacific Dogwood
Populus trichocarpa	- Black Cottonwood
Pseudetsuga menziesii	- Douglas Fir
Salix sp.	- Willow
Sorbus sitchensis	- Mountain Ash
Thuja plicata	- Western Red Cedar
Tsuga heterophylla	- Western Hemlock

Shrubs

Acer circinatum	- Vine Maple
Cytisus scoparius	- Broom
Gaultheria shallon	- Salal
Mahonia aquifolium	- Oregon Grape
Potentilla sp.	- Cinquefoil
Rosea sp.	- Wild Roses
Rubus leucodermis	- Black Rasberry
Rubus parriflorus	- Thimbleberry
Rubus spectabilis	- Salmonberry
Spiraea douglasii	- Hardhack
Vaccinium parvifolium	- Huckleberry

Low Plant Material & Perrenials

Achillea milefolium	- Yarrow
Athyrium filix-femina	- Lady Fern
Carex sp.	- Sedges
Dicentra formosa	- Bleeding Heart
Equisetum arvense	- Horsetail
Lonicera involucrata	- Black Twinberry
Lysichiton kamtschatcense	- Skunk Cabbage
Maianthemum unifolium	- Lily of the Valley
Polystichum munitum	- Sword Fern

GEOLOGY

General Overview

Several thousand years ago huge glaciers ground a path to the ocean over what is now the north shore mountains and the Lower Fraser Valley. The dwindling ice cover on the Capilano exposed a valley flanked by towering mountain peaks and incised by deep saddles.

From the location of the present Cleveland Dam the Capilano River flows generally in a north-south direction through highly jointed granitic terrain between shear canyon walls. In the lower stretch of the canyon, the uneven bedrock topography permits old river and glacial deposits to reach the river's edge in places. The slopes where the river and glacial debris rest are close to the natural angle of repose giving rise to some slides which, together with tributary creeks have deposited debris into the bottom of the canyon.

After spilling through the canyon the Capilano rushes onto its floodplain and meanders at low water levels through numerous channels towards salt water. Due to high bedloads during spring floods the course of the river has frequently shifted, choking old channels and forming new ones.

Since construction of Cleveland Dam, the Capilano Valley has undergone significant changes in dynamics. By regulating the river flows, annual flooding and consequent shoreline erosion have been reduced. Huge bolders and well rounded cobbles occupy the river bottom which were carried down by the previously unharnessed river. Within the last two decades, slides south of Holgate Creek tributary have dumped boulder and cobble till into the riverbed. The presence of weak varved clays underlying the till and ground water percolating through pervious recharge areas at higher elevations are factors causing instability in this area. Further down the river, residential development including removal of tree cover, pipeline installation and road construction adjacent to the river contributed to some localized slide activity. About two miles below the dam, old river benches have stabilized and support vegetative cover in excess of 15 years old. Where the river enters the floodplain, man-made diking has channelized the flow and reduced the meander pattern. However, the straightening of the river course by diking has locally increased stream velocity and led to increased bank erosion, as is evident adjacent to the'Kapilano 100' development.

Surficial Geology and its Effects on Proposed Park Development

The surficial or unconsolidated deposits occurring in the lower reaches of the Capilano River valley, as over most of the lower mainland, are primarily of glacial and post-glcial origin. The glacial deposits consist essentially of mixed-grained soils called tills and water-sorted sands and gravels. Such deposits are usually well compacted, having been reworked and compressed by successive advances and retreats of ice sheets up to 7500 feet thick.

Subsequent or post-glacial erosion by rivers and streams has resulted in the deposition of sand and gravel terraces along water courses, and silty sand deltas where creeks and rivers empty into the sea.

The distribution of surficial deposits in the Capilano valley below Cleveland Dam are shown on Fig. 1 and consist of the following: pervious sands and gravels, relatively impervious and compact glacial tills, mixed and stratified soils including glacio-lacustrine deposits such as varved (i.e. interbedded) silts and clays, and bedrock which occurs at or within about 10 feet of the ground surface. Upstream of the dam sands and gravels underly the reservoir, mixed soils occur along the reservoir shoreline and, at higher elevations, deposits of glacial till can be found.

As the ice sheets melted, glacio-marine deposits of silt and clay were deposited in coastal areas of the sea. When the land rebounded relative to the sea, possibly by 1000 feet or more, during progressive retreat of the glaciers, these glacio-marine sediments became exposed and can be seen today in the valleys of the Capilano River and Lynn Creeks. Post-glacial deposits in the lower mainland area are generally loosely packed, never having been compressed by the weight of the glaciers.

Geotechnical Factors Affecting Development

Since the development consist primarily of landscaping and area beautification, only a few geotechnical aspects are considered to have potentially adverse effects whereas other geological factors may well contribute to the enhancement of the project. These are described below.

1. Possible Adverse or Problematic Factors

   a. Unstable natural slopes - these consist of two general types, namely rock cliffs comprising outcrops of fractured and jointed rock as well as

rock overhangs, and unstable soil slopes.

Unstable rock occurs primarily in the canyon area within one mile below the dam. Prior to construction activity or public access near the base of or on the top of rock cliffs, the areas should first be examined by a competent geotechnical engineer or geologist to determine whether safety precautions need to be taken. Such safety measures would consist of, for example, support of loose rock by rockbolts or wire mesh anchored to sound rock, or the removal of loose or overhanging rock by blasting or by prying with bars, or the relocation of footpaths, lookouts, etc. to a less hazardous location.

Unstable soils in the Capilano valley consist of silts and clays and form part of the mixed deposits which border the eastern side of the River for about 2 miles downstream of Cleveland Dam and occur on both sides for the last half mile of this stretch of the river (see Fig. 1). Within the last twenty years at least four small landslides have occurred near the mouth of a tributary creek in the lower reaches of these mixed-deposits. Instability in this area is due in part to the steepness of the topography, but also to the weak nature of varved clays as well as to the presence of percolating water which permeates through pervious aquifers that conduct run-off water from recharge areas at higher elevations. Unstable soil slopes can best be stabilized by either flattening the natural slopes and/or tree planting and subsequently seeding, or constructing a buttressing berm of pervious sand and gravel at the toe of the slope.

b. Landslides caused by flash floods - During periods of heavy rainfall or high spring run-off, tributary creeks can often overflow their banks and erode new channels or trigger mass movement of overburden soils. This usually occurs in the vicinity of and adjacent to the creek themselves. To minimize damage by flooding or flood-related landslides, structures or roadways should be located away from the creek channels or otherwise be protected from flooding by a blanket of sand and gravel or blasted rock (riprap), or by the construction of small training dykes to divert the flow of water.

c. Erosion of river banks - The Capilano River in the historic past was subjected annually to wide variations in flows ranging from floods during spring run-off to very low flows in late summer. Severe erosion of the banks and channel bottom accompanied the higher flows. With the construction of Cleveland Dam in the 1950's and the consequent regulation of river flows, periodic flooding and shoreline erosion have been greatly reduced. However some erosion still occurs during the peak flows as well as in areas where man has interfered with nature e.g. by removing tree cover along the shoreline. River bank erosion can be minimized by placement of riprap, and, in some cases, by tree planting.

2. Enhancing Aspects

a. Artesian wells - In the lower reaches of the Capilano valley, the presence of deep deposits of sand and gravel overlain by more impervious soils gives rise to appreciable artesian pressures in the pervious gravel aquifer. In the early days this aquifer was a source of water for North Vancouver and several artesian wells were in use (see Fig. 1). In one, the flow reportedly exceeded 300,000 gallons a day. As part of park enhancement, old wells could be rehabilitated or new wells drilled to provide foundations, source of drinking water, wading pools, etc. However, records would have to be checked to obtain the exact location of the old wells.

b. Fossil marine shells - The rebound of the land relative to the sea after the last glaciation resulted in stoney clay deposits, which were originally laid down beneath the sea, being located today above sea level. These marine deposits contain the remains of sea animals and shell fish and numerous fossil specimens have been found in the Capilano valley as noted on Fig. 1. Samples of these fossils could be illustrated (e.g. by sign boards) as part of nature walks and areas in which fossils have been located could be sign-posted.

