OUTDOOR RECREATION RESOURCES IN THE MANAWATU With A PRELIMINARY CASE STUDY OF FOXTON BEACH AS A WATER-BASED RECREATION RESOURCE

A Thesis Presented in Partial Fulfilment of the Requirements for the Degree of Master of Arts in Geography at Massey University

By

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ABSTRACT

The subject of supply of outdoor recreation resources is discussed in this thesis. The nature of the resources suitable for outdoor recreation and the present use made of them are determined. The extent and use of one type of recreation resource in the Manawatu - the Water-based recreation resource - is extensively reviewed. A preliminary case study is made of Foxton Beach as a water - based recreation environment. The results of the study of the ecological implications of recreation on the beach and the visitor surveys conducted there are presented. Major areas of 'ecological intolerance' are described and the recreation behaviours exhibited by the visitors at the beach are reported. Foxton Beach is reported to be able to attract visitors from within and outside the Manawatu region.

PREFACE

"Leisure of course will be greatly extended. A much shorter work-week will no doubt prevail in 1980, and another ten or fifteen years will have been added to the average life-span ..... Not labour but leisure will be the great problem in the decade ahead. That prospect should be accepted as a God-given opportunity to add dimensions of enjoyment and grace to life."

David Sarnoff, FORTUNE
January 1955.

In this age of the population and leisure explosions New Zealand's landscape has become one of her most valuable - and most vunerable - assets. Yet there exists no recognised need to evaluate this asset for outdoor recreation. There is, moreover, surprisingly little concern about the implications that growing outdoor recreation has on this asset. One might offer, therefore, an evaluation of the Manawatu landscape for outdoor recreation resources, an account of its present supply and the ecological implications that outdoor recreation has for some of these resources.

This thesis is an exercise in Recreation Resource Planning and does not aspire to be anything more. The study is aimed mainly at making an inventory of recreation resources, with a case study on a water - based recreation resource. It is hoped that part of the results may be valuable in the field of Planning, and also stimulate further research in this much neglected relationship between leisure and natural resources.

ACKNOWLEDGEMENTS

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GLOSSARY

Fabridam:	An inflatable and deflatable rubberized fabric table which can be pressurized by either air or water. When fully inflated it acts as a fixed dam comparable to a rigid structure; when completely deflated it offers a minimum flow resistance and permits the passage of flood flows.
M.R.D.C.:	Manawatu Regional Development Council.
Outdoor Recreation:	"Leisure time activity undertaken in a relatively non-urban environment characterized by a natural setting for the primary purpose of enjoyment and physical or mental well-being."
O.R.R.R.C.:	Outdoor Recreation Resource Review Commission.
P.N.C.C.:	Palmerston North City Corporation.
P.N.C.D.A.:	Palmerston North Civic Design Association.

INTRODUCTION

The recreational use of leisure is as old as the hills and the history of outdoor recreation is as long as that of trade. It was not, however, until after the Industrial Revolution that together with a transformation in systems of transport and communications, and, the growth in affluence and leisure, did outdoor recreation in the developed countries make a significant impact on the national natural resources. Within the last twenty-five years or so its growth has been so significant and demanding that it has been now exploded with a new industry - the recreation industry. Internally in New Zealand, the index for the propensity to participate in outdoor recreation has also increased significantly.

Recreation is an accepted and important part of life and the inclusion of recreation planning within the planning world is now a vital and inevitable one. Fairly rapid changes in recreational requirements are expected to result from population growth, technological changes and economic factors in New Zealand. The increase in mobility over the last few years through the access to a motor car has provided an easy means of escape from the humdrum life of an urban environment: everyone wants to be a gypsy, keen to tow the caravan to get away from it all. This factor of mobility has triggered off an outdoor recreation movement that is often orientated towards countryside resources. Consequently, the growth and demand for outdoor recreation will bring major pressure for shifts in resource use. It is therefore important to plan for outdoor recreational use of resources. Hence, one of the principal

planning goals towards which this study was directed was the assessment of resources for outdoor recreation. The other goal was to account for how existing resources were used.

The concern with outdoor recreation is a natural one, and while demand on resources is inevitable following a rising and continuing trend for outdoor life, little is available in New Zealand on research and planning studies of outdoor recreation resources. Studies of any major significance to research understanding are limited to those on the Waimakariri River (Dalmer 1971; Hayward and Boffer 1972); Foreshore of Waimairi (Lincoln); and, Kawakawa Beach (Auckland Regional Authority 1972). This study hopes to make a contribution to the use of outdoor recreation resources in the Manawatu area.

The thesis proposes to focus on the supply aspect of resources for outdoor recreation. More specifically, it proposes to determine the nature of the resources suitable for outdoor recreation, and, where recreation resources have been developed, the present use made of them. The purpose of planning recreational resources is, first, to evaluate the physical environment for its suitability for outdoor recreation purposes (such an evaluation allows natural resources to be classified for outdoor recreation uses); and second, to allow the quality, quantity and spatial distribution of these to be identified and mapped. Chapter One of the thesis is provided with these objectives in view; the techniques used for evaluation are modelled closely along those used in the Lanarkshire Study (Coppock 1970).

The thesis is divided into three further chapters. Chapter two is concerned with the spatial dimensions and

patterns of user pressures where the spatial relationships between the 'available' recreation resources and peoples (which have recreation planning and development implications) can be discerned.

The third chapter presents an inventory of public outdoor recreation areas in the study area and also advances a cause for a 'regional agency' to manage, acquire and supervise development of recreation resources for the region.

Chapter four of this thesis looks at the use of a specific category of recreation resource - the water-based recreation resource. This chapter is divided into two parts: Part I describes broadly the present use made of the different types of water-bodies in the study area for outdoor recreation and the proposals made for future use of these resources. Part II defines Foxton Beach as a preliminary case study of a water recreation resource where the present use and future developments of the beach are considered from the ecological and social perspectives. The summary and conclusions are in the last chapter.

The area under study

The area under study comprises of the five counties of Kairanga, Oroua, Kiwitea, Manawatu and Pohangina. These counties are statistical areas and the grouping of these together help form a core unit for study. For the purpose of identification this core area shall be referred herein as the Manawatu region. An indication of the region's boundary and location with respect to the whole of the North Island is given in figure 1. The physical characteristics of the region is shown in figure 2. The dichotomy between lowland and upland is evident in this figure.

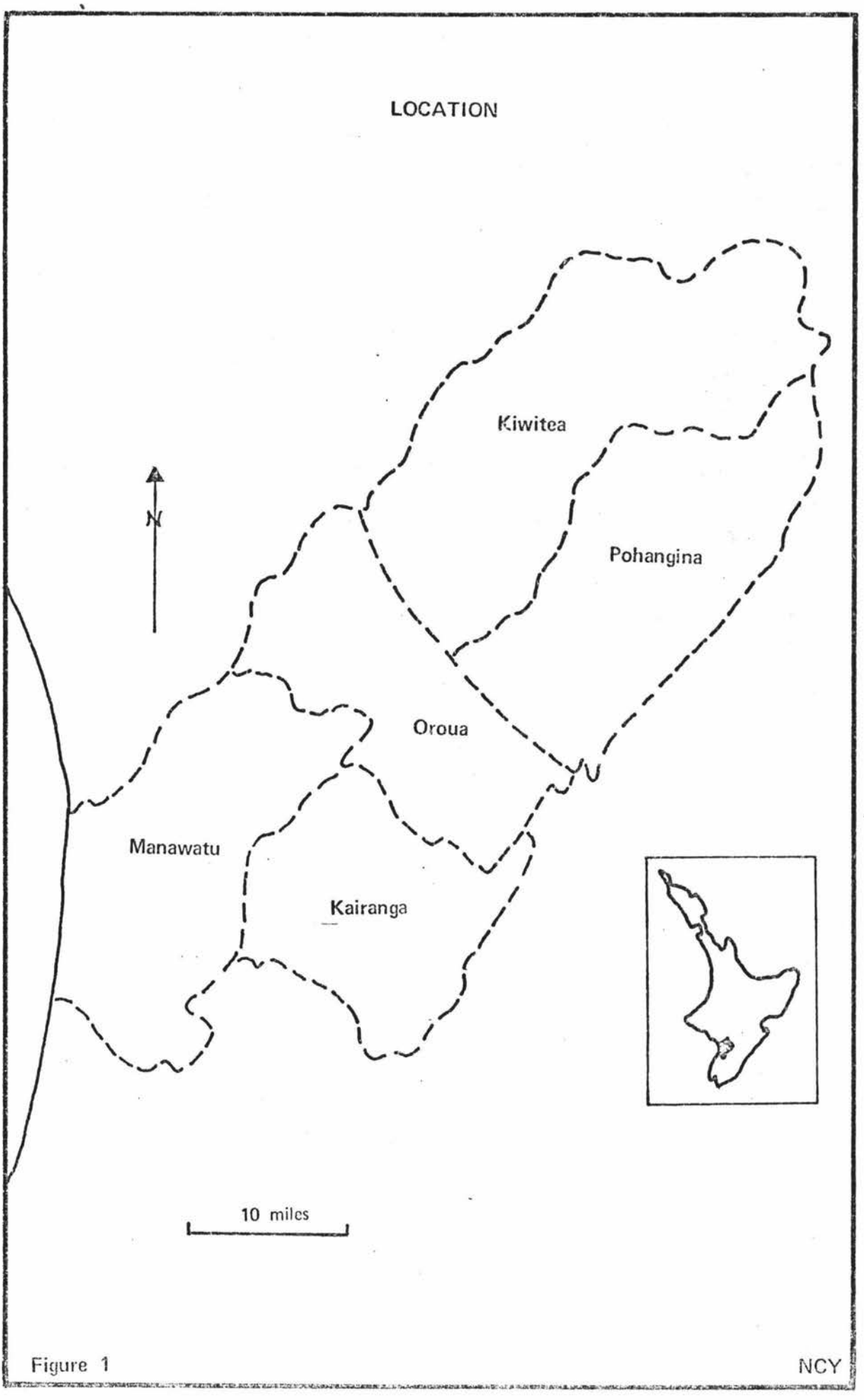

LOCATION
Kiwitea
Pohangina
N
Oroua
Manawatu
Kairanga
10 miles

Figure 1

NCY

On the west is a belt of sand in the form of dunes and plains and these extend up to twenty miles inland from the coast. This sand country represents the most recent stage in geological development of the region's coastal lowland. Inland from the sand belt lies the extensive sheet of alluvial flood plain. This is the fertile agricultural area. Relief at the sand country seldom exceeds fifty feet and those on the low lying agricultural plains seldom reach an altitude greater than twenty feet above sea level. This extensive lowland formed by the sand country and the agricultural plain gives way to a rolling and hill topography where the southern end e.g. the Mount Stewart - Halcombe - Feilding anticlines combine with the dissected river terraces to elevate the surface to heights between 120 to 600 feet. The eastern margin of the study area is bounded by higher reliefs e.g. the foothills and range environments of the northern Tarawas and the Ruahines.

The north-eastern margin is formed by the Rangitikei River and this is joined by the Kawhatau in the extreme north. The Oroua and the Kiwitea rivers run through longitudinally to 'divide' the region into halves, with the Manawatu river looping its way at the lower end to form the south-west end boundary.

STUDY AREA

Physical Characteristics

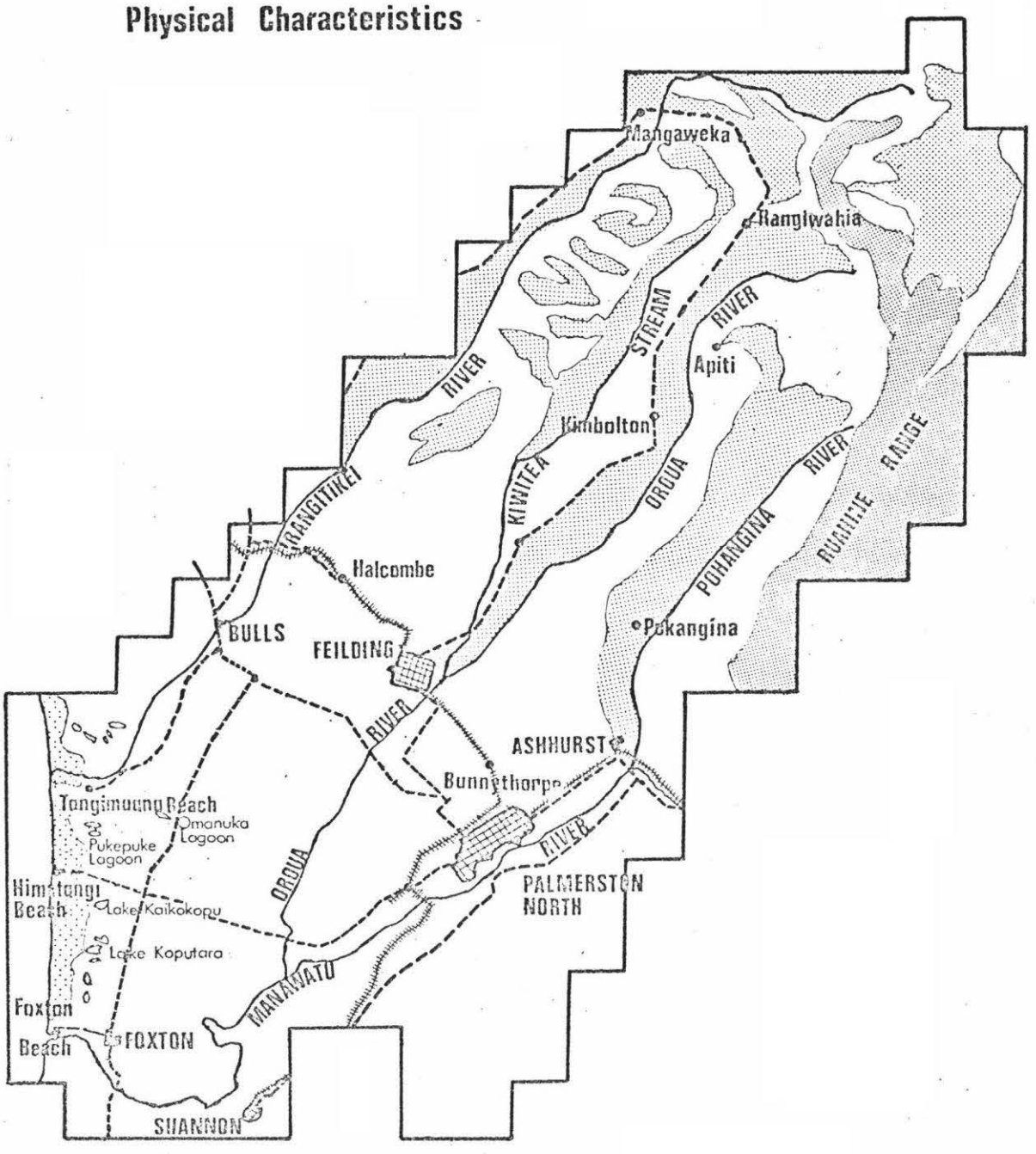


FIGURE 2

Chapter One

RESOURCE SURVEY

1.0 Introduction

Since outdoor recreation requires natural resources (Clawson 1966) the continuance of all outdoor recreation activities depends on the availability of physical resources able to support and sustain the demands they make. An objective evaluation of the supply of the recreation resources available in the Manawatu is therefore important if the present relationship between demand and supply of recreation is to be assessed and if proper allocation is to be catered for in the future.

This chapter aims to locate and identify those areas which because of their inherent physical characteristics, are suitable for outdoor recreational activities. The suitability of the Manawatu region for different outdoor recreation will be reflected by the areial extent and distribution of these resources.

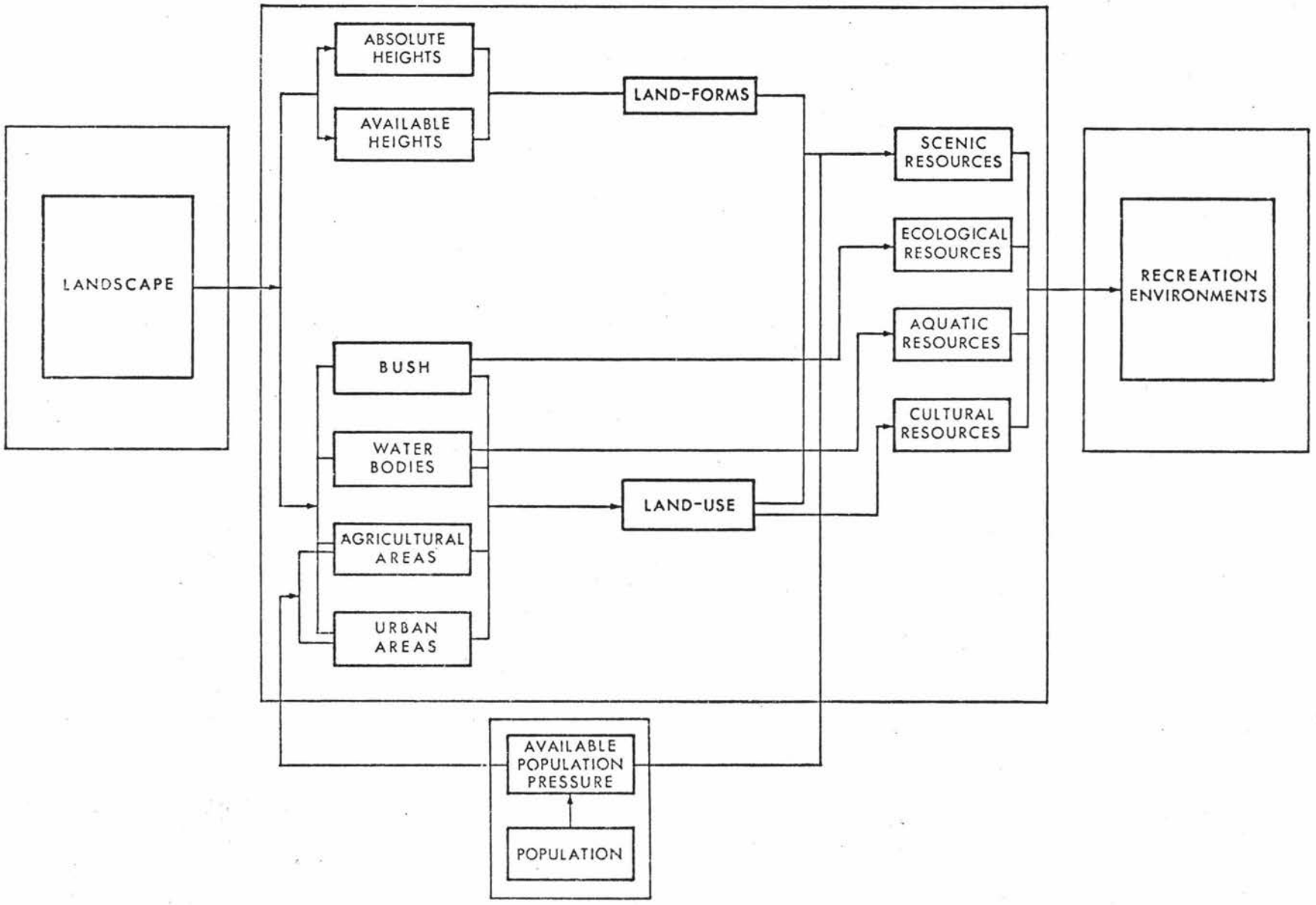
Studies carried out in measuring the capacity of the physical environment to support outdoor recreation are limited (Fines 1968; Linton 1968; Helliwell 1969; Coppock 1970; Christiansen 1970); of these the most comprehensive is the study on Lanarkshire (Coppock 1970) where the landscape was evaluated for its capability and potential as a resource for outdoor recreation. For the purpose and scope of this thesis exercise, the technique used in the Lanarkshire study seems most appropriate and thus has been adopted (with modifications met)

and applied to the Manawatu situation for the analysis and classification of its recreation resources. The classification seeks to provide a picture of the quality, quantity and distribution of natural resources of the Manawatu landscape suitable for recreation. While the comparative levels of capability of outdoor recreation could be assessed, the types of recreation to which the landscape is best suited could also be indicated. The classification, moreover, provides information for the formulation of policies for the future development of the landscape for recreational purposes.

1.1 Classification of resources

Land is classified according to its inherent physical capability to support outdoor recreation. Figure 3 shows a system relating land to recreation resources : the approach where land as an input can be broken up into its inherent component parts and how these inter-relate with human needs to formulate the various recreation environments. This approach has the advantage that it is able to satisfy the aim of the classification where it has been to define the types of recreation environments. It also has this added advantage : while the final result of this survey is to be a map delimiting graded recreation environments, it should be possible to identify the individual components that were considered in producing this map.

The physical environment of the Manawatu is classified into recreation resources according to the four elements considered below (Coppock 1970) and these are in turn considered in deciding the quality of a recreation environment:



Systems approach to recreation resource evaluation.

Figure 3

NCY

1. Its ability to support land-based recreational activities;
2. its ability to support water-based recreational activities;
3. the scenic quality of the environment; and,
4. the ecological quality of the environment.

This classification ignores the desirable use of a particular parcel for any types of development but indicates only the natural capability of the land to provide opportunity for recreation. It ignores, too, the factors of location, market and climate.

1.2 Methodology

The Manawatu region has been divided into squares measuring 2.8 miles by 2.8; the size of which is the basic grid for the New Zealand 1 inch to a mile and 1 inch to 3.95 mile topographical map series. The divided units while 'unnatural' provide a convenient definition of areas where they permit a direct comparison of areas. Such a system based on grid squares also facilitates the handling and analysis of data and provides an objective basis for classification purposes.

Classification of resources was based on data obtained from aerial photographs, mosaic maps, 1:63360 topographical maps for the five counties and surveys in the field. Each square in the region was evaluated using the criteria related to the different classified types of recreation resources. The detailed methods of evaluation were provided for in Appendix I.

Evaluation of the four types of recreation resources.

1.3 Land-based recreation resources

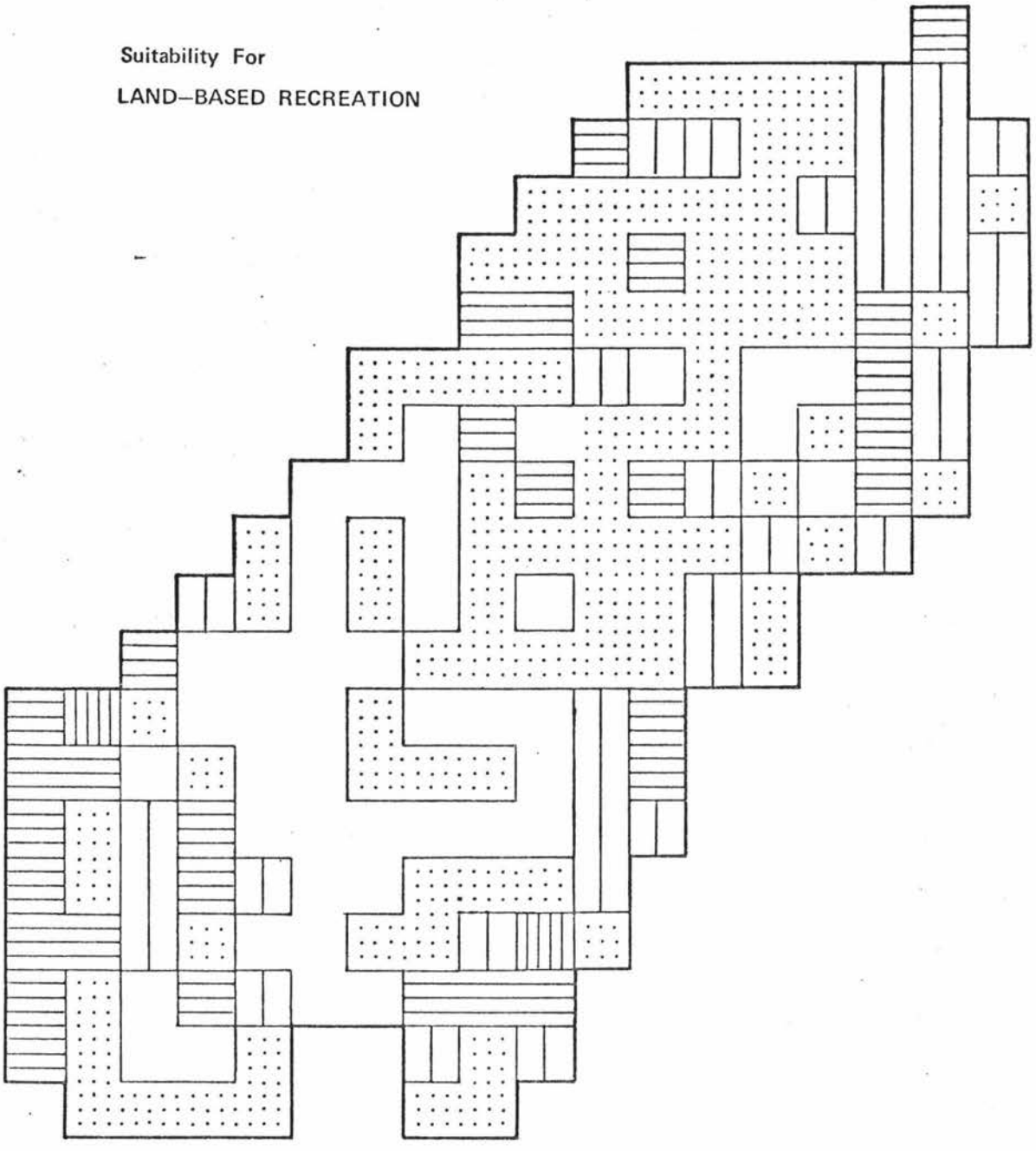
The diversity of the Manawatu landscape includes a narrow strip of coast to the west, the Ruahine Range to the east and confined between these is the extensive belt of improved agricultural lowlands. In its diversity, it also offers a contrast between uplands and lowlands. The uplands are generally able to support a wider range of outdoor recreational activities than the lowlands, in part because of their inherent qualities suitable for recreation and also because there is less conflict with other land-users than in the intensively used lowlands.

Land-based outdoor recreation in this region includes both passive and active types. Apart from organised sports the activities of which depend on formality and structured playing fields, other forms of land-based active outdoor recreational activities rely on the unstructured and natural settings. Picnicking, sun-bathing, driving for pleasure and a host of other passive recreation are enjoyed by the Manawatu people. The area most heavily used is the stretch of sandy coast, with less popular sites along the fringe of the Ruahines. The family car provides the main means of mobility into the countryside. Tramping and hiking, the more active recreational activities, are focussed on the Ruahine Range where its inherited heights and massive cover of virtually unspoilt native bush provide a home ground for the users' aspirations. Deer-stalking and pheasant shooting are also catered for by the abundance of wild-life which this area harbours.

Resource Survey

Suitability For

LAND–BASED RECREATION



Grade

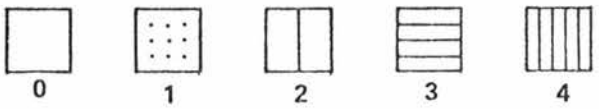


Figure 4

NCY

Thus, the countryside supports a wide range of outdoor recreational activities and the Manawatu land resources to support land-based recreation have been assessed under the following criteria:

1. Camping, caravanning and picnicking.
2. Pony trekking.
3. Walking, tramping and hiking, and
4. Game-shooting.

With the exception of the coast, the method of classification (see Appendix I) confirmed the upland - lowland dichotomy, with the former able to support a greater variety of activities. A large percentage (22.6%) of the lowlands was unable to support any of the criteria. This was due to a lack of 'recreation - vehicular accessibility' where fences on either sides of the major and secondary roads serving the agricultural areas blocaded recreationalists' penetration into the countryside. The lowlands, moreover, being agricultural areas and as such private lands have imposed to a large extent legal accessibility problems to the public. Camping, caravanning, picnicking and allied activities subsumed under these activities are very much affected by accessibility problems. Participants of such pursuits seem to want to be near their vehicles (Burton 1966 : 98 : 7). In easily accessible areas, they tend to support passive recreational pursuits. This tendency is reflected in the coastline grades and confirmed by the heavy use of the beach during summer. Similarly, accessibility has allowed the use of the Ruahine fringe areas for passive recreation (e.g. Totara Reserve).

Walkers, trampers and shooters are less affected by accessibility facilities. For these people remoteness, 'away from it all', may be a positive attraction. The assessed map (Figure 4) reflected the ability to support these activities, where the Ruahine with its natural bush and remoteness from neurotic urban confusion can offer trampers and walkers a sanctuary of peace and quiet.

The land-based recreation resource map was assessed according to the ascribed criteria. As can be seen in Table I, only 1% of the total survey area satisfied all the four criteria. This percentage included the area above Tangimoana and Bryant Hill at the foot of the Northern Tararua Range. A wide sweep of agricultural lands dominated the low grades (0 and 1) zone and where higher grades emerged, in isolated pockets of suitable topography and dune areas, their nature as such were capable of supporting walking.

Table I. Assessment of land-based recreation resources

Grade	Percentage of Survey Squares
0	22.6
1	42.5
2	18.5
3	15.4
4	1.0

1.4 Water-based recreation resources

A very delicate component of the landscape is water environment which includes predominantly tne drainage system, sea and other water-bodies. Apart from the heavy reliance on these environments by the domestic-economic sectors (where water

is used by households and industries) Man has also derived from these sources his more aesthetic pleasures and also his satisfaction from his water-based leisure activities.

The water environments, since they are capable of supporting human leisure needs, must also be assessed for their suitability and potential as a recreational resource base. Among the wide range of recreational activities that Man participates in, in a water environment, the popular ones are:

1. fishing,
2. picnicking and sun-bathing adjacent to water,
3. swimming and bathing,
4. canoeing and rowing,
5. sailing and boating,
6. power-boating and water-skiing.

Although the popularity of these activities varies considerably, the demands they make on the resources are often similar in both nature and scale. Because of this, it was decided to assess water environments in the Manawatu under the following five criteria, these criteria encompass the full range of water-based recreational pursuits.

(a) Fishing

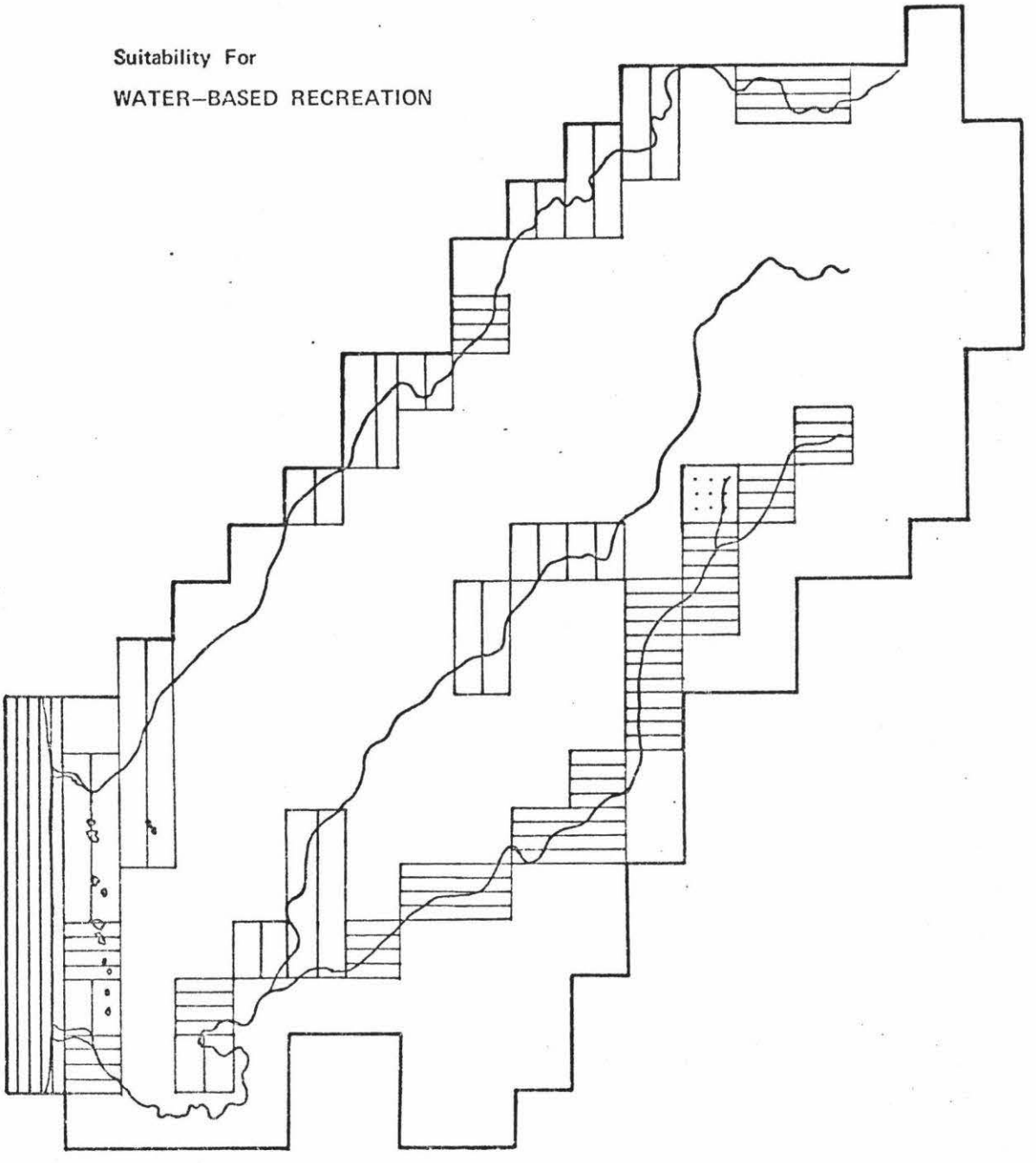
Fresh water fishing is popularly seeked in the major river systems of the Manawatu while the Rangitikei and Manawatu river mouths are the major spots for salt-water fishing. The capability and suitability of water resources to support fishing are dependent on size of and pollution on the resources.

Since pollution study is virtually a new field in governmental departments, there is no official report on the

Resource Survey

Suitability For

WATER–BASED RECREATION



Grade

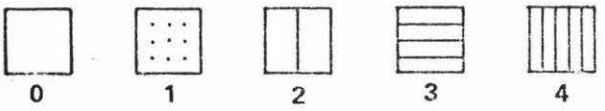


Figure 5

NCY

extent of pollution affecting fish in the drainage systems of the Manawatu. Criteria for water pollution vary markedly according to the use made of the water. Some agencies (e.g. scenic viewers) based their evaluations on water-clarity and visual impact while other bodies such as the Acclimatisation societies consider pollution in terms of chemical and organic qualities affecting fish and underwater habitats. For the purpose intended here, the writer thinks that the criteria for pollution based on proximity (of waters) to industrial activities is the most applicable. This criterion seems the most suitable since the effects of this pollution source is more obvious than those of other sources and that long term observation on pollution can also be made. Discharges from industrial activities do pollute the water environment (see chapter four, part I) with regards to its clarity, affecting its visual quality and chemical solubles from industry lend themselves as severe threats to water and fish ecologies.

Thus the survey square which contains that part of the river adjacent to freezing works or gravel mining, for instance, will be considered as polluted.

It is necessary to point out, however, that there are other factors (e.g. human, farm and industrial discharges) contributing to water pollution in the Manawatu, particularly in reference to the farming areas where animal and farm - product discharges are serious menances to the health of the water environments. Limited human and financial resources make it impossible for the writer to carry out a first hand assessment of pollution by these factors.

The other parameter that affects fish and fishing and also other activities is size of the water-bodies concerned. Nothing is available on literature on water-body size to recreation activity type in New Zealand. Hence, the dimensions prescribed in the Lanarkshire study for the different water-bodies for different recreational purposes have been adopted in this study.

Rivers and streams of 27 feet and more in width have been cohsidered capable of supporting fishing over an extended period of time. Those less than 27 feet in width are also important fishing resources but their importance, however, is only immediate and short - term and thus excluded. Figure 5 shows the extent of pollution of the developed major rivers of the required minimum width. These are the Oroua, Pohangina, Manawatu and the Rangitikei rivers.

A further water resource considered capable of supporting fishing is enclosed water-bodies (lagoons, lakes etc) of over 15 acres in area. These include the eight water-bodies scattered over a short distance inland from the coast. Lakes Kaikokopu, Kopatara and Puke-Puke lagoon being the more outstanding, comparatively larger sizes and suitable as fishing grounds although only at Puke-Puke is there any little fishing at the present moment.

(b) The nature of active water - based recreational pursuits like those of water-skiing, power-boating and skiing require water environments of a bigger dimension. The size chosen is a reflection of these water grounds capable of supporting water sports. For these purposes, rivers which

have a minimum length of one mile and breadth of 200 yards have been considered suitable. Likewise, the minimum requirement for enclosed water-bodies is 49½ acres. Lake Kopatara is the only water-body in the study area which meets this requirement.

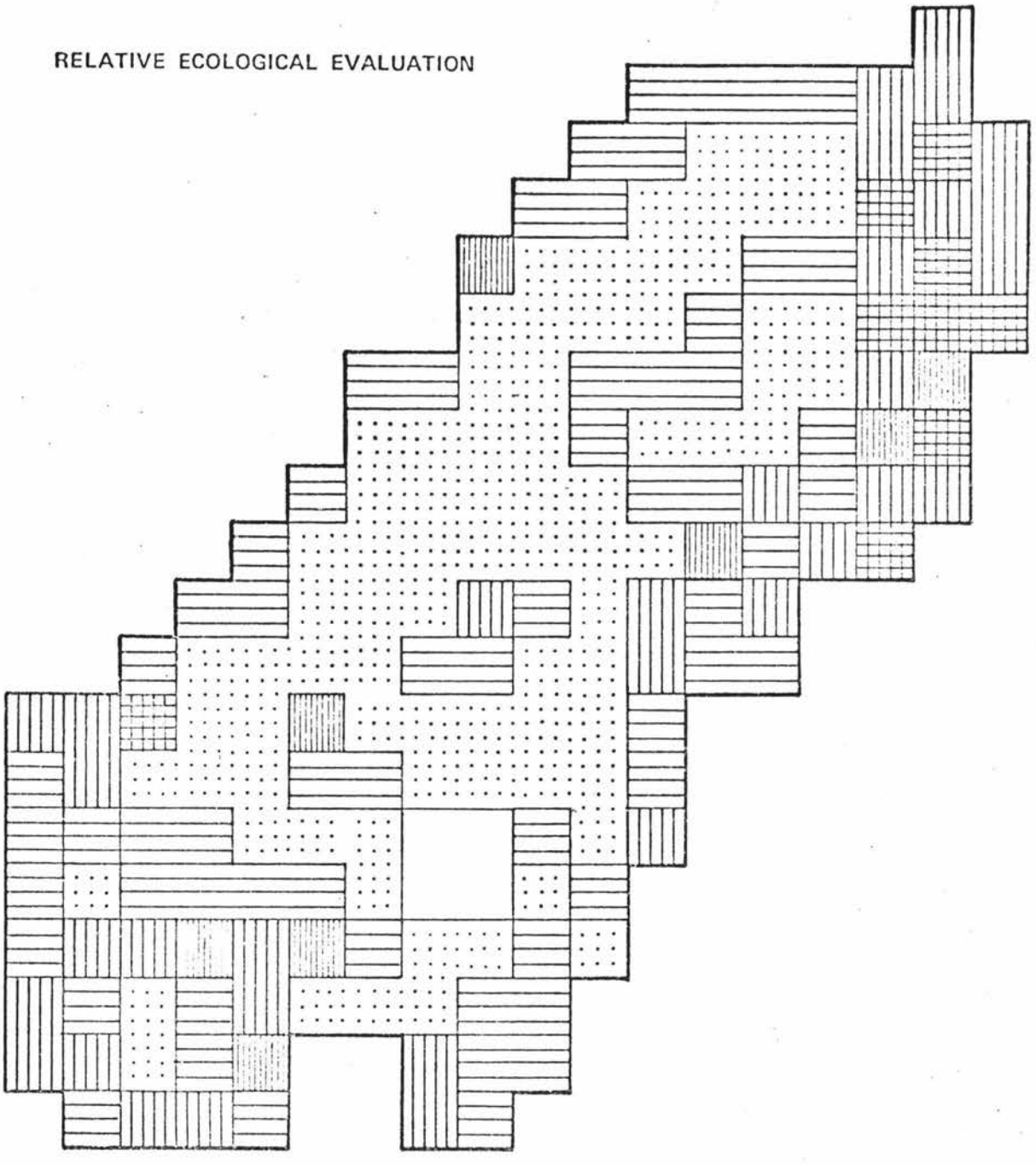
(c) The third criterion for assessment of water - environments is that of informal water - orientated activities. This includes all forms of informal and passive recreational pursuits from picnicking to sunbathing and observing people at play. Informal visits by the public are often made to the beaches and the river banks. Accessibility, thus, is the only constraint to users of related resources. Hence, all unpolluted waters within half a mile of unmetalled roads or otherwise, accessibility accounted for by the presence of foot-tracks, vehicular tracks and public right-of-ways, have been considered suitable.

(d & e) The next two criteria considered are the ability of water areas to support both active and passive sea-based recreational pursuits (i.e. coastal recreation). For the former, the sea is the obvious requirement. The latter takes into consideration the necessary stretch of sandy beach area required for passive coastal recreation purposes.

The distinction drawn here between sea-based recreational areas (including the coasts) and non-sea water-based recreational areas (excluding the coast) is important as the former is associated with a greater variety of pursuits. Associated with it, too, is the generally more attractive nature and hence greater intensity of use of the sea and beach.

Resource Survey

RELATIVE ECOLOGICAL EVALUATION



Grade

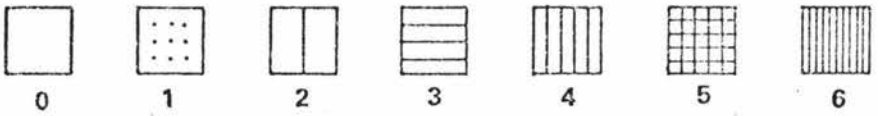


Figure 6

NCY

A summary of the results of the quality of water environments in the Manawatu is provided for in Table II.

