FINAL REPORT

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EXECUTIVE SUMMARY

Ocean Beach Domain is an important coastal reserve for Dunedin and within the wider coastal context of the city. Its importance encompasses a wide variety of uses including community, recreational, scenic and conservation. With the broad variety of uses and the historical modification to the reserve the condition and types of vegetation zones reflect those uses and historical change.

The vegetation within the reserve can be divided into five distinct types;

1. Low coastal shrub and low forest areas dominated by taupata.

2. Mixed exotic grassland with a few isolated shrubs and smaller trees.

3. Marram grass dominated fore and rear dunes that are interspersed with occasional taupata trees, lupin, and peripheral exotic grasses.

4. Headland salt field with glasswort and the New Zealand ice-plant along with some shore celery.

5. Sportsfield turf amenity turf areas

The fore dune areas have the poorest vegetation cover, with the western portion of the dune being denuded through erosion events more significantly than the fore dune area east of St Kilda, where the vegetation has retreated higher up the fore dune face.

There was a high proportion of weed species present in all areas of the reserve that require consistent control over the short to medium term. Most weed control measures are required in the low coastal forest and mixed exotic grassland areas.

Native and naturalised species of birds are present in small numbers, and their numbers correlate with the lack of suitable habitat for feeding and nesting. Sea lions are also regular visitors to the beach and this draws attention to the management of dogs and human visitors to the area.

Pest animal observations were low, and supplied catch data samples small. However, rabbit populations will vary from season to season and ongoing monitoring and control needs to continue. Activities on the reserve such as food sales, rubbish collection and litter control have direct effects on the presence of rats, mice and cats. It is likely that mustelid species may utilise the reserve while rabbits and vermin are present on the site or remain at uncontrolled levels.

CONTENTS

1.0 METHODOLOGY

The purpose of this report is to provide ecological information on the vegetation and wildlife values present on the Ocean Beach Domain Reserve. In undertaking this assessment the reserve has been divided into 9 zones for inspection.

Figure 1 Vegetation inspection areas.

The methodology of assessment for each of the 9 zones was as follows;

- A walkover assessment and identification of each area for plant, animal and invertebrate descriptions and observations.
- Digital photographic records of vegetation zones and communities of ecological interest.
- Assessment and analysis of recent aerial photography of vegetation zones and communities of ecological interest.
- Photographic assessment
- Use of GPS waypoint and mapping methodology to accurately record vegetation zones and communities of ecological interest.
- A comprehensive review and compilation of all ecological media relevant to the reserve.
- Liaison with the Department of Conservation and other relevant agencies for information and data that may be held on vegetation zones, communities and wildlife observations from recent years.
- A comprehensive report compiling field work assessment with known literature and other field data.

2.0 VEGETATION ASSESSMENT ZONES

The inspection found five distinct vegetation types within the reserve.

- Low coastal forest areas dominated by taupata and occasional ngaio. Ground cover is mixture of exotic grass, muehlenbeckia, lupin and invasive weeds such as periwinkle, montbretia and blackberry.

- Mixed exotic grassland with isolated shrubs and smaller trees. This zone type has a broad range of the most common coastal exotics and weed species. Typically these areas form the vegetation cover for peripheral banks on the reserve.

- Marram grass dominated fore and rear dunes that are interspersed with occasional taupata trees, lupin, and peripheral grasses.

- Headland salt field with glasswort and the New Zealand ice-plant and shore celery. Marram grass, lupin and *Senecio elegans* are also present in this area.

- Sportsfield turf amenity turf areas

Taupata (*Coprosma repens*) is the most common coastal tree species and dominates the areas of low coastal forest that are present on the reserve. It can also be found in sporadic areas of the fore and rear dune areas. Marram grass (*Ammophila arenaria*) is found throughout the reserve and has been able to colonise suitable areas by seed or vegetative reproduction and dispersal (Pope. 2005).

