

THE BANKS PENINSULA CONSERVATION TRUST

and

LYTTELTON PORT COMPANY

MANAGEMENT PLAN

SEPTEMBER 2016



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DESCRIPTION

LOCATION

17 ha of LPC land straddles a saddle between Sumner Road, above Buckleys Bay, and the eastern edge of Lyttelton township, above College Road. The land is in the Port Hills Ecological District towards the eastern end of the Port Hills.

BACKGROUND

The Banks Peninsula Conservation Trust (BPCT) and Lyttelton Port Company (LPC) have undertaken a long term partnership to develop the land for community recreational use, ecological protection and enhancement of the indigenous flora and fauna. It is anticipated that the BPCT and LPC will work with the local community and interested volunteers to develop the site for community recreation and enjoyment.

As the land is highly modified and dominated by exotic vegetation the planting of indigenous plants will speed up the regeneration process. The Management Plan and Planting Plan are being developed simultaneously with the covenanting process so that community engagement with volunteer groups can begin in preparation for planting.

An existing well used track starts at the end of the 4WD track at the northern end of Urumau reserve and ascends to the rocky ridgeline of the saddle which then connects with the crater walkway not far from the top of Chalmers Track. Excellent views are obtained from the rocky ridgeline over Lyttelton town and harbour to the west, and over Buckleys Bay and harbour to the east. There is good public access and the land is a popular recreational destination and thoroughfare to other reserves. Therefore an open space covenant is considered very appropriate for this site.

ADJACENT LAND USE

The LPC land is bounded by the Sumner Rd in the east and private land on the western boundary. The land is bordered to the south by Christchurch City Council (CCC) Urumau Reserve and to the north by Department of Conservation Reserves (Tauhinu-Korokio and Buckleys Bay Scenic Reserves). The boundaries are only partly fenced but as there is no grazing on the neighbouring land there is little risk of stock incursions.

Urumau Reserve to the south is covered in woody weeds including extensive gorse, broom and boneseed. A pine plantation covers the ridge and hill slopes on the eastern side. There are several tracks through the pines leading onto the LPC land.

Native forest and shrubland is the dominant cover on the adjacent Department of Conservation reserves. The track from the ridgeline on the LPC land extends up the spurs in the Conservation land to connect with the Chalmers Track.

PHYSICAL DESCRIPTION

Steep east and west facing slopes on both sides of a rocky ridgeline characterise the LPC land. The shallow very well drained soils of the steep slopes and rocky ridges are derived from underlying volcanic rocks and contain loess and mixed volcanic and loess colluvium.

The loess soils are prone to erosion and under the block of eucalyptus and wattle on the Lyttelton side and the pine block on the eastern side there are many tunnel gullies and underrunners. Sediment from the gullies above the Sumner Road are a main cause of concern for the LPC on the eastern side.

The land steepens at the northern end into rock bluffs and rock outcrops along the ridge.

VEGETATION

The original vegetation cover on this land would have been dry woodland dominated by ngaio, akeake, golden akeake, kanuka, broadleaf, matagouri and other small-leaved shrubs. Initially bracken and silver tussock would have replaced the forest after Polynesian fires. After Europeans arrived with more burning, grazing and spreading of weeds and pests, native forests were reduced and fragmented, so that much of the land is now dominated by exotic grasses and woody weeds. The neighbouring DoC reserves to the north of the LPC land still retains much of the original native vegetation composition of mahoe, ngaio, kowhai, and coprosmas (*C crassifolia* and *C virescens*) with many shrubs and ferns in the understorey. There are also many native vines. Plants in this reserve provide an excellent seed source for both natural regeneration and restoration plantings.

The land on the eastern (Buckleys Bay) side of the saddle is steeper and shadier than the Lyttelton side. A block of pines above the Sumner Road dominates the lower slopes. The mid-slopes display some patches of native regeneration emerging through gorse and patches of bracken suppress the grass in many places (Fig.1). The upper slopes are mainly covered in exotic grasses with scattered gorse at the southern end. The northern end has vigorous regeneration of native trees, shrubs and vines emerging through the dominant broom cover.

