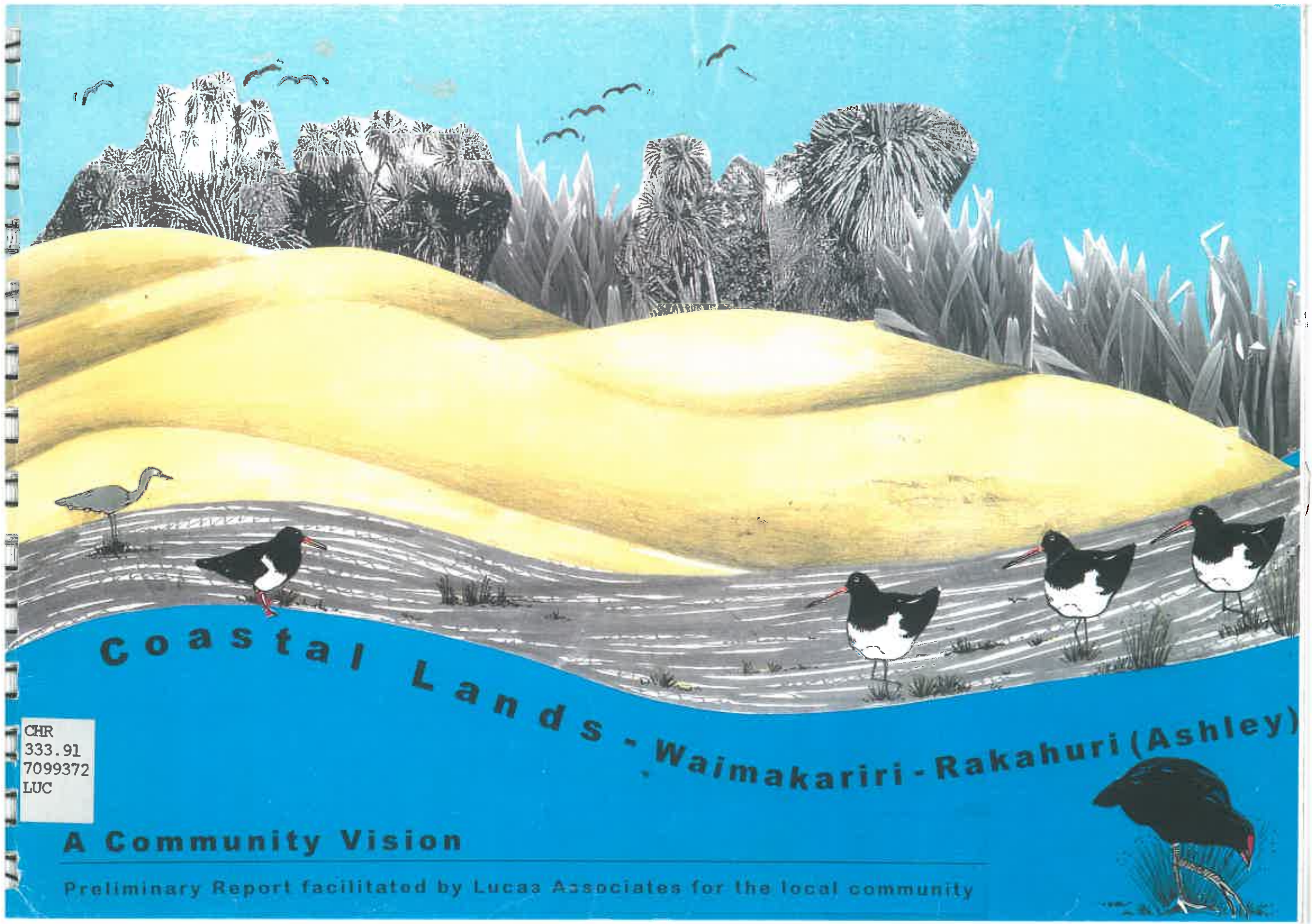


Coastal Lands - Waimakariri - Rakahuri (Ashley)

A Community Vision

Preliminary Report facilitated by Lucas Associates for the local community

The Coastal Lands of Waimakariri - Rakahuri (Ashley)

a preliminary report developing a community vision

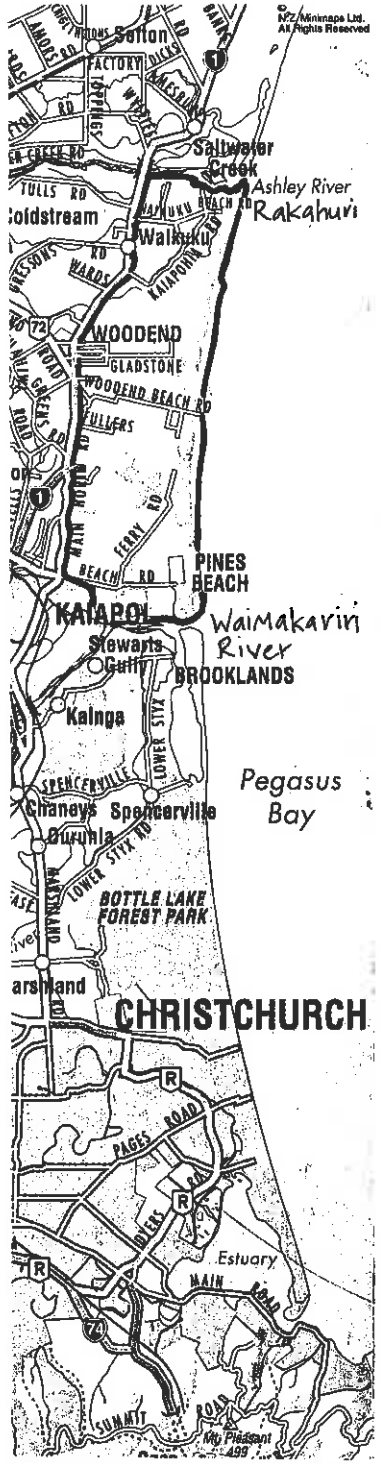
facilitated & documented by Lucas Associates
in consultation with the local community and iwi.

Contributing people and organisations include:
Di Lucas, Annabel Riley & Nikki Gray (Lucas Associates)
Rob Blakely & Chris Todd (Wai-Ora Trust)
Paul Mosely (hydrologist)
Andrew Crossland (ornithologist)
Ian Lynn (geomorphologist, Landcare Research)
John Archer & Matthew Lester (Earthwork)

Financial support is gratefully acknowledged from
Community Employment Grant (CEG), Waimakariri District Council and
Canterbury Regional Council

December 1998

Contents



Location Map

The Coastal Lands of Waimakariri - Rakahuri (Ashley)

Introduction

The Place

These coastal lands lie beyond the highway, between the braided rivers of Waimakariri - Rakahuri (Ashley) and located within the Waimakariri District. Upon these lands lie the coastal settlements of Waikuku Beach, Woodend Beach and Pines Beach/Kairaki. Each settlement hugs the coastline of Pegasus Bay and are closely associated with the rural/naturalistic character of the coastal dune system. This is reflected in the daily lives of residents, who value the open spaces and variety of recreational opportunities the coastal rural context offers.

Background and Objectives

Lucas Associates has been contracted by Wai-Ora Trust (a non-profit community organisation) to look at the potential of the Waimakariri - Rakahuri (Ashley) Coastal Lands for ecological restoration. The project is to explore and document options for these coastal lands and we are undertaking this through community consultation and professional analysis.

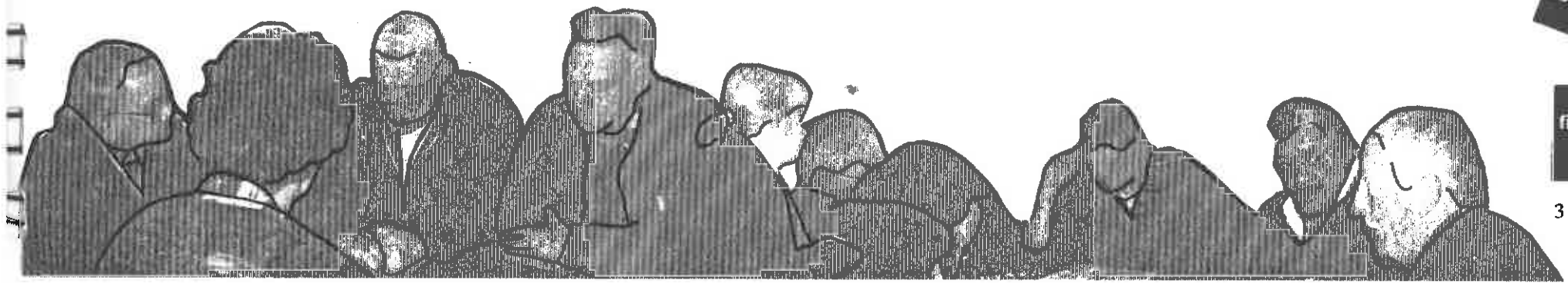
A further objective of Wai-Ora Trust is to identify potential employment and training opportunities for the community which may arise from any future ecological restoration.

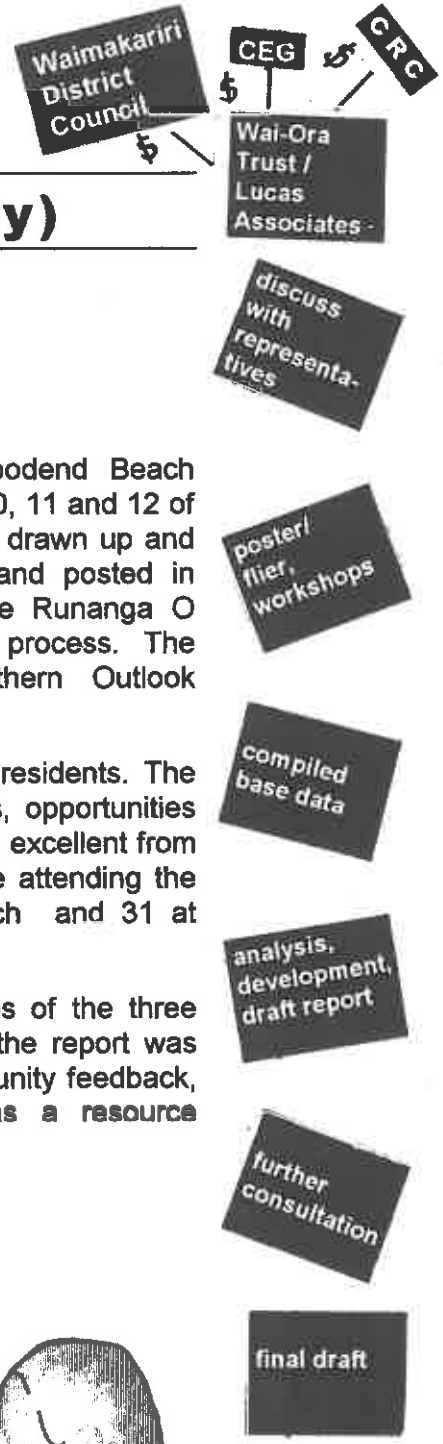
The Process

Three community workshops were held, in Woodend Beach Waikuku Beach, and Pines Beach/Kairaki, on the 10, 11 and 12 of August respectively. A poster and flier were earlier drawn up and distributed around the area, to interest groups and posted in shop/garage windows. Tuahuriri Runanga and Te Runanga O Ngai Tahu were invited to participate in the process. The workshops were also publicised in the Northern Outlook newspaper.

At the workshops groups were formed with local residents. The groups were then asked to identify values, issues, opportunities and visions of the area. Attendance was considered excellent from the local community and Runanga, with 29 people attending the Woodend Beach workshop, 43 at Waikuku Beach and 31 at Pines Beach.

This report has been compiled from the outcomes of the three workshops and subsequent analysis. In October the report was made available as a draft, for Runanga and community feedback, prior to being finalised and made available as a resource document





Key Recommendations

Recognising the importance of the area, the community consultation process and professional analysis suggest a vision for the Waimakariri - Rakahuri (Ashley) coastal lands that involves voluntary participation of landholders in:

- Retention of open space character;
- Conservation of local heritage;
- Restoration of natural areas and linkages to form a matrix within which various forms of production occur; along with,
- Retention and confinement of the low key beach settlements.

FOR LOCAL PEOPLE, GROUPS AND AUTHORITIES TO PROGRESS THE VISION:

ASSIST LANDOWNER PROTECTION

1. Identify indigenous remnant vegetation for landowners if protection management is sought.
2. Develop mechanisms to provide protection guidance and assistance to landowners if wanted.

WILDLIFE

3. Explore the potential to have wildlife surveys undertaken, particularly in association with local schools and community groups.
4. Community and landowner interests explore different management regimes for conservation and restoration.
5. Develop strategies and guidelines for wildlife enhancement.

WATER MANAGEMENT

6. Encourage understanding of groundwater levels and the ecological potential of the land-water interface.
7. Have guidelines developed for restoration and management of streams and wetlands.
8. Encourage and assist landowner/managers to exclude grazing stock from waterways and wetlands
9. Where there is space, encourage restoration of natural stream form and vegetation - rather than straight steep-sided, "shaved" drains.
10. Explore the potential for land-owner support to seek to re-instate stream flows crucial to wetland sustainability.
11. Explore the potential for expanding the area of wetlands - and encouraging their native biodiversity.

RESTORATION PROJECTS

12. Learn from existing restoration projects and identify potential restoration trial sites and demonstration plots in each type of ecosystem. Trial different establishment and management techniques.
13. Ensure recognition that wetland ecosystems extend well beyond the actual water or visibly wet area, so that appropriate management is sought.
14. Explore potential support for restoration projects.
15. Have restoration guideline details developed for each type of ecosystem to cover both large- and small -scale projects.
16. Encourage establishment, support and advice for Coastal Care Groups.
17. Along with trials and demonstrations, further develop the planting guides to enable people to undertake their own restoration activities.
18. Support and encourage neighbourliness, through complementing restoration efforts.

BIODIVERSITY MONITORING

19. Seek to establish indigenous biodiversity monitoring programmes in the community to identify and record the change that occurs.

WEEDS & WASTE

20. With the community, develop a database of existing and potential invasive plants (weeds) and develop a weed management strategy.
21. Encourage good practice in disposal of garden waste.
22. Encourage avoidance and removal of polluting practices.
23. Recognise cultural and heritage values in the selection, upgrading, management and monitoring of sewage treatment techniques.
24. Encourage the upgrade of community and individual sewage management schemes to avoid contamination and the degradation of natural and cultural values.

EMPLOYMENT & TRAINING

25. Develop a co-ordinated approach to employment on restoration programmes.

INTERPRETATION

26. Develop and provide appropriate interpretation of cultural history and of natural history.
27. Encourage discussions with tangata whenua prior to any new earth disturbance, to seek to avoid disturbance of cultural values

ENVIRONMENTAL RESULTS ANTICIPATED:

Community feeling empowered, responsible and able to manage their amenity, heritage and environment sustainably.

RECREATION

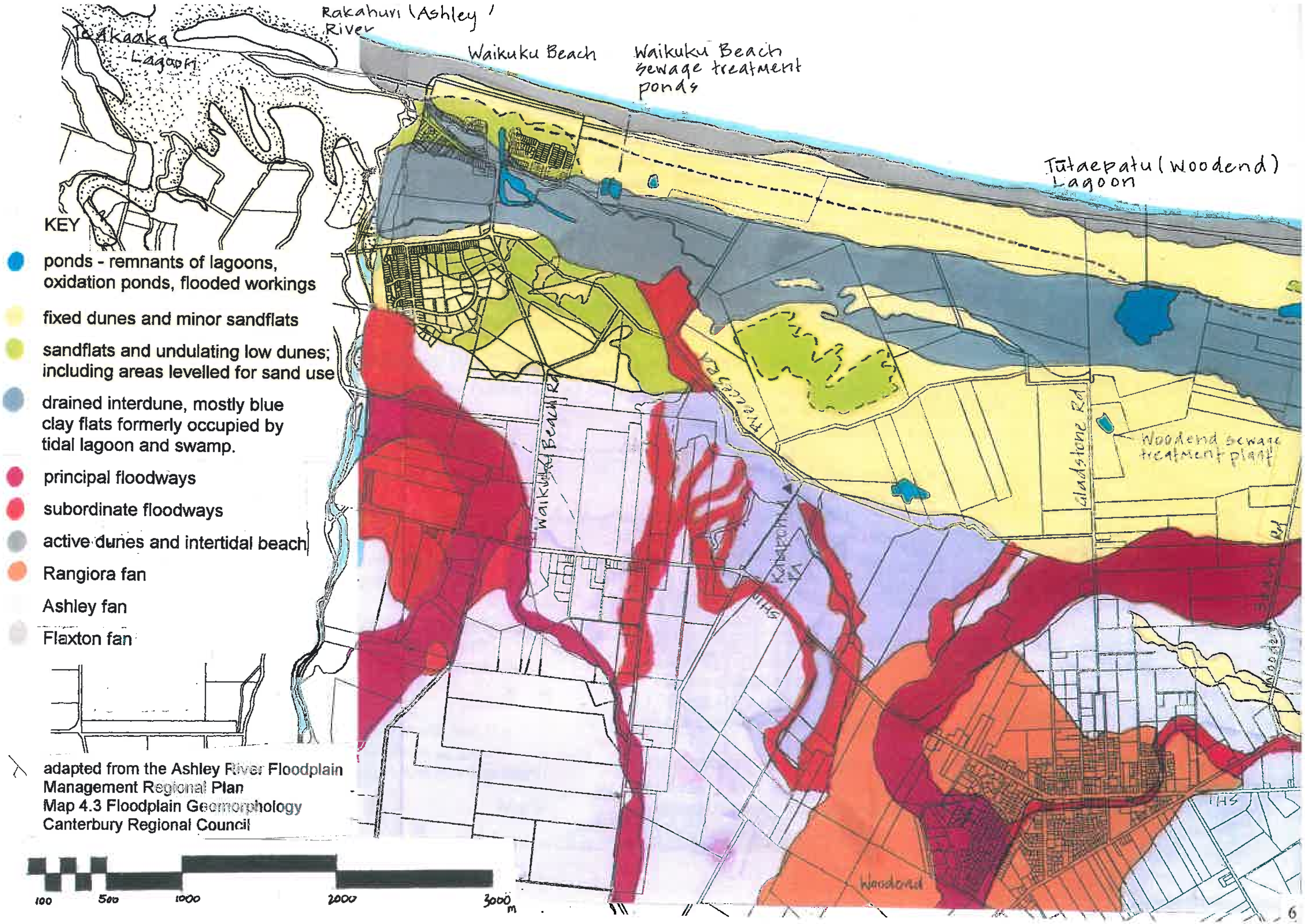
28. Seek development of a walkway system and other ecologically, socially and culturally appropriate recreation opportunities.
29. Develop mechanisms for reducing user conflicts e.g. separate areas, restoration timing, etc.

BUILDINGS

30. Have a local landscape guideline brochure developed in consultation with the community.
31. Develop a building guideline leaflet to articulate both rural and settlement character.

