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AN EXAMINATION OF THE LANDSCAPE
LOCAL TO WANAKA WITH PARTICULAR
REFERENCE TO THE DEVELOPMENT OF
PEMBROKE PARK

A research study submitted in
partial fulfilment of the re-
quirements for the Diploma
of
Landscape Architecture
in the
University of Canterbury

by

Lincoln College
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The Department of Lands and Survey and the Wanaka Islands Domain Board for the opportunity to undertake this study.

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THE BRIEF

The Department of Lands and Survey, and the Wanaka Islands Domain Board, are concerned that the scenic character of the landscape local to Wanaka is retained whilst catering for increasing recreational pressure and changing resource uses.

To achieve this aim a generalized evaluation of the landscape, its desirable features, and the problems of its visual content is to be carried out.

Detailed development proposals for Pembroke Park are to be prepared so that development relates to adjacent foreshore reserve lands and to the overall framework of the landscape.
(1) Geological History

In the Paleozoic era, about 250 million years ago, the Wanaka region and most of present day New Zealand were part of the seabed on which thick beds of marine sand and mud were being deposited. Derived from a land mass that lay somewhere to the west, the sediments accumulated to a great thickness of many thousands of metres.

During the Mesozoic era, about 130-140 million years ago, crustal compressions folded these ancient deposits and the folding, under the high temperature and pressure prevailing, resulted in recrystallization and development of the slabby foliation of the schists characteristic to the region. The folding elevated the rocks into a mountainous terrain that was completely levelled by erosion during later Mesozoic and Tertiary times.

During the middle Tertiary a low, swampy land clothed with tropical or subtropical forest existed, and towards the end of the Tertiary period, about 5 million years ago, strong rapid fault and fold movements established the main elements of the present physiography. The ranges of West and Central Otago began to rise and rivers began carving the valleys that later bore the great glaciers.

Periods of cold climate during the Pleistocene age saw extensive glaciation of the mountains and the excavation of great U-shaped valleys. Intervening periods of warmer climate in the Pleistocene allowed forests to develop on many of the ranges, and the formation of deep-weathering soils weakened the rocks for the erosive processes of the period of cold climate. Alluvial materials deposited in the valleys during cold periods
were later dissected into flights of terraces by the river systems. Morainic deposits bordered the large valley glaciers, and after the glaciers retreated and melted about 15,000 years ago, the main lake basins appeared.

(2) Landforms

The landforms of the region are dominantly those of glacial origin. Glaciated mountain ranges 1,500 to 2,700 metres high, culminating in the peak of Mount Aspiring (3,038m), form a backdrop to the glacial lakes of Wanaka and Hawea. Successive ice-advances in the Pleistocene have extensively modified the landscape, eroded deep glacial valleys, lake basins and cirques. Mountain peaks have been sharpened, and the great terraces and escarpments that are features of Wanaka's topography - for example, around Luggate township - have been aggraded by the rivers which carried away the glacial materials. The dominance of the peaks owes much to the fact that mountain foothills are notably absent - glacial action has resulted in ranges rising sheer from the valley floors and lake surfaces.

Lakes Wanaka and Hawea were excavated by valley glaciers that once extended as far down-valley as Lindis Crossing. They occupy steep-sided, U-shaped troughs the sides of which exhibit ice-scoured benches. The lake troughs have been greatly overdeepened by the glacial action so that the lakes are very deep and though the actual barriers that hold them consist of moraines, the bottoms of the lakes are far below the levels of the schist formations on which the morainic dams rest. As the glaciers retreated after the last cold period of the Pleistocene, low ridges of recessional moraines were deposited and these deposits and outwash gravels are the characteristic formations at the southern end of the lakes. The Clutha River
which rises from Lake Wanaka, is joined a few miles downstream from the lake outlet by the Hawea River draining Lake Hawea.

Glaciated surfaces have in many places been scraped bare by the passage of glacier ice over them and as a result have become conspicuously mammillated and deeply grooved with the development of irregular terraces. Further evidence of ice-scouring is afforded by prominent schist hills such as Mount Barker, Mount Iron, Mount Brown and the truncated spur formations of Roys Peninsula and around Glendhu Bay - all of which owe their distinctive forms to glacial erosion.
FIGURE 2: Lake Wanaka - a glacial lake impounded by end moraine. Wanaka Township is in the foreground and the Matukituki Valley appears beyond the truncated spurs of the Glendhu area.
(3) **Rocks**

The Paleozoic rocks in the region are the metamorphic rocks of the Haast Schist Group. Of this group, the Chlorite Zone schist forms a broad belt throughout Otago, and as the accompanying Geology Map shows this sequence lies extensively over the mountains of the Wanaka region. Because of their considerable extent and great thicknesses the schists are divided into sub-zones based on degree of foliation.

Tertiary rocks are represented by small deposits occurring in highly quartzose sequences on beds of deeply weathered schist.

The Pleistocene rocks include a wide range of unconsolidated materials deposited along the present-day river valleys and in the lake basins. Most of the deposits are flat-lying and were probably formed during and just after the peak of glacial advances. The materials include poorly sorted glacial till in old moraines around the lake margins, and thick beds of outwash gravels and morainic deposits spreading out from the moraines.

During recent times lake beach gravels have been deposited at higher Post-glacial lake levels around the lake margins. Alluvium has accumulated in the river valleys and morainic deposits of the present glaciers are characteristic in streams formed by melting ice.

The ancient river sediments contained rich concentrations of alluvial gold and considerable quantities have been won from workings south of Lakes Wanaka and Hawea. Today river and stream gravels provide supplies of concrete aggregate and road metal. A friable sand has been obtained for local use near Wanaka and in the Haast Schist Group, small irregular lodes of antimony and copper ores exist.
CLIMATE

Apart from its influence in soil formation, climate restricts or makes possible many uses of the landscape, such as farming or recreation, and decisions about vegetation types must take into account climatic conditions.

The intermontane basin in which Wanaka is situated derives its particular climatic qualities mainly from its location and physiography. Distance from the sea, and the presence of the high mountain barriers to the west which prevent the penetration of oceanic influences, result in a continental type of climate characterized by hot, dry summers and cold, dry winters.

(1) Winds
In the free atmosphere above Central Otago, winds are from a westerly aspect in all seasons. On the surface these winds are funnelled by the mountain ranges in a more northerly direction along the valleys and the basins such as that which contains Lake Wanaka. The funnelled wind tends to be strongest (50 to 65 km/h) in summer and weakest (30 to 40 km/h) in winter. Sheltered areas such as those around Glendhu Bay and Dublin Bay have a higher percentage of calms and light winds.

(2) Precipitation
The Southern Alps shelter the area very effectively from the rain bearing winds and give a concentration of precipitation on the west coast. The accompanying Rainfall Distribution Map shows that the "rain shadow" effect of the prevailing westerly winds passing over the intervening ranges causes an abrupt drop in precipitation from about 7,600 mm annually near Mount
Aspiring to about 640 mm at Wanaka, 50 kilometres away. The map also shows that average precipitation increases with altitude.

The variation of monthly rainfall is set out below.\(^{(1)}\) It is seen that monthly rainfall is at a maximum in autumn and a minimum in winter.

<table>
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Arid conditions are ameliorated with elevation and it is probable that the winter minimum does not extend above an altitude of between 900 and 1,050 metres. Precipitation above that height is augmented by snowfall. The permanent snowline lies between 2,100 and 2,400 metres, and in winter mountains above about 1,200 metres have snow lying for periods of a month or more.

Roxburgh records that "in 1878 snow lay 1½ metres deep in the Matukituki Valley for four months ... in the spring the weather changed and was unusually fine and warm for several weeks. Thus the stage was set for the deluge of the last week of September, 1878, with all its devastating consequences"\(^{(2)}\). The flood of 1878 has been the biggest in the short history of Wanaka, the level of the lake rising to 285 metres above sea level, or 4½ metres above normal lake level.

In summer, high temperatures, insolation and evaporation accentuate the dryness of the area already marked by low rainfall and as a result there are considerable moisture deficiencies. When rainfall is insufficient to supply plant needs soil moisture reserves are drawn upon - the amount used depending on the soil and plant types. Pasture growth, for example, is seriously retarded if during dry periods the soil

\(^{(1)}\) New Zealand Meteorological Office records.
\(^{(2)}\) P.125 Wanaka Story, (1957) Whitcombe and Tombs Limited
moisture is used up to the equivalent of about 75 mm of rainfall.

Although effective precipitation increases with altitude and snow-melt becomes an important source of soil moisture, plant growth is restricted at higher altitudes due to stronger winds and decreasing temperatures.

(3) Temperature

Characteristic of the intermontane basins of the South Island, the Wanaka region experiences a climate of temperature extremes - high temperatures in summer and very cold temperatures in winter, with relatively large diurnal ranges at all seasons.

The absence of moisture laden winds and major cloud formations not only allows insolation to produce high temperatures but makes Wanaka one of the sunniest places in New Zealand during the summer months. Extreme temperatures are generally above $30^\circ$C in December, January and February, these being $15^\circ$C above the extreme maximum for July. Low temperatures and high humidities are produced by radiational cooling on clear nights and the drainage of cold air down the mountain slopes especially when snow covered.

Ground frosts of $15^\circ$C to $20^\circ$C are common in winter although frosts can occur in any month of the year. Generally more than half the days with ground frosts are also days with screen frosts.
SOILS

Soil is the product of the interaction of parent material, climate, surface configuration, vegetation and time. The accompanying Soil Map indicates the pattern of the relevant soils found in the Wanaka region. The soil pattern is simplified by the wide distribution of rocks or more or less uniform composition. Most of the soils shown are formed either from basement schist or from loess or alluvium derived from it, and have properties determined largely by climatic gradation of rainfall distribution. The soils indicated may be divided broadly into seven main zonal groups.

(1) Brown-grey Earths

Formed on schist and greywacke materials eroded and transported in Pleistocene and post-glacial periods, brown-grey earths developed under short tussock grassland with rainfalls of 500 to 760 mm, and are mainly confined to the terraces and fans of the Upper Clutha Valley.

The soils of the high terraces and fans are droughty, stony and a well-developed clay pan and underlying Tertiary sediments act as drainage impediments when the soils are irrigated. Wind erosion has been widespread and the soils now support an open cover of weed grasses and scattered fescue tussock.

Soils on the intermediate terraces and fans are also droughty, stony and suffer from wind erosion. On the upper parts of the fans, soils are shallow, but deep fertile soils that are suitable for intensive cultivation under irrigation, occur on the lower parts.

Steepland brown-grey earths are very droughty, shallow soils, now extensively sheet eroded with much scree on the surface.
(2) **Yellow-Grey Earths**

These occur mainly on rolling moraines and loess covered terrace lands and fans in a climatic zone where rainfall ranges from about 500 mm to about 1000 mm. They are formed on loess derived from schist and are characterized by weak-structured, silt-loam topsoils and compact silty-clay subsoils. Although naturally well drained the compact subsoil or pan of these soils can act as a drainage impediment locally. The yellow-grey earths are of moderate natural fertility and respond well to lime and phosphates and molybdenum.

Soils of the terrace lands and fans are mostly deep and respond well to irrigation if adequate drainage is provided. On the rolling land and hills yellow-grey earths, where deep and on easy topography, can be cultivated and cropped, but wind and sheet erosion may occur because of the weakly developed topsoil structure.

Steepland yellow-grey earths are widespread up to altitudes of about 900 metres, on the mountains flanking the Upper Clutha and Cardrona Valleys. These soils are formed on stony slope deposits with a thin cover of loess in places, and having suffered from widespread sheet and gully erosion, management in the interests of soil and water conservation is of prime importance.