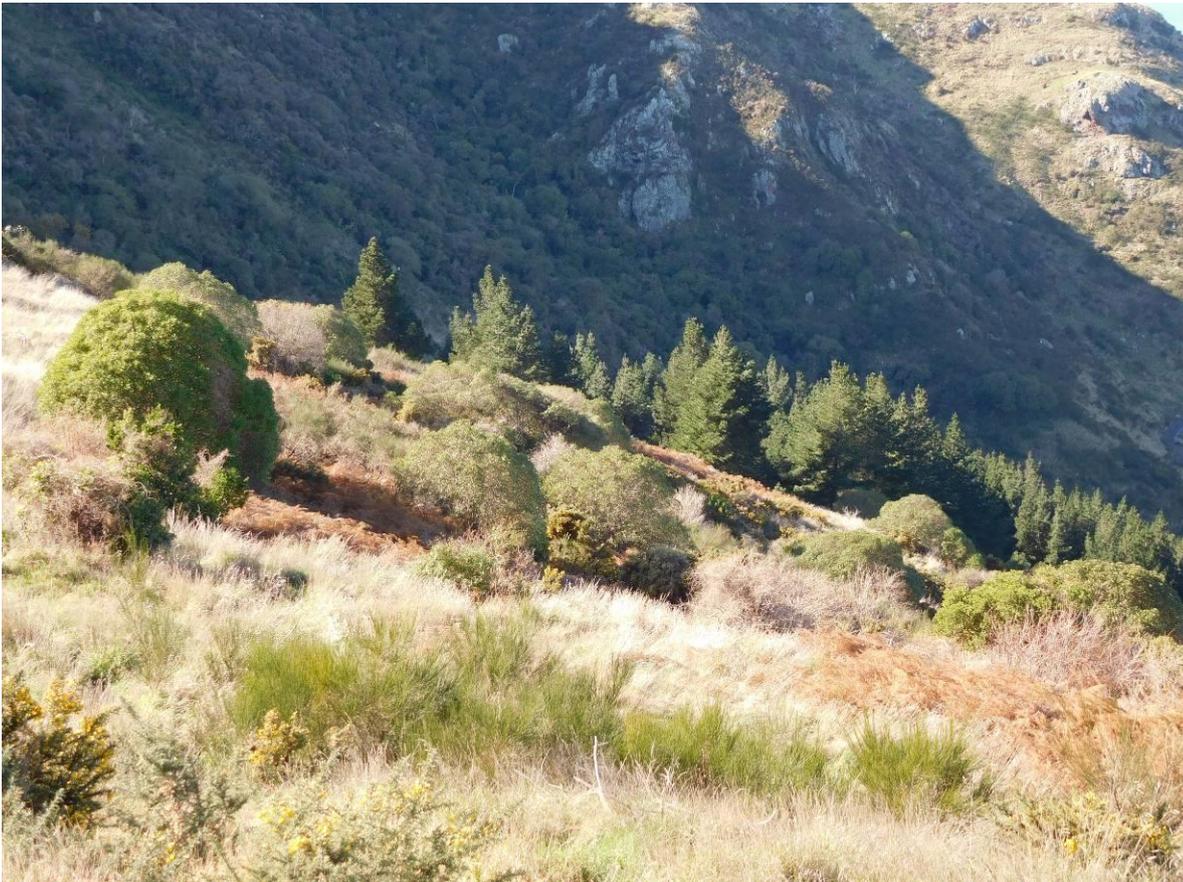


Fig. 1 Native regeneration is occurring through bracken on the eastern slopes. Note native forest on the adjacent Buckleys Bay Reserve. The block of pines is above the Sumner Road

On the western (Lyttelton) side the steep slopes are dominated by exotic rank grass (mainly cocksfoot) with scattered gorse and patches of broom. However, some indigenous plants have survived the rank grass competition. *Muehlenbeckia complexa* mounds and several matagouri are scattered in the grassland. *Muehlenbeckia* species are to be encouraged as they provide a valuable food source for lizards and native butterflies. Native regeneration is

mostly limited by tall pasture grasses but *Muehlenbeckia* species compete well with grass, smothering it and allowing for native regeneration to take place under its shade (Figs. 2,3,4).



Fig. 2 Mounds of *Muehlenbeckia complexa* below the rocky ridgeline lizard habitat



Fig.3 *Muehlenbeckia complexa* mounds below the ridge



Fig.4 Matagouri and scattered exotic broom on the grassy western slopes

A block of eucalypts and wattles on the lower slopes were planted in the 1980's along with a group of large macrocarpas at the northern end. Many natives (Coprosmas, akeake, mahoe) are naturally appearing under the eucalypt canopy. There are extensive patches of the native climbing spinach on the forest floor. Several native ferns have also established on the forest floor - they include *Asplenium appendiculatum*, *A. flabellifolium*, *A. oblongifolium* and *Polystichum oculatum*. These ferns are able to tolerate the dry conditions under the eucalypt canopy (Figs.5,6,7,8)