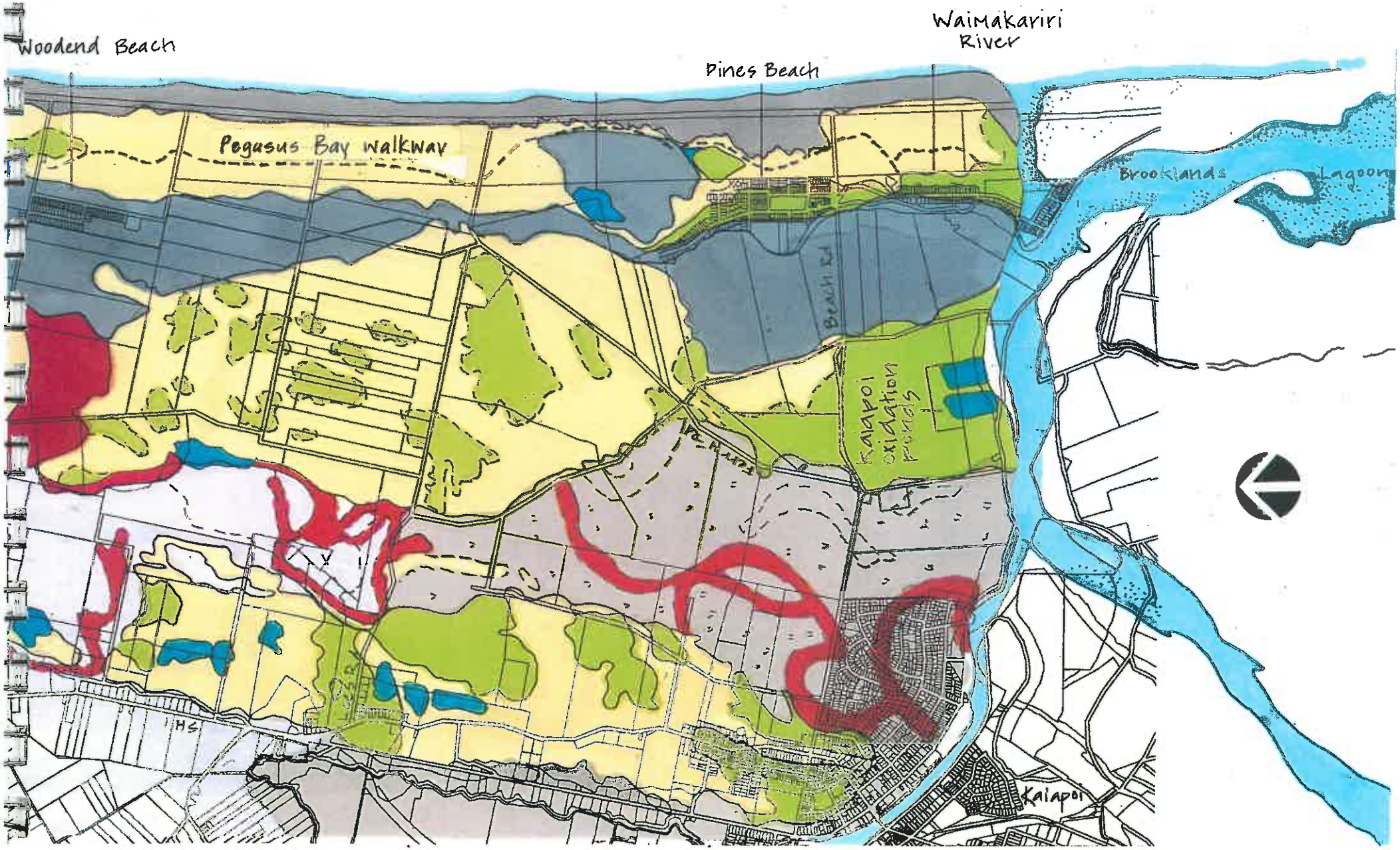
DISTRICT PLAN

32. To recognise and enable achievement of the recommendations outlined for restoration and settlement.



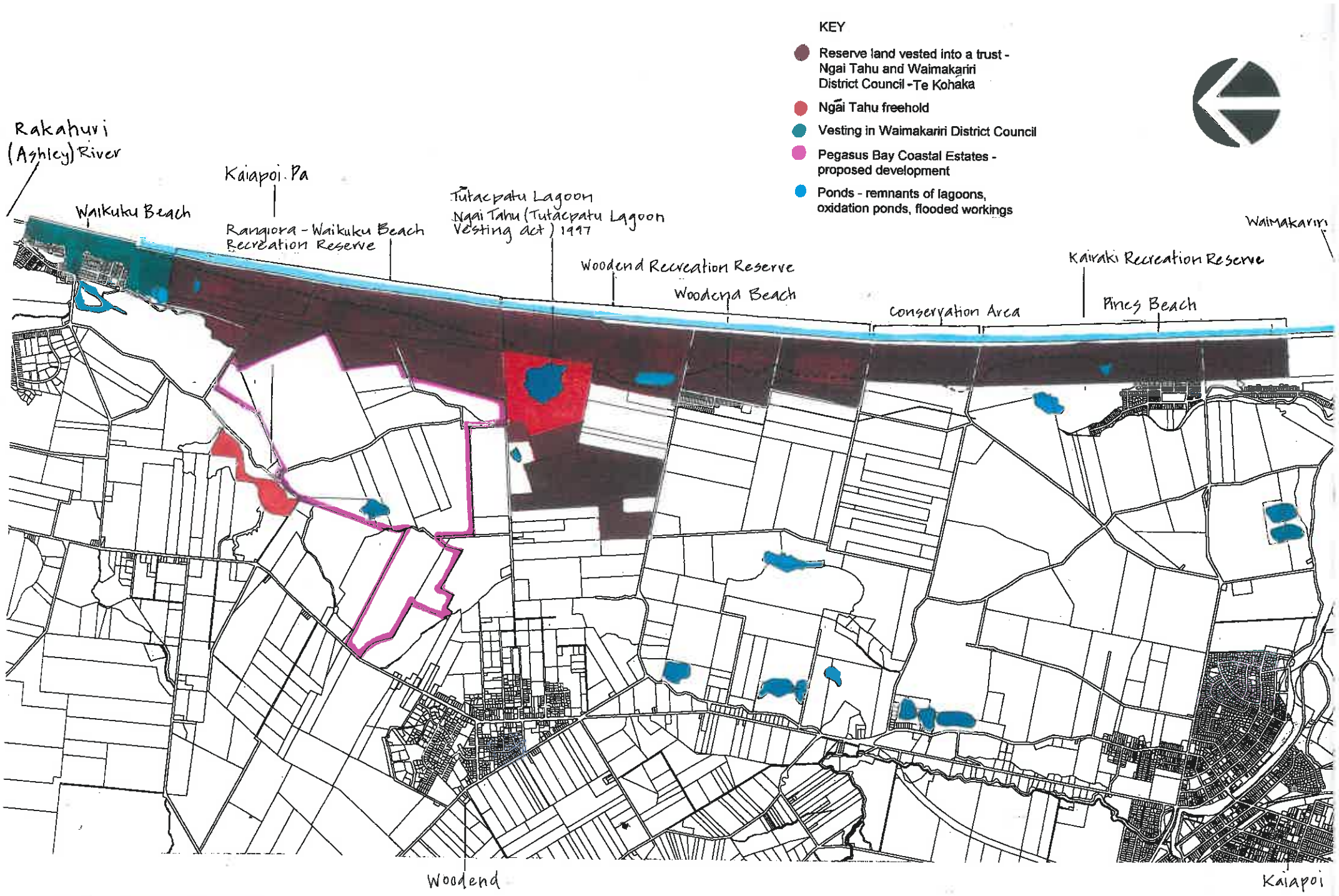
Te Akaaka Lagoon
Rakahuri (Ashley) River
Waikuku Beach
Waikuku Beach sewage treatment ponds
Tūtaepatu (Woodend) Lagoon
Woodend sewage treatment plant
Gladstone Rd
Waikuku Beach Rd
Preeces Rd
Kairaki Rd
SH1
Woodend
KEY
ponds - remnants of lagoons, oxidation ponds, flooded workings
fixed dunes and minor sandflats
sandflats and undulating low dunes; including areas levelled for sand use
drained interdune, mostly blue clay flats formerly occupied by tidal lagoon and swamp.
principal floodways
subordinate floodways
active dunes and intertidal beach
Rangiora fan
Ashley fan
Flaxton fan
adapted from the Ashley River Floodplain Management Regional Plan
Map 4.3 Floodplain Geomorphology
Canterbury Regional Council
100
500
1000
2000
3000 m

Coastal Lands -
land / water patterns




Rakahuri
(Ashley) River
Waikuku Beach
Woodend Beach
SH1
Woodend
m
100
500
1000
2000
3000

Aerial Photograph


KEY
Reserve land vested into a trust - Ngai Tahu and Waimakariri District Council -Te Kohaka
Ngāi Tahu freehold
Vesting in Waimakariri District Council
Pegasus Bay Coastal Estates - proposed development
Ponds - remnants of lagoons, oxidation ponds, flooded workings
Rakahuri (Ashley) River
Waikuku Beach
Kaiapoi Pa
Rangiora - Waikuku Beach Recreation Reserve
Tūtaepatu Lagoon
Ngai Tahu (Tutaepatu Lagoon Vesting act) 1997
Woodend Recreation Reserve
Woodend Beach
Conservation Area
Kairaki Recreation Reserve
Pines Beach
Waimakariri
Woodend
Kaiapoi
100 500 1000 2000 3000 m

Land Tenure

Community - Workshop Comments

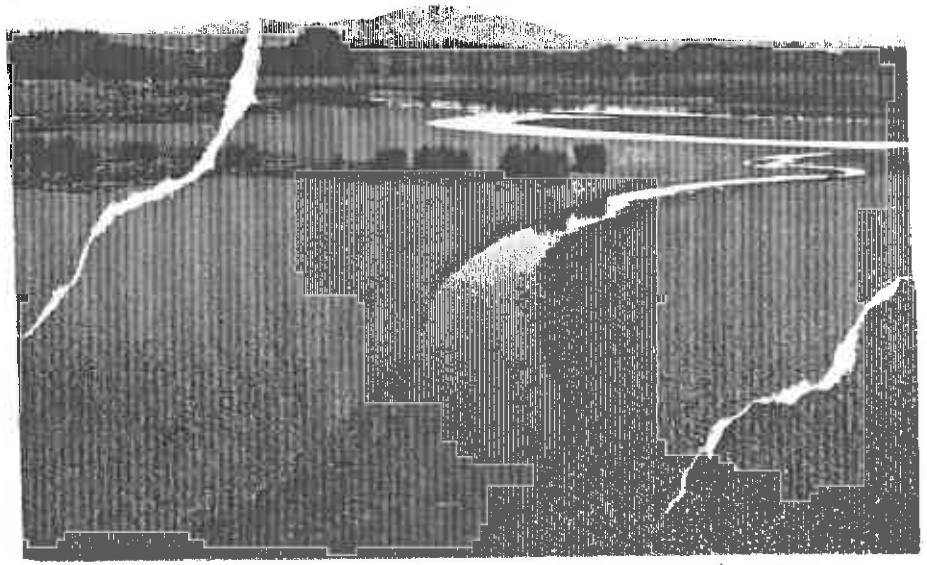
Values of these Coastal Lands Identified by the Community were:

Natural Character

- *"wilderness", remoteness, untouched wild landscape and rural character*
- *"natural / rural/ undeveloped"*
- *continuous natural belt from river to river*
- *sheltered quality especially Woodend to Pines Lagoon*

Wetland

- *Importance of Tūtaepatu lagoon*
- *Kairaki lagoon - "which people still remember as a flax swamp"*
- *mouth of Ashley lagoon (more like the West Coast)*



- *Ashley river / lagoon*

- *wildlife and native vegetation*
- *existing system for stability and character*
- *"Winters farm on Beach Road where it backs on to Pines and Kairaki is valued as a wetland"*

Vegetation

- *native vegetation*
- *vegetation (exotic and native) wildness*
- *introduced species of interest e.g. silver poplar - Pines Beach*
- *present vegetation cover i.e. pines, have a stabilising character*
- *pines give protection from the wind - Pines Beach*
- *pine forest is valued for gathering firewood and pine cones - Waikuku Beach*
- *"any forest is better than no forest" - Waikuku Beach*
- *forest - controls erosion*

Bird life / Wildlife

- *bird life e.g. at Taranaki Stream Ashley Lagoon - robins, fantails, herons (grey, white faced and white), bittern, marsh crake, shining cuckoo, Oriental cuckoo, bellbirds(have come back in the last 6 years), native pigeons, black fantail, brown creeper (recorded), morepork*
- *potential for wading birds - in Pines Beach village*
- *increase in breeding birds, migrating birds*

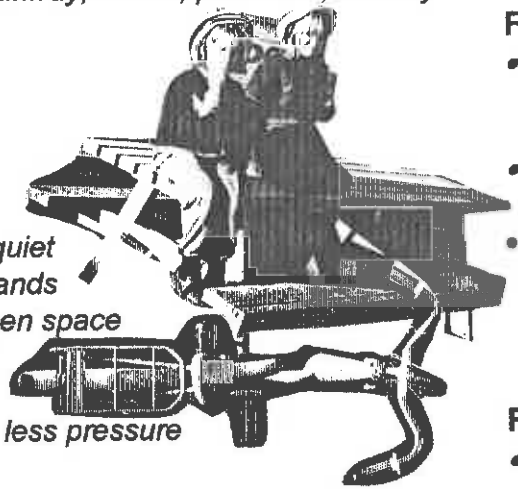
Clean Environment

- *value clean water in the Waimakariri river*
- *clean air / no smog*

values continued:

Experience

- *"here to escape the city - suburbia"*
- *variety of experience - lagoon, walkway, beach, pine walk, estuary*
- *country village atmosphere*
- *views into and out of lagoon*
- *rural character and atmosphere*
- *unspoiled environment*
- *freedom and isolation*
- *remoteness and distance*
- *tranquillity, peaceful, restful and quiet*
- *space in association with urban lands*
- *privacy, un-crowded, solitude, open space*
- *safe area for kids with little traffic*
- *sea noise adds character*
- *"lifestyle away from the rat race", less pressure*
- *coastal way of life*
- *place to be alone, without noise from motor bikes and 4WD*
- *unique and special environment*
- *baches -" We value the unspoiled environment and do not want the 'beach resort' style or to be suburbanised."*
- *the town should be maintained as a quiet family holiday place*
- *wish to retain the identity we have*
- *wilderness on our backdoor*
- *low value land*
- *restrictive development is an asset e.g. housing*



Community

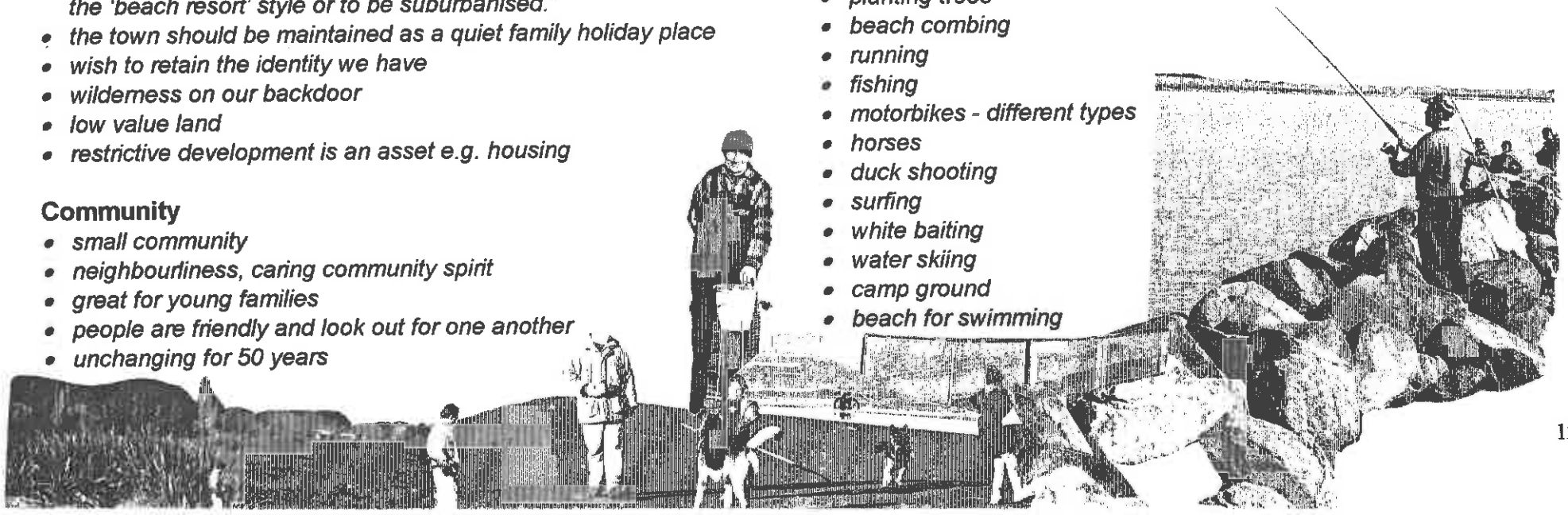
- *small community*
- *neighbourliness, caring community spirit*
- *great for young families*
- *people are friendly and look out for one another*
- *unchanging for 50 years*
- *"we enjoy the way our community interacts in our daily lives" e.g. shop, hall playground and school - Waikuku Beach*
- *"leave it as it is "*
- *good for kids - opportunities to play in forest, build huts*

Facilities

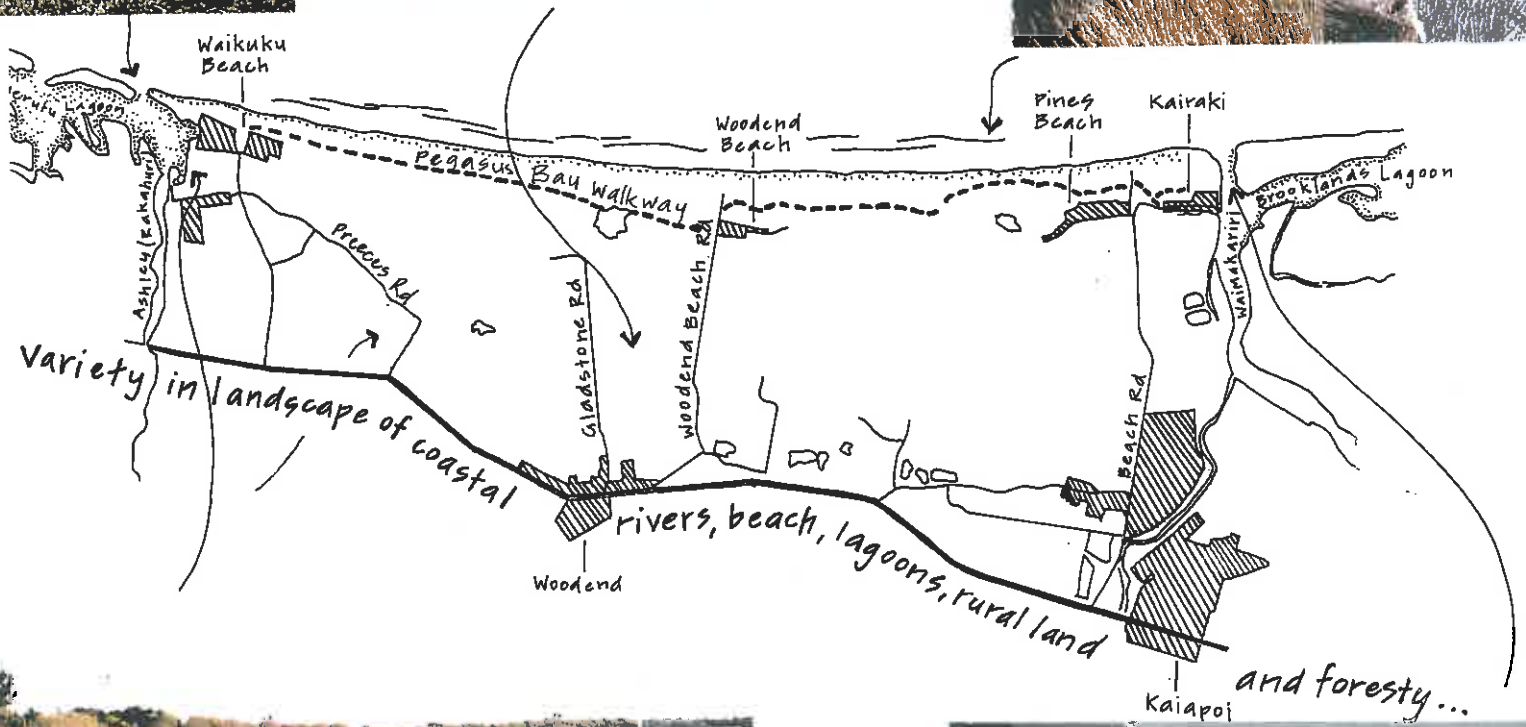
- *town shop - Pines Beach* (Woodend and Waikuku Beach settlements also have shops. At Waikuku Beach it provides a community focus)
- *fire brigade, watch dog group, youth group, play centre, camping ground, surf club, bowls, rest home*
- *"School is an asset to the community. The school as it operates is absolutely vital to Waikuku. Generations have fought to retain the school and it is integral to the settlement".* (The Waikuku school links the farm and beach communities).

