

Otipua Wetland

Saltwater Creek, Timaru



A community project



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OVER-RIDING PURPOSE

Otipua Wetland - a community project to re-create a wetland which will benefit wildlife, the environment, and people for the future. It will provide the opportunity to enjoy wildness, wetlands, and an indication of the huge diversity of flora and fauna at the edge of the city.

from the **Proposed Regional Policy Statement** (8.2 Issue Resolution):

Objective 1

Protection or enhancement of wetlands, particularly the gross area of wetlands, their ecological health and functioning, their cultural amenity and recreational values, and the preservation of their natural character.

Reason

To retain or increase the value to the Canterbury region of its wetland areas.

Policy 1

(c) Encourage restoration or enhancement of lost or degraded wetland areas.

"wetland" is

a collective term for permanently or intermittently wet land, shallow water and land-water margins. Wetlands may be fresh, brackish or saline, and are characterised in their natural state by plants and animals that are adapted to living in wet conditions (*Environmental Council, 1986*).



Otipua Wetland

Saltwater Creek Timaru

The restoration and enhancement of wetlands for nature and people at Saltwater Creek.

A PROPOSAL TO

- recognise the underlying natural diversity
- re-enrich the (currently pastoral) estuarine lands
- establish a range of native flora and fauna
- provide for visitor enjoyment

FOR THE CREATION OF

- beautiful wetlands and lake
- some reinstatement of the former big Otipua lagoon
- diverse and accessible local native vegetation
- a haven for local and migratory birds
- a resource for takata whenua - tuna; craft materials
- wilderness on the city edge

- a walking circuit linking the beach and Patiti Point
- an enriched landscape for people and nature
- unique local and visitor attraction
- a sophisticated interpretation centre and trail
- an educational resource for students - primary to tertiary
- appealing roadside facilities
- an enhanced southern entrance to Timaru

A LANDMARK, BEING

- a model and inspirational wetland restoration project
- an appropriate way of celebrating our biodiversity
- a fitting and memorable celebration of the year 2000



Otipua Wetland



NATURE OF UNDERLYING LANDS

A complex of estuarine, alluvial and downland systems:

estuarine

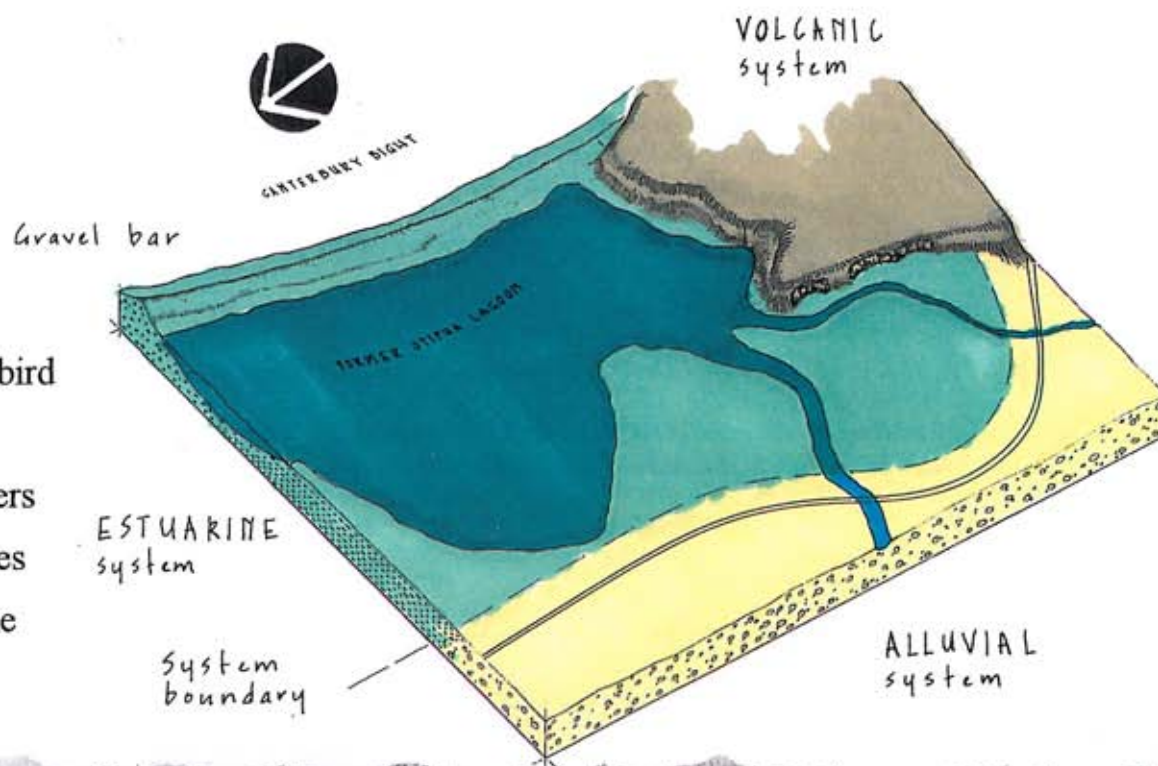
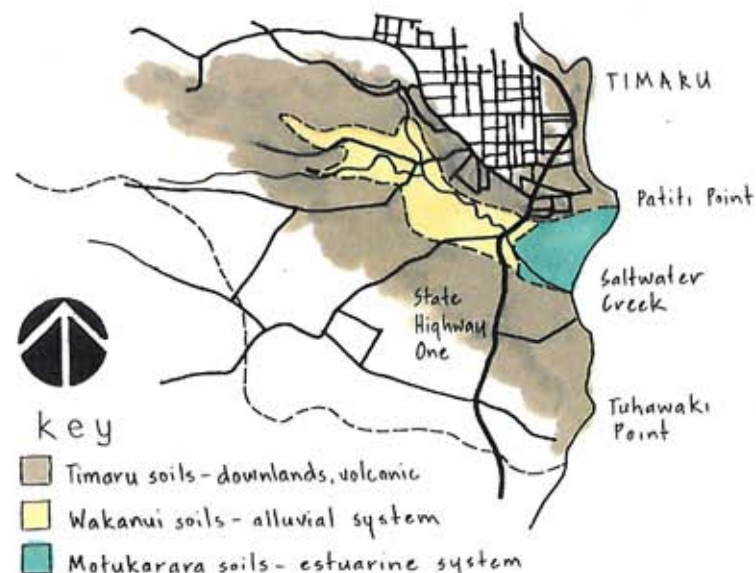
- part of the coastal environment
- built from interacting coastal and freshwater processes
- inter-related shingle spit, lagoon, wetland and mud flats
- made up of fines, shells and shingle
- strong saline influence
- coastal shrubland, rushes and sedges
- naturally rich in birdlife, fish, shellfish, insects, etc.

alluvial

- gentle valley bottom - a "mini plain"
- system built from stream deposits
- silt loams developed over greywacke gravels
- deep, fertile soils
- naturally kahikatea forest land of kereru, tui and bellbird

downlands

- volcanic timaru basalt blanketed with deep loess layers
- gently rolling landscape, some steep scarps and slopes
- downlands above, enclosing the alluvial and estuarine
- naturally totara-matai forestlands on deep loess soils



Otipua Wetland



SALTWATER CREEK TODAY

- the catchment is mainly rural, with many small holdings
- natural estuarine-alluvial-downland diversity less evident