Table II. Assessment of water-based recreation resources.

Grades	Percentage of Survey Squares
0	67.7
1	0.5
2	16.4
3	11.8
4	3.6

The strip of coast shows great potential for future development. Instead of only intensifying the development of traditional beach spots like those of Foxton Beach and Himatangi Beach, dispersed nucleated units could also be developed so as to create user - spaces subsequently attracting 'spill-overs' from the traditional sites to these new ones. The lakes show potentiality for passive recreation and these could be developed for future uses (see chapter 4, part I). At present, these lakes are used seasonally by duck-shooters (chapter 4, part I).

1.5 Ecological quality

As was demonstrated in Figure 3 for an evaluation of recreation resources, the use made by Man on the natural habitats of a landscape produces ecological quality from it. Although ecological quality is very difficult to evaluate or measure, it is still an important aspect of recreation in the countryside. The growing numbers of visits made to places of historical and scientific interests and native bush areas

(particularly to the Totara Reserve) confirm the demand for ecological resources. More recently, in New Zealand, the trend towards educational tours both by public and students to these resources have imposed an ever-increasing use-pressure on them. These irreparable and irreplaceable resources must be protected against detrimental effects from users, thus the need for an assessment of relative ecological quality of the landscape to bring out areas of greater importance for conservation purposes.

The technique for making an objective assessment of the conservation value of large areas was first devised by Helliwell (1969), the basis of it is:

(a) That the ecological quality of an area is assessed according to its ecological complexity and/or diversity, the quality of individual communities within the area are not assessed; and,

(b) That evaluation of quality is on the relative intrinsic biological richness of these different habitats.

The simplified version of Helliwell's technique in the Lanarkshire study was adopted, with a few modifications, for the Manawatu. Instead of a five grade system for Lanarkshire, six grades of ecological quality were applicable to the Manawatu landscape. Assuming all are equally common in the region and that all are of average quality, the habitats have been allocated (after New Zealand Forestry Department) the following scores:

Habitats	Score
Mixed podocarps	9
Beech	8
Highland soft and hardwoods	7
Highland grasses and tussock	6
Scrub	5
Swamps	4
Rivers and water-bodies	3
Dunes	2
Exotic trees	1

For evaluative purposes, the first four habitats were regrouped into two groups of mixed podocarps; and beech-highland soft and hardwoods - highland grasses and tussock. The detailed method of evaluation of ecological quality (natural habitats and historical/scientific areas) has been provided for in Appendix I.

Figure 6 shows the grading of ecological quality of the Manawatu and Table III is a summary of the grading results:

Table III. Assessment of conservation interest.

Grade	Percentage of Survey Squares
0	2.13
1	42.02
2	0
3	30.85
4	15.95
5	4.79
6	4.26

The figure does not pretend to define specific areas, but shows those areas of greater importance for conservation and thus provides a relative grading of ecological richness. Most of the highest grades squares reflected sites of historical and scientific interest. These sites are:

1. Moutoa Pa

An ancient Maori church which has been restored and removed to the present site at Moutoa from the site of an abandoned Maori village.

2. Opiki Toll Bridge

A privately owned bridge built in 1916 to serve the flax trade. It is 477 feet long and suspended from eight steel cables attached to 48 feet high towers at each end. This toll bridge is now no more in operation.

3. Mt. Stewart

442 feet high is the site of Centennial Memorial of the Manawatu district and including a crypt containing the names of early pioneers. From the lookout an excellent view is obtainable of the Manawatu plains overlooking six counties.

4. Totara Reserve

Known officially as State Forest 89. Declared a State Forest in 1886, this area of 663 acres has been preserved in its native state for scientific purposes. In 1920 the area was also declared a sanctuary for both native and imported birds.

5. Putai Ngahere

The main attraction here is the magnificient specimen of a very large totara tree estimated as being over 250 years old.

6. Himatangi Round Bush

Himatangi Bush is a remnant of a much larger forest which blanketed dunes and flats in the Himatangi Block about 3 miles W.S.W. of Rangiotu and 6 miles from Foxton. "This bush is of particular scientific interest because it is the only place between the Manawatu and Rangitikei (and possibly in the whole of the Western Wellington sand country) where any of the native dune vegetation of these ages (2,000 to 4,000 years ago) remains" (Esler 1968). This 150 acre bush also commands considerable scenic merit and from a high dune at its western extremity a panoramic view of the Manawatu Lowlands and hills can be gained. Himatangi bush contains at least 120 species of native plants and "as this bush lies in a region where native trees are a rare feature of the landscape it warrants preservation for its aesthetic and scientific worth" (Esler 1968).

Figure 6 shows the distribution of the high and medium grades to be centred along the ranges and river systems with grade I occupying most of the extensive agricultural lands.

1.6 Scenic Resources

For many a passive outdoor recreationist, a trip into the countryside or just driving for pleasure is a prime motive to enjoy the scenery of the landscape. The search for environmental aesthetics or scenic quality may be an innate perceptual need or a need derived out of a dissatisfaction from urban living. It may, however, be an environmentally - imposed learnt process when Man in a landscape is made to perceive

and be aware of the scenic quality instrumented by the landscape. Whichever the reason for it, the importance of the pursuit for and the enjoyment of scenery need no further stress. The result of scenic pursuit necessarily effects on the landscape a form of recreation resource - scenic resource.

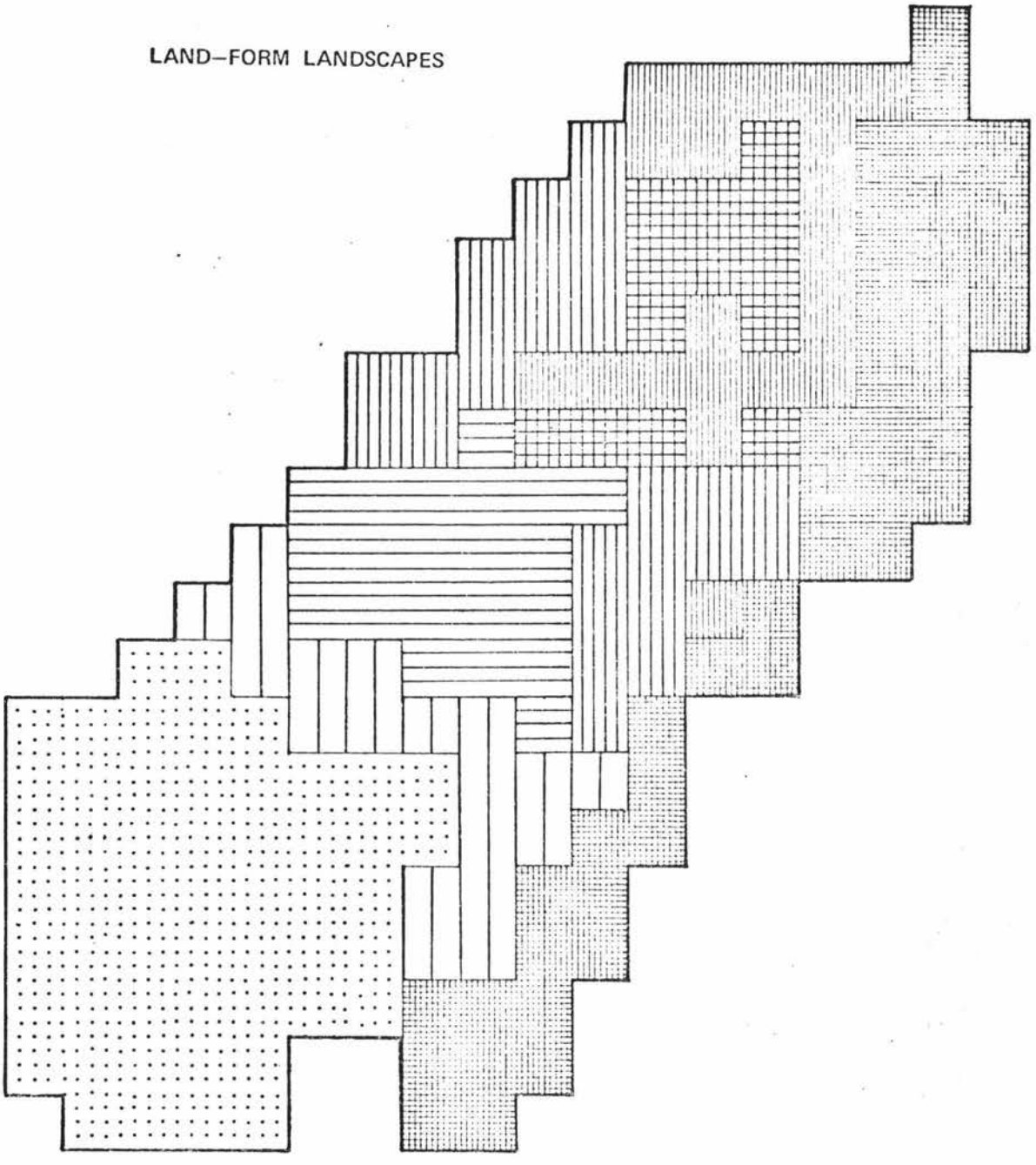
The quality of scenery (like beauty) although is in the eyes of the beholder, modern scientific method has given it an objective and scientific value for evaluation (Listowel : 1967). A landscape has shape and space relationships (gound-cover) and these two phenomena are the primary factors in effecting the awareness and enjoyment of scenic quality. Linton (1968) recognises these phenomena that make dramatic scenery and called them Landforms and Land-Use respectively, in his "Assessment of Scenery as a natural resource" (Linton 1968 : 84 : 3). He refers landforms to the combination of absolute relief (heights above sea-level) and the amplitude of relief (available relief i.e. the relief difference between the maximum and minimum heights). Absolute relief over any area shows the extent of spatial elevation. Available relief, however, presents the dissections in such elevation. The combination of these two relief features produce landscape distortions of 'geomorphic landscape type landforms' which by themselves impose and command scenery.

Landuse component of scenery relates to the ground-cover of the landscape. Ground cover comprises of both the natural habitats and man-made features, their combination of which produces spatial variation and diversity in land uses.

The method prescribed employed these two variables:

Resource Survey

LAND–FORM LANDSCAPES



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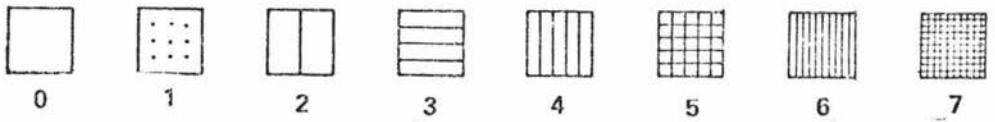

Figure 7

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landform and land-use landscapes for evaluating the scenic quality of the region (Appendix I). Each variable was capable of grading and a scenic quality evaluation map (figure 9) was derived from their combination.

1.6a. Landform landscapes (Figure 7)

Table IV shows the distribution in the survey area, of the seven landform types. The extensive lowlands and undulating lowlands reflect the wide extents of the 'agricultural plains' of the Manawatu, stretching from the coastal areas between the Rangitikei and Manawatu river banks right into Feilding and Palmerston North vicinities. 'Steep Hill Country' and the ranges are well covered by the northern Tararua and the Ruahine ranges and from here stretching eastwards across to Kawhatu into Kimbolton areas. The ranges and their highly dissected 'foothill country' are the main scenic foci. From a distance, these provide a remarkable scene of broken skyline towering from the Manawatu plains. Located in between these two broad categories of landform types are the 'Rolling Hill' and 'Hill Country' from fairly broken and dissected country of Ohingaiti to Rata on the north-west and Kimbolton south to Raumai on the south-east.

Table IV. Assessment of landform landscapes

Grade	Category	Percentage of Survey Squares
0	Lowlands	27.2
1	Undulating lowlands	9.7
2	Rolling Hills	10.8
3	Hill Country	13.3
4	Steep Hill Country	6.7
5	Lower Ranges	18.4
6	Higher Ranges	13.9

1.66 Land-Use Landscapes

Table V is the result of an assessment of the land-use landscapes of the Manawatu. The assessment is based on two assumptions : that scenically people prefer 'natural' environments to those where human influence is greatest and that it is diversity of scene which attracts. Diversity of scene is a perceptual necessity for "we cannot maintain prolonged awareness of a relatively uninteresting environment" (Vernon 1962 : 265). The technique used for land-use landscape assessment has been described in Appendix I.

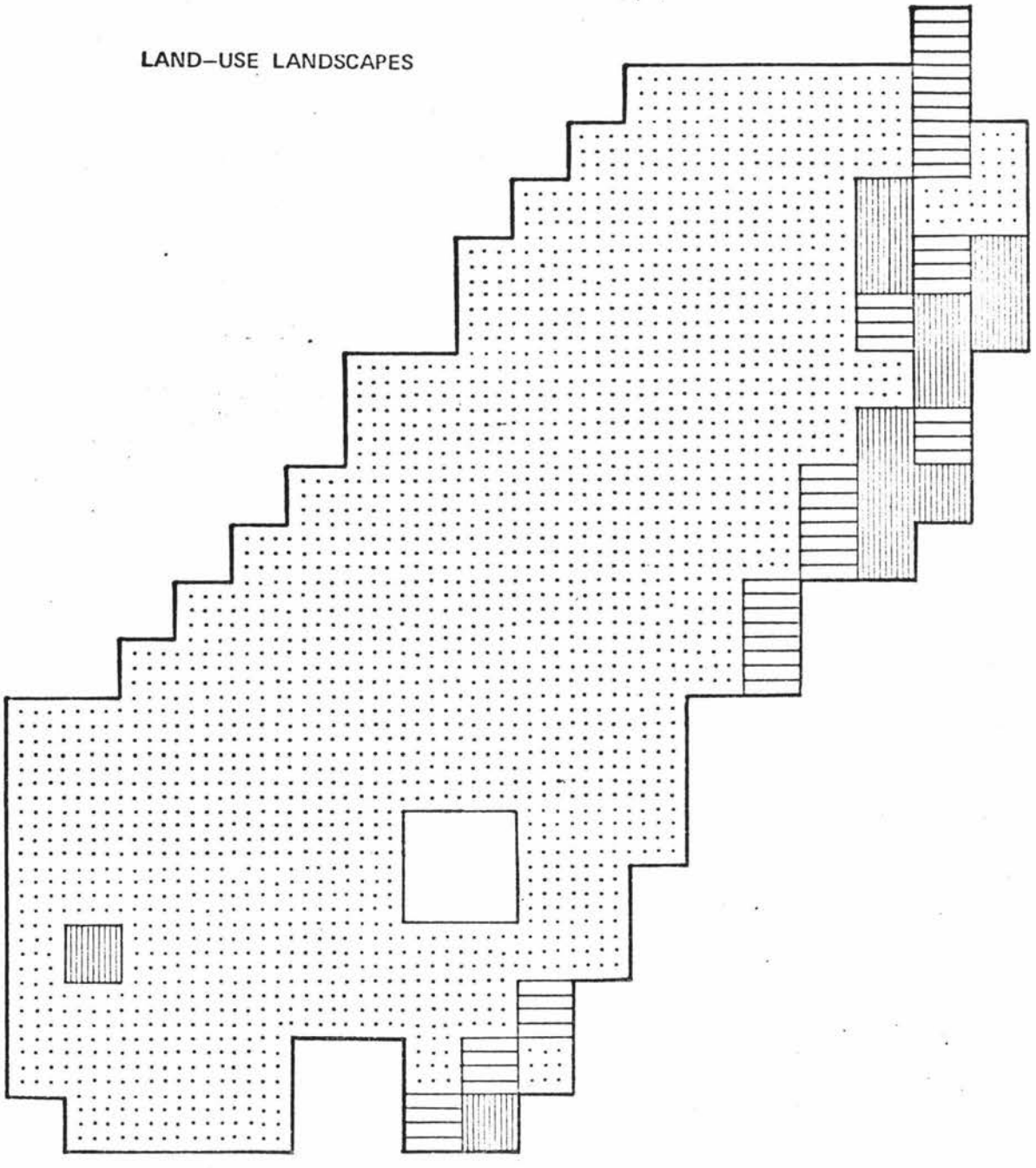
Table V. Assessment of land-use landscapes

Grade	Category	Percentage of Survey Squares
0	Urban areas	2.1
1	Agricultural areas	85.1
2	Scrub dominant areas	0
3	Bush dominant areas	6.7
4	Exotic plantations	0
5	Rivers and water-bodies	0
6	Diversified rural landscape	6.1

The components of land-use (categorised in Table V in ascending order) produce scenic quality in that order. The result in Table V confirms the extensive spatial occupation of agriculture (Figure 8 and see also Table VI). Scrub-lands only occupied certain areas, particularly along the foothills of the Ruahines and Tararuas. Exotic plantations were in small measures used as wind-breakers in farms. The only major plantation is located on the coast. While there were large tracts of rivers and water-bodies, these failed to be dominant (percentage-wise) within a 2.8 x 2.8 mile square. Only 6.1%

Resource Survey

LAND–USE LANDSCAPES



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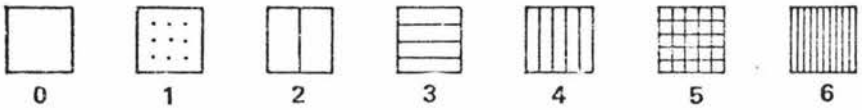

Figure 8

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of the total survey area were classed as diversified rural landscapes. These areas were, with one exception near the coast where water, exotic plantation and agriculture contributed to its diversity (Figure 8), mainly scattered along the Ruahine Ranges where diversity was a combination of bush, scrub and agricultural lands. As indicated in Table V, the Manawatu land-use landscape where agricultural lands predominated has little to offer in land-use scenery.

1.6c Scenic Quality

A map of scenic quality (Figure 9) of the Manawatu can be compounded from a combination of land-use landscapes and land-form landscapes (the relationships between their component parts were illustrated in Table VI, a major feature of which is the predominance of agricultural lands). Scores of land-use and landform are provided in the Table below:

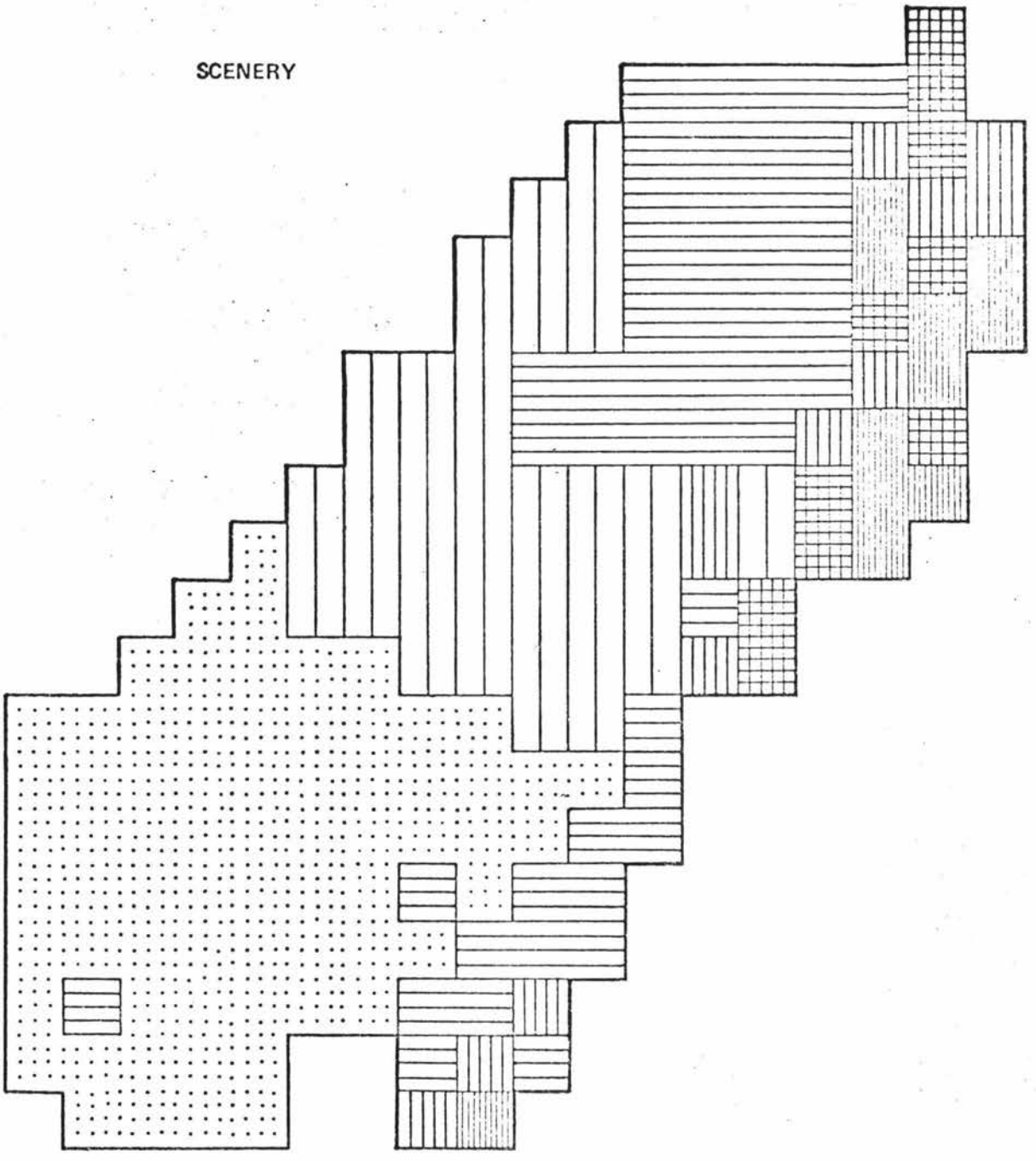
Table VI. Relationships of land-form and land-use landscapes.

	Land-Use landscapes						
	Urban Areas	Agricultural areas	Scrub	Bush	Exotic plantations	Rivers and Water-bodies	Diversified rural landscapes
Lowlands	1.9	96.2	0	0	0	0	1.9
Undulating Lowlands	10.5	89.5	0	0	0	0	0
Rolling Hills	0	100	0	0	0	0	0
Hill Country	0	100	0	0	0	0	0
Steep Hill Country	0	100	0	0	0	0	0
Lower Ranges	0	88.9	0	8.3	0	0	2.8
Higher Ranges	0	25.9	0	37.1	0	0	37.0

Percentage of total survey squares

Resource Survey

SCENERY



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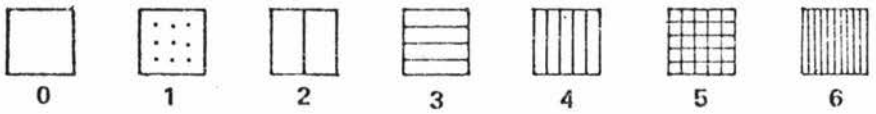

Figure 9

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Landscapes from each individual survey square were combined together to give a composite score. Each survey square was thus capable of scoring a composite score ranging from 0 to 12. These scores were graded into scenic quality grades as shown in Table VII.

Table VII Composite scores of land-use - landform landscapes, and assessment of scenic resources.

Grade	Composite Score	Percentage of Survey Squares
1	0 - 2	35.4
2	3 - 4	23.1
3	5 - 6	24.6
4	7 - 8	6.2
5	9 - 10	5.1
6	11 - 12	5.6

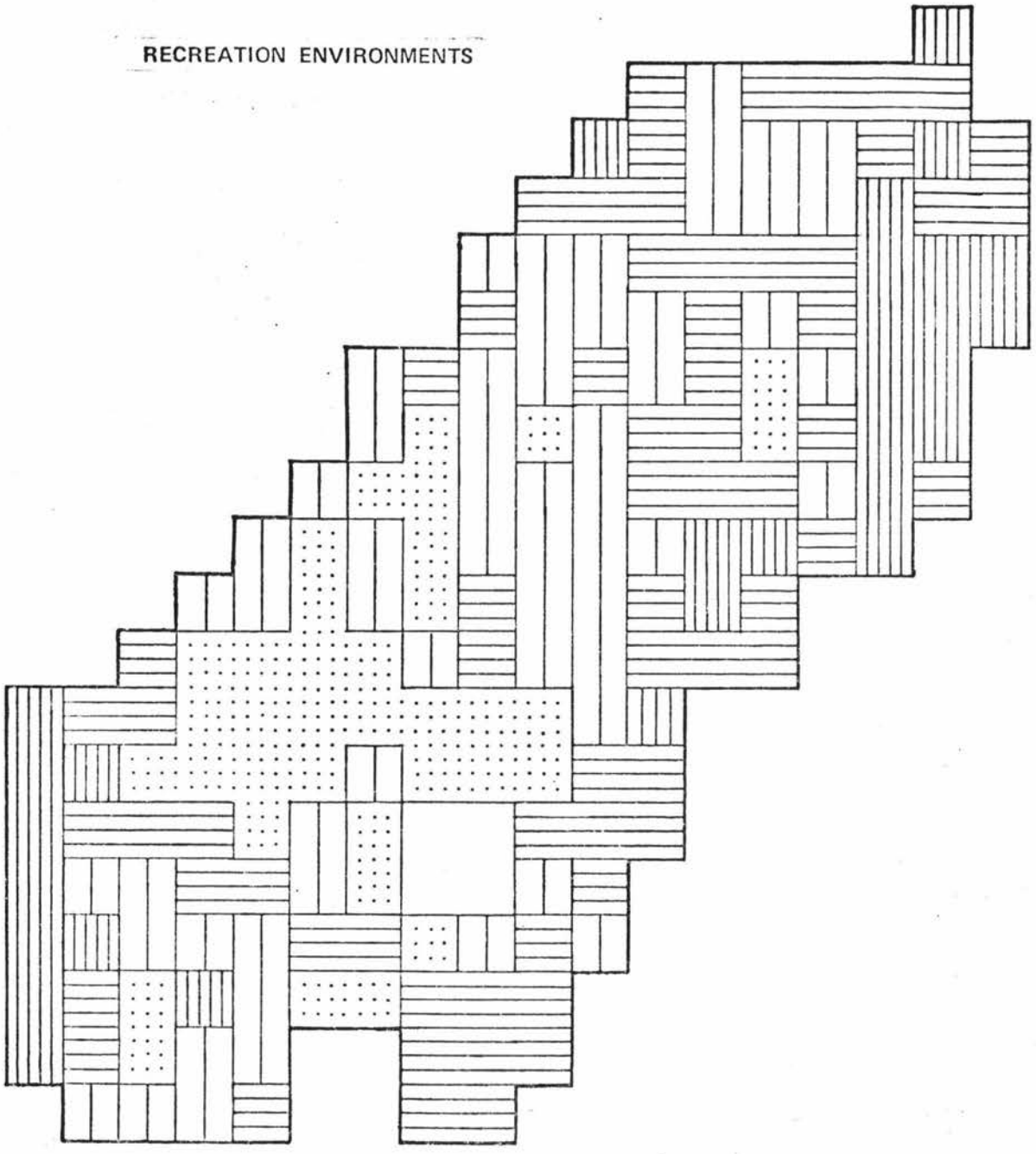
While a large proportion of the survey area was of lower grades reflecting the strong relationship between lowland - rolling hill country and the undiversified extensive agricultural areas, the upper grades areas consisting only of 10.7% of the total area were 'located' on the Ruahines. 30.8% of the medium grades areas covered the 'Hill' and 'Steep Hill Countries'. The results, in short, indicated that the level of scenic quality in the Manawatu was determined by the spatial extent of its land-use types and landform diversity.

1.7 The Manawatu landscape - a recreation environment

The four types of recreation resources were synthesized to produce a recreation environment. A map of relative recreation environments resulted by grading the synthesized squares (Figure 10). In theory each survey square in each of

Resource Survey

RECREATION ENVIRONMENTS



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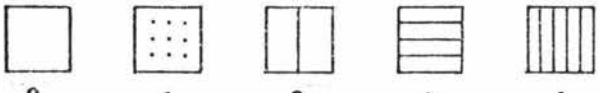


Figure 10

NCY

the recreation resource type was allocated a maximum score of 6, thus, the synthesized square had a maximum score of 24, accounting for the highest grade. In practice, however, the highest grade could only be allocated to scores of 13 and above. The theorectical and practical grade score systems were prescribed as below:

Table VIII. Theorectical and practical grade score system.

Grade	Theorectical Scores	Practical Scores
0	0	0
1	1 - 4	1 - 4
2	5 - 8	5 - 8
3	9 - 12	9 - 12
4	13 - 16	13 and above
5	17 - 20	
6	21 - 24	

The results of relative quality of recreation environments from synthesizing the four recreation type resources were provided for in the table below:

Table IX. Relative quality of recreation environments of the Manawatu.

Grade	Percentage of Survey Squares
0	2.1
1	18.4
2	30.3
3	33.9
4	15.3

The distribution of the relative quality of recreation

environments was indicated in Figure 10. The lowest grade (0) was reflected in Palmerston North City as the largest urban centre in the region. Grades 1 and 2 occupied most of the agricultural areas while the third grade areas reflected parts of the heavily-used coastal region, parts of the river systems and the foothills of the Tararuas and Ruahine ranges. The highest grade areas (15.3%) concentrated on the coast and also on the broad crests of the Ruahines.

Chapter Two

AVAILABLE POPULATION AND RESOURCES

2.0 Introduction

One of the first steps in the planning of recreation resources should be the identification of user-pressure for this is one indicator for assessing the need of any additional development or acquisition of resources. It also provides basic information as to where potential markets are. User-pressure is the pressure faced by resources when used, and can be classified as either 'actual' or 'available'. 'Actual user-pressure' is generated as a result of the actual numbers of people using a particular resource at a particular time and such pressure is difficult to quantify and assess as actual numbers tend to fluctuate daily according to physico-socio-economic conditions. 'Available user-pressure' is potential in that the user-pressure that might be generated on resources is available from the total available population of a given distance. This aspect of user pressure gives an objective basis for, and makes easier, quantification and assessment of the level of use of the resources. With reference to the previous chapter where resources were surveyed for their spatial distribution and availability, 'available population' defined on map forms as a method for assessing and quantifying user pressure on these resources seems the most appropriate. Two reasons are advanced for its usefulness:

(a) This method (map form) allows superimposition of resource and population data and thus permits the spatial relationships and the implications they

raise to be readily observed; and

(b) Data maps of 'available population' allow the spatial availability and patterns of user-pressure to be recognisable..

A series of maps has been compiled on 'available population', the objective being to show the spatial dimensions and patterns of user-pressures and their implications for recreation development planning. These maps show the intensity and patterns of 'available population pressures' and how these vary according to the distance at which 'available population' is calculated. The extent to which the spatial location and size of urban centres influence the intensity of available population is also considered. The emergence of 'zones' of pressures is noticed when 'cells' of similar pressure happen to cluster, and, depending on the size and clarity of spatial organisation of these clusters, these zones vary in their distinctiveness.

2.1 Methodology

Maps of 'available population pressures' have been calculated for fixed distances of 10, 30, and 50 miles. These distances have their respective significance in the recreation journey: the 10 mile distance indicates those areas where 'user-orientated activities' would find their greatest market. The 30 mile distance has been indicated as the average journey of a day tripper (see also Chapter 4); and the 50 mile distance is what can be considered as recreation distance travelled by day trippers for resources of very high quality and national significance (Coppock 1970; Mercer 1970). Since there is no available data for the study region as to the significance of

these distances (apart from the 30 mile distance) these overseas formulated dimensions have been adopted, and assumed to be broadly applicable to the New Zealand situation. This does not necessarily obviate the need, however, for research into the significance and roles of these distances in New Zealand.

The Manawatu region was divided into 2.8 x 2.8 mile squares (cells) as in the resource survey maps of the preceeding chapter, and the 'available population' was calculated by squares (cells) for each of the distinctive zones. 'Available population pressures' (available user-pressures) for a particular square can thus be defined as the total number of persons living within a fixed distance of the centre of that square.[1] The population figures were extracted from the 1966 New Zealand Population and Dwellings Census returns (At the time of writing, the 1971 figures were not fully available).

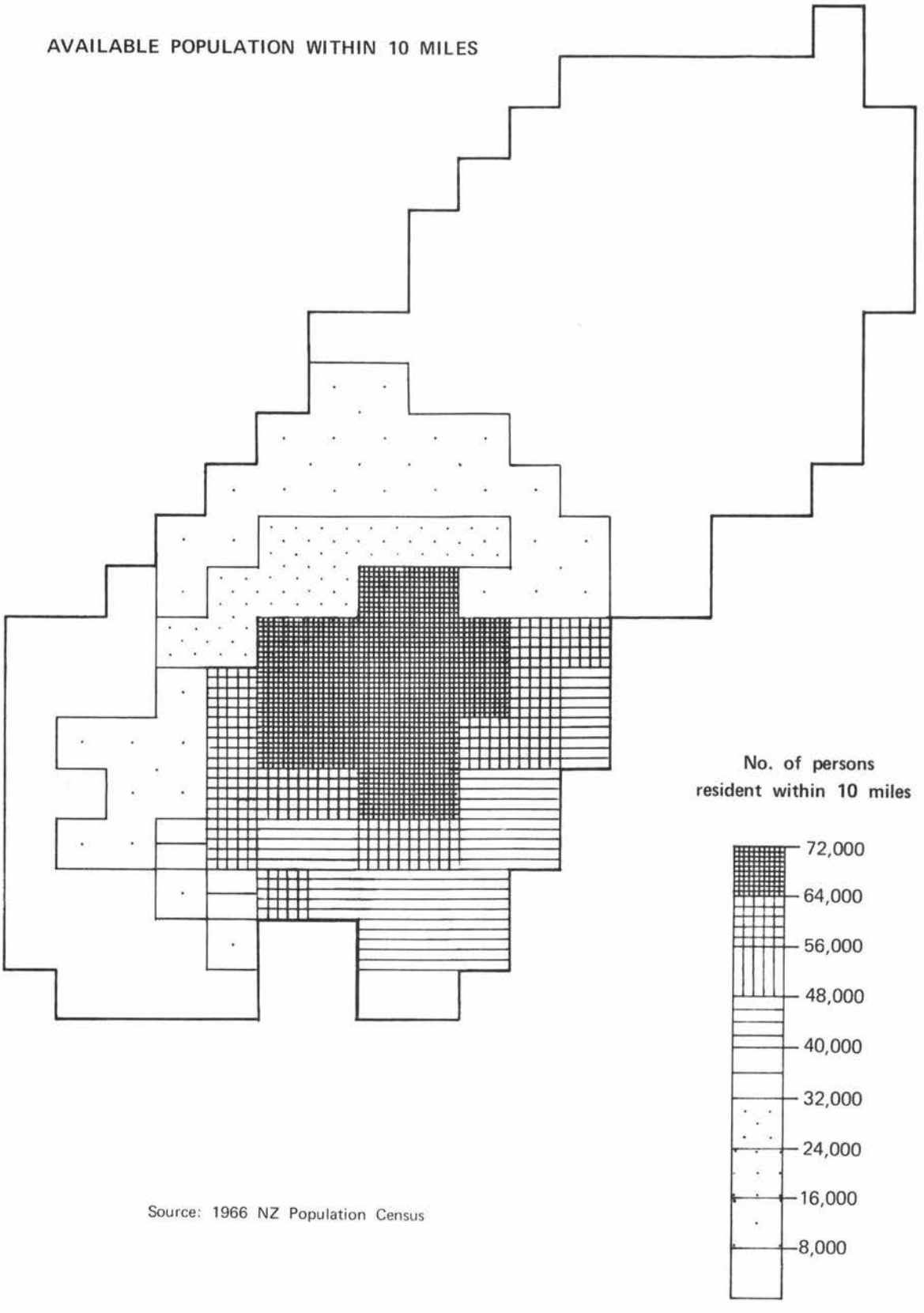
Spatial Availability of Population Pressures and their implications to resource planning

2.2 10 Mile distance

The heaviest available population pressures exist around the Palmerston North - Feilding area and its periphery. With this area as a core there emerge well defined population pressure zones where pressures decrease as distance from the core increases. This pattern can be attributed to the dispersed nature of the population density of this region, whereby the north-west - south-east axis of the region is relatively heavily populated with Palmerston North city as the heaviest source of available population, followed secondly by Feilding and then the secondary contributors such as the smaller urban centres

Population Pressure

AVAILABLE POPULATION WITHIN 10 MILES



Source: 1966 NZ Population Census

Figure 11

NCY

of Marton, Bulls, Rongotea and Bunnythorpe.

The effect of such a pattern of population distribution on the spatial availability within 10 miles is that the north and north-eastern parts of the region experience the lowest population pressures since sources of population are contributed only by the aggregate of dispersed numbers in the rural areas. 41% of the region is within this belt (in the north-northeast) and yet less than 8,000 people live within 10 miles. Another 12% has been confined to the south-western boundary where the lack of big urban centres and/or the western sea-board has been responsible for light pressures.

South of the north - north-east area are population pressures of a greater intensity, reaching between 9,000 and at least 17,000 people. Marton, Bulls and to a lesser extent Feilding are the contributing sources of available pressures. This zone gives way to the core area (heaviest pressure areas with population between 57,000 and at least 65,000) where Palmerston North and Feilding are the prime sources of population. Facilities can be expected to develop in this zone to exploit the large potential market for recreation. These facilities can only serve a local function as the 10 mile limit has been established as a measure of localized recreation journeys.

The influence of Feilding gradually declines as the core area gives way to a zone of medium pressure of at least 49,000 people, and smaller centres peripheral to the study area (such as Masterton and Pahiatua shape their importance.

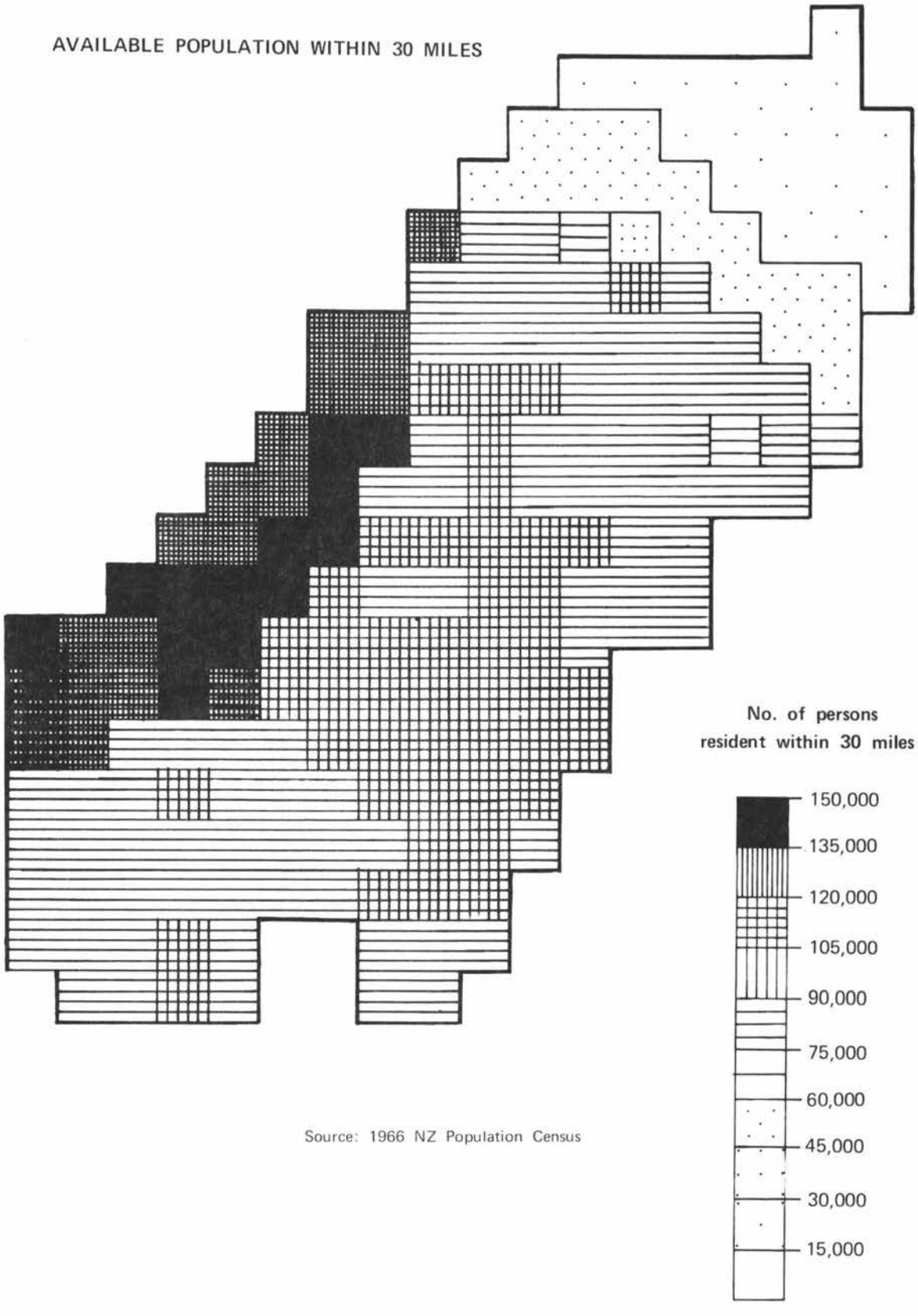
2.3 30 Mile distance

The pattern of population pressures at this distance changes significantly in comparison to that of the 10 mile

distance. This change can be attributed to the change in status of new available towns, within this distance. Where former towns of sizeable populations were not within range but peripheral to the region, these are now enveloped within the radius of the prescribed distance, their relatively sizeable populations contributing significant available pressures. Towns peripheral to the study area such as Levin, Marton, Wanganui and Masterton have all contributed their significance in shaping the final patterns of spatial availability of population pressures. Whilst the patterns resulting from the inclusion of these towns are eminent, the marked increase in numbers (i.e. size) of available population should not be overlooked. From the 1,000 to 11,000 difference in available population of the 10 mile distance, the impact of increasing the distance to 30 miles thus enveloping a larger number of larger towns (as mentioned above) has increased the available population size to at least 16,000 as a minimum pressure reaching to a maximum of not less than 145,000.