(3) **Upland and High-country Yellow-brown Earths**

These soils are commonly developed under annual rainfalls greater than about 900 mm, but on freely draining parent materials such as the outwash gravels and morainic deposits of the Upper Clutha Valley they have developed where annual rainfall is as low as 500 mm. On the basis of soil moisture regime the upland and high country yellow-brown earths have been subdivided into two groups - dry-hygrous and hygrous - the former occurring in
the dry Upper Clutha Valley and the latter in the more humid uplands and mountain lands.

Free from pans and compacted horizons yellow-brown earths are free-draining and friable both in topsoil and subsoil, but weakly developed crumb structure renders these soils liable to wind and sheet erosion when the natural tussock cover is removed.

The dry-hygrous yellow-brown earths on the terrace lands and fans of the Upper Clutha are shallow and stony. They are droughty and excessively drained because they overlie coarse unconsolidated gravels and wind erosion limits cultivation.

Dry-hygrous soils on rolling lands and hills are confined to the southern end of Lake Hawea where they overlie less porous moraine and rock. Consequently they are less droughty than the soils of the terraces.

Steepland yellow-brown earths are the dominant soils on the glaciated ranges above an altitude of about 900 metres. These hygrous soils are formed on schist rocks and slope deposits, and in some places on a very thin layer of loess. They are weakly weathered but strongly leached, and in general become more strongly leached at higher altitudes. The soils are very susceptible to erosion and when vegetation is burnt or grazed they have suffered widespread erosion.

Yellow-brown earths have a low natural fertility but respond well to sulphur and phosphate fertilizers up to moderate altitudes.

(4) Upland and High Country Podzolised Yellow-brown Earths and Podzols

These soils have many features common to those of the preceding group and have hygrous to hydrous moisture regimes. Differences are due mainly to the higher altitude and lower temperature that result in weaker weathering and lower production
and turn-over of organic matter.

Steepland soils related to upland and high country podzolised yellow-brown earths are widespread in the mountains above an altitude of about 900 metres where rainfall is in excess of about 4000 mm. Most of these soils are in native forest now managed as protection forest. Direct damage to soils by noxious animals occurs in these forests in addition to their indirect effects caused by modification of vegetation.

(5) **Gley Recent Soils**

These are confined to the flat flood plain of the Makarora River and are derived from schist alluvium accumulated in recent times. The soils have a high natural fertility and the absence of pans and cemented layers allows easy drainage.

(6) **Recent Soils**

Recent soils occur on the flat flood plains, low terraces, and gently sloping fans of the Cardrona, Motatapu, Matukituki and Makarora River valleys where sedimentation is rapid but where surface drainage is good. They are formed on alluvium that has been deposited in the recent past or is still being deposited by floods. Insufficiency of time has not permitted the profiles of these soils to become fully developed and they cannot be used for long-term cropping without structure deterioration. Natural fertility is medium to low.

(7) **Alpine Steepland Soils**

The limit of continuous soil mantle is about 1500 metres. Alpine soils occur above this altitude and have stony, shallow profiles not unlike Recent soils. Alpine soils however are strongly leached and their fertility is very low. Much of the
Land included in the Alpine soils is bare rock and scree and because of the steep topography erosion can be severe.
VEGETATION

(1) Distribution of the Natural Vegetation

The vegetation of an area in its natural condition reflects, to a certain degree, the sum total of all the climatic, soil, and other factors of that area. As indicated in the previous sections, the physical environment of the Wanaka region is very diverse. Altitude varies from 3,038 metres on Mount Aspiring to 278 metres on Lake Wanaka within the course of 32 kilometres. There are high summer temperatures and very cold temperatures in winter, with relatively large diurnal ranges at all seasons - and there is the contrast between the wet alpine zone and the dry regime south of the lakes. Such conditions provide the environments for a wide range of vegetation types - forest, scrubland, grassland, alpine herb-fields, to name the most distinctive.

The accompanying Vegetation Map outlines broadly, the distribution of natural vegetation in the Wanaka region as it was prior to European settlement.

Around Lower Wanaka and in the Upper Clutha Valley, below altitudes of about 900 metres and where annual rainfall does not exceed about 1500 mm, lowland short tussock grassland formed the dominant vegetation. Occurring on brown-grey and yellow-grey earths, and upland and high country yellow-brown earths, the grassland was characterized by fescue tussock. Blue and silver tussock often occurred in association with the fescue tussock. Patches of matagouri scrub were also present and kanuka occupied gullies on shady faces.

Beech and beech/podocarp forest covered many valleys in the lee of the ranges up to altitudes of about 1000 metres in areas receiving more than 1000 mm of rainfall annually. Soil types
beneath the forest included upland and high country yellow-brown earths (some being podzolised), and Recent soils of the Matukituki and Makarora Rivers.

The beech forests shown on the map are undoubtedly remnants of originally more extensive forests of this type. Fire, whether started by lightning or Maoris, and possible incomplete adjustment to past climatic changes have played their part in reducing the beech cover. Although the forests were composed principally of beech, there are stands of sub-alpine Hall's totara - rata - kaikawaka - celery pine forest. Several conifer associations - kahikatea, rimu, miro and matai in particular - also occurred among the beech forest.

On hills and steeplands receiving an annual rainfall in excess of about 1500 mm subalpine grasslands and scrublands existed up to an altitude of about 1800 metres. This zone of vegetation, characterized by snow tussock, with sub-alpine scrub in places, occurred principally on upland and high country yellow-brown earth soils.

Above this zone in the alpine barrens, the surface of bare rock, scree and rock waste supported a few widely scattered alpine herbs and grasses.

(2) Culturally induced vegetation

The land use pattern, and with it the culturally induced vegetation, of the present day follows the outline of the primitive vegetation very closely. This is the topic of a subsequent chapter, and here it is sufficient to say that improved pasture now covers most of the plains and downlands which were originally tussock covered although some areas have reverted to tussock. The tussock cover at higher altitudes was severely depleted by fire and overgrazing but is now recovering.
Milling operations between the 1860's and early 1900's resulted in the destruction of much of the forests but considerable areas remain largely intact if somewhat modified by the naturalisation of deer, pigs, and opposums. Destruction of the beech has resulted either in the extension of the adjacent grasslands or in the development of widespread scrub or fern areas.

One notable feature of the cultural landscape is the widespread use of exotic tree species for shelter belts and woodlots, including Douglas fir, gum, larch, macrocarpa and pine. Poplars and willows are characteristic along rivers and valleys where settlement has occurred, and also along the shores of the more accessible beaches of the lakes. And around Wanaka Township the English tradition of the early settlers is further reflected in plantings of ash, chestnut, lime, oak, poplar, plane, silver birch, sycamore and willow.
FIGURE 3: Poplar and willow associations near the Wanaka Township provide a better scale relationship in an expansive setting than the native flora remnants of kanuka, kowhai and flax.
WILDLIFE

The European colonists introduced species of birds and fish they considered desirable and many of these have adapted well to the habitats previously the domain of only native species. Because they had no competition, introduced animals thrived, but their overall effect on the vegetation has ranged from moderate to severe, so that today all introduced wild animals are declared noxious.

Wildlife occupying six distinct habitats within the Wanaka region are described. These habitats are closely related to the vegetation communities.

(1) Lakes and Wetlands

Paradise duck, native grey duck and shoveller, New Zealand scaup, and the introduced mallard are conspicuous water birds in the region. The native blue duck is restricted to the more remote mountain streams. In some valleys introduced black swan and Canada goose may be seen. Of the swampland birds pukeko is common while the bittern is found in rather limited numbers in restricted areas.

Lakes Wanaka and Hawea provide ideal habitat for rainbow and brown trout, as do most of the rivers and their tributaries in the region.

(2) Riverbeds

Black-backed and black-billed gulls, South Island pied oyster-catcher, black-fronted tern, pied stilt and banded dotterel are migratory sea and shore birds that nest along the shingly riverbeds of the main catchments in late Spring. Skylarks, various finches and other introduced birds, and the
native pipit frequent the more open valleys.

(3) Lowland Grasslands
The main bird species of the lowland tussock habitat were the native quail, pipit, harrier and eastern weka. Continual burning of native grasslands aided the extinction of the quail and weka. The pipit and harrier however, tended to benefit from settlement which has in general increased the area of habitat.

Liberated in the 1860's, rabbits rapidly became a pest, but intensive and effective rabbit control means that this animal no longer constitutes a threat to the vegetation.

Stoats and weasels were liberated in the 1880's in the belief that they would reduce the numbers of rabbits. Although sometimes useful in killing rabbits that have survived control operations, today stoats and weasels are regarded as noxious because they prey on birds and their eggs.

(4) Forests
Of the forest bird fauna, kakapo, kokako, piopio and bush wren appear to be on the verge of extinction. Native para-

keets, kaka and native robin are found in rather limited numbers in restricted areas and the migratory shining and long-tailed cuckoos are summer visitors to the forest canopy. The New Zealand pigeon, morepork, bellbird, tomtit, rifleman, brown creeper and fantail are more conspicuous and show some tendency to spread into habitats consisting of wholly or mainly of exotic trees.

Early legislation encouraged the liberation, increase, and spread of red deer but extermination policies have been pursued since deer proved harmful to the forest and high-altitude grassland.
Liberated in the early 1900's oppossums now infest great portions of the forests in the Matukituki and Makarora catchments, however their effect on the vegetation has not been severe.

(5) Scrublands
In shrubby areas, including the sub-alpine zone, grey warbler and white-eye are common, as is the introduced hedge-sparrow and in some areas song thrush, blackbird, redpoll and chaffinch.

(6) Alpine Zone
The rock wren as an inhabitant of scattered scrub in alpine herbfields and the edge of the sub-alpine scrub, is the most specialised of the alpine birds. The pipit and kea are commonly observed on the higher tussocky ridges, and the introduced chukar seems to have acclimatised well in the high, rough, tussocky gullies and rocky outcrops.

Liberated by early settlers hares increased rapidly and may be found up to altitudes of 2000 metres where their direct effect on select alpine vegetation is often severe.

Chamois and thar may be found in high-altitude basins and on precipitous rock faces, but they also utilise the alpine scrub and the forest. After liberation in the Mount Cook area in the early 1900's these animals were protected until their consequent effect on their habitat caused considerable concern.
FIGURE 4: The shallows of Roys Bay provide a popular habitat for waterbirds.
THE CHANGING LANDSCAPE

Nan Fairbrother suggests that landscape is the habitat manipulated by man for his own uses - it is the interaction of a society and the habitat it lives in and if either man or habitat changes then so inevitably must the resulting landscape. (1) A brief examination of the history of settlement and land use of the Wanaka region reveals that, except for the alpine barrens, the face of the natural environment has undergone considerable changes following a succession of cultural phases which have had different influences on different sectors of the environment.

It is therefore relevant to consider the present character of the Wanaka landscape as being part of a continuous process in which the landscape is undergoing change, as human needs and desires change. Although the past may explain the present it is not a mirror for the future, its relevance is to put in perspective the interplay of forces that may result in further changes to the landscape.

(1) Maori Occupation and European Settlement

There is little evidence to suggest that the Maoris were permanent inhabitants of the region - their tendency being to settle on the coasts and river mouths. Low winter temperatures were probably a prohibitive factor to inland habitation but it is believed that the Maoris lived in small semi-permanent villages in the vicinity of Lakes Wanaka and Hawea. These were essentially summer camping places visited on transalpine crossings and fishing and fowling expeditions.

Te Puoho, Te Rauparaha's fighting chieftain led a raid on

these settlements in 1836 that became the turning point in the Maori history of the region. The few who escaped never returned, thus when the European settlers arrived in the late 1850's there were no Maoris to dispute ownership of the land.