CONCLUSIONS

In summary, it is considered that there are no major geotechnical factors which would prohibit development of the proposed park. However, care should be exercised in locating pathways and other areas of public access to avoid areas prone to landslide activity, rockfalls or flooding. Unstable slopes

adjacent to proposed structures or nature walks should be flattened, protected with a weight berm at the toe or stabilized by seeding or planting of trees.

RECREATIONAL USE

The diverse landscape of Capilano Park provides for a number of recreational activities. However, since most of the present use of this park is of a casual or informal nature, there is little quantitative information on current recreational use. The estimates that are available include visits to the hatchery, Camp Capilano, Steelhead fishing and, to a limited extent, the watching of the annual kayak competitions.

Recreation activities include:

- fishing
- boating (kayak & canoe)
- river floating
- swimming and diving
- picnicking
- residential camping
- hiking, strolling & jogging
- viewing (hatchery, suspension bridge)
- spectating (kayak competitions)
- nature studies & orienteering
- photography
- dog walking
- motor cycling & teen parties

Many of these activities are seasonal with the highest use occurring in favourable weather. Some activities such as fishing and kayaking are dependent primarily on other factors; in these cases, fish migration and water-flow respectively.

Fishing

The Capilano River provides angling opportunities for steelhead and salmon fishing very close to the dense greater Vancouver population areas. The number of anglers that it can support at one time is, however, not great; presently estimated at 75 anglers at any one time by the Paish Study 1973. All but 8 of these are in the Canyon area, with most angling taking place between the hatchery and pipeline pool due to ease of access. The following are estimates for the year April 1, 1975 to March 31, 1976:

- 259 anglers fished on 2048 occasions
- they caught 299 steelhead, of which 241 were released and 58 kept
- their catch records were 0.145 fish per fishing occasion or, it took 7 fishing occasions to catch one steelhead.

There appears to be no trend in the number of anglers or angler days in the past 10 years; or, for that matter, the number of fish caught. Most steel-

head fishing occurs in the canyon pools between December and July. No estimates of use by salmon fishermen along the river are available except that the reported most significant consumptive use is by the Indians catching salmon for food.

The sportfishing opportunities of the river could be significantly improved if pools could be constructed between the canyon and the mouth. A number of pools existed in the lower river before its course was modified for land use and flood control. This would provide holding and feeding areas for migrating and resident fish and might provide spawning sites for chum and pink salmon. Presently, the migrating salmon - coho and chinook - swim directly from the mouth to the pools in the canyon.

Boating

The Capilano River is used almost daily by kayakers between March and November when there is sufficient waterflow. It is estimated that up to 10 kayakers per day would be a reasonable estimate of use. Each spring, a major kayak slalom competition occurs in the river canyon below the hatchery weir. Kayakers and spectators from Western Canada and the Pacific Northwest of the United States come to this competition. It has been estimated that upwards of 5000 spectators have viewed these competitions.

River Floating

River floating on the Capilano River comprises either the use of inner tubes or wet suits, both providing buoyancy. This is an occasional activity which is not encouraged. However, it does appear to be increasingly more popular.

Swimming and Diving

A few small beaches are used by swimmers along the river. However, because of their lack of accessibility and the water's frequently hazardous currents as well as low water temperatures, the extent of this activity is minimal. Perhaps the most frequently used area for this activity lies below the picnic area at the hatchery where high rocks and deep pools offer a thrilling diving experience for the young. A series of concrete steps lead to a bolder-strewn

area adjacent to the pool and efforts should be made to increase the use of this sunny spot.

Picnicking

While it does occur in the existing park at the facilities provided near the hatchery, it appears to be more popular along the river below the canyon, especially at Ambleside Park, where there is considerably more sunshine. Only in hot, dry weather, do people prefer to picnic in cool, shady canyons or under tall conifers. Another deterrent to the utilization of the existing picnic facilities is the lack of play space for children. The few picnic tables along the trails west of the river are seldom used.

Residential Camping

Camp Capilano is a residential camp located in the park. It is operated by the Vancouver Parks Board primarily for outdoor education programs for elementary school students. During the summer, community centers use the camp for youth and family programs. Weekend use is mainly by scouting groups (cubs and brownies) and occurs year round. In 1976 approximately 2,200 students and youths used the camp for week-long or weekend programs. The program involves a five day live-in experience with natural science and related outdoor studies. The preferred activities are hiking, swimming (in the heated pool), fishing, campfires (in a designated area near the camp), games, nature lore, archery and orienteering. No team games are played. Visits to the hatchery, dam and suspension bridge are usually included. The camp uses intensively its immediate environment and extensively the trails systems on both sides of the river. Older groups are usually taken to the west side of the river to obtain a more "wilderness" experience on the longer, more isolated trails.

NOTE: Overnight camping has long been recognized as a major regional recreation activity in North America. Camp grounds are administered by regional agencies, Provinces or States, and through the National Park Services. It is the opinion of the consultants that some form of overnight camping is an appropriate recreation activity, to offer

underprivileged children from the inner cities a first-time experience of this activity within relatively easy reach of their homes.

Hiking, Strolling & Jogging

Most hiking and strolling occur on the trails east of the river between the hatchery, pipeline pool and Camp Capilano, and to a lesser extent, along the west side of the river despite the greater miles of trails. The reasons for the difference in use are two-fold:

1. Parking facilities near the hatchery provide for easy access to the trails and picnic tables, and the two bridges near Dogleg Pool offer a loop system along the rugged river canyon.
2. Hikers using the extensive forest area in the existing park west of the river have only infrequent contact with the wilderness of the river. Furthermore, the corridor between the upper and lower reaches of the Capilano does not provide for regional amenities and parking facilities from which to explore the extensive trail system. Unfortunately, a west side access into the privately owned suspension bridge park does not exist - an apparent destination for many hikers interviewed.

The trail between Woodcroft, Klee Wyck Park and the existing Capilano Park is neither marked nor especially pleasing along the blackberry bordered power line right-of-way.

The present popularity of jogging in the park area has resulted in considerable use by local joggers who prefer a 'wilderness' setting.

At the south end of the park, the riverside trail between Woodcroft and Park Royal, and Ambleside Park, receives considerable use by Woodcroft residents walking to and from the shopping area or park, despite poor connections at Beacon Hill, crossing problems at Marine Drive and the present parking lots at Park Royal. The stretch between Beacon Hill and Woodcroft does offer occasional benches and landscaped slopes but is lacking in tree planting along the river bank.

Viewing

The Capilano River provides three features of tourist interest: the Capilano Suspension Bridge, the Capilano Fish Hatchery and the Cleveland Dam. All three are on one of the most popular tourist tours in the Vancouver area.

The Capilano Suspension Bridge Park, adjacent park trail and souvenir shop is an internationally advertised commercial operation charging admission. No visitor information is available as the owners wish to maintain its confidentiality. Suffice to say that it is an important tourist attraction for the Vancouver Region.

The Capilano Fish Hatchery is a federally operated facility designed to provide viewing opportunities of fish migration and hatching operations without guides. During this coming winter, the public display area is to be redesigned to improve the displays and provide a more informative and interesting experience. During the summer months in 1977, almost 150,000 people of the yearly total of 270,000 visited the hatchery. Most of this is attributed to regional and tourist visitors.

Cleveland Dam is operated by the Greater Vancouver Water District. Excellent views of the reservoir, Grouse and Hollyburn Mountains and the upper Capilano Canyon are provided from the top of the dam. Tours through the dam are available only to school groups aged 13 years or more and small professional groups. Tours for these groups are operated on special request on Wednesday afternoons. There are no tours for tourists.

In addition to the canyon itself and the facilities mentioned above, the park offers the historic Capilano Logging Railway Trestle used in the early 1900's.