The core area of heaviest pressure, instead of centering around the Palmerston North and Feilding area has shifted northwest in response to the increase in distance. This belt comprises 16% of the study area and has a population pressure of at least 121,000 people, the major sources of which are Palmerston North, Feilding, Marton and Wanganui. Southwards of this belt, the pressure decreases with a broad belt containing between 91,000 and at least 104,000 people interspersed or trenched by a higher pressure belt (106 - 120,000). Northwards the pressure is still relatively less, the bigger centres of Napier and Hastings lying beyond the 30 mile range.

Population Pressure



Source: 1966 NZ Population Census

Figure 12

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Since this distance is regarded as the 'average day trip zone' for outdoor recreationalists, recreation environs within this distance would have both a local and regional function. Observations and studies carried out (chapter 4) confirm this dual function to be characteristic of the beaches on the west; the picnic grounds of the bush environs of the Pohangina and the Ruahine Ranges; and the water spots along the major drainage systems of the Manawatu. A regional function will automatically assume that a greater number of users are attracted to these environs.

Where zones of large available population coincide with areas of high capacity for supporting outdoor recreation activities the greatest pressures on resources can be expected. The superimposition of the two maps of recreation environments (Figure 10) and the 30 mile distance (Figure 12) on to one another reveals the high grade areas (grades 3 and 4) to lie predominantly within areas having population pressures of at least 91,000 people. Only 32% of these high grade areas support pressures of less than 91,000 people. This percentage essentially refers to the northern part of the study region where relatively low pressures are attributed to the westward spread of predominantly rural populations and the general absence of large urban centres within the 30 mile distance. The high grade - high population pressure areas include sites such as Foxton Beach, Himatangi Beach; Raumai, Pohangna, Totara Reserve and the picnic spots on the Manawatu and Oroua Rivers. Because of the large available population resource in these high grade areas, these are potential recreation development sites. The high grade - low population pressure areas however, are important latent sources for recreation developments, especially

in that they may function as future receiving areas for over-spills from over-used and over-taxed areas. Such latent areas (e.g. the bush scapes and scenic areas of the Northern Ruahine recreation environs), it is worthy to note, are currently not very well publicised and developed, and as such recreational traffic flow into such regions seems very limited, the majority being directed towards the coasts and Totara Reserve. As a recommendation, these relatively under-used but high quality areas warrant closer examination with regards the possibility of developing recreational facilities.

2.4 50 Mile distance

The 50 mile recreational distance is regarded as the "distance at which only resources of very high quality and national significance can be expected to attract visitors" (Coppock 1970). While resources in the Manawatu vary in quality, the relatively highest quality resources assume, at best, an inter-regional significance. Such a limitation in significance may be attributed to the size, and more particularly, the lack of publicity, of the resources. The high grade areas shown in Figure 10 reflect these popular recreation sites of inter-regional significance, noticeably, Foxton and Himatangi beaches, the boating and fishing environs of the Manawatu River; and the shooting environs of the lake and mountain range areas.

Figure 13 depicts population pressures available at 50 miles where distinct zones of available population pressures with a strong tendency for pressures to decrease northwards, are discernable. At this distance, the southern end of the region receives the largest pressure where a minimum of 280,000 people live within 50 miles. The area immediately north of this zone

also receive relatively heavy pressures of at least 190,000 people.

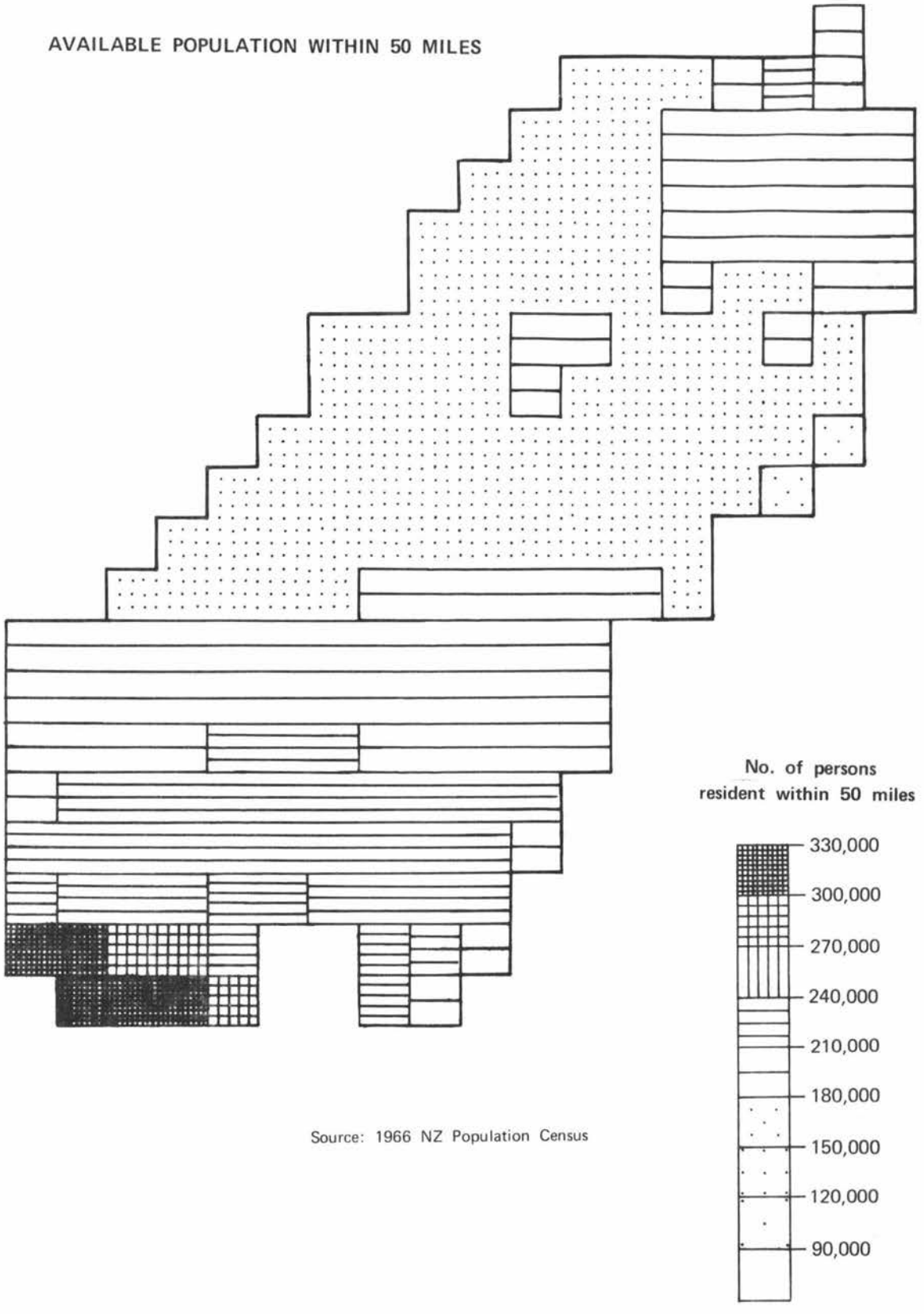
At this distance two significant trends are effected:

(1) The lowest pressure area occupies the central and north-west portions of the region unlike the pattern for the 30 mile distance whereby the lowest pressure area is in the north.

(2) At this greater distance, the north-east portion has become a significant medium range pressure zone with a minimum available population of 190,000.

The overall pattern of available population at 50 miles can only be attributed (as in all former cases) to the incorporation of sizeable 'newly' available urban centres within this increased range. At this distance significant population areas included are : Wanganui to the north-west; Hastings and Napier to the north-east; and Porirua and the Hutt Valley to the south. These are all centres of city status and their inclusion unequivocally means the availability of very large populations. It is the influence of these large populations, that is responsible for inducing for example, the belt of heaviest pressure in the extreme southern portion of the region and the unique belt of medium range pressures on the north-eastern extremities of the region. At 50 miles the 'extreme south' includes the influence of Hutt; Porirua; Paraparaumu and Masterton. Of these Porirua and Hutt as has already been noted are city sizes. In the north-west the 50 mile range has introduced the influence of Wanganui and Marton, whilst in the north-east Napier and Hastings become relevant sources of additional pressure particularly in association with the Palmerston North-Feilding complex thus producing the

Population Pressure



Source: 1966 NZ Population Census

Figure 13

NCY

'unique' north-east medium range pressure zone. The relatively low pressure belt (less than 180,000 people) of the central and northern portions of the region is attributed to the absence of new large urban centres such as Napier, Hastings, Hutt and Porirua. At 50 miles, overall available pressures are double that of the 30 mile distance. While the established urban centres are rich sources of available populations, heavier rural and semi-rural populations included at the 50 mile lend additional resources to overall availability of pressures. Semi-rural centres like Waipukarau; Waipawa; Paraparaumu; Otaki; Carterton and Greytown all have a population of at least 2,000 people.

The superimposition of the map representations of data on recreation environments and available population pressure at a 50 mile range shows that most of the high grade areas coincide with larger available population of at least 190,000 people. These present a sizeable market for developments of recreation resources attaining at least an inter-regional significance. Several popular recreation sites coinciding with heavy available populations and possessing high population carrying potentials for future development into more emphatic inter-regional prominence are worth pointing out. The first of these is the popular Foxton Beach environs, where its inter-regional role is noted (Chapter 4 Part II). This place is one of the few that carry the heaviest available population pressure of at least 310,000. Facilities at Foxton Beach, although limited, manage to support its position as a very popular, if not the most popular, recreation site for the region. The extension and further development of facilities may help to enhance

its inter-regional status even more. The same emphasis could be given to the high grade - high available population areas of the Manawatu River, for the planned development of 'camp-picnic' grounds, water-sports grounds or angling paradises are of inter-regional importance. A third area is the 'unique' north-eastern area where the development of appropriate facilities centering around mountain activities together with the high scenic quality can open further possibilities by capitalising on the large available market there (at least 190,000).

2.5 Summary and Conclusion

A number of salient points emerge from the maps and accompanying analysis. Firstly it is realised that these maps are viable analytical tools for identifying both the potential pressures and their relationships with resources when the latter's data is superimposed onto the available population data maps. The analysis shows that the Manawatu countryside is faced with varying degrees of user-pressure and that these also vary with the quality of the environment. The information collected reveals the need for closer examination and research into population - resource relationships, and particularly distressing from a conservation point of view are those areas of high quality corresponding to high population pressure areas. Another category worthy of note for further research is the low pressure - high quality type relationships where perhaps, proper management may mean an expansion of the current and future resource base.

Secondly it also points out the need for regular surveys along these lines to assess the extent and nature of change in potential and current use of the regions resources, if those resources are to be properly managed and conserved.

And thirdly, the test of the credibility of 'recreation distances' and their roles in enhancing the level of importance of resources in the Manawatu is most pertinent, for these relationships together with knowledge of use levels do influence the siting and development of specific areas, activities and facilities.

NOTES:

1. It should be noted, however, that distance has been measured in terms of absolute rather than relative distance. It therefore fails to account for such physical barriers as that formed by the northern Tararua and the Ruahine ranges and the psychological barriers incumbent upon them.

Chapter Three
Inventory and Management

3.0 Introduction

The need for basic statistical information, that is for compiling an inventory of outdoor recreation resources, is fundamental to the supply of these resources since this indicates the degree to which opportunity for recreation is available to the public. Public areas designated for outdoor recreation form 0.25% (1991.2 acres) of the total land area of the study region. Hundreds of other acres of both public and private lands have been used for recreation but this apparent abundance in many ways fails to provide an adequate supply of outdoor recreation opportunities to the public. The problem is not merely one of acres but also one of effective acres - acres of land and water available to the public and usable for specific types of recreation.

This chapter presents an inventory of public recreation resources; and, the possibility of enlarging this supply base by outlining the types of 'available supply' that exist in the region. It also includes a discussion on and a proposal for a central agency catering for outdoor recreation needs.

3.1 Inventory : Supply (numbers) and Opportunity

The inventory to be undertaken here is concerned not simply with supply (that is, numbers) but also with opportunity. This implies that consideration must be given to limitations placed upon the use of facilities, such as location and management. The opportunity to utilise these facilities is determined by the kinds and severity of restrictions imposed by these factors. It is in these kinds of situations that the concept of opportunity is so much more meaningful than simply the concept of supply.

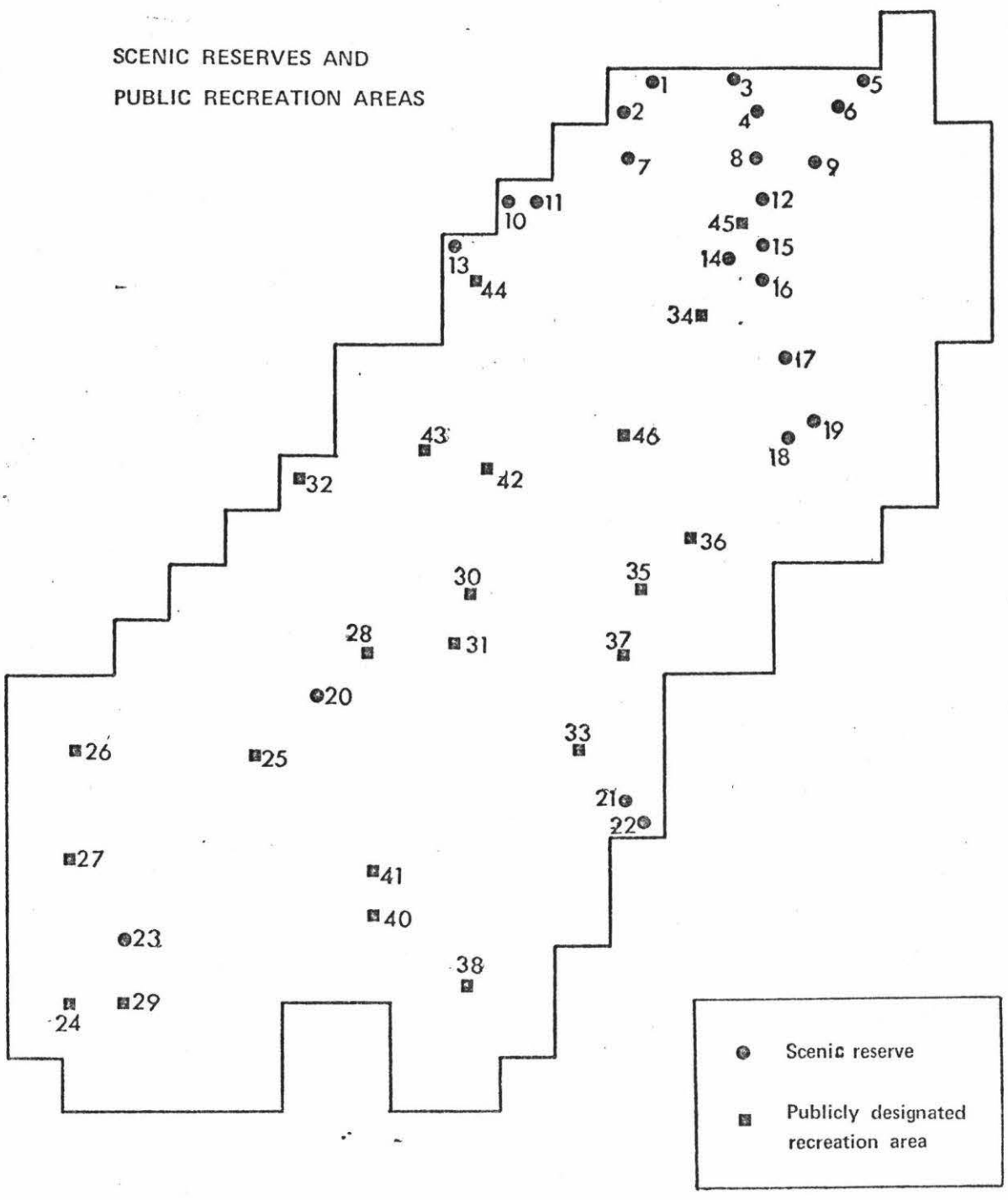
Supply indicates merely the number and size of facilities that are provided for; the extent of effective use of these are however, not always known.

The total supply of public recreation acreage which is to be considered within the region comprises all the recreation acreages designated as public recreation areas by the territorial district planning schemes, including also the acreages contributed by all existing scenic reserves within the region. While these scenic reserves are administered by the Crown, their inclusion into the territorial and regional supply system is justified as the recreational use made of some of these areas (e.g. Dress Circle; Round Bush) is quite considerable. Data or information on the 'opportunity level' of most of the areas, however, is not available and because of this reason the supply of these resources can only be described quantitatively. The necessary information for recreational opportunity was available only for those publicly owned recreational areas where the main source of information was sketchily available from local body officials,[1] the rest of the information has to be filled in from interviews of private citizens and fieldwork during 'peak periods'. It is out of necessity thus that the inventory of recreation opportunity applies only to those areas as designated in the planning schemes.

3.2 Supply : Scenic Reserves

Crown administered scenic reserves form a very important part of the existing supply of recreation acreage in the Manawatu since these 23 reserves make up 75% (5,060 acres) of the total recreation acreage. These reserves are areas of preserved native bush used either as wildlife sanctuaries

Outdoor Recreation Resources



The assigned numbers refer to
the names of the resources mentioned in the code

Figure 14

NCY

(e.g. Simpsom Reserve), scenic amenities (e.g. Dress Circle) or outdoor grounds for the very informal recreational pursuits such

Table X : The Supply of Scenic Reserves

SCENIC RESERVES	SIZE			DESCRIPTION	LOCATION ON MAP
Hautapu	23	0	0	Situated on Rangitikei River, bush covered with Matai, Totara and other species.	1
Mangaweka	182	0	32	Attractive bush and scrub	2
Galbraith	15	0	0	Characteristic bush of district	3
Titirangi	74	2	0	Fine example of native bush of district - esteemed as a bird sanctuary	4
Rangitane	90	1		Fair bush	5
Kawhatau	411	3	20	Attractive bush, subject to stock trespass	6
Kahu	21	2	16	Bush clad 'papa' cliffs fronting the Rangitikei River	7
Dress Circle	162	3	4	Finest scenic attraction in the region. Native bush and bird life	8
Auputa	63	2		Good stand of Rimu	9
Makohine	65	0	12	Good bush consisting mainly of two deep faces on both sides of the Makohine stream can be seen from the Makohine Viaduct	10
Ohingaiti	114	3		Heavy bush	11
C.T. Pemberton Memorial	12	2	33	Rimu trees	12
Simpson's	89	3	21	Attractive area of good bush valuable as a picnic area and bird sanctuary	13
Rangiwahia	205	2		Fair to poor native bush and shrub	14

Mangoira	63	3	10	Fair native bush and shrub	15
Apiti	78	2	35	Fair quality bush	16
Makiekie	105	2		Public picnicking at junction of Coal Creek and Horopitio Stream	17
Pohangina Valley	434	1	6	Attractive heavy bush in river valley	18
Pakoku	97	1	25	Only fair bush	19
Awahuri	15	1	30	Mixed native bush	20
Ballance Gorge	387	3		Bush covered slopes	21
Te-Ara Pokapu	71			Poor stand of bush but reservation should continue to prevent further erosion	22
Round Bush	2283	0	11	A readily accessible area containing a good selection of native trees, shrubs and climbers. Notable as the only area of bush along the coast near the Manawatu River mouth	23

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as camping and picnicking (e.g. Totara Reserve). Where once there was an abundance of native bush prior to European settlement, the continued economic demand of a modern economy on space and fertile land has since left a fragmented and meagre inheritance of only 5,169 acres of Crown administered scenic reserves of native bush in the region. Cumberland (1971 : 18) speaks of the misfortune of the New Zealand bush :

"For generations the New Zealand bush was the Polynesian's principal resource and source of livelihood but to the European it was a weed, a nuisance, an obstacle, a foe to be vanguished, something growing and occupying land where it was not wanted. And so the face of the North Island was rudely transformed."

When compared with the national figure, what is left of

native bush in the Manawatu constitutes only 0.8% of the national heritage (Town and Countryside 1970 : 2 : 2 : 24). The majority of the region's scenic reserves are to be found in the north along rivers. The biggest single piece of scenic bush the region has, comes to just above 2,000 acres (i.e. Round Bush), the rest are all relatively small in size. The spatial distribution of these resources has been provided in Figure 14 and Table X and describes the size and nature of these areas.

Native bush is becoming a comparatively very scarce resource and it is very essential thereby to be aware that any conservation practice for these areas must be the effort to preserve these areas in their natural state.

Recreation Opportunity :

3.3 A Classification

Burton (1971) expresses the important role of 'opportunity' in the classification of recreation facilities : "the classification of recreation facilities should be directly related to the classification of demands. That is to say, a categorisation of supply is only useful if it is related to a demand which it is capable of satisfying : which is merely another way of saying that we shall classify opportunity rather than supply" (Burton 1971 : 243 - 244). He also points out that location of facility and available recreation time are the two most critical factors in determining 'opportunity'. The need to subdivide these two factors is also recognised, before any 'opportunity' can be established. As a result, location is subdivided into the maximum time[2] and distance from the locality, while available recreation time is divided into five broad categories of, very

short periods up to an hour; a half day; a full day; periods of a few days; and annual holidays. The identification of these subdivisions has made it possible to construct an overall classification ; locality; neighbourhood; district; town/city; regional; and national.[3]

3.4 An Inventory of Recreation Opportunity

An inventory of 'recreation opportunity' in the Manawatu has been compiled according to the system of classification proposed by Burton. The size and general characteristics of recreation facilities in the region are such that opportunity levels could only exist within the divisions of the locality, the district and the region. Since the interest here is with informal outdoor recreation in the countryside the inventory has been made on all non-organised sports, non-urban, public recreation areas as defined by the District Schemes. A central reason for the inventory to be limited to only these resources is because availability to data on these areas is possible and much easier than it would be if all other recreation facilities were included. To collect data which relates to 'opportunity' on all other (public and private) areas would involve a full scale formal postal survey, circulated to households, clubs, and organisations about the levels of 'opportunities' that they made available to the public and to exclusive groups. The scale of costs, time and labour that would have been required, needless to say prohibits such an exercise. While accessibility to data is a major consideration in making the inventory on designated public recreation areas, the information obtained from these data, serves a very important objective - they give a basic picture of the

kinds of 'opportunities' made available to the general public by the respective territorial councils and the region as a whole. It is however, necessary to note that other public recreation environments are mainly defined along catchment areas and the nature and use of these shall be treated elsewhere.

3.5 Public Outdoor Recreation Areas

A feature common to most of these areas is that they are mostly reserves (including domains) and that the characteristics of their sites determine to a very large degree the types of activities sought in these areas. With the natural setting either in native bush or rivers, picnicking and a general day-out in the countryside are common and popular expressions of recreational persuits by visitors to these areas.

The opportunity level exhibited by these areas, although largely determined by the time-distance constraint, is also a function of the inherent quality of these areas. As a result, larger and more popular sites with their greater range of facilities

Table XI : An Inventory of recreation opportunity on publicly designated recreation areas

OPPORTUNITY LEVEL	FACILITIES	SIZE (ACRES)	COUNTY
Local District	Armadale Reserve	15½	Oroua
Local	Menzies Ford	1	Oroua
Local	Onepuhi Reserve	5	Oroua
Local District	Ashurst Domain	73	Oroua
Local District	Apiti Domain	35	Pohangina
Local District	Pohangina Domain	19	Pohangina
Region	Totara Reserve	833	Pohangina
District Region	Raumai		Pohangina

Table XI Continued

OPPORTUNITY LEVEL	FACILITIES	SIZE (ACRES)	COUNTY
District	Kahuterawa Reserve	11	Kairanga
Local District	Bledisloe Park	22	Kairanga
Local	Linton Domain	4	Kairanga
Local	Longburn Plantation	0.7	Kairanga
Local District	C.L. Pemberton Memorial Reserve	12½	Kiwitea
Local District	Mangoira Gorge Scenic Reserve	77	Kiwitea
Regional	Dress Circle	162	Kiwitea
Local	Beaconsfield Domain	2	Kiwitea
Local	Dunolly Domain	2	Kiwitea
Regional	Putai Ngahere (Vinegar Hill)	77	Kiwitea
Local	Rangiwahia Domain	9	Kiwitea
Local	Kimbolten Domain	17	Kiwitea
Local District Regional	Foxton River Mouth Reserve	4	Manawatu
Local District	Foxton Environs Public Park	326	Manawatu
Local District Regional	Foxton Beach Recreation Reserve Park	30	Manawatu
Local District	Tangiomoana Domain Reserve	10	Manawatu
District Regional	Motor Camp Park Tangionoana	1½	Manawatu
Local	Tangimoana Recreation Reserve	2½	Manawatu
Local District	Himatangi Beach Recreation Reserve	2	Manawatu
Local District Regional	Kaikokopu Stream Reserve	14½	Manawatu
Local District	Kowhai Park	9	Manawatu

as amenity factors (e.g. Foxton Beach and Totara Reserve) do attract longer periods of stay and most of these command the highest opportunity level, that is, regional. There are, however, only nine sites that fall within the regional category, and this reflects very much the lack of interest by territorial authorities in conceiving and providing for the needs of outdoor recreation on a regional basis. At the local level, the same apathy is prevalent when territorial recreation density and recreation land ratio are considered. Table XI provides an inventory of recreation opportunity in the Manawatu.

3.6 Recreation Density and Recreation land ration

Spatially most of these sites are situated within a radius of the day-trip zone (30 mile distance) from the major urban centres of Palmerston North and Feilding, and this is a zone that contains an "available population" of at least 105,000 people (refer Figure 12). However, the total recreation acreages in these counties are minimal in terms of the existing land areas by county, or on a regional total, and by the population of the respective counties. Recreational acreages only constitute 0.25% of the total 801,920 acres of land which comprise the region. Recreation acreage as a percentage of county land area does not exceed more than 0.6% in any one of these counties (Table XII). Pohangina County has allocated the most land for recreation considering the size of the county itself. Recreation acreage here is 0.54% (887 acres) of its total land area. The most 'deprived' county is Oroua which has only 0.08% (94.5 acres) of its land designated as public recreation areas. The ratio of recreation acreage to land area by county (and for the region as a whole) is far more satisfactory from the point of view of the

Table XII : Recreation acreage as percentage of total county land area

COUNTY	LAND AREA (ACRES)	(SQ MILES)	TOTAL RECREATION ACREAGE	RECREATION ACREAGE AS % OF LAND AREA
Oroua	121,600	190	94.5	0.08
Pohangina	165,760	259	887	0.54
Kairanga	115,200	180	37.7	0.03
Kiwitea	229,760	359	585.5	0.25
Manawatu	169,600	265	386.5	0.23
Regional	801,920	1253	1991.2	0.25

"Requirement of the Land Subdivision of Counties Act of 1946" where the claim is for 10% of the area to be set aside for reserves (Crawford 1970 : 28).

3.7 High Recreation Density

Palmerston North's density for Parks and Reserves[4] is used here for the purpose of comparison of recreation density in the absence of an established standard of what is often termed an 'acceptable density.' Parks and reserves for Palmerston North represent 33.19 acres per 1000 people, that is the density of 30.1 (persons to the acre) (Crawford 1970 : 27). The density for each county is calculated using a base population of 100,000. Two reasons have been offered for the use of this figure:

i) since the public recreation areas for each county are within the 30 mile zone where a population of at least 100,000 is available, and,

ii) the density based on 'available population' is realistic and tenable since recreation opportunities offered by most of the

more important recreation areas in the counties are at the district or the regional level, and that the recreation population is highly mobile.

The analysis of recreation density by county shows that even the 'least density' county is considered as having a comparatively and relatively high density. The comparison for density figures (by counties, Palmerston North's and De Chiara's standards) is provided in the following Table XIII.

Table XIII : Comparison of recreation densities

County	Recreation Density
Oroua	1052
Pohangina	113
Kairanga	2631
Manawatu	260
Kiwitea	171

Place	Standard Density
Palmerston North	30.1
Community Parks *	222
Regional Parks and reserves *	62.5
Picnicking Areas *	200

* Source : De Chiara, 'Planning Design Criteria' 1969 pg 203. The figures adjusted to include parking requirement of 1 acre per 1000.

High density in the Manawatu is attributed to the very insignificant proportion of land allocated for public recreation and to

the high ratio of population per acre of recreation land. The dangers associated with high density need not be over-stressed here. A high density, suffice to say, invariably leads to overcrowding which is detrimental to ecological conservation while inducing 'user - dissatisfaction.' A case for low density, that is, expanding the effective resource, is indisputable if a safe and economic level of conservation management and maximum 'user - satisfaction' are to be realised. The need for low density is perpetuated more so in the face of a growing demand for, and participation in outdoor recreation.[5] Of more importance in the area of optimum resource utilisation in the Manawatu, an expansion of recreation acreage invariably means the utilization of lands otherwise left idle and which have no benefit to society. Of particular relevance in this category are the Crown and Maori Lands, the land utilisation patterns of which are such that some large acreages (fragmented throughout the region) when they are used at all, are not fully utilised for any economic activity.

3.8 Crown Lands

There are at least 65,000 acres of Crown land in the region and this figure represents 8.2% of the national figure. The size of each unit of these lands varies markedly from as small as a 50 acre plot to as large as a 6,000 acre unit. The detailed figures for the distribution of these sizes have been provided in Table XIV and it can be seen that units of between 1001 - 3000 acres in size, contribute the most acreages to the total - these represent 39% of the total amount of Crown land in the region. Those that are below 100 acres in size, however, represent only 1.6%. In summary then, the table shows that fairly sizeable pieces of Crown land are available in the region and a

notable feature which emerges from the distribution of Crown lands (Figure 15) within the region is that the relatively larger units tend to be located in the upper portion of the region whilst the smaller units dot the lower portion.

3.9 Maori Land

The other important source of potential supply of recreation land is Maori land. Although adherents to the revival of 'Maoritanga' would object violently to any 'exploitation' of Maori land, leasing Maori country that is suitable for outdoor recreation is politically and culturally acceptable. This view has been reinforced by the then Honorary D. MacIntyre who said:

"Some Maori people are interested (in leasing their land) because it retains 'Whakapapa.' This land is still theirs. We can save these vital pieces of land now for our future generations" (New Zealand Countryside in 1980 Conference 1970 : 43).

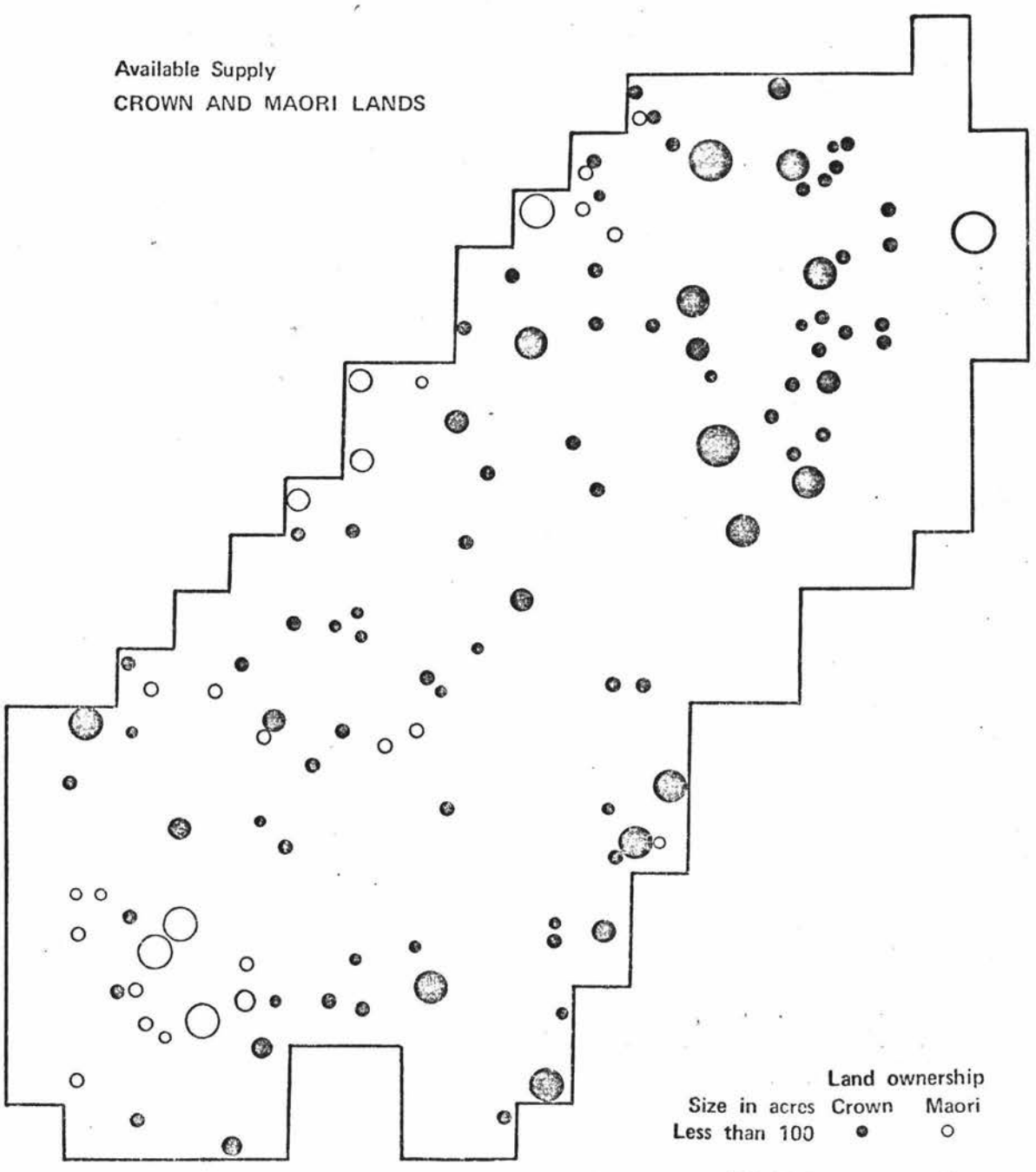
Land under Maori tenure in the region constitutes a total of at least 25,000 acres, representing 3.2% of the national total for Maori lands. The distribution of Maori land units is noted to be not as dispersed as the distribution of Crown lands : Maori lands are mainly located along the Rangitikei River with also some large pieces around the loop of the lower Manawatu River and the sand country adjacent to it. The distribution of land sizes (Table XIV) is quite similar to that of the Crown lands : the smaller sizes (i.e. 0 - 1000 acres) constitute a smaller majority than those above 1000 acres. A piece of Maori land worthy of attention here, is the 10,200 acre block located way up the remote extreme northern end of the Ruahine Ranges. Its size and location are qualities that satisfy the very basic requirements of region parks and camps.

TABLE XIV : AVAILABILITY OF CROWN AND MAORI LANDS IN THE MANAWATU

Size (Acreage)	Number of Acres	% of Regional Total Crown Land	Number of Acres	% of Regional Total Maori Land
Less than 100	1050	1.6	360	1.4
101 - 500	13,745	20.8	4,280	16.6
501 - 1000	11,905	18.0	2,650	10.3
1001 - 3000	25,700	39.0	8,270	32.1
3000 and above	13,600	20.6	10,200	39.6
TOTAL	66,000	% of National Total	25,760	% of National Total
		8.2%		3.2%

Outdoor Recreation Resource

Available Supply
CROWN AND MAORI LANDS



Source: Lands and Survey Department

Figure 15

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3.10 Comments

There is an abundance of available land (except coastal resources) to supplement the existing narrow resource base for public outdoor recreation. The total acreage from the earlier inventory of both Crown and Maori lands, accrued to at least 90,000 acres. Authorities designed to manage recreation resources should undertake a full investigation to determine the degree to which these lands can be made available for outdoor recreation purposes. Special considerations must be given to their size; topography; land use patterns; location; scenic quality and tenureship.

The inadequate available supply of coastal resources has just been hinted at. The existing recreation areas along the 9 mile coast are limited to those of Foxton Beach; Himatangi; and Tangimoana (a total of 64½ acres), while available supply for any further development of coastal recreation is limited to 1750 acres of Crown land north of Himatangi and 500 acres of Maori land around Lake Kaikokopu. Coastal recreation is an important part of the whole fabric of outdoor recreation in the Manawatu and any further development for both the present and future demand for coastal recreation might imply the need to acquire lands under private and State Forest tenureship.

A point worthy of note here is that the large majority of both Crown and Maori lands that are distributed throughout the region are within the 30 mile radius from the biggest urban centre, Palmerston North. Developments in any of these areas will imply an available market size and recreation trip typical of this zone. The distribution of both Crown and Maori lands, moreover,

is remarkably well located near existing popular sites; the purchase and development of these lands for recreation may provide new sources where pressures at peak periods at popular sites, can be syphoned off to. The possibility of "chains of recreation environs"[7] also exists in the patterns of the spatial arrangements of available Crown and Maori lands. These and other developments, however, require a central and efficient agency to manage and supervise the acquisition and development of new resources for the region as a whole.

3.11 A case for Regional Recreation and a Regional Agency

The need for a central organisation for outdoor recreation is made importunate in view of a growing national and regional demand for outdoor recreational pursuits and general incompetency involved with the multiplicity of local planning authorities 'catering' for outdoor recreation.

Local planning authorities in the Manawatu are too small to command sufficient resources, either by way of finance or trained staff, and rural local authorities suffer an added financial burden by having to cater for visitors from beyond their boundaries. Little thought, moreover, is given by any of them to the overall development of outdoor recreation throughout the region and there is at present no focal point for co-ordination of recreation policy, planning, programmes or management. These weaknesses and the implied duplication of finance and human efforts can only be omitted by adopting a regional approach to recreation planning : an organisation promoted on a regional basis can be most effective in executing a regional effort in outdoor recreation.[8] The political feasibility of maintaining such an organisation

and the concept of a 'region' is not only practical but wise and relevant to current government thinking. Since the inception of the Labour Government, New Zealand is envisaged to be split into twenty regions, and in recognition of the national leisure crisis Government has created the new Ministry of Recreation and Sport. It has been proposed that in each of the twenty regions there shall be a regional committee for recreation and sport. (Evening Standard).

3.12 Manawatu Regional Development Council

The nearest that the five territorial counties and other planning authorities came to grappling with problems associated with recreation on a regional level was through the Manawatu Regional Development Council (M.R.D.C.).[9] M.R.D.C. was conceived and borne in 1967 with a view to serving the region. Its main objective can best be described by Clause Seven of the constitution which rules that body.

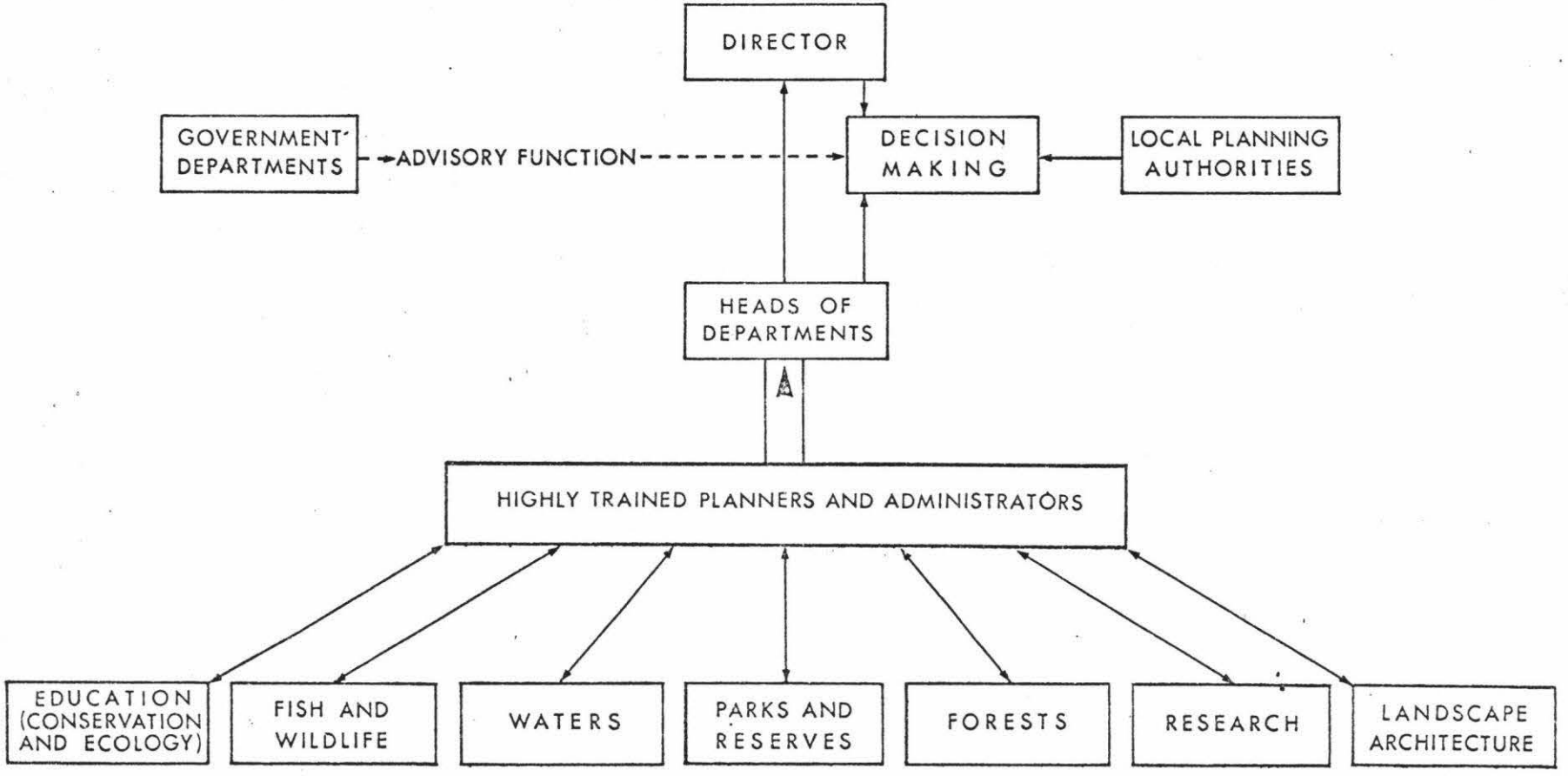
"The functions of the Council shall be to examine, and as far as it can, further and encourage any proposals for the advancement or well - being of the region or of any part of it."[10]

Consequent to the view and need of a regional basis for recreational planning, the Recreation Committee was appointed under the auspices of the M.R.D.C. The Committee circulated a letter to the various bodies comprising the M.R.D.C. on the 11th July 1969 requesting knowledge of their attitudes to the provision of recreational facilities on a regional basis. This principle was well affirmed by all but one Council (the Woodville County Council), hence the start of the existence of a Recreation Committee serving a region.