Recreation

- *simple, accessible, easy and numerous choices for recreation*
- *opportunities for unstructured / passive outdoor recreation*
- *variety of walks - walkway, beach, sand hills, forest, wetland*
- *collecting firewood*
- *planting trees*
- *beach combing*
- *running*
- *fishing*
- *motorbikes - different types*
- *horses*
- *duck shooting*
- *surfing*
- *white baiting*
- *water skiing*
- *camp ground*
- *beach for swimming*



Variety in the landscape of these coastal lands



values continued:

Cultural

- *the existence of Kaiapoi Pa site and pre European history in the area is of importance to New Zealand society in the future.*
- *Tangata whenua - waahi tapu, historic, artifacts, culture and spiritual*
- *preserving the Mauri (spirit of the area)*
- *mahinga kai*
- *respect for race and history*
- *the area proposed for Pegasus Development is of national importance for the pounamu working sites which predate Ngai Tahu by 300 years and Pounamu workshops (of Ngai Tuahuriri). It also connects Tutaepatu with Kaiapoi Pa site.*

Heritage

- *Maori/European heritage*
- *historical and archaeological values of our existing wetlands need to be fiercely protected*

Education

- *opportunity to learn about nature*
- *interaction between birds, insects e.g. Sand Scarata which move over the sand at night*
- *opportunity to learn about natural history/ecology e.g. people can see herrings feeding at floodgates*
- *opportunity to learn about different cultural/management of land (ecosystems)*

Access

- *easy access for people to enjoy the coast*
- *handy to the city but far enough away*
- *"public access is valued but not if it brings in too many vehicles, do not want motorised access to the beach and dune system".*

Production

- *farming - small scale horticulture, good market gardens inland,* (dairy farming is the traditional form of farming).
- *wetland and farmland integration e.g. seasonal inundation*
- *fishing viability (seasonal)*
- *good spring stock*
- *aquaculture*

Flooding

- *sand dunes provide a barrier from tsunami*
- *dune/wetland system provides a barrier against migrating sand over farmland*
- *track along beach is important for fire control*
- *regenerating coastal dunes*

Issues / Threats to these Coastal Lands Identified by the Community were:

Wetlands
- *native planting needs to be ecologically sourced*
- *loss of wetland will have effects on wildlife*
- *need native vegetation to attract a variety of birds and animals*
- *drainage*
- *subdivision/development threat to wetland*
- *ecology is significant*
- *subdivision will bring a change to hydrology, flooding*
- *need to enhance areas of wetlands to discourage vandalism*
- *difficulty of establishing native vegetation*
- *need to increase habitats for wildlife*
- *objects hindering water flow causing stagnation*
- *area behind houses on Featherstone Avenue to be cleaned up by Saltwater Creek. - Pines Beach*
- *land inland of the dunes looks a "shambles"*
- *preservation and protection of rare indigenous plants*
- *rare flaxes along Saltwater Creek (Kairaki) need saving*

Sand Dunes
- preservation and protection of sand dunes
- sand dunes keep out Easterly wind

Heritage
- too much interest in special sites may lead to vandalism
- lack of interpretation at some heritage sites

Education
- important to educate people on the environment

Walking Tracks
- *improve existing walking tracks which are unable to be used at times*

Forestry
- *logging / general maintenance*
- *mixed reaction to pine trees - stabilising factor to the beach, but suppressing other species. How do they fit into the environment?*

Management Plan
- *restoration needs a strong vision and policies*
- *need to prioritise*
- *a management plan should look at the whole area*
- *need a balance between access and conservation*
- *lack of confidence in District Council's agenda and of people's ability to have their wishes taken seriously*

Funding /Expertise
- *need considerable financial support for a major restoration project*
- *needs planning for 25-30 years with ongoing support and finances*
- *need qualified people for the job*
- *any restoration needs to be carried through with*
- *avoid commercialisation of area to fund restoration*

issues / threats continued:

Development

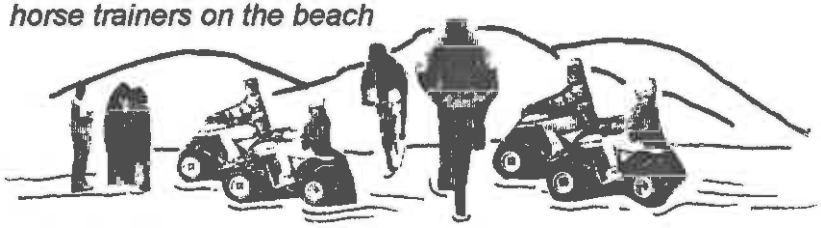
- *further large scale development will put pressure on natural resources i.e. water, loss of natural environment and infrastructure i.e. sewage*
- *it will pollute the environment, change and alter the waterways threatening existing productive land.*
- *loss of rural land*
- *District Plan needs to retain limits on development / subdivision*
- *development must respect existing community aspirations*
- *Pegasus Bay development - What is the future of the land - a town, a subdivision or rural land ?*
- *development will affect historic European and Maori sites*
- *future development will affect the water quality*
- *future development will cause urban sprawl*
- *leave it as it is - no development of roading or houses*
- *any interference with Te Kohaka Trust Reserve is to be resisted*
- *a few believe that development is not a threat*
- *Kaiapoi and Woodend are creeping out, we don't want them to come too far*

Population Increase

- *population growth could destroy the values that people live there for*
- *increase in traffic volumes, litter, vandalism and over population of the region - pressure on the environment, people, vehicles and animals*

User Conflicts

- *incompatibility of recreational users of tracks e.g. horses, motorbikes, cars, walkers*
- *need to separate horses/motorbikes and walkers*
- *horse trainers on the beach*



- *horses riding through picnic area on Ferry Road, Woodend Beach*
- *interest groups need designated areas e.g. for horses, greyhounds*
- *conflict between boaties and fishermen on rivers*

Motorbikes

- *motorbikes dangerous to children and horses*
- *recreational users of motorbikes play on the beach, sand dunes and walkway affecting plant life, wildlife and people.*

Vehicle Access/Speeding

- *no control on access to beach areas from Pines Beach/Kairaki.*
- *further access to beach and environments will allow more 4WD / bikes to degrade dunes and vegetation. There needs to be restricted access*
- *need to control vehicle access to beach and rivers to counter effects such as vandalism*
- *army vehicles have been tearing up the sand dunes*
- *speeding cars on Beach Road - Woodend Beach*
- *limited speed zone by Christian Camp dangerous, 30 km signs to be further westward - Woodend Beach*

Flooding

- *threat of tsunami*
- *would the wetland be effective in reducing flooding?*
- *existing properties have unknown threat of flooding*
- *effect on subdivision/development*
- *flooding from the Waimakariri river*
- *drainage /flood control*
- *sea level change should be brought into the calculations*

Drainage

- *needs to be maintained, on other hand, irrigation may be needed*

Issues / threats continued:

Fire
- *no provision for fighting fires except from Woodend Beach township,* (Waikuku Beach has a small voluntary fire brigade)
- *need for breaks between pine trees, avoid more pine trees*
- *much of the coast is not accessible for fire trucks or 4WD, there needs to be constant maintenance*

Pests
- *damage to plants from rabbits,* (wild cats, hares and possums also a problem)
- *ferrets, rabbits, possums and rubbish dumped* **will** *increase the problem of TB*

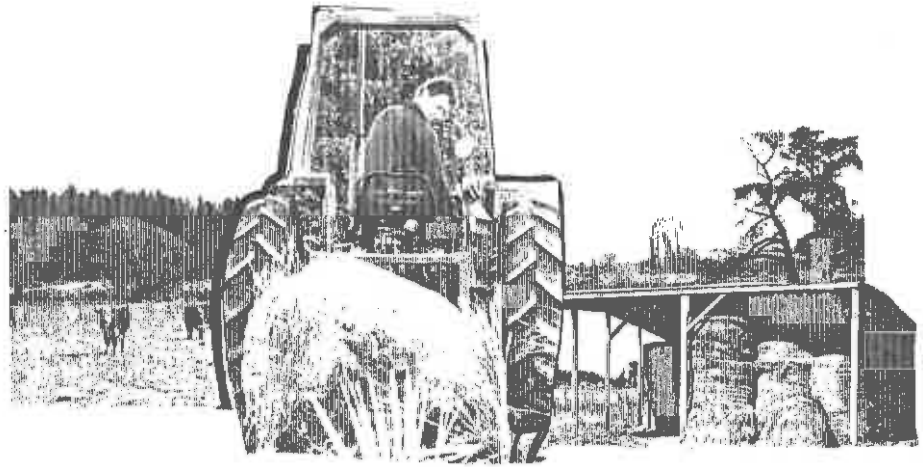
Weeds
- *weeds/invasive plants e.g. blackberry, pussy willow, wilding pines, nightshade*
- *weeds are a maintenance problem for new planting*

Erosion
- *sand dune coastal erosion - coast open to flooding, dunes need to be maintained*
- *boats/jet skis causing erosion to the Waimakariri river shoreline*

Pollution
- *control issues - toxins, stock carcass's lying around*
- *poisoning of ground water*
- *noise pollution e.g. from water sports and vehicles causing distress to wildlife*
- *air quality - increase of houses* **will** *effect the air quality*

By-laws
- *lack of enforcement of by-laws*

Production
- *how will wetland restoration affect farming land along the edge?*
- *how would an employment park affect the area?*
- *drainage/irrigation on the farm*
- *potential for commercial eel farms*



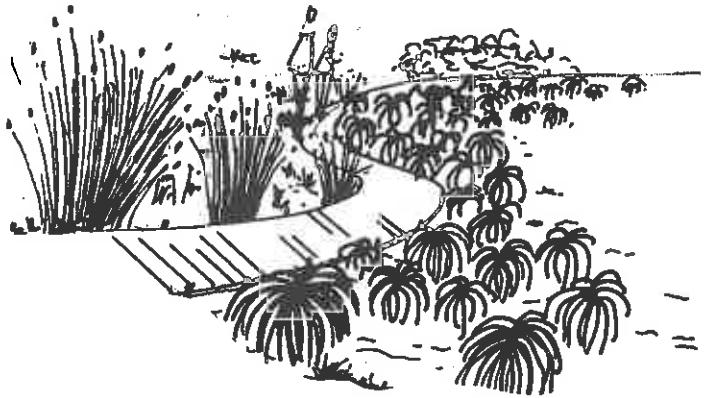
Sewage System
- *Kaiapoi sewage system is becoming overtaxed, with potential to threaten clean waterways*
- *water contamination from sewage, cattle farming, industry*
- *sewage is a problem which will get bigger with increased built development*
- *Woodend and Waikuku sewage ponds both overflow into wetlands areas - the council to look at a solution*
- *suggestion to move sewage to Bromley instead of using the small inefficient plants - expected to be expensive*
- *sewage is damaging the wildlife and the sand dunes/mahinga kai - health problem*
- *don't want any more oxidation ponds*

Opportunities / Visions of the Coastal Lands Identified by the Community were:

Restoration of Wetlands and Associated Ecosystems

- *to enhance and restore different ecosystems - existing lagoons, wetlands, vegetation, birdlife and other wildlife*
- *remnant stumps of Totara, Kahikatea, Kanuka forests have been found and are a cue to restoration options*

- *some Ngai Tuahuriri would like to restore the whole coast to native habitat*
- *maintain and optimise corridors for the birds from the mountains down the rivers, over the wetlands, sand dunes and out to sea.*
- *potential enhancement of fish habitat and breeding grounds*
- *a sanctuary for birds and other wildlife - insects and frogs - especially around the lagoon*
- *endangered plants and fish saved e.g. eels*
- *a managed ecosystem with a sustainable harvesting strategy - fish, ducks, trees*
- *restoration of native flora and fauna but in pocket areas only*
- *wetland /lagoon area increased - maybe to replace some of the pines - could plant fast growing natives*
- *lagoon cleaned up and wilding pines and gorse removed*
- *"like to see pockets of open water and emergent bush with open water plus bush corridors and connecting walkways"*



- *the natural character of the coastal dunes maintained*
- *insectivorous birds, including fantails helping keep insects in balance*
- *restoration of wetlands balanced with other uses*
- *council purchase and enhance wetland west of Park Terrace - Waikuku Beach*
- *Pines Beach wetland opened up - salt marsh vegetation/tidal environment recreated*

Vegetation

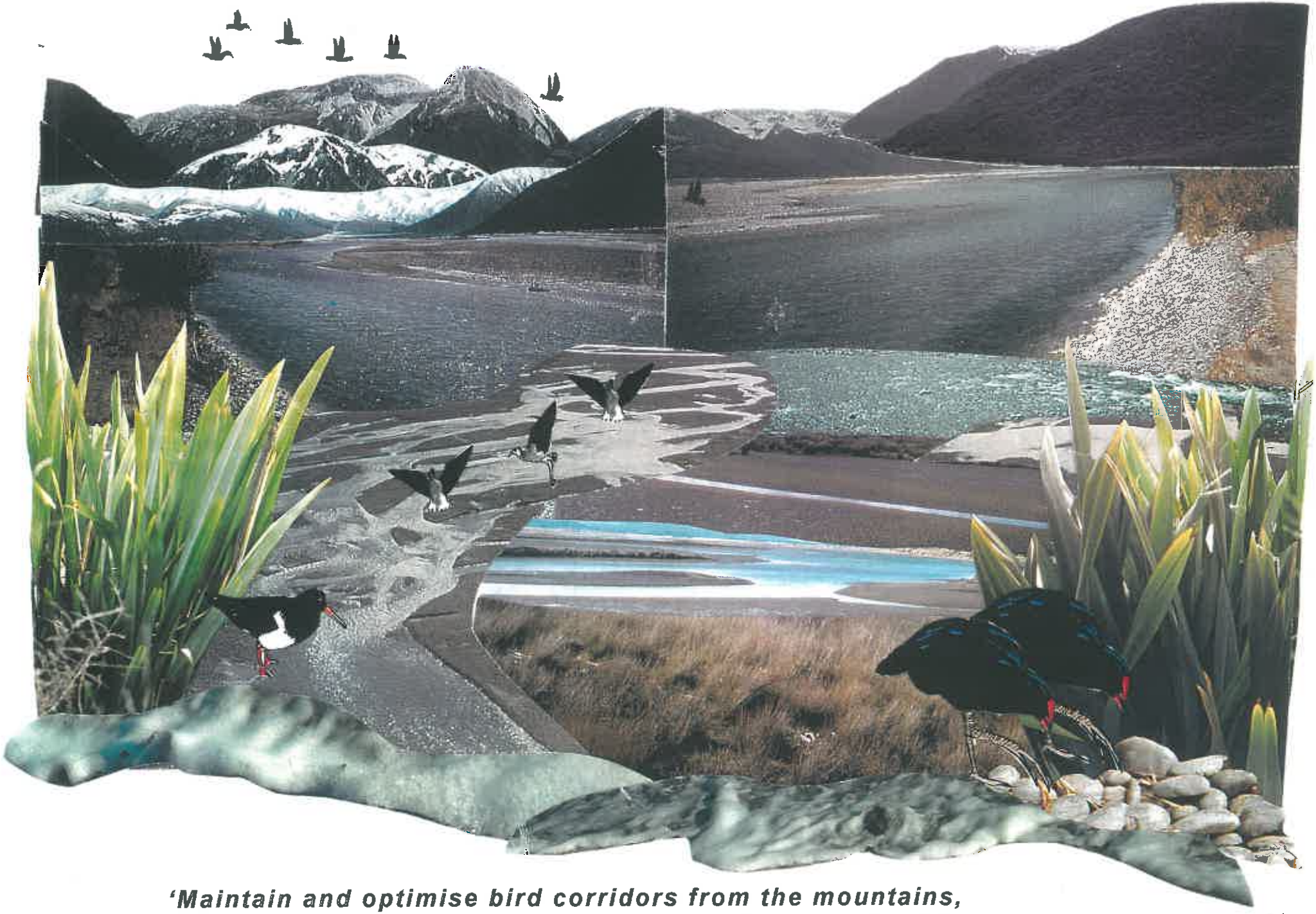
- *introduction of more native plants and trees*
- *establish native plants throughout pine forest to create suitable environment for native fauna to flourish - initially in managed pockets*
- *pine forests continuing as an important part of the environment for dune protection, wind protection and firewood.*
- *an area of native vegetation e.g. trees, flax, sedges*
- *re-establish vegetation which provides food for birds*
- *a coastal strip afforested with natives : providing natural variety rather than an artificial monoculture*

Conservation / Birdlife

- *people sees the land as a living environment - it has a personality*
- *potential for wading birds - in the village*
- *increase in breeding birds, migrating birds*

Experience

- *sanctuary, a place to retreat to*
- *would like it to stay the same*
- *an unspoiled environment with a sense of solitude*



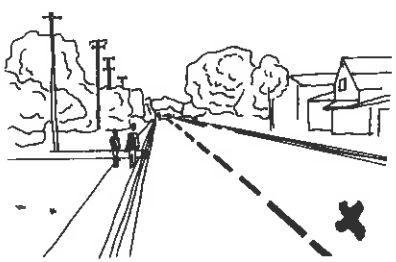
'Maintain and optimise bird corridors from the mountains, down the rivers, over the wetlands, sand dunes and out to sea.'

opportunities / visions continued:

- *size of community remains relatively unchanged - leave it rural*
- *local residents feel a sense that this is their place - beach / forest*
- *want it to remain unsophisticated - no beach resorts*
- *provide an environment which is safe and fun for kids to grow up*
- *free from vehicles and noise*

Settlements

- *retention of village atmosphere, retain soft landscape, country environment while having practical necessities i.e. drainage*
- *maintained and managed area providing services such as footpaths, but in a way which retains the haphazard and unplanned feel*



- *vision for future generations - leaving these valuable, vulnerable coastal lands protected in perpetuity - keep the same environment but still encourage new residents and some progress keep small community feel - friendly*
- *retain village commons - Pines Beach and Waikuku Beach*

Development

- *appropriate/controlled development that respects the environment*
- *an area that is kept as it is, free from the threat of development - whilst some development is okay, none is preferred*

- *no commercial or residential development backing onto dunes*
- *limited residential growth - no new town*
- *leave it rural*
- *retain "green belt" of undeveloped land around Waikuku Beach*

Recreation

- *a managed designated area for offroad vehicles, horses and greyhounds*
- *area for teenagers e.g. bikes, skateboards and basketball*
- *re-establish, improve the Pegasus Bay walkway*
- *establish an inter-linked network of walkways*
- *hides for bird watching*
- *historic trail*
- *pines retained around the playground / wilding pines gone*
- *Pines Beach motor camp a source of revenue and not perceived as a disturbance*

Access

- *managed and continued access to beaches all along the coastal strip*
- *opportunities for people of all ages, special needs, city visitors and children to access the coast*
- *restrict access to the beach for motorbikes - require permits or restricted access to pine forest*

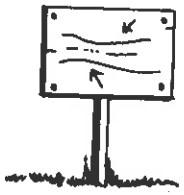
Cultural

- *integrated management based on partnership between cultures*
- *preserving resources and environment especially in forms of mahinga kai, special flora and fauna species, and, archaeological interests*

Identity

- *"If the three settlements are viewed as one entity then the individual communities may lose their identity and what we want to do with the area".- Pines Beach*

opportunities / visions continued:



- *living with a sustainable use of our land*

Education

- *information provided for locals on the environment and heritage through interpretation*
- *more education and public awareness of what is there in order to support enhancement of the area i.e. a place for people to come and relax, learn, appreciate and protect.*
- *public awareness of the wetlands for people who want to appreciate them, not damage them*

Employment

- *opportunity for conservation work, work schemes and training*

Community Involvement

- *opportunity for community to get involved in the implementation of the restoration e.g. planting*

Finances

- *financially sustainable restoration, not using rateable funds and done in stages*
- *restoration funded by governing body*

Management

- *a comprehensive management plan that can work towards common goals*
- *expertise and commitment contributing to restoration*

Ownership

- *secure ownership sought, of remaining wetland areas by Council, DOC (Te Kohaka O Tuhaitara Trust does not hold any land but was formed to develop an integrated management plan and implement it).*

Planning

- *covenants put on future development so that it doesn't dramatically change*
- *apply for some form of protective covenant to be placed on the coastal wetland system*
- *a heritage order*
- *a comprehensive plan that we can all work towards*

Pests

- *the willow problem eliminated or well under control, grazing helps keep down woody species*
- *pests and weeds controlled*

Production / Business

- *farming and wetland mix - seasonal inundation*
- *nature and culture tourism opportunities*
- *rural land of high production value needs to be protected*
- *a mixture of land uses suited to various different sites - forest, wetland, pasture - variety brings beauty*
- *long term - limited commercial development i.e. aqua culture -eels, production*
- *limited commercial opportunities to fund restoration projects - forestry, aquaculture and production*
- *co-ordinated forestry management plan so that recreation opportunities could be improved*
- *different types of production forest, of non invasive hardwoods*

Flooding

- *flood management through appropriate land use, definition of flood zone and by ensuring rural residential suitability*
- *need to establish a buffer between wetland and rural land for flooding*
- *a fully integrated flood management plan developed*
- *permanent buffer zone, between the sea and the inter dune belt*

Workshop Participants

Woodend Beach

Name	Organisation
John Archer	*Earthworks/resident*
David Ayers	*Waimakariri District Council*
Rob Blakely	*Wai-Ora Trust*
Marjorie Cobson	
Jim Cobson	
Kathryn Fordmeryer	
Miles Giller	
Nikki Gray	*Lucas Associates*
David Gregory	*Canterbury Regional Council*
Beryl Holdorf	*Horse Treks*
Olwyn King	*Advisory Group Waimakariri District Council*
Matthew Lester	*Earthworks/resident*
Di Lucas	*Lucas Associates*
Paul Mosley	" "
Erina McNeil	
Grena McNeill	
Clem Parfitt	
Ken Poole	
Valerie Poole	
Annabel Riley	*Lucas Associates*
Judith Roper-Lindsay	*Boffa Miskell*
Dave Sanderson	
Margaret Sanderson	
Bruce Thompson	*Waimakariri District Council*
George Thurston	
Sherry Thurston	
Chris Todd	*Wai-Ora Trust*
Viv Smart	
Doug Wethey	

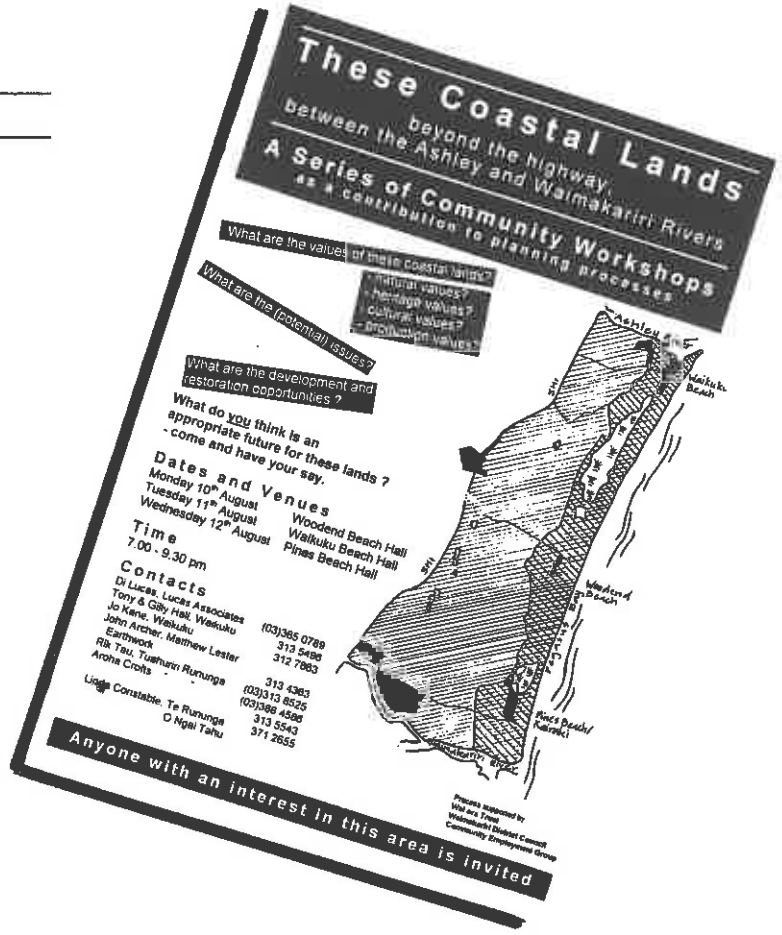
Waikuku Beach

Name	Organisation
Nick Allen	
John Archer	*Earthworks/ resident*
Bruce Bastion	
Bruce Bastion	
Marty Bennetts	*Rural Fire Crew*
Rob Blakely`	*Wai-Ora Trust*
Paula Brydon	
PW Brydon	
Hoana Burgman	*Ngai Tuahuriri RSMK*
Gillian Giller	
Nikki Gray	Lucas Associates
Raewyn Growoott	
Gilly Hall	
Merv Hall	
Tony Hall	
Nigel Harris	
Ngawati Heremaia	
Murray Kane	
Jo Kane	*Surf Club*
	Waikuku Residents Ratepayers Ass.
Peter Keene	*Rural Fire Crew*
John Kneale	*Holiday Park*
Matthew Lester	Earthworks/resident
Di Lucas	*Lucas Associates*
Paul Mosley	" "
Joyce McIvor	*Waimakariri District Council*
Michelle Philpott	
Neill Price	
Annabel Riley	*Lucas Associates*
Janine Riley	

Tony Robb	*Rural Fire Crew*
Jonathan Scott	
RJ Smith	
Gordon Stewart	
Brian Stoles	
Clayton Thomas	
Chris Todd	Wai-Ora Trust
Geoff Whale	
Isobelle Wilkins	
Claire Williams	Ngai Tuahuriri Resource Committee
Steve Wilson	*WEURFF*
Tracey Wilson	"
Peter ?	