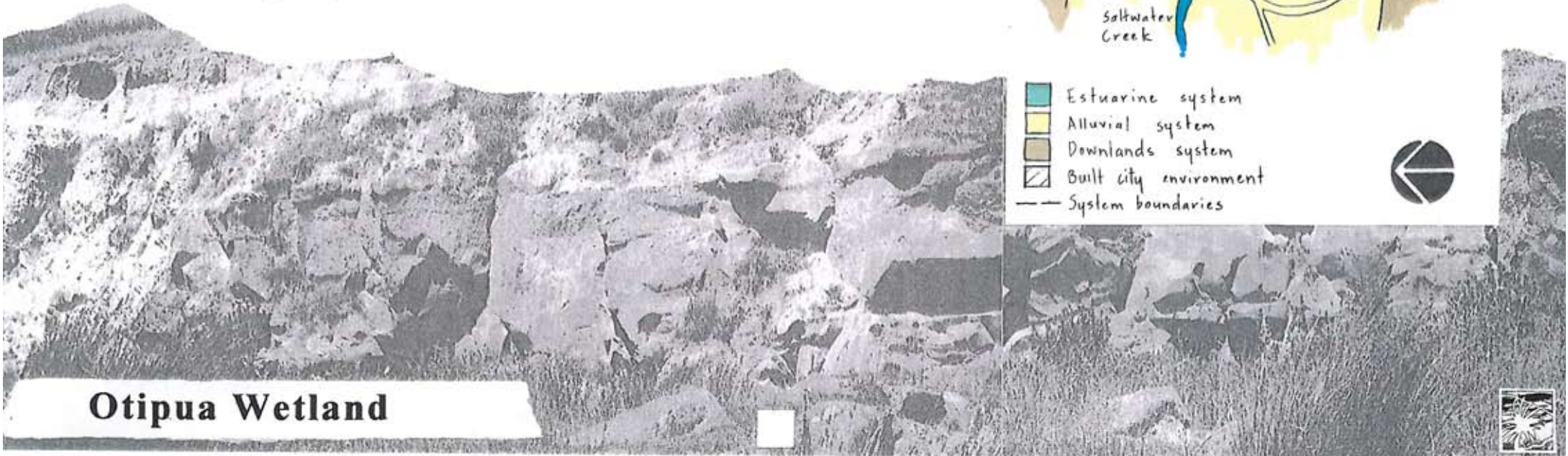
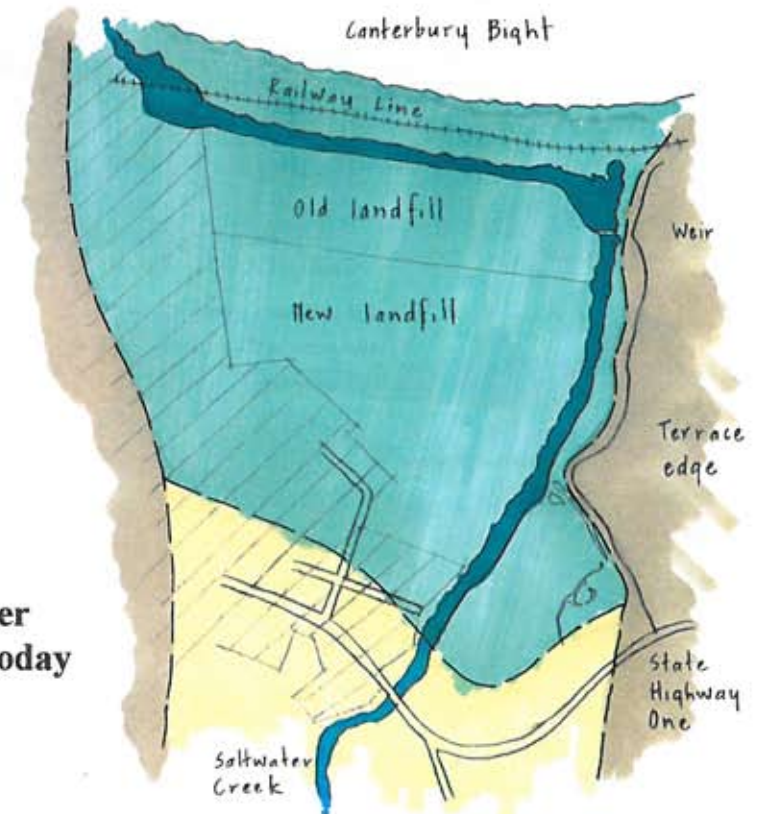
estuarine

- city development has encroached on the north bank
- former extensive lagoon has been claimed for landfills
- lagoon reduced to narrow right-angled creek and channel
- the creek is confined by stopbanks, retained by a weir
- rowers enjoy a straight, mostly open, creek course

alluvial and downlands

- streams confined by stopbanks
- alluvial flats and downlands in pasture and crop
- basalt outcrops very visible

Saltwater Creek today



Otipua Wetland

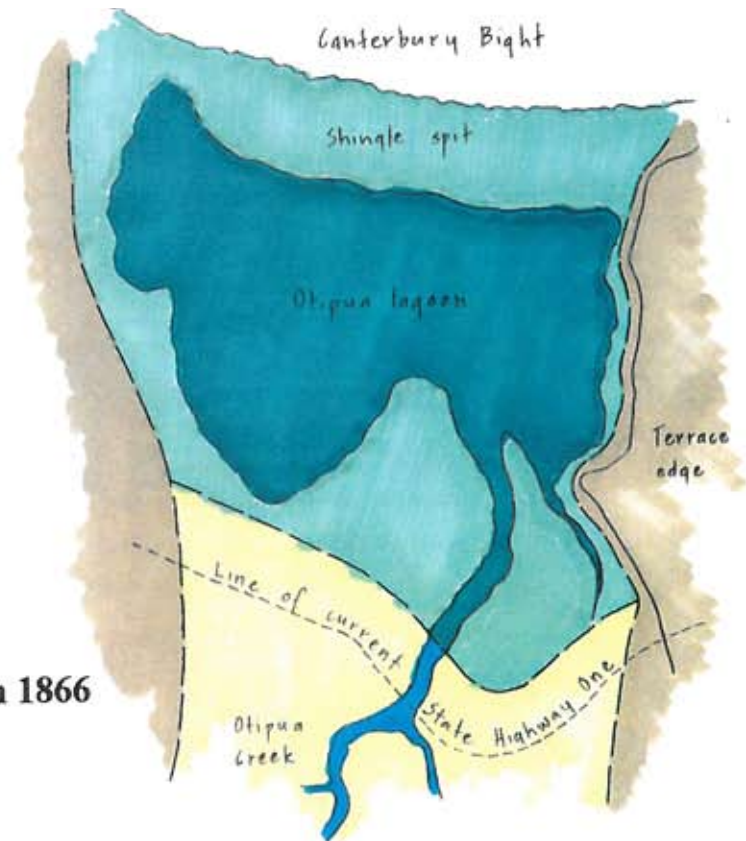
FORMER OTIPUA FOCUS

estuarine

- a huge lagoon separated from the coast by a gravel spit
- a place rich with fish and birdlife
- a food basket for takata whenua - especially tuna (eel)
- harakeke, pingao, raupo for weaving and mokihi
- the early settlers of the area lived on kokopu



Otipua Lagoon 1866



- Former lagoon - Estuarine system
- Estuarine system
- Alluvial system
- Downlands system
- System boundaries



Long finned eel

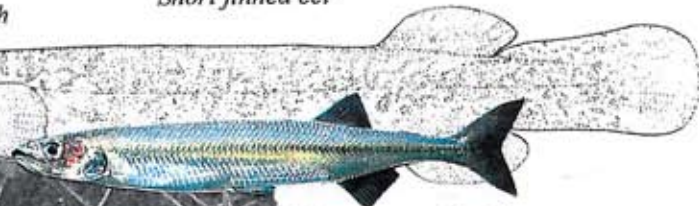


Short finned eel

Canterbury Mudfish



Smelt



Otipua Wetland



Giant kokopu

THE DESIGN PROPOSAL

The design (see plans, pages 9-12) provides for:

saltwater creek

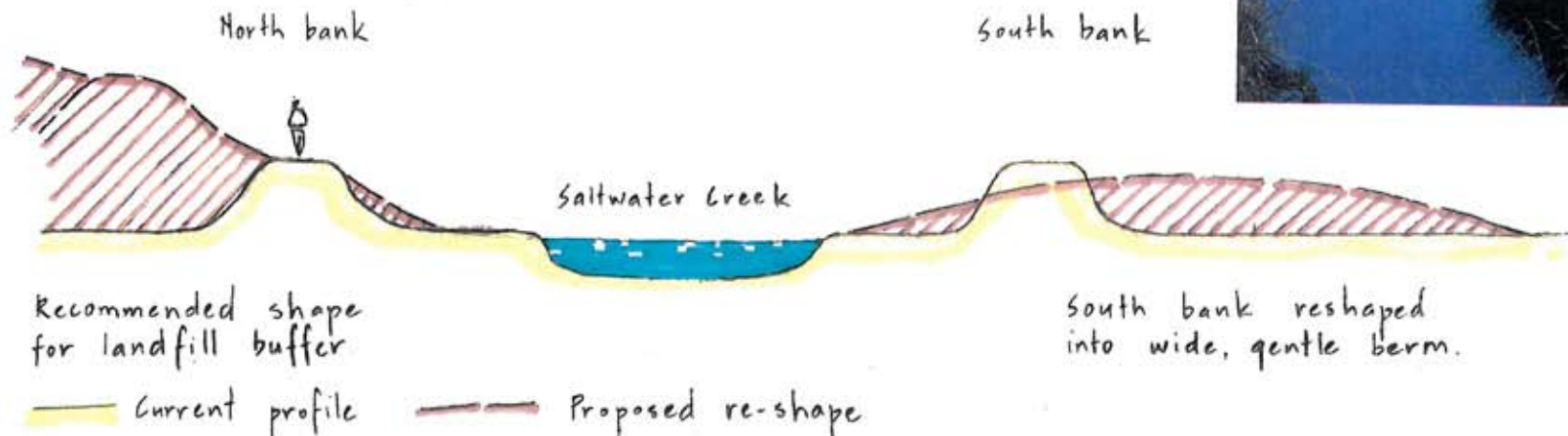
- creek channel to be maintained in current state
- removal of raupo from banks, to stop sediment and rubbish buildup and maintain rowing course
- reshaping of stopbanks and landfill buffer slope
- southern stopbank reshaped into a wide gentle mound
- planting as per various ecosystems
- retention of north side walking track
- south side walking access to beach under railway bridge

lake

- a lake of approximately 4 hectares to be created
- excavated to a depth of at least 1m
- island retreats for birds
- various water sources to feed lake