This committee however, is only an offshoot of a big machinery (M.R.D.C.) and not an autonomous agency; its structure and objectives do not make it a viable regional organisation for recreation development. The Committee is comprised of members seconded from the M.R.D.C., and the unimportance of it as an effective agency is demonstrated by the fact, (to quote the present secretary of the M.R.D.C.) "that it stopped functioning since 1969."[11] The personnel that constitutes the structure of the Committee is limited to political administrators who, in their full capacity act as "jurors" giving "verdicts' on any submitted proposals. A simultaneous function is to make recommendations or proposals for priority developments of recreation resources. The absolute necessity (and this is where it fails to be a workable agency) of committing itself to the multiple roles of supervisor, developer, manager, and researcher, is altogether missing. An independant, autonomous agency, fulfilling these roles would in many respects be more effective in focusing attention upon the importance of outdoor recreation and in obtaining public support for programmes. It would have advantages over the existing but defunct committee in co-ordinating the programmes of territorial submissions and would be in a favourable position to handle all delegated responsibilities ranging from the setting of goals to the administration of financial, technical and professional assistance. These arguments must hold in favour of establishing such an independant and autonomous agency for the Manawatu.

3.13 An Agency[12] - a proposal

The broad functions of this proposed agency is to



ORGANISATION OF A REGIONAL AGENCY

FIGURE 16

NCY

consider the needs of the peoples of the region for all phases of outdoor recreation and also to serve as a focal point for co-ordination of recreation policy, planning, programmes and management. Apart from these, ideally such an agency should also adopt these basic functions:

1. To stimulate, provide assistance to and co-ordinate related local authorities and private recreation programmes:

The role of the agency is to review and co-ordinate the various local authorities and private efforts in recreation programmes. It would not engage in the management of any lands, water or facilities which are under the jurisdiction of other agencies. A subordinate role is to stimulate and provide whatever assistance required by these planning bodies;

2. Encourage Regional Development of Recreation:

The agency is to act as the focal point for regional development of recreation and in this state would be in an excellent position to bring to the attention of local planning authorities opportunities for joint-action that would be to their common advantage;

3. Conduct Research:

The requirement of an effective research programme dealing with all aspects of outdoor recreation is most peremptory if optimum use of land and water resources is to be realised. Some of the important and pressing research required, such as a region-wide physical inventory and recreation survey should be undertaken and repeated periodically. The agency would also have authority to sponser research by qualified and interested institutions such as Massey University, the Agricultural Department and the like;

4. Administer financial assistance:

Providing adequate outdoor recreation opportunities will require investment of money and often the lack of this is the major drawback to any notable recreation development programmes in the study area. The proposed agency with its finance Government sponsered would be a source of finance in turn to local planning bodies and private organisations;

5. Its function is also to encourage inter-regional co-operation and liason with all government departments.

3.14 Composition of the Agency

It is envisaged by the author that the agency should be guided by a director whose responsibility it is to direct, and liase his agency with other regional agencies and with central government. Under his directorship shall be a team of highly trained planning and administrative staff - the personnel that would be considered for this team has been graphically presented in Figure 16, and the incorporation of local authorities here is relevant and important. The basic idea of assigning membership to these authorities within the agency, apart from being an act of appreciation for their co-operation in constituting a workable region, is to stimulate closer association and liason amongst themselves and with the agency, for the well-being of the region. The inclusion of local body membership within the agency, is also to preserve the "rights of objection" of any of the local bodies in any case where they are of the opinion that a proposed plan might be injurious, rather than a step towards promoting the well-being of the local territory concerned or the region as a whole. The 'sitting-in'

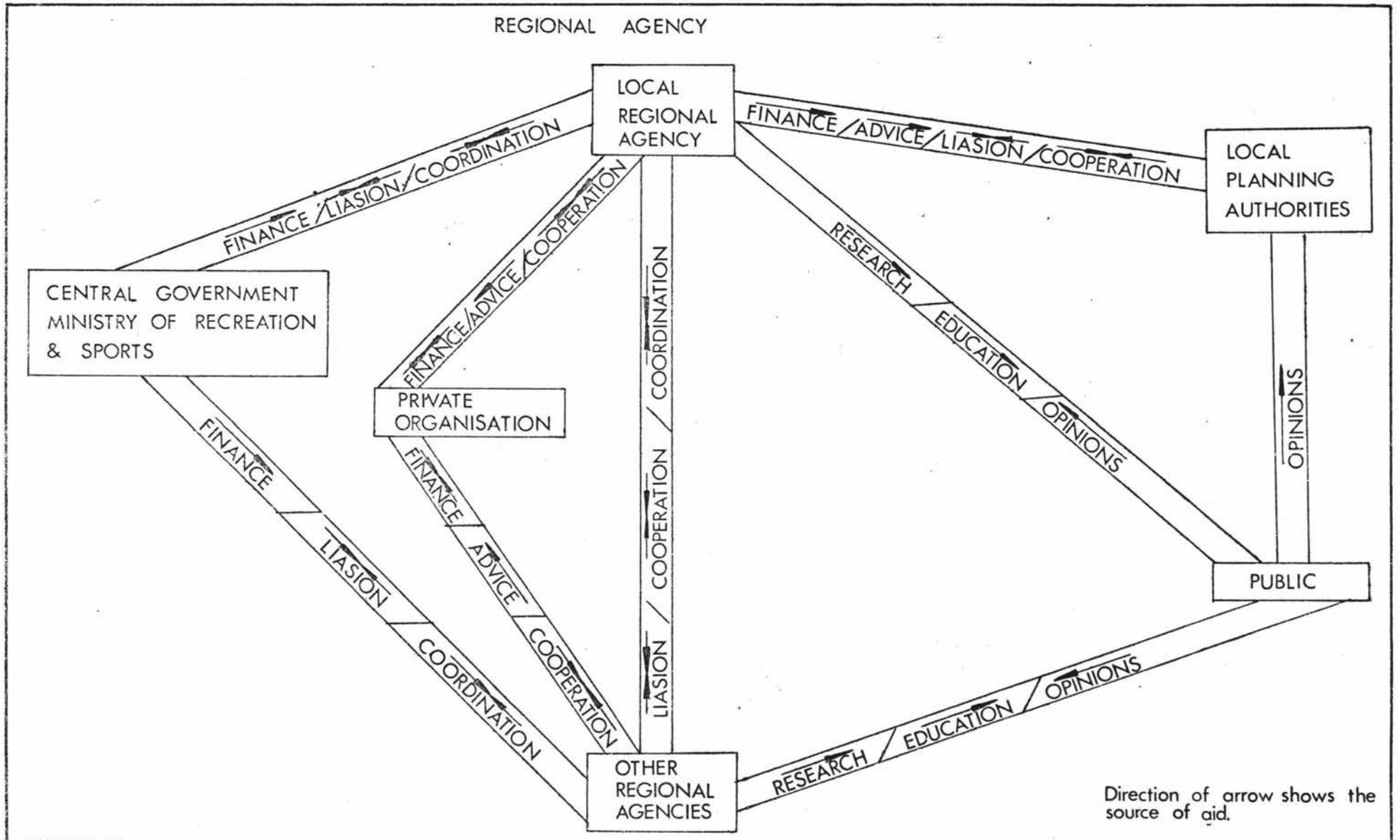


FIGURE 17

A Schematic Representation : RELATIONSHIP TO OTHER ORGANISATIONS

of governmental departments operates only at an advisory level to safeguard possible conflicts between land-use systems and regional recreational plans.

3.15 The Role of the Agency

As is schematically represented (Figure 17), the agency plays the ideal triple roles of arbitrator co-ordinator and manager-financier for the region that it represents. The agency is not independant of others, on the contrary, it must maintain a dynamic relationship with other regions, private organisations, local planning authorities, central government, and the general public, to ensure optimum results in its planning, the use of resources and meeting human needs.

3.16 Summary and Recommendations

Several salient points emerge from the preceeding task of inventorising existing outdoor recreation resources in the Manawatu. The first of these is that provisions for outdoor recreation are negligible : recreation acreages are low, opportunities limited, and recreation densities consequently high. There exist, moreover, very few acres of public coastal recreation resources. Such conditions reflect the lack of interest and emphasis placed on outdoor recreation planning by the respective territorial planning authorities.

A second point which emerges is that there is an abundance of 'available land' (Maori and Crown lands) which can be effectively tapped for recreation purposes under proper management.

The need for a regional basis in planning is also noted - the trend is for regionalism, as evident in the thinking

of the present government. The inherent economics of scale derived from regionalism, from the point of view of outdoor recreation planning are most favourable and advantageous in comparison to the existing mode of organisation under nucleated planning units.

Consequential to these emerging points the following recommendations have been submitted:

1. An autonomous regional agency should be instated with a view to inject an awareness into the planning bodies and the public, of the importance attached to planning for outdoor recreation; and to promote and plan for recreation where necessary on a regional basis.

2. This and other points concerned the immediate tasks of the agency : a full inventory of opportunities of existing recreation facilities for outdoor purposes, in the region, should be undertaken immediately.

3. A detailed regional survey on the trends and demands for outdoor recreation is a fundamental requirement as an indicator as to how, when and where, resources should be allocated.

4. There is also the need for the agency to determine what reserve areas are of national, regional or local significance together with the task of ensuring that adequate reserves are set aside on the coast and river banks.

5. And last but not the least, the agency's task is also to set up an education programme on the wise use and conservation of the countryside resources. After all there is only one earth.

NOTES:

1. Conversations with the territorial planning offices suggested that planning for recreational provisions has not been a priority policy for most of these offices.

2. The operative figure will depend, of course, on the modes of transport.

3. Although six classifications were used by Burton, he did not define the areal boundaries of these. The opportunity levels of recreation facilities in the study area occurred only at the locality, district and region. The boundaries of these levels have been defined as follows:

Locality : this is the local area which covers a radius of about 15 miles from the centre of the facilities.

District : the boundary of this is that of the county's boundary including also the immediate adjoining areas.

Region : this is defined by the outer boundary formed by the total area of the five counties of the study area, and including the immediate areas adjacent to the regional boundary.

4. This figure is applicable since public recreation areas in the counties are mainly of reserves and domains.

5. The O.R.R.R.C.'s (1962) results indicated a 58% increase in demand for outdoor recreation alone by 1976 in ten years time, and a 300% increase in the next 33 years.

6. All lands owned by the Crown excluding those designated

as lands for public uses, reserves and state forests.

7. The writer takes this to mean a group of recreation areas offering different facilities and these as a unit act as a 'region' in which facilities, to a user can be horizontally, vertically or haphazardly advantageous.

8. Recreation planning and its administration may be seen as basically a 'high order' service dependant upon a large market area and having a relatively far reaching range. Present bodies which endeavour to meet such functions however merely extend a 'low order' or localized and thus 'specific' service. The apparent advantage of an agency on a 'high order' basis is that it can envisage a total developmental and thus co-ordinated plan, taking into account total resource stock.

9. The M.R.D.C. is nothing but an interim measure for regional development, the 'region' consisting of interested local authorities of Kairanga, Dannevirke, Pahiatua, Oroua, Kiwitea, Pohangina and Manawatu Counties; the Palmerston North City Council; the Feilding, Foxton, Dannevirke boroughs; the Manawatu - Oroua Electric Power Board; and, the Ministry of Works.

"Apart from getting the neighbours to talk together and to look over the fences to see what is happening over the other sides, the M.R.C.D. was proposed out of the primary concern that recreation planning be carried out on a regional basis" - Interview with Mr I.C. Lovell secretary for the M.R.D.C. - 7th May 1973.

10. Clause Seven of the Constitution ruling M.R.D.C.

11. Interview with Mr I.C. Lovell, secretary for the M.R.D.C. - 7th May 1973.

12. A national bureau for outdoor recreation has been recommended by the O.R.R.R.C. and broad principles for that bureau can and have been applied here as proposed guidelines in setting up an agency in the Manawatu.

Chapter 4

THE MANAWATU WATER RECREATION ENVIRONMENTS

PART ONE

4.0 Introduction

Though the importance of water varies from century to century as man adapts his way of life to the environment, it has maintained continuing dual roles for domestic and economic uses to the present time. During the latter half of the twentieth century, however, two further uses are becoming prominent : the use of water, firstly for recreation and secondly for visual amenity - just sitting beside a wide expanse of water or "watching the tides roll in."

The results of the Outdoor Recreation Resources Review Commission showed that 44% of the American people have an inclination to spend their leisure in water-based recreational activities like swimming, sailing, fishing, canoeing or merely enjoying the more passive activities of picnicking or sitting beside water (O.R.R.R.C. 1962). The British survey indicated a similar importance of water in the developing pattern of British outdoor leisure life (British Tourist Association 1966 Recreation Survey). In New Zealand the Orewa (Turbott) and Palmerston North (Crawford 1969) studies revealed an outdoor recreation pattern similar to that of the O.R.R.R.C. These results are significant not only to the use made of and pressure exerted upon water recreation resources but also to developmental and planning policies for water recreation.

Water bodies for recreational purposes, in the Manawatu, are in the forms of lakes, rivers and the coasts (the seas and

the shores). The levels of use and types of activities that these bodies support reflect both the 'inherent' and 'external' parametric qualities of these water bodies. 'Inherent parameters' are those of size (including depth); water velocity; marine life and visual quality, whilst accessibility; distance to and knowledge of place; land ownership types; pollution and availability of general facilities are normally described as 'external parameters.'

The situation with regard to these parametric features, insofar as they affect leisure seekers, varies very little on the types of water bodies in the study area. Pollution, the lack of accessibility and knowledge of the place, inter alia, are three constraints most common to most of the water environments in this area. The presence of these constraints represents a loss of effective resources. The removal or careful manipulation of these constraints through conscious planning can result in a more widely distributed and more diversified resource base.

Part I of this chapter examines the extent of the use made of river, lake and coastal resources for outdoor recreation; and the constraints common to these resources. Several plans to develop the water resources for further recreational use have been proposed by statutory and private planning bodies and these plans are provided under the section "proposed plans". Part II focuses on a preliminary study of Foxton Beach for recreation, the problems associated with it and possible future development of its beach area.

The present use of water-based recreation resources

4.1 The river systems for recreation

The Kiwitea; Oroua; Pohangina and the Manawatu, are the major rivers that form the drainage system of the Manawatu region. Cutting through a variety of landscapes, (e.g. the rolling and hill countries in the north; the agricultural plains occupying the southern extent; the Ruahine Ranges flanking the east and interspersed by existing river terraces) these rivers contribute a major share to the scenic quality of the region, while also providing a major resource for water-based outdoor recreation. For the latter function, they support a variety of activities, popular among these being fishing, picnicking and swimming. Jet boating and non-powered boating are limited to the saline parts of the Manawatu river mouth at Foxton Beach and to the area at Whirokino (Plate 3). Canoeing centers mainly around the Hokowhitu Lagoon with the use of the rivers being very irregular.

4.2 Popular recreational activities

(a) Angling

Brown and rainbow trout and to a lesser extent finch are popular anglers fish found in these rivers. Faced with a diminishing water resource and with a water pollution problem, only parts of these rivers are suitable for angling. The popular fishing grounds are:

(i) the Manawatu River downstream from the Ngawapurua Bridge,

(ii) the Oroua River above Feilding,

(iii) the Manawatu River above Palmerston North,

(iv) the whole extent of the Kahuterawa stream and

(v) the Pohangina River.

A major problem facing the Wellington Acclimatisation Society regarding fishery management in these rivers is water pollution. Farm and industrial discharges have caused, in parts of these rivers, discolouration of water, siltation of river beds, weed and thick fungal growths, reduction in dissolved oxygen and modifications to bottom fauna and fish habitats. These parts of the rivers have been reported as polluted:

(i) the Pohangina River from above Komako to the Manawatu where pollution consists of farm discharges,

(ii) the Oroua River from Feilding to the Manawatu is polluted by industrial discharges from Borthwicks; effluent from freezing works and woolscour; and farm discharges from the Rangiotu area,

(iii) the Manawatu River from Ashurst to the river mouth is polluted mainly by fertilizer run-off, factory and industrial effluents, Longburn freezing works discharges; flax mill refuse and domestic wastes.

(b) Water-fowl shooting

This is another popular leisure-time activity which is pursued along the river beds in the study area. Water-fowl, pheasants and Californian quail are the species usually hunted. Although there are no statistics regarding shooting at these vis-a-vis cites, analysis from shooting diaries in the Manawatu area showed that of all shooting area types, ponds were frequented by 65% of the hunters, rivers by 48%, lakes by 20%, paddocks by 6% and swamps by 1%. 38% of all pheasant shooters hunted on river

beds (Wellington Acclimatisation Society report 1968-1970).

(c) Picnicking and Swimming

Apart from the rivers being used for angling and fowl shooting, picnicking and swimming are also popular activities. Swimming in these rivers is not an organised activity and is usually co-dominant with picnicking.

There are more than fifteen picnic sites along the river systems, some with only a local appeal (partially because of proximity and partially because of localised knowledge of their existence), while some, because of suitable parameters serve a much wider area. Of all the existing sites only eight are listed within the latter category. (Automobile Association). These are:

1. Totara Reserve.
2. Raumai Recreation Reserve.
3. Dress Circle.
4. Putai Ngahere.
5. Kahuterawa Stream.
6. London's Ford.
7. Menzies Ford.
8. Coulter's Ford.

Totara Reserve

This comprises 823 acres of land on the banks of the Pohangina River and is the largest riverside reserve in the Manawatu area. The most developed part of the site is the area near the confluence of the Pohangina River and Coral Creek. The southern part of this area is open ground with a swimming hole and a concrete barbecue facility. Toilets, swings, see-saws, a round-about, a servery building and rubbish drums are found on the

northern portion. The Y.M.C.A. maintains a camping ground within the reserve. Damage caused by river flooding is a serious problem to parts of the domain.

Raumai ("Quivering of the Spear")

The area at the Raumai Bridge (13½ miles from Palmerston North) is a popular picnic site on the banks of the Pohangina River where swimming is enjoyed on summer weekends, but public facilities are limited only to a few rubbish drums. The Palmerston North City Council has recently forwarded a bold plan for developing Raumai (Figure 22) which includes effective landscaping and the provision of playgrounds; toilets and a look out situation.

Dress Circle

This delightful picnic area is situated four and a half miles north of Rangiwahia, with an entrance from Kelpie Road. The picnic area is at the foot of an attractive waterfall and the unusual 'papa' formation surrounding the area has given it a natural ampitheatre. With the exception of a broad strip of open grass on the west bank of the river, the area is surrounded by natural bush. No facilities have been provided.

Putai Ngahere

Commonly known as 'Vingegar Hill' this picnic site is on the east bank of the Rangitikei River inside the Kiwitea County boundary. Visible from the driveway through the native bush that surrounds the entrance to the picnic area is a specimen of a large totara tree, estimated to be over 250 years old. Public facilities consist of one toilet, a pair of swings, two concrete barbecue stands a water tap and both male and female changing sheds.

Kahuterawa Stream

The Lions Club of Palmerston North has partially developed a small area of reserve along this stream. The waters here are shallow and thus are not very suitable for swimming, and no public facilities are provided. A cattle stop and a stone post entrance are the only provisions.

London's Ford

About two miles north of Kimbolton and situated on the banks of the Oroua River is a sheltered picnic area fringed by native bush. Although the river is good for swimming here, no facilities are provided.

Coulter's Ford

Like London's Ford, this area has not been developed at all, although the site is very suitable for swimming. The area is at present occupied by willow and other plant growth.

Menzies Ford

This is another popular picnic site on the Oroua River where good swimming is available. Regrassing and levelling of the picnic banks have been recently undertaken by the Oroua County Council.

4.3

Field observations of these areas confirmed the belief that recreation pursuits such as picnicking, camping and swimming at these recreation areas are of a 'destination type' activity; which implies planned or group trips with family or friends. In the more popular areas (e.g. Raumai, Totara Reserve, Putai Ngahere and Dress Circle) these characteristics are very important and must serve as planning guide lines in, the development of facilities. The development of facilities is not to frustrate but

to anticipate group needs where convenience, safety and user-satisfaction can be capitalised on, also serving as a means of grouping users together, in places designed to accommodate them. The effect of this is that it allows centralisation of 'wear and tear', consolidates the rubbish and reduces the areal extent of pollution.

The traditional concept of facility as merely a provision has to give way to a more dynamic concept whereby facilities must be treated as part of the whole infrastructure machinery which is viable and workable for recreation.

The facilities in most of the picnic sites are few and poorly maintained. Five out of eight sites do not have any forms of public facilities (e.g. Raumai, Vinegar Hill, London's Ford, Coulter's Ford, and Menzies Ford), only Totara Reserve being adequately endowed. It is remarkable that a scenic and popular place such as Raumai has no developed facilities and it was not until very recently that a plan which incorporates public facilities was envisaged. One important aspect of the infrastructure overlooked however in this plan and also in the other seven sites is controlled parking. Random parking, the present practice in all these areas arises out of either of these two elements:

1. Non-development of these areas or,
2. Satisfaction of the needs of picnickers.

Overseas studies support the claim that outdoor leisure seekers tend to stay near their cars. Wager conducted the following results :

Table XV Habits of Outdoor Recreationalists in Britian

ACTIVITY	% OF VISITORS	% OF VISITORS IN GROUPED ACTIVITIES
Sitting in a car	26	46
Sitting or picnicking near a car	20	
Sitting or picnicking away from car	6	56
Walking	20	
Pottering or strolling	7	
Playing family games	9	
Others	12	
Total	100	100

Source : Wager J. 1967 Outdoor Recreation on Common Land Town Planning Institute Journal pg 393 - 403

Assuming that these results are applicable to local conditions, the planning of an organised hierarchy of parking lots in relation to the different needs of picnickers is important. Three reasons are forwarded for this contention:

1. It is a feature of Wagers study that picnickers are grouped into two broad categories; those that picnic in or near their cars; and those that picnic or leisure away from their cars, therefore parking lots can also be categorised accordingly. Parking lots close to visual amenities (like near waters) can be provided for the former group for they usually seek a visual rather than a physical contact. Parking amenities for the latter group can be arranged near sources of activities and these car lots must be designed to blend in with the surrounding environment.

2. Arranged car parks reduce 'wear and tear' to localised spots. A directed car movement to specific parking sites ensure a greater amount of safety to wandering children, and,

3. Carefully designed parking lots (i.e. camouflaged by nature) enhance rather than interfere with the natural beauty of an area. There is nothing more distressing than to experience an open clearing in a natural bush area, capped with iron roofs. Dress Circle and Raumai were robbed of their natural beauty during peak periods because of such exposure.

4.4 Factors limiting the use of the rivers

It is evident from the preceeding discussion on the use of the rivers that only a very small proportion of the total length of the rivers are effectively used for recreation purposes. This is due, in part, to conservation needs and to the presence of constraints that limit opportunities for a more extensive use. The constraints most common to these rivers are presented in the forms of poor knowledge of the area; access difficulties; and water pollution.

(a) Lack of knowledge

The lack of knowledge of the existence of existing and potential recreation areas invariably means that the use of these areas is confined to an exclusive group of people who know of their existence, and also the non-use of other potential areas. While density of use may be very light consequent to exclusive knowledge of that area, overcrowding and competing demand of facilities may be generated in popularly known ones. This imbalance of use was evident over the last summer period between Mangaweka camp known only to very few people and the very popular Totara Reserve.

The lack of knowledge of recreation areas in the study area is a consequence of the virtual non-existence of publicity.

It seems that territorial planning authorities do not hold any real interest in or attach any importance to the satisfaction of outdoor recreation needs and the non-existence of publicity is an unfortunate consequence of it. Whatever publicity there is is undertaken chiefly by the Automobile Association where information is the priviledge of members only, and to a negligible extent, periodically by the Department of Lands and Surveys. Informal publicity by word of mouth from experienced users to other users seems to be the operative mode.

Lack of knowledge of potential areas brought about by the absence of surveys also contributes to the present level of use of these rivers. The other two constraints of lack of accessibility and pollution of waters that aggravate the present resource utilisation situation are discussed in the following paragraph.

(b) Lack of accessibility

With the expected increase in importance of informal outdoor recreation and where the expected trend is for water oriented activities, the question of access along the rivers of the Manawatu is likely to be of critical importance. De facto public access to these rivers is represented by forty - five vehicular and foot tracks spreading over an accumulated distance of 280 miles of riverscape. Some tracts of these rivers are well provided with access while others are relatively inaccessible. Should resources be suitable for outdoor activities in the latter case, inaccessibility will represent a loss of recreation opportunities on these tracts.

Literature on the important role of accessibility as a

linkage between resources and users; and how the lack of it becomes a constraint to resource utilisation has been widely written. No attempts, however, have been made to describe "an acceptable standard of physical accessibility" for analytical and comparative purposes. The proceeding analytical tool is an attempt to fill this gap; and provide a basic means to describe coherently and meaning - fully the comparative levels of accessibility along the rivers that drain the study area. The analytical tool conceived in this attempt is the "Accessibility Index (AI)" which describes the comparative levels of accessibility of the various tracts of a river. (The A.I. of a tract of a river can be expressed as follows:

$$A.I._{(i)} = \frac{Y_{(i)}/x \text{ miles}}{1/x \text{ miles}}$$

where A.I. is the accessibility index of a particular tract (i) of the river; $Y_{(i)}$ is the number of accessibility points for that tract (i) of the river; and x, the constant, is the length of the tract derived from the "average accessibility index (A.A.I.)" of the river. The A.A.I. which is represented as one access point per x miles (i.e. 1/x miles) is calculated by dividing the total length of a river by its total number of access points.

In the analysis of the A.I. a value of one, that is one access point per tract of river is employed as the criterion for minimum accessibility. It follows from this then that a tract that fails to have any access points shall be regarded as lacking in accessibility or non-accessible while an accessible tract must have one or more accessible points, that is, its A.I., must be a

value of 1 or more. The results of the A.A.I. and A.I. have been provided in Tables XVI and XVII respectively. The A.A.I. shows the extent to which a river is accessible, for example in the case of the Manawatu it is five miles per access point. It is not always the case however, that this figure means that an access is located at every fifth mile. In fact, an examination of the A.I. the access points are shown to be unevenly distributed. The A.I. while allowing accessibility between tracts to be compared also provide a basic picture of the spatial distribution and location of the access points, (Figure 18). The A.A.I. is important in so far as the general level of accessibility between rivers or of a river is being examined. Table XVI summarises their comparative levels of accessibility with the Kawhatau as the most accessible river, with an index of three miles per accessible point. The access points for the other rivers are, theoretically, placed further apart.

On examination of the A.I. the spatial locations of these access points suggest two spatial tendancies : nodal and linear clustering of access points on the river tracts. A tendancy to cluster nodally within a distance of one or two tracts of access points is suggested in at least two rivers (i.e. the Rangitikei River at 03;08;10; and the Oroua River at 06;08), while linear clustering - the distinct regions of longitudinal arrangements of accessible tracts vis-a-vis non accessible tracts - is indicated between 04 to 07 and 08 to 11 of the Rangitikei River, and less distinctly between 02 to 06 of the Oroua River and 03 to 04 of the Pohangina. The Manawatu River is more linearly spread in its access points. Looking from the point of

view of the locations of these access points it appears to be relatively easily accessible, with the only occasion of nodal clustering at 02.

The results of the A.A.I. and the A.I. suggest that while there are access points these are not sufficient to generate a potentially wider opportunity for outdoor recreation in these rivers. In fact it could be said that there has been an attrition of river resources by access restriction, for one has to, theoretically, travel six and half miles along the Rangitikei and five miles along the Manawatu River before an access point is reached. In one part of the Rangitikei River there is in fact a distance of at least twenty-six miles of inaccessible river (between 03 and 08). The A.I. (Figure 18) also points to a generally wide spacing between access points in some of the tracts of these rivers when in-between spaces are not accessible. Notable among these are : 05 to 06; and 08 to 09 on the Manawatu; 01 to 03 on the Pohangina; 02 to 03 and 06 to 08 on the Oroua; 01 to 03; 03 to 08 and 10 to 11 on the Rangitikei River.

These results indicate a general lack of accessibility in these rivers and the need to provide more accessibility is important if more opportunities are to be opened along these rivers for an increasingly outdoor population living in a highly mobile era.

TABLE XVI : AVERAGE ACCESSIBILITY INDEX

River	Lengths	Total Access Points	Average access Index
Rangitikei	72	11	6.5 miles/access
Oroua	60	12	5.0 " "

Continued ../

Manawatu	65	13	5.0 miles/access
Pohangina	30	5	6.0 " "
Kawhatau	12	4	3.0 " "

TABLE XVII

River	Tracts	Accessibility Index	River	Tracts	Accessibility Index
Rangitikei	01	1	Kawhatau	01	Nil
	02	Nil		02	3
	03	3		03	1
	04	Nil		04	Nil
	05	Nil			
	06	Nil	Pohangina	01	1
	07	Nil		02	Nil
	08	3		03	3
	09	1		04	1
	10	2		05	Nil
	11	1			
Manawatu	01	Nil	Oroua	01	Nil
	02	2		02	1
	03	2		03	1
	04	Nil		04	1
	05	1		05	2
	06	1		06	3
	07	1		07	Nil
	08	1		08	2
	09	1		09	1
	10	1		10	1
	11	2		11	Nil
	12	Nil		12	Nil
	13	Nil			

Manawatu Rivers

COMPARATIVE PHYSICAL ACCESSIBILITY

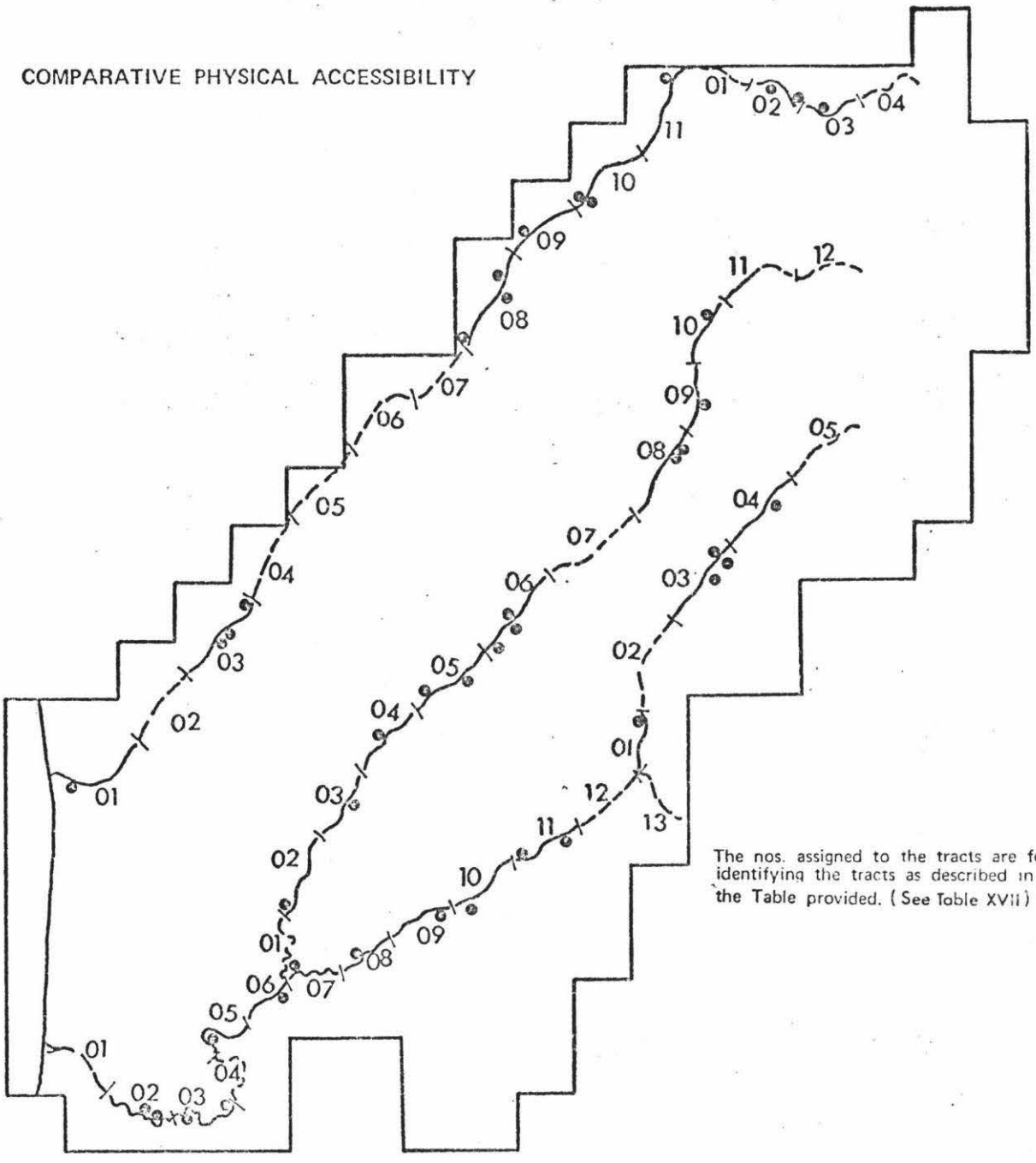


Figure 18

NCY

(c) Water Pollution

While actual assessments of the effects of water pollution on outdoor recreation pursuits has not been recorded or inventorised in the Manawatu area, it is not untrue to say that water pollution does present a serious constraint. It has been reported that fishing areas in the Manawatu river system, for example, have been greatly reduced by pollution of their habitats,[3] and field observations support and justify this claim. Large tracts of water below industrial sites such as freezing works; dairy factories etc, were found to be unsightly : artificial colonization of the water from organic wastes and deposits of stagnant foams and wastes lodged near the banks of these waters had made these areas organically polluted and visually nauseating, to say nothing of their repulsive smell. Metal mining is also another industry whose operations affect the visual quality of both water and physical environs (e.g. at Kakariki Road site and Komako site of Figure 19) Farm run-off, mainly of fertilisers and coliform from animals, is also thought to have noticeable effects on the water quality of these rivers that drain through farming areas.

At this juncture, it can be recognised on recapitulation, that water quality can be chemically (either organically or inorganically), and visually polluted. Organic pollution - contamination by bacteria, changes in the levels of PH, conductivity, total hardness etc - affects the recreationalists where sustained water is required for drinking, swimming, bathing and washing. Inorganic pollution by toxic substances has adverse effects on aquatic life. Research in this field shows

that D.D.T. for example affected fauna in the North Island (Hopkins 1966) and D.D.T. residues produced adverse effects on trout and trout eggs, (Hopkins 1969).

Visual pollution by sludge, floating solids, discolouration of water, smell and generally 'broken' bank environs discourage visits to these areas by both active and passive recreationalists.

The preceeding paragraphs point to the effects of water pollution on a wide variety of outdoor recreation activities; in fact, it has been noted that the reduction in recreation opportunities represents the most widespread consequence of water pollution in the Manawatu (MacCallum 1971).

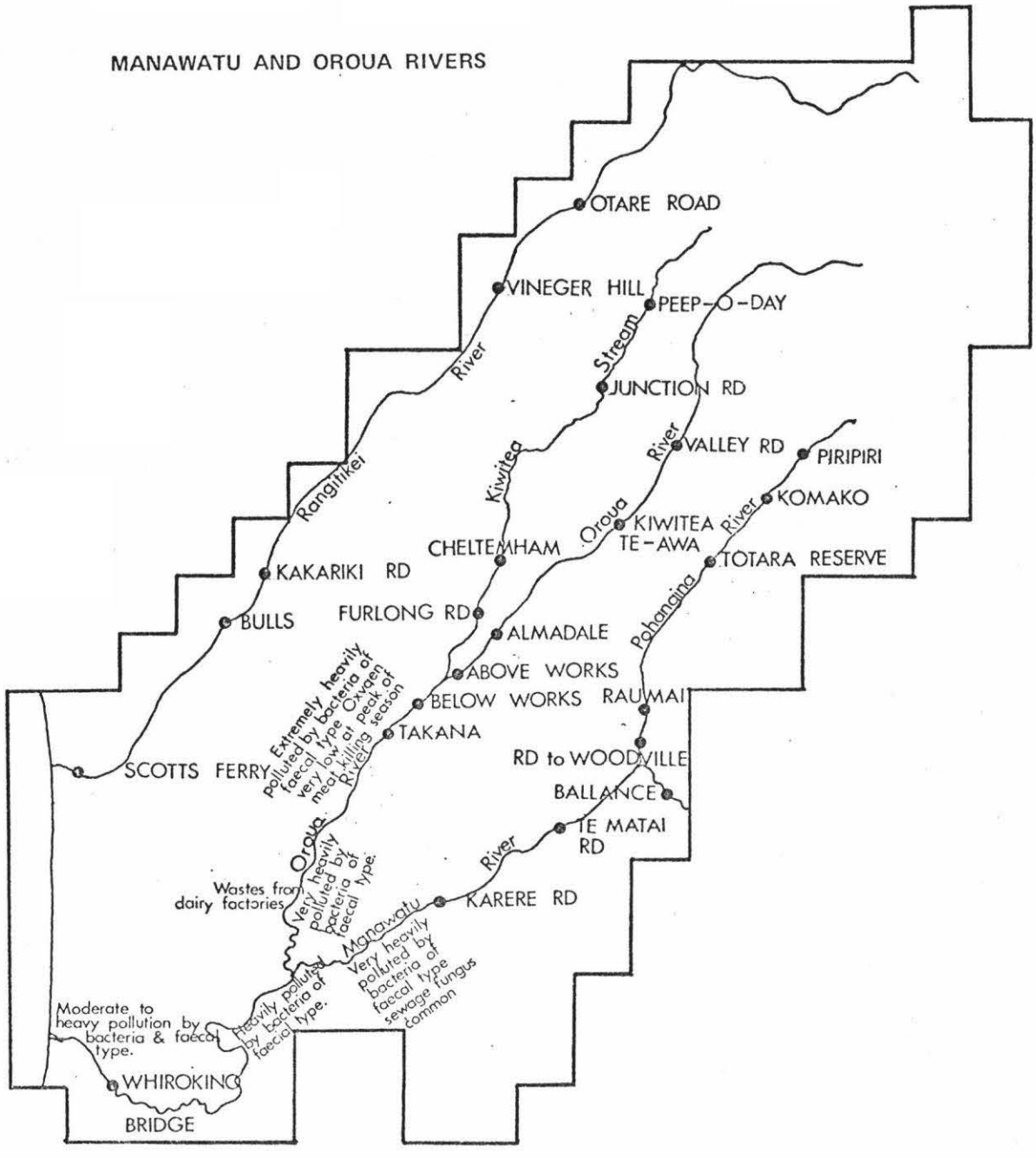
4.5 Water Quality of Rivers

Official concern for the health of these rivers was expressed as early as 1957. This resulted in an extensive survey on the Oroua and lower Manawatu rivers. This survey the first of its kind in this area, was conducted to examine the sources and extent of pollution in these two rivers. This report described the major sources of pollution as dairy and works industries and it can be observed from Table I of the AppendixII,that the local sources of pollution were comparable to those at the national level. (Appendix II Table II). Although the present numbers of such industries have diminished from 13 to 6 in the Oroua and from 25 to 17 in the Manawatu rivers; and the treatment of waste improved, they are still major sources of pollution to these rivers at the present day (Anderson 1973).

4.6 Extent of Pollution

The survey reported pollution to be widespread in the

River Pollution



Source : Pollution in the Lower Manawatu Oroua Rivers
WATER POLLUTION COUNCIL 1957

● 1973 Water Quality Test Sites

Figure 19

NCY

rivers concerned. Biological sampling showed that bottom fauna was undestroyed only at sites above freezing works (eg Borthwicks) and the destruction of bottom fauna by toxic substances and abundant growths of periphyton due to enrichment of water by organic wastes, occurred downstream from the works. Dissolved oxygen levels (significant for fish populations) were shown to fluctuate with the drastic fall at waters below works. Further tests on dissolved oxygen concentrations showed however, that dissolved oxygen levels in all the rivers tested were maintained at a reading above that required to sustain fish life (i.e. 7 ppm) See table XVIII. This may suggest an improvement in the treatment of works industries, although one sample series could not be expected to give a true picture of the effects of pollution on the dissolved oxygen concentration. The reduction in the numbers of dairy factories along the Oroua and Manawatu - a reduction in pollution source points - may be significant here.

Bacterialogical test results on the Oroua and Manawatu rivers indicated that all sites tested showed signs of faecal contamination. Below the waste outfalls of the freezing works; Feilding Borough septic tanks etc, all samples showed very high counts of coliform bacteria of faecal origin. The recent survey conducted (Table XVIII) also indicated bacterial contamination at such sites. The dryness of the season in which the tests were carried out may be suggested as the reason for the absence of nitrite in some of the sites[4]. Figure 19 is a summary of the extent of pollution concluded from the 1957 study.

4.7 Recent Survey

A series of chemical tests was conducted by the author

in conjunction with the Ministry of Works Water Testing Branch; and the Agriculture and Fisheries Department on the Manawatu and Oroua rivers, including also the Rangitikei, Kahuterawa, Kiwitea and Pohangina rivers. The survey was to provide an indication of the existing water quality of these rivers and where sites were applicable the water quality of existing recreation areas. The results are provided in Table XVIII.