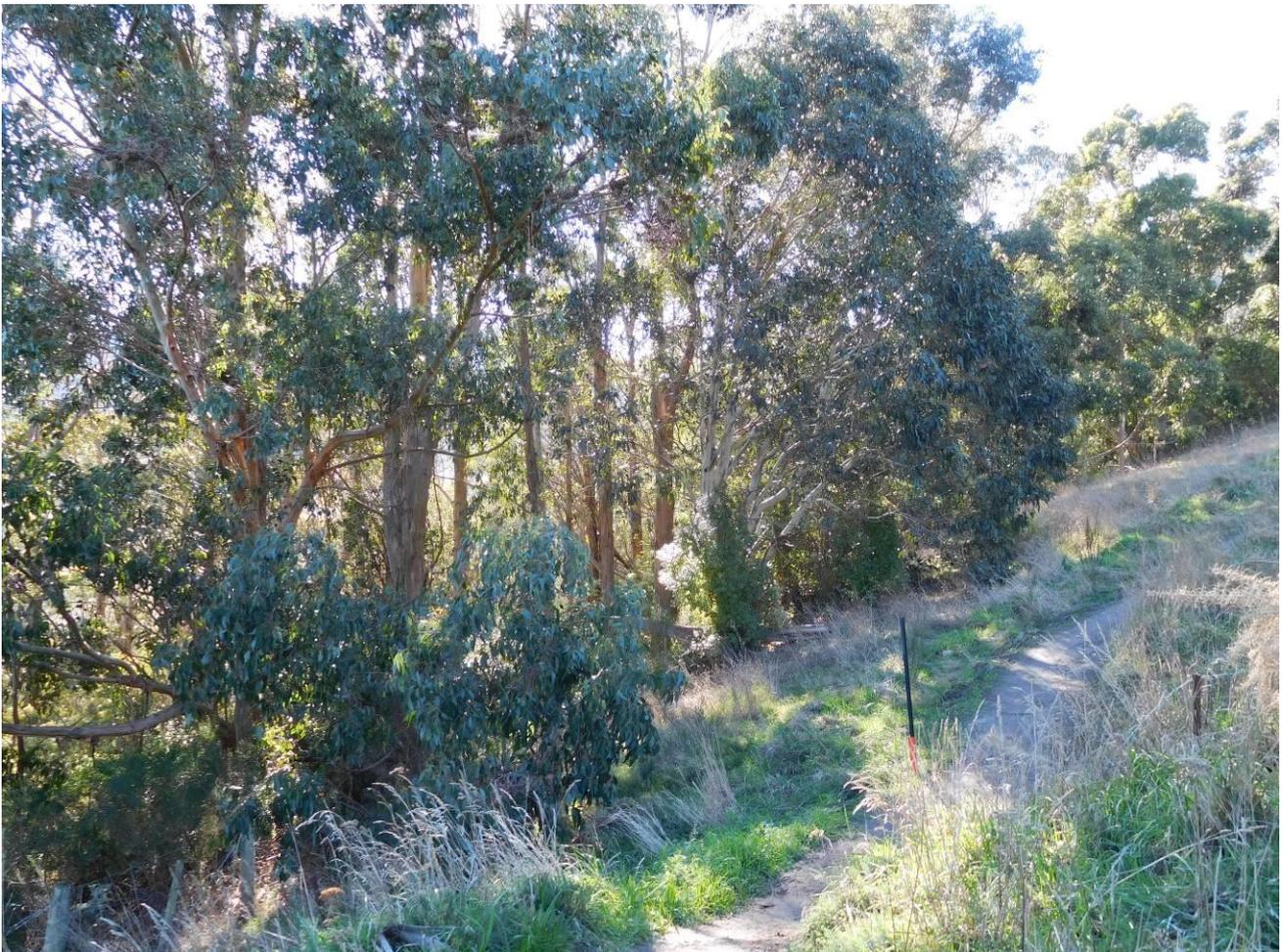


Fig.5 Eucalypt forest on the lower eastern slope



Fig.6 Native climbing spinach (*Tetragonia implexicoma*) **Fig.7** Necklace fern (*Asplenium flabellifolium*)



Fig.8 Shining spleenwort (*Asplenium oblongifolium*)

Towards the Tauhinu-Korokio Reserve the grassland merges into the forest clad reserve via rocky bluffs. Native trees, shrubs and vines present include kowhai, ngaio, cabbage trees, mahoe, *Coprosma crassifolia*, *C propinqua*, stinging nettle, *Clematis foetida*, native broom, and the shield fern *Polystichum oculatum* (Fig.9)

Dry stipa grasses occupy the dry rocky ridgeline with occasional gorse. Broom becomes more dense along the northern end of rocky ridgeline but several native shrubs and herbs have survived here amongst the exposed rocks. They include (prostrate kowhai, *Coprosma crassifolia*, native broom and the tiny flowered vine *Scandia geniculata*). Beneath the prostrate kowhai a scrambling herb *Chenopodium allanii* can be found. This herb has a threat status of 'At Risk - Naturally Uncommon'. The rocky outcrop on the saddle provides good habitat for lizards. *Coprosma* spp were planted amongst the rocks in 2015 to enhance the lizard habitat. *Coprosma* spp. provide food for lizards by supporting insects and providing fleshy fruits (Figs. 10-14).



Fig.9 Grassland merges in existing native forest of the Tauhinu-Korokio Reserve. Note flowering kowhai.