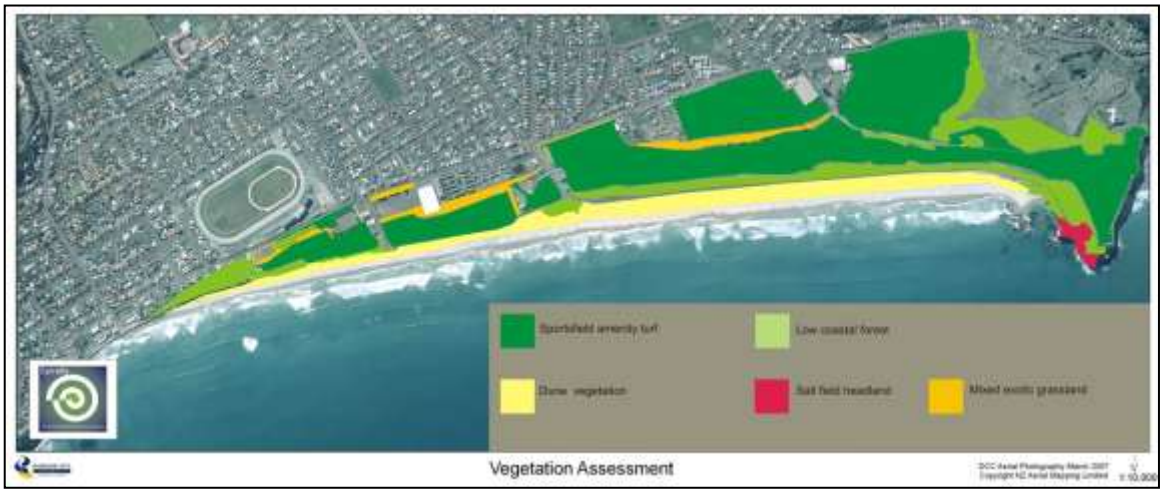

Figure 2 – Aerial photograph of the differing vegetation zones of Ocean Beach Domain

2.1 ZONE ONE

At its western end of the reserve a triangular shaped portion of low coastal forest runs behind the houses on Victoria Road and the walking track to St Clair. The Mahi Ora building is flanked by similar vegetation cover and exotic ice-plant. Along the track to St Clair are several mature Chatham Island akeake that were planted in the 1920's (ODB Minutes, 1931). There are a number of macrocarpa and pine along with gorse and broom within the area. The groundcover is rough exotic grasses, mallow, lupin, muehlenbeckia, blackberry, periwinkle and Marram grass. The Barnes Lookout has been planted with cabbage trees, flax, toetoe, hebe species and pikao. There are also a few self seeded karo in this area.

On the northern sides of the sportsfields running down a sloping bank to Victoria Rd are more areas of rough exotic grass mixed with taupata trees. This bank extends around to the bowling club on Moana Rua Rd. The area is weedy with lupin, mallow, stinking iris, broom and periwinkle present. The area adjacent to the tennis courts on Victoria Road has a heavy growth of exotic ice-plant surrounding the outer fence. The former stables site has been replanted in native species. Several Tamarisk trees grow in the amenity grass areas alongside Victoria Road.

Figure 3 Panoramic view from Barnes Lookout over the low coastal forest on the western end of Ocean Beach Domain

Summary

Strong tree growth has created good former rear dune cover. The open areas of rank grass are viable open space for weed establishment and need to be controlled and planted. The area provides valuable wildlife habitat as cover and feeding opportunities for birds.

Assessment Type

Mixed low coastal forest – taupata dominant

Management Recommendations

Weed species such as stinking iris, periwinkle, blackberry, broom and gorse should be removed from this area by suitable manual or chemical methods.

Further planting of endemic native species in these areas would improve this area and reduce the capacity for further weed infestation.

An investigation into the safety and structural soundness of the pine and macrocarpa should be undertaken.