While eleven qualities are tested for, those of PH, conductivity level (v); total hardness; nitrite, ammonical nitrogen, and dissolved oxygen concentration have direct significance for the outdoor recreationalist. PH and conductivity values indicate the drinkability of water, while total hardness which refers to the ease of lathering water when soap is applied, is significant, for washing purposes. The health of trout and other fish life is indicated by, amongst other things, the dissolved oxygen concentrations in the water. The useability of waters for swimming, bathing, drinking, that is, water quality that affects the hygiene of health of the user, is indicated by the presence of nitrite and ammonical nitrogen.

The results indicate that the PH values of all sites fall within the range of safe PH values for swimming water as prescribed by the Water Resource Council, i.e. water having a PH in the range of 6.5 to 8.3. With the exception of tidal sites such as Whirokino and Scotts Ferry, conductivity levels show salt content in all these sites are low and from this point of view the water is palatable. Salt content levels in the waters at freezing works sites (Karere Road; Feilding Works) however, are relatively higher than other sites and the examination of other

chemical readings suggest that these waters are unhealthy although they are palatable from the point of view of conductivity level. From the point of view of laundering and washing picnickers and campers might find some difficulty with lathering at sites where total hardness is greater than 60; particularly for those who experience town water supply where total hardness is around 30.

The presence of nitrite indicates that there are bacteria present which can convert ammonical nitrogen into nitrite. Results indicate that the Rangitikei River and the Pohangina are free of any indication of the presence of nitrite but that all the sites sampled along the Manawatu are bacterially contaminated. Caution must be exercised in the interpretation of nitrite readings since only a series of tests was carried out and these were done during the drier periods. It is suspected that nitrite readings may in fact be higher in all the rivers tested. Water quality at freezing works sites again suggest pollution by such industry : at the Feilding works there is the sudden appearance of nitrite (a reading of 0.02) with a high reading of 1.8 for ammonical nitrogen, calcium and also iron. Waters at Karere Road site also experience an increase in nitrite and ammonical nitrogen, calcium, phosphate and iron.

One of the common causes of fish pollution is drowning through the lack of dissolved oxygen in waters. With the exception of Peep-O-Day site, all sites surveyed show that dissolved oxygen concentrations in these waters are fairly well maintained and from this point of view are able to support fish and other organisms. Pollution of fishing grounds as claimed by the Manawatu Branch of the Acclimatisation Society could only have

TABLE XVIII : CHEMICAL TEST TO SHOW WATER QUALITY

FIELD SITES	PH	θ Temperature	V Conductivity level	TH total hardness	Ca Calcium	PO4 Phosphate	Fe Iron	NO2 Nitrite	NO3 Nitrite	NH4 Ammonical nitrogen	DO Dissolved oxygen
Rangitikei River											
Otare Road	8.2	19	160	63	53	-	0.5	-	-	0.4	10.5
Vinegar Hill	8.3	20	170	65	56	-	-	-	-	0.36	11.1
Kakariki Road	8.6	22	170	81	66	-	-	-	-	0.4	13.8
Bulls	8.1	16	165	77	60	Tr	0.36	-	-	0.48	11.0
Scotts Ferry	7.5	14	600	134	76	Tr	Tr	-	-	0.48	8.8
Oroua River											
Valley Road	7.5	15	100	46	38	-	-	-	-	0.64	10.2
Kiwitea	7.7	20	115	64	51	Tr	Tr	-	-	-	8.4
Almadale	7.6	13	100	60	53	- -	0.6	-	-	0.64	10.8
Above Works	7.5	14	100	63	48	Tr	-	-	-	0.56	10.8
Below Works	8.1	16	180	66	51	0.3	0.7	0.02	0.25	1.8	10.6
Takana	7.1	15.5	160	66	52	1.2	0.7	0.112	Tr	1.4	10.2
Kiwitea Stream											
Peep-O-Day	7.6	17	200	128	88	0.4	0.8	-	-	0.48	5.0
Junction Road	8.1	21	150	71	49	0.6	0.4	0.006	-	0.56	8.0
Cheltenham	8.0	20.5	180	66	44	-	-	0.002	-	0.56	7.8
Furlong Road	7.6	12.5	110	63	42	Tr	0.6	-	-	0.64	11.6

TABLE XVIII : CHEMICAL TESTS TO SHOW WATER QUALITY

CHEMICAL TESTS	PH	Φ Temperature	V Conductivity level	TH Total Hardness	Ca Calcium	PO4 Phosphate	Fe Iron	NO2 Nitrite	NO3 Nitrite	NH4 Ammonical Nitrogen	DO Dissolved Oxygen
Manawatu River											
Ballance	7.1	18.5	150	57	47	0.2	0.12	Tr	-	0.52	7.8
Te Matai Road	7.1	21	140	61	46	0.2	0.68.	Tr	-	0.52	8.9
Marere Road	7.1	20	180	60	48	1.7	0.7	0.006	-	2.0	7.4
Whirokino	6.9	19	500	76	37	0.6	0.9	Tr	-	0.56	6.8
Pohangina River											
Piripiri	7.4	19	100	41	35	Tr	Tr	-	-	0.48	9.5
Komako	7.0	18	100			-	-	-	-	0.46	8.6
Totara Res	7.4	20	130	50	41	Tr	-	-	-	0.48	9.3
Raumai	7.3	19	170	73	55	Tr	-	-	-	0.4	10.3
Rd. toW'ville	7.0	18.5	155	80	59	Tr	0.4	-	-	0.46	9.4
Mahuterawa Stream	6.5	18	85	16	9	-	0.8	-	-	0.68	10.0

Tr: Trace

resulted from other causes like inorganic toxic substances like D.D.T. or high phosphate levels from fertiliser run-off; or high mercury contents.

4.8 Water Quality at Recreation Areas

The test results on the eight survey sites which are also current popular recreation areas indicate that the qualities of these waters are fairly healthy. A site that would suggest some caution is required in using the water for drinking, is at Whirokino where the trace of nitrite has been indicated. Salt content levels at Whirokino and Scotts Ferry are expected to be high since these sites are under tidal influences. At Raumai and the road to Woodville sites, however, the salt content shows fairly high for such inland sites and total hardness for these sites is also high. Users at these sites might have some problems with the water for drinking and washing purposes. Similarly at Vinegar Hill, the water has also a salt content high enough to make it unpalatable.

4.9 Proposed Plans

This section deals with proposed plans submitted by planning bodies and individuals whose ideas on development of river resources are key contributions to an 'expansionist view' of water-based outdoor recreation provisions. These plans reflect the opportunities that could be created and in this way they can be included as part of the resource inventory.

Altogether there are three proposed plans documented : the Manawatu River Weir Plan and the Raumai Recreation Area Plan are official documents of the Palmerston North City Council and part of the Raumai Plan is being implemented. The third

proposed plan is that lodged by the Palmerston North Civic Design Association whose proposal for a 'Riverbank Development' project has been accepted by the said Council.

4.9 A Manawatu River Weir

The establishment of an artificial recreation lake along the Manawatu River within the city boundaries was proposed several years ago and in 1968 the Weir Committee was authorised to investigate the feasibility of such a project. The committee concluded from its study that "it is entirely feasible to create a recreational lake within the city" (Manawatu River Weir Feasibility Report : 18).

The Proposed Plan

Material

The Committee was in favour of a collapsible dam where flow could be allowed during floods. On this basis it was proposed by the Committee that two sections of Fabridam[5] about 175 feet along with a concrete pier in the river should be the type of weir used.

Location

The Committee's investigation recommended that the position of the weir should be some 400 yards upstream from Buick Crescent to the end of the reach of river above the Fitzherbert Bridge and before the shingle bar at Albert Street. This stretch of water would form a lake approximately 1.9 miles long with the water level at about 78 feet above sea level and an average depth of about 10 feet. The site of this proposed lake is provided in Figure 20.

Access

Plans for access to this lake have also been proposed : the area

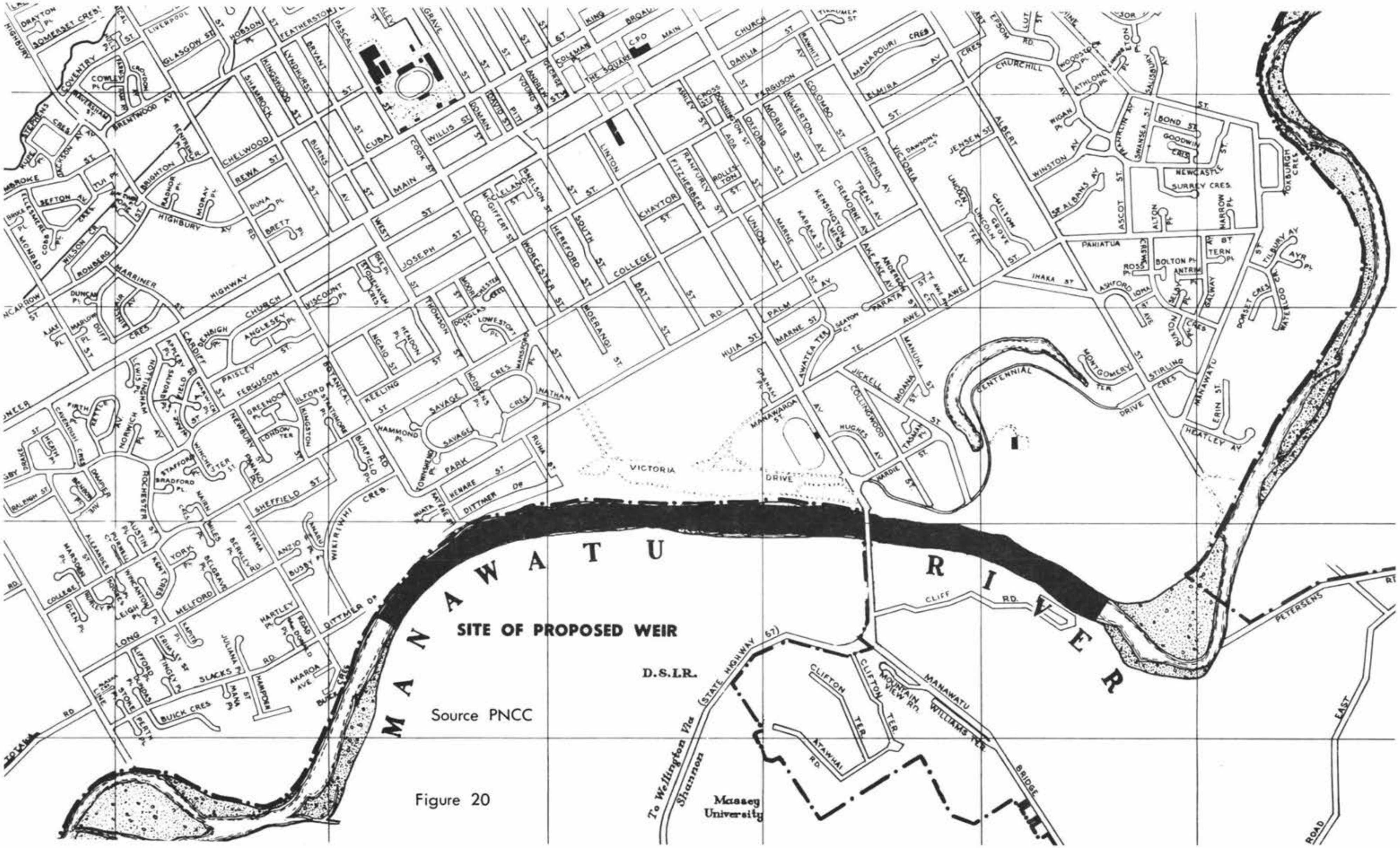

MANAWATU RIVER
SITE OF PROPOSED WEIR
D.S.I.R.
Source PNCC
VICTORIA DRIVE
CENTENNIAL DRIVE
CLIFF RD.
To Wellington Via Shannon (STATE HIGHWAY 57)
Massey University
MANAWATU WILLIAMS TER.
BRIDGE
PETERSENS
EAST ROAD

Figure 20

between Ditmer Drive and the river, and the area adjacent to Centennial Drive (Figure 20) were considered.

Comments

On completion of its report on the feasibility of the weir construction, the Weir Committee recommended that the Palmerston City Council (herein called the 'Council') agree in principle to becoming the Weir Controlling Authority. By November 1971 Council agreed with the recommendation but on the following two conditions:

(a) The Public Relations Office (P.R.O.) finding the total funds required for its erection and;

(b) If erected the Council's liability for the cost of maintainance to be limited to a maximum figure of $10,000 per annum.

The first condition reflects very strongly the low priority given to this project on the part of the Council. This low priority approach and the complete stagnation of any development of the weir. The P.R.O. is not a finance institution; to raise the total cost for installation - the 1969 cost figure was $465,000 - is going to prove a most monumental task for such an organisation. Costs since 1969 have increased considerably. Mallock and Hutt, the consulting engineers approached by Council have quoted these new figures in September 1971.

Costs	1969	1971 September
Constructing and installing	$465,000	$570,000
Yearly Maintenance	$ 5,000	$ 9,000

Most population centres in the study area are located inland and do not have an immediate approach to sea, coast and

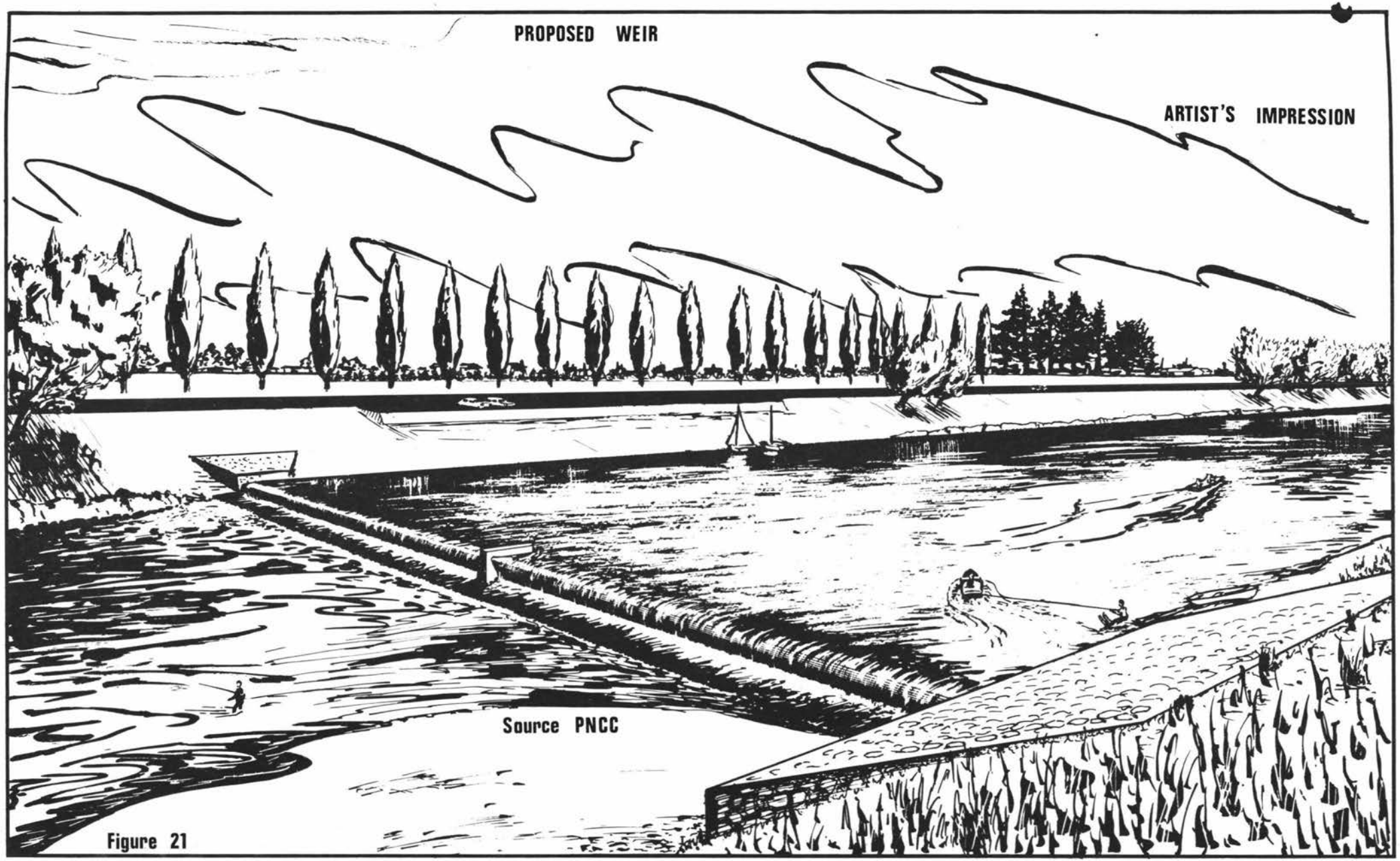


Figure 21

lake fronts which some locations enjoy. The installation of the weir would undoubtedly help meet the needs of these centers. The trend of outdoor recreation demand however, is for water oriented activities. These reasons justify a high priority approach to the establishment of the weir. While it is unjust that the P.R.O. should be carrying the whole burden of finding the finance it is likewise unjust that this should be on the shoulders of the Council. The weir, should it be erected, is going to attract not only the peoples from Palmerston North but also populations from other centres and in this respect any cost should be shared on a regional basis, the M.R.D.C., to make one possible proposal, should perhaps be exploited to carry out this function.

4.9 B Proposed Raumai Recreation Area

It is evident from the inventory made of picnic areas that there has never been any conscious planning given to the existing Raumai picnic area. Starting off as an informal environment for picnicking and swimming it continued in this way as it gained wide popularity, and it was not until recently that the Parks and Reserves office of the Palmerston North City Council gave Raumai any official attention. The outcome was a first attempt to consciously plan and develop Raumai into a camping, swimming and picnic area. A look at the proposed plan for Raumai (Figure 22) shows it to be a very bold effort.

Proposed Facilities

The proposed plan caters for the very informal outdoor pursuits, such as swimming, picnicking, childrens play, camping and scenic enjoyment. Facilities have been proposed to meet

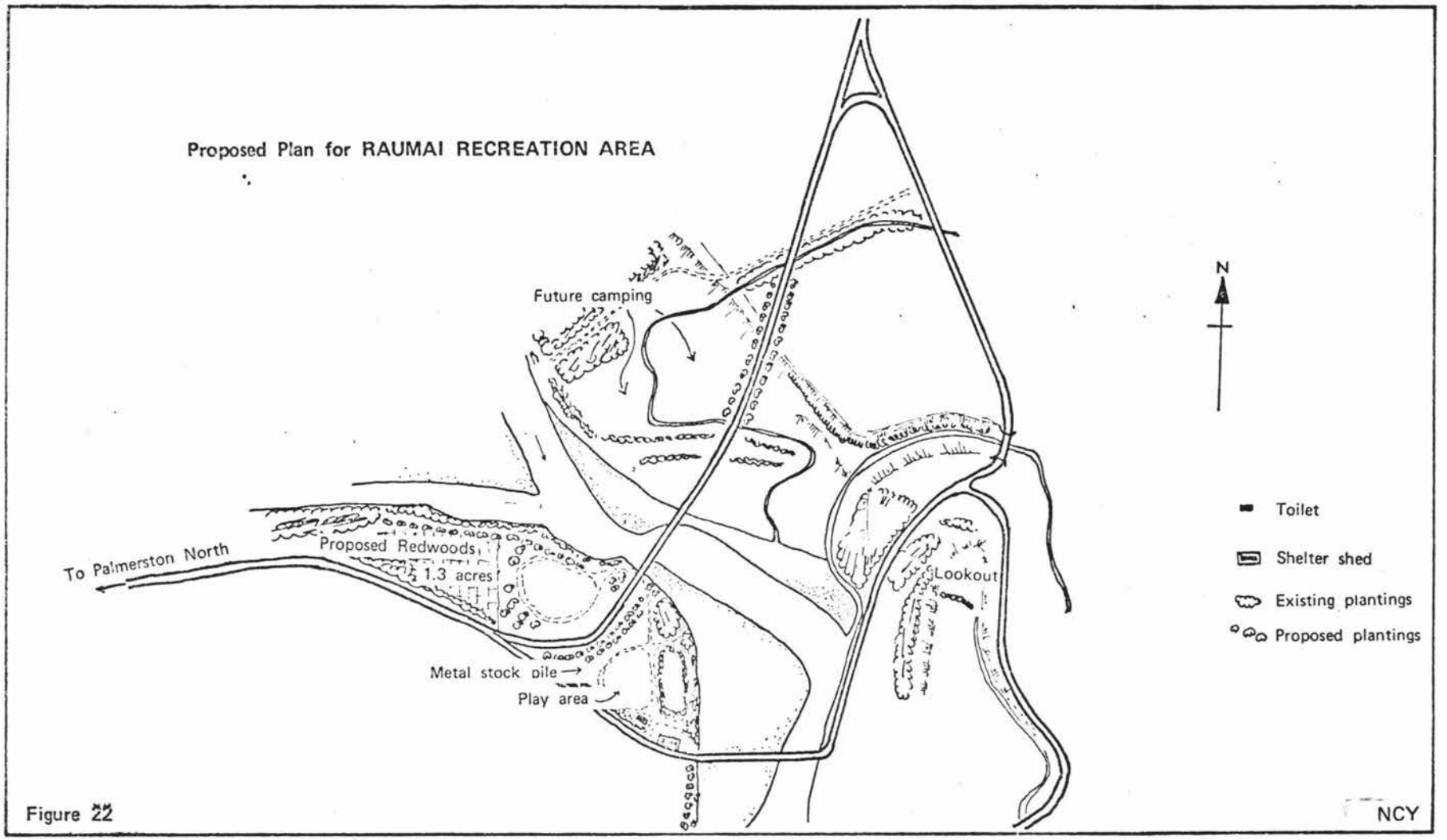

Proposed Plan for RAUMAI RECREATION AREA
Future camping
N
To Palmerston North
Proposed Redwoods
1.3 acres
Lookout
Metal stock pile
Play area
Toilet
Shelter shed
Existing plantings
Proposed plantings
NCY

Figure 22

these aims. The plan caters for two play areas, a toilet and changing shed for men and for women, a big camping ground tucked amongst trees, a broad stretch of metal beach for picnicking and swimming purposes; and also a look-out point planned on the rise to the east of the play area.

Comments

A very important aspect of recreational resource planning that the Raumai plan overlooked is that of providing structured car parking facilities. Haphazard parking is likely to cause damage to the physical and visual environments while properly structured parking facilities help reduce wear and tear to a local spot. Structured parking together with landscaping moreover, allows easier camouflaging of cars which is necessary to create an aesthetically pleasing environment. Set aside this shortcoming, the proposed plan is progressive; its underlying features can be said to suggest an effort to plan with a view to conserving the natural beauty and also to meeting the demands of a highly mobile and outdoor fun loving population.

4.9 C Riverbank Development

The development of a riverine walk and related facilities has been proposed by the Palmerston North Civic Design Association. This proposal was lodged for several reasons[6]:

(i) The Civic Design Association felt that there was a great need among young and older citizens for a less formal contact with nature and natural waterways.

(ii) Palmerston North City as the Civic Design Association sees it, is well endowed with urban gardens

and sports fields but lacking in informal natural and water environments; and

(iii) The frontage of the Manawatu River offers the opportunity of developing it into an amenity on both banks of the river.

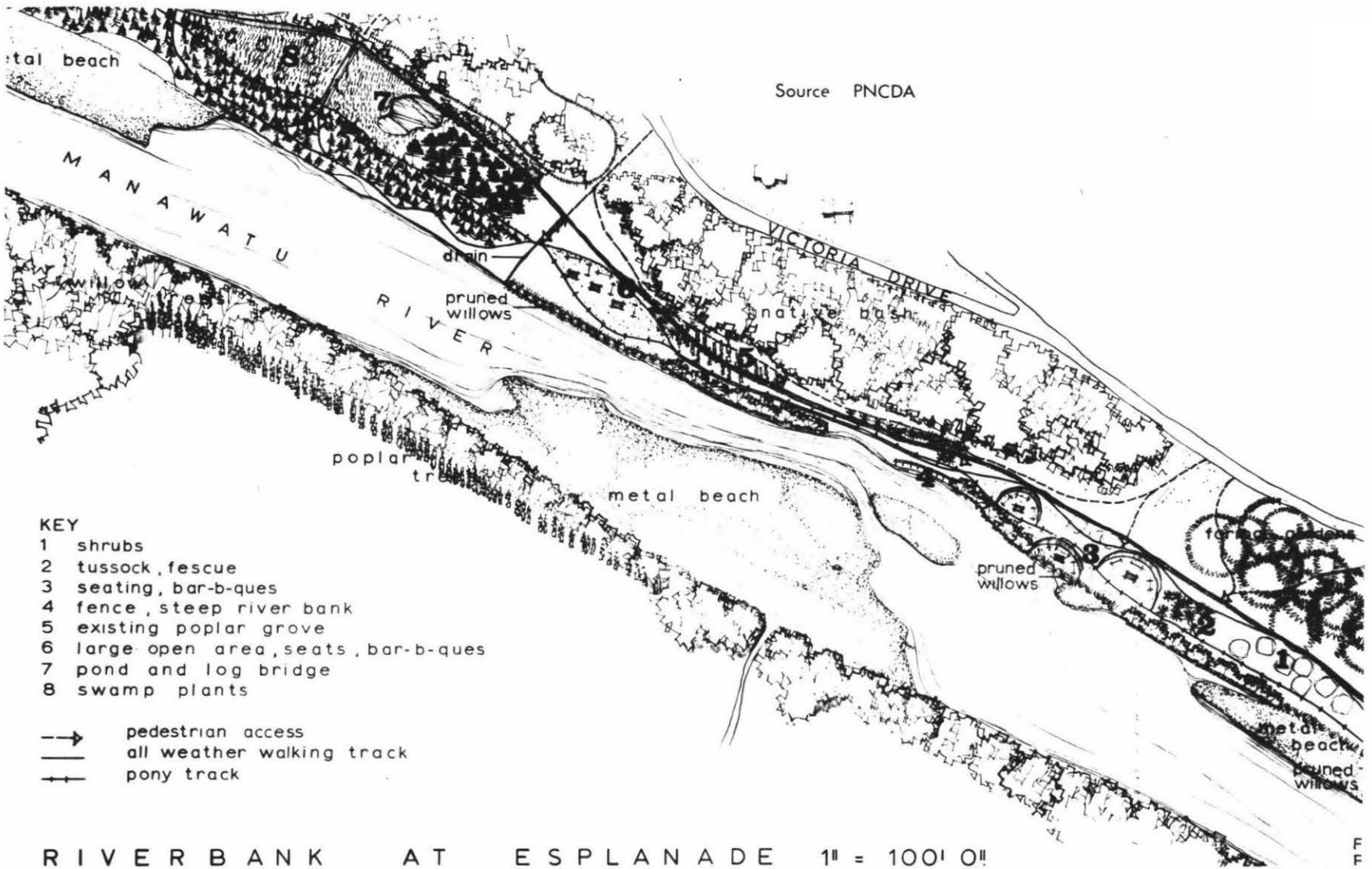
Since there are few external constraints that exist on the reach of the river immediately adjacent to the popular Esplanade it is suggested by the Civic Design Association that this stretch of bank should be the starting point of development, with future developments stretching across the other reaches of the river. The Palmerston North City Council has adopted the proposed project and recently work on the riverbank development has been in progress.

Proposed Facilities

The facilities envisaged in this scheme reflect broadly three types of outdoor activities (Figure 23) : walking for pleasure; picnicking; and pony trekking. An all weather walking track has been envisaged for the first activity; this track takes a participant through a variety of environments : picnic grounds river foreshore and fringed by different vegetation. Facilities for picnicking are in the form of barbecues and seats tucked between native bush and the pruned willows lining the foreshore. Pony tracks are also provided, weaving in and out of an interesting environment. The proposed plan (Figure 23) also shows a wide expanse of metal beach being provided for and these sites are very popular among swimmers and for those who care to relax near the water's edge.

Comments

A very striking feature of the proposed plan is the



RIVER BANK AT ESPLANADE 1" = 100' 0"

Figure 23

element of 'naturalness', where new proposals are built into the existing conditions, topography and vegetation of the river. The natural landscape is further enhanced by the recongnition of the need for careful landscape designing wherever possible to produce a more varied character (e.g. pruned willows and formal gardens).

Another feature of importance to user-resource relationships, is the carefully planned pedestrian access points that the scheme has provided for. There are however, several dissatisfactory points that one might observe in the scheme. The first of these is the total absence of planning for parking and associated facilities. The plan shows an environment heavily rich in vegetation and with trees at parts of the river as buffers, and such environments should be taken advantage of in providing parking facilities. Also, a walk way system perhaps should be designed into the native bush and to link it with the main walking track.

4.10 The Coast and the Lakes

The area of coastline under review extends from the mouth of the Rangitikei River in the north to the mouth of the Manawatu River in the south, a total distance of 13 miles of sandy beach, behind which are a set of very unstable foredunes and irregular dunes while the area is endowed with 13 miles of beach, the great bulk of recreational activity is concentrated within the surroundings of the three existing coastal settlements (Foxton Beach; Himatangi; and Tangimoana) where there is relatively easy road access, (Figure 24). These three settlements exhibit similar recreational provisions, with an emphasis on

beach and informal family or group activities. The following paragraphs describe the types of facilities that are found in Himatangi and Tangimoana, those at Foxton Beach are described in a later section where an in-depth approach is made.

4.11 A Recreation Facilities at Himatangi

This is located about 20 miles west of Palmerston North from where over half of its temporary population is drawn. Himatangi in 1970 had a permanent population of 92. The town layout is rectilinear in arrangement with sections in a uniform

Recreation facilities provided in this settlement include a community centre; trampoline; a boating pond with thirteen paddle boats; tennis courts; a skating rink; three barbecues; and a motor camp. The beach areas provides a rough and unofficial carpark. Popular organised competitions and beach carnivals have been arranged by private organisations (e.g. Himatangi Beach Progressive Society; Lions Club; Jaycess Club) over the summer vacations.

4.11 B Tangimoana

This is the most northerly of the beach recreation centres in the study area, and shares similar characteristics with Himatangi in that

(i) The township layout is of rectilinear design;

(ii) a majority of the section owners are absentee owners and;

(iii) both settlements give an impression characteristic of 'fringe-type' settlement where idle

sections are fronted by relatively well maintained homes, which are flanked by shanty type baches.

Provisions for recreational facilities in Tangimoana are assembled apart from the beach in three main areas:

(i) The Gus Anderson Park - this is at present very poorly maintained, with simply a poorly kept children's playground and three picnic tables.

(ii) The motor camp - this is about ¼ an acre in size, with four power points, two cabins and a basic amenities block.

(iii) The Recreation Reserve - a large part of this is also used by a dairy farm. There is however, a square concrete skating rink.

In addition to these there is a community hall with two adjoining tennis courts and a non-flush toilet block and an undeveloped carpark at the beach.

4.11 C Foxton Beach

It is sufficient at this juncture to remark that the facilities provided at Foxton Beach are much the same as those at Himatangi and Tangimoana.

The problem of a mixture of permanent and semi-permanent dwellers in these settlements has produced a conflict of recreational interests. The permanent residents who wish to improve visual amenities and are at conflict with the semi-permanent residents who do not wish to invest capital for the provision of recreational amenities. This has resulted in the inefficient and much neglected state of most of the recreational facilities and baches in these settlements.

4.12 The Lakes

Behind the irregular dunes are found a series of small fresh-water 'dammed - valley' lakes (Figure 24). These lakes are small and shallow and their lake margins are exposed open wave-out banks carrying beds of rushes and sedges which extend out to a depth of approximately 2 metres (Cunningham 1957 : 22-23).

4.12 A Puke Puke Lagoon

This comprises two lakes, the larger and more significant of which covers about 30 acres. This lake, soon to become an internal wildlife reserve, is at present used by seasonal duckshooters and Massey University's department of Botany and Zoology for research purposes. Access to and use of the lakes are dependant on the goodwill of the owners.

4.12 B The Foxton Lakes

This is a series of four lakes spreading linearly over a distance of nearly four miles. The sizes of these lakes vary from 10 to 25 acres. Access to these lakes is by trampling across the wider expanse of paddocks.

4.12 C Lake Kopatara

This is a connected series of three lakes, the largest being about 63 acres. Though forming an expanse of shallow water and rushes, there is abundant bird life in these water-bodies. A gravel road branching from the main metal road (Wylie Road) provides the only access to the farm where these lakes are situated. Access to these lakes (by consent of the owners) is by a two mile track across the paddock.

4.12 D Lake Kaikokopu

This is a single lake of about 45 acres and it is a haven for duckshooters. Use of the land is through permission of the owners. Physical access is by way of a gravel road the farm to the caretakers house situated about 30 yards from the shore of the lake.

4.12 E Limitations

Duckshooting is the common recreational pursuit in these lakes. Very little fishing is done, and only in one or two lakes (Kaikokopu and Kopatara). An important recreational value that these lakes possess is the high scenic quality their environments command. These are however three limitations that these lakes share in common which left unattended limit the potential recreational use of them :

(i) The limited average life span of approximately 50 years of naturals habitats[7];

(ii) The relative smallness of these lakes of any active water-sports;

(iii) The difficulty of both physical and legal access arising from their locations in private properties.

By removal of these constraints and by careful manipulation (artificial construction), these lakes can become a desirable element in the land-use pattern of the consolidated dunal belt, giving a wider range of the coastal environment. From the ecological point of view, any artificial manipulation may be considered distasteful, but the reality of the situation is such that one must choose the 'lesser of the two evils'. The present rate of eutrophication is severe enough to turn these

lakes into pitiful swamps in fifty years time[8]. The 'natural death' of these high scenic quality water-bodies will mean not only a loss of wildlife but also, obviously, the water bodies themselves. This will represent a loss of part of our natural assets as well as an opportunity loss. The consolidation of some of these lakes by dredging and then joining lakes within each series will at least help preserve, and given that legal and physical access can be obtained, will make available, these water-bodies for recreational pursuits such as boating and water-skiing.

4.13 Proposed Development Plan for Coastal Recreation

A critical planning issue in coastal areas is to provide the present and future generation with a wide range of sea-side activities. The existing range of recreational facilities on the coastal zone is limited to those offered by the townships and their immediate beach environments, with the use of the lakes being negligible. The proposed development plan outlined here is a step taken towards the recognition of the need to plan for a wider spectrum of coastal recreation.

The proposed plan (Figure 24) shows an intricate system of scenic/wagon trails developed along the paths of the lakes, the latter are singled out for boating and picnicking; wildlife; and 'leisure-fishing' purposes. Another emphasis in this development plan is the provision of recreation in a semi-forest type environment. The 'zone of development' is the broad-belt of consolidated dunes where ecologically this is a more tolerable area than the foredune area. This zone, moreover, offers a greater variety of natural scenery varying from dune hills to sizeable pine forests and lake that can be capitalized on.

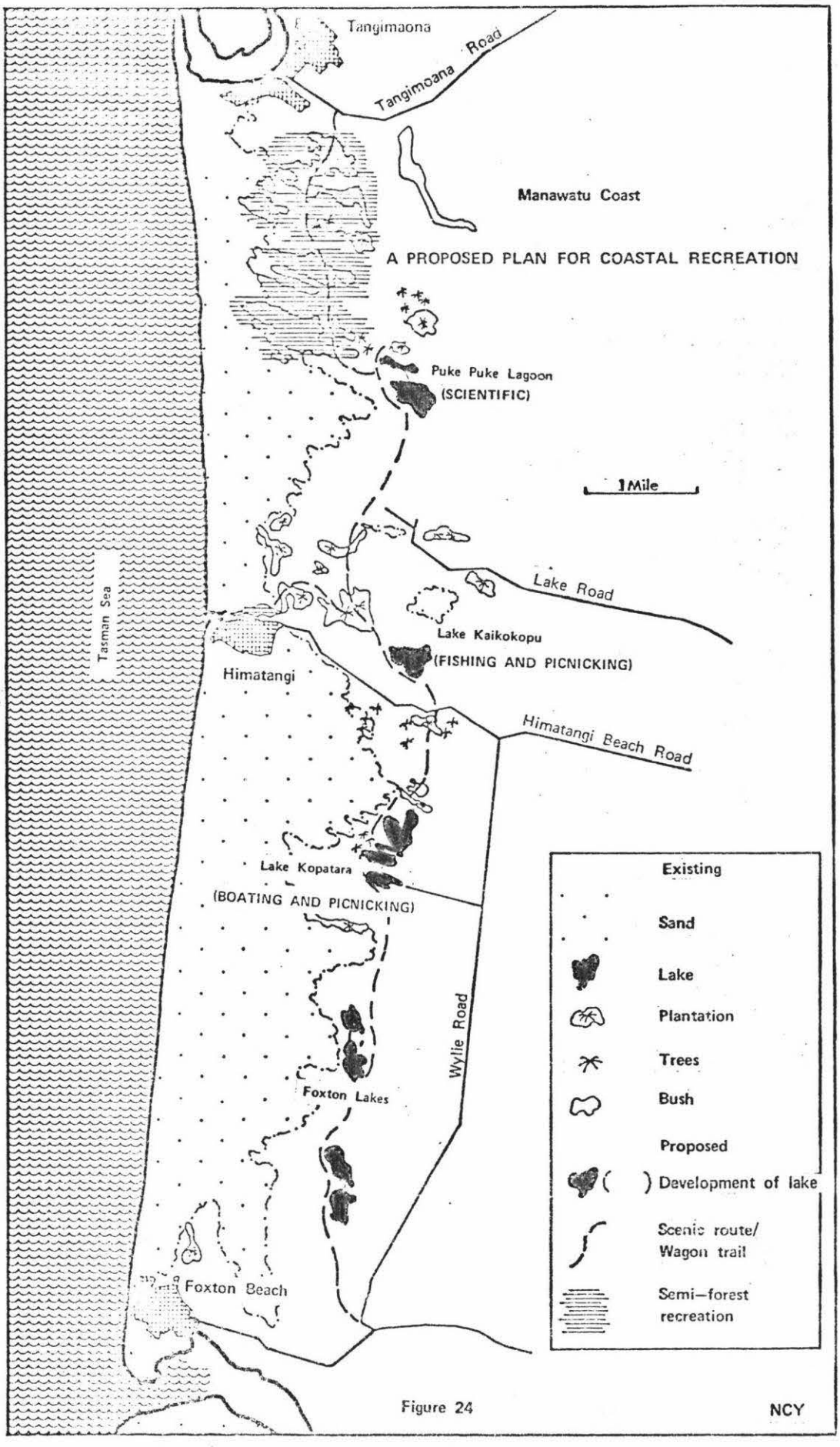


Figure 24

NCY

Some of the proposed provisions (e.g. wagon trails; enlarging lakes for boating and water-skiing) may seem to depart from present day thinking. Two factors operational to the Manawatu however, serve to justify the provisions of these facilities :

1. Boating and water-skiing activities are popular pursuits in the study area (Crawford 1969) and these are not really catered for. The present use of the Manawatu River for boating and water-skiing purposes is limited to only a few stretches of the river. The irregular pursuit of these activities here may also be attributed to the temporal suitability of these waters (seasonal dry and wet periods affecting river volume); or, the lack of absence of associated facilities for these recreational pursuits. The lakes (after development) on the contrary, provide the natural resources upon which boating and water-skiing can be pursued without incurring unnecessary frustrations.

2. A scenic route/wagon trail and the semi-forest recreation area are recommended in the hope that an outdoor loving people will respond to these new experiences. The psychology of the wagon trail is in the proverbial "pioneer spirit" of New Zealanders. The wagon trail can also be treated as part of the region's scenic route where recreationalists can stop at suitably designed picnic areas or lakes for refreshments, rest or other activities.

This proposed recreation system will be linked to that of the Foxton Beach system described in the next section of this chapter.

CHAPTER 4

The Manawatu Water Recreation Environments

PART TWO: FOXTON BEACH - A PRELIMAINARY CASE STUDY OF A WATER-BASED RECREATION ENVIRONMENT

4.14 INTRODUCTION

The beach is one of the very popular water-based spots that the New Zealand public frequent in their pursuit of outdoor recreation. Despite its popularity and often competing demands on the beach however, there has been hardly any research done in New Zealand into the beach environment for outdoor recreation. The whole spectrum of 'man at play on the beach' is also somewhat neglected in the fields of sociological and planning research. Foxton Beach is not free from such shortcomings and although this beach earned its popularity as a holiday resort for its hinterland as early as the latter part of the 1930's no attempt has been made to study the characteristics of the leisure behaviour of man on the beach, and their implications for the ecology of the beach environment.

The following section is a preliminary case study of a water based recreation environment in the Manawatu - the beach environment - the function of which is to provide data on the present use of beach resources and to examine possibilities for future development. More specifically, the beach is analysed in terms of its level of sensitivity to recreation activities; their resultant user patterns; and the types of recreation behaviours exhibited by leisure seekers at Foxton Beach. A brief review of the history and physical characteristics is included for it is these same factors that have moulded the present characteristics of Foxton Beach.

4.15 HISTORY

Back in the 1880's Foxton Beach was better known as the Te Wharangi Reserve owned by the then existing Foxton Harbour Board. The value of the beach to the Foxton Harbour Board and Foxton Borough was recognised as early as 1893 when the said Board was left without a harbour (Boniface) and by 1910 the Manawatu County Council provided its first access - a gravelled road - to the beach area. However while the importance of the beach was felt, the twenty-five years between 1910 and 1935 saw a period of relative stagnation in the development of it, as older established holdiay resorts took precedence in their importance. A change of fortune did no occur until 1936 when publci interest in the beach was aroused by some progressive businessmen from Palmerston North, and large amounts of money began to pur in for beach developments. Monies were invested in facility developments - a long seawall; a concrete skating rink; a paddling pool; a boat club house and club pier; tennis courts and a nine hole golf course., - which where to provide the basic recreational infrastructure of a coastal holiday resort.

"By 1946 Foxton Beach had become a weekend and holiday resort of Palmerston North and of the whole Manawatu and adjoining area." (Boniface:6)

Today with a relatively low cost per section, it still commands importance as one of the most popular if not the most popular weekend and holiday beach for the area under consideration [9].