The Europeans found the hills and river terraces lying in the shadow of the mountain chain were predominantly tussock covered. In the less arid mountain valleys beech/podocarp forests were found, but the presence of small remnant stands of forest on the grasslands indicated a far more extensive forest cover in earlier times. These forests, and the rivers and lakes undoubtedly supported large bird populations to which the Maoris, as skilled fowlers, must have been attracted. Whether by accident or a tool of hunting the Maoris triggered by fire the reduction of the drier lowland and montane forests. Naturally occurring fires may also have been responsible for destruction of forest cover, thus it is difficult to estimate the true extent of the effect the Maori had on the natural environment.

Scrubland and tussock grassland remained in place of the destroyed forests down to the times of European pastoral settlement. With the arrival of the first European settlers changes to the landscape were more thorough. The introduction of a comparatively sophisticated technology meant that habitat + farmer/sawmiller/miner produced a very different landscape from habitat + seasonal hunter.

The lowland short-tussock grassland of the moraines, terraces and escarpments at the southern end of Lakes Wanaka and Hawea, and the tall-tussock covered uplands appeared to be ideal sheep country to the new-comer and sheepmen may be regarded as the chief founders of settlement in the Wanaka district. The tall tussock was invariably associated with matagouri,
speargrass, manuka and kanuka thickets and this vegetation was burnt off to induce a more palatable short-grassland.

(2) Mining and Milling

Barely had sheep been introduced when the discovery in the 1860's of rich concentrations of alluvial gold in the river sediments south of the lakes led to gold rushes. The demand for food thus increased and widened the scope for farming. Mining operations, especially in the Cromwell Gorge and Cardrona Valley, at first were restricted because of the serious lack of timber on the goldfields. Timber at the head of Lake Wanaka was felled to meet the demand for mining and for buildings in the new townships that were springing up everywhere on the goldfields. Sawyers were initially cutting timber in the Makarora bush mainly to supply local farming needs, but with the development of the goldfields milling of the beech/podocarp forests was extended to the Hawea and Matukituki bush.

Although the sluicing, and later dredging operations left their mark on the river valleys the direct impact of gold-mining on the landscape was slight compared to the indirect impact resulting from its requirement for timber. Many of the goldmining towns were transient features in the landscape but the milling of forests around the lakes proliferated lasting changes, to the vegetation pattern, that were started with fire in pre-European times. By the end of the last century the mills had done their worst in the beech forests of the Matukituki - the Makarora mill continued to operate for a few years but activity declined with the decline in goldmining. Most of the surviving indigenous forest stands are today managed as protection forest.
(3) Towns

It was during the goldrushes that the foundations of close settlement and the modern network of road communications were laid. The Clutha River proved a formidable obstacle to early travellers in the district, and in the 1860's a ferry service near the confluence of the Clutha, Hawea and Cardrona Rivers at Albert Crossing (later Albert Town) provided the only means of crossing above the Dunstan. With hundreds of prospectors crossing daily, Albert Town soon developed into the commercial hub of the Wanaka district, a position it retained until the late 1870's when it was gradually conceded to Pembroke (now Wanaka).

Roxburgh, records that "although by the late 60's the Cardrona mining industry had by no means petered out, some miners were looking for other means of livelihood. Theodore Russell considered setting up business as an hotel-keeper in the Wanaka district ..... The obvious place was at the foot of the lake. This was the junction of the shortest route to Lake Wanaka from Queenstown via the Crown Range and Cardrona, with the dray track from the Matukituki, and the road from Albert Town (the gateway to Wanaka by way of the Lindis from North Otago and Canterbury, and now the West Coast by way of the Haast Pass road). So Russell settled in Pembroke in 1867, building his hotel from Matukituki timber."(1)

Although the first survey of the proposed township of Pembroke was made in 1865, the establishment of the hotel must have been a significant step in the development of settlement, as was the later launching on Lake Wanaka of the sailing ship "Surprise" - a vessel that carried both cargo and passengers. With hotel visitors embarking on pleasure cruises Pembroke had begun to grow as a tourist centre, but its main wealth was in

FIGURE 5: "The obvious place was at the foot of the lake." Wanaka today with the main highway into the town shown in the foreground.
supplying the farming population around the shores of Lake Wanaka, and in shipping out the products of their land.

At a Lake County Council meeting in 1878, Robert McDougall proposed that the Waste Land Board be asked to grant a reserve of 100 acres (approximately 40 hectares) in each riding of the County for the planting and rearing of young forest trees. The result of the subsequent request was that in the Cardrona Riding, about 10 kilometres out of Pembroke the Lake County Forest Nursery was established. In 1881 of 45,000 young plants in the nursery available for sale, 20,000 were destroyed by rabbits. Wire netting fences prevented further damage and plants of all varieties were sold and replanted throughout the district for several years. From the nursery came all the sequoias and most of the pines and the silver birches seen in Wanaka today. (Roxburgh, P.125).

(4) Agriculture

Up until the beginning of this century the search for gold, and the associated activity of milling the forests, eclipsed agriculture as the major enterprises in the Wanaka district. With the gradual decline in mining activity many prospectors turned to farming, and as land development took place the countryside became essentially agricultural.

In the northern part of the Upper Clutha Valley the more fertile soils on the fans and some of the deep soils on the older moraines were intensively cropped and relatively closely settled. Problems wrought by overstocking and economic depression were aggravated with the introduction of the rabbit. Leamy and Schofield record that "the rabbit pest and economic conditions created a static type of farming based largely on the cereal - fallow - cereal system. There was no permanency
in pastures and development could not occur beyond the confines of the better and more profitable soils."(1) Rabbit killer policies adopted in the mid-1940's and improving economic returns markedly assisted land improvement and development. Improvement was also achieved by the introduction of small private irrigation schemes.

The use of fertilizer, fallowing, the adoption of improved pasture species, the use of innoculm, and the rapid reduction in the amount of cropping ensured that pastures lasted longer than they had previously done so. (Leamy and Schofield P.62). The result was a transition towards more extensive pasture, land and animal production. Of the cropped areas, low fertility was the most serious factor to overcome and the introduction of the fallow and cereal greenfeeds played a part in improving soil fertility before pastures contributed much grazing. On some of the cropped areas transition to pasture was assisted by more intensive use of irrigation. Lighter moraine and terrace soils under extensive fescue tussock association were developed to pasture and more intensive grazing by establishing green-feed crops before sowing out to lucerne and lucerne and cocksfoot pasture.

The close undulating nature of some of the land in the Upper Clutha Valley has posed physical difficulties of getting water onto the land, but expansion in irrigation and improvement in the efficiency of water usage has led to greater intensification of farming. Most of the agricultural activity thus takes place on the better soils of valley floors, the surrounding mountain slopes being used exclusively for grazing.

On the more strongly leached steepland soils extensive areas of tussock association have come under run management.

FIGURE 6: Utilization of the fans and terrace lands near Wanaka for intensive and semi-intensive grazing has resulted in a distinctive ground pattern.
During early stages of settlement burning of the tussock grassland, the introduction of game animals and overstocking, resulted in problems of soil erosion and a deterioration of the land and consequent reduction in carrying capacity. For a long period management of extensive run country continued along the lines established in the early days and the depleted vegetation improved little, often returning to a state of scrub and bracken fern. The fight against the regrowth of scrub and fern has not always been won, but the introduction of agricultural aviation for rabbit poisoning and topdressing in the decade after the Second World War has helped considerably in improving the high country runs. The adoption of better farming techniques, control of burning by the Catchment Board, and the adoption of soil conservation practices have also contributed to run improvement.

(5) Tourism

While mining and sawmilling are now minor activities in the Wanaka district, agriculture, after over a century of occupancy is now a well established undertaking and continues as the major activity on the land.

With the decline of mining and sawmilling the town of Wanaka continued to persist as a feature of the landscape, its importance being in its role as a service and social centre for the surrounding rural population. The town has developed in accordance with the progress in farming, however much of its growth and development must be attributed to its being used as a holiday centre since the establishment of the first hotel and the launching of the sailing ships. The alpine, lake, and pastoral scenery; reliably clear, dry weather conditions at all times of the year; and opportunities for both winter and
summer recreation, contribute to making the Wanaka district attractive to tourists and holiday-makers.

Although the town continues to service the surrounding rural population, it is evident that there is an increasing emphasis on its catering for the needs of the holiday-maker and tourist. Recreational activity in the district is at present mainly confined to the summer months but the potential for all-year-round recreational activity is apparent. The demand for recreation and the recreational opportunity both appear to be great enough to suggest that overall, recreation could assume greater regional significance than any other use in the future.

After a century of European settlement the establishment, in 1964, of Mount Aspiring National Park (now covering some 275,400 hectares and embracing a substantial portion of the Southern Alps) represents a change in man's attitude towards the environment of the Wanaka region. The need to exploit the natural resources of the region has given way to a desire (and perhaps a need) to preserve some of the countryside for aesthetic and recreational purposes.
STABILIZATION OF LANDSCAPE CHARACTER

The cultural pattern at present evolving in the Wanaka district is depicted on the accompanying Landscape Units Map. If the landscape is viewed as a continuum, ranking from what appears to be completely man-made to that which is apparently untouched by man, the landscape units represent segments of the continuum. Excluding the lakes, eight landscape units are shown - each unit represents a specific ground pattern and indicates the extent of man's impact on the landscape. There is seldom a hard and fast delineation between units, rather, zones of transition from one to the next.

The alpine barrens occur at high altitudes (above about 1500 metres) on the mountain ranges and include areas of permanent snow and ice. The remainder of the surface is bare rock, scree and rock waste on which alpine plants are scattered.

Above an altitude of about 1000 metres is a zone of unimproved subalpine grasslands and scrublands. Although used for very extensive grazing outside the National Park boundary, the steepland high-country yellow-brown earths of this zone are weakly weathered, strongly leached, very low in nutrient status and highly susceptible to erosion. The use of fire and the treading of the soil by animals is detrimental to their conservation. (1) Vegetation sensitivity increases with altitude and there is an increasing tendency to retire these lands from grazing by domestic animals, (and to eradicate feral grazing animals) and use them along with the alpine barrens for purposes of water and soil conservation.

Beech and beech/podocarp forest form a distinctive landscape unit in some of the more remote valleys of the Wanaka region,

considerable portions of forest being preserved within the National Park. Stands outside the Park are managed as protection forest for water and soil conservation purposes. Because introduced animals have resulted in the modification or removal of the most palatable species of vegetation, namely large-leaved Coprosma, Broadleaf, Five Finger, and the elimination of future canopy trees, the eradication of browsing animals is part of the management policy for these remnant indigenous forests.

**Extensive grazing** is practised on improved tussock country below altitudes of about 1000 metres where leaching is less severe. Included in this zone, on steepland yellow-brown earths, are the fescue tussock grasslands that replaced the indigenous forests of pre-European times. Steepland yellow-grey earths above altitudes of about 500 metres on the mountains flanking the Upper Clutha and Cardrona Valleys also support fescue tussock grassland. Both soil types have suffered from widespread erosion due to burning and overgrazing of the grassland cover, but with oversowing, and topdressing with sulphurized superphosphate, extensive grazing can be practised in conjunction with satisfactory conservation of soil and water.

Extensive grazing is also practised on the shallow, stony, dry hygrous yellow-brown earths of the terraces lands and fans of the Upper Clutha Valley. These droughty and excessively drained soils are susceptible to wind erosion and this is a limiting factor to their being cultivated, however the introduction of lucerne and cocksfoot has resulted in improved grazing pastures.