2.2 ZONE TWO

Zone two is predominantly an area of sportsfield that runs west from the railway at Moana Rua Road to above the playground and biking area on John Wilson Drive. An embankment runs along the southern side for almost the complete length of the sportsfields to the playground. A group of mature pine stand adjacent to Victoria Rd. A second group of pines intermixed with taupata run from adjacent to Moana Rua Road to behind the ice rink facility's car-park. This area has considerable litter and showed signs of vegetation dumping. The embankment and railway line was a mixture of long grass, wild turnip, mallow and areas of heavy periwinkle growing amongst the thick exotic grass on the bank. This was interspersed with sporadic mature taupata.

Figure 4 Railway embankment of Zone Two.

Summary

Predominantly a sportsfield turf area with banks of heavy mixed exotic grass and exotic trees along the northern periphery.

Assessment Type
Mixed exotic grassland with a few isolated shrubs

Management Recommendations

Weed species such as stinking iris, periwinkle, blackberry, broom and gorse should be removed from this area by suitable manual or chemical methods.

Further planting of endemic native species would enhance this area and reduce the capacity for further infestation.

2.3 ZONE THREE

This zone includes the sportsfields at Hancock Park with peripheral plantings of Chatham Island akeake, flax and *Senecio greyii*. The mixed coastal forest runs in a long strip parallel with the golf fairway up to the top of the John Wilson Drive road embankment. It continues running below John Wilson Drive on the northern side to the headland. It is a mixture of tree species such as taupata, macrocarpa, tamarisk, elder, pine, ngaio, cabbage tree, and sycamore. The ground and lower canopy is a mixture of thick grasses, thistles, marram, lupin, mallow and exotic ice plant. Convolvulus, muehlenbeckia and old mans beard has gained canopy coverage in a number of areas of the zone. There was a number of "garden escapes" or the result of vegetation dumping such as geranium, and echium present. Parts of the top of the embankment on the John Wilson Drive side has a heavy bank of marram grass caused by moving sand to the northern side of the road being colonised. Exotic ice plant, lupin and Marram grass dominates at the western end of the zone.

Figure 5 The northern embankment of John Wilson Dive and part of Zone Three.

Summary

This zone is a floristically mixed area of low cover with some larger exotics on a relatively steep site. The area provides valuable wildlife habitat as cover and feeding opportunities for birds and invertebrates.

Assessment Type

Mixed low coastal forest – taupata dominant

Management Recommendations

Weed species such as old mans beard periwinkle, blackberry, broom and gorse should be removed from this area by suitable manual or chemical methods.

Further planting of endemic native species would enhance this area and reduce the capacity for further infestation.

An investigation into the safety and structural soundness of the pine and macrocarpa in this zone would be useful.

2.4 ZONE FOUR

On the southern side of Tahuna Park lies a small remnant dune that runs almost the length of the park and rises approximately 2-3 metres before sloping away to the golf course fairway. The vegetation coverage is a mixture of rough exotic grass, mallow, lupin taupata, mature & semi mature pines, gorse, broom, and ngaio.

Figure 6 The vegetation coverage of a remnant dune on the southern side of Tahuna Park.

Summary

The zone is a modified remnant dune structure with heavy exotic grass cover and some woody species including weeds.

Assessment Type

Mixed exotic grassland with a few isolated shrubs and trees.

Management Recommendations

Weed species such as periwinkle, blackberry, broom and gorse should be removed from this area by suitable manual or chemical methods.

Further planting of endemic native species would enhance this area and reduce the capacity for further infestation.

An investigation into the safety and arboriculture soundness of the pine and macrocarpa with a view to eventual replacement would be useful for further management.

2.5 ZONE FIVE

This area is predominantly low coastal forest that runs adjacent to the main walking track through the golf course and flanks the number one and number two fairways and the lowest cemetery vehicle entrance on Tahuna Road. The zone exhibits the same ground and tree cover typical of the reserve. There is heavy muehlenbeckia coverage on the western portion of the area adjacent to the cemetery that has overrun many of the trees in this area. Thick exotic grass flanking the tree and low coastal forest areas is heavily covered with exotic ice-plant and some harakeke. Macrocarpa and pine make up the other major tree species in the area.