4.16 PRESENT TOWN LAYOUT AND FUNCTION

Foxton Beach township, with a permanent population of 859 (New Zealand Census Population and Dwellings 1966) sprawls along both sides of the main access way (Ocean Beach Road). Like the other two beach settlements (Himatangi and Tangimoana), Foxton Beach also has a rectilinear layout while the township still has very much of a semi-fringe atmosphere permanently occupied residential houses intermix with holiday homes and these are interspersed with vacant allotments.

With the characteristics of a relatively low cost residential area, beach amenities and semi-fringe atmosphere, the township attracts a retiring population (Figure 25) and a semi-permanent one also. The latter can be demonstrated by the fact that in 1971 out of a total of 1100 properties in the settlement, only 37.2% (409) of the houses there were permanently occupied.[10] Wile the township attracts semi-permanent and permanent residents to the area, the beach, the focus of the Foxton landscape, draws in many weekend visitors for recreational purposes. In fact, it is their short-term visits that contribute to the seasonal living popularity of Foxton Beach. During the inter-holiday and winter periods activities at the beach are relatively quiet, limited only to the movements of its local residents and fishermen fishing off the coast. 'The lights shine in December' when hordes of visitors crowd to its shores. Visits made to the beach are most frequent during the summer seasons followed by long public holidays. Although shell-fish and whitebaiting seasons draw visitors to this shore, it is the beach and its adjacent sand dunes that provide the main attractive facilities for outdoor recreationalists.

4.17 PHYISCAL FEATURES

The township is bordered on the west by a belt of sand in the form of very unstable foredunes. The foredune north of the car-park (Ocean Beach) is more well defined (although breached in places) than those around the estuary. The foredune at the latter site modified by tides and exposure to wind with the latter resulting in numerous blow outs and miniature wet sand plains. The unstable foredune with its gentle windward and somewhat steeper lee slope generally rises to between 10 to 35 feet in height. In front of this foredune is a stretch of sandy beach (the intertidal zone) and at lowest tide there may be a space varying from 120 to 180 feet in width. At the estuary, this width is greater: the exposed ground including mud-flats is between 200 to 250 feet wide. Behind the foredune and north of the car park lies a belt of young dunes (Cowie's Motuiti Phase). South of the car-park this belt of young dunes is very narrow as residential development encroaches beachwards. The township of Foxton Beach sprawls in a vague triangular fashion across the expanse of recently formed sand plains.

4.18 CLIMATE

Foxton Beach environs being in the 'Sand Country' lies within Robertson's D climate district and is charaterised by warm summers and mild winters, a prevailing west to north-west winds with relatively frequent gales and a rainfall between 35.50 inches evenly distributed throughout the year.

4.18a WIND

Seasonal changes in wind speed and direction at Chatea are provided in Figure 25, strongest wind coming from the WNW direction with a maximum wind speed recorded in spring and a

Foxton Beach: Relative location, age-sex structure and wind patterns

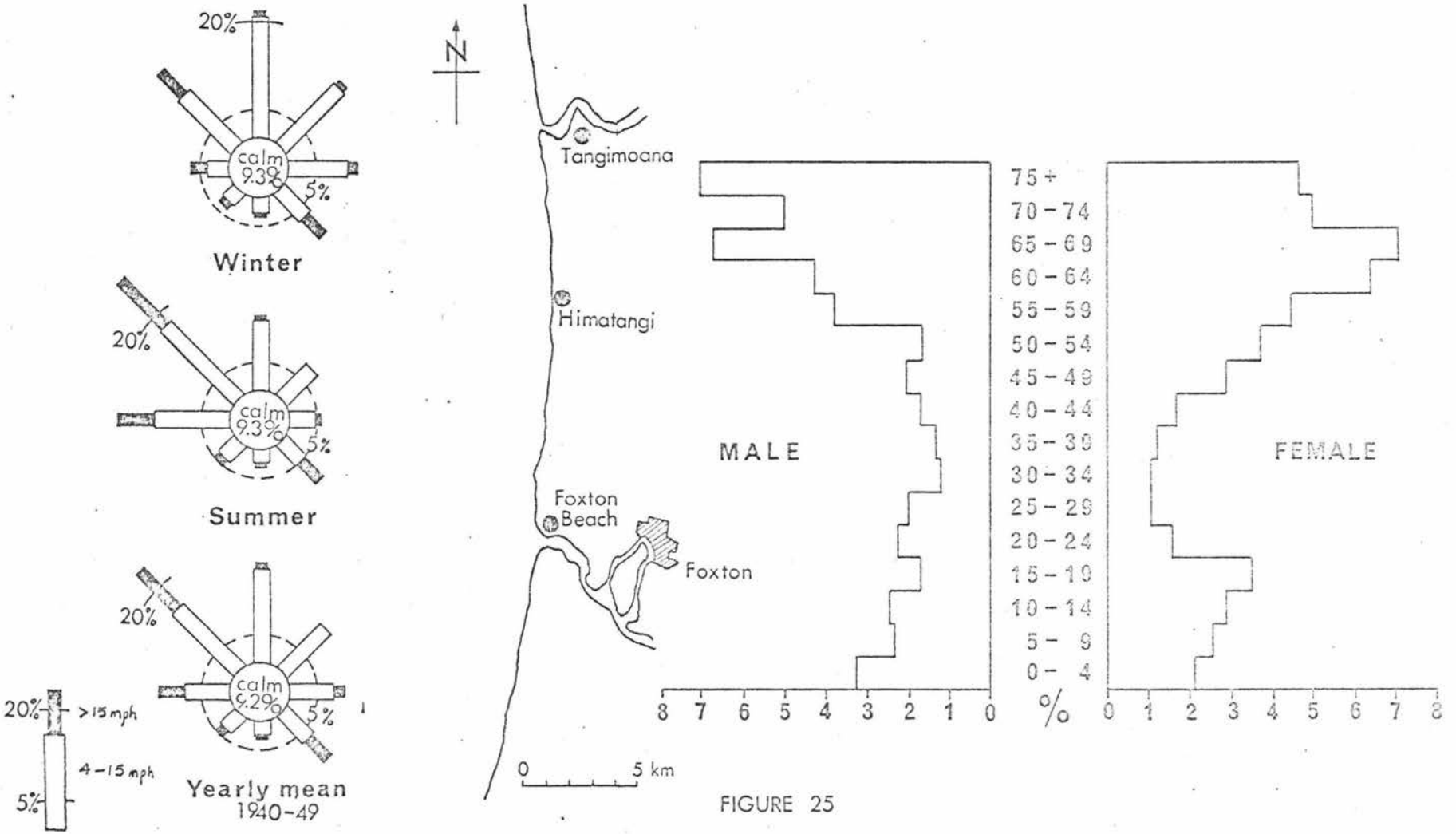


FIGURE 25

SOURCE: DATA ON PERCENTAGE FREQUENCY OF SURFACE WIND SPEED AND DIRECTION AT OHAKEA, 1940-49; Gibbard,R 1973

POPULATION STRUCTURE FROM VOLUME 2, 1966 CENSUS OF POPULATION AND DWELLINGS

minimum through the winter months. The general WNW to ESW direction of dune movement observed at Foxton Beach indicates the dominant WNW wind pattern.

4.18b TEMPERATURES

Temperatures are moderate with only minor seasonal differences. The January, July and mean annual temperatures at Onakea station are provided in Table X1X.

4.18c RAINFALL AND TEMPERATURE

Saunders (1968) in describing the climate of the 'Sand Country' records these data that the average annual rainfall for the Foxton-Tangimoana area is below 35". Most of the rain is brought by esterly winds, with the heaviest falls during the late summer season. The average number of rain days annually is between 100 and 175.

4.18d SUNSHINE

Sunshine hours for the sand country are also recorded by Saunders. He estimates that there are approximatley 2000 hours of bright sunshine a year and that locally Foxton has one of the highest sunshine totals with a mean of 2061 hours per year.

4.19 ECOLOGICAL FEATURES

Two areas of ecological importance which have implications for recreation planning are, the mudflats and the surrounding environment of the estuary; and the coastal dune area. The mudflats of the Manawatu estuary rich in marine organisms are the feeding grounds for coastal birds. (Plate 16) The dune habitats of the estuary where vegetation is scarce and light, attract waders and gulls which obtain most of their food from the shell banks or even from the sea, but requiring adjacent open country for nesting.

TABLE XIX MEAN DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR OHAKEA (1940 - 1970) (^{o}C)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL
Mean Daily Temperature	17.5	17.7	16.6	13.9	11.2	9.1	8.3	9.3	11.0	12.7	14.3	16.2	13.2
Mean Daily Maximum	22.1	22.4	21.2	18.2	15.3	12.9	12.4	13.3	15.1	16.8	18.6	20.6	17.4
Mean Daily Minimum	12.9	13.0	11.9	9.6	7.1	5.2	4.3	5.2	6.9	8.5	10.0	11.8	8.9

Source : New Zealand Meteorological Service unpublished records.

Observations indicate that the other stretch of shore (i.e. along Ocean Beach) is another but less important feeding ground during low tide, at which time the majority of the birds there are gulls. Here also the roosting grounds of the birds coincide with popular recreation areas. Recreation in such areas may present ecological problems as it has been reported that birds of various species have moved away from their usual roosting grounds as a result of the increase in holiday makers in the area (Auckland Regional Authority 1972:43)

The ecological features of the coastal dune area can best be described in terms of its vegetation and dune profiles. Vegetation is very light in the Foxton Beach landscape since a large part of the area is inundated with moving sand and the limited number of plant species found here are those capable of withstanding the adverse conditions of a coastal dune environment. To understand the immediate sites a general survey of two profiles of Foxton Beach was made in which problems of the area were noted. The obvious problems were breaching in places at the foredune and blowouts and dune erosion at the rear as a result of a disturbed plant growth and uncontrolled human activity in this area.

4.20a PROFILE A

This is taken from the western shore south of the carpark through to the bank of the estuary. Starting at the beach a shallow and very unstable foredune is formed. Behind this is the secondary dune which is only partially stabilized and which is colonized by marram and pingao grass.

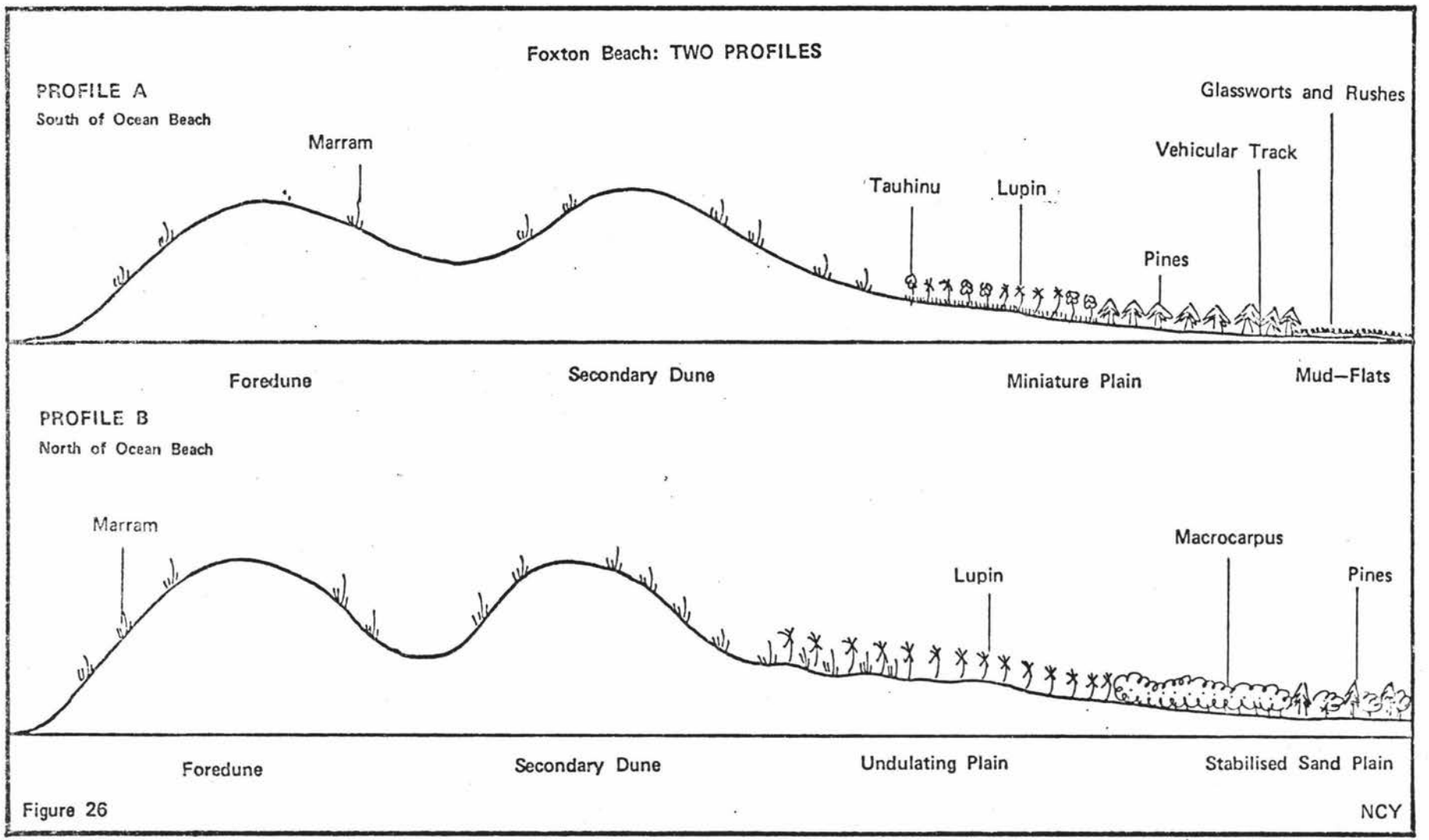


Figure 26

NCY

Blow outs and dune erosion in places at this part of the profile are not uncommon. Lupin and Tauhinu (Cassinia leptophylla) with a cover of clover growth have stabilized the small plain and inner dune which lies behind the second dune. Stabilisation is mature at the miniature forest of pinus radiata and small wet sand plains of the Manawatu River estuary. (Figure 26) Here the vegetation community consists of rushes and glasswort.

Beach buggying and other activities pursued between the inner line of foredune and the secondary dune has caused environmental damage to several localities here. Planning measures must be adopted to stop the abuse of sensitive environment.

4.20b PROFILE B

Profile B taken north of the car-park has a more prominent foredune in comparison with that of the preceeding profile, and its secondary dune is also more prominent and stabilized. At the back of this dune is stretch of undulating sand plain where stabilizers are a mixture of marram and lupin. This area is immediately backed by a smoother plain where lupin is the predominant vegetation. Behind this is the 'inner plain' which seems very well stabilized by a mature macrocarpus community and pine growth is also evident but this is still a young stage.

While the foredune and secondary dune appear to be more stable, and plant cover more dense than those in the preceeding profile blow-outs and erosion do occur. If these areas are to be preserved in their natural states, measures to close these areas to users will have to be taken.

The profile and relative stability of these dunes are dependant upon the anchoring vegetation; the latter involves at least three converging factors (after McHarg). These are;

1. Ground water level - if the water table of ground water falls below a critical level (through the use of shallow wells) the stabilizing plants will die;

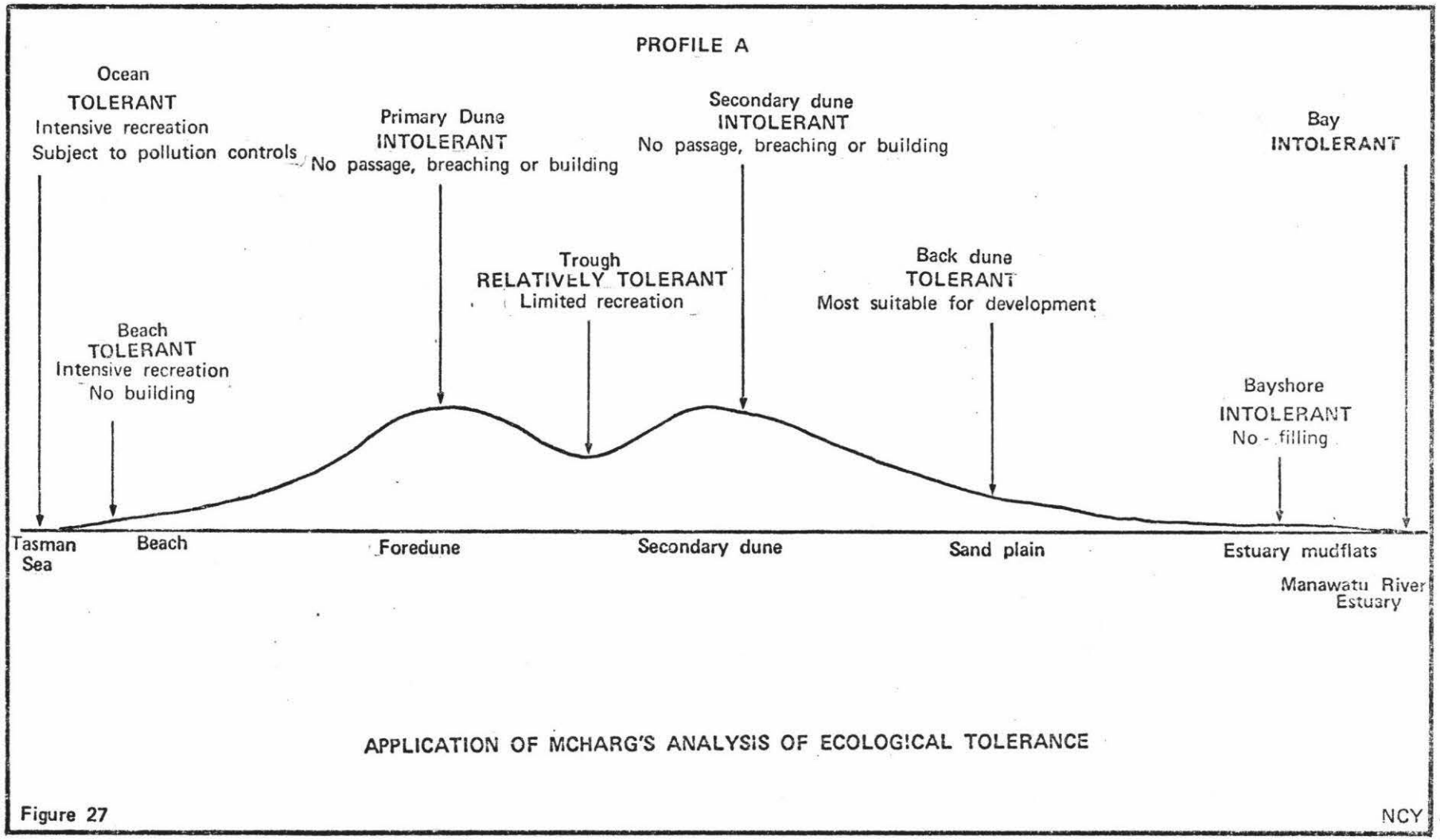
2. Littoral drift - littoral drift is the agent of sand replenishment. Any tangential construction will arrest the littoral drift. If the latter occurs the source of sand to supplement the dunes will be denied;

3. The critical vegetation - dune grass - is most vulnerable to tramping.

4.21 ECOLOGICAL SENSITIVITY OF THE COASTAL DUNES:

The recognition of ecologically sensitive 'zones' within an environment is most pertinent to resource planning because the continued use of resources available to man is absolutely in one sense, dependant on his appreciation of and obedience to the laws of nature.

McHarg's investigation into the ecological sensitivity of the dune environment shows that some parts of the dune environment are tolerant to recreation while others are not. His zones of tolerance are depicted in Figure 27: the beach is declared as "astonishingly tolerant" (McHarg:13), cleaned twice a day, of the debris that man leaves, by tides. The primary dune zone (foredune) is absolutely tolerant (McHarg:13). The anchoring vegetation cannot stand any tramping and as a consequence the use of this zone must be prohibited. The trough is much more tolerant as it is more protected from the wind, storm and blowing sand. The problem here is groundwater and the lowering of its water table to a critical level will mean the death of plants. The vegetation of this zone exists only because of the relative abundance of fresh-water.



APPLICATION OF MCHARG'S ANALYSIS OF ECOLOGICAL TOLERANCE

Figure 27

NCY

The inland dune or the secondary dune is as intolerant as the foredune and should not be developed. The back dune (behind the secondary dune) is a more permissive environment where fresh water is more abundant.

The final zone is the bay, estuarine or marsh zone and these environments are amongst the most productive in the world (McHarg). It is in these nutrient rich locations that the infantile stages of most fish is spent and they are also the feeding grounds and homes of shellfish and wildfowl.

This analysis provided by McHarg indicates that the widest stretch of back dune would appear to offer the maximum opportunity for the concentration of facilities and recreation.

4.22 RECREATIONAL USE OF FOXTON BEACH

Outdoor recreation at Foxton Beach consists of the public recreation facilities provided by the settlement and the natural environments of the beach and dunes. The latter encompasses two popular areas or zones - Ocean Beach (the beach area including the dunes 100 yeards south of the boat ramp at Ocean Beach and about 185 yeards north of it); and the River Mouth Beach (the estuary, where the Ocean meets the river, incorporating the dunes and mudflats strectching inland to the boat launching ramp). It should be noted however that these two names are given only for identification purposes.

4.23 PUBLIC RECREATION FACILITIES

These include (see Plate 17)

1. A ten acre recreational reserve centre which has a children's playground, tennis courts, a sports field, a boating pond, a miniature golf course and a concert stadium.

2. Across the road from this reserve is a public picnic

ground (see Plate 18)

3. A formal public carpark together with public toilets, situated at Ocean Beach. (see Plate 19)

4. A ramp for launching boats at the inner estuary (see Plate 20).

Most of these facilities are poorly maintained, the sports field and the playground in particular are overgrown with weeds and in parts swampy. Overall it seems that the lack of response to these facilities has been a result of the general untidiness and poor maintainence of them and visually they are not conducive to a pleasant environment.

4.24 PUBLIC ACCOMMODATION

Accommodation for non-local recreationalists is provided by the three existing holiday camps:

1. Pinewood Motor Camp - This is a 7½ acre camp site (leased out by the Manawatu County Council) and shares a common boundary with the public site adjacent to it. Situated on the right bank of the Manawatu River mouth, this camp ground is well endowed with trees on a rolling maturely stabilized sand topography. This camp is able to accommodate a maximum of thirty-two caravans, two sleeping cabins and with additonal space for some 100 tents. Though the normal amenities of toilets, showers and kitchen are provided, they are not well maintained and are insufficient in proportion to the visitors received.[12] A sum of $4,000 has been agreed on by the Manawatu County (after several confrontations by the leasee) to be used for repairing the existing facilities and also for the construction of a new shower block. The concrete block building will give the camp an extra six showers and 17 hand basins.[13]

2. Manawatu Caravan Club Camp, - This camp formerly owned by the Manawatu Automobile Association can accommodate a maximum of 100 caravans and campers are restricted to members of the Automobile Association and Manawatu Caravan Club. In addition to usual amentiies there is a social hall.

3. Holiday Motor Cabin - This privately owned accommodation site does not provide space for caravans or tents. Instead, converted huts are used as cabins, with a maximum accommodation capacity of 100 people. There are a total of 30 cabins, visitors sharing a communal television lounge and two kitchens. While the cabins fulfill the function of providing accommodation, aesthetically they are most unpleasant. The cabins are very run down and could have done with a coat of paint fifty years ago. The surrounding environment is not at all landscaped, thus the whole place looks like a deserted shanty-town of the kind that one so often sees in western movies.

At no accommodation site, except that of the Pinewood Motor Camp, has any attention been paid to visual effect. At Pinewood Motor Camp the environment is made pleasantly natural with pines dotted about the camp site. A conscious effort to design and landscape camp grounds is as important as keeping up the standards of public facilities. Legislation for a "minimum standard" of landscaping quality of such places is the only quick means of enforcing the necessity for landscape and design.

The present popularity of Foxton Beach is not so much the result of these facilities but rather, the potentials offered by its beach dune scapes for recreation. Unlike the latter, public facilities are not much used at all.

4.25 RECREATION ON THE BEACH

The majority of people congregate at either of these two areas (Ocean Beach and River Mouth Beach) for their recreational pursuits. The former name is officially used to describe the area around the carpark while the latter name is given here for want of a name to identify the recreation area of the estuary.

4.26 RIVER MOUTH BEACH

This refers to the estuary environment (see Plate 13) starting from the shoulder of the estuary (where ocean meets river) incorporating the dunes and mudflats, and stretching up river to the boat launching ramp. The strip of mudflats and sandy beach fringing the Manawatu River mouth stretches over a distance of nearly 1¾ miles. While the mean high tide line covers most of the sand areas, submerging parts of the smaller frontal dunes, the intertidal zone provides an average width of about 160 yeards of beach.

Although the beach is nearly 1¾ miles long , less than a mile of it is heavily used for recreation: the localised site is limited to the lower estuary, the area between the river entrance and the sailing club. The abundant dunes of varying sizes confonting the sea; a sizeable area below mean sea-level which extends inwards from the lateral beach but behind the foredune; the wide expanse of a relatively sheltered beach and the easy access to it have helped this site become a recreational facility worthy of use by leisure-seekers.

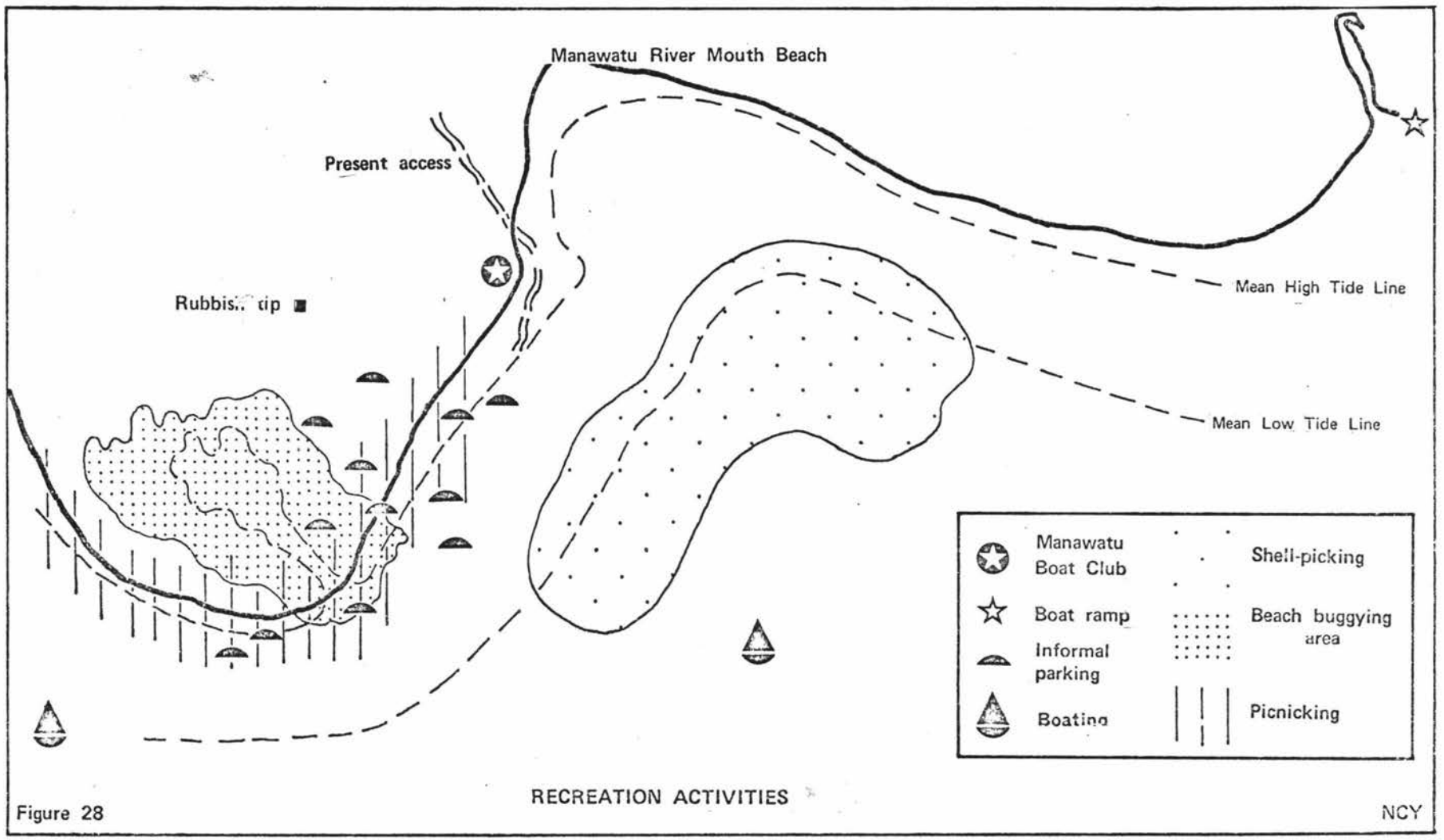
The other part of the esturary is non-dunal and muddy: the present encroachment of houses, moreover, occupying the foreshore of this stretch of beach has derived unconfined space and visual pleasure for recreational purposes. The only contribution that this

"disadvantaged" part of the estuary makes is that adjoining waters contribute to the estuary with its relative advantage becomes the 'gravity-centre' resulting in the anomalous situation whereby the lower shoreline is overburdened while the inner reaches of the estuary area are relatively free from use (with the exception of boat lauching).

From the recreation point of view the uncontrolled use of space within the confines of the 'gravity centre' has led to several problems, the major ones being associated with overcrowding and user-conflicts. Free movement into this area without regard to 'maximum capacity' during peak periods has often led to keen competition for quality space. It has also partly been responsible for the unintentional occupation by users, of the ecologically more sensitive environments. While overcrowding is also a cause, the existing absence of any beach zoning policy has perpetuated in this area, a situation where recreationalists intermingle within the same space in pursuit of their different activities. User-conflicts arise out of this inter-mingling between the passive and more active types of beach-orientated activities. The common phenomenon of clashing interests here between beach buggy riders and picnickers; jet-boaters and swimmers; vehicle and man; are examples of such user-conflicts. An alleviation of such conflicts can largely be provided through an imposed zoning system.

4.27 RECREATION ACTIVITIES

Water-based recreation in the estuary includes swimming, boating, sailing and water-skiing. While swimming is generally limited to the area along the shoreline where the water is not more than eight feet in depth the latter is not the best swimming area because of its muddy bottom. Boating and sailing use the same water



RECREATION ACTIVITIES

Figure 28

NCY

space as speed boating and water-skiing. The shallowness of the estuary during lowest tide periods presents some problems to such activities.

Beach-buggying is very popular in this area, with most of its activities centered around the inner line of the foredune - mean high tide zone area, and the larger more stable dunes across from it. (Plate 21). In their transition from one area to another buggies have to pass through a zone of family picnic activities and moving cars. To these two groups the buggy activity is presenting a safety problem particularly from the more careless buggy drivers. The zoning patterns conceived in Figure 30 is an attempt to break down such user-conflict.

Figure 28 shows that picnickers and cars occupy much of the sandy foreshore area with reservations for the muddy shores. The public picnic site is also used by picnickers. There is however only one access point to this 'advantaged' part of the estuary.

4.28 ZONING OF THE ESTUARY FOR RECREATION

Any zoning practices for recreational purposes must take into consideration the ecological importance of that area for reasons expounded by McHarg (see 4.21). Cooper (Hite ed 1971 : 133) reminds us: "any system of management devised for the coastal zone must, as a first consideration, reflect the ecological processes that occur in that zone. These basic natural forces and processes form, in a sense, the constraints within which a management system must be developed. If it develops outside these constraints or fails to take them into consideration, it will 'fail'. Thus the delineation of ecologically sensitive boundaries in Figure 29.

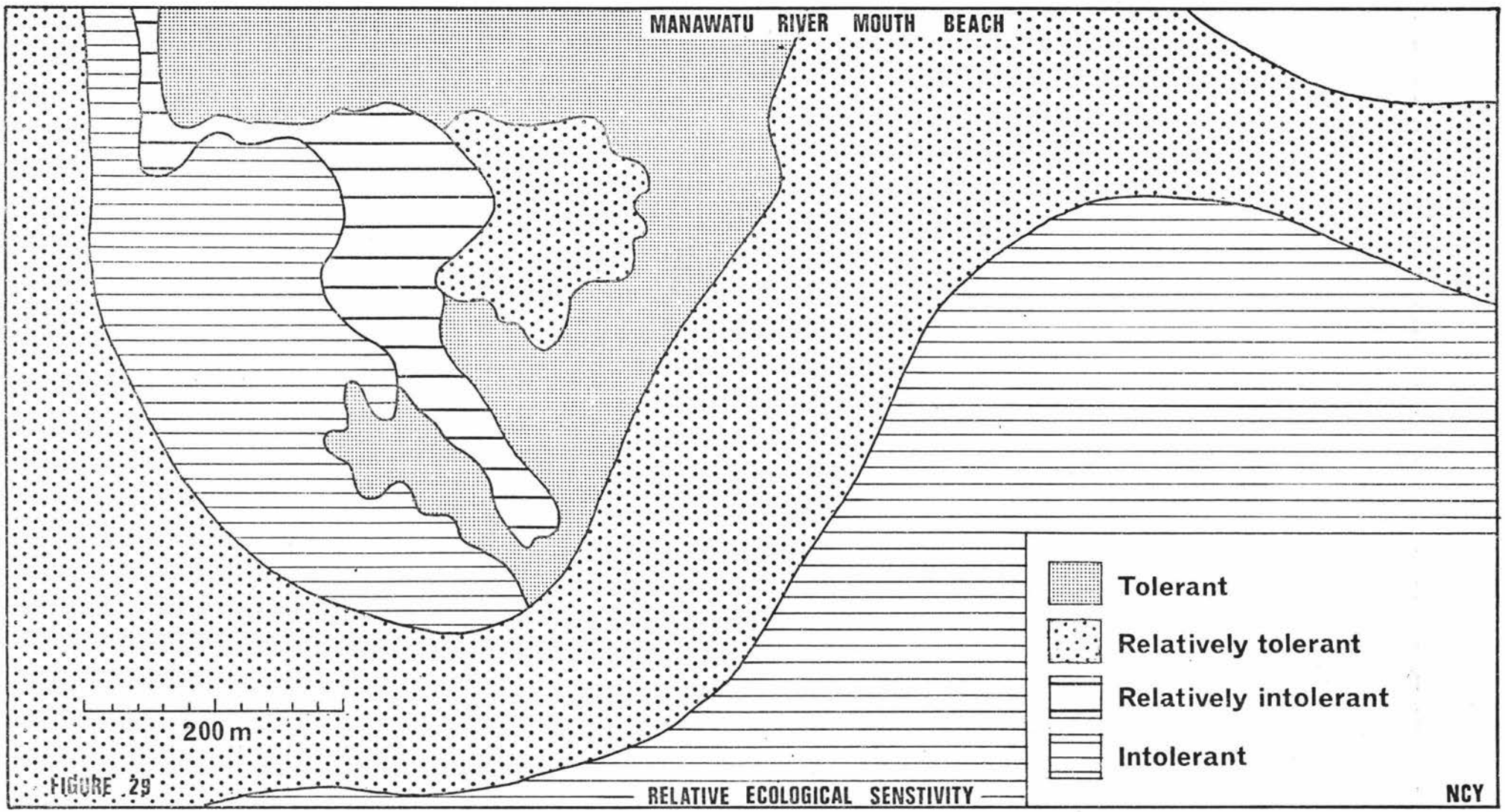

MANAWATU RIVER MOUTH BEACH
Tolerant
Relatively tolerant
Relatively intolerant
Intolerant
200 m
RELATIVE ECOLOGICAL SENSTIVITY
NCY

FIGURE 29

There are distinctly two broad zones of absolute intolerance namely the very unstable foredune, and the shallow water zone of the estuary which is rich in marine life and also the feeding ground for birdlife. The other intolerant zones are those areas occupied by the somewhat less defined but more stabilized secondary dunes.

The major tolerant zone occupies the sandy inter-tidal zone. Included in this zone is the protrusion inland bounded between the foredune in the west and the more stabilized secondary dunes on the east. This is an area of under mean high tide influence. The other relatively tolerant zones are those areas covered by back-dunes, troughs and sand-plains.

It is evident that conflicts exist between man and activities, and these and ecological boundaries. A large part of the very sensitive foredune is used for beach buggying activities while the ecologically diversified but sensitive area of mudflats is infested with shell-fish pickers. Water-skiing and power boating use the same stretch of shallow water where shell-fish and other marine organisms thrive. This can be considered ecologically incompatible and harmful because noise and extreme water movement may have adverse effects on the life cycle of these organisms.

The identification of these 'conflicting zones' (i.e. between ecological sensitivity and use) provides the basic principle in zoning of the estuary for recreation. The other principle involved of course, is the wise allocation of "free environment" suitable for each individual recreation zones suggested for the estuary (see Figure 30). Two zones are delineated within the estuary and three others from the river entrance outwards.

ZONE I: THE PASSIVE ZONE - this zone is for housing the participants of passive activities like playing in the eroded sand dune behind the stabilized dunes, picnicking and general relaxing.

ZONE II: THE PASSIVE BOATING ZONE - the less adventurous and less active pursuits of sailing and non-powered boating are included in this zone which takes in all the water area except those shallow parts where they are ecologically most sensitive. The latter includes the zone of prohibition prescribed to maintain and conserve marine and wildlife in the estuary.

ZONE III: THE SWIMMER'S ZONE - these areas are relatively shallow not often over eight feet deep and moreover do not have a muddy bottom. These are areas suited for swimming purposes although they are not the best swimming grounds in Foxton Beach.

ZONE IV: THE ACTIVE ZONE - the limited water area of the estuary does not support the case for its being used for the more active and more adventurous water sports of speed-boating, water-skiing and competitive sailing. Moreover, the ecology of these shallow waters in the estuary prohibits such activities. As these activities require more open water space the most suitable area will be the open sea. The fourth zone thus could be delineated from the entrance of the river outwards to the sea.

Beach buggy activities are not accommodated by any of the land zones because of the prime ecological consideration for the dune environment in the estuary. There are however, some sizeable and well stabilized dunes just behind the secondary, dunes north of Ocean Beach and these dunes perhaps, could tolerate this activity.

OCEAN BEACH (Plates 22, 23, and 26)

In comparison with the River Mouth Beach, Ocean Beach is more popular with family visitors because of the public amenities it offers. Unlike the former, Ocean Beach offers such public facilities as a formal parking area; a changing shed; a pair of concrete ramps; and also has the service of beach patrols during the summer season.

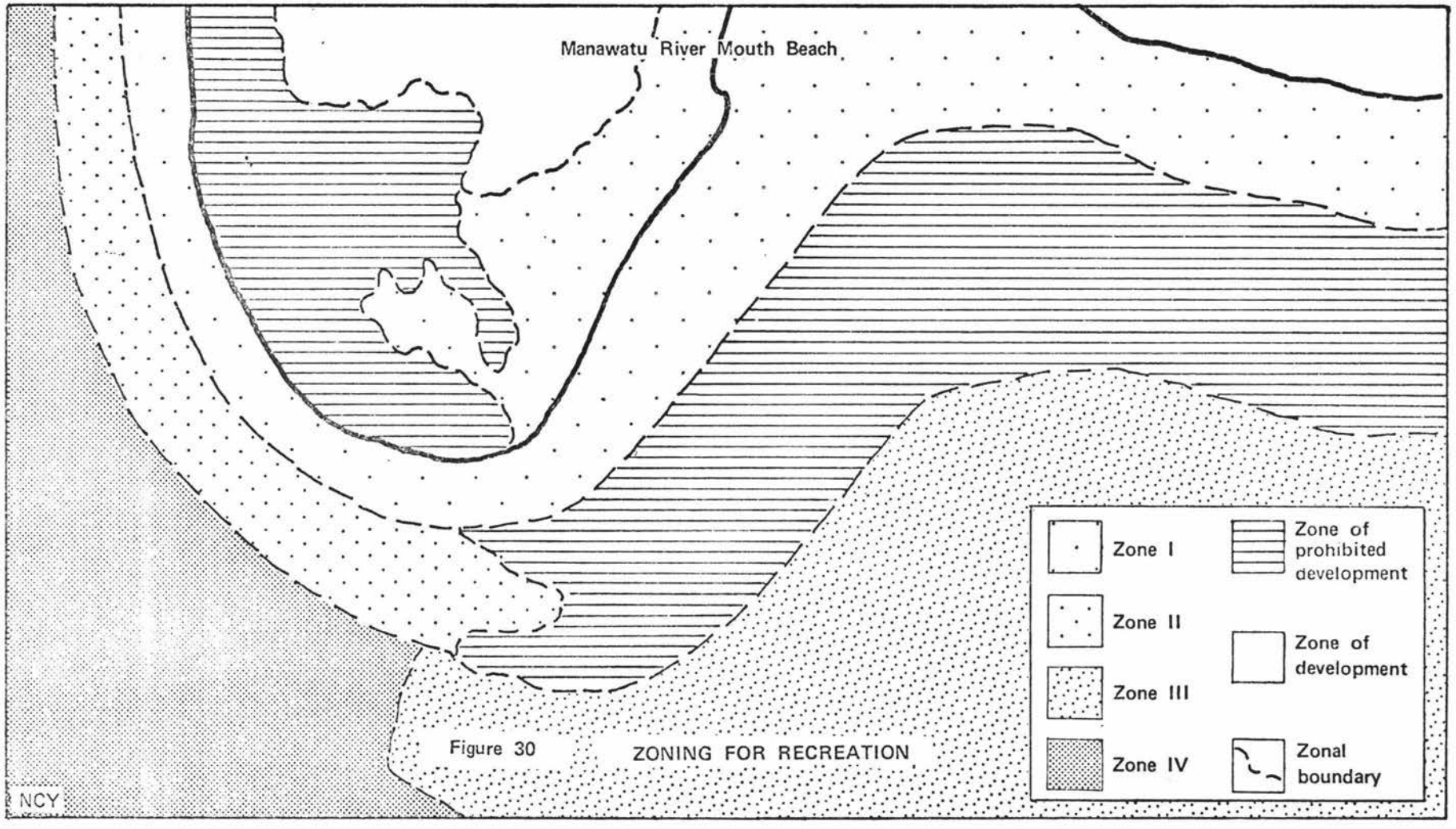


Figure 30 ZONING FOR RECREATION

These facilities are all located in the same area, that is, the area between the boat ramp and the rear end of the public car park.