**Semi-extensive grazing** is being developed on the more moist hygrous yellow-brown earths of the rolling lands and hills of the Matukituki Valley. The same type of farming is
practised on shallow yellow-grey earths on rolling morainic country in the Upper Clutha Valley. Where deeper and on easy topography, yellow-grey earths support intensive grazing. Recent soils of the main river valleys are also being developed for intensive and semi-intensive grazing.

The most intensive farming in the Wanaka district occurs on the terrace lands and fans in the Upper Clutha Valley where deep, well-drained, yellow-grey earths and Recent silt-loams are irrigated for intensive cropping and grazing.

Urban Settlement constitutes the final landscape unit depicted on the accompanying map. By far the greatest urban development has taken place in Wanaka Township which has approximately 1060 permanent residents. The next largest settlement in the district is Albert Town with a population of 96. Eight years ago Wanaka's population was 300 and in 1969 there were 800 permanent residents. Although favoured as a place of retirement, holiday homes account for the greatest proportion of building development. Holiday-makers are also accommodated in one hotel, two guest-houses, 15 motels, a Youth Hostel and a camping ground - with a caravan park and three motor-camps providing additional accommodation within a 12 kilometre radius of the township.

Most urban development of recent years has extended from the commercial zone (at the southern end of the lake) around the eastern shore towards and beyond Eely Point. Housing development continues to proceed there but new subdivisions are now being developed on the western side of Roy's Bay up to three kilometres from the town's urban core.

The spread of housing development physically represents the apparent popularity of Wanaka, but the population figures for the peak summer holiday period more strikingly represents
the increasing popularity of Wanaka as a base for recreational pursuits. Five years ago the population of Wanaka and Glendhu Bay during the peak holiday period (three weeks over Christmas-New Year) was 12,000. In 1971 the population for the same period was 23,000, (1) and 26,000 is the estimated figure for 1972.

With the exception of the zones of urban development, the distribution and extent of each landscape unit representing a specific ground pattern, is closely related to climatic factors and the distribution and extent of the various soil types of the Wanaka district.

In broad terms, as the full potential of each landscape unit is realised, and hence the ground pattern within each unit assumes a consistency, the landscape character of the district will approach stabilization.

Because the land above about 1000 metres is of little use except for very extensive grazing and the conservation of water and soil, the landscape will continue to be dominated by high, apparently barren mountain ranges. Snow, blanketing the mountains down to low levels, increases their dominating effect in winter. On the mountain slopes below about 1000 metres the greenness of the improved low altitude tussock grasslands contrasts with the more brown, unimproved and often eroded grasslands of higher altitudes. The overall barrenness of the landscape can be considered as an appealing characteristic of the region - remnant indigenous forest and exotic tree plantings however, bestow variety in terms of colour and textural pattern to some of the lower mountain slopes and fans.

(1) Bulletin No.2, Hands Off Lake Wanaka Committee (Nov.1972)
In the main river valleys, and on the fertile soils of the terrace lands and fans, intensive farming affords a marked degree of local visual relief with a more varied pattern of landuse. Although relatively barren, the ice-sculptured roche moutonnées around Glendhu Bay and at the southern end of Lake Wanaka, punctuate the flat river valleys and gentle rolling nature of the moraines and give local character to these two areas.

The expanding urban development of Wanaka Township is, in the regional context, a minor pattern generating element, but is nonetheless significant in terms of human encounter.

Lakes Wanaka and Hawea are obvious contributors to the overall character of the region - their very flatness serves to emphasize the ruggedness of the surrounding mountains. However, perhaps their greatest contribution to overall landscape character lies in their ephemeral qualities that are largely determined by variations (both minor and major) in climatic conditions. Such effects as surface rippling, changes in water colour intensity, and ability to reflect the surrounding landform, vegetation and overhead cloud formations give an element of transience to the character of the Wanaka district landscape.
FIGURE 7: Reflections as a transient quality of Lake Wanaka. A scene in Roys Bay.
RECREATIONAL USE OF THE LAND

The increasing popularity of Wanaka as a base for recreational activity has been mentioned in the previous chapter. A detailed survey of recreational land use in the region has not been carried out and would be beyond the scope of this study. Traditionally the region has been thought of as a source of summer holiday pleasure where camping, visiting the beaches, boating, fishing and golf, are the main activities, with climbing and hunting being the pursuits of a considerably fewer number of more active sportsmen.

Although these activities are still exceedingly popular, this chapter sets out to indicate that outdoor recreation opportunities in the region cover a much broader spectrum, and that as the demand for recreational resources increases a more widespread and intensive use of the variety of recreational resources available could result.

RECREATIONAL OPPORTUNITIES

(1) Outdoor Living

Long hours of sunshine, high temperatures and low rainfall makes the Wanaka district ideally suited for summer tenting and caravanning. The Wanaka Islands Domain Board camping ground in Wanaka, reaches occupation capacity during the peak Christmas - January holiday period. Other camps - Penrith at Beacon Point, Pleasant Lodge on the Glendhu Bay Road, Lake Outlet, and Glendhu Bay also reach capacity during this period. The increased demand for campsites is reflected in the Domains Board's decision to make available more land near Wanaka, providing a minimum of facilities, for camping. The proposal of private promoters to establish, also close to Wanaka, a
camping ground with a caravan park and an "international - type caravan park", also reflects the popularity of outdoor living. (1)

Staying in holiday houses or baches is for the purposes of this study considered to be outdoor living, as occupancy of such accommodation is subject to a seasonal peak during the months December, January, February and March, when most daylight hours are spent outdoors. Approximately half the dwelling units in Wanaka are holiday houses. Building permits more than doubled in value in the two year period 1971-72, (2) and the development of subdivisions beyond Eely Point and on the Glendhu Bay Road is mainly for holiday accommodation.

(2) Visiting the Beach

Whether for swimming or the more passive uses of sunbathing and picnicing, visiting the beaches around the lake shore is an activity of considerable pleasure for many people especially during the summer period. Although there are approximately 100 kilometres of beaches around Lake Wanaka only those in Roys, Glendhu and Dublin Bays are easily accessible by road and hence receive the most intensive use.

(3) Boating

Power boating is an exceptionally popular summer activity on Lake Wanaka. Craft are launched near the township, at the Outlet, and at Glendhu Bay, but limited facilities for launching and trailer parking present congestion problems for both enthusiasts and other shoreline visitors.

Water-skiing is popular especially in the sheltered waters of Glendhu and Dublin Bays. Ski lanes are marked in these and in Roys Bay to minimise conflict with other uses.

(1) Otago Press, (July, 1973)
(2) Bulletin No.2, Hands Off Lake Wanaka Committee (Nov.1972)
FIGURE 8: The beach at Eely Point - an easily accessible recreational resource.
Participation in sailing on the lake is at present minor, but with the increasing popularity of "trailer-sailer" craft, Lake Wanaka with its sheltered southern bays could become more frequented by yachtsmen.

The Clutha, Matukituki, Wilkin and Makarora Rivers offer opportunities for jet-boating and canoeing enthusiasts.

Lake Wanaka offers considerable opportunities for scenic launch cruising, however the largest commercial launch is licensed to carry only seven adults. Although larger tourist craft have been operated on the lake their fate has usually been removal to Queenstown where demand for trips is on a more year-round basis.

(4) Fishing, Shooting and Hunting

Fishing and bird shooting come under the jurisdiction of the Wildlife Branch of the Department of Internal Affairs who, as part of their activities, manage a fish hatchery at Wanaka and a Wildlife Refuge in Roys Bay.

Lakes Wanaka and Hawea are regarded as excellent rainbow and brown trout fishing resources, as are the rivers flowing into and out of the lakes. Most fishing occurs along the lake and river shorelines which are easily accessible by car. Boat owners, of course, fish more remote spots and are able to practise trolling - Stevenson's Arm being popular for this.

The flats centred on Paddock Bay (near Glendhu) are favoured for shooting ducks and Canada Geese; Quail and chukar are other game birds sought over a wider range of country.

Game animals hunted include deer, chamois, and thar, but the policy of noxious animal control in the National Park, State Forests and other mountain lands (especially using helicopters) may eventually limit the opportunity for hunting these animals in the region, for recreational purposes.
FIGURE 9: The Matukituki Valley - a relatively remote recreational resource.
(5) Climbing, Tramping and Walking

The alpine regions of the Mount Aspiring National Park offer almost unlimited opportunities for climbing. However, the glaciated nature of the country presents a steep climb up to the summer snowline above which skilled mountaineering techniques are required. General remoteness and this element of inaccessibility limits the use of the mountains as a training ground and restricts use to the more experienced climbers.

The Matukituki, Motatapu and Wilkin Valleys offer ideal tramping opportunities, and near Wanaka township Mount Roy and Mount Iron offer walkers panoramic views.

(6) Pony-trekking

Although at present not a significant recreational activity in the region, the rolling moraine country at the southern end of the lake and the lower Matukituki Valley appear to be ideal resources for the development of pony-trekking.

(7) Skiing and Iceskating

A skifield, having a skiable area equal to that of Coronet Peak, is being developed at Treble Cone, in the lower Matukituki Valley, 24 kilometres by road from Wanaka township. Difficult access from the road up to the ski slopes is at present a limiting factor to usage of the field, but the provision of some type of cable-way access would alleviate this problem. At present a 26-bed hut provides accommodation for skiers at Treble Cone, but ultimately skifield accommodation would be limited to service crew.\(^{(1)}\) This would minimise problems of water supply to and sewage disposal from the skifield - skiers could be accommodated in the hotels, motels and holiday

\(^{(1)}\) Cleland, R.W., pers. comm.
houses available in Wanaka.

On occasions, Diamond Lake (in the vicinity of Treble Cone, but easily accessible from the road) may freeze over and provide ice for skating. Having an area of three hectares the lake would have the capacity to cater for a considerable number of skaters.

(8) Golf, Tennis and Bowls

An eighteen hole golf course, tennis courts and an outdoor bowling green (which can be floodlit for night play), are located near the centre of the Wanaka township and thus offer active recreation opportunity within the urban area.

(9) Landscape Recording and Viewing

Many people gain pleasure from sketching, painting, or photography and the scenic qualities of the Wanaka landscape offer considerable scope for these pastimes. For others pleasure is found in the study of natural history and the opportunity for this is likewise very extensive.

For many people however, pleasure is obtained from simply looking at the landscape. It is probably fair to assume that participants in some of the recreational activities mentioned (such as tramping and boating), gain pleasure from the passing landscapes. Similar assumptions may be made with regard to driving or being driven for pleasure.

In a study of outdoor recreation in Christchurch, Ann Neighbour found that car-driving functions as a recreational experience in its own right, and was the second most popular recreational pastime after picnicing. This may also be true in the Wanaka district, but because of the high scenic

quality of the landscape it is suggested that driving for the purpose of landscape viewing is likely to be a more important activity than driving for its own sake.

Destinations for scenic drives (with distances given in kilometres) include:

- Glendhu Bay - West Wanaka (20)
- Motutapu Gorge (25)
- Matukituki Valley (48)
- Cardrona Valley (26)
- Outlet - Lake Wanaka (5)
- Dublin Bay (10)
- Mount Burke Station (23)
- Lake Hawea (18)
- Makarora - Haast (64)
- Kidd's Bush - Hunter Valley (43)

Each of these destinations afford opportunities for various recreational activities, hence driving for the purpose of landscape viewing may be combined with other objectives such as picnicing or swimming.

Charter bus tours increase the capacity of roads as a means to landscape viewing, and the use of light aircraft and helicopters for scenic flying provide further transport alternatives for the landscape viewer and recorder.