Shaping Recommendations



vegetation

- all vegetation to be locally sourced native species
- vegetation selected to match the 3 underlying systems
- 3 systems divided into ecosystems, in response to specific conditions
- various wetland, shrubland and forested areas
- an indication of the biodiversity possible here
- establishment of swathes of vegetation
- planting on landfill slopes to provide a buffer
- planting on downlands/scarp edge to separate public wetland from farmland
- underplant pine trees by lagoon with natives and gradually remove

wildlife

- range of habitats provided for birds, fish and lizards
- large area cut off from public access - wildlife priority
- mud flats for wading birds
- islands as retreats for roosting and nesting birds
- provision of tall trees and forest habitat

-  Predominantly people
-  Predominantly wildlife
-  Intermediate areas



Otipua Wetland



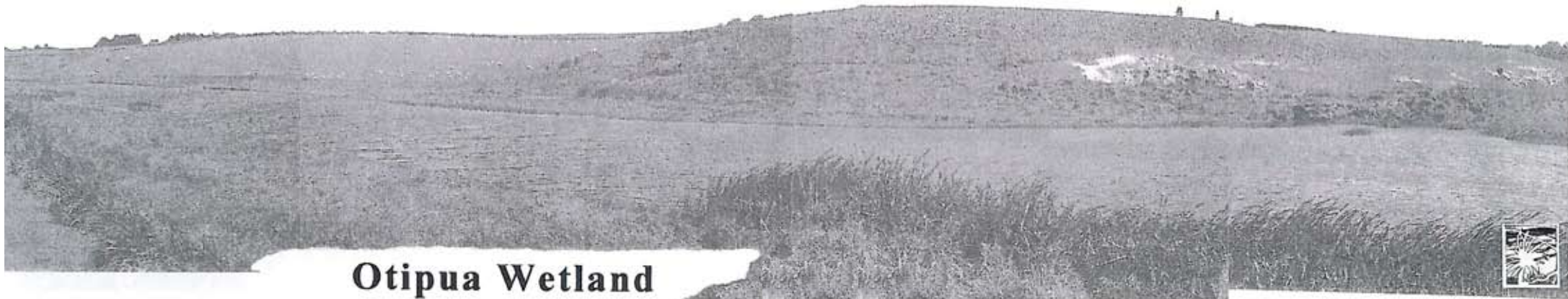
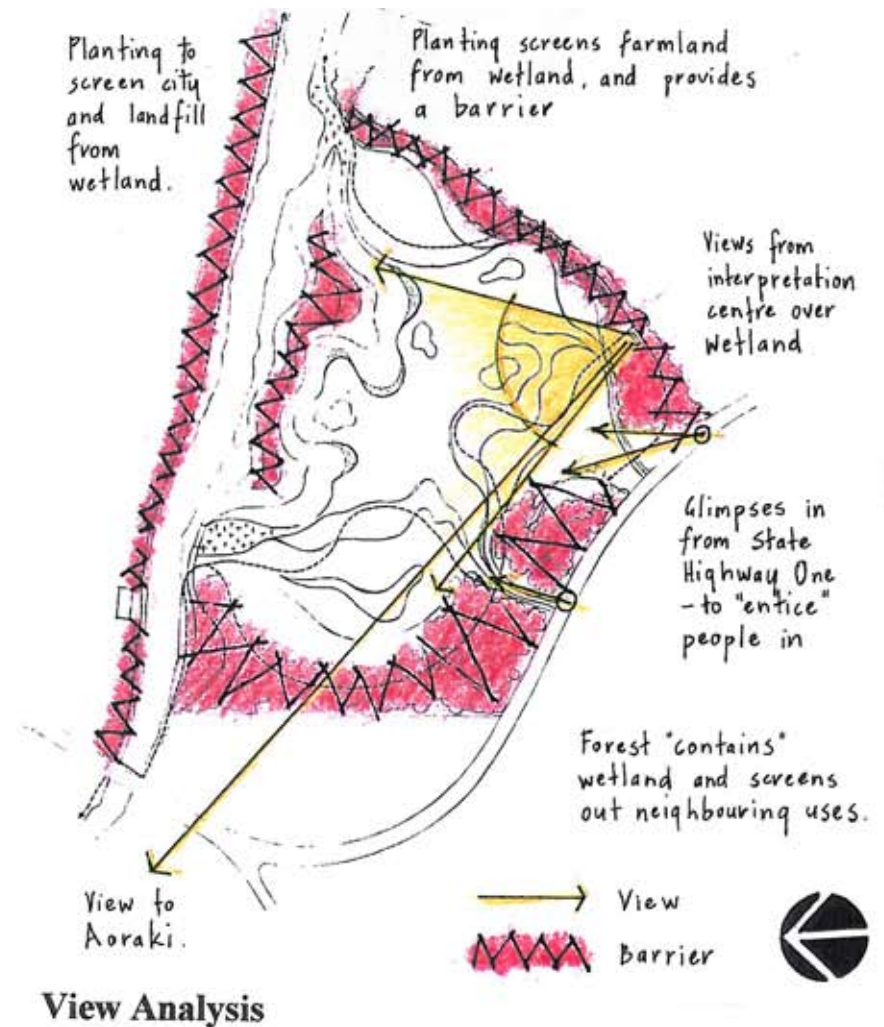
public facilities

- provision of a range of facilities to allow public use
- entrance from State Highway One
- signage in lead-up and along wetland walks
- car and bus parking, toilet and picnic facilities
- interpretation centre on scarp with overview of site and view of Aoraki
- paths and boardwalks around the lake, creek and lagoon
- a range of loop-walks of differing duration
- walking links with Caroline Bay, Patiti Point and Centennial Park

future

once the wetland and lake are vegetated, establish:

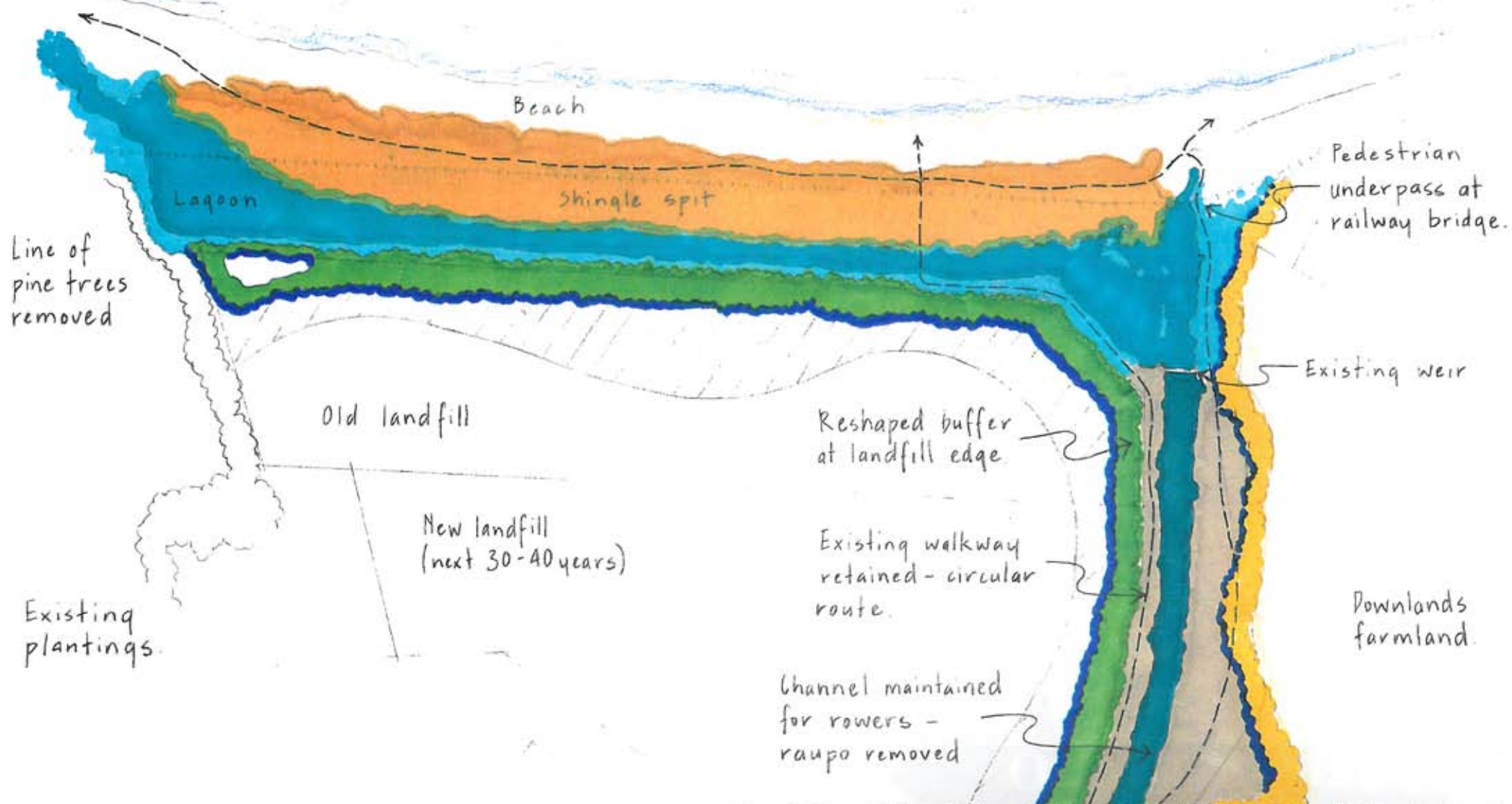
- interpretative stations strategically through wetland
- hide(s) for discreet viewing of wildlife
- non-commercial eel harvest by takata whenua
- cultural materials harvest