Figure 7 Low coastal taupata forest with heavy muehlenbeckia coverage.

Summary
This zone is a sizeable section of coastal taupata forest with other larger exotic trees that have heavy vine growth suppressing the canopy.

Assessment Type
Mixed low coastal forest – taupata dominant

Management Recommendations
Weed species such as old mans beard periwinkle, blackberry, broom and gorse should be removed from this area by suitable manual or chemical methods.

Selected Muehlenbeckia clearing would open the canopy, but this should be done with caution as this plant provides feeding opportunities for birds and invertebrates.

Further planting of endemic native species would enhance this area and reduce the capacity for further infestation.

2.6 ZONE SIX

This zone is immediately adjacent to the Leonard Wright Memorial at Lawyers Head and extends along the slope to the eastern side of the road. It is the same in composition to the coastal shrubland/forest described in other zones. *Angelica pachycarpa* has become well established within the cover of the taller trees and is likely to be a garden escape or from vegetation dumping in the area.

Figure 8 *Angelica pachycarpa* growing within a break in the coastal forest canopy – Zone Six

Summary

This zone is a similar section of low coastal taupata forest seen previously in other areas of the reserve. The vegetation provides shelter and buffers the site from wind.

Assessment Type

Mixed low coastal forest – taupata dominant

Management Recommendations

The removal of weed species such as angelica is highly desirable in this area.

Further planting of endemic native species would enhance this area and reduce the capacity for further infestation.
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2.7 ZONE SEVEN

The headland area includes the small salt field assemblage adjacent to the vehicle turn around at the end of John Wilson Drive. The salt field species extend down the steep cliffs. The summit and parts of the upper slopes of Lawyers Head carry low turf vegetation of buck's horn plantain (*Plantago coronopus*), glasswort (*Sarcocornia quinqueflora*) and native & exotic ice plant, with a few patches of shore celery. Adjacent to the salt field is an area of thick exotic grasses and lupin.

Figure 9 Lawyers Head salt field species.

Summary

Zone seven is a small but interesting assemblage of plants on a very testing site that needs greater protection from pedestrians and invasive weeds.

Assessment Type

Headland salt field

Management Recommendations

The salt-field plants are very hardy, but will become damaged by foot traffic without appropriate pedestrian footpaths or barriers.

Further planting of endemic native species would enhance this area and reduce the capacity for further infestation.

Site safety should be reviewed in this area.

2.8 ZONE EIGHT (EASTERN ZONE)

Zone eight is a marram grass dominated fore-dune running from the rocky cliffs at the end of John Wilson Drive to the St Kilda Surf Club. The construction of John Wilson Drive has created a steep embankment running from the road edge immediately behind the fore dune. The area shows the development of a smaller incipient dune. The fore dune is dominated by marram though this is patchy in places and the density and spread of vegetation has been influenced by the heavy seas and erosion events in recent years. The marram grass has been pushed up the dune face by the eroding scarp face of the fore dune. Behind the fore dune crest the marram grass becomes more moribund as the density increases and there is a mixture of lupin, mallow, exotic grass and harakeke. Sporadic taupata shrubs grow throughout the area behind the fore dune crest up to the road. A solitary pine was found in the rear dune area. Angelica is found at the far eastern end and has become well established. Isolated pikao plants have flourished on the steep dune face at the eastern area where public access was once available, but are being inundated with marram grass. Around the public entrances at St Kilda there is some pikao and exotic ice-plant. Foot traffic at the St Kilda entrances has reduced a large swathe of vegetation along the fore-dune face and this has created a significant area of loose sand.

Figure 10 John Wilson Drive embankment showing the rear dune vegetation and embankment.

Summary
The density of the Marram grass along the fore dune face has been affected by the erosion of sand, though there is some sign of incipient dune development. The marram grass has moved up the slope towards the dune crest where it grows strongly aided by moving sand. The rear area behind the dune crest has a very dense cover of Marram grass and other exotic coastal species.

