

VEGETATION

Rehabilitation Plan



Lord Howe

ISLAND BOARD

Table of Contents

1	Background.....	3
1.1	Introduction.....	3
1.2	Objectives	4
1.3	Key threats to native vegetation.....	4
1.3.1	Weed invasion	4
1.3.2	Cattle grazing.....	4
1.3.3	Vegetation dieback	5
1.3.4	Vegetation clearance	5
1.3.5	Forest fragmentation.....	5
1.3.6	Erosion.....	6
1.3.7	Altering the Hydrological regime	6
2	Native vegetation associations and rare plants under threat	6
2.1	Riparian areas.....	6
2.2	Coral sand beach and dune association	6
2.3	Poa grassland	7
2.4	<i>Howea forsteriana</i> (principally remnant Palms in paddocks).....	7
2.5	<i>Drypetes - Cryptocarya</i> association (areas experiencing canopy dieback).....	7
2.6	<i>Calystegia affinis</i> at Old Settlement	7
3	Legislation and Policy.....	7
3.1	Lord Howe Island Act 1953	8
3.2	Permanent Park Preserve Plan of Management 1986.....	8
3.3	Lord Howe Island Board Corporate Plan 2001 -2004	8
3.4	Strategic Plan of Management for the Lord Howe Island World Heritage Property	8
3.5	Threatened Species Conservation Act 1995.....	8
4	Criteria for Prioritising Rehabilitation sites	9
5	Management Philosophy	10
5.1	Guidelines for rehabilitation projects.....	10
5.2	Rehabilitation techniques	10
5.2.1	Assisted natural regeneration	10
5.2.2	Revegetation.....	11
5.2.3	Successional planting	12
5.2.4	Maintenance	12
5.2.5	Landscaping.....	12
5.2.6	Palm Plantations	12
6	Resourcing.....	13
6.1	Funding	13
6.2	Volunteers	13
7	Recommended Actions	13
7.1	Riparian areas in settlement	13
7.2	Native grassland	21

7.3 Bushland corridors	23
7.5 Threatened Species Recovery Actions	29
7.5.1 <i>Calystegia affinis</i> site, Old Settlement	31
7.5.2 Seabird nesting areas	32
7.6 Maintenance sites	34
7.7 Special Leases	35
7.7.1 Remnant Palms in paddocks	35
7.7.2 Landslips and eroded areas	36
7.7.3 Electric Fencing	36
7.7.4 Special Lease conditions	36
7.8 Nursery	37
7.9 Roadside beautification and public amenity plantings	37
7.10 Tree Removal	37
8 Review	38
9 References	38
Abbreviations	38
Common plant names	39
Map of all revegetation areas	40

Background

1.1 Introduction

The Lord Howe Island Board (Board) has a statutory responsibility to manage the native vegetation of the Island to conserve and enhance the World Heritage values.

The natural values of Lord Howe Island are of international significance. The vegetation associations are unique as a result of a large number of species being endemic to the Island. The vegetation provides habitat to a number of threatened species. Land clearing has had an impact on the vegetation in the Settlement Area and has resulted in the degradation of vegetation associations.

The Board have been undertaking revegetation projects over the past 15 years. The coastal foreshore was one of the first areas targeted for revegetation. In recent years the restoration of Shearwater nesting areas at the Big Muttonbird Ground has been one of the most successful revegetation projects on the Island.

Lack of funding to undertake maintenance of revegetation projects over the past decade has resulted in a few sites becoming overgrown with weeds. This unsatisfactory outcome is a waste of resources and reflects a poor public image.

This plan for 2002 to 2007 will provide strategic directions for the future to ensure that resources are allocated to the highest priority projects and that maintenance is undertaken to ensure the future success of these projects.

While the Rehabilitation Plan is intrinsically linked to the Weed Management Strategic Plan (2002), which focuses on weeds as the main cause of degradation of core (or intact) bushland areas, it focuses on restoring or reconstructing vegetation associations where the main cause of degradation has been land clearing.

In this plan, the term rehabilitation refers to both the techniques of weed control to allow natural regeneration (assisted natural regeneration) and planting to restore or re-construct the native vegetation community on site (revegetation).

The plan covers only Lord Howe and Blackburn Islands. The other off-shore islands have not been included as there has been no evidence of clearing of native vegetation on them. The potential impact of weeds on their native vegetation associations (predominately native grassland) has been addressed in the Lord Howe Island Board Weed Management Strategic Plan 2002. A high priority recommendation of that plan is to "monitor offshore Islands for new weed incursions".

Due to the nature of the bushland clearing on Lord Howe Island, this plan focuses on land zoned: foreshore protection, environment protection, Permanent Park Preserve and special lease.