Spectating - Kayak Competitions

Each Spring, usually in May, an international class kayak slalom competition is held on the Capilano river. This is the most popular kayak slalom event in the Vancouver area and draws crowds of near 5,000 according to the kayak officials.

No other significant spectator activities have been reported in the study area.

Nature Studies and Orienteering

Most of the interpretive use of the park is made by the school children and youth groups who stay at Camp Capilano. They use the existing park area as an outdoor laboratory for environmental education and outdoor recreation. The park and river corridor are also used by student and college groups from

the adjacent municipalities and Greater Vancouver Area for environmental studies. Orienteering is an activity involving competitive use of map and compass for route finding. It is an excellent method to learn map-reading, terrain analysis and compass use. This activity has become quite popular in recent years. Camp Capilano, school groups and orienteering clubs often use the park area for short courses and training - most of which occur in the forested area west of the river.

Photography

The park-like forest, wild flowers, bridges and breath-taking juxtaposition between the Capilano and sheer rock cliffs, as well as a variety of lighting options provide for spectacular photographic opportunities.

Dog Walking

With restrictions on dogs in adjacent municipal parks, dog owners are more and more exercising their dogs in Capilano Park. Today this is one of the most prevalent uses of the park and is likely to increase as dog controls elsewhere become more stringent.

Motor Cycling and Teen Parties

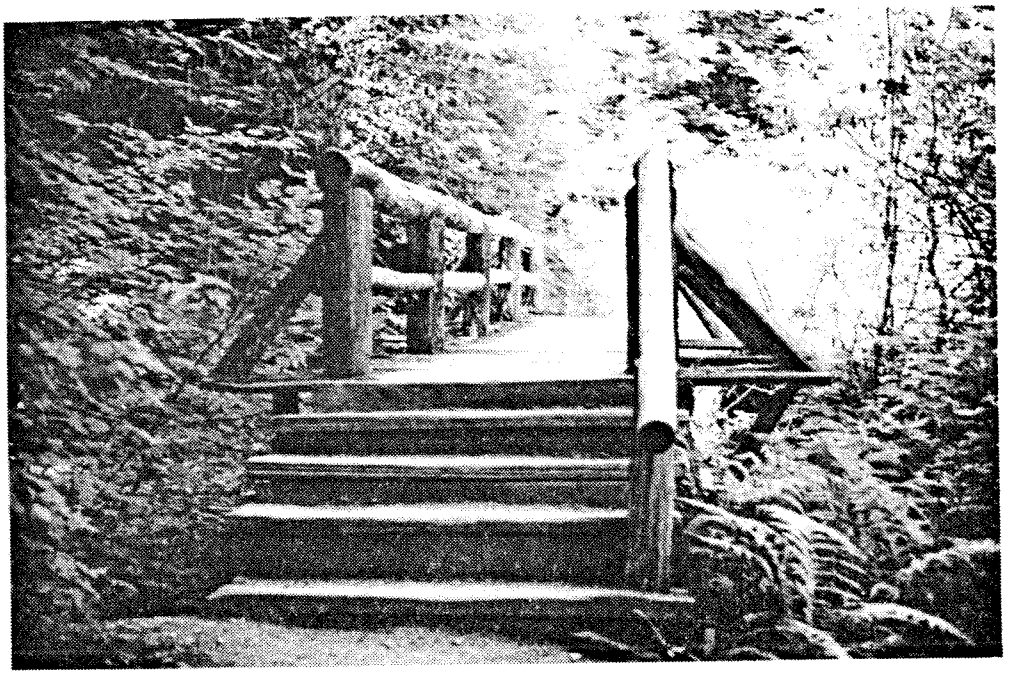
Motor cycling occurs almost entirely along the trail between the park proper and the Upper Levels Highway. As this route is presently not heavily used by pedestrians, there have been only a few use conflicts reported. Motorcycles are presently permitted to use the cleared area west of the river just north of the Upper Levels Highway. Future use of this recreation option is discouraged as it conflicts with the wilderness experience of this park.

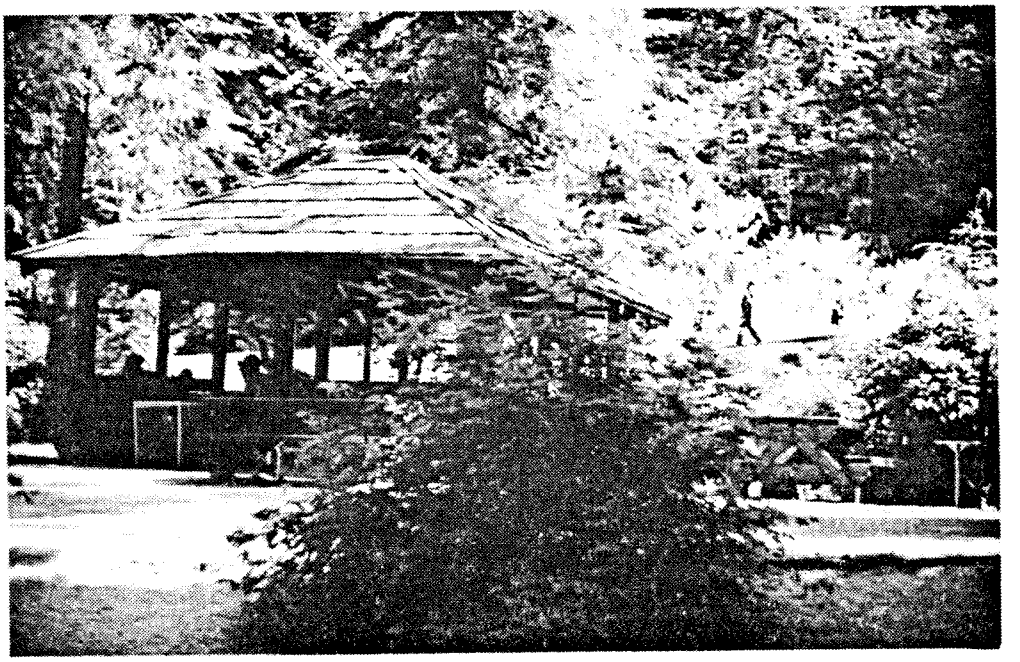
Teen parties frequently occur in the park area which, in the past, have been disruptive and destructive. Park authorities elsewhere in North America have recognized the continued existence of these activities and have given permission to students to construct permanent shelters for party use. The results included better policing by authorities and less litter in the natural areas.