OVERALL CONCEPT

To Patiti Point and
Caroline Bay.

Canterbury Bight



key

-  Three-square, toe toe sedgeland
-  Ngaio, ribbonwood shrubland
-  Harakeke, raupo, pukio swampland
-  Kahikatea swamp forest
-  Kowhai, totara scarpland
-  Karamu, kohuhu buffer slope
-  Wiwi, oioi saline lagoon
-  Pingao, kuaka shingle spit
-  Interpreted walk
-  Long-term planting (10-20 yrs) - part of ongoing landfill rehabilitation.

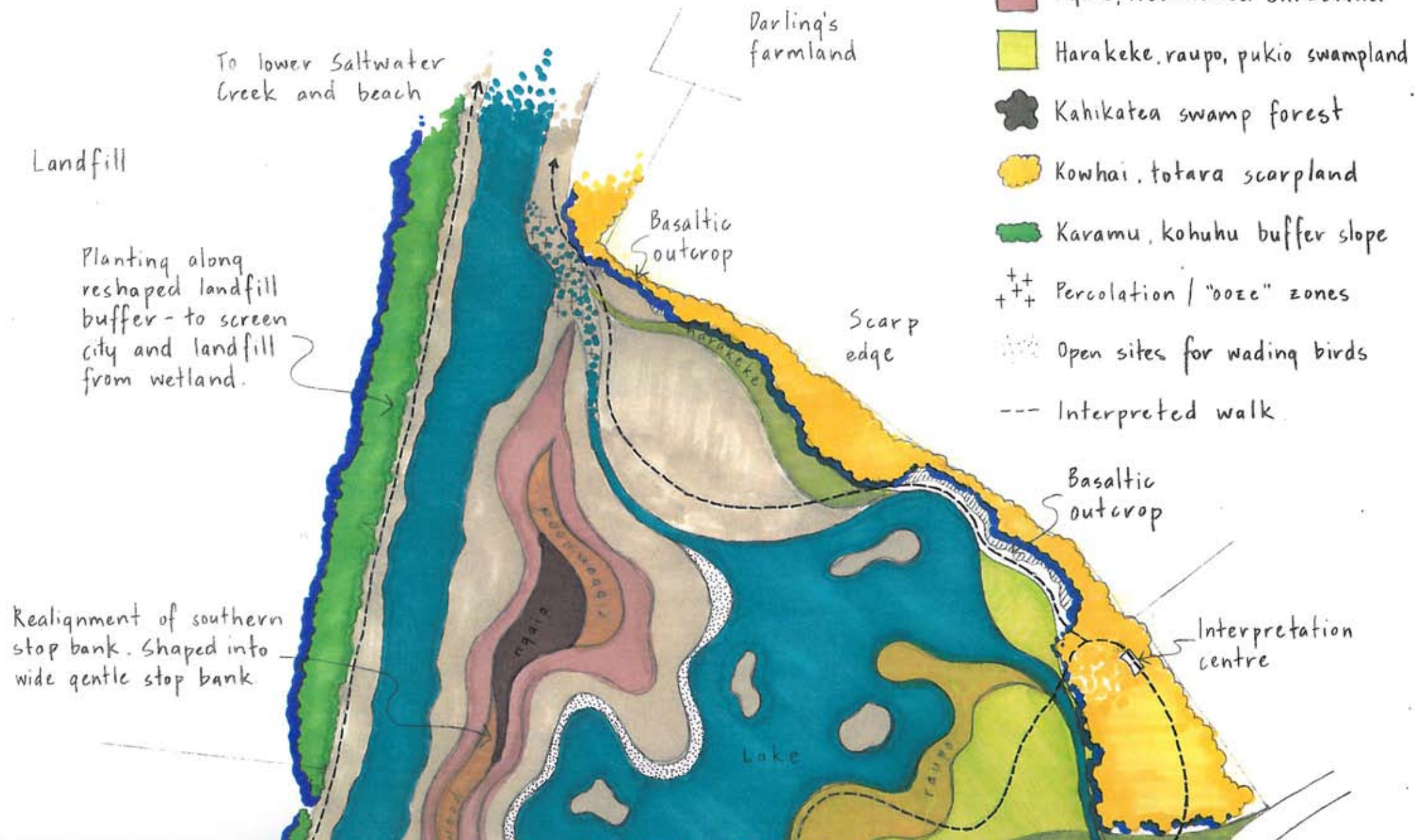


Scale 1:6000



Otipua Wetland

CONCEPT DETAIL





Scale 1:2500

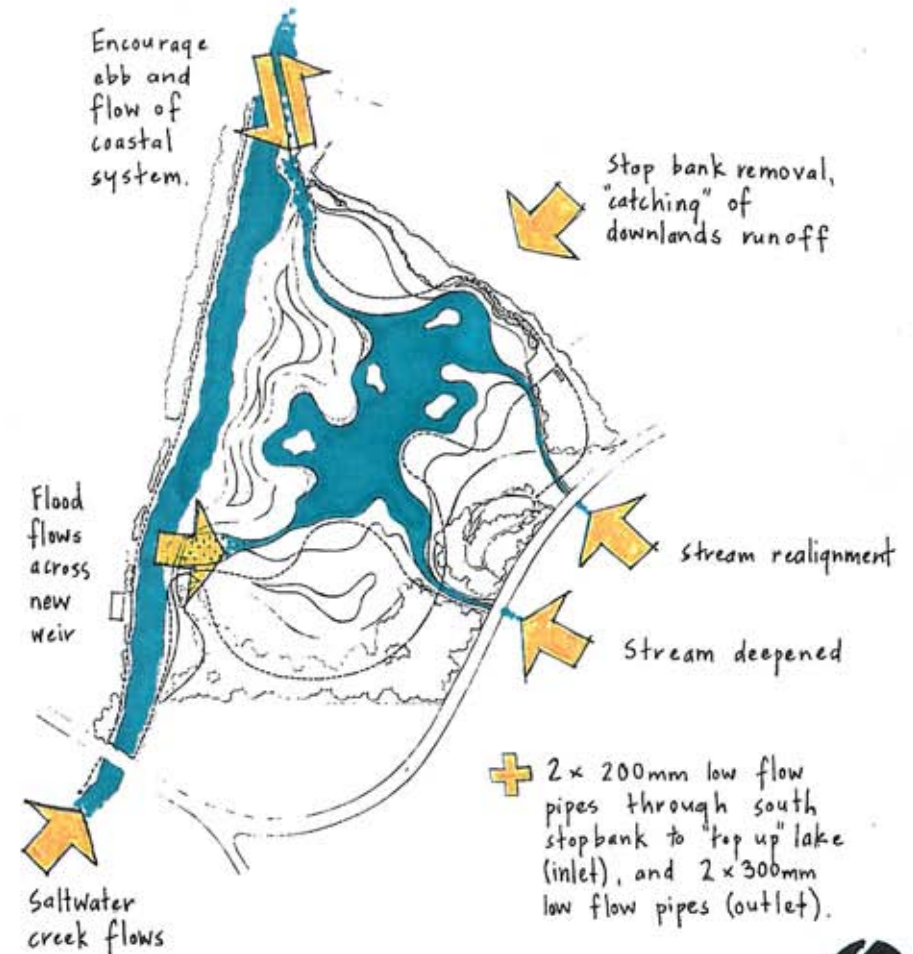


Otipua Wetland

WATER SUPPLY

The water for the new lake is supplied from a number of sources:

- lake and creek water levels hydraulically connected
- pipes through south stopbank between Saltwater Creek and the lake to maintain lake water level
- overflow of new “planted” weir in southern stopbank - flood flows from Saltwater Creek
- flows over weir are low velocity, slowed by planting
- stormwater flows from regraded and naturalised minor creeks
- removal of stopbank below scarp to catch runoff from downlands
- possible access to groundwater
- OR if soils impermeable, they will retain lake water
- at low flow, lake will have no effect on creek water level
- at high flow, beneficial effect, as the lake will act as a flood retention/storage area - alleviating flood peaks and stream backup
- review height of weir for design proposal



Otipua Wetland

PUBLIC FACILITIES

A range of facilities are proposed to enable public enjoyment

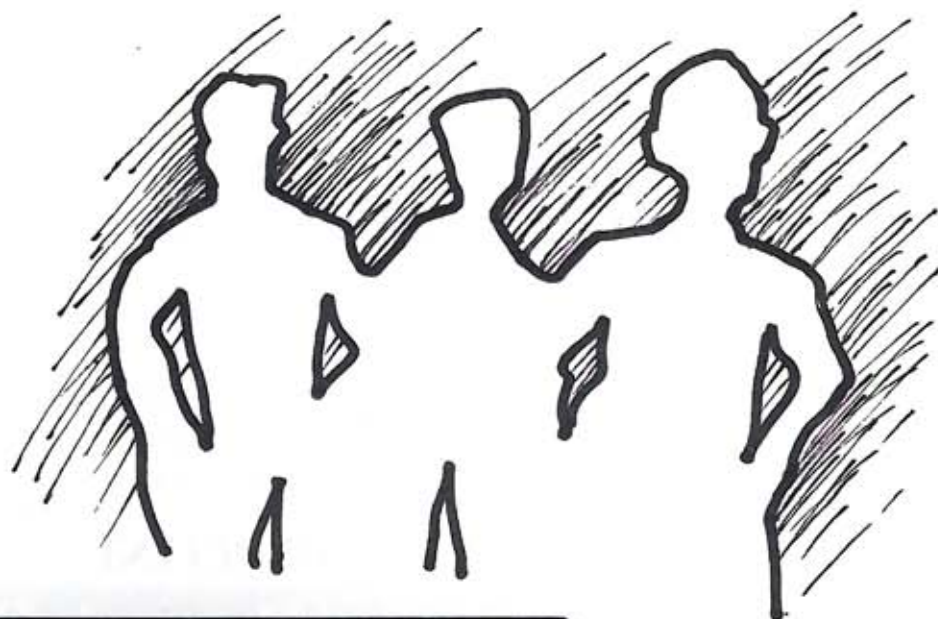
At the entrance to the wetland

- vehicle access from State Highway One
- small scale, low impact car parking
- bus bay(s) for use by schools etc.
- a unisex, disabled, closed-system toilet
- grassed area for picnics and gatherings

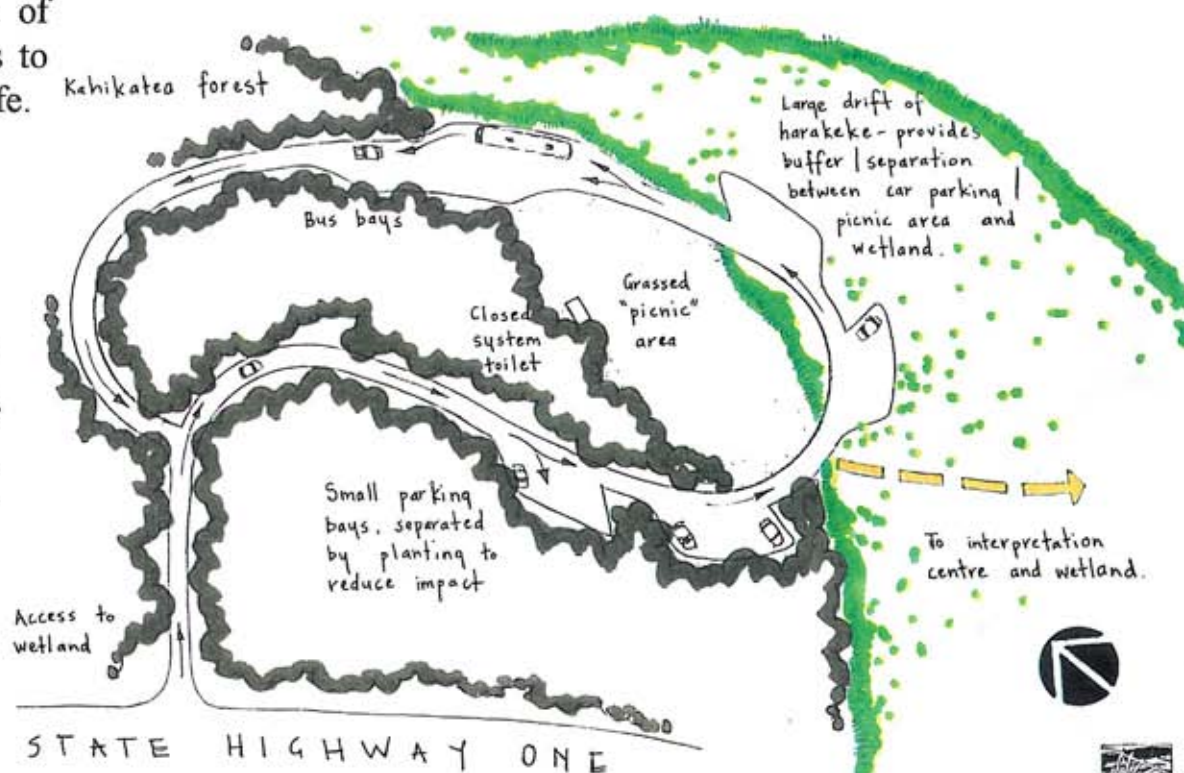
All these facilities are buffered from the wetland proper by the proposed kahikatea forest and an extensive drift of harakeke (flax). These separate out the differing uses to have minimum impact on wetland functioning and wildlife.

Other facilities include

- a low key but *state of the art* interpretation centre
- interpretative trail through the wetland
- all facilities lit by daylight only - no after-hours lighting
- boardwalks and paths around the lake, creek and lagoon, made with materials representative of each system
- a range of walks of varying length
- walking links with Centennial Park, Patiti Point and Centennial Park



Otipua Wetland



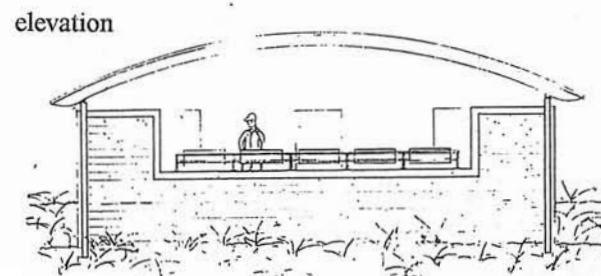
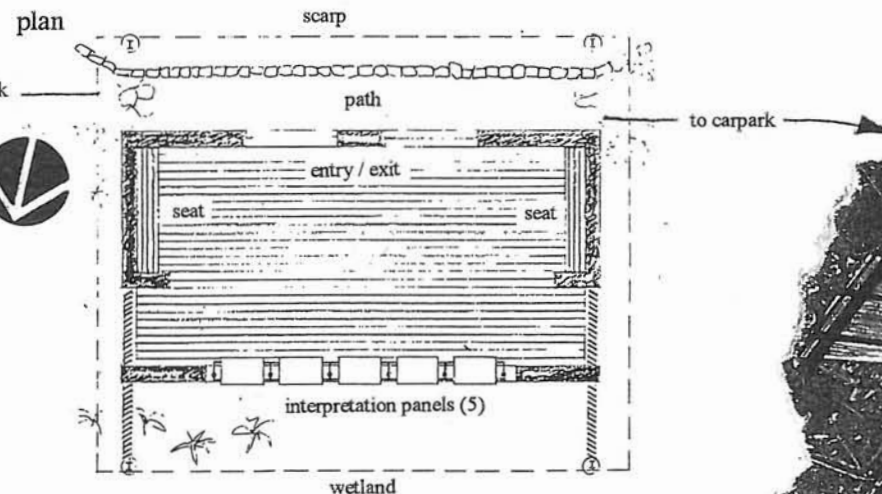
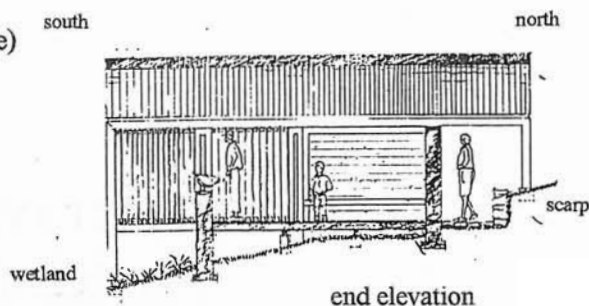
INTERPRETATION