1.2 Objectives

The objectives of this plan are:

1. Restore and re-construct the native vegetation communities most under threat from past vegetation clearing;
2. Identify ways to manage threats to minimise their degrading effects on core areas of native vegetation;
3. Develop a strategic approach to Board managed rehabilitation projects;
4. Support a cooperative approach to rehabilitation of degraded vegetation with the local community, school children, volunteers and other agencies, and foster community support for actions recommended in this plan; and
5. Satisfy legislative responsibilities and Board policy requirements.

1.3 Key threats to native vegetation

1.3.1 Weed invasion

Weeds opportunistically encroach on areas that have been disturbed and have the ability to out-compete with the natives. The dominant weed affecting the natives mentioned in this plan is Kikuyu grass (*Pennisetum clandestinum*). This weed is easily controlled using low concentrations of Glyphosate. The thick mat of Kikuyu prevents other weed species from growing in this area. However, when the Kikuyu is controlled, annual and perennial pasture weeds will colonise the treated site. Follow-up control of these weeds during the summer is required to prevent them seeding.

In addition, the favourable light conditions created at a revegetation site can promote other invasive weeds (such as Climbing and Ground Asparagus) to colonise these sites. Removing these invasive weeds at the juvenile stage prior to them being able to out compete with the new plantings or set seed is required.

Maintenance of rehabilitation sites is an essential component of the revegetation. Lack of maintenance after the grass is controlled could result in a weed problem with a greater diversity of weeds, some of which could be more invasive and harder to control than the Kikuyu grass which covered the site at the commencement of the project.

Ensuring that measures are in place to prevent the introduction of new species to the Island is a key measure to ensure that this risk is minimised.

1.3.2 Cattle grazing

Cattle can prevent natural regeneration of native plants and degrade existing remnant native vegetation by browsing and trampling. Cattle can also spread weeds into the bush through attachment their fur, hoofs and in their faeces.

Overgrazing of pasture can also result in increased surface runoff and create greater potential to expose soils to erosion, particularly on steeper slopes where landslips can occur.

1.3.3 Vegetation dieback

Both Pickard (1983) and the Australian Biological Resources Study (1994) comment on the dieback of native vegetation on Lord Howe Island (such as at Old Settlement and behind Pinetrees). The Greybark-Blackbutt (*Drypetes-Cryptocarya* lowland rainforest) association is particularly susceptible to canopy dieback.

The Australian Biological Resources Study (1994) states that "a phenomenon which has been noted in the lowland and submontane forests is that of canopy dieback. On islands, notable for strong winds, this is not a new occurrence but has been exacerbated by the clearance of sheltering plants, exposing the trees growing in the forest behind to the often salt-laden wind. Three species in particular provide outer protection; shrubs or small trees of Tea Tree (*Melaleuca howeanana*), Bullybush (*Cassinia tenuifolia*) or Juniper (*Myoporum insulare*) are all resistant to salt spray, especially the Tea Tree. By contrast two trees which seem particularly susceptible to wind (damage) are Scalybark (*Syzygium fullagarii*) and the Banyan (*Ficus macrophylla* subsp. *columnaris*). In fact, rapid reduction in the number and extent of the latter, and the often unhealthy state of the trees, was noted as long ago as 1882".

1.3.4 Vegetation clearance

While large scale land clearing of native vegetation no longer occurs on Lord Howe Island, the impact of vegetation clearing on a smaller scale needs assessment.

The death of individual trees in the Settlement Area through approved felling, natural senescence or as a result of dense weed invasion can have a significant local impact on the floristic structure of the vegetation community. One large tree can open up the canopy sufficiently to allow light levels to change and promote a suitable habitat for the colonization of invasive weed species. These cleared areas may allow strong winds to penetrate further into the bushland area causing dieback or local residents may utilise the new clearing for planting introduced garden plants both situations causing further degradation of the vegetation community. On an individual basis some of these impacts maybe reversible but collectively the impact could be slowly changing the floristic integrity of the vegetation community in an irreversible way.

1.3.5 Forest fragmentation

While approximately 75% of Lord Howe Island is protected within the Permanent Park Preserve (PPP), the Preserve is split into two sections, one on the northern and one on the southern end of the island. There is no continuous bushland corridor between the two separate areas of the PPP.

The Hunter report highlighted the need to strengthen bushland corridors linking core (intact) bushland areas to facilitate the movement of fauna.

1.3.6 Erosion

The impact of different types of erosion is evident throughout the Island. While natural processes in the southern mountains cause dramatic landslips to occur, these areas are rapidly colonized and stabilised by regenerating plants.

Some Special Leases contain examples of mass movement (such as Landslips), stream erosion and terracing along slopes. These areas cannot be readily colonized (and hence stabilised) by regenerating plants as cattle continue to feed and trample on young plants.