Pines Beach

Name	Organisation
John Archer	*Earthworks/resident*
John Billington	
Graeme Brixton	
Scott Butcher	
John Cooke	
Aroha Rewiti Crofts	
Janice Crossett	*Pines/Kairaki Beach Association*
Peter Davis	
Fred Evans	
Nikki Gray	*Lucas Associates*
Ursula Hack	
Glenys Hall	*Pines/Kairaki Beach Association*
Sharon Hancox	*Pines/Kairaki Beach Association*
Anna Harris	*Pines/Kairaki Beach Association*
Ian Hewson	
Keith Hodgson	
Joy Hodgson	*Pines/Kairaki Beach Association*
Ann Holder	
Wirenui Hopkinson	
Tokomasu Howard	
Di Lucas	*Lucas Associates*
D Lundy	*Waimakariri District Council*
Darryl Mallock	
Paul Mosley	*Lucas Associates*
Colin Page	
Robert Poole	
Annabel Riley	*Lucas Associates*
Barry Shearsby	
Chris Todd	*Wai-Ora Trust*
Reeve	



Taonga Tuku Iho
The Nature of the Place

From the opportunities and visions identified in the workshops, conservation and restoration of heritage values was understood to be important. The report therefore explores further the nature of this place to provide information, and then guidance for conservation and restoration management for land owners etc, who may be interested.

Heritage / Culture

Heritage and cultural values have been signified as of major importance in the coastal lands of Waimakariri - Rakahuri. This has been demonstrated through the workshop consultation process undertaken for this project, as well as in the resource documentation - for example, Te Whakatau Kaupapa, submissions and evidence regarding Pegasus Bay Coastal Estates Ltd., and, the knowledge of those involved in contributing to report development.

The coastal wetlands of the Waimakariri - Rakahuri have long been important to tangata whenua. These lands are in the rohe of Ngai Tahu and the takiwa of Ngai Tuahuriri and others before them for hundreds of years. The area has a long lived-in history so that there are important patterns, sites and resources that tell of these times - mahinga kai, pa, urupa and other waahi tapu cue to these values. There are also layers of tragedy and sadness.

The area also remains important today and for the future as a lived-in or cared for place for tangata whenua. It is therefore important the coastal lands are not viewed as merely historic heritage, but are recognised as living heritage, and as living culture. Conservation of heritage values and restoration of cultural values, integrated with appropriate production and living, are therefore considered appropriate.

Articulation of specific values may be more appropriately undertaken by tangata whenua. This report seeks planning, processes and information sharing to ensure the values are not threatened, but respected and conserved.

Because of the intensive lived-in history of this place, the sacredness of many sites and the need to respect the values, any earth disturbance proposed would preferably be discussed with tangata whenua.

Tetahi Korero Tuku Iho Kia Matou O Ngai Tuahuriri
Guidelines for Ngai Tuahuriri

Extracts as adopted by Te Runanga o Ngai Tuahuriri meeting of the 1 November 1998.

Kaupapa Tikanga

"Hei manaaki hei tiaki hei whakamana te mana motuhake te tino rangitiratanga o nga whanau ki o ratau taonga tuku iho na nga tupuna".

Guiding Principle

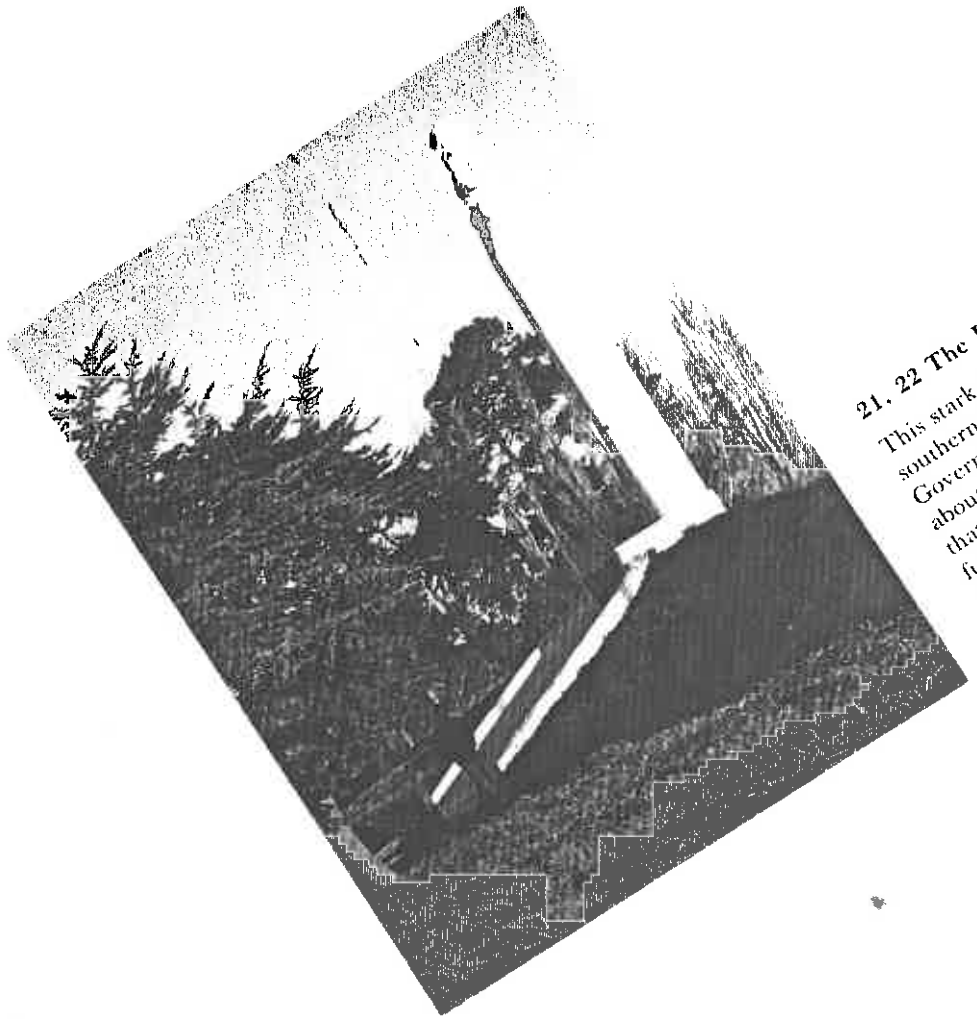
To empower our people with dignity to protect their independence and ownership of their heritage left to them by their ancestors.

Kaupapa Tikanga

Tino rangatiratanga is the right of all persons to own his/her independence and heritage in a responsible manner

LAND OF MEMORIES

A CONTEMPORARY VIEW OF PLACES OF HISTORICAL SIGNIFICANCE IN THE SOUTH ISLAND OF NEW ZEALAND



21, 22 The Kaiapohia Monument

This stark monument, completed in 1899, stands by the remains of the southern battlements of the great Kaiapoi pa, 'sold' by Ngati Toa to Governor Grey in 1847 under the Wairau Purchase. The pa was founded about the year AD1700 by Tuahuriri's son Turakautahi, who predicted that the natural local food supply of eels and waterfowl could be successfully augmented by food 'swung in' from the surrounding countryside. Hence the pa was called Kai-a-poi. The control of the West Coast pounamu by Ngai Tuahuriri's close relatives the Poutini Ngai Tahu soon made Kaiapoi the greatest pounamu-trading centre in the land. The pa was surrounded on three sides by deep swamp, giving canoe access to a hapua (lagoon) on the Rakahuri (Ashley) River. Only the southern defences of the pa faced dry land.

The Kaiapoi pa was destroyed by Te Rauparaha's forces after a long siege in 1832, to avenge the killing of some of his relatives there two years before. The siege ended when the southern battlements were breached by fire, fanned by a strong southerly wind. The defenders perished or were taken into captivity, except for those who escaped through the swamp. Among those who escaped were the tohunga (learned man) Karaki and his young son Tiramorehu, later to become one of the most prominent chiefs of Ngai Tuahuriri and the most distinguished Ngai Tahu tohunga of his generation.

Whenua i maharatia, haehae ngā tākata

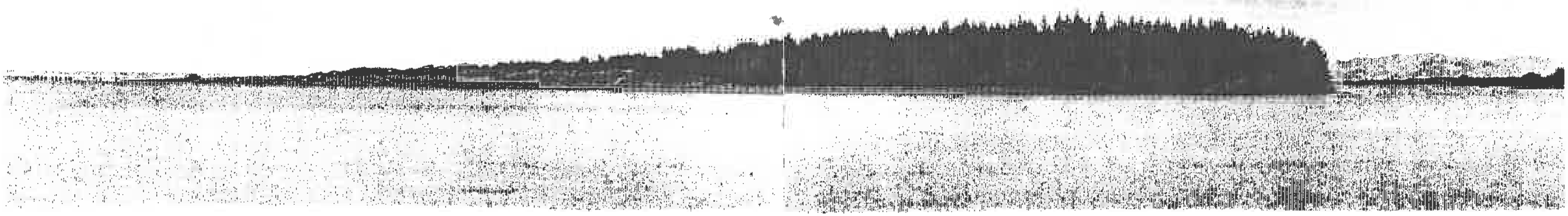
Land of memories, scarred by people

23. Waimakariri River mouth

Here the Waimakariri (cold water), Ngai Tuahuriri's river, approaches the open sea. In the distance beyond the lagoon to the south are the sprawling ridges and steep crags of Horomaka (Banks Peninsula), with the 920-m dome of Ahu Patiki (Mt Herbert) rising above all. To Ngai Tuahuriri fishermen off the coast the peaks of Maungatere, Ahu Patiki, and other prominent mountains served as marks to locate the customary fishing grounds, for the food supplies of the ocean were regarded as a continuation of the mahinga kai on land. The Waimakariri rises in the snows of the Southern Alps and its waters never fail. Like other snow-fed rivers its flow tends to be greater in warm weather when the snows are melting — as in the 'fresh' shown in this picture. Thus the natural tendency of the river is a periodic flushing out of its channels, which wind among braided shingle beds a kilometre wide when the level is low. Before European settlement began in the 1850s, the lower reaches of the Waimakariri and Rakahuri (Ashley) connected with a maze of waterways and wetlands fed by underground springs of the purest artesian water, which nourished a wealth of mahinga kai rich in bird life, eels, fish and natural vegetation. For this reason, when Crown Commissioner Kemp arrived in 1848 to purchase Canterbury, the Ngai Tuahuriri negotiators proposed to retain the 100,000 ha between the Waimakariri and Rakahuri, leaving the territory south of the Waimakariri for the Europeans. This arrangement was denied them. Instead, their four hundred people were confined to a 1,000-ha reserve at Tuahiwi, with a promise that they would retain their mahinga kai, while the rest of the 100,000 ha they had asked for was allocated to (at first) a dozen or so settlers.

The onset of European settlement brought the destruction of Maori mahinga kai and put an end to the traditional Ngai Tahu way of living off the countryside. In the interests of agriculture, industry and town settlement, swamps were drained, streams were diverted, and natural vegetation was burned. The lower Waimakariri channel was straightened and stopbanks were built to prevent flooding, thus cutting off the water from the former wetlands. Worse still in its effects was the European habit of regarding natural, life-giving waters as a receptacle for excrement and all kinds of other filth — a practice unthinkable to the 'savage' Maori. Today the discharge of town sewage, agricultural effluent, and industrial waste from meat works and woollen mills has made the lower Waimakariri and its associated creeks virtually unusable to the Maori as a source of food.

PHOTOGRAPHS
Mark Adams
TEXT
Harry Evison



Hydrology

Wetlands similar to those on the West Coast would have covered the coastal strip of the Waimakariri - Rakahuri (Ashley) 200 years ago instead of the willows and grasslands you see today. The interdune area was once a continuous wetland which over the years has been drained and modified. This area is also in a flood path (see Coastal Lands - land / water patterns map pp 4-5).

Water drives the existence of wetlands. There are two basic reasons. The first is the balance between the inflow and outflow of water, which changes with the season. In winter, for example, it is usually a lot wetter than in summer, because vegetation is transpiring less moisture.

The other main reason a wetland may occur is because of the topography and low gradient, so water is ponded and saturates the soil. Near sea level the gradient may be too gentle for water to get away easily. Wetlands are often situated in bowl-shaped depressions which is the situation in this coastal strip. It is possible to identify a former wetland by the type of soil or remnant vegetation.

Inflows

Water comes into the area through rainfall and through the Waimakariri and Rakahuri (Ashley) rivers which cut through the Ashley fan. Water also comes from underground springs fed from the Rakahuri (Ashley) river which give rise to the streams which run across this area.

An increase in the need for irrigation by land managers further up the plains may mean less water coming out of the springs at the foot of the fan.

Outflows

Water moves off the area through overland drainage and streams flowing into the Waimakariri and Rakahuri (Ashley) rivers. Seepage back into the groundwater aquifer is not very significant because of the high water table as it is so close to sea level. Two significant processes are: evaporation from the soil and ponds, and transpiration by vegetation. These processes are important because it is possible to modify them. Trees intercept and transpire about 650 mm of water per year, which is twice the amount transpired by grassland and close to the annual rainfall in the area.

Changing Regime

A wetland can be modified by changing different aspects of the inflow and outflow. It can be made wetter or drier depending on what the objectives are for the area and how it is managed. As early as 1865 Waiora stream (originally mapped as Kawari) was diverted from its natural course eastward to Tutaepatu Lagoon and redirected northward into Waikuku stream. The original course of the stream is now dry pasture, although it can still be seen on aerial photographs (Evison, H.C, Te Wai Pounamu).

Our ability to modify the environment is also determined by external factors such as climate. Over recent years, the weather patterns have been changing and Canterbury appears to have become more prone to drought. We do not yet know whether such changes are permanent or simply part of a cycle but they will affect how much we can modify our environment and undertake ecological restoration.

Effects of a drought - Photo by Florence M. Neill

Through natural processes sea level is rising by about 1.5 mm per year. The shoreline along this part of the coast is moving outwards by about 2 metres per year on average. Together, these trends will cause the gradient towards the sea to drop so that these coastal lands could get wetter in years to come.

Opportunities exist for the community to decide on their vision for their environment and to assess the practicalities, strategies and management for achieving the visions.

Wildlife

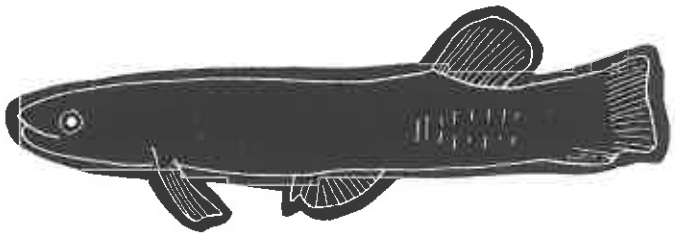
Fishlife

In the estuaries, wetlands and streams of the Waimakariri - Rakahuri Coastal Lands, there is a great range and abundance of fishlife including tuna (eel), patiki (black flounder), and inanga (whitebait). With the wetland and stream restoration sought, fishlife is expected to be enhanced considerably.

Native fish known to be found in the coastal strip include:

Rakahuri (Ashley) River and Te Akaaka (Ashley) Estuary

Banded Kokopu	*Galaxias fasciatus*
Bluegill Bully	*Gobiomorphus hubbsi*
Canterbury Galaxias	*Galaxias vulgaris*
Canterbury Mudfish	*Neochanna burrowsius*
Common Bully	*Gobiomorphus cotidianus*
Common Smelt	*Retropinna retropinna*
Inanga, Whitebait	*Galaxias maculatus*
Koaro (Whitebait)	*Galaxias brevipinnis*
Longfinned Eel	*Anguilla dieffenbachii*
Patiki, Black Flounder	*Rhombosolea retiaria*
Shortfinned Eel	*Anguilla australis*
Torrent Fish	*Cheimarrichthys fosteri*
Upland Bully	*Gobiomorphus breviceps*



Rakahuri / Ashley River Wetlands

Canterbury Mudfish	*Neochanna burrowsius*
Inanga, Whitebait	*Galaxias maculatus*
Shortfinned Eel	*Anguilla australis*

Taranaki Stream

From Te Akaaka (Ashley) estuary to Tutaepatu lagoon

Common Bully	*Gobiomorphus cotidianus*
Common Smelt	*Retropinna retropinna*
Giant Bully	*Gobiomorphus gobioides*
Longfinned Eel	*Anguilla dieffenbachii*
Patiki, Black Flounder	*Rhombosolea retiaria*

Little Ashley Stream

Common Bully	*Gobiomorphus cotidianus*

Waikuku Stream

Longfinned Eel	*Anguilla dieffenbachii*

Waimakariri River Mouth

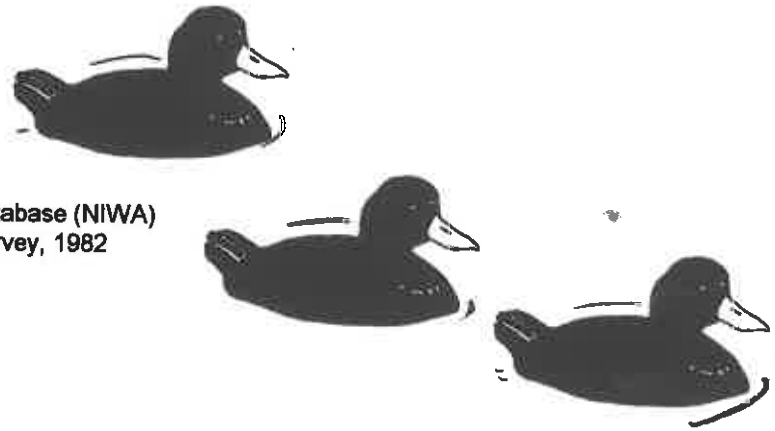
Black Flounder	*Rhombosolea retiaria*
Common Smelt	*Retropinna retropinna*
Inanga, Whitebait	*Galaxias maculatus*
Kanakana, Lamprey	*Geotria vulgaris*
Stargazer	*Leptoscopus macropygus*
Stokells Smelt	*Stokellia anisodon*

Waimakariri River Estuary

Common Bully	*Gobiomorphus cotidianus*
Common Smelt	*Retropinna retropinna*
Giant Bully	*Gobiomorphus gobioides*
Inanga, Whitebait	*Galaxias maculatus*
Longfinned Eel	*Anguilla dieffenbachii*
Patiki, Black Flounder	*Rhombosolea retiaria*
Shortfinned Eel	*Anguilla australis*
Stokells Smelt	*Stokellia anisodon*
Torrent Fish	*Cheimarrichthys fosteri*
Yellow Eye Mullet	*Aldrichetta forsteri*

Beach

Elephant Fish	*Callorhyncus milii*
Gurnard	*Chelidonichthys kumu*
Kahawai	*Arripis trutta*
Paddle Crabs	*Ovalipes cathurus*
Pipis	*Paphles australis*
Red Cod	*Pseudophycis bacchus*
Rig	*Mustelus lenticulus*
Trough Shells	*Mactra spp.*
Tuatua	*Amphidesma sutriangulatum*



National Freshwater Fish database (NIWA)
Department of Lands and Survey, 1982

Birdlife

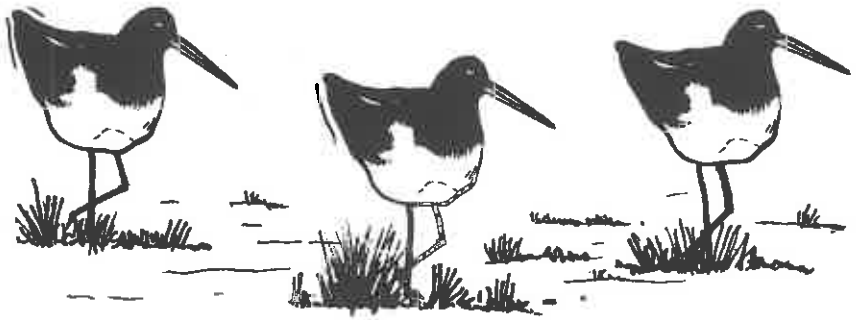
The Waimakariri - Rakahuri (Ashley) coastal strip provides habitat for a wide range of native, migratory and introduced birds. A total of 105 bird species have been recorded from this area, including 76 species that utilise estuarine, freshwater wetland and beach habitats. Although many of these 105 species have been recorded at the Rakahuri (Ashley) or Brooklands Lagoon only, at least 70 species (including 40 wetland/coastal species) occur in the coastal lands that lie between.