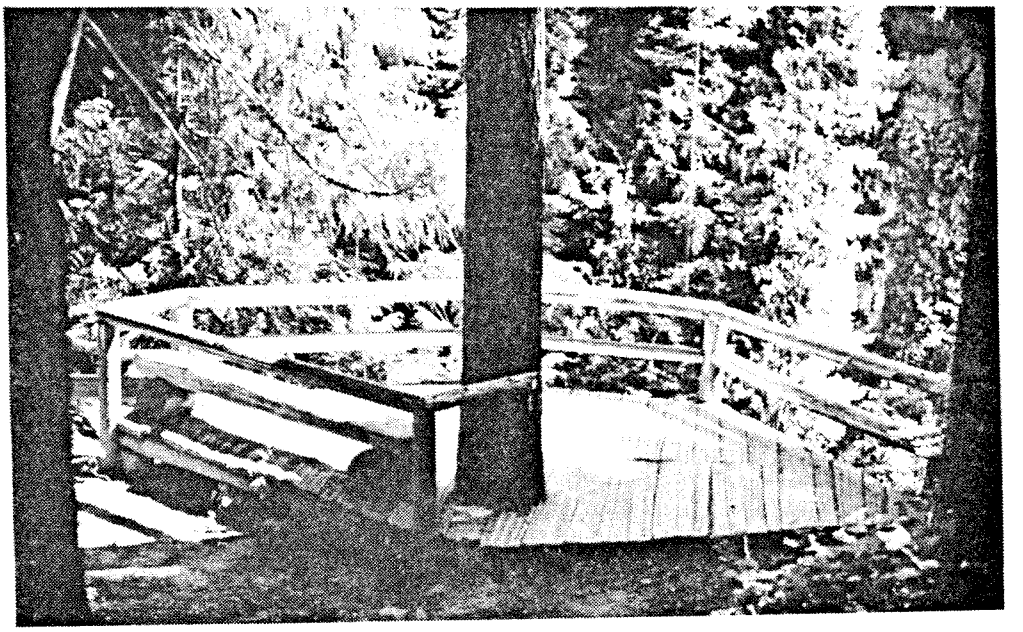
Recreation Use Estimates

Degree of use: High = H, Moderate = M, Low = L, Nil = N

USE/ACTIVITY	LOCAL	REGIONAL	TOURIST
Fishing	H	L	N
Kayaking	L	H	L
Swimming	L	N	N
River Floating	L	L	N
Hiking/Strolling	M	L	N
Jogging	M	N	N
Dog Walking	H	N	N
Picnicking	L	L	L
Viewing			
Suspension Bridge	L	M	H
Hatchery	L	H	H
Dam	M	M	M
Scenery	M	M	L
Outdoor Education/ Nature Study	L	M	N
Outdoor Photography	M	L	N
Orienteering	L	M	N
Residential Camping	N	H	N
Spectating	L	M	L
Motor Cycling	L	N	N
Teen Parties	L	N	N







LAND ACQUISITION

The terms of reference of this study included a recreational assessment of privately owned properties near the Upper Levels Highway segment of the river which perhaps should be acquired for regional park purposes. These include on the east bank the 10-acre Riverside parcel and, on the west bank of the river, the McIntyre property as well as a parcel of Cedar Crescent development, each approximately 4 acres in size. Briefly stated, the Riverside land was recently approved for single residential subdivision development; the McIntyre property includes a residence, and the Cedar Crescent site is a vacant property belonging to a multi-residential development across the river canyon.

NOTE: The Cedar Crescent property has been excluded from the Regional Park's boundary as a result of expropriation action which led to an unduly high award by the arbitrator. Nevertheless, an evaluation is being presented to illustrate the relative merits of the different land purchases available to the GVRD.

In order to assess these properties as to their recreational potential, the following comparisons are presented.

METHODOLOGY FOR ESTABLISHING THE ACQUISITION POTENTIAL OF PRIVATE PROPERTIES FOR INCLUSION INTO CAPILANO REGIONAL PARK

Method for Evaluation

Step I - Different weight values are assigned to major categories to emphasize their degree of significance.

- Site accessibility, high weight value of 6.
- Site characteristic, moderate weight value of 4.
- Site preparation, low weight value of 2.
- Activity potential, high weight value of 6.
- Site threatened by development in the near future, high weight value of 6.

Step II - Assign a score value from 0 to 6 to each criteria in each major category.

- 6 = high score; 5 = moderate to high score; 4 = moderate score;
- 3 = low to moderate score; 2 = low score; 1 = nil to low score;
- 0 = no score.

Step III - Multiply the sum of all scores in each major category by the assigned weight value of each major category to determine the sub-total value of each respective category.

Step IV - Add the sums of all five categories to establish the total value of each property. The property with the highest numerical value is the one recommended for acquisition in whole or in part.

	RIVERSIDE LAND	MCINTYRE PROPERTY	CEDAR CRESCENT
EASE OF SITE ACCESSIBILITY	Scores	Scores	Scores
(Weight value of 6)			
by car	6	2	0
by transit	5	0	0
from local road	6	2	0
from arterial road	6	0	0
from adjacent regional park	3	6	6
	26	10	6
(Sum of scores x weight value=sub total value)	26x6=156	10x6=60	6x6=36
SITE CHARACTERISTIC			
(Weight value of 4)			
topographic difference to rest of park	6	2	2
exposure (sunlight)	6	1	1
(1:1) tree cover to open space ratio	6	1	1
external noise affecting the site	1	5	5
adjacent traffic volumes	1	6	6
	20	15	15
(Sum of scores x weight value=sub total value)	20x4=80	15x4=60	15x4=60
SITE PREPARATION			
(Weight value of 2)			
ease of providing parking facilities on site	6	2	2
ease of road construction into site	6	2	2
	12	4	4
(Sum of scores x weight value=sub total value)	12x2=24	4x2=8	4x2=8
REGIONAL RECREATION PARK POTENTIAL			
(Weight value of 6)			
boating access (canoe,kayak)	5	0	0
picnicking	6	3	3
swimming,wading (access to/or pools)	3	0	0
fishing	3	1	1
camping	6	1	1
hiking (trough site to other destination)	2	2	2
horseback riding	1	1	1
sight seeing	3	3	3
nature studies	3	3	3
outdoor games	5	1	1
	37	15	15
(Sum of scores x weight value=sub total value)	37x6=222	15x6=90	15x6=90
SITE THREATENED BY DEVELOPMENT			
(Weight value of 6)	6	2	0
(Sum of scores x weight value=sub total value)	6x6=36	2x6=12	0x6=0
TOTAL VALUE:	518	230	194

It is recognized that the comparative findings are somewhat of a subjective nature. Nevertheless, the rather substantial differences in numerical values reaffirm earlier suspected attributes and limitations of these properties regarding regional recreation potentials.

The results further suggest the following options regarding land acquisition for inclusion into the regional park system.

1. Acquire ten (10) acres of the Riverside property for park purposes i.e. picnicking, boat access, fishing, incidental games, shelter, toilet facilities and parking.
2. Acquire a portion (discussed later) of the Riverside land for park use and accept the development of the remaining site for subdivision use. Included in this option are two further alternatives:
   a. Acquire the necessary lots for park development without changing the configuration of the subdivision lot layout, or
   b. Acquire the necessary park site and request the re-design of the subdivision to increase the width of the presently proposed 20 foot easement along the river bank.
3. Acquire a 50 foot public easement along the Riverside river bank, and acquire the McIntyre property.

RECOMMENDATION: Acquire as soon as possible the ten acre Riverside property for park development, or, if budgetary constraints do not permit this required expenditure, acquire as soon as possible a portion of the site as outlined above under 2b and on the following pages (a minimum of two to three acres).

NOTE: See fold-out for location.

It should be noted that land acquisition costs were considered in only very general terms.

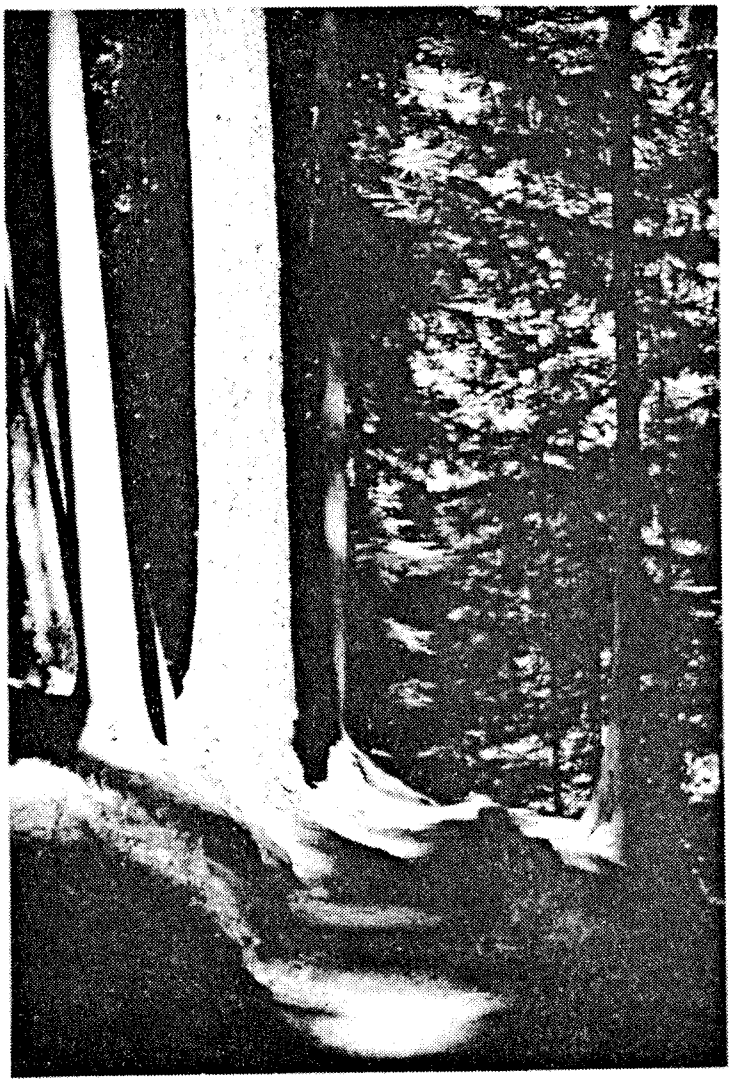
Partial Land Acquisition of the Riverside Property

Given the premise that the site is desirable from a recreational point of view and that it is an integral part of the river corridor with access to a regional park facility within an urban area, the determination of "minimum acreage" requirements becomes a rather difficult task.