1.3.7 Altering the Hydrological regime

Inappropriate earthworks, drainage and land clearing have the potential to alter surface and subsurface flows. Low lying vegetation communities such as the Sallywood Swamp Forest may depend on a particular flow regime and actions which may significantly alter this should be avoided.

1 Native vegetation associations and rare plants under threat

The following vegetation associations and rare plants have experienced severe disturbance as a result of past land clearing and are considered the highest priority for protection [Hunter (2002), Pickard (1986) and Hutton (2001)].

A draft nomination is currently being prepared for listing *Lagunaria* (Sallywood) Swamp Forest on Lord Howe Island as an endangered ecological community under the NSW Threatened Species Conservation Act.

2.1 Riparian areas

Sallywood swamp forest

Hunter (2002 Section 2.2.5) wrote that "while the subspecies of Sallywood present on Lord Howe Island also occurs on Norfolk Island, the vegetation type is endemic to Lord Howe Island. It is nearly all cleared and is not conserved (in the PPP)".

Mangrove community

Hunter (2002 Section 2.2.9) wrote that the *Aegiceras corniculatum* association covered 2 hectares or 0.1% of the Island, with less than 25% of the original extent remaining." No stands are protected in the PPP.

2.2 Coral sand beach and dune association

Most of this association occurs on Lagoon, Neds, Middle, Blinky and Kings beaches, with only a small area occurring in the PPP at North Bay. "The native vegetation of the beaches and dunes in the Settlement Area has been quite heavily impacted by human activities" (Hunter 2002, Section 2.2.14)

The endangered herb *Chaemasyce psammogeton* has previously been recorded at the Lagoon Beach and Blinky Beach. The degradation of the coastal dune vegetation community and weed invasion are considered the main threats to the survival of this plant.

2.3 Poa grassland

This association is being severely threatened by Kikuyu. The remnant stand of Poa grassland at Muttonbird Point is likely to be permanently lost if the Kikuyu grass is not contained from the edges of the stand. Due to competition with invasive pasture grasses, there are no native Poa grassland communities remaining in the Settlement Area.

The Kikuyu is also considered a threat to the Wedgetail Shearwaters which nest on Muttonbird Point, with the thick grass impeding access to burrows and long runners having the ability to trap birds.

2.4 *Howea forsteriana* (principally remnant Palms in paddocks)

Pickard (1983, p.181) classifies the disturbance to this vegetation type in the settlement area as severe, stating that cattle prevent regeneration by eating young palms.

The remnant palms growing in cleared paddocks are also not able to regenerate due to the thick Kikuyu grass understorey. Once these mature palms die no young palms will be able to replace them and hence the native vegetation community at that location will be totally lost.

Howea forests have been identified in the Lord Howe Island Board Weed Management Strategic Plan as having a relatively low degree of weed invasion as the thatch acts like a weed suppressor. Limited resources are required to restore *Howea* forests by fencing off remnant palms from cattle and spraying Kikuyu.

2.5 *Drypetes - Cryptocarya* association (areas experiencing canopy dieback)

"Some 65% of the Greybark-Blackbutt rainforest type within the Settlement Area has been cleared or modified" (Hunter 2002, Section 2.2.1).

This association has experienced dieback along the PPP boundary at Old Settlement, Neds Beach Common, above Moseley Park and along the southern boundary above the Little Island track. Severe dieback of this vegetation is also evident behind Pinetrees (along the Transit Hill bushland boundary).

2.6 *Calystegia affinis* at Old Settlement

This plant is listed as endangered under the NSW Threatened Species Conservation Act. Hutton (2001) identified *Calystegia affinis* as a rare plant, with the population at Old Settlement requiring rehabilitation works to ensure the conservation of this plant in the Settlement Area.

2 Legislation and Policy

The Board has a number of responsibilities to reconstruct degraded landscapes and habitats within the Lord Howe Island World Heritage group.

3.1 Lord Howe Island Act 1953

The Lord Howe Island Board is responsible for the care, control and management of Lord Howe Island in accordance with the above act. All land is vested in the crown; there is no freehold title. Perpetual Leases are granted for settlement and Special Leases are granted for other purposes (usually agriculture).

3.2 Permanent Park Preserve Plan of Management 1986

The PPP is identified in the Schedules of the Lord Howe Island Act and is managed in accordance with a Plan of Management.

While the Plan of Management makes many recommendations regarding weed control on the Island, the following excerpt (p62) is the only reference to potential revegetation projects. "Because of its (Kikuyu Grass) propensity to invade undisturbed areas, and to seriously disturb vegetation structure, the species will require substantial control efforts. Priority will be given to eliminating the infestation on Muttonbird Point which is impeding bird burrowing in the Poa grassland of the main rookery there".

The project described above has yet to be commenced.