Waterfowl (swans, geese, ducks, coot and pukeko) and wading birds (waders, herons and bittern) are the two major groups utilising wetlands in the coastal strip. Sites such as Tutaepatu, Kairaki Lagoon and Taranaki Creek are important nesting, moulting and wintering sites, complementing the estuarine habitats at the mouths of the Waimakariri and Rakahuri (Ashley). Tremendous potential exists to enhance and restore habitats within the coastal strip. Any such enhancement could be expected to draw in birds from the neighbouring estuaries, and to attract passing migratory birds moving along the North Canterbury coastal flyway.

Native bird species recorded Tutaepatu lagoon

Australasian Coot	*Fulica atra australis*
Korimako, Bellbird*	*Anthornis melanura*
Black Swan	*Cygnus atratus*
Karoro, Black-backed Gull	*Larus dominicanus*
Black-billed Gull	*Larus bulleri*
Black-fronted Tern*	*Sterna albostriata*
Pipipi, Brown Creeper*	*Finschia novaeseelandiae*
Caspian Tern	*Sterna caspia*
Piwakawaka, Fantail*	*Rhipidura fuliginosa*
Riroriro, Grey Warbler*	*Gerygone igata*
Kahu, Australasian Harrier	*Circus approximans*
Kawau, Black Cormorant	*Phalacrocorax carbo*

Kotuku, White Heron	*Egretta alba*
Little Cormorant	*Phalacrocorax melanoleucos brevirostris*
Marsh Crake*	*Porzana pusilla affinis*
Matuku, Australasian Bittern	*Botaurus stellaris poiciloptilus*
Mute Swan	*Cygnus olor*
Kotare, NZ Kingfisher	*Halcyon sancta vagans*
New Zealand Shoveler*	*Anas rhynchotis variegata*
Papango, NZ Scaup*	*Aythya novaeseelandiae*
Parera, Grey Duck	*Anas superciliosa*
Pied Cormorant	*Phalacrocorax varius varius*
Poaka, Pied Stilt	*Himantopus himantopus*
Pukeko	*Porphyrio porphyrio*
Putangitangi, Paradise Shelduck*	*Tadorna variegata*
Tarapunga, Red-billed Gull*	*Larus novaehollandiae sopulinus*
Pipiwharauroa, Shining Cuckoo*	*Chrysococcyx lucidus lucidus*
Tauhou, Silvereye	*Zosterops lateralis lateralis*
South Island Pied Oystercatcher*	*Haematopus ostralegus finschi*
Spur-winged Plover	*Vanellus miles*
Tete, Grey Teal	*Anas gracilis*
Tuturiwhatu, Banded Dotterel*	*Charadrius bicinctus*
Welcome Swallow	*Hirundo tahitica neoxena*
White-faced Heron	*Ardea novaehollandiae*
White-fronted Tern*	*Sterna striata*



Native bird species recorded from Ashley - Saltwater Creek or Brooklands - Waimakariri estuarine areas only

Black Stilt*	*Himantopus novaezealandie*
Black-fronted Dotterel	*Charadrius melanops*
Gull-billed Tern	*Gelochelidon nilotica macrotarsa*
Little Black Cormorant	*Phalacrocorax sulcirostris*
Reef Heron	*Egretta sacra sacra*
Royal Spoonbill	*Platalea leucorodia regia*
Southern Crested Grebe	*Podiceps cristatus australis*
Wrybill*	*Anarhynchus frontalis*

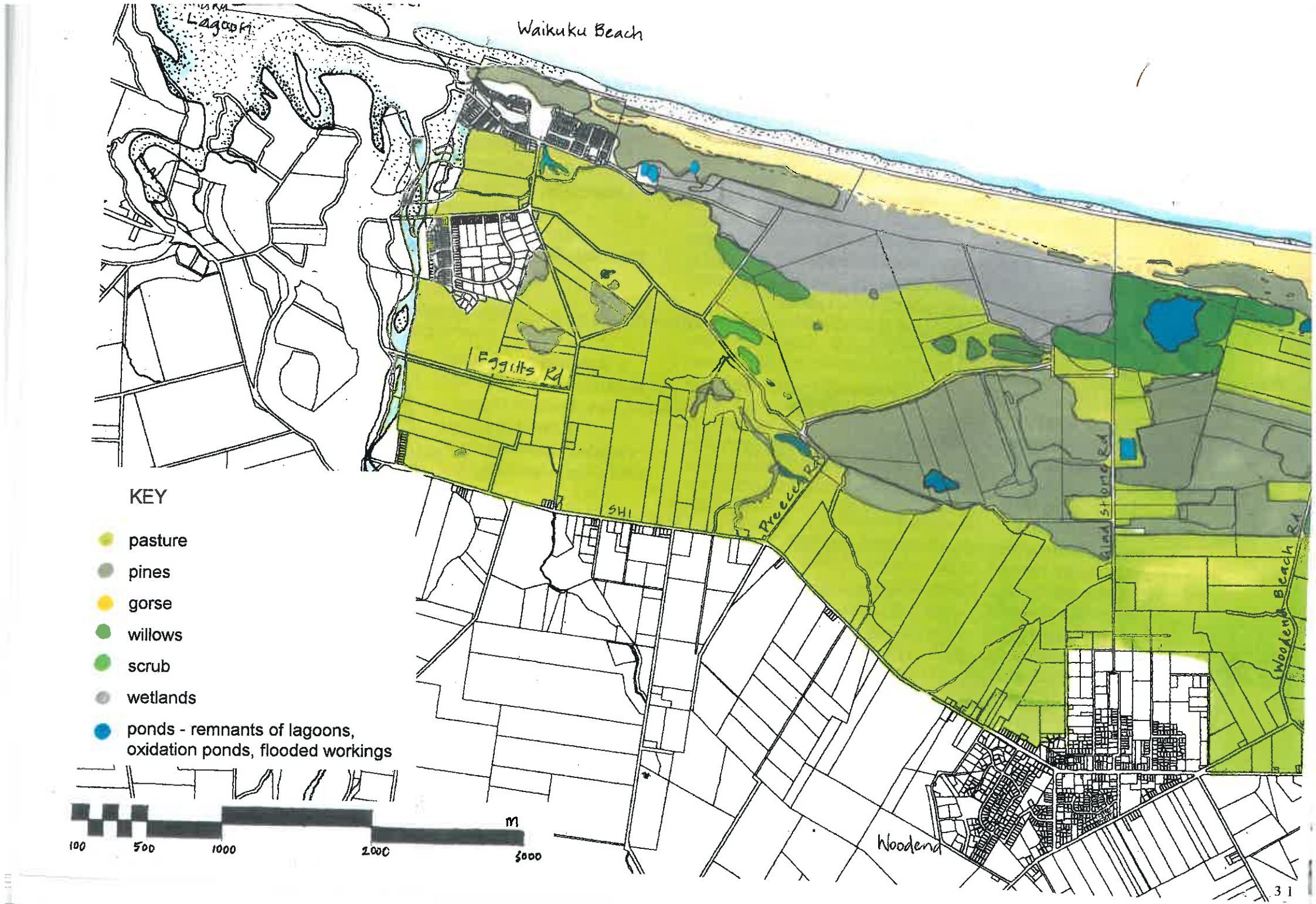
Other native bird species recorded

Australasian Gannet	*Sula bassana serrator*
Australasian Little Grebe	*Tachybaptus novaehollandiae*
Kereru, New Zealand Pigeon*	*Hemiphaga novaeseelandiae*
Spotted Shag*	*Stictocarbo punctatus*
Variable Oystercatcher*	*Haematopus unicolor*
White-flippered Penguin*	*Eudyptula minor albosignata*

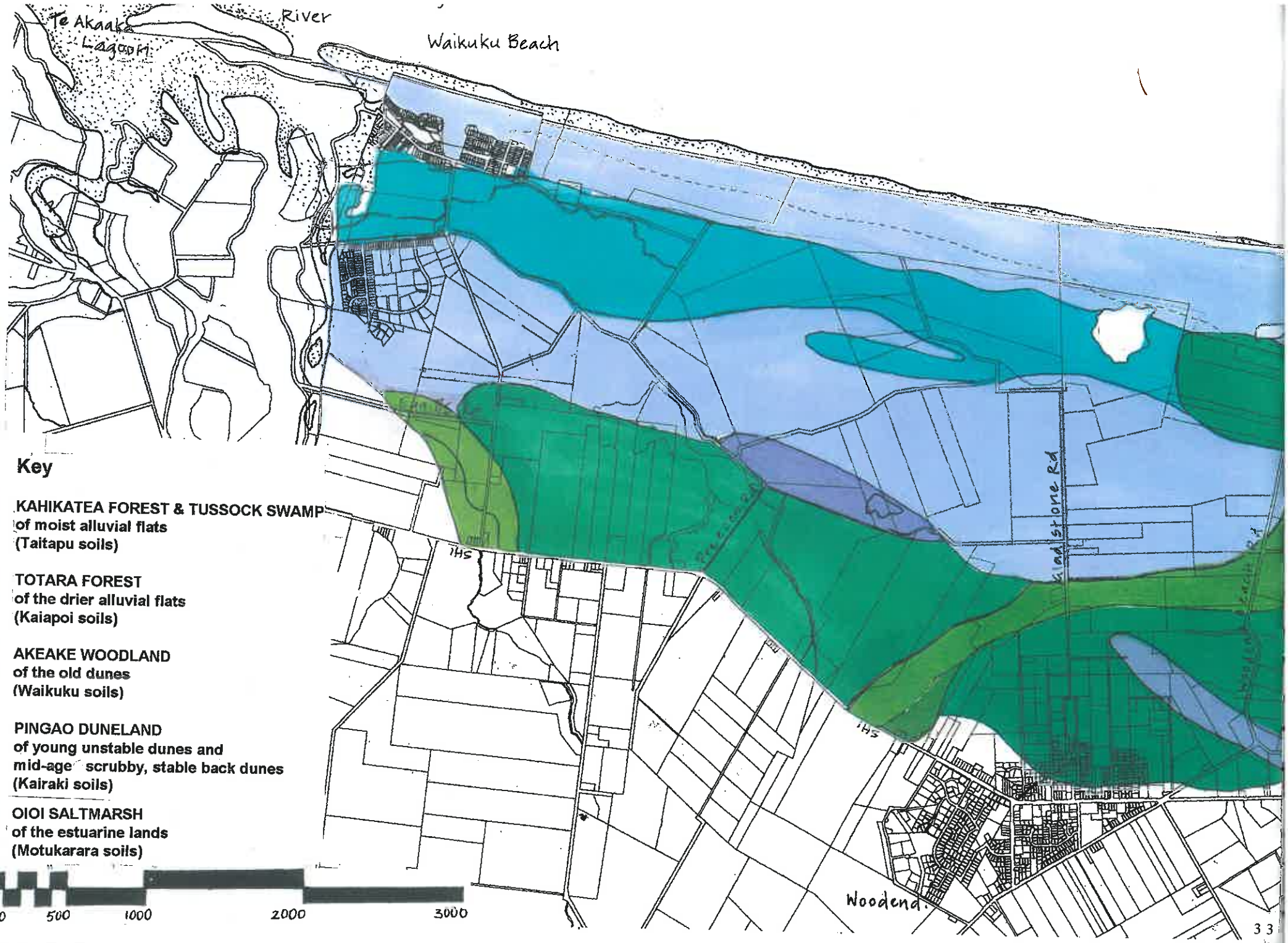
***Endemic**

Other wildlife

No surveys and specific data were available on native reptiles and invertebrates for the area. The importance of invertebrates, particularly for fishlife, is well known.

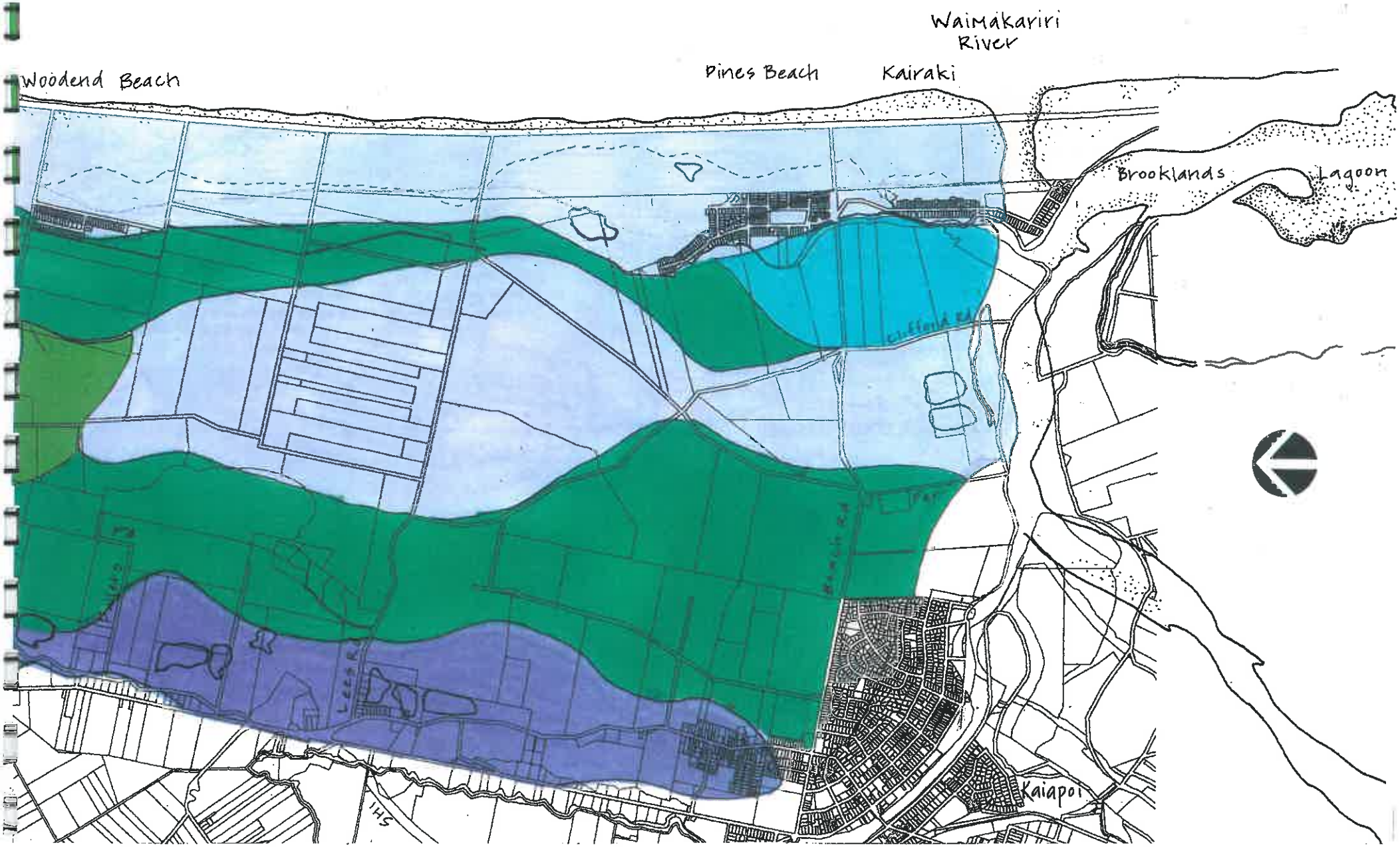

Lagoon
Waikuku Beach
Eggitts Rd
SH1
Preece Rd
Gladstone Rd
Woodend Beach Rd
Woodend
KEY
pasture
pines
gorse
willows
scrub
wetlands
ponds - remnants of lagoons, oxidation ponds, flooded workings
100
500
1000
2000
5000
m

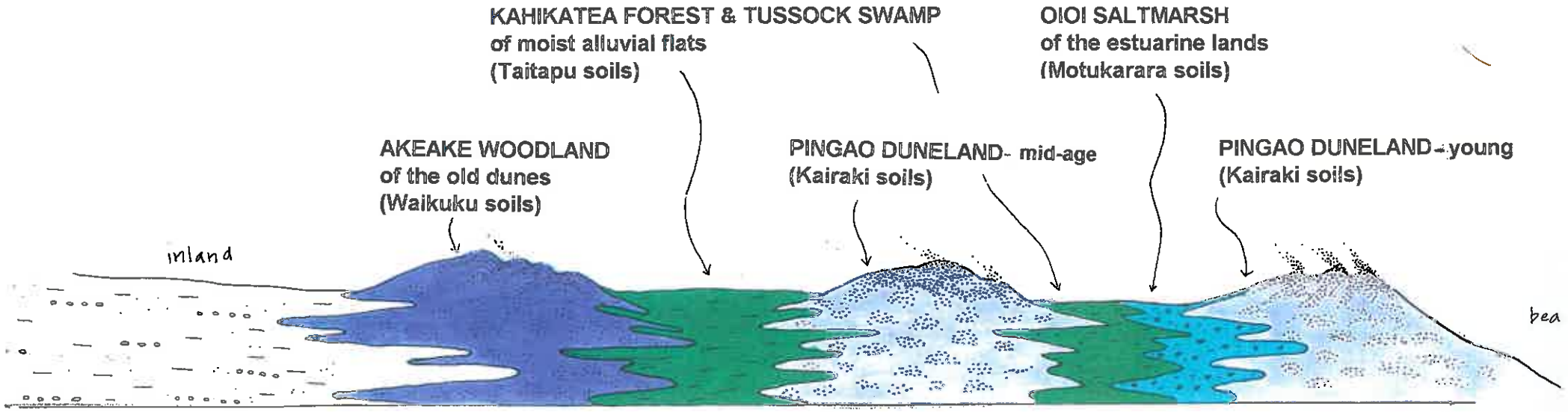
Existing Vegetation Overview


Te Akaaka Lagoon
River
Waikuku Beach
Key
KAHIKATEA FOREST & TUSSOCK SWAMP
of moist alluvial flats
(Taitapu soils)
TOTARA FOREST
of the drier alluvial flats
(Kaiapoi soils)
AKEAKE WOODLAND
of the old dunes
(Waikuku soils)
PINGAO DUNELAND
of young unstable dunes and
mid-age scrubby, stable back dunes
(Kairaki soils)
OIOI SALTMARSH
of the estuarine lands
(Motukarara soils)
100
500
1000
2000
3000
Gladstone Rd
Woodend

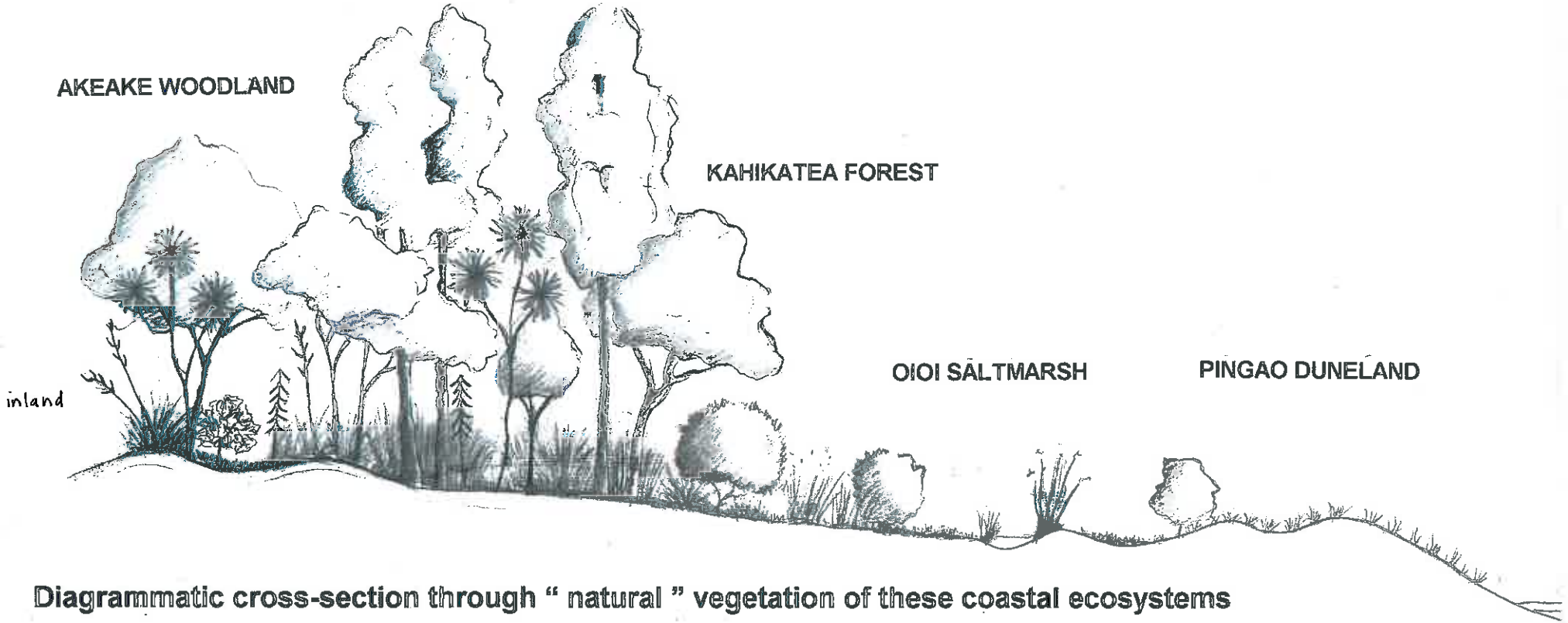
Underlying Ecosystems

"what nature intended"

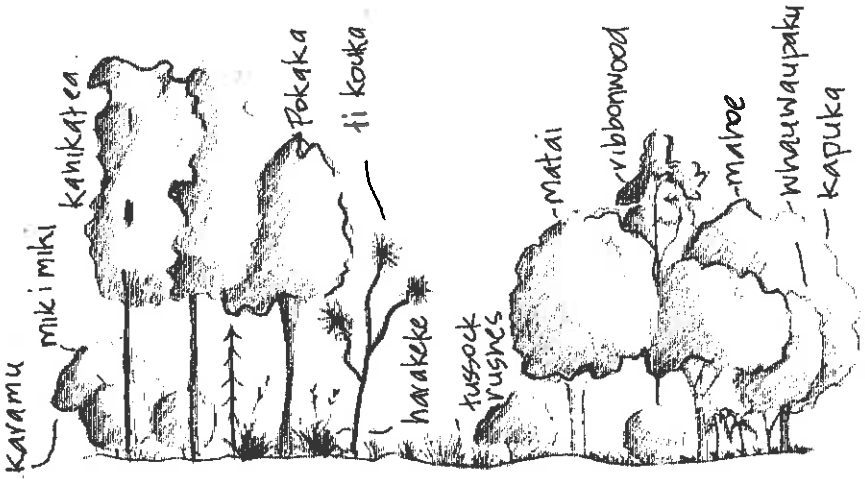




Diagrammatic cross-section through land system underlying ecosystems



Diagrammatic cross-section through " natural " vegetation of these coastal ecosystems

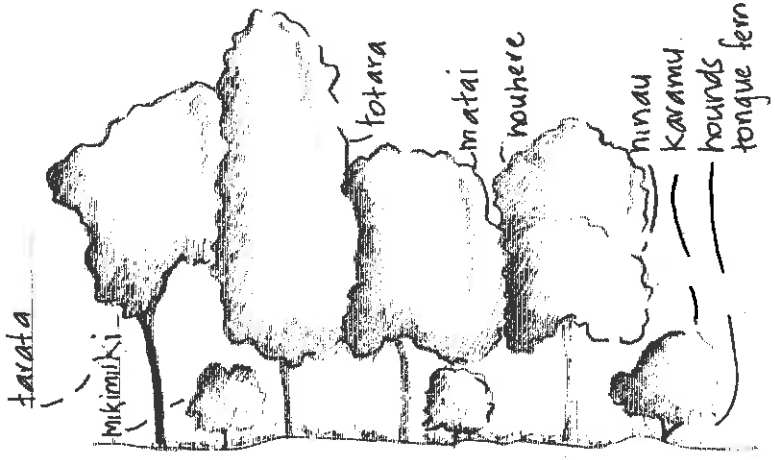


KAHIKATEA FOREST & TUSSOCK SWAMP of moist alluvial flats

Taitapu soils (silt loams to sandy loams)

Taitapu soils are formed on flat to gently undulating low lying former swampland from deep, fine textured, poorly drained greywacke alluvium.