1. Existing acreage requirements for various regional recreation uses are based on the "carrying capacity" of the land which is related to environmental sensivities and soil characteristics to safely handle a given number of users, including sewerage disposal requirements. Since these disposal requirements are based on rural situations,standards on the Riverside land would require appropriate adjustments as water, sewerage and power services are located in close proximity.

2. Provinces and States in North America frequently deviate from standard guidelines because of local needs and management concerns. Example: One standard calls for 20 pinic sites per acre while another standard suggests the minimum spacing of pinic tables at 10 feet, and a range from 90 to 130 tables per picnic area without reference to acreage requirements.

To overcome the absence and/or non-applicable quantative standards for a partial development of the site, a preliminary design was developed to accommodate desirable recreation options and the resulting area recommended as a minimum for acquisition (2-3 acres) as seen on the accompanying design.



SUMMARY FINDINGS AND RECOMMENDATIONS

THE CAPILANO RIVER CORRIDOR IS A SCENICALLY SIGNIFICANT RECREATION AREA WHICH MUST BE PRESERVED AND ENHANCED THROUGH APPROPRIATE DEVELOPMENT CONTROLS AND SENSITIVE DESIGN.

1. Acquire at an early date the Riverside property in whole or in part and develop the area as indicated on the accompanying preliminary plan.
2. Acquire the McIntyre property at a future date for inclusion in the regional park.
3. Secure and enhance visual and pedestrian access to the park and along the entire Capilano River from Cleveland Dam to Ambleside Park.
4. Protect and enhance the cultural and natural resources of the recreation corridor for recreation, scientific, scenic, historic and educational purposes.
5. Integrate the recreation area with surrounding land uses and activities.
6. Provide for convenient parking areas close to points of regional access.
7. Prevent major access points into the park through local neighbourhoods.
8. Utilize existing parking lots for park uses whenever possible.
9. Locate new parking areas along the periphery of the park and design these facilities in a linear and pocket-type fashion.

THE CAPILANO IS A MAJOR DOMESTIC WATER RESOURCE AND FISH REARING RIVER WHICH MUST BE PROTECTED.

1. The Cleveland Dam and its domestic water supply reservoir has not been designed to facilitate the easy control of river flows nor has it been designed to accommodate height additions. In order to supplement low summer flows for fish migration and to increase boating opportunities, two options area available to control the flow of the river.

   a. Create additional storage up-stream from the present reservoir. The present reservoir could then be held at a lower level to provide flash flood controls. The additional water up-stream could be used to secure domestic water needs well above demands.

   b. Additional storage areas for domestic use could be created on other systems of the Water District, including the Seymour and Coquitlam rivers.

2. River rehabilitation measures, erosion protection and safety of continuous access must be considered in all river and bank developments.

3. Wooden cribbing structures at erosion sites are sympathetic to the river environment and allow for the re-vegetation of the river banks.

4. When appropriate, provide for native trees and shrubs to stabilize river banks and to provide shade cover for anadromous fish.

5. Anglers are presently limited to 17 pools and runs within the canyon. It is suggested that additional angling access is not desirable in order to maintain a high quality fishery and catch success rate.

6. Consideration should be given to re-establish previously lost pools below the Upper Levels Highway, especially along the Riverside property area. Engineering and feasibility studies should be undertaken at an early date.

7. Consider the construction of a weir across the mouth of the river to provide for: the enumeration of anadromous fish entering the river, a marking program designed to determine migration patterns, holding areas and migration speeds, and to accommodate fish viewing.

8. Consider the suitability for fish viewing platforms in selected access areas.

9. A priority consideration should be given to a fishing pier at the mouth of the river, together with marketing facilities for fresh, whole fish. (Consider the re-establishment of the Indian Food Fishery).

10. Provide for the monitoring of water qualities.

THE CAPILANO CORRIDOR IS A SCENICALLY UNIQUE AND REGIONALLY SIGNIFICANT RECREATION AREA WHICH MUST BE PRESERVED AND ENHANCED.

1. Preserve the Wilderness Quality of the Capilano River Canyon.
2. Provide for a variety of recreational choices.
3. Consider the year-round potential of the river in recreational developments.
4. Provide for design and implementation strategies that are flexible to respond to changing regional demands.
5. Develop strong visual and pedestrian connections between Capilano Park and adjacent educational and recreational facilities.
6. Recreation and educational uses of the river's physical and biological resources require safe and convenient access into and along the canyon, floodplain and estuary.
7. Provide for information signs throughout the park, including directions and identification of native plant materials in areas of high visitor use.
8. Provide for environmental options in the location of trails and initiate a careful tree-thinning program under the direction of a landscape architect to open scenically significant vistas.
9. Serious consideration should be given to construct a trail bridge across the Capilano River immediately north of the existing privately owned suspension bridge so as to provide for additional trail loop options.
10. At the present time, the privately owned Suspension Bridge Park does not offer public access from the west side trail. Ideally this park should be acquired for regional park use and the souvenir facilities to remain in private ownership. In the event that such a proposal is not acceptable or economically feasible, serious consideration should be given to construct a trail-bridge across the Capilano River, immediately north of the privately owned park so as to provide for additional trail loop options connecting both sides of the river bank.
11. All new path construction must avoid geologically unsafe areas.
12. Additional observation platforms should be located near the river canyon. Provide for maximum safety through appropriate designs and construction.
13. Provide for benches, trash containers and occasional shelters along trails of high visitor use.
14. As a minimum, improve the "beach area" below the Hatchery parking lot where much of the diving from rocks occur by selectively removing some of the bolders.

15. Provide for additional parking pockets on the east side of the river, south of present parking facilities.
16. Provide for a continuous and improved trail system from Ambleside Park to the Hatchery, including access to adjacent parks
17. The GVRD should review its policy regarding the inclusion of overnight camping as a regional recreation activity to offer underprivileged youngsters from the inner cities a first-time experience of this activity within relatively easy reach of their homes.