RECREATIONAL EXPECTATIONS

Lack of truly relevant quantitative facts about recreational use of land in the Wanaka region makes it difficult to gauge recreational demand. A general lack of data about the important factors indicative of types of recreational demand and how these factors are changing throughout New Zealand limits comparisons with similar situations. P.J. McKelvey suggests that in the absence of this information
"all that can be done is to look at national population trends and figures, and other available figures which give an approximate indication of recreation preferences. Such figures are membership totals of Federated Mountain Clubs, New Zealand Deerstalkers' Association, Royal Forest and Bird Protection Society, and the total number of fishing licences issued, all by years over the last 15 years or so."(1) The following diagram from McKelvey's paper suggests that growth in demand for and interest in outdoor recreation exceeds the rate of increase of the New Zealand population.

Trends in the growth and location of population in New Zealand are reported in the proceedings of the Physical Environment Conference 1970.(2)

The two most striking trends in the location of population within New Zealand are the growth of the North Island relative to the South Island and the urbanization of the population.

In twenty years time the following urban populations will have been achieved:

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auckland</td>
<td>1 million</td>
<td>- 50% of population of northern North Island</td>
</tr>
<tr>
<td>Wellington</td>
<td>500,000</td>
<td>- 50% of population of southern North Island</td>
</tr>
<tr>
<td>Christchurch</td>
<td>400,000</td>
<td>- 40% of population of the South Island</td>
</tr>
</tbody>
</table>

By the year 2000, 81% of the population will be accommodated on 2% of the land in urban and suburban situations. Increase in population and urbanization will be accompanied by more free time, greater discretionary income, and more mobility.

While there may or may not be grounds for predicting a recreational explosion in New Zealand on the basis of these

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(2) Anon. "Trends in the growth and location of population in New Zealand".
FIGURE 10: A comparison of the increase in the population of New Zealand with the increase in outdoor recreational interest.
projections, it is fairly certain there will be a substantial expansion in the recreational use of land.

Ann Neighbour's study on the urban population of Christchurch showed that the demand was for recreation and related activity in the countryside and Neighbour postulates that "as cities absorb more and more rural environment and as the physical and psychological stresses of urban living become more apparent, so does the demand for an alternative 'natural' environment increase."(1)

For Wanaka, the implications of the foregoing should result in an increasing interest in the region as a recreational resource for urban populations centred especially on Christchurch, Dunedin and Invercargill. These centres at present supply the majority of the summer holiday crowds.(2) More mobility however, means it is conceivable that the district could also be used more, as an outdoor recreation centre, for the greater concentrations of urban populations in the North Island.

If demands are placed on some of the recreational resources (mentioned earlier in this chapter) that have not yet been significantly developed, changes to both the function and character of Wanaka could result. To the demands for recreation must be added the demands of tourism. The number of overseas visitors on holiday or vacation to New Zealand has increased as the figures for the past decade indicate:(3)

<table>
<thead>
<tr>
<th>Year</th>
<th>Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962</td>
<td>73,756</td>
</tr>
<tr>
<td>1972</td>
<td>149,219</td>
</tr>
</tbody>
</table>

(1) P.74 Outdoor Recreation Patterns in Christchurch. A Survey of Activity Patterns (1973)
Growing demand, plus heavy tourist promotion and falling group travel costs, should ensure that these figures continue to rise. Throughout New Zealand the trend in tourism has been towards the mobile holiday, travelling throughout the countryside, and although the development of tourism in the Wanaka district has increased since the opening of the Haast Pass Road to Westland in 1965, there is little to encourage the tourist to stop over in Wanaka. Because of this, Wanaka has maintained its summer holiday-centre atmosphere (catering for the more static holiday of the outdoor-living and boating enthusiast) as compared with the more commercially orientated tourist-centre such as Queenstown.

Development of the Treble Cone ski-field is cited as an example of a recreational resource that could act as a change-agent to Wanaka. Having a capacity similar to that of Coronet peak ski-field near Queenstown, Treble Cone could take the pressure off this already developed field, the skiers being accommodated in the facilities available in Wanaka but at present chiefly used only in the summer months. With people being attracted all the year round, demand for the operation of scenic launch trips in winter as well as summer could be stimulated. This, in turn could act as an attractant to the tourist, (as distinct from the outdoor sportsman).

It is not prudent to continue such postulation without relevant quantitative facts about recreational demand (alluded to earlier) and how these factors are changing, but future planning in Wanaka and the surrounding district must ensure that influxes of resource-based recreation seekers and tourists do not overrun the very resources that attract them.
ATTITUDE AND CONCEPTS

In the previous chapter it was suggested that pressure on the recreational resources of the Wanaka region is likely to continue to increase as tourism develops and the overall population of New Zealand increases, becomes more urbanized, attains more leisure time, greater mobility, etc. The previous chapter also indicated that the appreciation of the Wanaka scenery is a recreational activity in its own right, albeit a passive one, and for the sportsman scenery may be considered as a resource of equal or secondary importance to the activity in which he is participating.

Thus the scenery of Wanaka must be considered as a natural resource, the appreciation of which is an integral part of recreation experience, and in catering for the increased recreational use of the region, there must necessarily be concern for the landscape as a visual resource.

Scenic resources are frequently thought of as the unique and spectacular, and in New Zealand the traditional and still largely current attitude is to emphasize the desirability of preserving at least in selected areas, the characteristic beauty of the landscape and providing access and facilities for recreation and enjoyment of such natural features. This emphasis has resulted in a significant provision of extensive national parks and smaller reserves. (1)

Although the establishment in 1964 of Mount Aspiring National

Park reflects, in part, a concern for the scenic values of the Wanaka landscape, it is an example of concern for the unique and spectacular. The remoteness of the park has meant that emphasis has been placed on a scenic resource seen (except at a distance) by a comparatively few number of people for a very short time. Concern with the scenic values of the surface of the land or the landscape continuum and with the relationship of a broader range of resource issues has largely been ignored. We have made a habit of keeping beauty and non-recreational land use in different compartments instead of unifying them and thus enriching the visual quality of the environment.

Floyd L. Newby (1) in a 1972 paper entitled "Understanding the Visual Resource", says that in a time when we are being almost overwhelmed with cliches about environment and ecology, we must recognise that man is truly a visual animal with respect to his environment. He learns more, reacts more, and appreciates more through his visual system than through any other sense.

In the Wanaka situation the lake and the mountains are the major visual components of the landscape. Variations in landform, different kinds of land cover, and manipulation of the land's surface by man are all subservient to landform. However, the resulting ground patterns, in conjunction with the basic landform, determines the character of the landscape. John Ormsbee Simonds, an American landscape architect, suggests that -

"no matter what the landscape character of an area, and no matter what the mood it produces in us - exhilaration, sadness, eeriness or awe - we experience a very real pleasure in sensing the

(1) Division of Recreation, Bureau of Land Management, U.S. Department Interior.
unity and harmony of the total scene. The more complete this unity and harmony, the more complete the pleasure of the observer. The degree of evident harmony or unity of the various elements of a landscape area is a measure not only of the pleasure induced in us, but also of the quality we call 'beauty'. For beauty by definition is 'the evident harmonious relationship of all parts of a thing observed'"(1)

The Wanaka landscape is similar to other rural landscapes in that the major visual result and hence the degree of landscape unity rests basically upon landscape management, for the appearance of the landscape is derived largely from the way in which the land is used. The specific cultural ground patterns of the Wanaka region (as depicted on the Landscape Units Map) result from use of the land largely for farming and the requirements of soil and water conservation. Recreational use of the land has developed as a rather secondary use of the land and does not have the broad pattern-generating effects as these other land uses.

To achieve the unity and harmony of the total scene that Simonds alludes to, the superimposing of a cultural pattern on the landform should (ideally) be refined in visual terms.

In the Wanaka situation, with the exception of the zone of urban development, the distribution and extent of each landscape unit representing a specific ground pattern is closely related to climatic factors and the distribution and extent of the various soil types. The overall pattern of land use thus has a degree of ecological order that displays positive visual value. Because of this the opportunity for refining the landscape in visual terms is not in the overall pattern of land use, but in the more detailed aspects of how the pattern generating elements of each landscape unit, such as crop fields,

pastures, wood-lots, fences, roads and buildings, are arranged within the framework of the natural landscape to give harmonious space relationships, texture patterns and colour arrangements - i.e. a sense of visual order. In planning to satisfy visual needs regarding this more detailed level of land use, a visual evaluation of the quality of the detailed landscape is necessary.

**VISUAL EVALUATION OF THE LANDSCAPE LOCAL TO WANAKA**

As stated at the beginning of this study, the landscape local to Wanaka may be considered to comprise Roys Bay, Glendhu Bay and Dublin Bay. Within this locality 12 "identity areas" were mapped, their outline being shown on the accompanying Landscape Identity Areas Map.

Although the boundaries of these areas may be redefined, at present they appear as reasonably finite areas. Their structural unity and visual continuity make them logical areas within which particular management goals may be related to specific environments. The following discussion includes comments about the nature of existing development, the kinds of visual impressions observed, imminent potential impacts, or directions for development that seem to be desirable.

**Landscape Identity Areas local to Wanaka**

(1) Mount Iron
(2) Dublin Bay
(3) Lake Outlet
(4) Beacon Point
(5) Beacon Point Road farmscape
(6) Anderson Road area
(7) Eely Point subdivision
(8) Township
(9) Old Wanaka Homestead area
(10) Wanaka - Mount Aspiring Road - pastoral area
(11) Wanaka - Mount Aspiring Road - Damper Bay area
(12) Glendhu Bay

(1) **Mount Iron**
This roche moutonnée is a prominent local feature of the landscape when approaching Wanaka by road from Albert Town or Luggate. The steep rocky bluffs of the ice-plucked southern end present a dramatic form on an otherwise flat terrain, and a scattered vegetation cover of short tussocks, bracken fern and young pines give a coarse texture to the faces that increases the visual impact.

Viewed from the lake side, Mount Iron, although still a prominent local feature appears as an undramatic and simple, gently sloping hill.

(2) **Dublin Bay**
This enclosed bay has a series of remnant beach terraces leading down to the present beach at the water's edge where tall kanuka scrub at the southern end of the bay offers shade for picnicing.

Immediate enclosure is given by the bracken-covered slopes of Mount Brown (555 m), and low rolling morainic hills over which vehicle access approaches the bay. Vegetation cover on this rolling country is short tussock grassland, the appearance of which is given a course texture by patches of bracken fern, kanuka and young pines.

In the Wanaka region much of the short tussock grassland at low altitudes is being converted to improved pasture, and
FIGURE 11: Dublin Bay showing the short tussock grassland whose preservation as a visual resource is recommended.
preservation of some of this grassland (such as that in Dublin Bay), although highly modified from its natural association, is recommended as an example of a visual resource that is being depleted.

Prohibition of camping and the presence of only a few holiday houses gives the bay an undeveloped atmosphere, but the beach and terraces have an almost ragged appearance given by isolated gum and silver birch trees, patches of kanuka and pines, and the presence of scattered litter bins, signs, toilet facilities, fences and vehicle tracks.

The feeling of enclosure experienced in Dublin Bay is enhanced by the southern end of The Peninsula which rises sheer from the waters edge to an altitude of 810 metres. The ice-terraced slopes of The Peninsula provide a backdrop to a view over the flat area of the Mount Burke Station where poplar, willow and conifer trees give textural differences and an element of vertical interest on an otherwise flat plane. Some tree associations however, are visually weak and a few isolated poplars at the northern end of the Dublin Bay beach typify this fault.

The Peninsula and Roys Peak provide the frame for a more dramatic view to high mountains above the distinctive truncated spur features at the end of the Matukituki Valley.