3.3 Lord Howe Island Board Corporate Plan 2001 -2004

One of the strategies listed in this plan is to "Prepare and implement a vegetation management plan to restore disturbed areas".

3.4 Strategic Plan of Management for the Lord Howe Island World Heritage Property

A number of actions are identified in this plan relating to restoring or reinstating degraded landscapes. It is recommended as a High Priority that a Revegetation Plan be developed that identifies opportunities and priority areas for habitat restoration.

The restoration of wetlands (where possible) and degraded landscapes which impact on the scenic values are recommended as a Moderate Priority in the Strategic Plan of Management.

Recommendations relating to ensuring agricultural practices are based on the principles of ecologically sustainable development and do not degrade World Heritage values was given a Moderate Priority in the Plan. Actions included the investigation of restoring native vegetation to parts of leases which are no longer used for agriculture and developing initiatives to assist with the replanting of native vegetation on some cleared land.

3.5 Threatened Species Conservation Act 1995

The main objective of this Act is to conserve biological diversity. The Act provides for the listing of endangered species, populations and ecological communities, vulnerable species and key threatening processes. It makes provisions for the

preparation and implementation of recovery plans for threatened species and the designation of areas as habitat critical to the survival of threatened species, populations or ecological communities. The Lord Howe Island Threatened Species Recovery Team has been formed under this Act.

There are six plants on the Island currently listed under this Act as endangered. Five of these, *Carmichaelia exsul*, *Calystegia affinis*, *Polystichium moorei*, *Coprosma innopinata* and *Xylosma parvifolium* are endemic, whilst *Chaemasyce psammogeton* also occurs on the mainland.

3 Criteria for Prioritising Rehabilitation sites

The following criteria reflect the key responsibilities and impacts that are considered by the Board when setting priorities for native vegetation rehabilitation sites. The word "sites" includes locations, vegetation communities and habitat areas. The availability of resources (financial, human and physical) also influences which programs are implemented.

Highest priority: (based on conservation objectives)

- A. Actions identified in recovery plans for threatened species (ie. statutory requirement);
- B. Loss or degradation of habitat that is negatively impacting threatened or significant fauna species;
- C. Vegetation community with very limited intact representation on the Island. Vegetation communities that have been reduced significantly and are likely to be lost unless processes causing the degradation cease;
- D. Sites inside or bordering the Permanent Park Preserve with the object of preventing dieback of native vegetation;
- E. Sites where there is natural resilience (ie. remnant trees in a paddock). If nothing is done to reduce the process of degradation, then canopy trees will eventually senesce and natural resilience will permanently be lost. Natural regeneration is more cost effective, reduces maintenance and maintains the genetic integrity of plant communities;
- F. Vegetation corridor linking the northern and southern sections of the Permanent Park Preserve;
- G. Sites suffering from significant or potential erosion problems (caused by landslip or stream movement) and where natural processes of regeneration are being halted by poor management;
- H. Riparian areas in the settlement.

Medium priority: (based on economic or community perception objectives)

- I. Where continued management is necessary to maintain significant benefits gained from previous projects;
- J. High public profile sites;
- K. Site selected as a high priority by the local community or community involved in the past;
- L. Areas currently mowed by Board. The replanting of these sites will save the Board funds in the long term.

4 Management Philosophy

5.1 Guidelines for rehabilitation projects

- Effective primary weeding and preparation of site prior to commencing planting.
- Only plant species that would have occurred at the site prior to settlement should be planted. Pickards vegetation survey can be utilised as a reference.
- Monitoring of species composition is required during the revegetation project to ensure that the structure of the vegetation planted mimics as close as possible the pre-settlement vegetation composition. Pickards list of common species for each vegetation type should be used as a guide. This may require diversifying the plants currently available from the Nursery.
- Consider the placement of species on a site in relation to whether they are a pioneer or climax species. Fast growing shrubs could be utilised on the boundary of the site as a wind break, while canopy tree species could be planted in locations where gaps occur in the canopy.
- Place tree guards around palms to protect them from wind burn.
- Establish a maintenance schedule for watering, follow-up weed control and supplementary planting. Laying of thatch or mulch maybe required.
- All rehabilitation sites should be entered onto GIS to assist with monitoring and reporting.

5.2 Rehabilitation techniques

5.2.1 Assisted natural regeneration

This method involves weed control in an area with natural resilience (a native seed bank) and where native regeneration occurs without planting.

It can be used in areas with native canopy trees (such as remnant Palms in paddocks) or on the edge of core (intact) bushland areas where native seeds are likely to colonise the treatment area (such as at the PPP boundary).