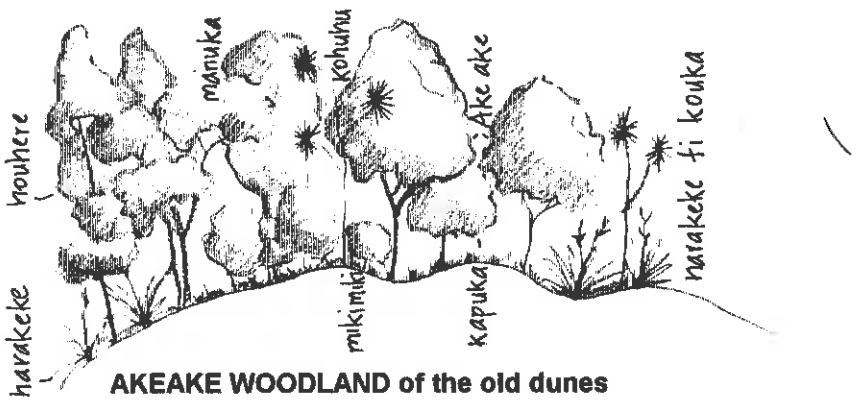
A mosaic of excessively drained sand dunes soils (Waikuku and Kairaki) and slowly draining Motukarara and Taitapu soils in the interdune hollows and depressions forms the coastal belt.



TOTARA FOREST of the drier alluvial flats

Kaiapoi soils (silt loams to sandy loams)

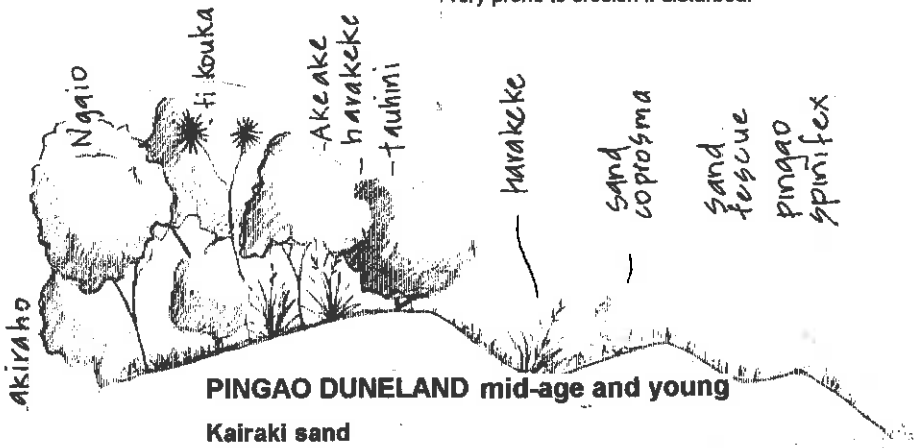
Kaiapoi soils are formed on flat to gently undulating deep fine textured greywacke alluvium. In their natural state they are imperfectly to moderately well drained with distinct sub soil mottling. Kaiapoi soils are moist in summer, but have high water tables in winter. The more freely draining shallower soils are subject to seasonal drought.



AKEAKE WOODLAND of the old dunes

Waikuku loamy sand

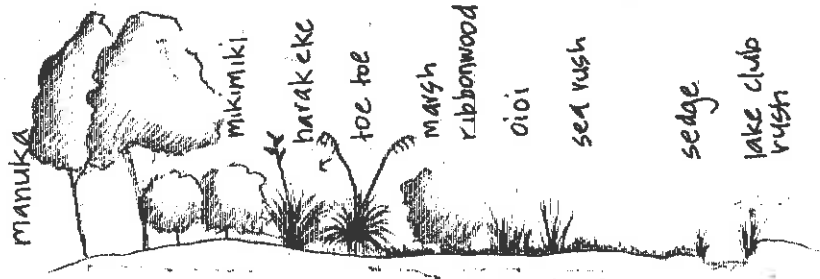
Waikuku loamy sand soils are formed on older, more stable fixed sand dunes with weakly developed topsoils and topsoil structures. They are excessively drained and very prone to erosion if disturbed.



PINGAO DUNELAND mid-age and young

Kairaki sand

Kairaki sand is formed on excessively drained, young raw dune sands held together primarily by plant roots, which doesn't possess a distinct topsoil, and is very prone to wind erosion.



OIOI SALTMARSH of the estuarine lands

Motukarara soils (sandy loams to clay loams)

Motukarara silts are formed on low-lying poorly drained flat to undulating lake margins and estuaries on fine to coarse saline estuarine sediments. Motukarara soils are young and show little profile development, and a wide range of salinity levels is reflected in the native vegetation.

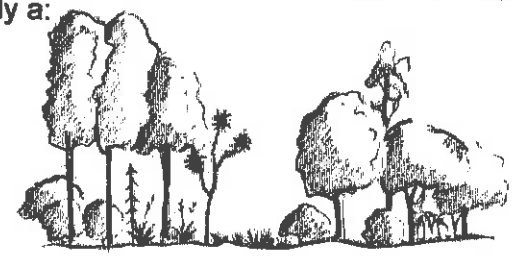
Diagrammatic cross-sections through " natural " vegetation of these coastal ecosystems

Restoration Guide

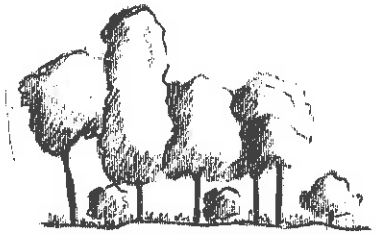
With the considerable community interest in restoration of the native ecosystems of these Waimakariri-Rakahuri coastal lands, some preliminary guidance is provided. This is a general guide to the sort of potential there is in the area, to assist landowners and those wishing to explore options. Whilst the data may be interpreted for a site in one of the general ecosystems identified, a detailed restoration plan for a particular site is recommended before undertaking a project.

Ecosystems Framework

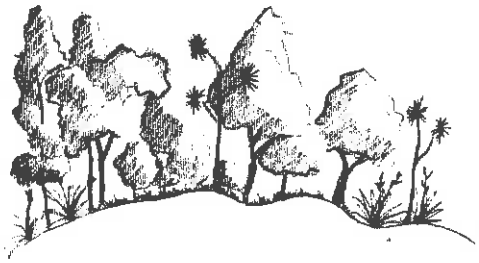
From the landform, soils and hydrological data, broad ecosystems have been identified, mapped and described. These indicate what nature intended for that general area, particularly the type of vegetation, e.g. whether it is inherently a:



- **KAHIKATEA FOREST & TUSSOCK SWAMP of moist alluvial flats;**



- **TOTARA FOREST of the drier alluvial flats;**



- **AKEAKE WOODLAND of the old dunes;**

- **PINGAO DUNELAND of young unstable dunes and mid-age scrubby, stable back dunes;**

- **OIOI SALTMARSH of the estuarine lands.**

Scarcely anything of the vegetation of such native ecosystems remains.

Be Realistic

It will be difficult if not impossible to re-establish what once may have existed - conditions have changed, nature has been fragmented, and some species are now locally extinct! However, opportunity to re-establish some semblance of a functional ecosystem often remains.

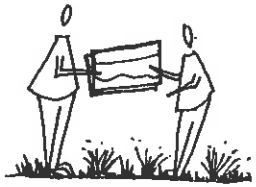
Even a small gesture, such as creating a small grove of local bush in your backyard, will contribute to increasing habitat for wildlife and for enhancing the natural character of your area.

It is important to investigate the viability of any effort at re-establishment. For some areas, drainage and weed threats may make restoration difficult. Therefore it is important to thoroughly investigate a site, its potential and its limitations. Attempting something that is realistic and achievable is important, or a lot of effort can be wasted. Just creating a haven for weeds may be more harmful than helpful!

First Protect

Before considering investing effort in starting a restoration project, see if there are already natural values that you can nurture. It is important to understand what exists already, or all your good intentions at restoration could unintentionally destroy some natural values. There may be native plant communities present that you hadn't noticed - even small herbfields or turfs. There may be areas that are currently used by wildlife - seasonally wet areas or grasses that wading birds feed on, willow trees that shags nest in, and, logs for lizards.

Make a map of your area, note any existing natural features and the patterns of the land and soils - such as wet areas, dry or sandy areas. Note also how these link across boundaries to adjoining natural patterns and features. Make a plan of the natural patterns of your area and its environs. The overall maps included in this preliminary report of the hydrological, landform and soil patterns of the Waimakariri - Rakahuri (Ashley) coastal lands may help you get started. As well as checking on the ground, aerial photos can help in understanding the land patterns.



For any existing natural values, an understanding of the existing management that allows them to occur is important. For example, for open grass or herb communities, stock grazing may be helping by preventing weeds invading. In other areas, stock may be slowly destroying shrubs or dunes and stopping natural regeneration. Elsewhere, exotic plants may be invading, such as pine seedlings, gorse and marram.

You may notice whether existing natural values have been improving or deteriorating, and work out why.

Restoration Site Selection

The first priority is to protect and assist natural values that already exist, whether on the area you are interested in, or on neighbours. Complement what is around - expand on, link and buffer existing habitats. Look for the greatest opportunities - these will mostly be on

waterways, the estuaries, and, the kahikatea forest ecosystem of the alluvial flats, where rich forested wetlands supporting a myriad of fish and birdlife would naturally occur.

Weed Risk Assessment

Address problems before you start. First work out how you will deal with potential weeds. There is little point in planting near seeding invasive plants. Some seed will come in by wind, some with birds, others with water, stock, vehicles and people. Some of the plants need wet areas,

some dry; some need full sun, others love shade. Some tolerate grazing; others race away when grazing is absent - such as grey willow seedlings which, if both male and female plants are present, will rapidly take over wetland areas. It is important you do a weed risk assessment to ensure your restoration efforts will be successful.

Developing a weed management strategy for the Waimakariri-Rakahuri (Ashley) coastal lands should be straight-forward with the strong community support, interest and local knowledge. It will make a significant contribution to restoration opportunity.

For restoration it is not just the traditional agricultural or horticultural weeds that you need to worry about, it is mostly garden plants that have the potential to invade. For example, the berries of cotoneaster, ivy, privet and holly are widely spread by birds and these plants are major threats to existing and potential native forest. Other plants threaten other ecosystems.

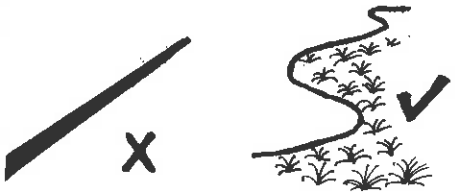
A community weed programme could identify the existing and potential problem plants, and encourage people to remove these from their properties. A community awareness programme could also discourage people from dumping garden waste over the fence, over the bank, etc. This waste along with dumped pot plants and aquarium water are major sources of weed invasions.

Trial a Patch

Plan for the overall, but start small to make sure you have the materials and the skills to establish and to manage the area adequately. A small successful restoration area is much more effective and encouraging than a large half-pie area over-run with weeds. So, develop a realistic staging plan. For planting, begin with a trial area to test different species and planting techniques, and to see how you get on with management.

Restore Natural Patterns of Landforms and Waterways

In some areas, restoration will involve changing the vegetation by mass planting. In other areas it may be necessary to first restore landforms or water levels. If an area has been flattened or drained, or a waterway straightened, rather than rushing in and planting this modified state, first consider the potential to re-construct something of the original landform and wetness. Re-creating the gentle slopes, the curved alignment, the pools, islands and marshy areas, provides opportunities for a richer native diversity.



You may have the opportunity to fill in drains, re-open springs and remove other barriers to re-create wetlands of the kahikatea forest ecosystem. For areas in the oioi estuarine ecosystem, once you allow the tides to again wash in, the salt marshes and meadows will probably re-establish naturally - you may not need to plant them.

Site Preparation

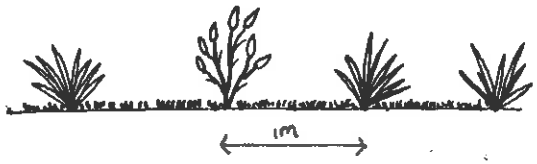
Even a trial planting has to be protected from grazing stock and permanently protected. So take care to make sure secure fences surround your restoration site before you start any plantings or your efforts may be all in vain. A permanent fence with a style and no gate is often the best protection for restoration sites adjoining farmland.

Particularly in dry sites, removing existing vegetation from planting sites is important to give new plants a start as the existing vegetation will take out all available moisture. But the need to clear existing vegetation will depend on what exists, what is intended, and the management effort available. It is pointless completely clearing a site of weed trees and shrubs if you are not able to manage the mass of new weeds that will immediately emerge. Also, in exposed sites, it may be wise to leave some protective shrubby cover to shelter new plantings.

Restoring Native Ecosystems in Existing Pasture

In general, it is necessary to remove grass competition when planting. Clearing 1 metre diameter planting "spots" is a standard laying technique, perhaps using bio-degradable chemical or screefing and dense mulch (that won't wash or blow away).

For much restoration planting, to provide quick cover and canopy closure for weed control and forest development, many species need to be planted just 1m apart. Usually this means grass control over the entire planting area.

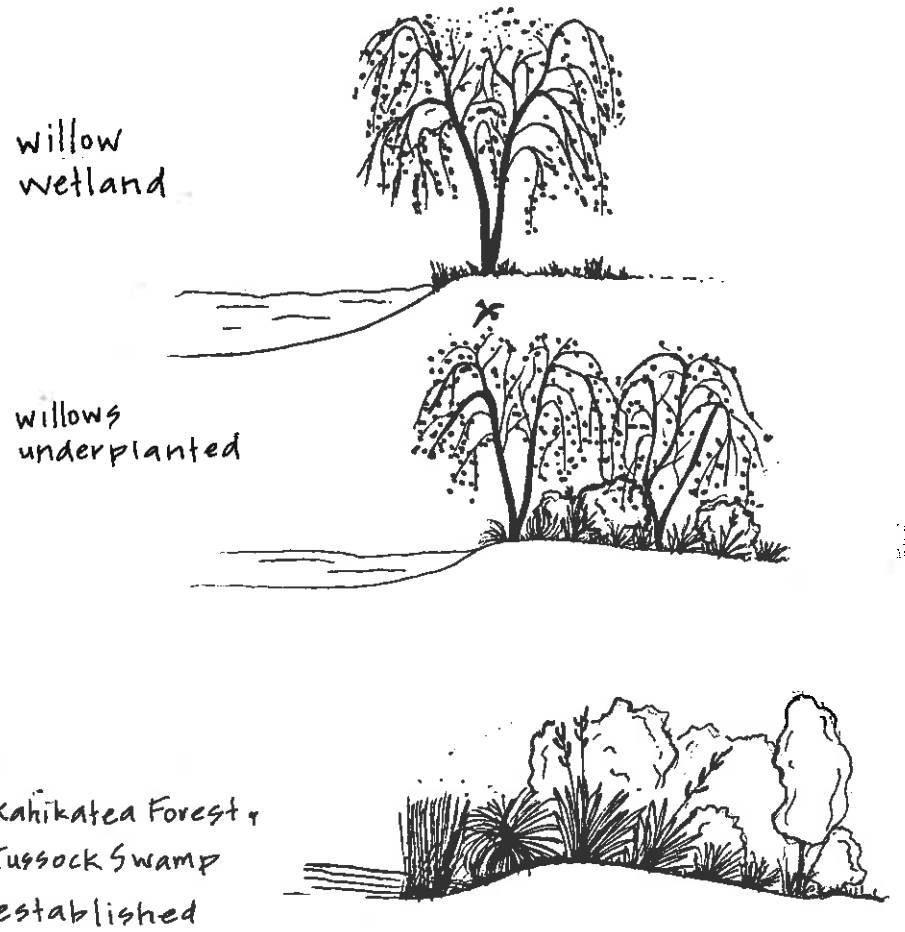


Restoring Native Wetland Ecosystems in Willow Groves

As willow are light demanding and will thus not seed in and establish under dense shade, and because they can provide a useful micro-climate for new plantings, carefully assess the advantages and disadvantages of clearing the site. Also, before any clearing, check to ensure you don't remove natural native regeneration that may already be occurring under the willows.

As they are often not particularly invasive, rather than immediately clearing crack willows, consider phasing options. You may only need to thin the trees, or remove big unstable limbs. You may be able to use the willow canopy to shade and shelter the young plants to reduce the vigour of weeds such as blackberry, and to continue providing habitat for birdlife. The native forest species can just be planted under the crack willow canopy, and the willows gradually phased out, naturally or assisted. However, for the extremely invasive grey willow, complete removal of at least the female trees will be essential before any restoration planting begins. A lot of effort can be wasted if proper grey willow control is not undertaken.

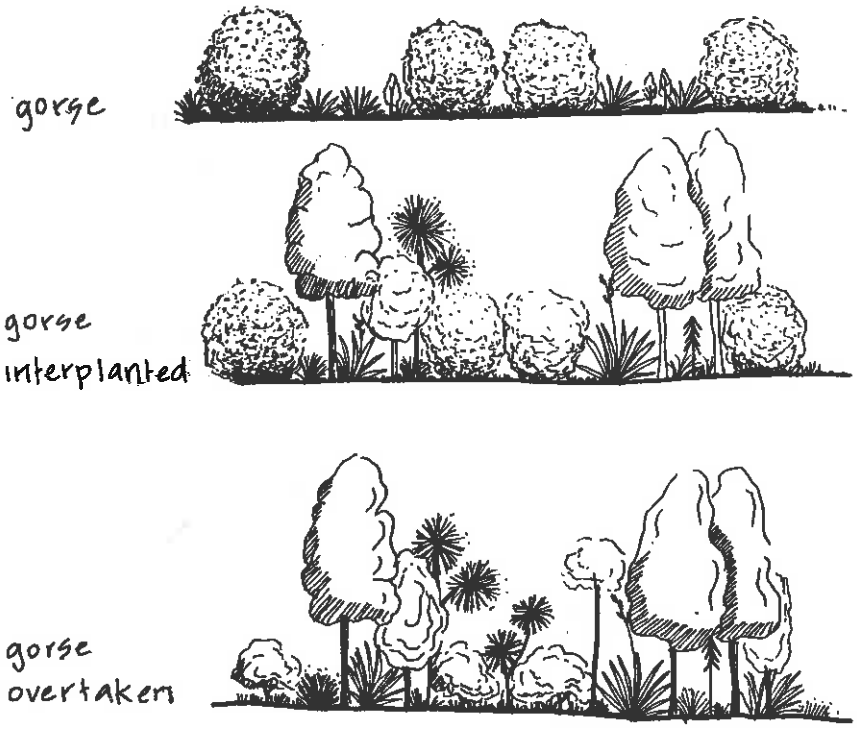
Re-establish the streamside and wetland sedges and rushes that love to be at least partly immersed - you may need to plant these in summer when water levels are low. Lots of over-hanging vegetation is important for fish habitat.