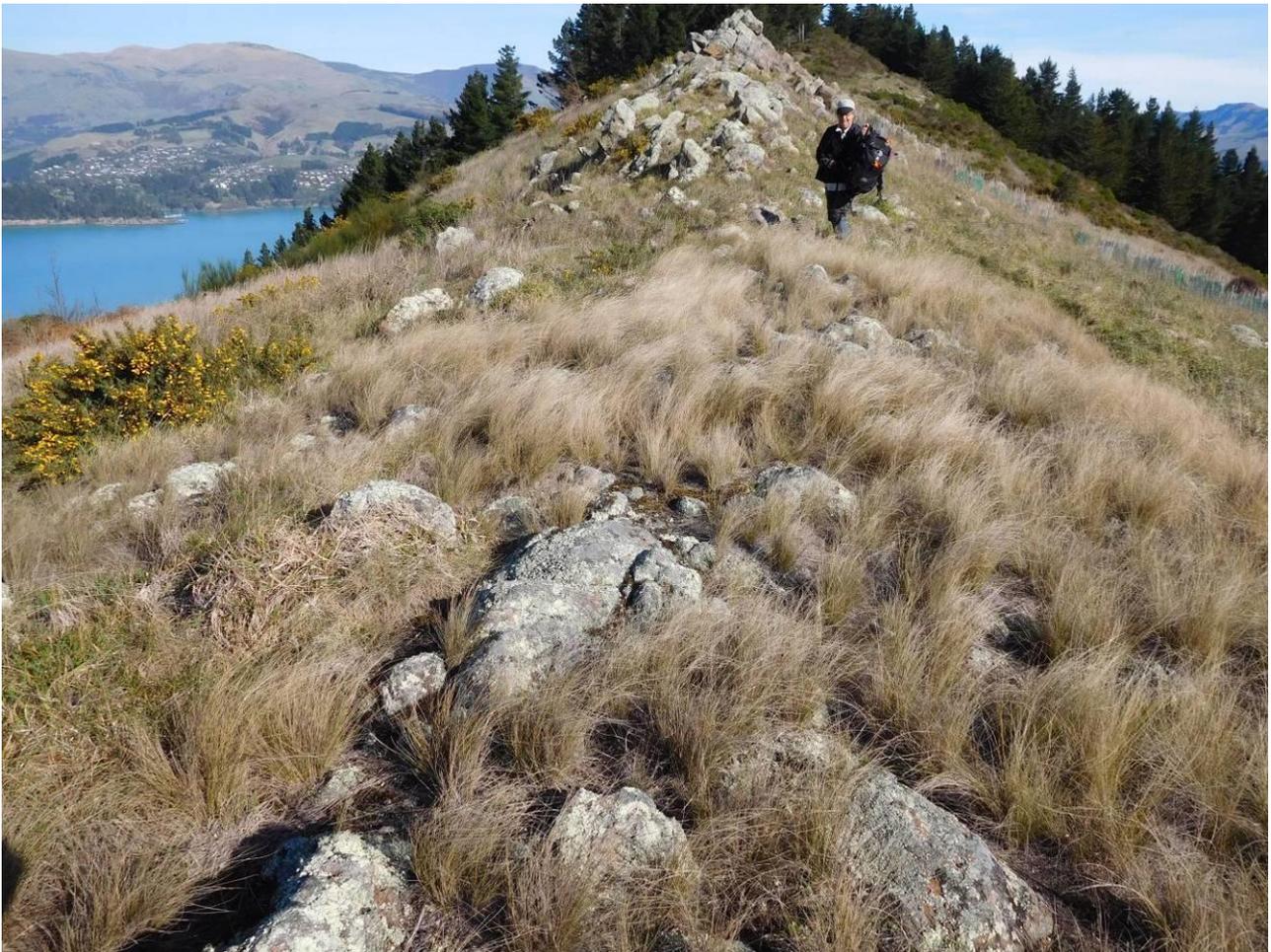


Fig.10 Stipa grassland along the rocky ridge with coprosma plantings to the right of the knoll



Fig.11 Prostrate kowhai



Fig.12 *Chenopodium allanii* under prostrate kowhai



Fig.13 *Coprosma crassifolia* on the main ridge



Fig.14 The small rock fern *Cheilanthes sieberi*

FAUNA

Lizards are present on the rocky knoll on the ridge and recent and future plantings will improve the habitat by providing shelter and food for lizards (Fig.10).

Bellbirds and fantails are common in the area

Animal pests possums and rats are no doubt present.

STRUCTURES AND DEVELOPMENTS / FENCING AND GRAZING

Although there are remnants of fences around the boundary of the LPC land, the only fence in reasonable condition is the fence along the lower boundary above Lyttelton. The LPC land and the adjoining reserves have not been grazed for some time.

There are no other structures on the land but it is intended to provide some seating at viewpoints in the future.

MANAGEMENT ISSUES

NATIVE FLORA AND FAUNA

Any indigenous plants in this area have national importance due to the wholesale loss of lowland biodiversity, especially lowland dryland biodiversity. There are several Nationally Uncommon species present on the LPC land including *Chenopodium allanii* (At Risk - Naturally Uncommon)(Fig.10) and *Coprosma virescens* (At Risk - Declining).

The history of the Port Hills reveals an almost complete loss of the original vegetation cover due to land development. The mosaic of low kowhai/kanuka forest, dry shrublands and grasslands that once covered the hills has almost entirely disappeared. The hill slopes would have supported vegetation communities of trees and shrublands with prostrate kowhai clinging to the rock outcrops. In spite of the highly modified surfaces and overwhelming dominance of exotic plants, a few tiny remnants remain in the form of a few species that are adapted to the very dry conditions. The clusters of native broom, matagouri, *Muehlenbeckia complexa* and bracken on the steep hill slopes are an indication of the forest and shrublands that would have once colonised the slopes. Similarly the prostrate kowhai, *Coprosma crassifolia* and native broom are remnants of the original flora adapted to the very dry exposed nature of the rocky ridges and outcrops.

When considering restoration opportunities on this land the highest priority should be given to protecting existing native communities. As any native vegetation on original landforms (rock outcrops and hill slopes) is rare in lowland Canterbury, the few clusters of native broom, matagouri, *Muehlenbeckia complexa*, prostrate kowhai and *Coprosma* spp. are valuable and worth protecting. These very small remnants provide an opportunity for restoration on an original landform.

Although the LPC land is dominated by exotic grassland and exotic trees, several remnants of native forest and shrubland remain and provide an opportunity for enhancement with restoration planting. The land on the west (Lyttelton) side of the saddle is mainly covered in rank exotic grasses and is likely to regenerate into native bush very slowly on its own. However a variety of native plants have survived years of modification (clearance of the original forest cover, grazing and the present dominance of exotic trees and grasses), with remnant forest /shrubland on the DoC boundary and prostrate kowhai / *Coprosma crassifolia* / native broom on the rocky ridgeline and the matagouri and *Muehlenbeckia complexa* in the grassland. In addition, self introduced native trees and ferns have established under the eucalypt canopy and native plantings carried out by volunteers in the 1980s in a shallow gully on the west facing slopes are now doing well. The large area of grassland on the west facing slopes provides an opportunity to enhance and restore the native ecosystems and to improve the habitat for birds, lizards and invertebrates. The mid slope zone will have good deep soils and be suitable for planting with appropriate native tree and shrub species. Planting in this zone will add to the walking experience and also provide good bird habitat and a connection between the town and regenerating gullies around Chalmers Track. Views from the tracks and the rocky ridgeline can be retained by planting shorter stature plants near the track and ridgeline.