Assessment Type
Marram grass dominated fore and rear dunes

Management Recommendations
Weed species such as periwinkle, angelica and pine should be removed from this area by suitable manual or chemical methods.

Further planting of endemic native species would enhance this area and reduce the capacity for further infestation.

Appropriate tracks, barriers would reduce damage to the dunes caused by human traffic

The pipeline construction area including the roadway access will need reinstatement and planting to ensure a well vegetated continuation of the existing fore-dune.

2.9 ZONE NINE (WESTERN ZONE)

The area begins at the high-point of the dune adjacent to the lifesaving vehicle entrance to the beach and continues to the sea wall at St Clair. There is a high dune that slopes down to the car-park behind the playground. This area has strong cover of taupata and ngaio along with exotic ice-plant, lupin, marram grass and mallow. Moving west along the car park boundary there has been harakeke and pikao planted. Along the crest to Moana Rua Road is ostensibly exotic grasses, senecio, lupin and mallow. On inspection the fore dune has a steep face and was between 5-10 metres high. From the surf club to Moana Rua Rd the vegetation was predominantly sparse clumps of marram interspersed with lupin and *Senecio elegans*. Sporadic mallow and taupata have hung onto the steep eroded face. There was no vegetation present in areas of the fore dune where there was a visible stratum of fill or where sand re-nourishment had been undertaken using dredge sand.

From Moana Rua Road the pattern of the fore dune is similar, the vegetation is sporadic and there are large patches of open sand. The top of the dunes have extensive marram grass and other exotic grass cover. The modified back-slope adjacent to the sportsfields is substantially vegetated in planted ngaio, Tasmanian ngaio, pohutukawa, toetoe, and harakeke.

Summary

The pattern of fore-dune vegetation has been heavily influenced by the fill deposited in this area. Subsequent collapses and re-nourishment has reduced the sand holding marram grass along most of this area. The crest and the back slopes have good cover of shrub and forest species, but the fore-dune is in poor condition over most of its length.

Assessment Type

Marram grass dominated fore dune with narrow rear dune tree assemblage.

Management Recommendations

In the fore dune there is no weed control operations required at this stage.

Future re-nourishing operations should be accompanied with planting of sand binding species to reduce the movement of sand and create a suitable dune buffer.

Development of suitable pedestrian access points is required to reduce further damage to the remaining vegetation.

Figure 11 Zone Nine fore dune vegetation has been heavily affected by the erosion and instability of fill placed historically in this area.

2.10 DISCUSSION OF VEGETATION INSPECTION

The vegetation patterns within Ocean beach Domain fall into five areas;

The inspection found five distinct vegetation types within the reserve.

- Low coastal forest areas dominated by taupata and occasional ngaio. Ground cover is mixture of exotic grass, muehlenbeckia, lupin and invasive weeds such as periwinkle, montbretia and blackberry.

- Mixed exotic grassland with isolated shrubs and smaller trees. This zone type has a broad range of the most common coastal exotics and weed species. Typically these areas form the vegetation cover for peripheral banks on the reserve.

- Marram grass dominated fore and rear dunes that are interspersed with occasional taupata trees, lupin, and peripheral grasses.

- Headland salt field with glasswort and the New Zealand ice-plant and shore celery. Marram grass, lupin and *Senecio elegans* are also present in this area.

- Sportsfield turf amenity turf areas

In terms of the condition of the vegetation inspected on the reserve, the fore dune area of Zone Nine is in particularly poor condition. The erosion, fill, and re-nourishment works have taken their toll on the viability of any vegetation growing in this area. The fore dune face of Zone Nine is in need of a physical and vegetative restoration programme to assist the protection of the remaining dunes and the building of new active dunes in the future.