(3) Lake Outlet

This may be approached by vehicle track around the lake edge from Dublin Bay and from Beacon Point, the main access however, is from in the direction of Mount Iron.

A small gorge through which the Clutha River flows, makes the Outlet interesting in itself, but the eye is drawn to a panoramic skyline view of the distant mountains divided by the
FIGURE 12: Looking towards the Harris Mountains from Lake Outlet. Kanuka vegetation dominates the shoreline. On the right The Peninsula gives a sense of enclosure.
southern end of The Peninsula into the peaks of the Young Range over Stevenson's Arm, and the closer, more imposing Harris mountains culminating in Black Peak (2308m) over Roys Peninsula.

Local enclosure is given by low hills and a series of river terraces that lead down to a beach at the waters edge. The tussock-covered hills have a similar coarse texture to those of Dublin Bay given by patches of bracken fern and manuka, and pines occurring in small stands or as single specimens.

A proliferation of power poles, signs and vehicle tracks give a sense of visual disorder and four houses appear as intrusions on the river terraces due to their unfortunate siting.

More sensitive treatment is recommended with regard to the siting of future recreational developments and facilities.

(4) Beacon Point

Fine views of distant mountains are revealed as the observer moves round the bottom of the low promontory that forms the Point, and it is the opportunity of being able to view the total landscape of the southern end of Lake Wanaka as a sequence of views, that makes up the character of this identity area.

When travelling along the vehicle track from the lake outlet, the view into Dublin Bay is suddenly superseded by a view of the Harris Mountains, and further round the Point attention is focused on Roys Bay and the Wanaka township with the ice-worn Pisa Range forming a backdrop. Towards the township visual interest is given by the textural pattern resulting from mixed plantings of deciduous and evergreen trees.

For the motorist, Beacon Point offers the most conspicuous
overall view of the smooth rounded forms that make up the truncated spurs at the end of the Matukituki Valley.

A camping ground sited on the Beacon Point promontory is effectively screened from view with pine trees, but on the flat land below, scattered clumps of manuka, poplars and pines give a ragged appearance to the area.

(5) Beacon Point Road Farmscape

Defined by shelter plantings of silver birches, gums and pines, this flat area has a certain pastoral charm given by an old cottage, farm sheds, holding pens and fences. Views across the lake are afforded between stands of mature gums, pines, poplars and willows which although rather formal in their arrangement add character to the scene as does the presence of livestock.

Because of the danger of housing subdivisions to physically and visually monopolize the lake foreshore area from the town centre to Beacon Point, retention of this pastoral setting as amenity open space is strongly recommended. If uneconomic for farming, this area could be developed (for example) as a horse riding centre, which would perhaps provide an even more visually stimulating scene than the present one.

(6) Anderson Road Area

This area is characterized by a gently rolling morainic topography that slopes down from Mount Iron towards Beacon Point. Short-tussock grassland is the main vegetative cover but the dull grey-brown colour of the tussocks is occasionally interspersed with the light green of kanuka in the gullies and the darker green of small plantings of young pines on hill crests.
FIGURE 13: Pastoral charm along the Beacon Point road - is housing the best use for this area?
Urban development is beginning to obtrude into this identity area from the vicinity of Eely Point. Because this whole area is visually significant from Beacon Point Road and the lake, future urban development should ideally be the result of "total area planning" so that amenity open space and tree planting can be incorporated in the development to ensure a visually satisfying pattern of housing.

(7) Eely Point Subdivision

Urban development in the vicinity of Eely Point has catered for a considerable portion of housing in Wanaka.

The most visually acceptable development has occurred close to Eely Point Road where houses have been located in the midst of a mixed stand of mature trees including gums, firs, larches, pines and poplars. Although some trees have been felled to provide intimate building sites, sufficient have been left to visually absorb differing architectural styles as well as to provide a degree of privacy. Deciduous trees allow sunlight to penetrate in winter months and the absence of footpaths, curbing and channels, and road sealing help preserve the natural character of the setting.

The most recent urban development - north of Aubrey Road - is potentially the most visually unacceptable in the area. Housing appears to be of substantial quality but the overall pattern is not essentially different from suburban tracts occurring in cities such as Christchurch, Dunedin or Invercargill where standardized engineering practices and town-planning regulations regarding street layout and width, treatment of curbing and footpaths, street furniture, yard requirements, etc. can lead to suburban development patterns that have an overall monotonous visual similarity. Such development of
FIGURE 14: Wanaka Township showing extension of housing development beyond Eely Point into the Anderson Road identity area.
"suburban anyplace" effects a dilution of the special lake/alpine character that distinguishes Wanaka.

Although curvilinear roading patterns as used in the Aubrey Road development can contribute to providing a visually stimulating urban landscape, by giving a sense of containment and spatial modulation, their virtue is diminished (as in this situation) if house placement and style are neglected in a treeless situation.

Visual disunity is resulting from the construction of houses of widely differing architectural style utilizing an equally wide range of building materials. The relative closeness of houses affords little opportunity for large trees to become established and give a measure of visual absorption to the houses. Street trees planted as an afterthought to road formation and house construction are little more than a cosmetic attempt to "beautify" the urban landscape, when in fact good visual character in an open treeless situation can only result by determining the roading pattern, the impact of house placement, the three-dimensional effect created by topography, houses and vegetation, and the overall pattern of open space, before construction commences.

South of Aubrey Road is an older established housing development where trees are now of sufficient size to act as an integrating element, but here housing does not appear to be as dense as in the new development.

(8) Township

From the lake shore local visual containment of the township's urban core is afforded to the south and east by conifer plantings on low morainic hills, while to the west are the mixed stands of deciduous and evergreen trees of the old Wanaka Homestead beyond which the slopes of Roys Peak (1,587m)
FIGURE 15: The shopping centre in Helwick Street. Overhead wires mar the scene but their removal would do little to enhance the basic pattern of development.
dominate.

The rectilinear grid roading pattern of the housing settlement on the flat land at the end of the lake does little to exploit visual impressions. The streets appear to be too broad in relation to the daily activities staged there and to the scale of the houses, however, it may be conceded that the expansiveness of the streets and lack of substantial trees gives this part of Wanaka a character in keeping with the expansiveness of the lake. Overhead wires impair views, especially down streets orientated towards the lake and mountains, and location of such wires underground would help enhance visual impressions from this area.

The part of Ardmore Street with the National Park Headquarters, post office, library, hall, bus depot, service stations and an hotel, is the hub of Wanaka in terms of activity. Road curvature and slope, and a view down towards the lake stimulate visual interest as does the hotel grounds. A hillside backdrop on the north side of the street provides a good scale relationship that would otherwise be lacking due to low building height in relation to street width.

Unscreened caravan sales yard, service station and grocery store along the waterfront are of dubious visual quality and the secondary shopping development extending back from these along Helwick Street do little to enhance the waterfront area. This linear shopping centre constructed in the ubiquitous concrete block has, like much of the housing, little charm to contribute to a resort atmosphere.

(9) Old Wanaka Homestead Area

This wooded area gives a richness to the character of the landscape local to the township. A mixture of deciduous trees (including ash, chestnut, larch, lime, oak, plane, poplar, silver
FIGURE 16: An avenue of English trees in the Old Wanaka Homestead identity area. At fast speeds the repetition of the trunks can be confusing to the traveller - the scale of the avenue is adapted to the pace of horses or pedestrians rather than motorcars.
birch, sycamore and willow) and evergreens (including *Abies* spp., Douglas fir, gum, pine and Giant sequoia) provide variety of colour and texture to the area when viewed from a distance.

Beneath the canopy the avenue-type plantings give a feeling of tight enclosure that is a pleasant contrast to the general feelings of expansiveness experienced in the other identity areas described so far. Plays of light and shadow, and seasonal variations in leaf formation and colour, offer visual interest.

Although this enclosed landscape has the ability to visually absorb the proposed housing development when viewed from without, visual degradation within the area could result if the development destroys, or is not subservient to, the basic pattern of tree groupings. All trees of visual significance should therefore be preserved and any sub-canopy tree planting should not appear to be at variance with the established associations. To minimise loss of visual quality this whole area should be the subject of a "total area plan" so that a basic pattern of sub-canopy planting is considered in conjunction with house and street layout.

(10) Wanaka - Mount Aspiring Road - Pastoral Area

This identity area extends from the Homestead area described, to just beyond the beginning of the track leading up to the top of Roys Peak.

Once the motorist emerges from the wooded area, the human scale diminishes and the mountain scale, given by the slopes of Roys Peak, takes over. Low, truncated spur formations obscure the view to the lake, but occasional glimpses of the lake between the formations offers an element of surprise to the motorist. Between the footslopes of Roys Peak and the spur formations, are flat areas which are used for intensive
FIGURE 17: Pastoral scene on the Wanaka - Mount Aspiring Road. The form of the truncated spurs is complemented by the distant ranges.
agriculture. The pattern of cultivated fields, fences, farm buildings, shelter plantings, and the presence of animals, enlivens the scene and provides a contrast to the relatively bare spur formations and bracken-fern covered slopes of Roys Peak.

The proposal to establish a limited facility camping ground on Recreation Reserve land near Waterfall Creek will require careful consideration. Without trees to screen or mask development activities the camping ground could appear as a visual intrusion and out of character in this pastoral setting, especially if sited on the flat land adjacent to the Wanaka - Mount Aspiring Road, and if sited near the lakeside, its visual impact when viewed from the water or the other side of Roys Bay, would need to be assessed.

(11) Wanaka - Mount Aspiring Road - Damper Bay Area

This area is basically similar to the previous one, in that a degree of enclosure is given by the footslopes of Roys Peak and a series of truncated spur formations that restrict views to the lake. The humanized elements of the pastoral landscape are, however, replaced by two shallow bodies of water and associated swamplands occupying depressions between spur formations. These wetlands provide environmental enrichment because of the visual impact they create and in the fact that they attract waterfowl.

A view into Damper Bay also provides interest, but the main impact of this identity area is given by the spur formations. Because of their closeness to the road, they appear larger, and hence assume greater visual significance than in the previous identity area described. This effect,
FIGURE 18: The distinctive feature landscape of the Damper Bay area of the Wanaka - Mount Aspiring Road.
and the view over the spurs to the peaks of the distant Harris Mountains serves to diminish the human scale even further.

(12) Glendhu Bay

When approaching Glendhu, the Harris Mountains attract attention, until the sudden appearance of the waters of the bay provide a unique visual experience. From the bay, views of Mount Aspiring and surrounding peaks of the Main Divide offer further visual stimulation, but local landscape quality lies in the dramatic appeal of glacier-eroded truncated spurs. The bare, ice-plucked bluffs of the spur remnants, backed by high mountains, and set against the foreground of the lake, present a unique and complementary natural environment of extremely high scenic value. The individuality of the bluffs makes this area a dramatic composition in bold forms.

Along the lake foreshore, willows, backed by poplars and Douglas firs, provide the visually dominant vegetation and serve to absorb a camping ground. In terms of their form, colour, and shade-giving ability, these trees are a refreshing element in an otherwise generally hot and barren landscape, and because of this they must also be regarded as important to the landscape quality of this identity area.
FIGURE 19: Glendhu Bay - a unique natural landscape composition.
RESERVE LAND LOCAL TO WANAKA

OVERALL PATTERN AND SIGNIFICANCE OF RESERVES

Within the identity areas contained in Roys Bay, Glendhu Bay and Dublin Bay, are areas of land administered as reserves. The extent and form of control reserve land local to Wanaka is indicated on the accompanying Land Status Map.