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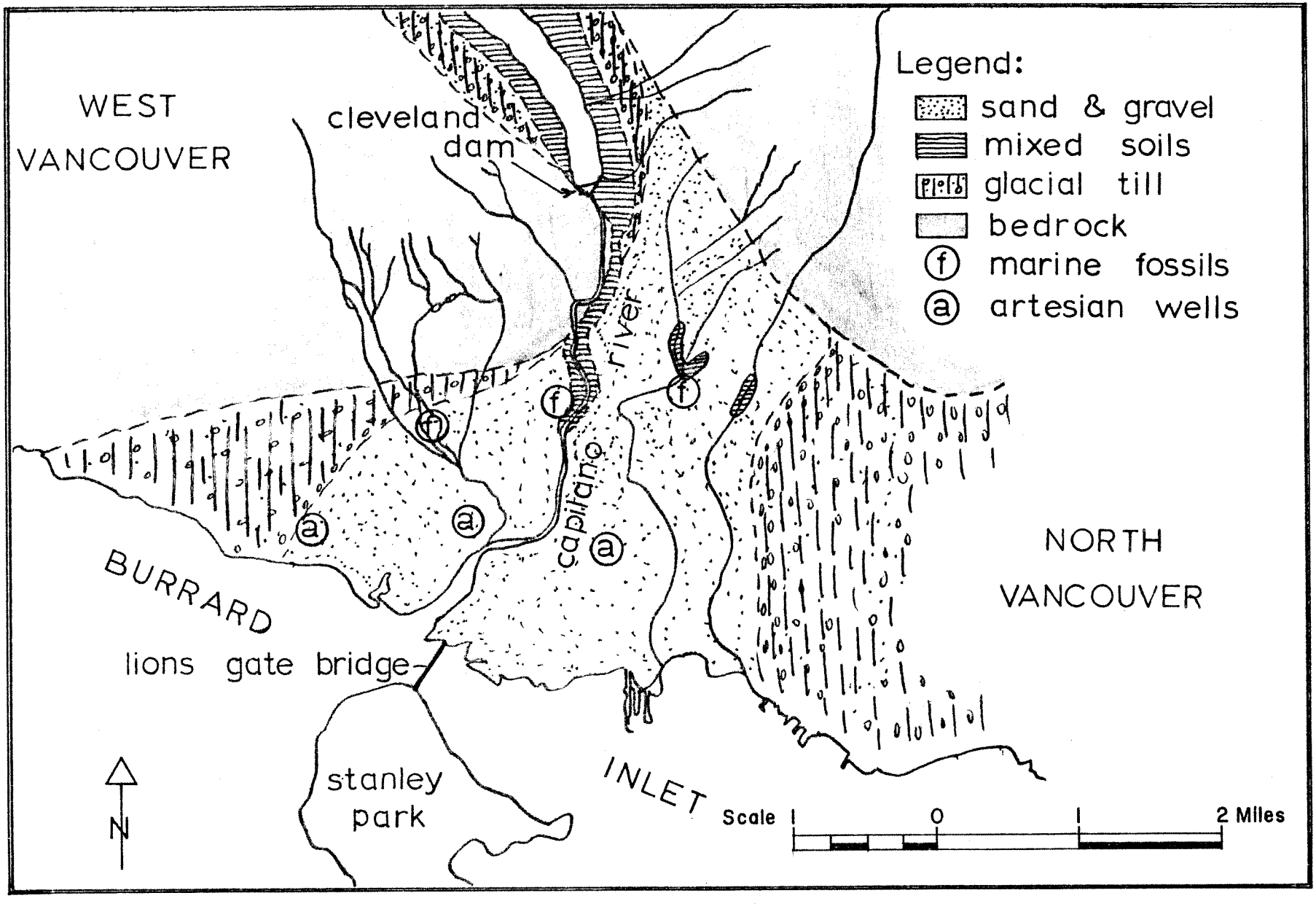
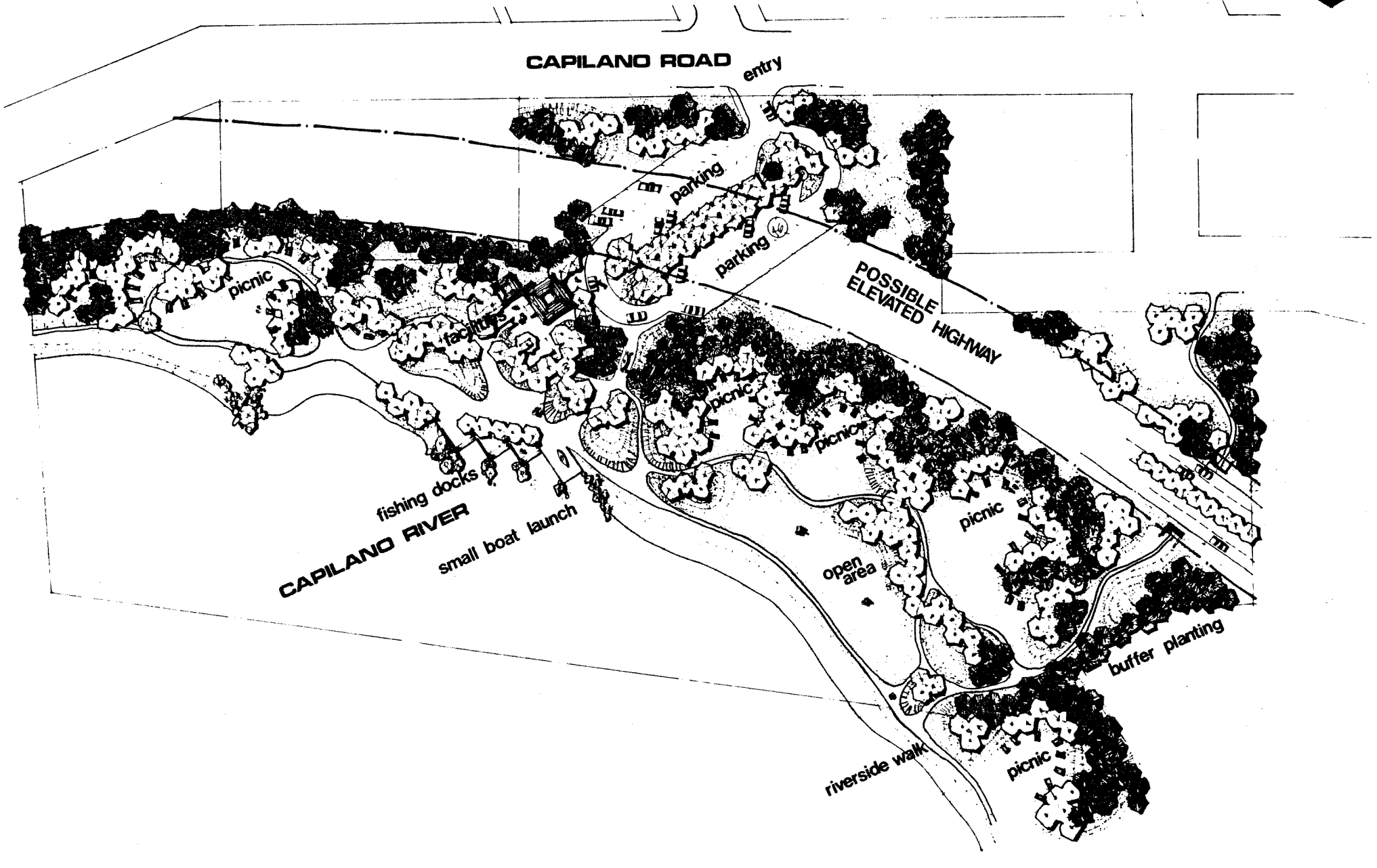
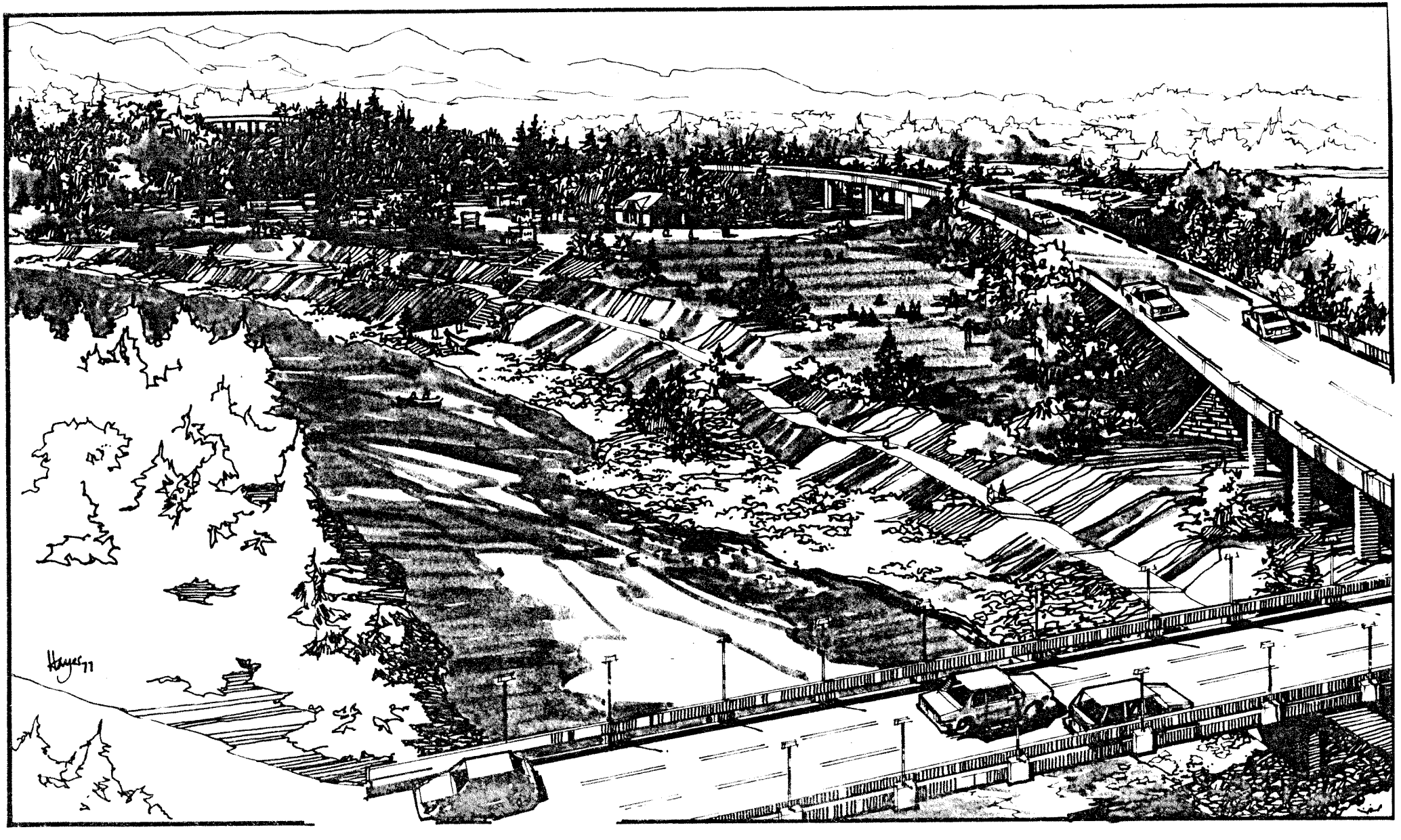