The condition of the vegetation of the fore dune area of Zone Eight is slightly better with quite healthy growth and density of the marram grass on site, despite retreating to the higher areas of the dune face. Zone Eight differs physically from Zone Nine because it has an attached rear dune formation that is thickly covered with marram grass and other exotic coastal species. Whereas, in Zone Nine the fore dune abuts sportsfields, carparking, roads and wide clay cap covering the dune crest.

In the taupata dominated low coastal forest areas the general condition of the cover is good. However, there is a need for more consistent and localised weed and litter control. The dominance of a naturalised tree species like taupata has created a new type of plant assemblage in these areas that is not consistent with the historical vegetation cover of this area. Its importance to the reserve in the absence of any endemic alternatives can not be underestimated.

The mixed exotic grassland areas are weedy areas that require greater levels of control. Ideally these types of zones should be replanted to increase the amount of rear dune buffer available in the reserve. In terms of their condition these areas could be described as fair, since the weediness of the sites negates the positive features of the grass cover.

The headland salt field is a small but unique assemblage. The flat area portion of the salt field has been rather artificially created by the levelling of the area adjacent to the vehicle turnaround. The decrease in the number of people on this site has had a positive effect on the vegetation. However, adjacent areas of lupin and marram grass will require control to avoid suppressing the salt field species.

3 DESCRIPTION OF WILDLIFE VALUES

Several birds were seen or heard while in the taupata dominated areas of the reserve or in more sheltered parts of the sportsfields. Common introduced species such as thrush (*Turdus philomelos*), sparrow (*Passer domesticus*) and blackbird (*Turdus merula*) were observed. A pair (possibly nesting) of variable oyster catchers (*Haemotopus ostralegus*) was observed in the small debris field adjacent to the closed public access near the Lawyers Head car-park. The pair utilised the small accreting area of sand built up by wood and kelp. These debris areas appeared very rare along the length of the beach and limit the breeding opportunities for this species. Red billed (*Larus novaehollandiae*) and black backed gulls (*Larus dominicanus*) were also observed.

A female sea lion (*Phocarctos hookeri)* was observed on the beach not far from the present pipeline position. The endemic New Zealand sea lion is one of the world's rarest pinnipeds, and has a highly localized distribution. Most of the population is found in the Auckland Islands although some animals disperse as far as the New Zealand mainland including the Otago coastline and the Peninsula (Childerhouse & Gales, 1998). The New Zealand sea lion is classified as “vulnerable” by the IUCN (Reijnders et al. 1993) and “threatened” owing to range restriction under the New Zealand Marine Mammals Protection Act 1978 and the New Zealand Threat Classification Status (Hitchmough 2002).

Sea lions are not infrequent visitors to the coastal environment of Ocean Beach Domain. During the 2007 re-nourishment activities a female sea lion (tag number 3777) used the low taupata cover at the beach. Sea lions visiting Ocean Beach are likely to continue as populations on the Otago Peninsula continue to grow (Wright, 1998). However, hauling out space is limited on the narrow beach with its steep fore dune face (Jim Fyfe, pers comm).

There were no lizards observed on the reserve. There is potential habitat for common species of skink or gecko in the western end of the reserve and possibly

some of the sheltered areas of the golf course. However, without observations it is speculation as to whether there are any on the reserve.

Where there is human activity there is a likelihood of rats and mice. Litter, food premises, sporting clubs and neighbouring houses will influence the presence or absence of such species in the immediate vicinity of the reserve (Atkinson, 1972). Research has shown that mice (*Mus musculus*) have a negative effect on invertebrate populations in dune areas around Otago (Miller & Webb, 2000, Ruscoe, 2001). Rats (*Rattus rattus & Rattus norvegicus*) also utilise the urban environment and the opportunities for food and shelter that it provides (Atkinson, 1972). They too have an impact on bird and invertebrate populations if left uncontrolled (Innes, 2001). A sighting of a domestic cat in John Wilson Drive during the site inspections suggests that rubbish bins and litter may offer opportunities for food scraps in the area.