The ridgeline and saddle is rocky with very thin soil and would naturally be covered in lower growing native plants such as prostrate kowhai, porcupine shrub, native broom, coprosmas and grasses. Planting here could improve the lizard habitat.

Native planting should be staged over several years as time and resources allow, starting at the southern end (Uruman Reserve end) and moving towards the northern end. Woody weeds need to be cleared first and several years controlling grass growth around the plantings will be required. It is very important to use locally sourced plants. The adjacent DoC reserve should be used as the seed source for all plantings. Details of suitable plants and where to plant are included in a separate Planting Plan.

The land on the eastern Buckleys Bay side of the saddle is steeper and shadier than the Lyttelton side, and the upper portion of the slope is mainly covered in exotic grasses with scattered gorse but there are some patches of native regeneration emerging through gorse on the midslopes. Towards the northern end mahoe, Coprosmas and ngaio overtop the broom in places. Patches of bracken suppress the grass in several places. Bracken is thought to be an indicator of earlier forest cover and given time and a seed source native forest species are likely to seed into it. This makes bracken a successional species and it should be encouraged. The eastern slopes are likely to continue to regenerate in natives given time and a nearby seed source. So planting is unnecessary here apart from restoration of the pine area after the pines have been felled.

PLANT AND ANIMAL PESTS

Woody weeds are generally limited in both number and extent so that it should be possible to control and manage them to limit their spread. Constant vigilance will be needed to control any new incursions.

Eastern slopes

Where there is native regeneration through broom and gorse as on the eastern slopes the broom and gorse can be used as a nurse crop allowing native regeneration to take place underneath. Extensive spraying of gorse and broom is detrimental to the regeneration process so the block of broom and patches of gorse on the eastern flank is best left to be overtopped by native species. However, broom and gorse should be kept clear of the rocky ridgeline.

Woody weeds on western slopes

As the western slopes are dominated by grass and suitable for planting, the scattered gorse, broom, karo and boneseed will need to be cut and poisoned before planting takes place. Gorse/broom/boneseed removal should start at the Uruman Reserve end and work north across the west-facing grass slopes (the Lyttelton side) cutting the gorse, broom and boneseed to ground level and pasting with glyphosate. After the grass face has been cleared of woody weeds the gorse and broom could be cleared from the ridge. When working around the native broom along the ridge, particular care should be taken to clearly distinguish the native broom from the exotic weedy broom, making sure that the native broom is not damaged (Fig.17). Likewise great care is needed removing the exotic broom around the prostrate kowhai and *Coprosma crassifolia* on the ridge. Near the main ridge there is a single boxthorn and several boneseed that should be removed by cutting and pasting (Figs. 15,16).



Fig.15 Boneseed surrounded by broom



Fig.16 Boxthorn



Fig.17 Native broom (yellow-green) compared to the exotic broom (dark green).

A large area of blackberry occupies a shallow gully at the northern end and another patch just above the College Rd houses. The larger patch of blackberry looks as if it has been sprayed in the past but there are still live stems. As there are some native trees emerging from the blackberry spraying is likely to be detrimental to the native plants. The best option is to cut the stems back to the crown and paste the crown with glyphosate. Similarly the smaller patch should also be removed.

Near the College Rd track access is an area of suckering corked elms. They are actively spreading out and need to be controlled before they become more dense and spread further. Cutting at the base and pasting with glyphosate may keep them under control but something stronger may be required as they are difficult to kill. Further advice should be obtained as to how to best manage these trees.

Eucalypt/wattle forest

The eucalypt/wattle forest was planted in the 1980's but it is not suitable for the loess slopes due to the many tunnel gullies and underrunners that have developed under the tree canopy. Removal of the eucalypt/wattle forest and planting with natives will help reduce erosion and improve the habitat for birds and native fauna. A staged approach is suggested rather than felling the whole forest at one time. Ideally the trees would be poisoned and left standing so that regeneration could take place underneath before they break down. However where people are likely to frequent the area this practice is not safe. Therefore, staged removal of the eucalypts is proposed. Firstly weedy species should be removed from under the canopy. Weeds that should be removed include boneseed, karo, Cotoneaster and any seedling or sapling wattles and eucalypts. Most of these are scattered but there are large areas of gorse which may be more problematic but still achievable. The invasive exotic fern

Polypodium vulgare is becoming established but numbers are such that they could be controlled by carefully pulling them out. Good identification skills are needed so as not to be confused with the native ferns that are establishing.

Staged felling of the eucalypts and wattles by 30m each year should be started at the southern end. Trees should be cut into short lengths so that the wood lies on the ground creating habitat for lizards and invertebrates. The logs will also rot more quickly in contact with the ground. Local people may also like to collect firewood from the felled trees. When felling trees care should be taken to avoid the naturally occurring native trees, shrubs and ground cover. Native plants that have naturally established under the canopy include ngaio, kohuhu, akeake, mahoe, lemonwood, 5 finger (Fig.18), red matipo (Fig.19), *Coprosma robusta* and *Coprosma virescens*. In addition there are extensive areas of the climbing native spinach covering the forest floor. Native ferns (*Asplenium oblongifolium*, *A appendiculatum*, *A flabellifolium* and *Polystichum oculatum*) have also naturally established on the forest floor. All these plants will be the basis of the emerging native forest to be supplemented by further staged plantings as the eucalypts and wattles are felled.



Fig.18 Five finger under the eucalyptus canopy



Fig.19 Red matipo under eucalyptus

The macrocarpas at the northern end of the eucalypts should be felled. However they are not a priority and could be retained for a few years to give some shelter for the plantings above.