Restoring Ecosystems in Gorse Scrub

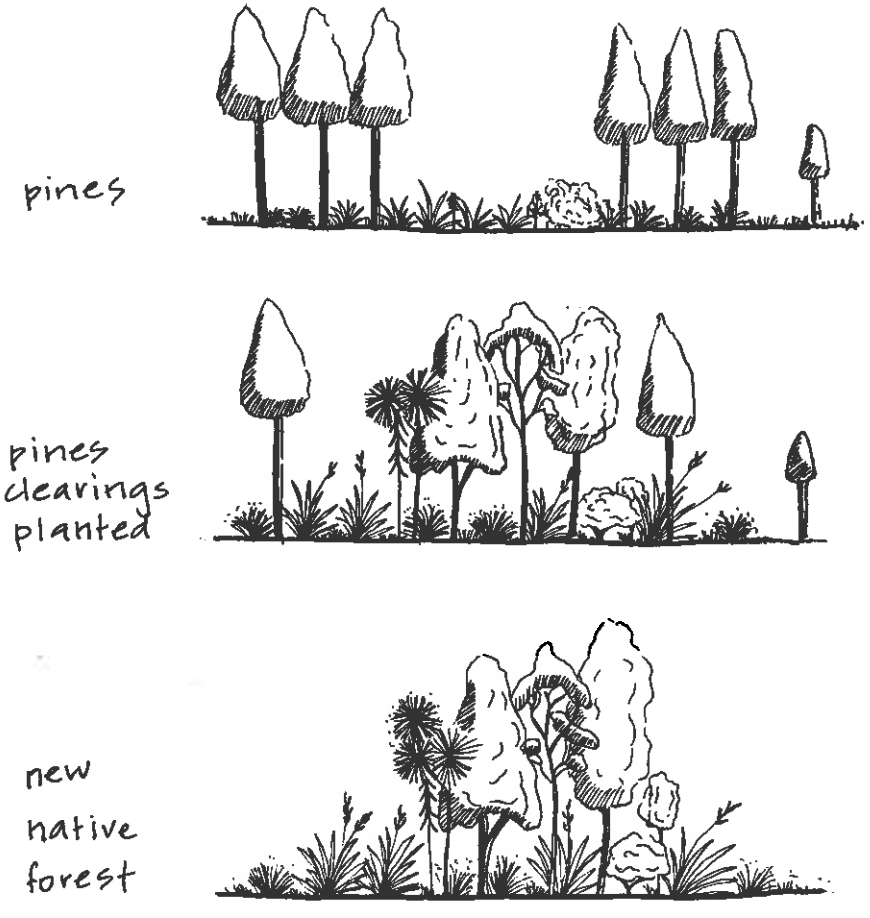
Gorse may provide a micro-climate, good soil litter, and nitrogen, and can be a useful nurse plant for re-establishment of taller forest and woodland. Although the seed has a long viability in the soil, it is a light-demanding plant and new, dense, evergreen tree and shrub cover should prevent a new gorse crop establishing. Therefore, if possible, plant in amongst the gorse, perhaps in lines to provide access.

Re-establishment of low grassland and dune cover in gorse-covered areas provides a greater challenge. The gorse may need to be cleared first and conditions may enable gorse seedlings to continue to appear for a long time. The practicalities need to be carefully weighed.



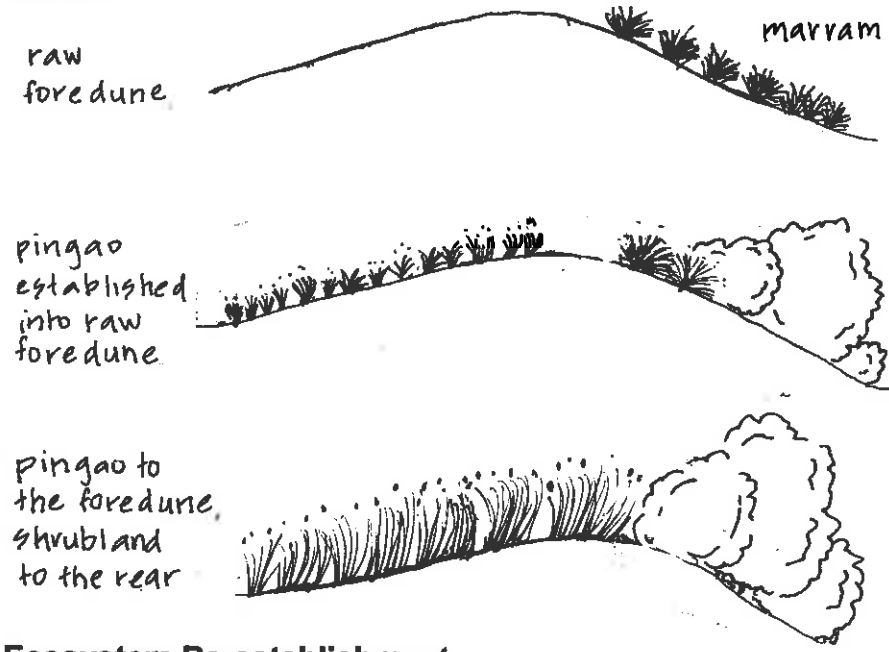
Restoring Ecosystems in Pinelands

Planted and wilding pine forests both occupy these coastal lands. They can provide a microclimate for re-establishment of native forest and woodland, but removal to at least provide sheltered clearings or coupes to plant behind or within is probably necessary. However, retention of pines may provide an ongoing seed source to invade other vulnerable areas, and whilst retained, the pines will visually dominate the area.



Dune Vegetation Restoration

A dense dune cover of marram grass provides a very competitive environment for re-establishment of fore-dune plants such as pingao and spinifex. However, for the older back dunes with greater stability and soil development, spot clearance and dense planting of first stage native shrubs and trees can compete to dominate and shade out the marram.



Ecosystem Re-establishment

Consider existing and potential wildlife, and how you might plan to improve their ecosystems. The lizards of the dry grasslands may be of particular interest - or the wetland and bush birds, or the aquatic fishlife.

The data on each main ecosystem suggests a general vision of what was and could perhaps be again in each area if land owners and land managers are interested.

Which Plants to Use

A plant list is provided for each ecosystem which includes a considerable range of trees, shrubs, grasses, ferns, groundcovers, etc. that are thought to belong naturally in each area. You might consider selecting species from the list for the ecosystem most like your site. The plants listed are all local native species.

Although species may be tolerant once well-established, be wary of planting in the inter-dune flats as these are very prone to damaging frosts.

More detailed guidance needs to be developed for each type of ecosystem, and interpreted in the planning for each restoration site to suit people's aspirations and the inputs they have available.

Plant Supply

To maximise restoration potential, use plants propagated from natural local vegetation ("eco-sourced" plants), so they are genetically adapted and belong here. Local forms express the identity of this place. Preferably order the plants 2 years in advance of the proposed planting.

For plantings, allow about 1 plant per metre for shrubs; low cover plants (sedges, rushes, pingao, ferns, etc.) at half metre spacings (4 per square metre); small-growing trees (kanuka, akeake, ngaio, etc.) at 2 to 5 metre spacings; and, large growing trees (kahikatea, totara, etc.) at some 6 to 10 m spacings with shrubs and low cover massed between. Full species lists follow, listing what occurs naturally in each ecosystem - the trees, shrubs, groundcovers and vines

On-Going Management

The task is not complete just because the planting has been done! The planting is the easy part. Maintenance is essential to allow those plants to flourish. Keeping them clear of grass and weeds for at least three years is a crucial task. This allows the plants to join together and form a canopy. Many of the potential weeds are light-demanding, and will not invade once the canopy shades out the ground.

After several years when you have canopy closure, you can inter-plant with the more tender and long term species. For the forest ecosystems, plant the long-term tall canopy species under this first low canopy, for example the kahikatea. Also, plant in the understorey species that need the shade of the canopy, such as the ferns.

Further Guidance

This is a preliminary report. Preliminary restoration guidance is provided for those who may be interested. Restoration planning for specific sites, and more detailed guidance for the various ecosystems, is intended to be developed later.

KAHIKATEA FOREST & TUSSOCK SWAMP

plants of moist alluvial flats (Taitapu soils)

TALL TREES

Dacrycarpus dacrydioides	kahikatea, white pine
Elaeocarpus dentatus	hinau
Elaeocarpus hookerianus	pokaka
Prumnopitys taxifolia	matai, black pine

TREES & TALL SHRUBS

* *Carpodetus serratus*	putaputaweta, marbleleaf
Coprosma lucida	shining karamu
C. robusta	**karamu**
Cordyline australis	**ti kouka, cabbage tree**
Griselinia littoralis	**kapuka, broadleaf**
Hoheria angustifolia	**houhere, narrow-leaved lacebark**
Hoheria populnea[1]	**houhere, lacebark**
Leptospermum scoparium	**manuka, tea tree**
Lophomyrtus obcordata	rohutu, NZ myrtle
* *Melicope simplex*	poataniwha
* *Pennantia corymbosa*	kaikomako
Pittosporum eugenioides	tarata, lemonwood
Pittosporum tenuifolium	**kohuhu, black matipo**
Plagianthus regius	**manatu, lowland ribbonwood**
Pseudopanax crassifolius	horoeka, lancewood
* *Streblus heterophyllus*	turepo, small-leaved milk tree

SHRUBS, SCRAMBLERS

Coprosma propinqua	**mikimiki**
Coprosma rubra	**red-stemmed coprosma**
Hebe salicifolia	**koromiko**
Myrsine divaricata	weeping mapou
Pseudopanax anomalus	a shrub pseudopanax

GROUNDCOVERS

Anemanthele lessoniana	bamboo grass, windgrass
Carex flaviformis	**yellow sedge**
Carex lambertiana	a sedge
Carex secta	**pukio sedge**
Carex solandri	a sedge
Carex virgata	**swamp sedge**
Cortaderia richardii	**toe toe (toi toi)**
Deschampsia caespitosa	**tufted hair grass**
Juncus gregiflorus	**wiwi, tussock rush**
Juncus pallidus	**wiwi, tussock rush**
Phormium tenax	**harakeke, NZ flax**
Pratia angulata	panakeneke, creeping pratia

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1. This is not the common, broad-leaved *Hoheria sexstylosa* introduced from the North Island.

Bold=main species for relatively fast growing first stage planting into open sites, but * are vulnerable, ** are particularly vulnerable in frost pockets.

ADDITIONAL PLANTS FOR SHELTERED SITES:

LARGE TREES

Alectryon excelsus	titoki
Hedycarya arborea	porokaiwhiri, pigeonwood

TREES & TALL SHRUBS

Aristotelia serrata	**makomako, wineberry**
Coprosma linariifolia	**narrow-leaf coprosma, yellow-wood**
Coprosma rotundifolia	round-leaved coprosma
Fuchsia excorticata	kotukutuku, tree fuchsia
Melicytus micranthus	manakura, shrubby mahoe
Melicytus ramiflorus	mahoe, whiteywood
Myrsine australis	mapou, red matipo
Pseudopanax arboreus	whauwhaupaku, five-finger
Pseudowintera colorata	horopito, peppertree

SHRUBS, SCRAMBLERS

Clematis paniculata	pua waananga, bush clematis
Coprosma areolata	thin-leaved coprosma
Coprosma rhamnoides	red-fruited mikimiki
Parsonsia spp.	NZ jasmine
Passiflora tetrandra	kohia, native passionvine

GROUNDCOVERS

Forest

Astelia fragans	kakaha, bush flax
Dianella nigra	turutu, blue berry
Microlaena avenacea	bush rice grass
Uncinia uncinata	watau, hook sedge

Open swamp

Baumea rubiginosa	
Libertia ixioides	**mikoikoi, NZ iris**
Schoenus pauciflorus	bog rush
Urtica linearifolia	ongaonga, narrow-leaved

FERNS

Asplenium gracillimum	makau, hen & chicken
Asplenium terrestre	spleenwort
Blechnum chambersii	kiokio, a hard fern
Blechnum fluviatile	ray water fern
Blechnum minus	kiokio fern
Blechnum penna-marina	kiokio fern
Cyathea smithii	katote, soft tree fern
Dicksonia fibrosa	kuripaka, wheki ponga, a tree fern
Dicksonia squarrosa	wheki, rough tree fern
Histiopteris incisa	mata, water fern
Hypolepis ambigua	rough pig fern
Pellaea rotundifolia	button fern
Phymatosorus diversifolius	hounds tongue fern
Polystichum richardii	pikopiko, shield fern;
Polystichum vestitum	puniu, shield fern,

Bold=main species for relatively fast growing first stage planting into open sites

TOTARA FOREST plants

of the drier alluvial flats (Kaiapoi soils)

LARGE TREES	
***Elaeocarpus dentatus*	**hinau**
Podocarpus totara	totara
Prumnopitys taxifolia	matai, black pine
TREES & TALL SHRUBS	
Coprosma lucida	shining karamu
Coprosma robusta	**karamu**
Cordyline australis	**ti kouka, cabbage tree**
***Fuchsia excorticata*	kotukutuku, tree fuchsia
Griselinia littoralis	**kapuka, broadleaf**
Hoheria angustifolia	**narrow-leaved houhere, lacebark**
***Hoheria populnea*[1]	**houhere, lacebark**
Kunzea ericoides	**kanuka**
Leptospermum scoparium	**manuka**
Lophomyrtus obcordata	rohutu, NZ myrtle
Pittosporum eugenioides	**tarata, lemonwood**
Pittosporum tenuifolium	**kohuhu, black matipo**
Plagianthus regius	**manatu, lowland ribbonwood**
Pseudopanax crassifolius	lancewood
Sophora microphylla	South Island kowhai

[1] This is not the common, broad-leaved *Hoheria sextylosa* introduced from the North Island.

Bold=main species for relatively fast growing first stage planting into open sites. but *are vulnerable, ** are particularly vulnerable in frost pockets.

SHRUBS	
Coprosma propinqua	**mikimiki**
Coprosma virescens	pale green coprosma
Hebe salicifolia	**koromiko**
GROUNDCOVERS, etc.	
Acaena novae-zelandiae	bidibidi, piripiri
Cortaderia richardii	**toetoe (toitoi)**
Phormium tenax	**harakeke, NZ flax**
Phymatosorus diversifolius	hounds tongue fern

ADDITIONAL PLANTS FOR SHELTERED SITES:

TREES & TALL SHRUBS	
***Alectryon excelsus*	titoki
****Aristotelia serrata***	**makomako, wineberry**
Coprosma areolata	thin-leaved coprosma
****Coprosma linariifolia***	**narrow-leaf coprosma, yellow-wood**
Coprosma rhamnoides	red-fruited mikimiki
Coprosma rubra	red-stemmed karamu
Melicope simplex	poataniwha
***Melicytus ramiflorus*	mahoe, whiteywood
****Myoporum laetum***	**ngaio**
Myrsine australis	mapou, red matipo
****Pennantia corymbosa***	kaikomako (slow growing)
***Pseudopanax anomalus*	shrub pseudopanax
Pseudopanax arboreus	whauwhaupaku, fivefinger
***Streblus heterophyllus*	turepo, small-leaved milk tree
GROUNDCOVERS	
Astelia fragrans	kakaha, bush flax
Libertia ixioides	**mikoikoi, NZ iris**
Microlaena polynoda	a rice grass
Microlaena stipoides	a rice grass
Pteridum esculentum	**rahurahu, bracken fern**
Uncinia uncinata	

AKEAKE WOODLAND plants of the old dunes (Waikuku soils)

TREES AND TALL SHRUBS

Coprosma repens	taupata (pre-European introduction)
Coprosma robusta	**karamu**
Cordyline australis	**ti kouka, cabbage tree**
Discaria toumatou	**matagouri, wild irishman**
****Dodonaea viscosa***	**akeake**
Griselinia littoralis	**kapuka, broadleaf**
Hoheria angustifolia	**houhere, narrow-leaved lacebark**
Kunzea ericoides	**kanuka**
Leptospermum scoparium	manuka
****Myoporum laetum***	**ngaio**
Olearia avicenniifolia	**akiraho, a tree daisy**
Olearia paniculata	**akiraho, golden akeake**
****Pittosporum eugenioides***	**tarata, lemonwood**
Pittosporum tenuifolium	**kohuhu, black matipo**
Pseudopanax crassifolius	lancewood
**Solanum laciniatum*	poroporo
Sophora microphylla	**South Island kowhai**

SHRUBS & SCRAMBLERS

Ozothamnus leptophyllus	**tauhinu, cottonwood**
Coprosma crassifolia	**thick-leaved mikimiki**
Coprosma propinqua	**mikimiki**
Coprosma rhamnoides	red-fruited karamu
Corokia cotoneaster	korokio
Helichrysum lanceolatum	niniao
Melicytus alpinus	**porcupine shrub**
Muehlenbeckia astonii	**a rare pohuehue shrub**
Muehlenbeckia complexa	**shrubby pohuehue**
Olearia odorata	**a fragrant shrub daisy**
Pomaderris phylicifolia	**tauhinu**

GROUNDCOVERS, NICHE PLANTS

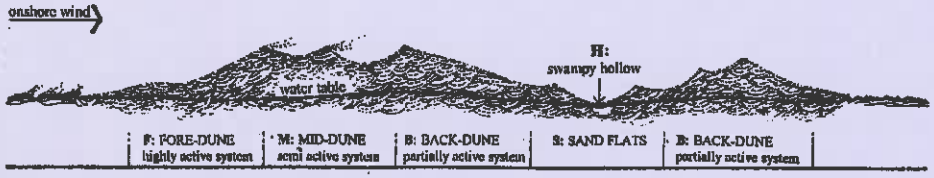
Carmichaelia australis	**NZ broom**
Coprosma acerosa	**sand coprosma**
Dichelachne crinita	long-hair plume grass
Gnaphalium audax	cudweed
Isolepis nodosa	**wiwi, knobby clubrush**
Libertia ixioides	**mikoikoi, NZ iris**
Linum monogynum	rauhuia
Pelargonium inodorum	namunamu, a cranesbill
Pteridium esculentum	**rahurahu, bracken fern**
Senecio glomeratus	a NZ groundsel

IN ADDITION PLANTS FOR SHELTERED SITES: TREES AND LARGE SHRUBS

Corynocarpus laevigatus	karaka (pre-European introduction)
Melicytus ramiflorus	mahoe, whiteywood

Bold=main species for relatively fast growing first stage planting into open sites, but *are vulnerable, ** are particularly vulnerable in frost pockets.

PINGAO DUNELAND plants of young unstable dunes and mid-age scrubby, stable back dunes (Kairaki soils)



Plants keyed to landform units, as shown in diagram:
(F) = Foredune; (M) = Mid-dune; (B) = Back dune; (S) = Sand flats; (H) = Swampy hollow

(F) = Foredune; (M) = Mid-dune; (B) = Back dune; (S) = Sand flats; (H) = Swampy hollow

TREES & LARGE SHRUBS

Coprosma repens	taupata (M,B) (pre-European introduction)
Cordyline australis	**ti kouka, cabbage tree** (B,S)
Discaria toumatou	**matagouri, wild irishman** (M,S)
Dodonaea viscosa	**akeake** (M,B)
Kunzea ericoides	**kanuka** (B)
Leptospermum scoparium	**manuka, teatree** (B,S)
****Myoporum laetum***	**ngaio** (M,B)
Olearia avicenniifolia	**akiraho, a tree daisy** (M,B)
Olearia paniculata	akiraho, golden akeake
**Solanum laciniatum*	poroporo (M,B)

Bold=main species for relatively fast growing first stage planting into open sites, but *are vulnerable, ** are particularly vulnerable in frost pockets.

SHRUBS & SCRAMBLERS

Carmichaelia australis	makaka, NZ broom (M,S)
Cassinia leptophylla	**tauhinu, cottonwood** (M,S)
Clematis afoliata	pohue, leafless clematis (M,S)
Coprosma acerosa	**sand coprosma** (F,M)
Coprosma crassifolia	**a thick-leaved mikimiki** (M,S)
Coprosma propinqua	**mikimiki** (M,B,S)
Corokia cotoneaster	korokio (M)
Discaria toumatou	matagouri
Helichrysum lanceolatum	niniao (M)
Melicytus alpinus	**porcupine shrub** (M)
Muehlenbeckia astonii	**a rare pohuehue shrub** (M,B)
Muehlenbeckia complexa	**shrubby pohuehue** (M,S)
Olearia odorata	**fragrant shrub daisy** (M)
Plagianthus divaricatus	**houi, saltmarsh ribbonwood** (F,S)
Pomaderris phylicifolia	tauhinu (M)
Sophora prostrata	prostrate kowhai (M)

GROUNDCOVERS etc.