One type of reserve common to all identity areas discussed in the previous chapter (with the exception of Mount Iron and the Anderson Road area) is the 20 metre wide Foreshore Reserve which allows access along the lake edge and also along the banks of the Clutha River. As well, certain "key" places to which people are attracted, especially along the lake waterfront, have been designated Recreation Reserves - for example at Eely Point, Glendhu Bay and Lake Outlet - these reserves being considerably wider than the standard Foreshore Reserve.

Other significant areas of land reserved for recreation purposes includes 40 hectares at Waterfall Creek on the Wanaka - Mount Aspiring Road; the camping ground, Showground, Pembroke Park and related foreshore area in Wanaka Township; and the golf links and reservoir areas surrounding the main urban area. A low rocky shelf, that is normally below lake level, extends from Eely Point to Beacon Point and this too is designated Recreation Reserve.

A largely unplanted area, designated Plantation Reserve and comprising 195 hectares, occupies a considerable portion of the Anderson Road identity area, and an 18 hectare area in Dublin Bay is unspecified Crown Land.

Classification of the whole of Rabbit (or Crescent) Island,
beyond Roys Peninsula, and part of Mount Iron, as Scenic Reserves is the only acknowledgement of the visual importance of any of the land local to Wanaka. Rabbit Island has been reserved Scenic because its vegetation cover (especially the open forest and kanuka woodland) represents a type that is being actively reduced. The smallness of the Mount Iron Scenic Reserve would indicate that its reservation is mainly related to its value in being a vantage point for viewing the Lower Wanaka area, rather than for its own visual value.

Beaches around the shores of Lake Wanaka are generally very narrow and are well within the 20 metre Foreshore Reserve. In another chapter, reference has been made to the recreational significance of the lake shore beaches, especially those in Roys Bay, Glendhu Bay and Dublin Bay. The beaches may also be considered to be visually significant because those that are easily accessible, are relatively limited in extent and are subject to seasonal variation in width as the lake level fluctuates within a natural range of about one metre.

Plans for hydro-electric developments in the Clutha Basin entail the construction of a dam near Luggate and an imposed control of the lake between levels of 278.7 metres and 276.3 metres. 278.7 metres is approximately one metre higher than the average of Maximum High Water levels during the summer months for 32 years (1939-70) and holding the lake water at that level would flood the beaches.

As it is, without control of the lake level, snow-melt causes the lake to rise naturally to its highest levels during the summer months, when the beaches are most frequented. The

extent of the beaches is thus diminished at a time when, because of the number of people present, their value as a recreational and visual resource is at its greatest. 278.7 metres is a flood level which has been reached or exceeded on only 191 days during the 32 years 1939-70(1). Maintaining the lake at this level causing the beaches to be submerged would thus mean the loss of an important resource local to Wanaka.

The natural, seasonal fluctuation of the lake may be regarded as an interesting phenomenon in its own right, and as Wanaka is the only remaining large southern lake without any form of artificial water-level control, preservation of this characteristic may be of intangible value.

The most important beaches have been incorporated in Recreation Reserves, and apart from the beaches some of these reserves contain other elements of visual significance. For example, the Glendhu Domain Recreation Reserve encompasses the foreshore area at Glendhu Bay that supports the willow and poplar trees which are key elements in contributing to the scenic qualities of the Glendhu identity area.

In the description of the Dublin Bay identity area, the short tussock grassland present in the bay was referred to as a visual resource of some significance, as were the wetland areas along the Wanaka - Mount Aspiring Road. Similarly, the Beacon Point Road "farmscape" was cited as another area having high visual value. None of these features are at present protected by being designated as a reserve or having use-restrictions incorporated in lease agreements. It is therefore suggested that these features, and in fact all the identity areas listed in the previous chapter, be the subject of further study so that the possibility of preserving areas of aesthetic merit, that may be threatened by change, can be investigated. Areas

(1) Bulletin No.2, Hands Off Lake Wanaka Committee (Nov.1972)
of dubious visual quality should, of course, also come under consideration and where possible steps taken to effect their enhancement.

As well as allowing public access and preserving certain features of visual value within identity areas, reserve land by its location, nature and/or management, can serve to define identity areas, or to visually relate one identity area to another thereby presenting a degree of sequence to the observer.

Some identity areas, however, by their very nature may visually relate to adjacent identity areas so that a succession of perceptions or experiences having continuity is revealed to the observer. Along the Wanaka - Mount Aspiring Road, for example, truncated spurs in the landscape give visual linkage or continuity to three identity areas. As the traveller emerges from the wooded Old Wanaka Homestead identity area the spurs are at first seen as occasional features in a pastoral landscape. Further along the road the spurs begin to restrict views towards the lake - further along still, in a wetland area, the spurs are a dominating element in the landscape and completely block views of the lake. At Glendhu Bay the spurs appear as dramatic features in a grand-scale landscape. Thus in passing through three identity areas, containing farmland, wetland, and lake scenery respectively, the truncated spurs are elements present in varying degrees in each area and serve to present a continuity of visual experience to the observer.

Preservation of a sequence of this magnitude may involve management of the spur features so that their basic character is retained throughout, rather than their outright reservation.

This example of visual relationship between identity areas requires the observer to move through the identity areas. Such
a sequence may be described as a "flow" sequence because without the movement of the observer from one identity area into another, the sequence would be neither apparent nor meaningful. Other sequences may result from "static" situations in which the observer is able to see two or more identity areas from a single position. In these circumstances the sequence may be given by a series of climax or accent points. Such a situation presents itself on foreshore areas in Roys Bay, where identity areas including the Eely Point subdivision, Township, Old Wanaka Homestead, and the Wanaka - Mount Aspiring Road pastoral landscape can all be seen.

ROYS BAY

Whereas the truncated spurs on the road to Glendhu Bay were seen as naturally occurring features that served to visually link a series of identity areas in a landscape of basically natural content, in the Roys Bay situation the content of the identity areas is basically consciously arranged and organised by man. Trees, as well as in part defining these identity areas, also serve to be the dominant element which, by creating a series of accent points, give a sense of visual linkage to the identity areas within the bay. Several groups of trees that are part of this visual association, such as those on Ruby Island and Eely Point, the plantation surrounding the reservoirs, the Golf Links, and the Motor Camp and Show Ground, occur on land designated Recreation Reserve.

Thus the Recreation Reserves of Roys Bay although important for the recreational opportunities they offer, are also significant in that they support tree groupings that present a degree of sequence to the observer.
Important tree groupings, however, such as those in the Old Wanaka Homestead area, are not on Reserve land, nor are they covered by a Protection Order. It is therefore essential that in order to ensure that the basic framework of tree groupings providing visual linkage between and within the identity areas be identified so that unprotected groupings can either be considered for reserve acquisition or for coverage by Protection Order. A visual analysis of Roys Bay should also ascertain whether the basic framework of tree groupings is in any respect lacking and thus requires the establishment of additional groups of trees.

Once the basic framework of tree groupings that define, and provide visual linkage between, identity areas has been determined, individual tree groups should be assessed with regard to their outline and tree composition, as modifications may be required so that the groups relate to one another in an aesthetic manner.

Another factor to consider is the arrangement of trees within the outline of groups. The importance of some tree groups may only relate to the external visual effect they create, whereas other groups, especially those on Recreation Reserves, may have the additional value of creating environments within which particular activities such as golf, picnicking or camping take place. Planting design within these groups should therefore relate to site use and appreciate requirements for internal open space, movement of pedestrians and/or vehicles, etc.

As well as the visual relationship between reserve areas of Roys Bay, of considerable importance also is the matter of pedestrian and vehicle access to and between the reserves. Vehicle access throughout the Roys Bay area seems to be well catered for but at present there is little provision for
pedestrians to move to or between reserve areas on paths that are separated from road carriageways. Being in close proximity to areas of urban development the reserves are within easy walking distance and future planning should ensure that where possible separate walkways link the reserves to one another and to the urban areas, and that roads do not always follow close to the lake shoreline to the detriment of walkers and beach users.

Factors relating to areas of specific visual and recreational significance within Roys Bay are outlined below:

(1) **Eely Point Recreation Reserve**
- This has an island-like quality - offers good views, picnicing and a small beach.
- Plantings of pine and Douglas fir increase the prominence of the Point and make it an important feature of Roys Bay.
- Plantings however, lack variety in arrangement and have a monotony of colour tone.
- Movement of vehicles around the Point could detract from the use of the beach and the general atmosphere of the foreshore.

(2) **Boat Launching Area**
- One of the few sheltered sites for launching craft in Roys Bay however it offers limited facilities for manoeuvring and parking vehicles and trailers.
- Proliferation of slipways gives untidy appearance.
- Cars and trailers parked along the roadside cause traffic congestion and visually detract from the appearance of the foreshore.
FIGURE 20: The boat harbour and launching area in Roys Bay. Black Peak is on the skyline beyond the pine-covered Ruby Island.
(3) Reservoir Forestry Block Recreation Reserve

- Visually important as a backdrop to the township, and the plantings of pine and Douglas fir relate to similar plantings on Eely Point and Golf Links.
- The block, however, has an overall monotony of colour tone and a harsh outline.
- Use for active recreation is limited but the forest has potential for walkways to be developed within it or along the Lismore Street edge to link the main shopping centre with the Eely point subdivision area.

(4) Mount Aspiring National Park Headquarters

- Important focal point at the entrance to the township.
- Tree planting could emphasize this fact as well as relating to the form of the trees on the Reservoir and Golf Links areas.

(5) Golf Links

- Also visually important as a backdrop to the township. Pines and Douglas firs relate to Reservoir forestry block, and Motor Camp and Show Ground plantings.
- Foreground plantings of poplar and willow along Bullock Creek offer relief of form and colour to the blanket planting of the Golf Links.
- A group of Giant sequoias near the Cardrona Road end of the Golf Links are a significant landmark and form part of the visual association of conifer trees surrounding the township.

(6) Motor Camp and Show Grounds

- Although the plantings of Douglas fir in these two areas relate to the other conifer plantings in Roys Bay in terms
of colour, there is a weakness in their overall relationship given by the fact that the trees of the Motor Camp have been topped, and those that areuntopped in the Show Grounds exist only as a single row.

(7) Wharf Reserve

- This area is an important focal point being the closest foreshore area to the shopping centres.
- Children's playground creates a poor visual impression.
- An array of power poles, garish advertisements, and buildings including toilets, ticket booth and mobile food stalls add to the visual disorder.
- From within the area poor views are obtained of a caravan sales yard, service station and shops which are situated across the road that passes along the foreshore.

(8) Pembroke Park and Related Foreshore Area.

- Being immediately at the end of the lake, and between the commercial centre of the town and new urban development, the Park is an important focal point.
- The Park has an almost formal character given by its rectangular shape and the harsh line of surrounding houses and trees.
- Being relatively featureless, good views over the Park to the lake can be obtained, but there is little to attract active use of the area.
- A single clump of pines on the Park is too small to relate effectively to other tree groups surrounding the township.
FIGURE 21: The Wharf Reserve and children's playground as viewed from Lismore Street. The road defines the area but as a focal point the Reserve lacks character.
FIGURE 22: Looking towards the Wharf Reserve from the children's playground. A clutter of poles, fences, and buildings create a confusing scene.
Dungannon Street acts as a barrier to use of the foreshore area to extend onto the Park.

The kowhais and stunted willow trees along the foreshore, although offering some visual relief and a measure of shade, appear out of scale with the expansiveness of their surroundings.

(9) Old Wanaka Homestead Area

As previously mentioned the trees of this area are very important to the overall character of Roys Bay (p.69).

The extent of the plantings makes them the most dominant group in the Bay and their variety of form, colour and texture contrast with the homogeneity of the other feature plantings.