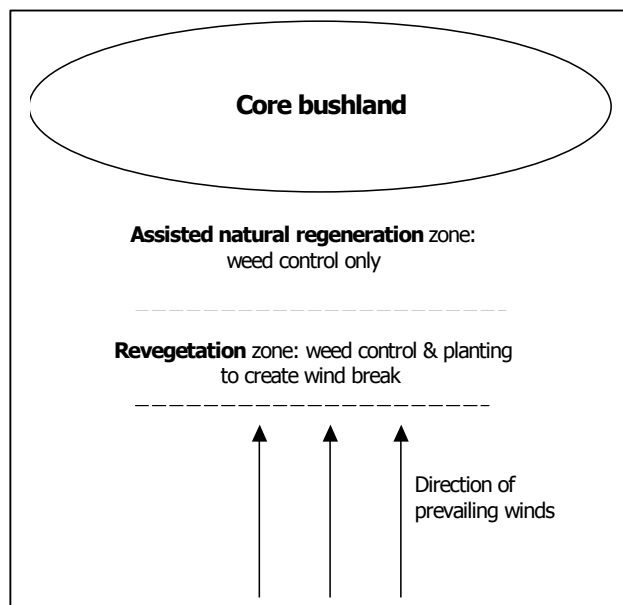


Figure 1 – Assisted Natural Regeneration

5.2.2 Revegetation

When an area has lost its native seed bank revegetation is required. Some areas within the Settlement Area and Blackburn Island have been cleared of native vegetation for decades. The viability of native seed in the soil in these areas is unknown, but considered very limited (particularly in areas where the soil has been disturbed by agricultural, gardening or construction practices).

Revegetation generally involves the following steps:

- weed control
- planting
- watering
- laying thatch or mulch (as required)
- erecting tree guards/ wind breaks
- erecting water catchments in areas that cannot be accessed by vehicle
- follow-up watering (as required)
- follow-up weed control (as required)

On sites neighbouring bushland areas a combination of assisted natural regeneration and revegetation may be the preferred option. Figure 1 illustrates a possible scenario with the zone closest to the bushland receiving weed control treatment only (no planting) and a zone closer to the direction of the prevailing winds receiving a treatment of weed control and revegetation. This will create a buffer zone which will act as a wind break to provide a more optimal environment for native plants to regenerate naturally.

5.2.3 Successional planting

Successional planting is a technique used in rehabilitation projects, whereby fast growing native species, such as Bullybush, Juniper, Tea Tree and Hopwood are planted as a primary coloniser of the site. These plants have the role of stabilising the site against erosion, establishing a windbreak to allow other, more wind sensitive species to grow and establishing a native canopy to reduce the level of weed control required.

By planting fast growing shrubs on the boundary of an existing forest that has had a clearing on the windward side, the aim should be to provide a gradual increase in the height towards the intact forest canopy. In this way the new plantings allow the wind to be directed up over the top of the canopy.

Successional planting can be required after the first few years of the rehabilitation project for the following reasons:

- Increase species diversity;
- Replace plants that have died;
- Changing the composition of plantings to reflect the vegetation community that is being restored;
- Planting of wind or salt sensitive species that would not have survived in the initial plantings.

5.2.4 Maintenance

Maintenance is an essential component of any rehabilitation project.

On-going weed control to provide optimal conditions for the native plants to grow, watering plants over dry periods in the first few months after planting and supplementary planting are all required.

5.2.5 Landscaping

Landscaping projects are different to revegetation projects as the site selection is not based on conservation goals. The main aim of landscaping projects is to provide aesthetic improvements, such as providing shade trees for public utility areas or plantings for roadside beautification. Landscaping projects generally occur at high public profile sites.

Landscaping projects should follow the principles outlined under the "Guidelines for rehabilitation projects" above. Landscaping projects can also include planting native canopy trees with exotic mown grass groundcover. Landscaping projects have not been addressed in this plan.

5.2.6 Palm Plantations

Areas identified as a high priority for native vegetation rehabilitation, which were not covered in Howea forest pre settlement, should not be selected for Palm Plantations. These conservation areas should be rehabilitated to reflect the original floristic composition of the vegetation community.

5 Resourcing

6.1 Funding

Obtaining external funding will be fundamental in fully implementing the recommendations of this plan.

Grant applications should ideally be written to cover three years of funding, to ensure adequate follow-up weeding and supplementary planting are undertaken. This is often difficult as the grants generally only provide funding for a 12 month period.

The rehabilitation process is long. Examples of unsuccessful revegetation projects are visible in the Settlement Area. Without regular maintenance weeds recolonise areas treated.

Most rehabilitation projects should be planned over at least a five year period. After five years the level of maintenance required reduces considerably. This reduced schedule of maintenance will generally be required for a number of years, with the entire project length being up to 10 years in duration. Factors such as exposure to extreme weather conditions will vary the rate of maintenance required.

6.2 Volunteers

In the past, members of the local community, school children and the Friends of Lord Howe Island have assisted with planting projects.