A key aspect of the project is the opportunity for interpretation. This had led to an interpretation centre, and interpretative trail.

interpretation centre

- located on the volcanic scarp
- walk up to it from car park
- views looking out over the wetland
- view to Aoraki
- location of 5 interpretation panels
 - past history and current situation
 - development of project
 - overview of three systems
 - interpretation of downlands/volcanic system
 - interpretation of the wetland
- from here you move out into the wetland

Interpretation centre
as designed by
architect Peter Kent
(more detailed plans available)



interpretative trail

- wandering through the wetland
- detailed interpretation of systems and species
- changing experiences - passing through swathes of different vegetation, going right out to the lake edge and underneath the basalt outcrops
- location of interpretation panels after establishment of wetland
- access along trail for the disabled



**Otipua
Wetland**

ECOSYSTEMS

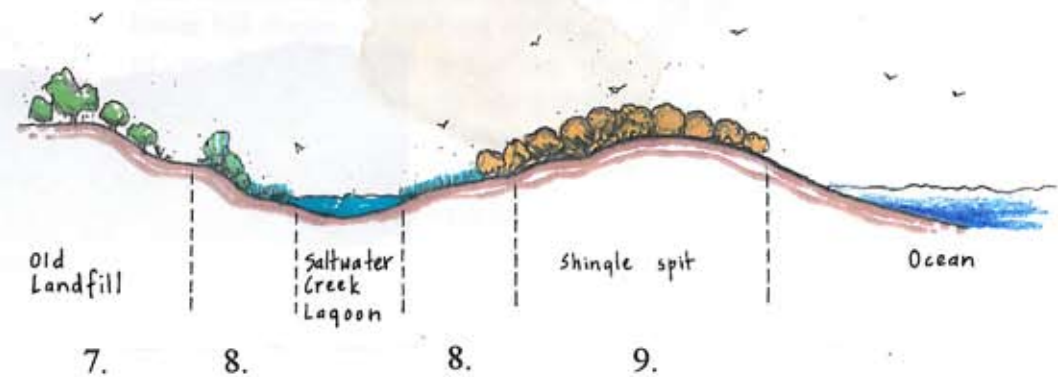
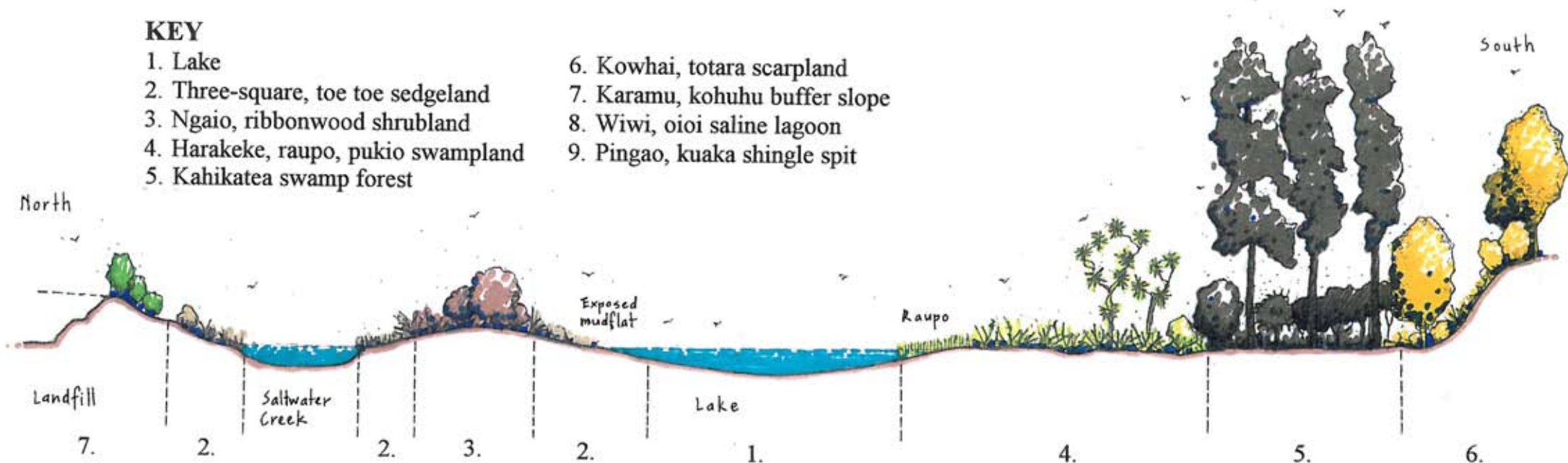
The three broad estuarine, alluvial and downland systems are further divided in the design to create a suite of distinctive ecosystems. The general landform and conditions, along with some of the plants, birds, lizards and fish are noted for each of these ecosystems.

Their descriptions indicate the diversity of flora and fauna possible here, and indicate opportunities for interpretation. The signature plants for each ecosystem are distinctive to that location, and are selected from the extensive plant lists for each ecosystem. The full lists will be incorporated at the detail design stage of the project.

These ecosystems and their relative locations are:

KEY

- | | |
|-------------------------------------|--------------------------------|
| 1. Lake | 6. Kowhai, totara scarpland |
| 2. Three-square, toe toe sedgeland | 7. Karamu, kohuhu buffer slope |
| 3. Ngaio, ribbonwood shrubland | 8. Wiwi, oioi saline lagoon |
| 4. Harakeke, raupo, pukio swampland | 9. Pingao, kuaka shingle spit |
| 5. Kahikatea swamp forest | |



1. Lake

This aquatic ecosystem of the proposed lake lies at the centre of the wetland with areas of open water greater than one metre in depth. It provides excellent habitat for water fowl such as grey teal, shoveler, paradise shelduck and scaup, along with the little and black shag. Indigenous fish such as short and long finned eel, inanga and common bully would be expected. If there was some sort of permanent access to the ocean, a wider variety of fish could be expected, including smelt, upland bully and giant kokopu.

2. Three-square, toe toe sedgeland

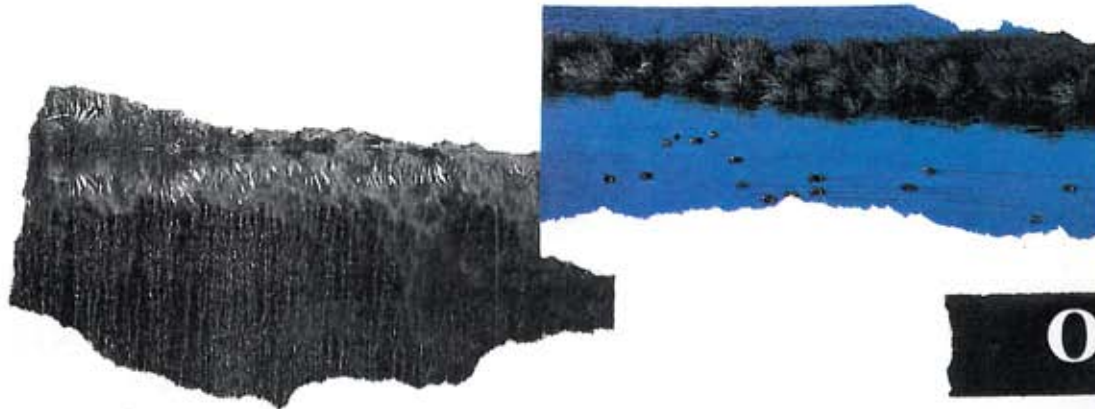
This wetland ecosystem ranges from areas of shallow water to regions above the permanent water level that will be periodically flooded. Characterised by sedges and rushes, there are also extensive clear, open mud-flats, providing good habitats for wading birds. The white-faced heron, kotuku (white heron), pied stilt, pied oyster catcher, grey teal, shoveler, banded dotterel and royal spoonbill are all likely to be found here. Short and long finned eel, along with inanga could be expected in the shallow waters.

3. Ngaio, ribbonwood shrubland

This ecosystem occurs on the wide and gently sloped realigned southern stopbank. It is above the Three-square, toe toe sedgeland ecosystem, and would be partially inundated on occasion. It consists of predominantly shrubby vegetation, with large, dramatic drifts of ngaio and marsh ribbonwood. In this ecosystem you may find nectar eating birds such as bellbird and silvereye, along with kingfisher, and it would provide suitable habitat for the common skink.