Rabbit (*Oryctolagus cuniculus*) observations (faeces, burrows or animals) were low for the period observed. Data received from the Cemetery Unit for Dec 9th, 2007 - Sept 30th 2008 showed that 26 rabbits and two possums (*Trichosurus vulpecula*) were shot. It is difficult to extrapolate any trend from such a small data sample. However, coastal regions in Otago are very prone to population changes of rabbits that have a severe effect on vegetation. In the early 1990's the rabbit population was high enough for the use of the illegally introduced RCD (Paul Pope, pers comm).

There is no information on predation rates of birds or invertebrates within the reserve by mustelid species. However, if the population of rabbits or vermin remains high it is entirely possible that predatory mustelids take advantage of the available food source in the area. Stoats (*Mustela erminea*) and ferrets (*Mustela furo*) are opportunistic animals that will make swift changes to their diet during changes in prey availability (Clapperton 2001; King et al, 2001). The predator/prey paradigm in relation to animal abundance needs to be considered while planning future animal control operations.

Summary

Ocean Beach Domain has been highly modified over the last 100 years and these changes have altered the available habitat to endemic native birds and pinipeds. As sea lion populations increase around the Otago Peninsula visits by sea lions will continue to occur from time to time on the beach and possibly in accessible rear dune sites (habitat permitting). Bird populations are generally of common species. The control of rabbit populations should be undertaken with a view to understanding predator prey relationships of associated predatory species.

Management Recommendations

Rabbit & possum control operations throughout the reserve should be continued using suitable methods (night shooting, poisoning, or burrow poisoning) for public open space.

Continued and regular monitoring of the rabbit population using night counts and faecal pellet counts should be utilised to measure species abundance.

A trial monitoring and trapping programme for mustelids would give a broader understanding of the reserve and assist in protection of wider biodiversity assets.

Regular monitoring and enforcement of rubbish disposal by neighbours and occupiers of the reserve should be undertaken to reduce opportunities for vermin.

Consideration might be given to removing opportunities (such as overfull rubbish bins and littering) from the reserve to reduce food scavenging by cats.

Regular liaison with Department of Conservation staff over sea lion activities would assist in providing management guidelines for the reserve.

4 CONCLUSIONS

Ocean Beach Domain is a highly modified coastal environment whose ecology reflects the level of modification that has occurred on the reserve. The fore dune is almost entirely exotic marram grass or other exotic species. Its distribution and density have been heavily influenced by the physical movement of the various types of fill and the strong storms affecting the fore dune area (particularly in the western zone).

In the eastern half of the beach the marram grass has retreated up the eroding dune face. On the western side the vegetation is severely depleted due to a higher degree of fill material (therefore slope instability) along a greater length of the beach. The two areas of beach contrast physically and vegetatively because the eastern end has a rear dune establishment flanked by the sloping road embankment. There is also more evidence of incipient dune formation at the eastern end of the beach and such formations will also influence the patterns of vegetation seen in the area.

Ocean Beach Domain has no rear dune plant assemblages in the traditional sense of sequential vegetation inhabiting suitable space in the dune profile. The degree of modification and stabilisation of the previous active dunes has left pockets of land with specific floristic characteristics. These are quite isolated from their natural position in a sequential profile, and utilise a mixture of exotics and native species.

The modification to the vegetation and changes in the broader environment influence the type and abundance of wildlife in the reserve. The high sportsfield and amenity turf use means very little habitat for nesting or feeding birds. The generally narrow isolated fingers of low coastal forest provide the only suitable potential habitat in the area.