Fig. 1. SURFICIAL GEOLOGY of CAPILANO VALLEY

Riverside Property Development Proposal

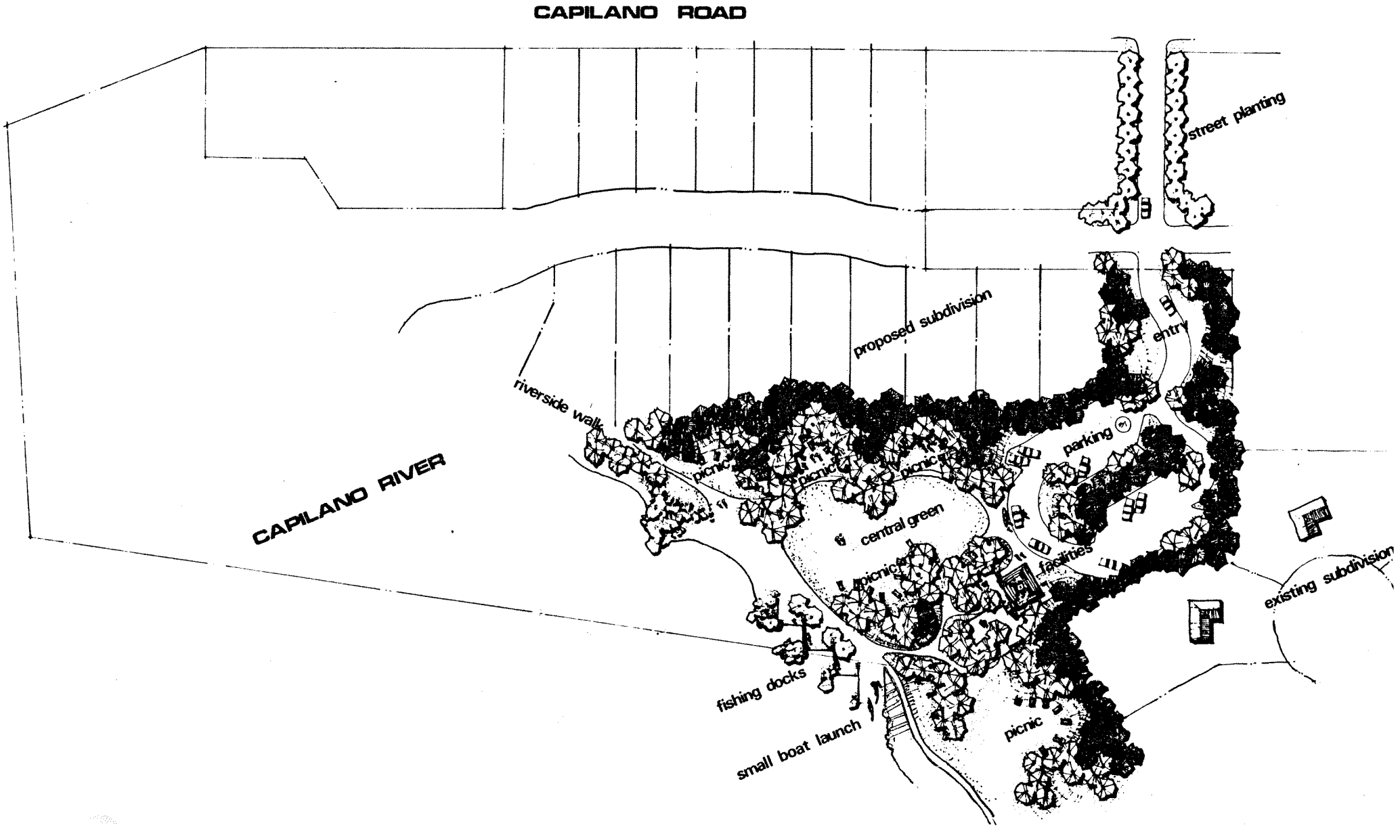
ALTERNATIVE ONE





Riverside Property Development Proposal

ALTERNATIVE TWO



DAMSITE HATCHERY

CANYON · natural

TREE THINNING IS RECOMMENDED NORTH OF CAMP CAPILANO TO OPEN VISTAS INTO THE RIVER CANYON

EXISTING PICNIC AREA IS UNDERUSED DUE TO EXCESSIVE SHADE. INITIATE A TREE TRIMMING PROGRAM TO ALLOW FOR SUN EXPOSURE

PRIMARY REGIONAL RECREATION AREA PROVIDING FOR PICNICING, LOOP TRAILS RIVER VIEWING, DIVING ROCKS & POOLS

CAPILANO FISH HATCHERY, A PRIMARY REGIONAL ATTRACTION

POTENTIAL PARK ACCESS AND A SERIES OF 'POCKET-PARKING' AREAS TOGETHER WITH RESTROOM FACILITIES.