This on-going involvement should be encouraged and developing a sense of community ownership of some rehabilitation sites should be investigated as a possible way to assist in the long term maintenance of the site.

6 Recommended Actions

The following sections summarise the rehabilitation programs to be undertaken, based on the priorities established in Section 4.

7.1 Riparian areas in settlement

Riparian areas in the settlement have been identified as containing vegetation communities which are under serious threat [Hunter (2002), Pickard (1983) and Mandis Roberts Consultants (2000)]. In particular the Sallywood swamp forest and Mangrove vegetation communities found at Old Settlement, Soldiers Creek and behind the bowling club require restoration. A draft nomination for listing this community as endangered under the NSW Threatened Species Conservation Act is currently being prepared (March 2003).

Riparian areas should be fenced off from cattle. Rehabilitation techniques including weed control and replanting be undertaken, as required, to restore the communities.

Due to the close location to the runway, Moseley Park is not recommended for wetland restoration.

Responsibility: Board to seek funding to fence and rehabilitate these areas. Special lease holders to agree to project (including fencing off cattle) and assist in ensuring cattle do not enter these rehabilitation areas. Modify the conditions of Special Leases to reflect these changes.

Aim: Reconstruct Sallywood swamp forest at Old Settlement and behind the Bowling Club. Protect Mangrove communities at Soldiers Creek and Cobby's creek.

Impacts: Kikuyu grass and cattle grazing.

Recreational use: The paddock at Old Settlement is used by people accessing the Max Nicholls track to North Bay or Malabar. Developing a boardwalk through the mature (reconstructed) Sallywood swamp forest maybe a recreational and educational opportunity for the future.

Mangrove community

Vegetation formation: Closed Evergreen Shrub

Dominant species: *Aegiceras corniculata*

Common species: Trees:

Aegiceras corniculata
Lagunaria patersonia

Herbs:

Sarcocornia quinqueflora
Triglochin striatum

Sallywood community

Vegetation formation: Evergreen Closed (swamp) Forest

Dominant species: *Lagunaria patersonia*

Common species:

Trees:

Hibiscus tiliaceus
Lagunaria patersonia
Pandanus forsteri

Justification: C, E, G, H, J

Management Strategy:

Old settlement creek:

Stage 1: fence off creek/swamp area in stages. Restoration should work outwards from existing revegetation project at the bridge (south) and from the PPP boundary (north).

The remnant Palms in the paddock near the PPP boundary in the north represent a previous Curly Palm (*Howea belmoreana*) forest. These remnant palms should be incorporated into the fencing of the riparian area and control of Kikuyu should be undertaken to assist the natural regeneration of palms.

Stage 2: Extend the fencing along the riparian area and undertake weed control and revegetation activities. The revegetation projects in the south and north will eventually link up to ensure the protection of the whole riparian area at Old Settlement.

Cobby's Creek:

Stage 1: control Kikuyu grass surrounding remnant mangroves to encourage the natural regeneration along edges of creek. Replant along edges of creek.

Stage 2: extend riparian buffer zone into area currently dominated by Kikuyu grass. This cleared area would have previously been part of the Greybark/Blackbutt association.

Soldiers Creek (and tributaries):

Stage 1: fence off existing mangroves and remnant trees along riparian areas from cattle. Encourage the expansion of mangroves and natural regeneration of native species by controlling weeds (such as exotic pasture grasses).

Stage 2: supplement planting along creek edge as required to stabilise banks and reconstruct vegetation community.

Management issues:

The implementation of this project will require the cooperation of leaseholders.

Possible erosion caused by herbicide spraying along creek banks. This will be avoided by leaving a strip of exotic grass along any sloped creek banks, until riparian areas are revegetated.

Performance Measure: These sites are recommended for water quality and invertebrate monitoring. The establishment of a school or volunteer based "Streamwatch group" with assistance from an experienced person to set project up would provide valuable information on any possible changes to the creeks as a result of the rehabilitation project (such as monitoring changes in turbidity). The comparison of these three creek systems to undisturbed creeks in the PPP would also be of interest.

As this type of monitoring should occur over a number of years, the feasibility of the on-going involvement of the school children or other interested volunteers should be investigated.

Duration of project: It is anticipated that planting at the Old Settlement site will be over a three year period, with approximately five years of maintenance weed control and watering afterwards.