Austrofestuca littoralis	sand fescue (F,S)
Calystegia soldanella	nihinihi, sand convolvulus (F)
Carex pumila	**sand sedge (S)**
Cortaderia richardii	**toetoe (toitoi) (S)**
Desmoschoenus spiralis	**pingao, golden sand sedge (F)**
Euphorbia glauca	**shore spurge (F)**
Isolepis nodosa	wiwi, knobby clubrush (F,H,M,B)
Linum monogynum	rauhuia (F,M)
Microtis unifolia	onion leaved orchid
Phormium tenax	**harakeke, NZ flax (S)**
Pimelea arenaria	sand daphne (S)
Pteridium esculentum	rahurahu, bracken fern (M,B)

NICHE PLANTS FOR DAMP OR WET SITES

Carex flaviformis	yellow sedge
Carex geminata	rautahi, purei, cutty grass (H)
Epilobium billardiereanum	willowherb (H)
Gunnera dentata	sand gunnera (H)
Hierochloe redolens	karetu, holy grass (H)
Isolepis basilaris	a turf club-rush (H)
Juncus pallidus	**wiwi, a giant rush** (F,H,S)
Juncus gregiflorus	tussock sedges
Leptinella dioica	cotula (H)
Lepidosperma australe	four square sedge
Mazus pumilio	a carpet musk (H)
Nertera setulosa	nertera
Schoenus concinnus	a turf sedge (H)
Schoenoplectus pungens	**three-square** (H)
Schoenus pauciflorus	bog rush

Bold=main species for relatively fast growing first stage planting into open sites

OIOI SALTMARSH plants
of the estuarine lands (Motukarara soils)

SHRUBS

Coprosma propinqua	**mikimiki**
Leptospermum scoparium	manuka, tea tree
Muehlenbeckia complexa	**shrubby pohuehue**
Plagianthus divaricatus	**houi, saltmarsh ribbonwood**

TUSSOCK GRASSES & FLAXES

Bolboschoenus caldwellii	a sedge
Cortaderia richardii	**toetoe (toitoi)**
Cyperus ustulatus	umbrella sedge
Hierochloe redolens	karetu, holy grass
Isolepis nodosa	**wiwi, knobly clubrush**
Juncus maritimus	
Juncus pallidus	**sea rush**
Lepidosperma australe	
Leptocarpus similis	**oioi, jointed wire rush**
Phormium tenax	**harakeke, NZ flax**
Schoenoplectus pungens	**three-square**
Schoenoplectus validus	**lake club rush**

GROUNDCOVERS

Apium prostratum	sea celery
Leptinella dioica	cotula
Limosella lineata	NZ mudwort
Samolus repens	moakoako, sea primrose
Selliera radicans	selliera

Bold=main species for relatively fast growing first stage planting into open sites

Weeds & Invasive Plants

The following non-native invasive species are especially relevant to biodiversity and habitat protection, and revegetation projects in these coastal lands. They are already a problem in these coastal lands, or are a problem elsewhere and are potentially invasive weeds for natural areas here. You should also be aware of the 'Control' and ' Surveillance' plant pest lists available from the Canterbury Regional Council. Removal of potentially invasive plants from surrounding lands is desirable if restoration is to be achievable.

Common Name	Scientific Name
agapanthus	*Agapanthus orientalis*
aluminium plant	*Galeobdolon luteum*
barberry	*Berberis darwinii*
barberry	*Berberis glaucocarpa*
beggars tick	*Bidens frondosa*
bittersweet	*Solanum dulcamara*
blackberry (wild aggregates)	*Rubus fruticosus agg.*
boneseed	*Chrysanthemoides monilifera*
boxthorn	*Lycium ferocissimum*
broom	*Cytisus scoparius*
buddleia	*Buddleia davidii* (excluding hybrids)
Californian thistle	*Cirsium arvense*
cape ivy	*Senecio angulatus*
cotoneaster	*Cotoneaster* spp.
crack willow	*Salix fragilis*
elderberry	*Sambucus nigra*
German ivy	*Senecio mikanioides*
gorse	*Ulex europaeus*
grey willow	*Salix cinerea*
hawthorn	*Crataegus monogyna*
hemlock	*Conium maculatum*
ivy	*Hedera helix*
marram grass	*Ammophilia arenaria*
periwinkle	*Vinca major / minor*
silver poplar	*Populus alba*
smilax	*Asparagus asparagoides*
spartina, cord grass	*Spartina* spp.
spindle tree	*Euonymus europaeus*
spiny broom	*Calicotome spinosa*
sweet briar	*Rosa rubiginosa*
tagasaste, tree lucerne	*Chamaecytisus palmensis*
tree lupin	*Lupinus arboreus*
wandering willy	*Tradescantia fluminensis*
willow weed	*Polygonum persicaria*

Beach Settlement Guidelines

Existing Character

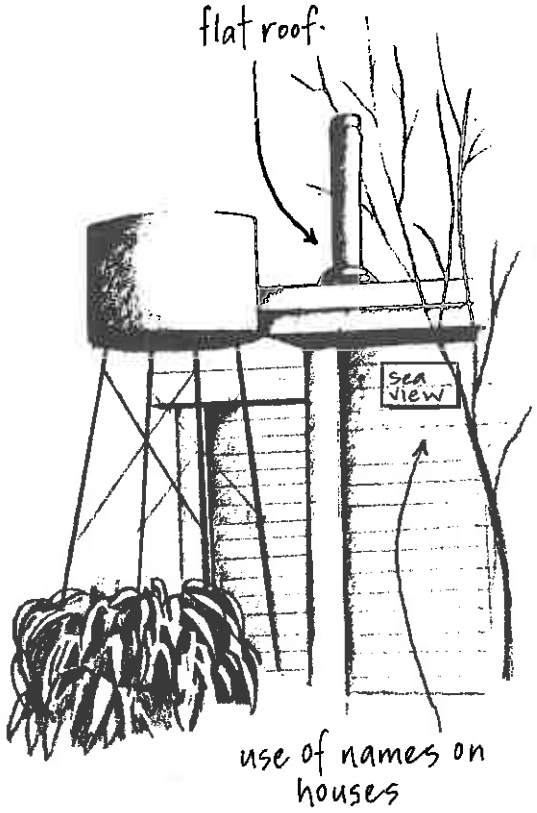
The coastal settlements of Waikuku Beach, Woodend Beach and Pines Beach / Kairaki each has a unique character which is reflected in their setting, history, size and people.

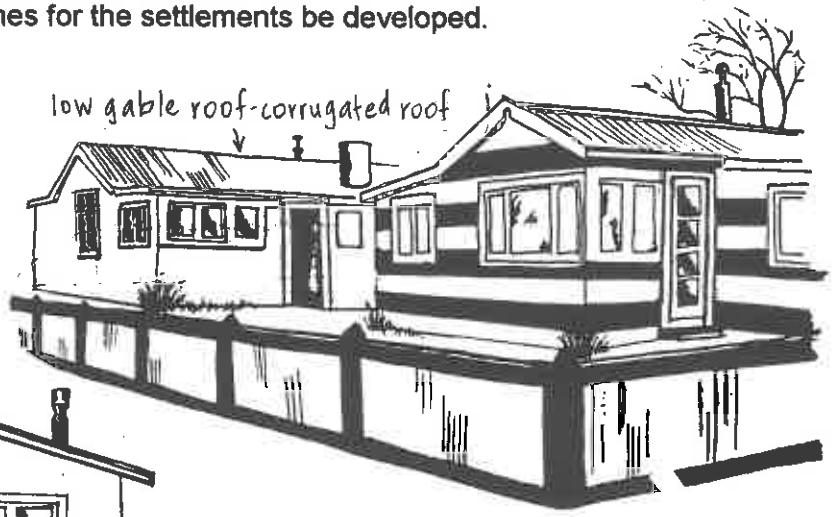
Each settlement hugs the coast line of Pegasus Bay, lying between the braided rivers of the Waimakariri and Rakahuri (Ashley). The small settlements are closely associated with the rural/naturalistic character of the coastal dune system. This is reflected in the daily lives of inhabitants, who value the open spaces and variety of recreational opportunities the coastal rural context offers.

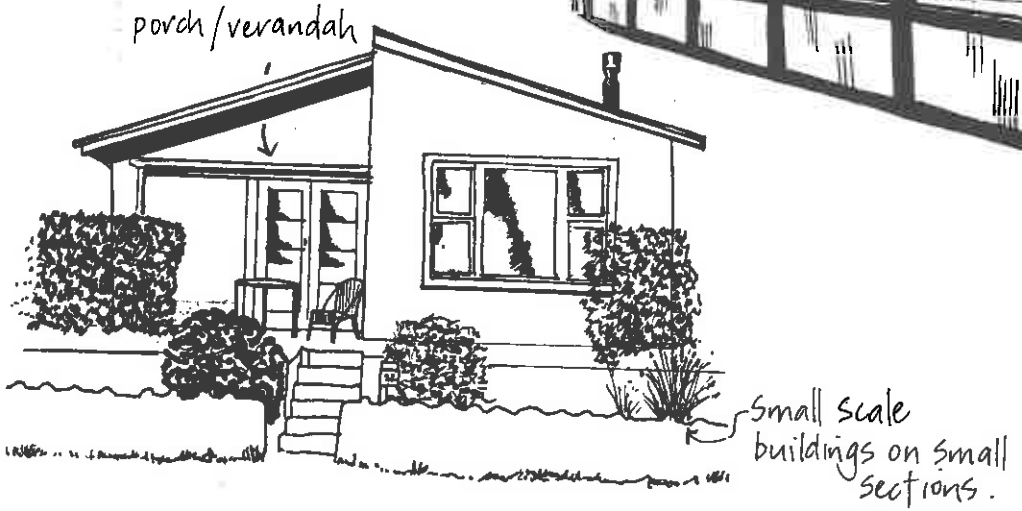
Although there have long been settlements in these coastal lands, Waikuku Beach and Pines Beach / Kairaki sprang up in the early part of this century, with Woodend Beach first subdivided in the 1930's. These three settlements developed as a holiday spots which had ready access to the beach, lagoons and rivers.

The settlements are made up of a variety of housing styles but the most common style is the 'bach'. A style which has developed through the 'grass roots' to become a national architectural icon of waterside holiday spots throughout New Zealand.

From the workshop consultation process it was clear that people want to conserve the character of these settlements. It was suggested that guidelines for the settlements be developed.







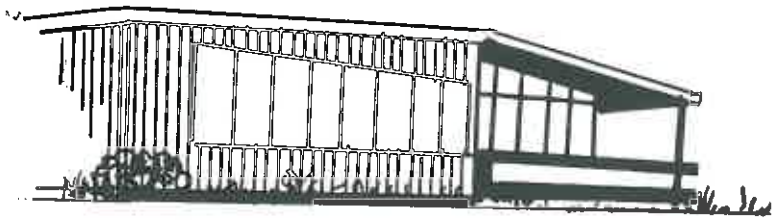
Design Guidelines

To retain existing character, but allow for traditional spontaneity, some simple guidelines have been developed which avoid suburban or urban character in form, scale, materials and density

Blending new and old buildings

a) New buildings and amendments to the exterior of existing buildings should respect the bach character of Waikuku Beach, Woodend Beach and Pines Beach / Kairaki.

b) The form and size of new buildings should respect the scale and form which has been established by existing buildings.



Scale

a) Small dwellings which are relative in size to the section.

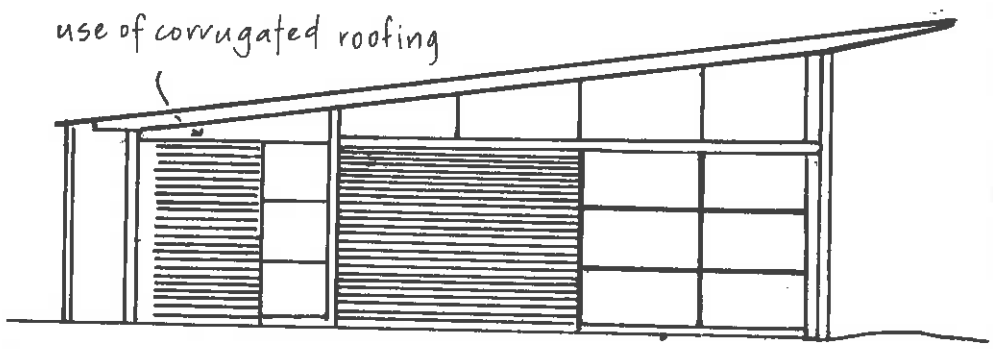
Form

b) Single storey dwellings are preferable, a stepped floor level or attic room could be an alternative.

Roofs

c) Low pitch roofs, 0 -27 degrees.

d) Flat roofs, mono-pitch and gables

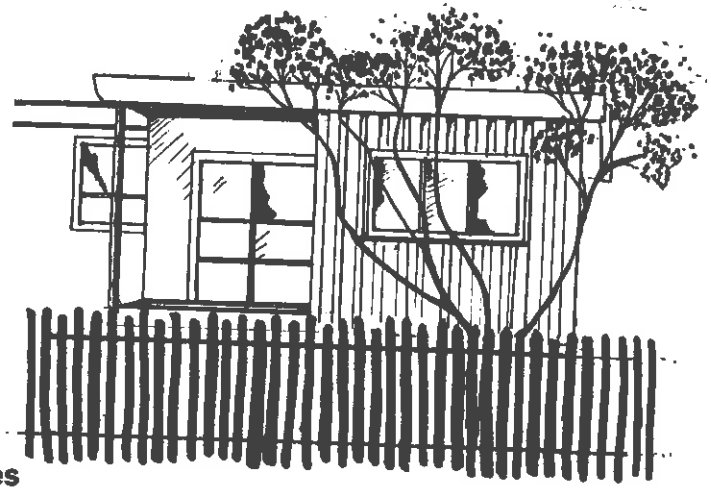


Height

e) Eaves to a maximum of 5 metres above ground level

Materials

f) Roof - Frequent use of corrugated roofing rather than tiles
Walls - Timber, sheet claddings, avoiding masonry or brick.



Fences

g) Low fences to a maximum height of 1 metre or alternatively vegetation to define front boundaries.

Verandas

h) Use of verandas and porches providing a welcoming intermediate space between the street and front door

Recommendations

Recognising the importance of the area, the community consultation process and professional analysis suggest a vision for the Waimakariri - Rakahuri (Ashley) coastal lands that involves voluntary participation of landholders in:

- Retention of open space character;
- Conservation of local heritage;
- Restoration of natural areas and linkages forming a matrix within which various forms of production occurs; along with,
- Retention and confinement of the low key beach settlements.

For local people, groups and authorities to progress the vision:

ASSIST LANDOWNER PROTECTION

1. Identify indigenous remnant vegetation for landowners who wish to be informed of any values that may exist on their land and that they can then consider protecting.

2. Develop mechanisms to provide protection guidance and assistance to landowners if wanted.

WILDLIFE

3. Explore the potential to have wildlife surveys undertaken, particularly in association with local schools and community groups to better identify and understand existing invertebrates, fish, lizards and birds, and what existing habitat may be important to them. The diversity of insect life that eel gorge on, for example, could amaze and fascinate children.

4. Community and landowner interests explore different management regimes to assess the help or hindrance of existing management for conservation and restoration. For example, identify barriers to fish passage, such as culverts and weirs.

5. Develop strategies and guidelines for wildlife enhancement.

WATER MANAGEMENT

6. Encourage understanding of groundwater levels and the ecological potential of the land-water interface.

7. Have guidelines developed for restoration and management of streams and wetlands, for both the quantity and the quality of their waters, as well as their biota.

8. Encourage and assist landowner/managers to exclude grazing stock from waterways and wetlands to remove the source of many nutrient and sediment pollutants, and to allow for water-cleansing buffer vegetation to establish.

9. Where there is space, encourage restoration of natural stream form and vegetation - rather than straight steep-sided, "shaved" drains.

10. Explore the potential for land-owner support to seek to re-instate stream flows crucial to wetland sustainability, such as the Waiora Stream to Tutaepatu.

11. Explore the potential for expanding the area of wetlands, encouraging their native biodiversity and ensuring minimum water levels.

RESTORATION PROJECTS

12. Following community and landowner consideration and discussion, learn from existing restoration projects and seek to identify potential restoration trial sites and demonstration plots in each type of ecosystem, whether on private land or land which has a public interest. Trial different establishment and management techniques, e.g. mixed species planting to establish a kahikatea forest, versus planting of a close pure kahikatea stand only.

13. Ensure recognition that wetland ecosystems extend well beyond the actual water or visibly wet area, in all types of season, so that appropriate management is sought for the full area of influence, to minimise drought effects on heritage values.

14. Explore potential support for restoration projects - whether community, commercial, local government or other agencies.

15. Have restoration guideline details developed for each type of ecosystem, to cover both large- and small-scale project activities. These be made available to all landowners/managers, and to others involved in decision-making on these lands.

16. Encourage establishment, support and advice for Coastal Care Groups, to co-ordinate energy and information, and to be notified of problems.

17. Along with trials and demonstrations, further develop the planting guides to enable people to undertake their own restoration activities.

18. Support and encourage neighbourliness, through complementing restoration efforts, proving linkages, extensions and buffers, and through controlling potentially invasive non-native plants.

BIODIVERSITY MONITORING

19. Seek to establish indigenous biodiversity monitoring programmes in the community (e.g. in schools) to identify and record the change in nature that occurs - e.g. are there more kereru or lizards each year? - or, a greater variety of insects over a stream?

WEEDS & WASTE

20. Together with the community, develop a database of existing and potential invasive plants (weeds) and develop a weed management strategy for the area to encourage removal of certain threatening species.

21. Encourage good practice in disposal of garden waste to reduce the threat of invasive plant spread.

22. Encourage avoidance and removal of polluting practices, whether of ground water or surface water.

23. Recognise cultural and heritage values in the selection, upgrading and monitoring of sewage treatment techniques.

24. Encourage the upgrade of community and individual sewage management schemes to avoid contamination and the degradation of natural and cultural values.

EMPLOYMENT & TRAINING

25. Develop a co-ordinated approach to employment on restoration programmes. If owners wish to undertake a series of projects, seek a co-ordinated to involvement of the community and tangata whenua to maximise potential employment and training opportunities.

INTERPRETATION

26. Develop and provide appropriate interpretation of cultural history and of natural history to help in the public understanding and respect for the specialness of these coastal lands.

27. Encourage discussions with tangata whenua prior to any new earth disturbance, to seek to avoid disturbance of cultural values

RECREATION

28. Seek development of a walkway system and other ecologically, socially and culturally appropriate recreation opportunities.

29. Develop mechanisms for reducing user conflicts e.g. separate areas for quiet and noisy activities, restoration timing to avoid wildlife breeding, etc.

BUILDINGS

30. Have a local landscape guideline brochure for building form, materials, colours, etc, developed in consultation with the community to assist people to consider landscape development and management that complements the vision.

31. Develop a building guideline leaflet to articulate both rural and settlement character and to assist people in considering any renovations, extensions or new development.

DISTRICT PLAN

32. To recognise the local vision identified for heritage management and restoration, support is pursued for the District Plan to support recommendations 1-31 above to enable achievement of a restoration and settlement vision.

References

Buxton, R. 1991.
Wetlands a Management Guide.
Department of Conservation

Boffa Miskell, 1992.
Management of Conservation Values in the Waimakariri District

Canterbury Regional Council, September 1997.
Groundwater of the Waimakariri - Ashley /Plains
A resource summary Report

Canterbury Regional Council, May 1995.
Ashley River Floodplain Management Regional Plan Technical Investigation

Christchurch City Council. 1998.
Restoring Avoca Valley Stream - Video.
Waterways and Wetlands Team, Christchurch City Council.

Crossland, Andrew, 1998
Birdlife of the Waimakariri - Ashley Coastal Lands, Pegasus Bay, North Canterbury
Report for Lucas Associates

Department of Conservation, 1994.
New Zealand Coastal Policy Statement Policy,
Department of Conservation, Wellington

Evison, Harry C, 1993
Ngai Tahu Land Rights, (3rd edition),
Ngai Tahu Maori Trust Board, Christchurch

Evison, Harry C, Adams, M. 1993
Land of Memories - a Contemporary view of places of historical significance in the South Island of New Zealand
Tandem Press

Kirk, RM, 1992
Coastal Processes and Hazards in the Waimakariri District

Lucas Associates. 1996.
Indigenous Ecosystems of Otautahi Christchurch. Set 3: Plants of the Plains of Shirley-Papanui and Fendalton-Waimairi. For Agenda 21 Forum & the CCC Community Boards.

Lucas Associates, Christchurch City Council. 1998.
Restoring Avoca Valley Stream - A Community Model.
Waterways and Wetlands Team, Christchurch City Council.

McDowall, R.M, 1990.
New Zealand freshwater fishes; a natural history and guide.
Heinemann Reed, Auckland

Meurk, Colin; Lucas Associates; Christchurch City Council, 1997.
Streamside Planting Guide. What to plant and how to maintain native plants along freshwater streams in Christchurch.
Waterways & Wetlands Team, Christchurch City Council

Meurk.C, 1998.
Brief of Evidence of Colin Meurk for Pegasus Bay Coastal Estates Ltd
Application for a Change to the Waimakariri District Council District Plan,- Rangiora District Section

Parks Unit, Christchurch City Council, 1992.
***The Estuary: Where Our Rivers Meet The Sea**: Christchurch's Avon-Heathcote Estuary / Edited by S-J Owen.* Batyprint (NZ) Ltd, Christchurch.

Pegasus Bay Coastal Estates Limited, 1997.
Application for a Change to the Waimakariri District Plan - Rangiora District Section.
Boffa Miskell

Submissions on Hearings, 1998.
Application by Pegasus Bay Coastal Estates Ltd for a Change to the Waimakariri District Plan - Rangiora District Section.

Tau, Te M.; Goodall, A.; Palmer, D.; Tau, R. 1990.
Te Whakatau Kaupapa: Ngai Tahu Resource Management Strategy for Canterbury Region.
Aoraki Press, Wellington.

Waimakariri District Council
Proposed Waimakariri District Plan
Notified 20 June 1998

Waimakariri District Council, August 1995.
Pines/Kairaki Discussion Document
Waimakariri District Plan Review

Waimakariri District Council, August 1995.
Waikuku Beach Discussion Document
Waimakariri District Plan Review

Waimakariri District Council, August 1995.
Woodend Beach Discussion Document
Waimakariri District Plan Review