PRIVATE PROPERTY. CAPILANO SUSPENSION BRIDGE. ACCESS FROM WEST TRAIL INTO PRIVATE PARK IS HIGHLY DESIRABLE

PRIMARILY A TRANSITION AREA WITH SOME VERY NICE BEACHES. EXISTING TRAILS TO BEACHES SHOULD BE SIGNED

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CAPILANO VIE
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CREATE NATURE STUDY AREA IN WETLAND ZONE. EXPAND BOARD-WALK AND INTERPRETATION SYSTEM

CAMP CAPILANO

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CAPILANO RIVER

CAPILANO

CLEVELAND DAM

CAPILANO GOLF AND COUNTRY CLUB

NORTH

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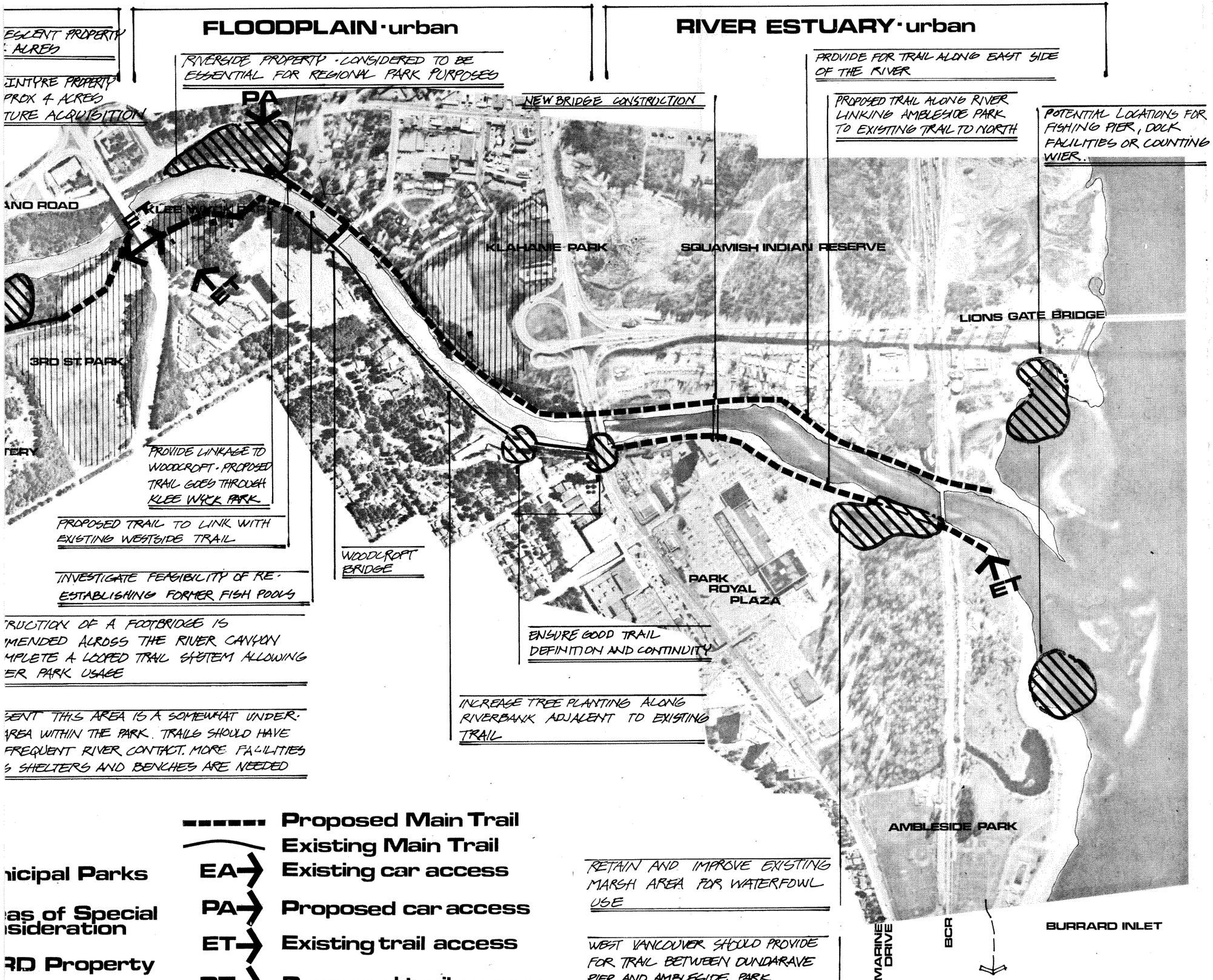
SCALE

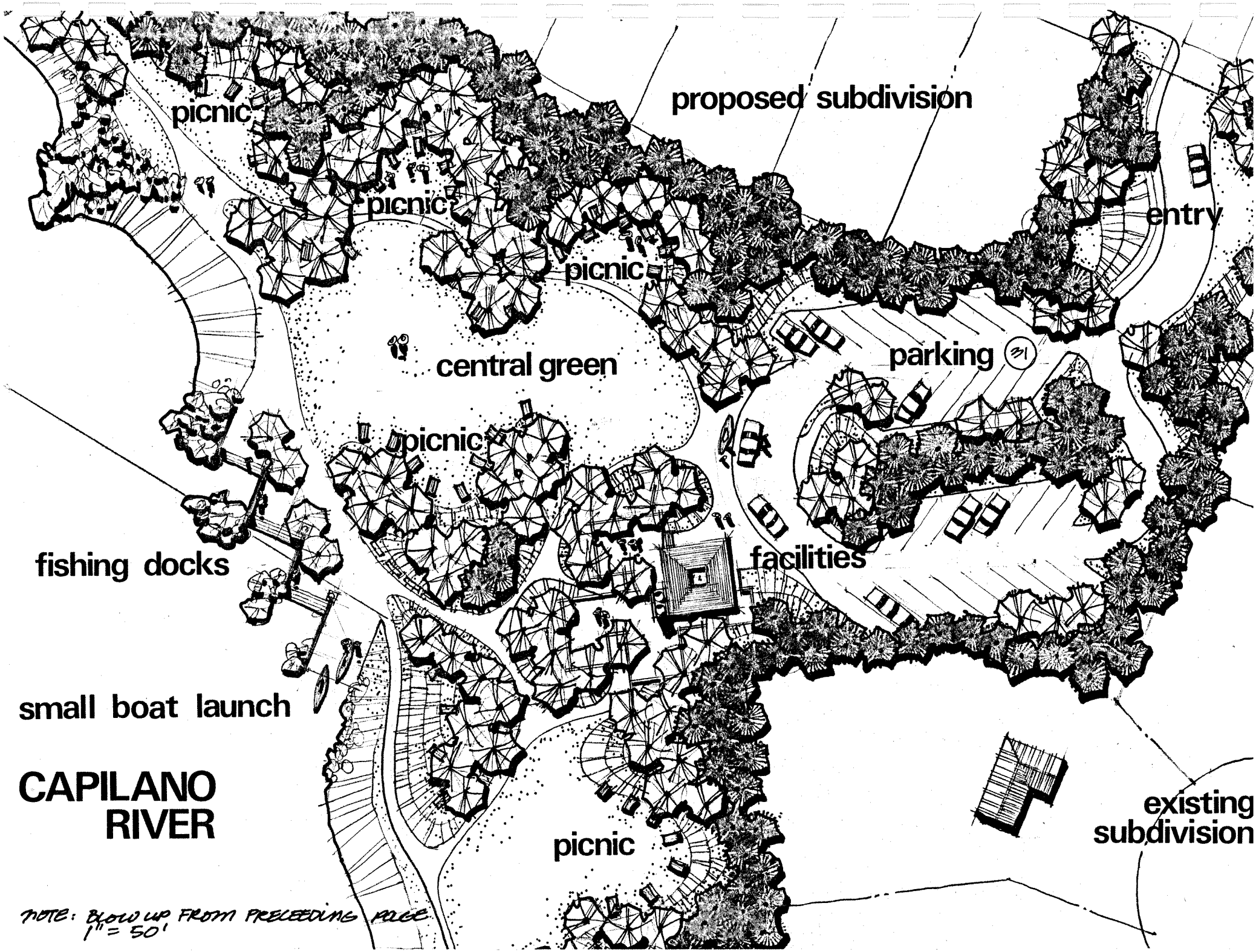
DEVELOPMENT RECOMMENDATIONS

Capilano Regional Park

PREPARED FOR GREATER VANCOUVER REGIONAL DISTRICT PARKS PLANNING DEPARTMENT

EKOS PLANNING AND ENVIRONMENTAL DESIGN GROUP LTD.





NOTE: BLOW UP FROM PRECEEDING PAGE
1" = 50'