Resources required (estimate only):

Old Settlement

Year 1

Fencing

Labour: 4 people X 2 days

Materials: <1km of fencing for entire riparian area (utilising existing fences)

Pre-planting (weed control)

Labour: 4 people X 1 day

Materials: herbicide (low rates minimal usage)

Planting

Materials: 2000 plants

Labour: 4 people X 4 days

(and assistance from volunteers)

Year 2:

Maintenance

Labour: 2 people for 8 days/ yr

Year 3:

Expansion

Materials: 2000 plants

Labour: 4 people X 4 days

(and assistance from volunteers)

Years 3 - 5

Maintenance

Labour: 2 people for 8 days/ yr

Years 5-8

Maintenance

Labour: 2 people for 6 days/ yr

Cobbys Creek

Year 1

Pre planting preparation

Labour: 2 people X 1 day

Planting

Materials: 1000 plants

Labour: 4 people X 4 days

Year 2

Maintenance

Labour: 2 people X 4 days/ year

Year 3-5

Maintenance

Labour: 2 people X 4 days/ year

Year 4 (if funding allows)

Expansion of site:

Pre planting preparation

Labour: 2 people X 2 days

Planting

Materials: 2000 plants

Labour: 4 people X 4 days

Maintenance:

As per years 3-5

Soldiers Creek (and tributaries)

Year 1

Fencing

Materials: <1km of fencing

Labour: 2 people X 2 days

Pre planting preparation

Labour: 1 person X 1 day

Planting

Materials: 1000 plants

Labour: 4 people X 4 days

Year 2

Maintenance

Labour: 2 people X 4 days/ year

Year 3-5

Maintenance

Labour: 2 people X 4 days/ year

Due to the large scale of the riparian restoration projects in the settlement, external funding will need to be sought to implement this project.

Ideally in kind support from the Friends of Lord Howe Island, the leaseholders, local school children and the local community to assist with planting will greatly reduce the costs of the project and will provide a great sense of community ownership for the project.