At the western end of the eucalypt block, ivy has formed a dense mat on the forest floor. Ivy is detrimental to native regeneration as it smothers seedlings and can also extend up tree trunks. Adjacent landowners have spent considerable effort clearing the ivy. These actions are to be commended and encouraged. It is great to see the efforts of adjacent landowners looking after and contributing to the native restoration by keeping weeds under control and planting with locally sourced natives.

Pine plantation above the Sumner Road

The loess soils are prone to erosion and under the pine block on the eastern side there are many tunnel gullies and underrunners evident. Sediment from these gullies is a major cause of concern for the LPC as there is a considerable cost to controlling sediment contaminating the coal piles below the Sumner Road. Removal of the pine forest and restoring the land with native forest would lead to improved outcomes with reduction in sediment and enhancement of biodiversity values over the land. The Sumner Road will be closed for earthquake repairs until the end of 2017 so this presents an opportunity to fell the forest over the next year so that tree felling can be carried out while there is no traffic on the road. Rather than felling the whole block at one time a staged approach is suggested. It is proposed that LPC include it in their work programme for the next year to fell the trees along side the road (30m uphill from the bottom edge of the forest) and for 30m back from the northern end of the forest. When felling trees care should be taken to avoid any naturally occurring native trees that may have established on the forest margins. The northern end is close to existing native forest on Buckleys Bay Reserve which may increase the chances of native trees establishing naturally. Trees should be cut into short lengths so that the wood lies on the ground where it will rot more quickly, create habitat for lizards and invertebrates, and help reduce runoff. Logs should not be piled on top of each other as this could be dangerous when planting and weed control takes place. Staged native planting can be carried out when the sites become accessible after felling (Fig.20).



Fig.20 The pine plantation above the Sumner Road

Future weed control

Constant vigilance is required to keep weeds under control. Neighbouring reserves and Lyttelton residences contain several other weedy species including sycamore, wilding pine, ash, hawthorn, elderberry and spur valerian. However, the number and density of woody weeds on the eastern faces means that their control is manageable and well worth

the effort. Once cleared of weeds it should be reasonably easy to keep any further incursions under control. After planting, maintenance will be required around the plants for about 5 years or until the plants can spread out and compete with the grass. Once the plants shade out the grass less weeding is required. Hand weeding around the plants is recommended rather than spraying.

PUBLIC ACCESS AND USE

The Banks Peninsula Conservation Trust and Lyttelton Port Company have undertaken a long term partnership to develop the land for community recreational use, ecological protection and enhancement of the indigenous flora and fauna. It is anticipated that the BPCT and LPC will work with the local community and interested volunteers to develop the site for community recreation and enjoyment.

Good public access is provided to the 17ha site with an existing well graded track, marked with red topped standards, that starts at the end of the 4WD track at the northern end of Urumau reserve and travels on a moderate walking gradient to the rocky ridgeline of the saddle. The track continues along the ridgeline and connects with the crater walkway not far from the top of Chalmers Track. The well graded track gains height quickly and provides excellent views from the saddle ridgeline over Lyttelton town and harbour to the west, and over Buckleys Bay and harbour to the east.

There is direct access from the town via Foster and College Roads and via the Urumau Reserve. The eastern side can be accessed via the ridge or via tracks through the Urumau Reserve to the pine block above the Sumner Road.

There are intentions to improve public facilities by constructing seats at viewpoints. There will also be public involvement with planting, plant maintenance, weed and pest control.

RESEARCH / MONITORING / STUDY

Seven photopoints have been established to monitor growth in existing native areas and planted areas (Appendix 2). The photopoints should be re-photographed every 2 years to monitor changes.

Plantings should be recorded and monitored. Planting dates, weeding dates, and numbers of people are all useful information to have.