The most impressive specimen trees (firs and Giant sequoias) occur around the homestead site and a reserve centred on these plantings would offer public access to a setting unique to Roys Bay.

The larch plantings beyond the homestead area are not as visually significant as the dense main body of planting, but serve to provide a transition to the open pastoral setting of the Wanaka - Mount Aspiring Road.

(10) Waterfall Creek Recreation Reserve

Although at present relatively barren, the planting of trees on the part of the Reserve leading down to the lake shore (possibly in conjunction with the development of a limited facility camping ground (p.42 and p.73) would serve to complete the association of groupings around Roys Bay.
FIGURE 23: Pembroke Park seen in relation to the township and the specimen trees of the Old Wanaka Homestead area in the foreground. Mount Iron is in the mid-distance beyond which is the Upper Clutha Valley.
Ruby Island Recreation Reserve

* In conjunction with Eely Point, the island is a definitive feature of Roys Bay.
* The presence of the island is emphasised by the pine trees growing on it.
* As well as adding interest to the general scene, the trees form part of the series of the accent points in Roys Bay.

Pembroke Park

1. Present Character.

Pembroke Park is a rectangular area of 10.5 hectares located in a central position near the lake shore at the southern end of Roys Bay. The park is completely surrounded by straight roads that are part of the grid-iron pattern surveyed for the original town of Pembroke. Beyond the surrounding roads the lake and foreshore bound one side of the park, linear housing development bounds two other sides, and a row of Douglas firs separating the park from the Show Grounds bounds the remaining side.

The park is fundamentally flat and featureless although a distinctive micro-relief is given by a series of low remnant gravel beach terraces that extend across the area. These terraces would have once extended across the full width of the end of Roys Bay, however, the housing development and Show Grounds that surround Pembroke Park have all but obliterated these features.

Being directly at the southern end of Lake Wanaka, the park is not sheltered from the prevailing westerly winds that are funnelled down the lake by the flanking mountain ranges.
The rain shadow effect of the prevailing wind passing over the Southern Alps results in the park receiving only about 640 mm of rain per year, and although this is relatively evenly spread throughout the year (p.11), there are considerable soil moisture deficiencies during the summer months (p.11).

Being close to the lake and averaging only about three metres above normal lake level Pembroke Park commonly receives ground frosts of up to 15°C to 20°C caused by the effects of radiational cooling and the drainage of cold air down the surrounding hill slopes.

Shist and quartz stones, gravels and sands form the parent material of the soil on the park which supports a moderate cover of ephemeral weeds and grasses. Known as Eely Gravelly Sand the soil is coarse-textured, very shallow, and porous. A typical profile is:

50 mm dark grey loose structureless stony and gravelly sand;
on sandy gravel and stones (shist and quartz).

Leamy and Saunders suggest that Eely soils are of limited suitability for irrigation, because of their very shallow depth and any calculated irrigation benefit is low. (1)

That this soil can support trees of reasonable size is evidenced by a single clump of pines on Pembroke Park. These trees reach an average height of about 10 metres on the park and along the foreshore adjacent to the park are several kowhais averaging about 5 metres in height. A row of willow trees along the immediate foreshore are stunted, however, this could be because of disease or their lengthy annual submersion when the level of the lake rises to its maximum in spring. (2)


(2) Parkam, B.E.V. Botany Division, N.Z. D.S.I.R. Correspondence, Department of Lands and Survey files.
FIGURE 24: Pembroke Park from the foreshore. Housing development terminates in a harsh line along Brownston Street.
Elsewhere in Roys Bay willows growing on the same soil type do not appear to be affected by disease or physiological conditions.

Lacking any significant topographic features and supporting only one small group of trees, Pembroke Park has a very open nature. Any impact of immediate enclosure given by the row of Douglas firs along the Show Ground end is lost by the surrounding housing development which is of low density and supports few trees of significant stature.

The openness of the park relates to the expansiveness of the lake and also means that good views can be obtained across the park to the water and distant mountain ranges, and from within the park views of the surrounding tree-covered morainic hills can easily be obtained. As previously mentioned, the size of the group of pines on the park, and the height of the kowhai and stunted willows along the foreshore, do not relate to the general scale of their setting.

(2) Present Use.

Pembroke Park itself is little used for recreational purposes. Surface undulations given by the old beach terraces make it unsuitable for active sports and lack of shade-giving trees makes the area uninviting during the hot months of summer.

In contrast the foreshore area, which is separated from the park by Dungannon Street, receives intense use especially during the summer period. Holiday-makers and their cars crowd the area which is used for picnicing, swimming and sunbathing. The kowhai and willow trees afford a measure of shade.

Dungannon Street serves to act as a barrier to the use of Pembroke Park by visitors to the foreshore. Lack of shade, movement of vehicles along the road, and a view blocked by cars
Although providing a human scale, the kowhais and stunted willows, along the foreshore adjacent to Pembroke Park, do not relate to the overall scale of the surroundings.
parked along the foreshore are deterrents to the use of the Pembroke Park side of the road, although it is sometimes used for car parking.

The roads that surround the park carry a considerable amount of traffic, especially during the summer period. Dungannon Street not only carries visitors to the foreshore area but also the majority of traffic using the Wanaka - Mt. Aspiring Road leading to Glendhu Bay, the Matukituki Valley, and the urban development around and beyond the Old Wanaka Homestead area. A considerable portion of the traffic from the town's commercial centre to the Wanaka Islands Domain Board Motor Camp, and to the Cardrona Valley, also use Dungannon Street. However, this traffic is now being encouraged to use Brownston Street, along the back of Pembroke Park.

The park is thus subject to a considerable amount of traffic movement around its perimeter and the openness of the park could be considered to be a virtue in that it affords good views to travellers.

(3) Future Use.

The commercial area of Wanaka, centred on Ardmore and Helwick Streets, may be considered as the "active" focal point of the township. Pembroke Park, as a "passive" focal point, could serve an equally important function.

With the spread of urban development into and beyond the Old Wanaka Homestead area, the park will be in a more central position relative to the extent of the housing in the township and as the only large area of open space within the township, it should be worthwhile to retain the park for the views and visual relief it offers as an area of transition from the
With the predicted greater use of the recreational resources in the direction of Glendhu Bay and the Matukituki Valley, the importance of Pembroke Park as a visual resource will increase as more people pass by it en route from the township. The park area shall also assume visual significance to traffic moving from the commercial area to the proposed housing development in the Homestead area. As a result of this development there should result an increase in pedestrian movement along the foreshore area adjacent to Pembroke Park.

Because of the presence of the beach and shade-giving trees, the foreshore area should continue to be an attraction, however, use of Pembroke Park as an area for passive recreation is not likely to increase as long as the park remains in its present relatively inhospitable state. Realignment or closure of Dungannon Street would allow the foreshore area to accommodate more beach visitors and encourage use of Pembroke Park especially if the latter had groups of trees planted on it that provided shade and yet permitted views through to the lake.

In accordance with the concept of Pembroke Park as being a passive focal point of visual significance, facilities for active outdoor sports are not envisaged as being appropriate developments for the park. The Show Grounds can be utilized for field sports such as rugby and hockey, and sports such as bowls and tennis, requiring specialized construction facilities, are provided for elsewhere in the township. There appears to be an adequate amount of reserve land available (other than Pembroke Park) to cater for additional sports facilities of this nature, should their demand increase.
Facilities for indoor recreational activity, however, are lacking in Wanaka. An old hall in Ardmore Street is no longer safe for public use and local residents have expressed interest in the need for a community centre that could be used as a theatre and dance hall, as well as catering for indoor sports such as badminton, bowls, miniature rifle shooting, etc.

As an area of land central to the township, Pembroke Park would seem an ideal site to locate a building which could be used for community recreation and a community centre on Pembroke Park would serve to endorse the park as a focal point of Wanaka. The scale of the park is such that it should be able to accommodate such a building and associated car parking facilities without detracting from the concept of the park as a visual resource of an essentially passive nature.
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DESIGN PHILOSOPHY

The design proposal for Pembroke Park takes into consideration the need for a community centre complex, use of the lake foreshore area, pedestrian and vehicular movement, the operational relationship of these factors and their aesthetic aspects. The proposal is concerned with the spatial organization of the functional areas, the character of the different zones created, and the overall character of the whole park and foreshore area.

To close off that part of the Wanaka - Mount Aspiring Road across the foreshore would necessitate all through traffic to move along Brownston Street and probably increase traffic flow in Helwick Street - Wanaka's second commercial street. By not closing this road, potential problems associated with the concentration of vehicles along single routes and the disruption of general traffic flow should be avoided.

The design proposal does however call for the realignment of this road to run through the park. However, by taking the road further back from the foreshore, greater scope is afforded to permit increased usage of the lake frontage, and the opportunity arises to use the area of park towards Brownston Street for the different functions associated with a community centre complex. Brownston Street will continue to allow travellers from the Cardrona Valley, the motor camp, and possible future urban developments beyond the motor camp, to move directly out of the township onto State Highway 89 without the necessity of their passing through the town's commercial centre.

Location of a community centre on that part of Pembroke Park between Wanaka - Mount Aspiring Road and Brownston Street means all vehicular traffic around the end of the lake would
pass by the complex, thus enhancing its value as a focal point. Being situated near the end of Youghal Street the community centre is conveniently located should it be used as a gymnasium for the Wanaka District High School.

Vehicle access into the community centre from Brownston Street would be less dangerous than an approach from the Wanaka-Mount Aspiring Road and should be convenient to the majority of users. Trees would screen the carpark associated with the complex and also provide an enclosed shaded area for the open-air theatre.

Tree planting is arranged to offer spatial modulation as well as afford views through to the lake and distant mountains. Walking tracks are proposed to provide a visually attractive route relying on contrasts of open and closed space for pedestrians from the motor camp and possible urban developments beyond, and also from the commercial part of Wanaka.

On the foreshore side of the Wanaka-Mount Aspiring Road a tearoom and shop, with an associated carpark, is proposed to cater for foreshore users, whilst a sheltered outdoor sitting area and children's play area are associated with the kiosk. The siting of this whole complex is proposed in a position that is central to the foreshore at the end of the lake and is thus ideally situated for all foreshore users and will also relieve the congestion experienced at the Wharf Reserve.

The opportunity exists to construct a two-storied building here - the size of the envisaged surrounding trees being sufficient to visually absorb such a structure. The upper floor could be used as a restaurant and the whole complex be visually exciting.

Because of Wanaka's location it is often used as a short stop-over place by travellers moving to or from nearby Queenstown.
Refreshments are frequently taken in a side street of many holiday resorts and the essence of the resorts are not experienced. An opportunity exists in Wanaka for the traveller to partake refreshments right on the foreshore where a magnificent view over the lake to the mountains can be experienced, and then take a stroll along the lake front, so that this becomes the short-stay visitor's impression of Wanaka - not just a refreshment stop in another small town commercial area.

The rest of the park foreshore area has been designed as an area for walking, picnicing, sitting in the shade and generally enjoying the beach front without the intrusion of motor vehicles. Two loop roads off Wanaka - Mount Aspiring Road give access to informal car parking areas beneath trees. These parking areas would be adjacent to picnicing areas and only a short walk from the beach. Clumps of trees are located to offer relief from the intense heat of the summer sun, afford shelter from the prevailing wind as well as provide a degree of visual interest.

The choice of tree species was based on three major parameters:

(1) The existing trees growing successfully on the soil type of Pembroke Park around the foreshore.

(2) The individual design characteristics of the trees in terms of form, seasonal colour, variation, texture, height, and growth rate.

(3) The ecological suitability of the species in terms of their tolerance to the limiting natural elements.