The topography around Ocean Beach is quite similar to that described in Profile B. A strip of permanent beach about 10 yards wide left exposed during mean high tide and the width of the inter-tidal zone averages out to around 150 feet. Behind the sandy permanent beach is the belt of unstable foredune breached in places by both natural and human agents. Behind this lies the trough which gives way to a broad belt of prominent secondary dunes. The secondary dune runs into a huge sheet of plain on the leeside and the present uncontrolled housing development has encroached right up to the foot of the leeward slope of these dunes.

4.30 Recreation activities and problems associated with the beach.

The majority of beach recreation activities are pursued within the confines of the sandy beach. Amongst the popular activities are sunbathing, swimming and picnicking. Boating is also pursued here. The foredune is irregularly used and predominantly by the younger age group as a play area, but also by a small percentage of the more energetic of the older age group who take walks on it.

Two major problems confront users at Ocean Beach, the first of these being safety. The patrolled zone of the water is confined to the area between the two boat ramps, an area of not more than 80 yards wide. While safety of swimmers is relatively assured within this stretch of water, those who swim outside this perimeter do not benefit from the attention of the lifesavers.

Yet another threat to safety is moving vehicles and it is not uncommon to witness cars and motorcycles travelling at faster than the permitted speed of 20 m.p.h. Accidents mainly involving young children have been bitterly reported[14]. A system of policing speed along this beach has been introduced but the times of duty of these traffic officers are somewhat too infrequent to be effective. The 'safety zone' moreover, is too small an area to accommodate all those who wish to swim there.

Another problem is littering. Broken bottles and 'left-overs' from picnic snacks are quite commonly found littering this beach. Driftwood is also contributing to the overall untidy appearance of the beach (Plate 22). A similar problem, though somewhat different in cause exists at River Mouth Beach where prevailing winds have frequently caused severe litter and smell problems to the area adjacent to the present rubbish tip (Plates 24 and 25).

Two other problems, this time associated with the visual quality of the beach and its adjacent environment can be noted in passing : the visual quality of the carpark and the problems of housing encroachment. The carpark was planned to bring cars together at a central place on the beach front but visitors have used the area, not only as a parking lot but also an unofficial lookout point. The construction of the carpark is such that the netting at the front of the park in the path of the prevailing wind is catching sand which results in sand pile up (Plate 27) and when unremoved the latter may cause (and has on numerous occasions) obstruction to the view of the ocean while at the same time producing an unsightly scene at ground level. Also,

since the carpark is exposed to the prevailing wind and parking and viewing are now co-dominant activities to some users, it may perhaps serve both functions more effectively if a series of foredunes are allowed to develop and this backed by a more stabilized series of dunes behind it, and with the carpark constructed behind these at a level higher than these dunes. The new siting and elevation of such a carpark will mean a great reduction in sand-blast on the dunes in front. The elevated height will also reduce the amount of potential sand collected, at the same time enhance the function of a 'look-out' point.

The present encroachment of housing adds to the despoilation of the beach environment. There is a lack of orderliness in house siting along the beach front, with quite a few of them situated and scattered right on the foot of the lee-side of the existing secondary dune (Plate 28). Beach encroachment should be legislated against in order to ensure :

(i) a prolonged inheritance of the dune environment; and

(ii) where applicable, and where ecology allows, the public rights of access to the beach.

Field observations have made possible the identification of these problems existing at River Month Beach and Ocean Beach. Part of the results of the questionnaire surveys moreover, confirm their existence.

Questionnaire Surveys

Questionnaire surveys were conducted at Foxton Beach to provide basic data from which a fuller understanding of the recreational use of the beach can be obtained. The data collected moreover, can be a valuable aid in making planning management decisions.

4.31 Methodology

Surveys were administered over three different types of weekend. Interviewing took place on Sundays of these weekends since this is the day of the week that most people have the opportunity for outdoor recreation. The first of these surveys was administered on the 22 October 1972 - Labour Sunday - a public holiday weekend. The second survey was conducted on a 'normal' Sunday (22 November 1972) followed by the last one on the 14 January 1973 which was a Sunday during the summer vacation period.

Questionnaires were administered at those areas where most people were found. These areas were; the river mouth area (herein called River Mouth Beach); Ocean Beach north (i.e. the area north of and including the boat ramp and carpark); and Ocean Beach south (i.e. the area south of and including the boat ramp). Because of limited human resources and because of the layout of the beach, it was beyond the researcher's means to control and check movements and cross-movements of people for random sampling. A sampling method was arrived at however, where a member of every fourth group of people was interviewed by survey assistants who were walking along the three survey sites.

4.32 The Questionnaire

The content of the questionnaire can be broadly classified into three main sections. The first section concerned the characteristics of visitors and their visits. Included in this section were details relating to length of journeys, origins of visitors, and the use made of the beach by each visitor. The second section was concerned with the

degree to which visitors were satisfied with the existing conditions on the beach, and the changes, if any, they would like to see made. The last section was designed to provide details of personal characteristics of visitors, these were the composition of groups; age; sex and marital status.

4.33 Characteristics of Visitors

1. The majority of people interviewed at Foxton Beach travelled by car (Table XX). 95.8% of all visitors interviewed used the motor car as their dominant method of travel, thus emphasising the role of the motor car in the pursuit of outdoor recreation.

Table XX. Method of Travel

	Percentage of Visitors			
Method of Travel	Survey 1	Survey 2	Survey 3	Cumulative Total
Walking	1	3.4	3.3	2.7
Bicycle	-	1.7	-	0.6
Motorcycle/Scooter	-	-	0.8	0.3
Car	99	93.2	95.9	95.8
Bus/Coach	-	-	-	-
Other	-	1.7	-	0.6

2. Distances travelled varied greatly from individual to individual but the patterns were about the same in all three surveys. In terms of percentage from cumulative totals of distance travelled, most of the journeys were from the distance cohort 25-29 miles. When the average distances were calculated for each survey, the results confirmed largely the above result (Table XXI). The grand average for the distance travelled over the three days was 28.3 miles. Quite a

significant proportion it should be noted travelled only short distances of up to 4 miles, coming mainly from the Foxton - Foxton Beach area. It seems however that Foxton Beach is able to attract visitors from quite a distance away and particularly during holiday weekends. Table XXI shows that during the Sunday of the Labour Weekend public holiday, 12% of those interviewed came from 60 or more miles away.

Table XXI. "How far have you travelled to get here today?"

	Percentage of Visitors			
Distance travelled	Survey 1	Survey 2	Survey 3	Cumulative %
0 - 4	10	15.4	19.1	15.1
5 - 9	3	0.9	0.8	1.5
10 - 14	3	0.9	3.3	2.4
15 - 19	4	2.5	5.8	4.2
20 - 24	12	3.4	21.7	12.5
25 - 29	28	45.3	22.5	32.0
30 - 34	14	10.3	7.5	10.4
35 - 39	5	1.7	7.5	4.7
40 - 44	5	2.5	4.2	3.8
45 - 49	0	0.9	0	0.3
50 - 54	3	1.7	4.2	3.0
55 - 59	0	5.1	0	1.8
60 and over	12	7.7	1.7	6.8
Don't know	1	1.7	1.7	1.5
Average distance travelled	33.0	29.0	23.0	
Cumulative average				28.3

3. The origins of these journeys were contained in Table XXII and a graphic representation of its data was plotted

in Figures 31-34. It is apparent that visitors came from within the region and also from outside of it.

Table XXII. Origins of Visitors

Origins of Visitors	Percentage of Visitors			
	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Palmerston North	45	54.7	45.0	48.3
Feilding	16	4.2	7.5	8.9
Marton	1	1.7	2.5	1.8
Foxton	5	6.8	6.7	6.2
Foxton Beach	7	10.2	13.3	10.4
Pahiatua	3	0.9	1.7	1.8
Opiki	-	-	0.8	0.3
Hunterville	1	-	0.8	0.6
Shannon	3	0.9	1.7	1.8
Woodville	1	-	1.7	0.9
Ashhurst	-	1.7	1.7	1.2
Dannevirke	1	3.4	0.8	1.8
Levin	3	3.4	3.3	3.3
Awahuri	-	-	0.8	0.3
Oroua Downs	-	0.9	1.7	0.9
Glen Oroua	1	-	-	0.3
Wanganui	1	0.9	0.8	0.9
Cheltenham	-	-	1.7	0.6
Mt Stewart	-	-	0.8	0.3
Sanson	-	-	0.8	0.3
Ohakea	-	0.9	0.8	0.6
Ballance	-	-	0.8	0.3
Longburn	-	-	0.8	0.3

Continued

Table XXII. Continued

Origins of Visitors	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Rongotea	1	-	0.8	0.6
Himatangi	1	-	0.8	0.6
Linton	-	-	0.8	0.3
Wellington	7	6.8	0.8	4.7
Raumai	-	0.9	-	0.3
Bainesse	-	0.9	-	0.3
Waipukurau	1	-	-	0.3
Masterton	1	-	-	0.3
Gisborne	1	-	-	0.3
Bunnythorpe	-	1	-	0.3

4. While Foxton Beach attracts also the long distance traveller it seems that the beach satisfies little more than the needs of the day-tripper. Table XXIII indicates that not more than 11% of those interviewed were on holiday there and the majority of these had their own accommodation.

Table XXIII. "Is your visit a trip out from home or part of a holiday stay here?"

	Percentage of Visitors			
	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Trip Out	89	92.3	85	88.7
Holiday Stay	11	7.7	15	11.3

5. It is apparent from Table XXIV that most visitors to Foxton Beach were not casual visitors; the majority of those interviewed were making planned trips and had usually been to the

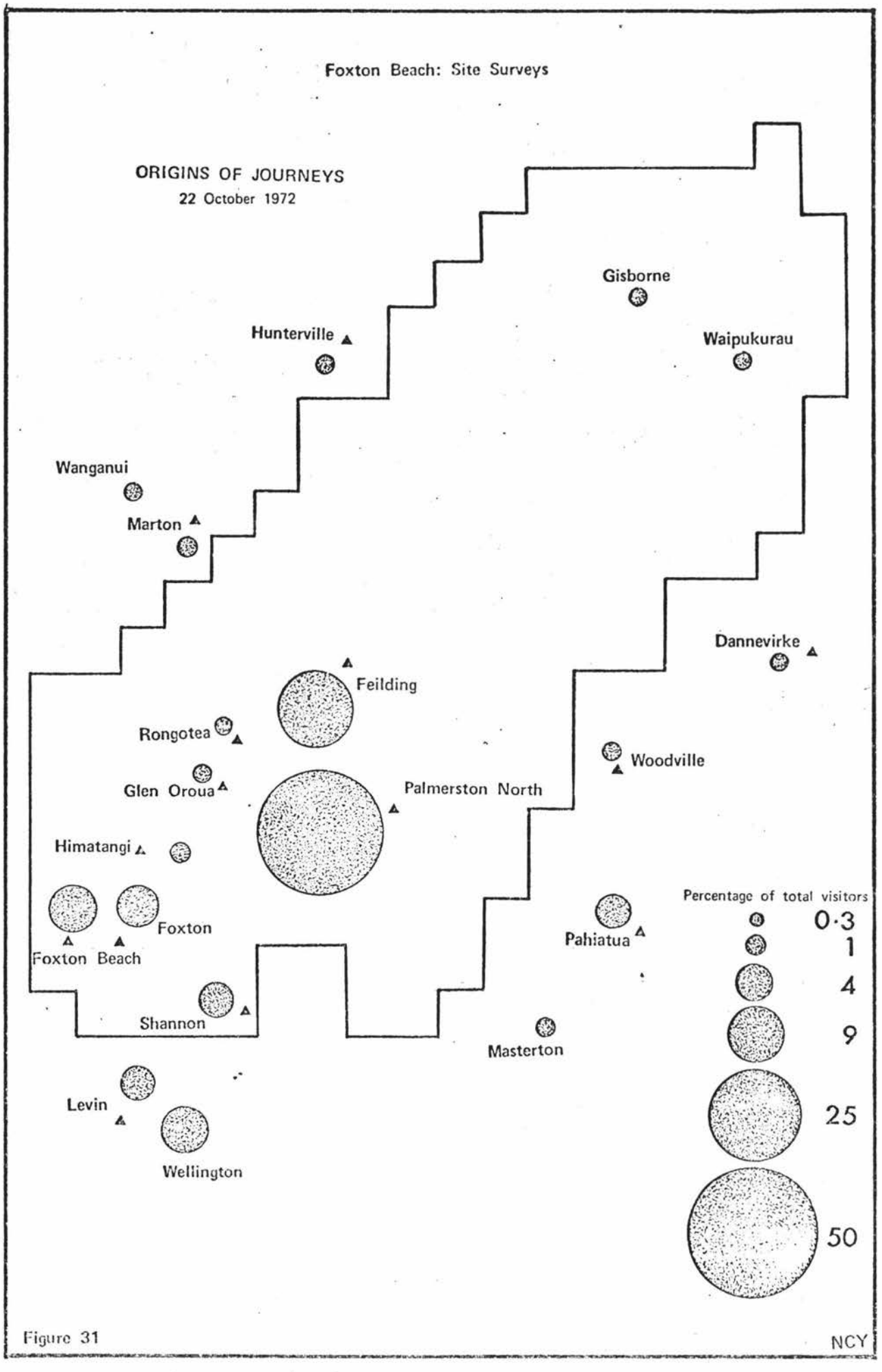


Figure 31

NCY

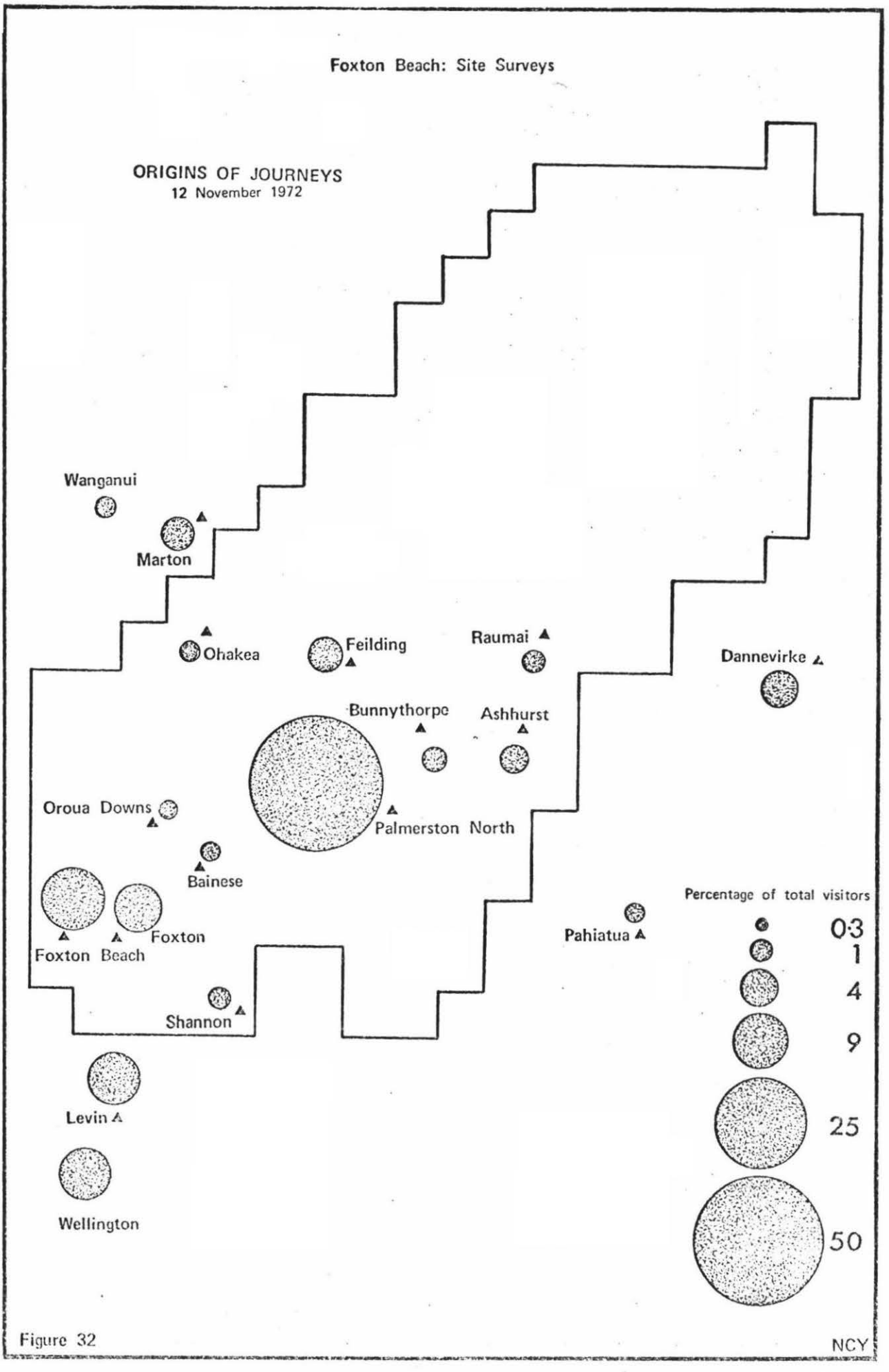

Foxton Beach: Site Surveys
ORIGINS OF JOURNEYS
12 November 1972
Wanganui
Marton
Ohakea
Feilding
Raumai
Dannevirke
Bunnythorpe
Ashhurst
Oroua Downs
Palmerston North
Bainese
Foxton
Foxton Beach
Pahiatua
Shannon
Levin
Wellington
Percentage of total visitors
0·3
1
4
9
25
50
NCY

Figure 32

Foxton Beach: Site Surveys

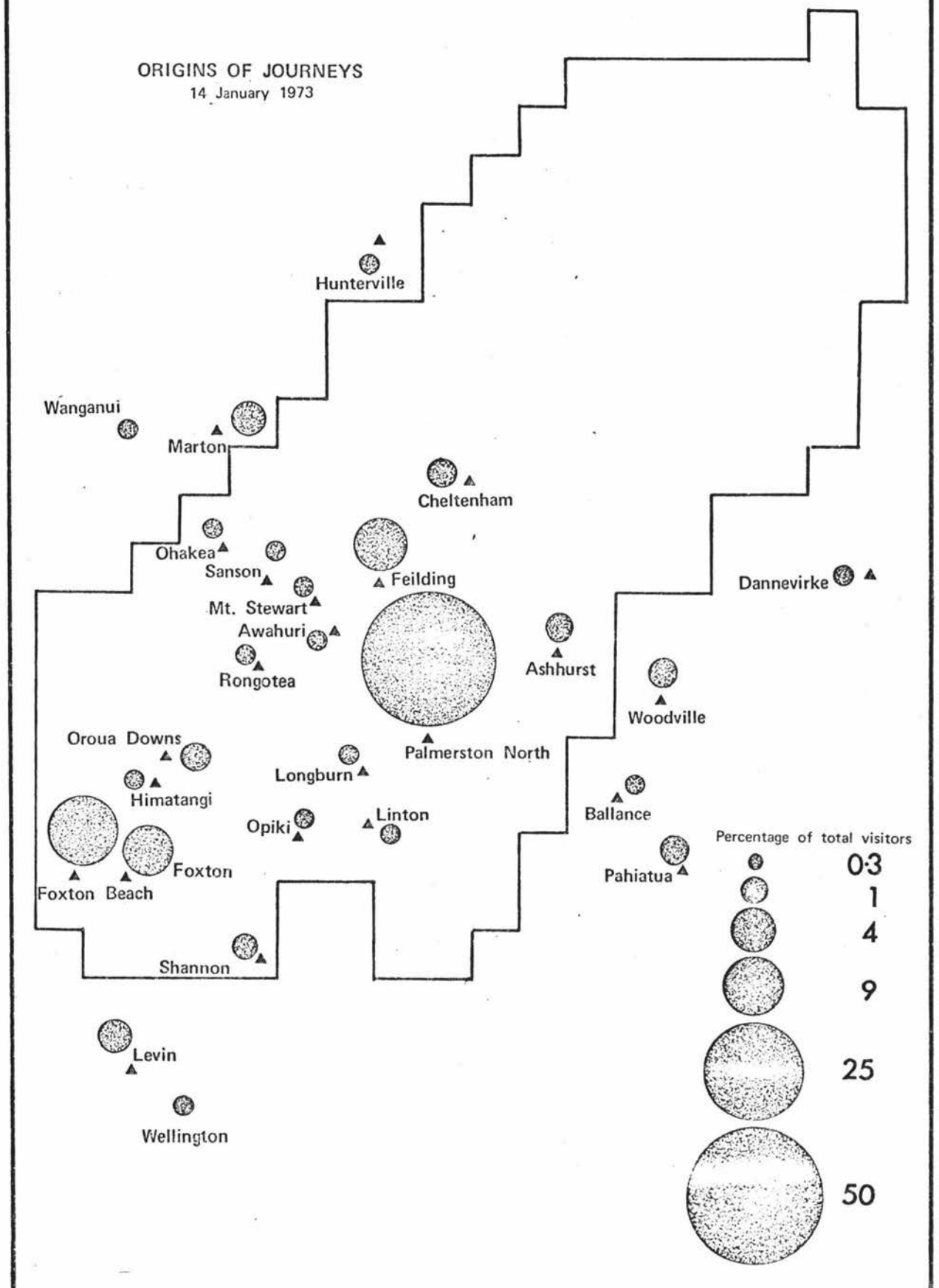
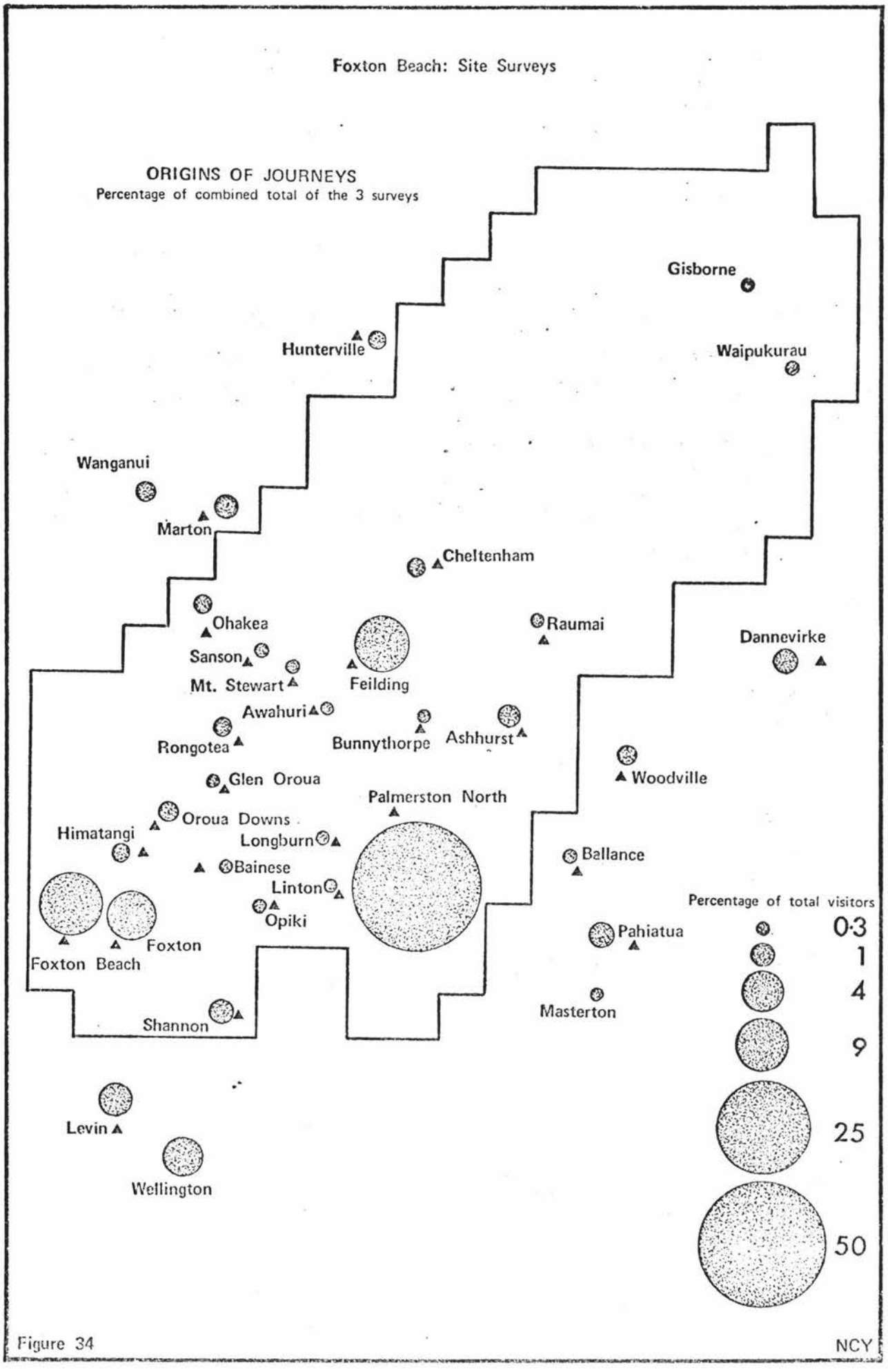


Figure 33

NCY


Foxton Beach: Site Surveys
ORIGINS OF JOURNEYS
Percentage of combined total of the 3 surveys
Gisborne
Hunterville
Waipukurau
Wanganui
Marton
Cheltenham
Ohakea
Raumai
Dannevirke
Sanson
Mt. Stewart
Feilding
Awahuri
Rongotea
Bunnythorpe
Ashhurst
Woodville
Glen Oroua
Palmerston North
Oroua Downs
Himatangi
Longburn
Ballance
Bainese
Linton
Opiki
Pahiatua
Foxton
Foxton Beach
Masterton
Shannon
Levin
Wellington
Percentage of total visitors
0·3
1
4
9
25
50
Figure 34
NCY

beach before. The results in the table below perhaps indicate the appeal of the 'rural' nature of Foxton Beach which attracts people making planned excursions - four out of five visitors interviewed had set out from home with the intention of visiting Foxton Beach, and nine out of every 10 visitors interviewed on all the survey occasions had visited Foxton Beach before. These results indicate that recreational visits to Foxton Beach are seldom haphazard; they are usually planned on the basis of previous knowledge of the area.

Table XXIV. Patterns of Visiting Foxton Beach

Did you plan to come here today or were you just passing?

	Percentage of Visitors			
	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Planned Visit	89	88.9	93.3	90.5
Just Passing	11	11.1	6.1	9.5
Have you been here before?				
Visited before	93	93.2	95.8	94.1
First visit	7	6.8	4.2	5.9

---

6. The ordered pattern of recreational visits to the beach is confirmed yet again when the timing of the previous visits is examined (Table XXV). The majority of those interviewed had visited the beach within the last month (grand cumulative % of 48.9%). Although the results of individual surveys showed some discrepancies in timing of visits, this is expected particularly of the first survey where interviews were administered in late spring as against the rest which were conducted in summer. The influence of seasons over the patterns

was borne out when the two surveys made during summer were examined. These showed that one out of three had visited the beach during the week previous to the date of the survey as against the ratio in the survey where one out of every ten had done so.

Table XXV. When was your last visit?

	Cumulative percent of visitors who had visited site before			Cumulative Percent
	Survey 1	Survey 2	Survey 3	
Within last week	11	31.6	39.2	28.1
Within last fortnight	21	39.3	49.2	37.3
Within last month	33	53.8	58.4	48.9
Within last 3 months	47	61.5	64.2	57.8
Within last year	78	82.9	86.7	82.4
Over one year ago	94	92.4	94.2	93.1
Total	100	100	100	100

7. The reasons why people visit Foxton Beach are indeed numerous; they are influenced by personal motives and by the characteristics of the beach. Table XXVI is a summary of the reasons given by visitors over the three surveys and the varied nature of their reasons is most noticeable. It can be said however that for those who come to Foxton Beach, there are two basic groups - the informal outing oriented group whose destination is not dependant on activities offered by the beach; and the activity oriented group whose pursuits require the water or the beach. This group is clearly dependant on what is available or provided by the beach conditions.

The results of the groupings of the reasons show that the great majority of those interviewed belong to the informal

outing group and for the Foxton Beach is the destination of a planned Sunday driving excursion. Swimming seems also a popular pastime, particularly for those who visited the beach during the warmer season.

Table XXVI. "What were your reasons for coming here?"

	Percentage of total responses			
	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Activities oriented	25.4	34.2	26.0	28.8
Swimming	9.1	11.6	13.0	11.5
Surfing	4.5	3.7	2.1	3.3
Boating/Yachting	-	4.4	-	1.5
Fishing/Shell Fishing	3.6	13.1	10.9	9.7
Beach buggying	7.3	0.7	-	2.3
Horse-riding	0.9	0.7	-	0.5
Informal Outing	68.0	62.9	67.1	66.1
Dayout/drive	52.7	46.0	38.3	45.0
Picnicking	0.9	1.5	-	0.8
Bring children out	5.5	3.7	6.8	5.3
Sunbathing	0.9	4.4	19.2	8.9
Visiting friends/ relatives	4.5	5.1	1.4	3.6
Nice beach	4.5	2.2	1.4	2.5
Others	5.4	2.9	6.9	5.1
Closest beach	2.7	1.5	3.4	2.5
House here	1.8	-	1.4	1.0
Live here	-	0.7	-	0.3
Holiday/Stay here	0.9	0.7	2.1	1.3

4.34 Beach Conditions and Changes

Visitors to the beach were asked whether they were satisfied with the area the way it was or if there were any changes they would like to see made. Since those seeking recreation are able to choose where they spend their leisure hours it is perhaps expected that they go to places which satisfy them, however results from the respondants did not clearly indicate this expectation. During the first occasion there was a slight majority who expressed satisfaction, but on the second survey a higher number of those seeking changes was indicated. The third survey indicated a somewhat ambiguous position whereby change and non-change responses were approximately equal. The combined results of these three surveys indicate however, a slight tendancy to seek changes (Table XXVII).

Table XXVII. Satisfaction with Beach

	Percentage of Visitors			
	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Satisfied	53	40.1	50.8	47.8
Changes desired	47	59.9	49.2	52.2

Those who were dissatisfied with conditions at Foxton Beach, were asked to specify the types of changes they felt would improve the area. Although as many as nineteen changes were listed, the frequency of certain changes desired made it possible to broadly classify the types of changes desired into three categories, these were:

(i) Safety,

(ii) Amenities and,

(iii) Facilities.

The need felt for safe enjoyment of the beach confirms very much what field observations have noted about conflicting interests (4.27 and 4.28). Most of those who indicated a need to zone the beach (i.e. seperate beach buggies and moving cars from picnickers) were those interviewed at River Mouth Beach where the beach buggies were the most popular activity.

Table XXVIII. Changes desired at Foxton Beach

	Percentage of Visitors			
	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Safety	22.9	17.6	23.0	20.9
Cars prohibited on beach	10.4	5.0	9.5	8.0
Zoning of beach	8.3	11.3	5.4	8.4
Bigger patrol area	4.2	1.3	8.1	4.5
Amenities	20.9	22.6	41.9	30.3
Changing sheds, showers	2.1	2.5	8.1	4.5
Toilets	8.3	6.3	17.5	10.9
Seats and benches	-	1.3	1.4	0.9
Shelter and shade	4.2	2.5	6.8	4.5
Rubbish bins	2.1	-	5.4	2.5
Trees	4.2	10.0	2.7	7.0
Facilities	27.0	31.2	10.8	22.1
Recreation facilities	8.3	11.3	5.4	8.4
Picnic facilities	6.2	1.3	-	2.0
Entertainment/more to do	12.5	16.3	5.4	11.3
Hotel	-	1.3	-	0.4
Others	29.2	29.6	24.4	26.7

continued

Table XXVIII. Continued

	Percentage of Visitors			
	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Cars allowed on beach	-	1.3	2.7	1.5
Keep site clean	8.3	8.2	10.8	9.4
Shops located nearer beach	4.2	-	2.7	1.0
Improve beach front	2.1	-	-	0.4
Improve car park	6.2	12.5	1.4	7.0
Improve access	8.4	7.6	6.8	7.4

The lack of amenities at the beach has been a source of great dissatisfaction to visitors. There is only one changing shed and one toilet at Ocean Beach and none at River Mouth Beach.

Whatever recreation facilities there are at Foxton Beach are limited to those described earlier under "public recreation facilities", and these are genrally speaking, provisions made for children up to sixteen years of age. Those whose sought more recreation facilities and entertainment were of the young adult - adult age group. It is also important to note that the majority of those who were on holiday at Foxton Beach sought more of these type of facilities.

Improvements to the car park and access roads were also suggested and indicate the importance which should be given to meeting the needs of the car-borne visitors. An enccuraging feature was the appeal for cleanliness and tidiness at the beach and there were regrets for rubbish tins.

Respondants were also asked to specify the types of facilities they would like to see developed at Foxton Beach. The results confirmed the pressing needs for the provision of basic conveniences such as toilets and changing sheds, as was pointed out earlier. The lack of "things to do" at Foxton Beach is reflected in the high responses made toward the suggestion for a multi-purpose recreation restaurant (Table XXIX), and it is noticeable that the majority of these respondants were between 20 - 39 years old.

Although there was a one to one ratio in those interviewed to seek changes at the beach, nine out of every ten interviewed also indicated that they would return to Foxton Beach again regardless (Table XXX). The majority of those interviewed during the warmer days of the surveys indicated that they would return within the next fortnight. It is also noticeable that while only two out of five interviewed in the second survey indicated that they would like to visit Foxton Beach again, two out of every three interviewed in the third survey took this stand (Table XXXI). Such results may suggest the need of the people to get away to the beach on a nice day, even though the conditions there may seem short of the ideal.

Table XXIX. "Which of the following facilties would you like to see developed?"

	Percentage of total responses			
	Survey 1	Survey 2	Survey 3	Cumulative Percentage
barbecue facilities	11.9	19.6	20.9	17.6
multi-purpose recreation restaurant	29.3	18.5	23.5	23.2

Continued

Table XXIX Continued.

	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Toilets and changing sheds	27.0	32.7	34.8	31.5
tables and benches	12.7	14.9	13.0	13.7
lookout	5.6	3.0	0.9	3.2
accommodation	10.3	4.2	1.7	5.4
others	3.2	7.1	5.2	5.4

Table XXX . "Would you visit Foxton Beach again in the near future?"

Percentage of Visitors

	Survey 1	Survey 2	Survey 3	Cumulative Percentage
Yes	96	99.1	98.3	98.0
No	4	0.9	0.7	2.0

Table XXXI. "When do you think you will visit this place again?"

	Cumulative percentage of total responses			Grand Cumulative Percentage
	Survey 1	Survey 2	Survey 3	
Within next week	19	32.5	49.2	34.4
within next fortnight	33	41.9	62.5	46.6
within next month	57	76.1	78.3	71.2
within next 3 months	74	84.6	79.1	79.5
within next 6 months	76	88.0	79.1	81.3
within next year	81	89.7	84.1	85.2
Total	100	100	100	100

4.35 Composition of Groups

The examination of the composition of groups of visitors revealed the importance of outdoor recreation as a family activity. At least 50% of all groups in the samples were family units (on average over the three surveys three out of every 5 interviewed belonged to family units - Table XXXIII). The size of groups of visitors was shown to be consistent over the three surveys, the minimum size being 4.7 persons per group and the maximum being 5.3 persons per group. It is evident from the Table (XXXII) that very few visitors came to the beach alone. There was only a total of 15 people out of a grand total of 337 people who came to the beach alone.

Table XXXII. Size of Groups

Size of Group	Percentage of Visitors			
	Survey 1	Survey 2	Survey 3	Cumulative Percentage
1 person	4	5.1	4.2	4.5
2 persons	11	15.4	18.3	15.1
3 persons	11	10.3	9.2	10.1
4 persons	17	23.9	19.2	20.2
5 persons	18	13.7	18.3	16.6
6 persons	17	3.4	11.7	10.4
7 persons	10	3.4	5.0	5.9
8 persons	3	6.0	5.8	5.0
9 persons	4	1.7	-	1.8
10 persons	5	17	8.3	10.4
Average size	4.9	5.3	4.7	5.0

Table XXXIII. Composition of Group (%)

	Percentage of Visitors			
	Survey 1	Survey 2	Survey 3	Cumulative %
Alone	4	5.1	5.0	4.7
With family	58	50.4	73.3	60.8
With friends	38	40.2	19.2	32.0
With organised groups	-	4.3	2.5	2.5

The personal details of visitors were obtained to provide tentative data on the personal characteristics of beach visitors, and this data has been summarised in Table XXXIV. The examination of data on sex composition seems to support the claim that "males are more likely to participate in recreational activities" (O.R.R.R.C.), than females. Data on the marital status of these visitors showed that the majority of them were married and this suggests the confirmation of family oriented trips to the beach. Details on the ages of these people showed very few significant differences over the three survey periods. Although the predominant age group is between 15 and 34, there were also a significant proportion from other age groups. This may be evidence that recreation on the beach is not only the prerogative of the young and early middle-aged but also of older visitors.

Table XXXIV. Personal Data of Visitors (%)

	Percentage of Visitors			
	Survey 1	Survey 2	Survey 3	Cumulative %
Sex				
Male	64	59.8	55.8	59.6
Female	36	40.2	44.2	40.4
Marital Status				
Married	66	63.2	75.0	68.2

Continued

Single	32	33.2	24.2	29.7
Other	2	3.5	0.8	2.1
Ages				
Less than 15	1	4.3	0.8	2.1
15 - 19	24	12.8	9.2	14.8
20 - 24	19	20.5	18.4	19.3
25 - 29	13	17.1	15.0	15.1
30 - 34	14	9.4	13.3	11.3
35 - 39	4	9.4	10.0	8.0
40 - 44	9	10.2	11.7	10.4
45 - 49	6	6.0	8.3	6.8
50 - 54	7	4.3	2.5	4.5
55 - 59	-	-	-	-
60^{+}	6	6.0	10.8	7.7

4.36 Summary

Several salient points which have planning implications emerge from the questionnaire surveys. These are:

1. Foxton Beach is able to attract both local and regional recreational traffic. The majority of the visitors are day-trippers who travel on grand average a distance of 28.3 miles and traffic from outside the local and regional area forms a total average of about 10% of all visitors interviewed. The above results largely confirms the regional importance of Foxton Beach for recreation, therefore any planning procedures for Foxton Beach should recognise this importance.

2. The majority of those who came had set out the intentions of visiting Foxton Beach and the motor car is their

dominant method of travel. The usual requirements associated with these characteristics are access, car parks and user facilities however, these requirements are insufficiently provided at Foxton Beach.

3. Motivation for visits to Foxton Beach falls broadly into two categories, firstly the 'informal outing' group and secondly the beach activities oriented group. The sea and the natural environment of the beach attract a particular clientele while environments suitable for activities like beach buggying, fishing, boating and surfing are important factors in attracting the activities oriented group.

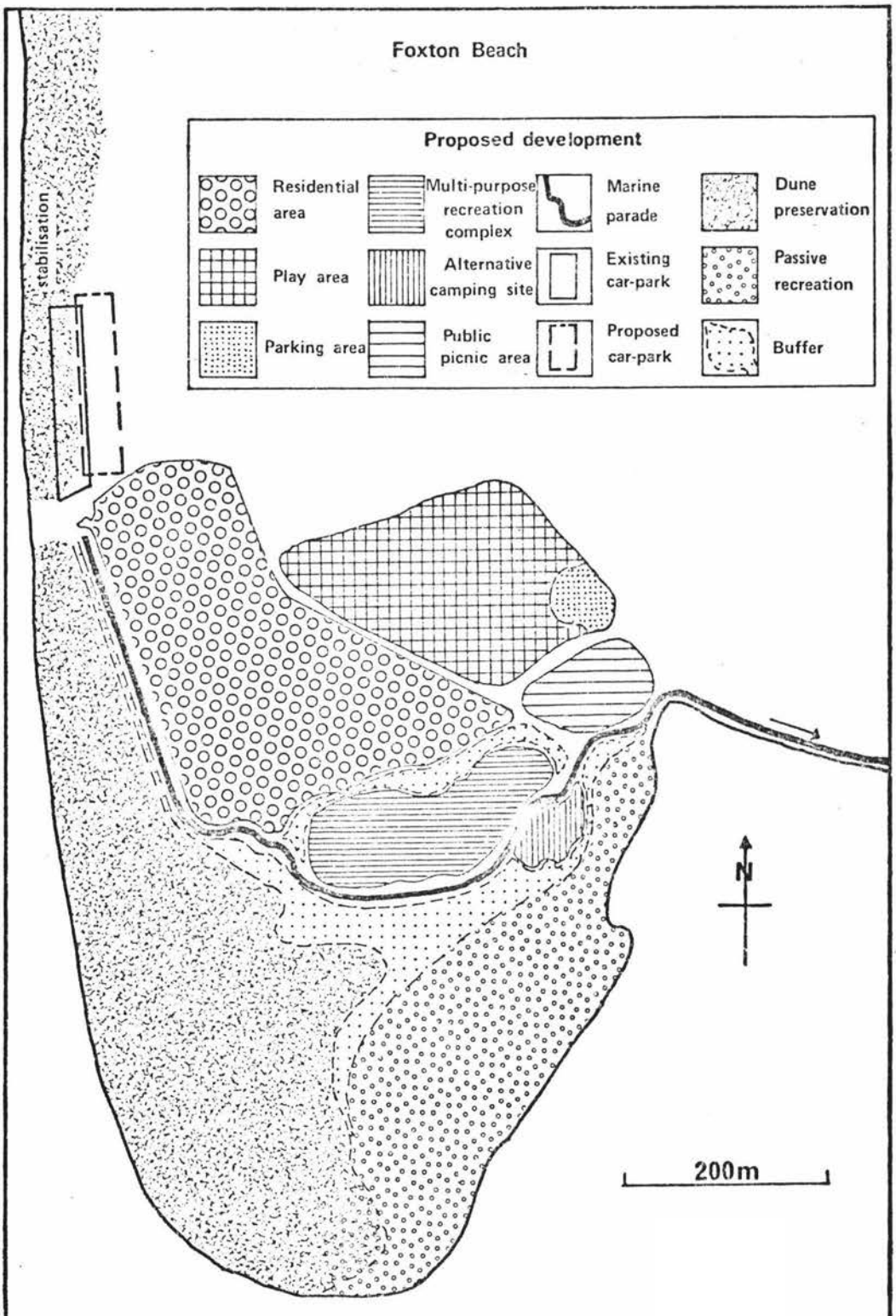
4. While results about desires for change or non-change are not clear, the most frequent suggestions made by those who want changes are for more amenities, entertainment facilities and safety measures.