4. Harakeke, raupo, pukio swampland

Occurring next to the lake, this ecosystem consists of shallow waters and expanses of low lying swampy ground. Dominated by sedges and rushes, this is the only area containing raupo (in two large drifts), and also contains large drifts of harakeke and ti kouka. The swampland provides excellent habitat for the bittern and marsh crane, and you could also expect white faced heron, pied stilt, grey teal, shoveler and pukeko. Inanga and eel would inhabit the shallow water, and common skink would occur in the drier land areas.



Otipua Wetland



5. Kahikatea swamp forest

These swampy forested areas occur on the deep and fertile Wakanui soils of the alluvial system. This will be a richly diverse tall podocarp forest community, with over 30 species of trees and shrubs present, forming a striking band of tall dark green vegetation. It will provide good habitat for bush birds such as kereru, fantail and silvereye, and may also attract kingfisher and shag, who would dive from the tall trees into the lake for food. The common skink would also dwell here.

6. Kowhai, totara scarpland

The kowhai, totara scarpland consists of the downland-slopes surrounding the wetland. This scarpland can be further divided into three characteristic ecosystems (shown below). These are the ecosystems of the Timaru downlands volcanic system, where a varying layer of loess overlies the Timaru basalt.

6. Kowhai,
totara
scarpland

6c. Matai,
totara
downland.

6b. Silver tussock,
mikumiki
rockland.

6a. Tarata, mahoe
toe slope.



6a. Tarata, mahoe toe-slope

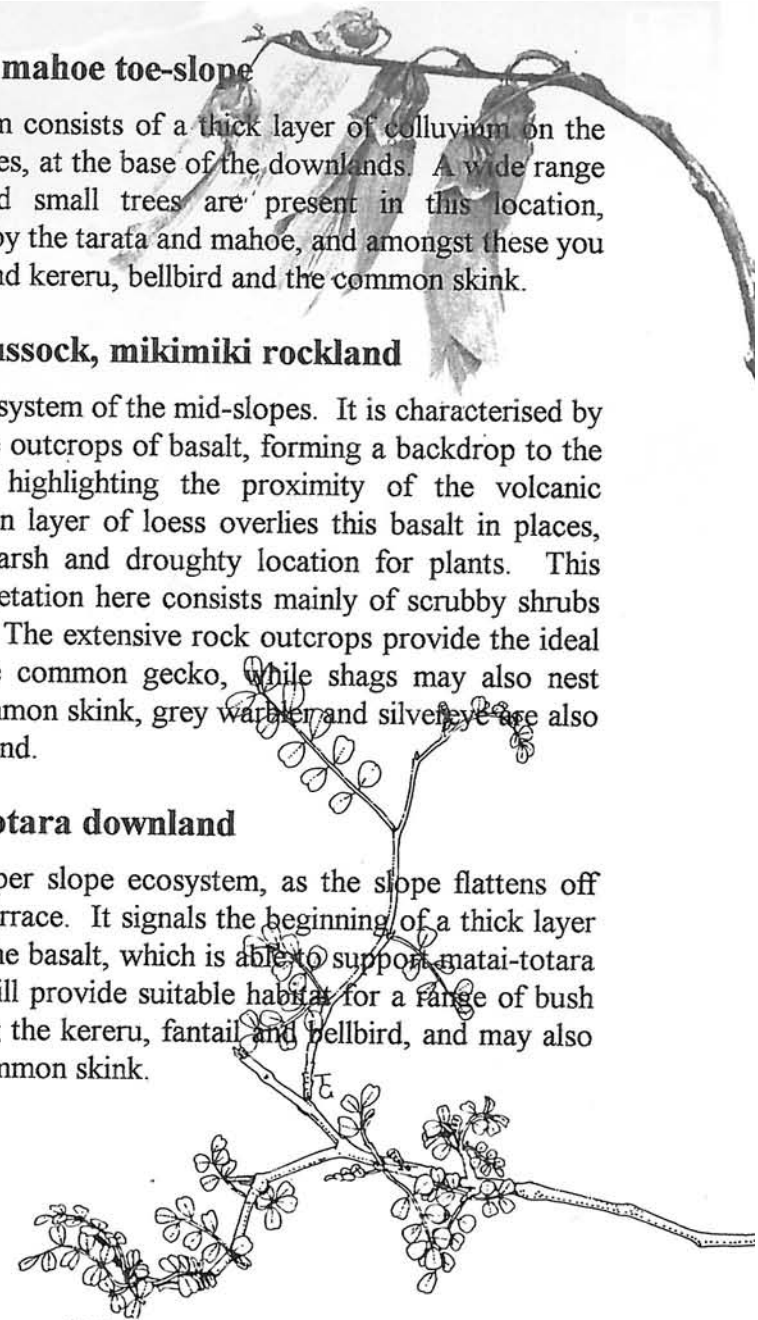
This ecosystem consists of a thick layer of colluvium on the lower hill slopes, at the base of the downlands. A wide range of shrubs and small trees are present in this location, characterised by the tarata and mahoe, and amongst these you are likely to find kereru, bellbird and the common skink.

6b. Silver tussock, mikimiki rockland

This is the ecosystem of the mid-slopes. It is characterised by stunning, large outcrops of basalt, forming a backdrop to the wetland, and highlighting the proximity of the volcanic system. A thin layer of loess overlies this basalt in places, making it a harsh and droughty location for plants. This means the vegetation here consists mainly of scrubby shrubs and tussocks. The extensive rock outcrops provide the ideal habitat for the common gecko, while shags may also nest here. The common skink, grey warbler and silvereye are also likely to be found.

6c. Matai, totara downland

This is the upper slope ecosystem, as the slope flattens off into a gentle terrace. It signals the beginning of a thick layer of loess over the basalt, which is able to support matai-totara forest. This will provide suitable habitat for a range of bush birds, including the kereru, fantail and bellbird, and may also support the common skink.



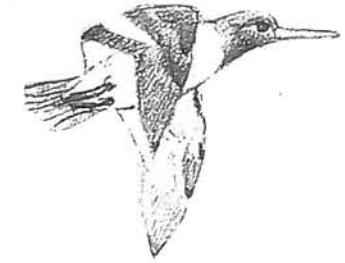
7. Karamu, kohuhu buffer slope

This ecosystem consists of the buffer slope constructed to hide the landfill, along the northern edge of Saltwater Creek. The conditions encountered here are likely to be harsh, so the plants selected will need to have a wide range of tolerances, and also be able to screen the landfill and the fence to be erected on the top of this buffer. For this reason, small tree and shrubby species such as the karamu and kohuhu have been chosen. Fantail, silvereye and the common gecko could be expected here.

8. Wiwi, oiwi saline lagoon

This ecosystem occurs at the base of Saltwater Creek running parallel to the ocean. Along with Saltwater Creek, it functions as a lagoon, since both mouths are almost always closed. It includes the swampy margins around the lagoon. The standing water provides good habitat for a wide range of birdlife, including the black shag, spotted shag, white-fronted tern, black-fronted tern, oyster catcher, banded dotterel, royal spoonbill, paradise shelduck, pied stilt, white-faced heron and kotuku (white heron). Marsh crake and bittern would also inhabit the margins, while fish such as common bully, inanga, and the long and short finned eel would also occur here.

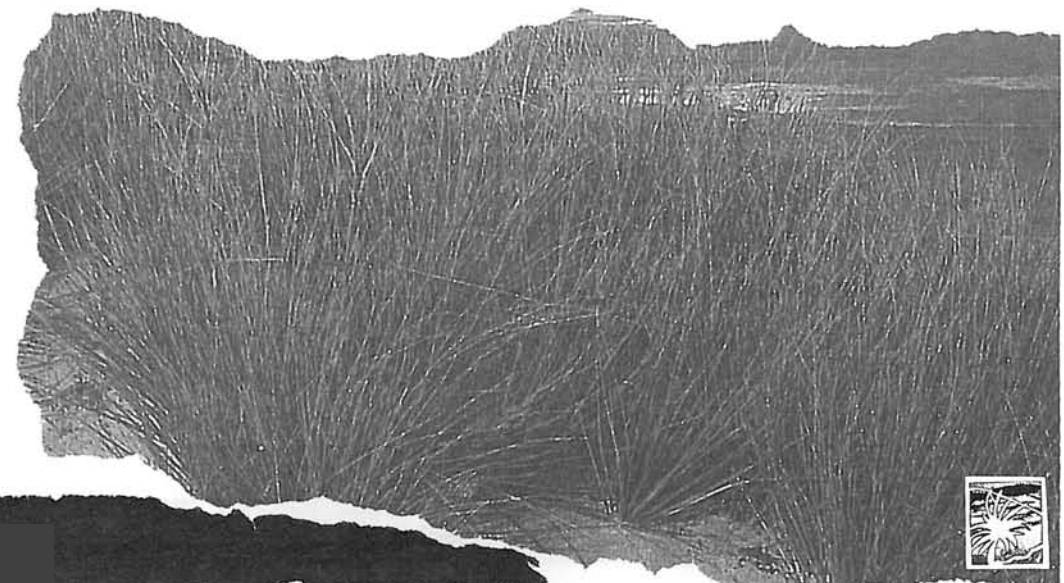
If it was possible to have some sort of fish pass or permanent access to the ocean, a much wider range of fish would be present. This could include giant kokopu, upland bully, smelt, flounder and whitebait, all of which need to return to the ocean to breed.