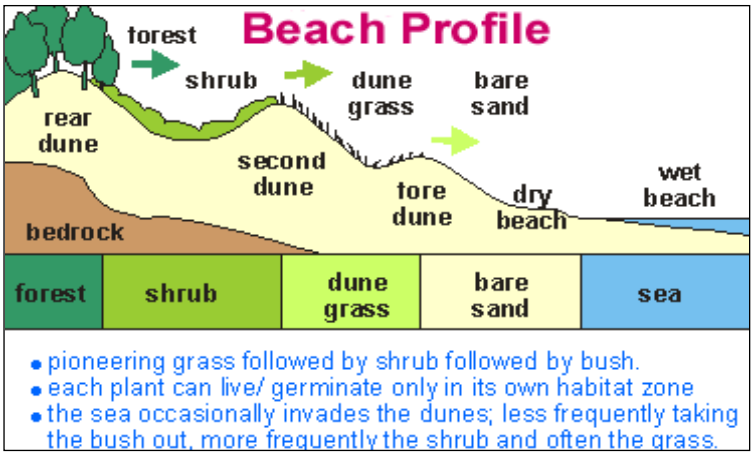

Figure 12 Schematic beach profile showing sequence of vegetation associated with unmodified dune sites

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6 APPENDICES

Appendix One

Species	Common name	Native/Exotic	Type of plant
Acaena pallida	sand bidibidi	N	herb
Achillea millefolium	yarrow	E	herb
Agrostis capillaris	browntop	E	grass
Agrostis stolonifera	creeping bent	E	grass
Ammophila arenaria	marram grass	E	grass
Angelica pachycarpa	angelica	E	herb
Apium prostratum	shore celery	N	herb
Brachyglottis greyi		N	shrub
Calystegia sylvatica	convolvulus	E	vine
Carpobrotus edulis	pig face	N	succulent herb
Chamaecytisus palmensi	tree lucerne	E	tree
Cirsium arvense	Californian thistle	E	herb
Cirsium vulgare	Scotch thistle	E	herb
Clematis vitalba	Old mans beard	E	vine
Coprosma kirkii		N	shrub
Coprosma repens	taupata	N	shrub
Corokia cotoneatser	corokia	N	shrub
Cortaderia richardii	toetoe	N	grass
Cotula dioica		N	herb
Crocosmia x *crocosmiiflora*	montbretia	E	herb
Cupressus macrocarpa	macrocarpa	E	tree
Dactylis glomerata	cocksfoot	E	grass
Desmoschoenus spiralis	pikao	N	sedge
Disphyma australe	ice plant	N	succulent scrambler
Echium pininana	echium	E	shrub
Griselinia littoralis	kapuka	N	tree
Hebe elliptica	shore hebe	N	shrub
Hypochaeris radicata	catsear	E	herb
Iris foetidissima	stinking iris	N	herb
Isolepis nodosa	club rush	N	rush
Lavatera arborea	tree mallow	E	shrub
Lupinus arboreus	tree lupin	E	shrub
Melicytus ramiflorus	mahoe	N	tree
Muehlenbeckia australis	muehlenbeckia	N	vine
Myoporum insulare	Tasmanian ngaio	E	tree
Myoprum laetum	ngaio	N	tree
Olearia nummularifolia var *cymbifolia*		N	shrub
Olearia traversii	Chatham Is akeake	N	tree
Pelargonium x *hortorum*	Common geranium	E	herb
Phormium cookianum	mountain flax	N	tussock herb
Phormium tenax	flax	N	tussock herb
Pinus radiata	radiata pine	E	tree
Pittosporum crassifolium	karo	N	tree
Pittosporum tenuifolium	kohuhu	N	tree
Plantago coronopus	buck's horn plantain	E	herb
Rubus fruticosus	blackberry	E	vine
Rumex obtusifolius	dock	E	herb
Sambucus nigra	elder	E	shrub
Sarcocornia quinqueflora	glasswort	N	succulent herb

Species	Common name	Native/Exotic	Type of plant
Sedum acre	stonecrop	E	Succulent scrambler
Senecio elegans	purple groundsel	E	herb
Senecio minimus	fireweed	E	herb
Solanum laciniatum	poroporo	N	shrub
Sonchus oleraceus	sow thistle	E	herb
Tamarix aphylla	tamarisk	E	tree
Tetragonia trigyna	shore spinach	N	herb
Ulex europaeus	gorse	E	shrub
Vinca major	periwinkle	E	vine