MANAGEMENT POLICIES

Management Issue	Policy	Recommendations	Action
Native Flora and Fauna	Protection and management of existing native remnants. Grassy western slopes to be planted in native trees and shrubs.	<p>The first priority is to maintain the best conditions for natural regeneration to take place particularly on the eastern slopes where regeneration of native trees through broom is apparent. Staged native plantings across the western slopes is planned (see planting plan). Planting only numbers that can be maintained (weeded, etc) for several years. Any planting is to be with eco-sourced species from the local area (preferably the adjacent DoC reserves).</p> <p>Photopoints have been established and should be repeated every 2 years.</p>	<p>Project coordinator should refer to the planting plan for species to plant, weed control etc. It is important to source all seed from the local area (preferably the adjacent DoC reserves).</p> <p>BPCT will visit covenant periodically to carry out ecological monitoring.</p> <p>BPCT will redo photopoints and monitor planting survival.</p> <p>BPCT will provide landowner with results from any ecological monitoring programme and inform them of any management actions needed.</p>
Plant and Animal Pests	<p>Control of unwanted plants and animals listed in the Canterbury Regional Pest Management Strategy (RPMS) (ECan 2005) are the responsibility of the landowner in terms of the covenant agreement (e.g. gorse, broom, rabbits).</p> <p>Control of pest plants and animals will be carried out in accordance with the requirements of the RPMS and the Biosecurity Act 1993.</p> <p>Control methods will be chosen to minimise any detrimental effects on native vegetation and wildlife.</p>	<p>Broom is the main cover. Use broom and gorse as a nurse crop allowing native regeneration to take place underneath. Spraying of gorse and broom is detrimental to the regeneration process. Gorse, broom and boneseed on the western grass slopes should be cut at ground level and pasted with glyphosate. Exotic grass should be sprayed in preparation for planting.</p> <p>Any animal pest control using baits or traps should bear in mind the high visitor numbers of walkers and dogs</p>	<p>Ongoing dialog with LPC, BPCT and volunteer groups.</p> <p>BPCT will provide information and advice to landowner on recommended control methods for plant and animal pests.</p>
Structures and Developments / Fencing and Grazing	Fencing is not required as there are no stock on the adjoining properties.	Continue exclusion of stock from the covenant.	
Public Access and Use	Public access will be maintained via the several access points and the provision of tracks.	Public access will be maintained via the several access points and the provision of tracks.	Track maintenance to a good standard and ensure views are not obscured.
Fire	The local authority, Christchurch City Council has a regulatory role for fire in general, but DOC is responsible for controlling fires near DOC boundaries. No fires to be started within the covenant area.	Ensure that no fires are started in the covenant or on the surrounding land.	Call 111 in the case of fire.
Research / Monitoring / Study	<p>BPCT will implement ecological monitoring in partnership with LPC to assess vegetation condition of the existing native remnants and identify any threats to biodiversity values in the covenant. Planting success is to be monitored.</p> <p>Copies of data and/or reports from monitoring or research will be provided to the LPC.</p> <p>Landowner should inform BPCT if other parties undertake ecological research or monitoring in the covenant (to ensure that BPCT is aware of additional information that may be available for the covenant).</p>	Photopoints have been established and should be re-photographed every 2 years to monitor the native regeneration.	<p>BPCT will visit covenant periodically to carry out ecological monitoring.</p> <p>BPCT will monitor photo points to record vegetation change.</p> <p>BPCT will provide landowner with results from the ecological monitoring programme and inform them of any management actions needed.</p> <p>BPCT may review the management plan with the landowner for the covenant as required or at the landowner's request.</p>

APPENDIX ONE: PLANT SPECIES LIST

Naturally occurring native plant species recorded on 17,25 August 2016 ¹

Scientific name	Common name	Life form	Comments
<i>Acaena juvenca</i>	bidibid	herb	
<i>Asplenium appendiculatum</i>	ground spleenwort	fern	
<i>Asplenium flabellifolium</i>	necklace fern	fern	
<i>Asplenium oblongifolium</i>	shining spleenwort	fern	
<i>Calystegia tuguriorum</i>	NZ bindweed	vine	
<i>Carmichaelia australis</i>	native broom	shrub	
<i>Cheilanthes sieberi</i>	rock fern	fern	
<i>Clematis foetida</i>		vine	
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki	tree	
<i>Coprosma propinqua</i>	mikimiki	shrub	
<i>Coprosma robusta</i>		tree	
<i>Coprosma virescens</i>		tree	At Risk - Naturally Uncommon
<i>Cordyline australis</i>	cabbage tree, ti kouka	tree	
<i>Dichondra repens</i>		herb	
<i>Discaria toumatou</i>	matagouri	shrub	
<i>Dodonaea viscosa</i>	akeake	tree	
<i>Einadia allanii</i>		dicot herb	At Risk - Naturally Uncommon
<i>Griselinia littoralis</i>	broadleaf, kapuka	tree	
<i>Helichrysum lanceolatum</i>		shrub	
<i>Kunzea ericoides</i>	kanuka	tree	
<i>Lophomyrtus obcordatum</i>		tree	
<i>Meliccytus ramiflorus</i>	mahoe, whiteywood	tree	
<i>Muehlenbeckia australis</i>	large-leaved pohuehue	vine	
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine	vine	
<i>Myoporum laetum</i>	ngaio	tree	
<i>Myrsine australis</i>	red mapou, red matipo	tree	
<i>Oxalis exilis</i>	native oxalis	dicot herb	
<i>Pittosporum eugenioides</i>	lemonwood, tarata	tree	
<i>Pittosporum ralphii</i>	karo	tree	not natural to this area
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo	tree	
<i>Plagianthus regius</i>	lowland ribbonwood, manatu	tree	
<i>Poa cita</i>	silver tussock	grass	open areas
<i>Polystichum oculatum</i>	shield fern	fern	
<i>Pseudopanax arboreus</i>	fivefinger	tree	
<i>Pteridium esculentum</i>	bracken	fern	
<i>Scandia geniculata</i>		vine	
<i>Solanum laciniatum</i>	poro poro	shrub	
<i>Sophora prostrata</i>	prostrate kowhai	shrub	on ridge
<i>Tetragonia implexicoma</i>	Climbing native spinach	herb	
<i>Urtica ferox</i>	Stinging nettle	shrub	