5. The investigation into the facilities wanted at Foxton Beach confirms strongly the urgency of the need for basic user-amenities. The popular choice of a multi-purpose recreation restaurant, made largely by the 20 - 39 age group reflects the needs of a particular clientele.

4.37 Conceptual Plan

The conceptual plan provided here is a planning strategy developed out of the results of the investigation into firstly, the relationships between users and the environment; and secondly, the patterns observed from the questionnaire surveys. The strategy is concerned with setting policy guidelines for recreational developments and recreation resource conservation.

The plan, see Figure 35, is of a general nature and defines the areas for development or non-development for recreation.



A CONCEPTUAL PLAN FOR RECREATION DEVELOPMENT

Figure 35

NCY

The fore and secondary dunes are defined as a non-development zone where the prime motive is to restore, rehabilitate (where applicable) and stabilize these dunes. The location of the west end section of the proposed scenic road or marine parade (which is fringed by trees) through elevated ground would act as a physical barrier between the ecologically sensitive dune zone and the planned recreation area and the settlement. The alignment of trees also has ecological implications. The scenic road turns east inland to occupy the stretch of foreshore and such a step is intended to stop further urban sprawl and if necessary, even push housing development further back where space is required for that road.

4.38 Development areas

Basically there are two areas for development; the existing public recreation area and the proposed area for the location of a multi-purpose recreation restaurant complex which incorporates the complex and the nearby existing motor camp. The planning strategy in the public recreation area is one of upgrading the present standards of facilities with a view to promoting better use of this area. With suitable landscaping, improvement and addition of facilities (e.g. adventure playground) in this area, Foxton Beach can be partially freed from description as 'a place where there is nothing to do'.

The above situation is envisaged to be greatly reinforced by the development of a 'high grade recreation area' capable of attracting all age groups and providing all year round service. This calls for the proposal of a multi-purpose recreation restaurant complex which includes a variety of physical - social -

visual amusements with provisions for accommodation. The environment upon which this complex is located must attain a high quality of landscaping, where man-made features complement instead of being discordant with the surrounding natural landscape. This proposal has been offered here for two main reasons:

1. Planning is for people and quite often people need to be provided with new challenges and this means opening new dimensions for their leisure. The proposal of this multi-purpose recreational complex is an example of planning innovation.

2. It is clear from the results of the questionnaire surveys that more facilities and amenities are required at Foxton Beach (Tables XXVIII and XXIX).

"No matter how attractive the beach and foreshore, other forms of recreation are necessary." (Easdale 1969 : 123). The provision of this complex will mean an extension of the range of 'things to do' at Foxton Beach. Moreover, the proposed site provides a congenial environment to centralise some of the required basic amenities.

It can be argued that such a proposition is economically impractical because a complex such as this, in a location such as Foxton Beach can only cater for a seasonal demand (i.e. during summer), thereby leaving also a non-profit period. This is not necessarily the case however, when one takes into account the social implications it will have for the regional population because of its novelty and the extended opportunity and range of recreational experiences it offers. The decline of its novel function can be insured against by using this complex as a conference venue, offering an alternative to such heavily taxed venues such as Massey University or other halls in Palmerston

North. A place such as the one proposed can also be a very congenial surroundings for club gatherings (e.g. the Rotary Youth Week).

A recreational complex such as this, located at Foxton Beach, has two advantages, apart from the fact that the beach is already a popular regional resort.

1. It offers a wider range of recreation activities for Foxton Beach and for the region; and

2. Politically, the siting of this facility is not incongruous with current intentions to promote incentives for growth of its hinterland, that is to say Foxton.

The preceeding investigation has shown that a need and a use for some form of social amenity exists at Foxton Beach. The complex has been proposed, bearing in mind the types of people to be catered for, the types of location and the position the beach occupies within a regional context.

NOTES

PART ONE

1. All figures and information given here were secured through personal communication between the writer and the President of the Manawatu Branch of the Wellington Acclimatization Society.

2. Estuaries are not included in these analyses for they are usually regarded as beach rather than river environs.

3. Acclimatization Society; personal communication with the President of the Manawatu Branch. While pollution was noted, he did not make mention of which type of pollution was affecting the fish life.

4. 1957 survey showed that coliform counts were very much higher during wet periods.

5. Fabridam - the fabridam is an inflatable and deflatable rubberized fabric table which can be pressurized by either air or water. When fully inflated it acts as a fixed dam comparable to a rigid structure; when completely deflated it offers a minimum flow resistance and permits the passage of flood flows.

6. Palmerston North Civic Design Association Riverbank Development Report April 9th 1972 (Chairman D. Taylor).

7. Dr Ogden of the Department of Botany at Massey University, who also heads the study of wildlife and ecology at Puke-Puke Lagoon, assessed that because of the high rate of eutrophication these lakes will be covered up in 50 years time, simply by the process of natural succession of plant life.

8. Personal communication with Dr Ogden, Ecologist Massey University. See also Elson White (1970).

PART TWO

9. The Manawatu County Council is of the opinion that Foxton Beach is the largest popular playground in the area of the Regional Council of Manawatu County Council to the Secretary of M.R.D.C. 15th March 1968.

10. While the Census publication does not provide for the differences between permanent and non-permanent occupied houses these can be calculated by using the 'density per dwelling' principle. The formula is given below:

$$\text{Total properties} - \left\{ \frac{\text{population}_i}{\text{density of dwellings}_i} \right\}$$

$$= \text{permanent properties.}$$

In the case of Foxton Beach, the total number of properties for 1971 was 1,100 houses. The population was 859 and a density per dwelling of 2.1 was agreed upon by the Chief Clerk of the Manawatu County Council (this figure also corresponded to that figure given by Trilin (1971).

11. Since no direct climatic data are available for Foxton Beach, those for Ohakea will serve the purpose of indicating the type of climate Foxton Beach experiences. Ohakea is the nearest available climatic station to Foxton Beach.

12. The complaint lodged by the leasee to the Manawatu County Council (the leaser) regarding a larger sum of financial assistance for the maintenance of a higher standard and greater number of these amenities were not well received by the said Council. The amenities situation in this camp is further aggravated by picnickers adjacent to it. As check on the status of visitors is not possible, picnickers often trespass onto the

the property to use the amenities (as pointed out by the leasees during a personal interview).

13. It was not until about half a year later that Council finally conceded to fulfill the obligation to give more financial assistance to the camp. A report of the financial assistance was provided in "The Evening Standard" 19th August 1972.

14. A female respondant made the complaint that one of her children aged three was 'knocked down' by a moving car twice on the same day. Two others reported that their children had been injured by moving cars on the beach.

CHAPTER 5 : SUMMARY AND CONCLUSIONS

5.0 The purpose of this final chapter is to summarise the findings of the previous chapters and to make recommendations based on these results for the future planning of outdoor recreation in the Manawatu region.

5.1 The ability of the Manawatu landscape to support and sustain outdoor recreational activities had been evaluated in the chapter on resource survey. It was found that only a small proportion (1%) of the study area was able to satisfy all the four criteria used in the assessment of land-based recreation resources. The inability of the land to satisfy all the criteria reflects the predominance of agricultural lands and poor accessibility.

In the assessment for water-based recreation resources, two thirds of the area did not satisfy any one of the criteria used in the classification and those that did satisfy all the criteria (3.6%) were limited to those areas on the coast. Other significant areas were those along the reaches of the Manawatu, Pohangina and Kawhatau rivers. The coastal lakes were relatively less significant.

The ecological quality was also assessed and it was noted that areas of medium to high grades tend to be centred along the ranges and river systems while low grades occupied in most instances the agricultural plain.

In terms of scenic quality, the contrast between the agricultural lowlands and the uplands were again evident. The low 'capability' area was attributable to the physical setting;

the area which lies within the agricultural plain has no great relief and land-use differences.

The four components in the assessment of the suitability of the Manawatu landscape to support outdoor recreation were synthesised to produce a map of the relative quality of recreation environments. The assessment for relative quality was for macro units and did not include the qualities of individual sites. The final map showed the dearth of high quality recreation areas: only 11% of the whole area contained on the broad crests of the Ruahine Range. The next highest grade areas were found along parts of the river systems; and the foothill areas of the Tararua and Ruahine ranges.

5.2 Available Population and Resources

The countryside is vulnerable to pressures from leisure seekers, hence the identification of the spatial location and dimension of 'available user-pressures' : the 10 mile distance user-pressure map showed that heavy pressure (57,000 - 65,000 people) centred around the Palmerston North - Feilding area. Within this short distance, user-oriented recreation facilities should be developed along 'nodes' of population concentrations. The 30 mile distance showed that high capability for supporting outdoor recreational activities. High grade recreation areas were faced with population pressures of at least 91,00 at this distance. This distance was considered 'an average day-tripper zone' and resources within this distance would have a regional importance. The 50 mile distance map showed that most of the high grade areas again coincided with a large available population of at least 190,000 people, these present a sizeable market for development of recreation resources

with inter-regional significance. Foxton Beach environs - of regional and inter-regional significance - coincided with heavy available population where the pressure exerted was calculated to be at least 310,000 people.

The spatial relationships between people and resources at these distances have recreation resource development and management implications.

5.3 Inventory and Management

An inventory was made of all 'public outdoor recreation areas' in the region, to show the scope of the recreation opportunity that it offers. An inventory was also made, of suitable available land for further development. It was found that provisions for outdoor recreation were negligible : recreation acreages were low (0.25% of total land area in the study area); opportunities limited; and recreation density consequently high. It should also be noted that there were very few acreages accrued to public coastal reserves in the study area.

The inventory made on 'available lands' for recreation showed that there was an abundance of 'available land' (Maori land : 25,760 acres; Crown land : 66,000 acres) which can be effectively tapped if under proper management.

A case was put forward for the establishment of a central agency for recreation where all the machinery of planning procedures can be centralised. The recommendation was for an autonomous regional agency.

5.4 Water - recreation resources

PART ONE: The extent and use made of water-bodies in the Manawatu region was examined and results showed that while these water-

bodies were supporting a variety of outdoor pursuits, a large proportion of these resources were left 'idle' owing to certain constraints placed upon them. The constraints common to these resources (lack of knowledge; lack of accessibility; and water pollution) were explored and results indicated that these had limited the effective use of the resources considerably.

The demand for water recreation has made itself felt: private as well as planning authorities saw the need for more water resources to be developed and plans were submitted for proposed development. These plans are: the development of an artificial lake along a stretch of the Manawatu River; the development of Raumai for public recreation; and the river-walk development along parts of the Manawatu River.

PART TWO: This focused on a preliminary case study of Foxton Beach as a water resource for outdoor recreation, with emphasis on firstly environmental sensitivity to recreation; and secondly the recreation behaviours of people on the beach. Examination of the former aspect showed that major areas of intolerance were to be found around the estuary area and that these were patronized by both conflicting leisure seekers and activities. A zoning system is necessary in order to resolve the conflict situation and the zoning system designed is illustrated in Figure 30 .

The recreation behaviours exhibited by leisure seekers at the beach are studied via questionnaire surveys which were administered on three occasions during the summer period. The results of the surveys have been discussed in the preceeding chapter and hence need not be reiterated in full here. For a quick summary however, these three results can be recapitulated:

(1) Foxton Beach is able to attract visitors from both within and outside the Manawatu region;

(2) The majority of the visits made to the beach are planned excursions; and,

(3) The results of the surveys indicated a lack of amenities and facilities at the beach.

5.5 Recommendations

As an aid to planning for outdoor recreation in the Manawatu several recommendations are made here on the basis of the findings from the previous chapters:

1. The supply of recreation is little known in the Manawatu, and the author earnestly recommends that responsible planning bodies start assessing the potential supply of recreation resources for reasons expounded in an earlier parts of the thesis. Since changes in land-use patterns affect the levels of suitability of the landscape for outdoor recreation, the assessment done should be received and reassessed periodically. Scenic quality resources are irreplaceable and the mapping out of these should be given prime consideration. The spatial dimensions of people are also important as they have spatial relationships with resources and these relationships ultimately affect the development and management of recreation and thus should be closely looked into at a local as well as on a regional scale.

2. The resource survey results indicate that the countryside east and west of the study area, that is, the range environs and the coast, respectively, are high grade areas because of their 'inherent' natural qualities. These areas should be conserved as areas of relatively natural country and

should be free from any major urban and industrial developments. The same policy should be applied to those parts of the rivers that are scenically and ecologically high in quality.

3. Opportunity for outdoor recreation is very limited in the Manawatu area and since there are acreages available in the form of Maori and Crown lands, the possibility and feasibility of securing parts of these lands should be looked into.

4. The constraint placed by lack of accessibility contributes to the diminition of recreation opportunity. At present, the level of accessibility within the regional landscape is very low; and where accessibility permits, there is a general lack of order and continuity. The removal of this constraint and the planning for a dynamic system of accessibility should be a resource planning prerogative where the situation allows or calls for a more effective use of resources. Pollution is also another recreation constraint here and planning authorities should work in close liason and consultation with the local branches of the newly established Water Resource Commission or the water-resource department of the Manawatu Catchment Board in reviewing and tackling pollution problems.

5. Facilities and amenities for water recreation are relatively few. The natural water-bodies of the coastal lakes contain the necessary qualities of a water recreation resource and the development of these for the demands of water-recreation should be closely examined.

6. The importance of Foxton Beach as regional resource for outdoor recreation has been recognised in the study of that beach for recreation. The author recommends that its regional

importance and function should be acknowledged and considered in any development of that area for recreation.

7. The results of the Foxton Beach study also support the cause for an urgent programme to rehabilitate and preserve the dunes along the coast.

8. The author believes that firstly the proposed multi-purpose recreation complex at Foxton Beach is well sited to cater for the need and capability of the beach to support and attract a wider range of recreation, secondly that it has suitable political and economic implications for the growth of Foxton, and thirdly that is appropriate to the large urban populations inland. If this proposal is adopted, the types of materials used and the design of the facilities and landscape should be given careful consideration in the light of its surrounding beach and 'pseudo-forest' environmental locality.

9. A major conclusion from the synthesis of all results provided in the thesis is the need for all aspects of planning for recreation to be in the charge of a regional recreation planning agency.

10. The countryside is vulnerable to pressures from leisure seekers : often recreation activities are not compatible with the ecological demands of the environments. In view of this, steps should be taken to educate the public on the protection of areas of ecological importance. Two outstanding resources should be paid particular attention in "conservation education"; the dune environment; and native bush. The latter is becoming comparatively a dwindling resource and "conservation education" must be directed at preserving them in their natural state.

a photo coverage

of some

outdoor recreation resources

all photographs by the author

Plate 1: Relief typical of 'Lower Range' landform.

Plate 2: Relief typical of 'Rolling Hill' landform.

Plate 3: Power-boating environment of Whirokino Bridge, Manawatu River.

Plate 4: Totara Reserve. Known for its extensive and heavy native bush; and public facilities for picnicking and camping.

Plate 5: Looking at the existing Raumai picnic area from the old Raumai bridge.

Plate 6: Landscaping for the proposed 'Raumai Recreation Area'. The new bridge on the right is now completed.

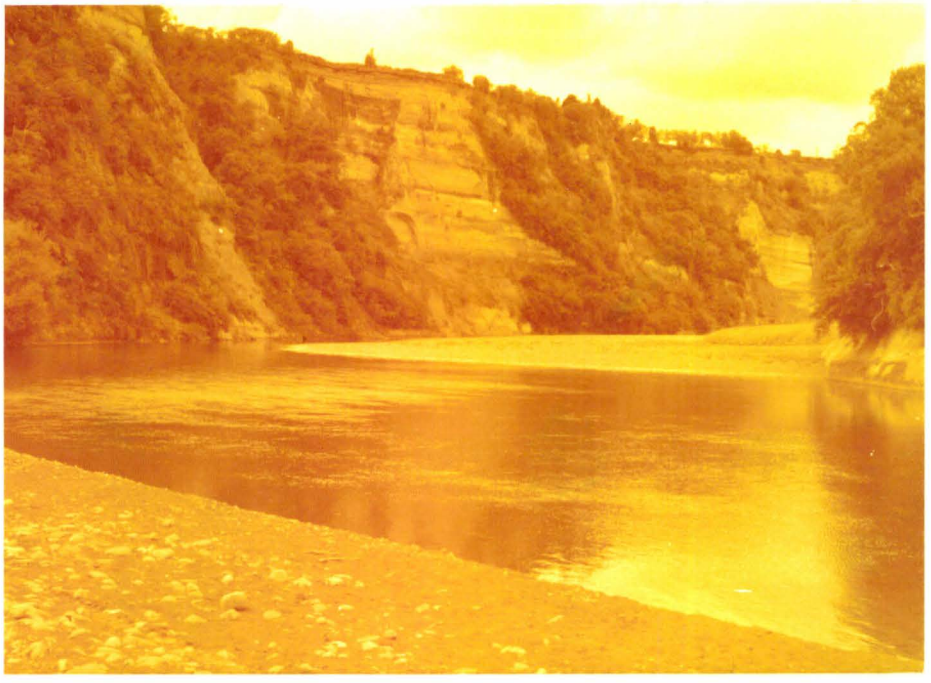


Plate 7: A view of Vinegar Hill picnic area, Rangitikei River.

Plate 8: Scenic view of Oroua River upstream from Menzies Ford.

Plate 9: An aerial view of Himatangi township and its beach area. Note the rectilineal layout of its township.

Plate 10: A view of Tangimoana beach front. The litter box shown on the right of the photo is a move towards keeping the beach clean.

Plate 11: A view of Lake kaikokopu. This is a haven for duck-shooting. Note the invasion of rushes on water space.

Plate 12: A view of Lake Kopatara.

Plate 13: An aerial view of Foxton Beach.

Plate 14: An aerial view of Foxton Beach looking northwards. Note the broadly rectilineal pattern of the township which gives the place a somewhat formal atmosphere.

Plate 15: The foredune environment of Foxton Beach. Note the sparse vegetation in this dunescape.

Plate 16: Low-tide at the Manawatu River Mouth Beach, the latter is a popular feeding ground for birds.

Plate 17: An aerial view of the public recreation facilities at Foxton Beach township.

Plate 18: Looking at the entrance to the public picnic area which is situated next to Pinewood Motor Camp. The only other public convenience at Foxton Beach can be seen tucked behind the first row of trees.

Plate 19: A view of the recently installed public car park. The building at the centre is the public convenience and the rear building is the 'Life Saving Club'.

Plate 20: Low-tide at the Manawatu River Mouth Beach boat ramp. This ramp is used by both commercial fishing vessels and leisure crafts.

Plate 21: Beach-buggying inside the ecologically 'intolerant zone'.

Plate 22: A view of Ocean Beach looking northwards. Note the untidiness of the beach(at the far north of the photo) caused by drift woods.

Plate 23: A view of Ocean Beach looking southwards.

Plate 24: A view of the present site of Foxton Beach's rubbish tip. The site is quite exposed to the direction of the prevailing wind.

Plate 25: A legacy of bad planning. Waste materials from the exposed rubbish tip scattered by prevailing wind, causing visual and hygenic problems.

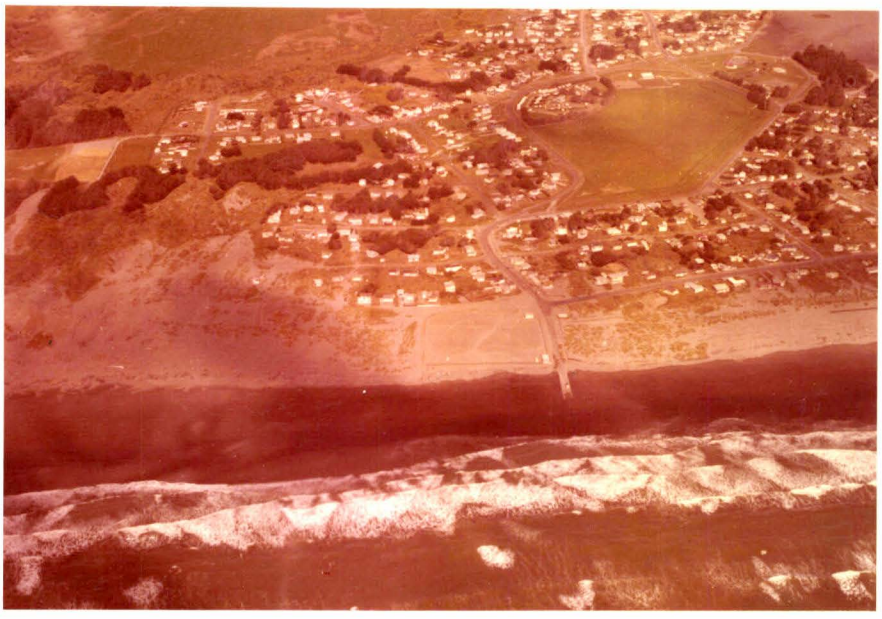


Plate 26: An aerial view of Ocean Beach. The public car park is faintly visible, marked out by the soft outline of the rectangle adjacent to the beach.

Plate 27: Looking at the public car park from the beach. Note the sand pile up at extreme left.

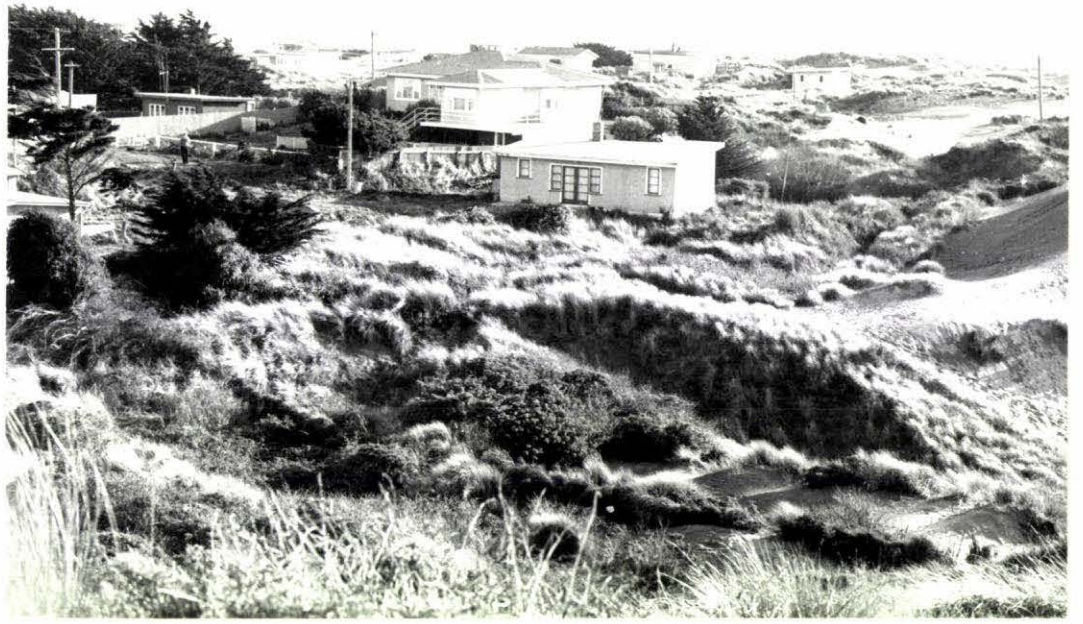


Plate 28: Housing encroachment on the beach front, Foxton Beach.

APPENDIX 1

Classification of Landscape Resources

The landscape is classified according to its natural ability to provide opportunities for outdoor recreation, the purpose of such classification being to present a qualitative distribution and location of recreation environments which may be generated and sustained per unit area of land.

The landscape is classified into recreation resources according to these four elements:

1.) its ability to support land-based recreation activities.

2.) its ability to support water-based recreation activities.

3.) the scenic quality of the environment.

4.) the ecological quality of the environment.

An evaluation of each 2.8 miles x 2.8 miles square is made using these 4 criteria, the results being presented in map form. The final map of recreation environments is produced by synthesizing the results into one composite map.

Criteria for evaluation of the suitability of the landscape as recreation resources:

1. Land-based recreation resources

The physical environment can be assessed for its suitability as land-based recreation resources under the following criteria:

A. Camping, caravanning and picnicking: the only constraint accepted for these activities is lack of vehicular access and all countryside linked by metal roads (unfenced), vehicular tracks, unmetalled unfenced roads, foot-tracks and established right of ways have been deemed suitable;

B. Pony-trekking: 1) areas above 400 ft, and below 1500 ft with established right of ways, bridle-ways and foot-tracks are considered suitable (Foxton Beach Pony Club)

2) dominant dune areas as they provide sandy ridges are also considered suitable.

C. Walking, tramping and hiking: 1) all areas above 1000 ft are considered suitable

2) dominant dune areas are also considered suitable as their topography and proximity to the sea provide particularly interesting environments for walkers.

D. Game-shooting: all areas assessed as shooting areas by the New Zealand Forestry Department.

2. Water-based recreation resources

A very delicate component part of the physical environment is the water environment. Apart from the heavy reliance on this environment by the domestic-economic sectors, man has also derived from it his more aesthetic pleasures and also his satisfaction from his water-based leisure activities. The water environment, since it is capable of supporting human leisure activities, has need to be assessed for its suitability and potentiality as a recreation resource.

Among the wide range of recreational activities that man participates in a water environment, the more popular ones are:

1. Fishing
2. Picnicking and sunbathing adjacent to waters
3. Swimming and bathing
4. Canoeing

5. Rowing, sailing and pleasure boating

6. Motor-boating and water-skiing

Although the popularity of these activities varies considerably, the demands they make upon the resource are often similar in both nature and scale. Because of this it was decided to assess water environments in the Manawatu under the following criteria.

A. Fishing:

a) All unpolluted rivers and streams over 26 ft in width

b) All enclosed water bodies over 15 acres in area

B. Other active water-based persuits:

a) All unpolluted waters with dimensions as follows minimum length - 1 mile, minimum width 200 yards

b) enclosed water bodies of at least 49½ acres in area

C. Informal water-orientated activities:

All unpolluted waters within ½ mile of unmetalled roads, otherwise accessibility accounted for by the presence of foot-tracks, vehicle tracks etc.

D.* Active sea-based persuits:

All squares containing coastlines.

E.* Informal sea-based activities:

All coastlines with a stretch of sandy beach.

* Because of their multi-use nature, coastlines that satisfy D and E are given the highest grading of 4, otherwise a grade of 3 is allocated if it satisfies either D or E.

The major river systems and the coast have been graded according to the prescribed criteria:

Grade 0 - those squares that support none of the criteria

Grade 1 - those squares that support only one of the criteria.

Grade 2 - those squares that support any two of the criteria, this is not applicable to the squares that contain coastline.

Grade 3 - squares qualifying for three or more of the criteria and squares with coastlines that qualify for either criteria D or E.

Grade 4 - coastline squares that support criteria D and E.

3. Relative Ecological Quality

The basis of grading ecological quality is in terms of ecological complexity and diversity. The natural habitats can be graded accordingly assuming that all are equally common in the region and that all are of average quality.

Natural habitats	Grade
Mixed podocarps	9
Beech	8
Highlands soft & Hardwoods	7
Highland grasses and tussocks	6
Scrub	5
Swamps	4
Rivers and water bodies	3
Dunes	2
Exotic trees	1

To simplify grading purposes the first four groups were reclassed into 2 groups of firstly mixed podocarps and secondly beech highland soft and hard woods and highland grasses and tussocks.

Each 2.8 x 2.8 mile square can be graded under the following criteria:

Grade 6: a) squares with over 10% of their area in any 4 of the following habit groups:

1) Mixed podocarps

2) Beech - highland soft and hard woods-highland grasses and tussock

3) Rivers (at least 3 miles in length) and water bodies

4) Swamps

b) areas of historical and scientific interest

Grade 5: squares with over 10% of their area in any 3 of the above habitat groups.

Grade 4: squares with over 10% of their area in any 2 of the above habitat groups.

Grade 3: squares with over 10% of their area in any one of the above habitat groups.

Grade 2: squares which contain over 10% of their area in exotic trees.

Grade 1: squares with least 10% of their area under improved agriculture.

Grade 0: squares with at least 10% of their area as urban.

4. Scenic Resources:

While scenic quality is largely in the eyes of the beholder, a systematic and objective way of evaluating this is possible, using the major landscape variable of landform and landuse. The former variable is not just restricted to Absolute Relief (heights above sea-level) but incorporates into it also a new dimension, that of Available Relief. Available Relief of a place is the relief difference between the maximum and minimum heiths. The combination of landform and landuse patterns of an area, qualified by certain criteria, can be graded for its scenic quality.

A. Landform Landscapes:

These can be categorised and graded in terms of the availability of both Absolute and Available Relief. The categories and grades are as follows:

Grade	Category	Reliefs	Heights
0	Lowlands	AB	0 - 199 ft
		AV	0 - 199 ft
1	Undulating lowlands	AB	0 - 499 ft
		AV	0 - 499 ft
2	Rolling hills	AB	500 - 1499 ft
		AV	0 - 399 ft
3	Hill Country	AB	500 - 1999 ft
		AV	400 - 599 ft
4	Steep Hill Country	AB	1499 - 3000 ft
		AV	400 - 799 ft
		or AB	1500 - 1999 ft
		AV	600 - 800 ft & above

5	Lower Ranges	AB	1000 - 2999 ft
		AV	800 - and above
6	Higher Ranges	AB	3000 ft and above
		AV	0 - 6000 ft

B. Land-use Landscapes

The grading of scenic resources from land use patterns assumes two important elements: that human beings prefer the natural habitats to man-made features, and that diversity is the thing that attracts. The landuse patterns in the Manawatu were graded as below.

Grade	Category
0	Urban areas
1	Agriculture dominant areas
2	Scrub dominant areas
3	Bush dominant areas
4	Exotic plantation dominant areas
5	Rivers and enclosed water bodies dominant
6	Diversified** rural landscapes

** Criteria for diversified land use landscape:

a) squares that support rivers and or water bodies together with at least the presence of any of the following 3 use types of agriculture (which must not occupy more than 60% of the squares), bush, plantation and scrub;

b) squares that do support rivers and or water-bodies but supporting any of the land use types of scrub, bush, plantation, agriculture, as a dominant land use type and where the rest of the same land use types together constitute at least 40% of the square.

C. Relative Scenic Quality

Relative scenic quality of the Manawatu landscape is serived by grading the landform landuse composite scores of a given square. Thus a square that scored grades of 2 and 4 for landform and landuse respectively will be allocated a final scenic grade of 3 according to the scenic quality grading system set out below:

Grading system of scenic quality

Grade	Land-form - Landuse composite scores
1	0 - 2
2	3 - 4
3	5 - 6
4	7 - 8
5	9 - 10
6	11 - 12

E. Relative Quality of 'recreation environments'

The individual gradings allocated to the squares in the four different types of recreation resources can now be synthesised together to give a map of relative quality of recreation environments. Each individual square theoretically will have a maximum potential score of 24 points derived from the combinations of grades of the four landscape elements that produced recreation environments. In reality however, the highest points scored by any of the squares was 7, thus if a four points per grade system were to be used to assess relative recreation environments, the theoretical grading system has to be adjusted.

The theoretical and practical grading systems for the relative recreation environments of the Manawatu are indicated below:

Grade	Score
0	0
1	1 - 4
2	5 - 8
3	9 - 12
4	13 - 16
5	17 - 20
6	21 - 24

Theoretical grading score system

Grade	Score
0	0
1	1 - 4
2	5 - 8
3	9 - 12
4	13 and above

Practical grading score system

APPENDIX II

Table I : Sources of Pollution in 1957

Sources of Pollution	Description
OROUA RIVER	
General	The effluent of the Feilding Borough septic tank is discharged into an open drain, which also carries the wastes of the Feilding abattoir; woolscour and boiling down works and sale yards.
Industries	
Borthwick Freezing Works	This discharges waste water into the Oroua River about 300 yards upstream from the Feilding Bridge. The daily volume of waste is about one million gallons at the peak of the season.
Boiling Down Works	This makes one or two daily discharges of digester gravy and the discharges run through an open swamp to the open effluent channel.
The Kawa Wool Co.	This discharges about 3,500 gallons of foul wash from the scour tanks per day.
Feilding Borough Abbatoir	Makes no attempt to save blood or paunch contents. These are discharged to a save all along with wash water effluent from a septic tank at the abbatoir. Its effluent joins the flow from the septic tank in the open channel.

Feilding Saleyards	The drainage from these is discharged to the open - waste drain.
Open-Waste Drain	This carries the wastes of the woolscour, abbattoir, Feilding septic tank, boiling down works and the saleyards - a smelly turgid effluent.

Dairies

Cheltenham Dairy Factory *	Discharges about 50,000 gallons of waste water daily.
Rongotea Dairy Co.*	This factory discharges waste water into the main drain and the latter discharges to the Oroua River at Rangiotu.
Tui Dairy Co. Ltd*	The waste is discharged to an open drain which enters the main drain.
Taikorea Dairy Co.*	Discharges its waste to an open drain and the latter eventually enters the main drain.
Mangawhata Co-op Dairy*	Wastes are discharged to the main drain about 2 miles above its entry point to the Oroua River.
Rangiotu Dairy Factory	Discharges wastes into the Oroua River about 50 yards below the highway bridge at Rangiotu.

MANAWATU RIVER

General

Palmerston North City Sewerage	Garbage is dumped on the bank of the river near the Awapuni Racecourse while sewerage is discharged into the Mangaone Stream close

t o where it joins the Manawatu. The rubbish tip is on the bank of the river near the septic tanks and is smelly and unsightly.

Industries

Palmerston North Abattoir	Discharges floor, offal and pen washings into the sewer.
Casing Factory*	Canterbury By-products Ltd. Wastes are also discharged into the sewer. The factory effluent has a high salt content.
Clausen's Plating Works	Discharges wastes to the city sewer. This waste contains drippings of sulphuric acid, caustic soda, chromic acid, nickel salts and cyanides. The drippings however are well diluted before entering the sewer.
Ice Cream Factories	The daily waste of Burrells Factory alone was about ½ gallon of icecream together with the waste water.
Breweries	Waste water contains small amounts of yeast.
Milk Treatment Station	The daily wastage from the milk treatment plant is about 10 gallons of milk.
Jacquard Hosiery Mills	Discharges liquid wastes containing dyes to the Palmerston North sewerage system.

Government Communities

Linton Military Camp	The waste runs to two open septic tanks, the effluent from which is discharged by an open flume to the Manawatu River.

Massey Agricultural College	The effluent is discharged to the Tiritea Stream about half a mile above its junction with the Manawatu.
D.S.I.R. Grasslands Establishment	Discharges septic tank effluent to the Massey College Sewer.
Mangahoa Village	Discharges its wastes to the Mangaone Stream below the Mangaone hydro-electric station.
Palmerston North Gas Works	The daily wastes include 1,000 gallons of ammonia water.
Aokautere Dairy Factory	This factory makes cheese using 1000 to 1100 gallons of milk daily. Along with washings the wastes are discharged into the Aokautere stream about three quarters of a mile above its confluence with the Manawatu.
Glaxo Laboratory N.Z. Ltd at Bunnythorpe (Glaxo Dairy Factory)*	This makes milk powder and pharmaceuticals from a daily milk intake of 2,750 gallons of milk. Wastes during peak seasons are about 30,000 gallons daily.
Railway yard at Palmerston North	Engine steam washings and oil swamp wastes and stormwater are discharged into an open drain which runs into the Mangaone Stream.

Kairanga Co-op Dairy Co. Ltd	The wastes of this factory are around about 8,000 to 9,000 gallons of casein whey and together with floor and can washings totals up to 40,000 gallons daily. The wastes are discharged into a natural lagoon in the bed of the Manawatu River.
Longburn Freezing Works	The works discharge meat and dairy wastes into the main flow of the Manawatu River.
Awahuri Dairy Co. Ltd	This dairy factory discharges waste water and dairy wastes into the Manawatu about 10 miles from Awahuri.
Superior Laundries Ltd at Longburn	This discharges from 8,000 to 10,000 gallons per day of boiling and rinsing water, containing soil from clothes and 2 lbs of liquid detergent and 15 lbs of sodium metasilicate. The wastes are drained into the Manawatu near Rangiotu.
Tokomaru Dairy Co.	This factory makes cheese only and the wastes are pumped into Tokomaru River and thence to the Manawatu River.
Shannon Co-op Dairy Co. Ltd	The estimated waste flow here is about 4,000 gallons per hour from the evacuator and 5,000 gallons per day from washings. These are discharged into the Mangaone Stream which joins the Otaura Stream before running into the Manawatu River.

Foxton Flaxmill (Woolpack and Textiles Ltd). This mill discharges about 30 tons of liquid wastes daily into the isolated arm of the Manawatu River below Foxton.

* Have since ceased operations

Source : Ministry of Works : Pollution in the Lower Manawatu and Oroua Rivers 1957.

Table II : Pollution effects of major industries in New Zealand 1952.

Industry	No's in N.Z.	No's inspected	No pollution	Slight pollution	Considerable pollution
Sawmills	497	7%	41%	27%	32%
Flaxmills	20	35%	0	14%	86%
Butter factories	116	15.5%	5.5%	5.5%	89%
Cheese factories	230	10%	9%	0	91%
Freezing Works	38	58%	4.5%	4.5%	91%
Woolscours	32	20%	0	14%	86%
Cowyards	34,000	0.9%	5%	20%	75%

Source: New Zealand Water Conference 1970 proceedings Part III pg 55.4

APPENDIX III

Foxton Beach Questionnaire Survey

Questionnaires were administered at Foxton Beach between 1200 hours and 1700 hours on these occasions : 22 October 1972, 12 November 1972 and 14 January 1973. The returns of 100, 117 and 120 questionnaires were received respectively. Prior to these surveys a pilot run was conducted on the 1st October 1972.

Since movements of the populations at the beach could not be controlled and checked, random sampling was not possible. It was decided, however, that Survey Assistants interview one in every four cases (persons, groups of people or car-loads). Interviewers were briefed against bais sampling towards any one specific age-group or sex. On all the three survey occasions, Survey Assistants were positioned along the extent of the beach between Manawatu River Mouth Beach and approximately 1000 yards north of the car-park at Ocean Beach.

Weather conditions at the beach were mainly fine during the last two occasions and cloudy - sunny during the first.

The Survey Questionnaire

MASSEY UNIVERSITY

Department of Geography

Visitor Survey Questionnaire 1972/3

Name of Site ..... Time ..... Date .....

Weather .....

1. How far have you travelled to get here today?

..... miles

Don't know 0

Continued

2. Where have you travelled from today?

..... city/town/village

3. What was you main method of travel to get here?

walking 1

bicycle 2

motorcycle/scooter 3

car/van 4

bus/coach 5

other (specify)..... 6

4. Have you been here before?

Yes 1

No 2

(If No go to question 6; if Yes continue with question 5)

5. When was your last visit?

Within last week 1

" " fortnight 2

" " month 3

" " three months 4

" " year..... 5

Over one year ago 6

Don't know 7

6. Did you plan to come here today or is this in conjunction with a trip somewhere else?

Planned Visit 1

Visit in conjunction 2

(If 1 continue with question 7; if 2 go to question 8).

7. What were your reasons for coming here?

.....

.....

.....

8. What have you been doing since you have been here, and what do you plan to do during the rest of your stay?

.....

.....

.....

9. Are you satisfied with the beach area the way it is, or are there any particular changes which, in your view, would improve it?

Satisfied 1

Change desired 2

(If 1 go to question 12; if 2 continue with question 10)

10. What are these changes?

.....

.....

.....

11. Which of the following facilities would you like to see developed:

a) Barbecue facilities 1

b) Tables and benches 2

c) Multi-purpose recreation restaurant (with both day and night recreational and social facilities 3

d) Toilets and changing sheds 4

e) Lookout 5

f) Accommodation 6

g) Others (specify) 7

12. Do you think there are too many people here or too few?

too many 1

too few 2

just about right ... 3

13. Is your visit a trip out from home or part of a holiday stay here?

Trip out from home 1

Holiday stay here 2

14. What kind of accommodation are you staying in?

Camping 1

Caravanning 2

Motel 3

Guest Hotel 4

Other (specify) 5

15. Would you visit this place again in the future?

Yes 1

No 2

(If yes continue with question 16; if no go to question 17).

16. When do you think you will visit this place again?

Within next week 1

Within next fortnight 2

Within next month 3

Within next three months 4

Within next six months 5

Within next year 6

Don't know 0

17. Are you here by yourself or with other people?

Alone 1

With family members 2

With friends 3

With organised group ... 4

18. How many people including yourself are in your party?

.....

Interviewee's personal information

19. Sex: Male ..... 1 Female 2

20. Are you married or single?

Married 1

Single 2

Other 3

21. Could you please tell me your age?

Less than 15 years old 1

15 - 19 " " 2

20 - 24 " " 3

25 - 29 " " 4

30 - 34 " " 5

35 - 39 " " 6

40 - 44 " " 7

45 - 49 " " 8

50 - 54 " " 9

55 - 59 " " 10

60 and above 11

Thank you.

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