9. Pingao, kuaka shingle spit

This is the ecosystem of the spit below the saline lagoon. A part of the estuarine system, it is a gently sloping, naturally formed barrier bar with some sands and fines overtopping the shingles. The vegetation here is predominantly low, twiggy, shrubland, including pingao, matagouri, ngaio and silver tussock. Birds such as the kuaka (godwit), banded dotterel, oyster catcher and black and white fronted tern would use this area. It also provides the habitat for four different types of lizard. These are the green gecko, spotted skink, common gecko and common skink.

Note all species used are to be indigenous and locally sourced.



Otipua Wetland



ONGOING MANAGEMENT REQUIREMENTS

- secure the site in perpetuity under the Reserves Act
- a secure but inclusive management structure established
- liaise with Arowhenua Runaka regarding management
- recognise this as a dedicated use in the District Plan
- maintain a tranquil and semi-wilderness setting
- preclude inappropriate “neighbours” eg. noisy activities
- monitor groundwater levels at site boundaries
- Saltwater-Otipua catchment management upgrade
- upstream, riparian vegetation established
- contaminated outfalls eliminated
- creek and lake water quality and salinity monitored
- monitor and adjust planted weirs in and out of lake
- investigate any unpredicted effects
- monitor wildlife in liaison with associated groups
- ascertain what local native fauna belong in each habitat
- with expert help, re-establish missing fish, lizards, insects
- investigate the possibility of a fish pass through the spit
- domestic stock excluded from whole wetlands site
- control weeds and animal pests that threaten wildlife
- horse and motorbike riders permanently excluded
- prohibition of boating and shooting in the wetland
- exclusion of all dogs

Otipua Wetland



APPENDIX : INDIGENOUS ECOSYSTEM NAMES

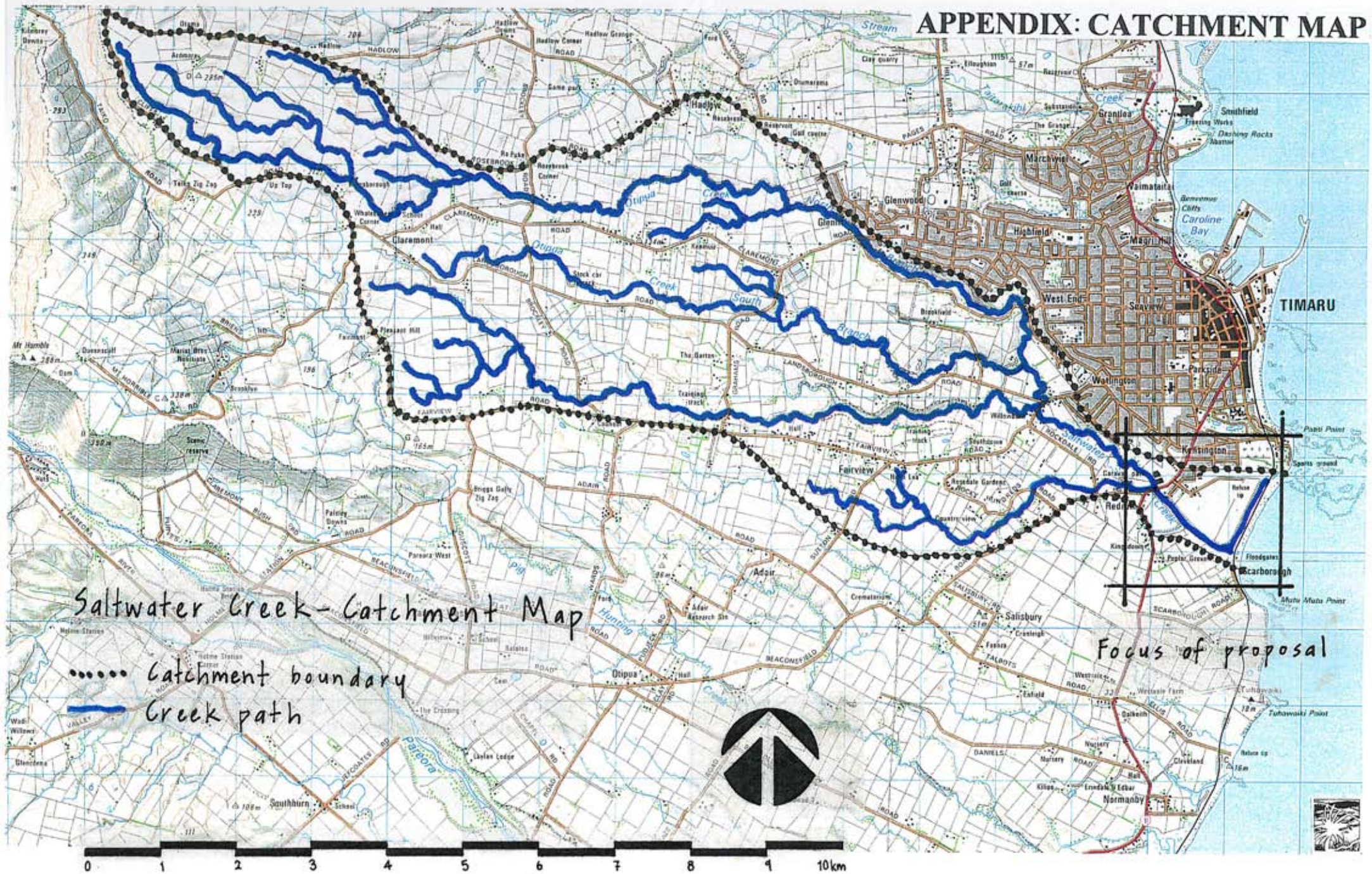
OTHER NAMES FOR PLANTS LISTED:

harakeke, flax	<i>Phormium tenax</i>
kahikatea	<i>Dacrycarpus dacrydioides</i>
karamu	<i>Coprosma robusta</i>
kohuhu	<i>Pittosporum tenuifolium</i>
kowhai	<i>Sophora microphylla</i>
mahoe	<i>Melicytus ramiflorus</i>
marsh ribbonwood	<i>Plagianthus divaricatus</i>
matai	<i>Prumnopitys taxifolia</i>
mikimiki	<i>Coprosma propinqua</i>
ngaio	<i>Myoporum laetum</i>
oioi, jointed wire rush	<i>Leptocarpus similis</i>
pingao, gold sand sedge	<i>Desmoschoenus spiralis</i>
pukio, sedge	<i>Carex secta</i>
raupo	<i>Typha orientalis</i>
silver tussock	<i>Poa cita</i>
three-square	<i>Schoenoplectus pungens</i>
toe toe	<i>Cortaderia richardii</i>

tarata	<i>Pittosporum eugenioides</i>
ti kouka, cabbage tree	<i>Cordyline australis</i>
totara	<i>Podocarpus totara</i>
wiwi, sea rush	<i>Juncus maritimus</i>
and the bird, kuaka, the godwit	



APPENDIX: CATCHMENT MAP



Development of this proposal has been facilitated by a working party. This party is chaired by Mr Vern Brosnahan and facilitated by Mr Bruce McCully, reporting to the Southern Area Committee of the Canterbury Regional Council.

Members of the working party represent the Canterbury Regional Council, Timaru District Council, Central South Island Fish and Game Council, Arowhenua Runaka, Timaru Rowing Club, Southend Ratepayers, Department of Conservation, Forest and Bird, Marine Watch Trust, Schools, Federated Farmers and the National Council of Women.

The proposal has been prepared by Lucas Associates' team of

Di Lucas, Warwick Moffat, and Ines Stager (landscape architects); Ian Lynn (geomorphologist), Colin Meurk (botanist), Peter Kent (architect) and Grant Banbury (curator), and Bob Hall (civil and environmental engineering consultant).



Lucas Associates, landscape planners, 351 Manchester Street, Christchurch (ph/fax 03 3650 789)

February 1997

The Canterbury Regional Council is facilitating a community working party process to complete the Otipua Wetlands project at Saltwater Creek, Timaru. It recognises the biological significance of wetlands in Canterbury and the need to actively promote their restoration.

The Timaru District Council is also actively involved, and playing a strongly supportive role in the project. It is also involved with a coastal study and management of the Redruth landfill immediately adjacent to the wetland area.

Both Councils are required to contribute towards maintaining and protecting biodiversity as a consequence of international charters the government is signatory to.