Introduced plant species ²

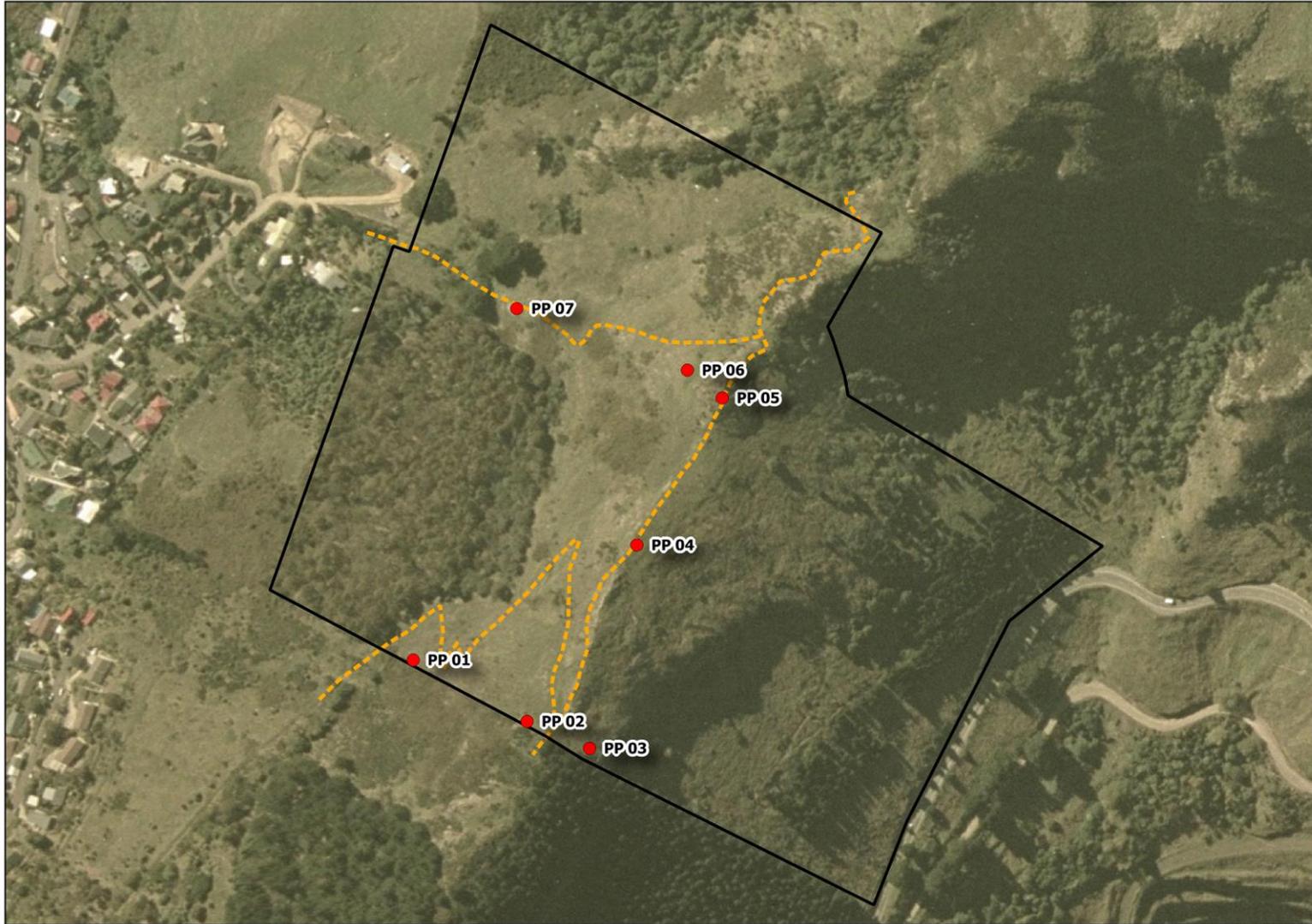
Scientific name	Common name	Life form	Weed status
<i>Acer pseudoplatanus</i>	sycamore	tree	
<i>Agrostis capillaris</i>	brown top	grass	
<i>Anthoxanthum odoratum</i>	sweet vernal	grass	
<i>Austrostipa sp.</i>		grass	
<i>Bromus diandrus</i>		grass	
<i>Cerastium glomeratum</i>	chickweed	dicot herb	
<i>Chamaecytisus palmensis</i>	Tree lucerne	tree	
<i>Chrysanthemoides monilifera</i>	boneseed	shrub	
<i>Cirsium vulgare</i>	Scotch thistle	dicot herb	
<i>Cotoneaster simonsii</i>	cotoneaster	shrub	
<i>Cupressus macrocarpa</i>	macrocarpa	tree	
<i>Cytisus scoparium</i>	broom	shrub	
<i>Dactylis glomerata</i>	cocksfoot	grass	
<i>Hedera helix</i>	ivy	enfant	
<i>Holcus lanatus</i>	Yorkshire fog	grass	
<i>Hypochoeris radicata</i>	catsear	dicot herb	
<i>Lolium perenne</i>	ryegrass	grass	
<i>Lyceum ferrocissimum</i>	boxthorn	shrub	
<i>Marrubium vulgare</i>	horehound	dicot herb	
<i>Prunus sp</i>		tree	
<i>Rosa rubiginosa</i>	brier	shrub	
<i>Rubus fruticosus agg.</i>	blackberry	vine	
<i>Sambucus nigra</i>	elderberry	tree	
<i>Silybum marianum</i>	variegated thistle	dicot herb	Containment Pest Plant (ECan RPMP)
<i>Stellaria media</i>	chickweed	dicot herb	
<i>Ulex europeus</i>	gorse	shrub	
<i>Ulmus x hollandica</i>	corked elm	tree	Lots of suckers
<i>Verbascum thapsus</i>	woolly mullein	dicot herb	

¹ **Surveys:** Ecological survey for management plan 17, 25 August 2016 by Carol Jensen

² not all introduced species are listed (e.g. some common pasture grasses and herbs were not recorded)

³ **Weed status in ECan (2005) Canterbury Regional Pest Management Strategy 2005-2015:**

APPENDIX TWO: PHOTO POINTS



Grid references (GPS readings) for photo points

Note: Grid refs are NZTM

	East	North
pp1	1578206	5172405
pp2	1578284	5172364
pp3	1578327	5172351
pp4	1578359	5172488
pp5	1578416	5172586
pp6	1578393	5172605
pp7	1578279	5172646

Photo points (see separate file)