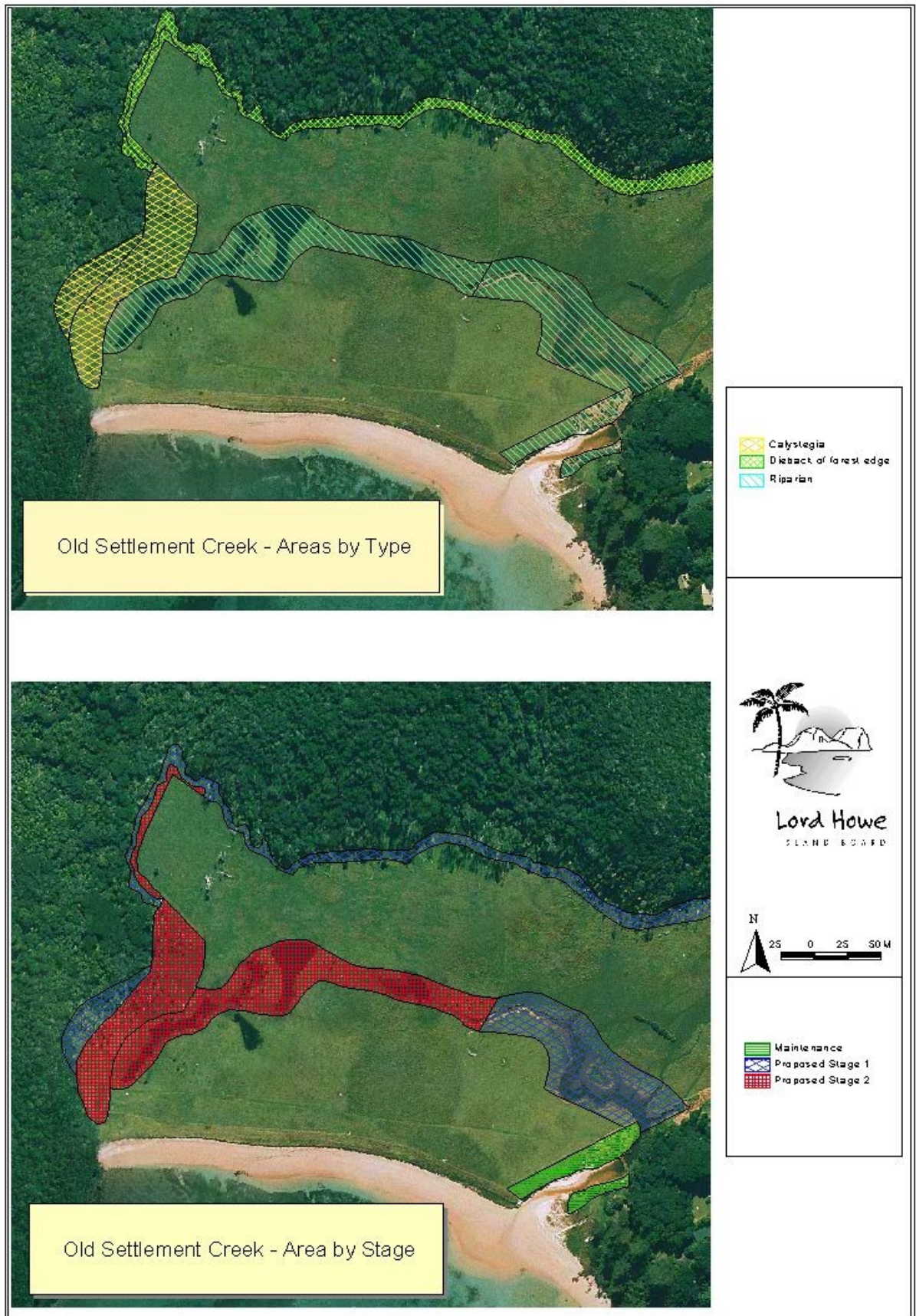


Figure 2 - Recommended Areas at Old Settlement Beach

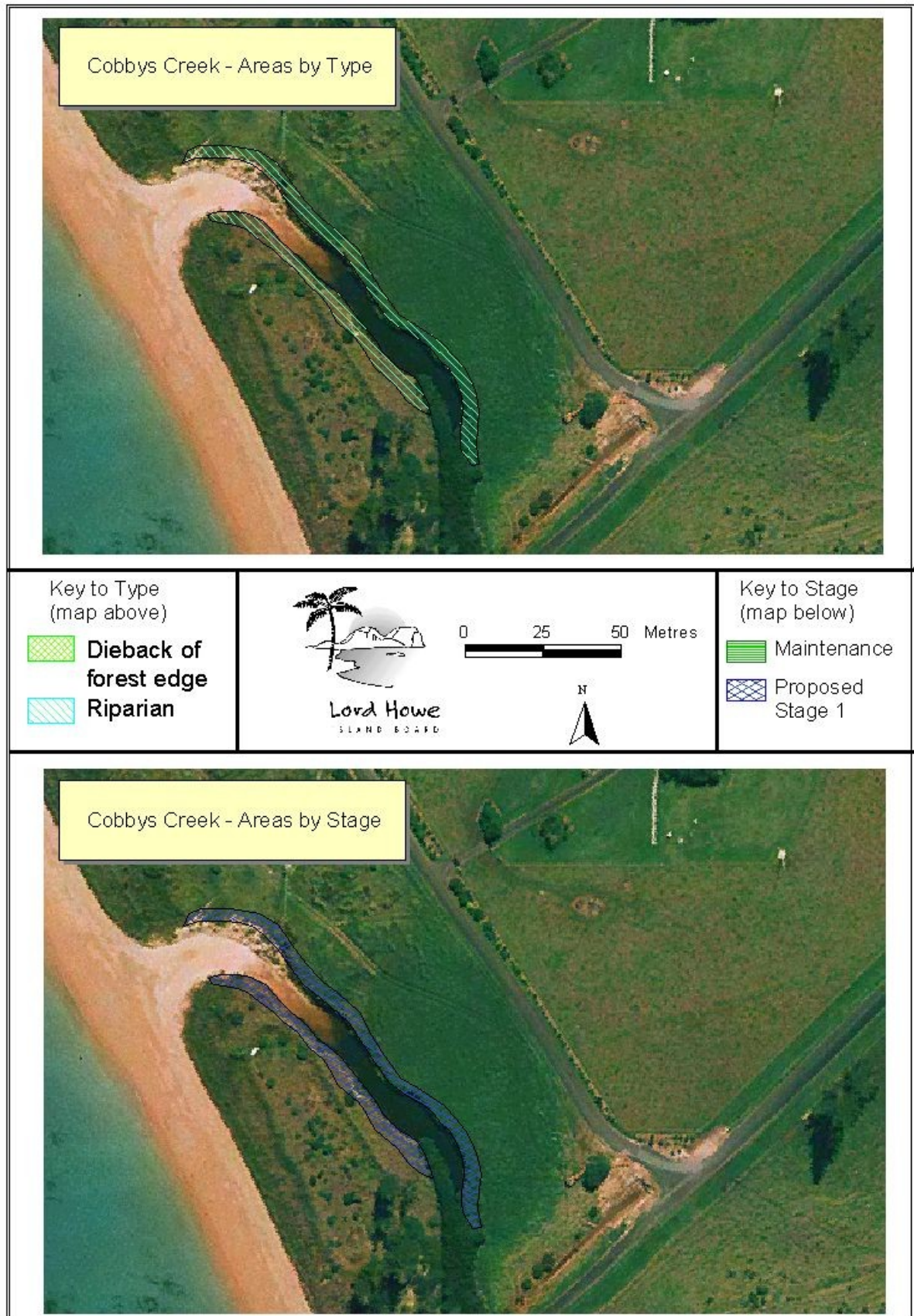


Figure 3 - Recommended Areas at Cobbys Creek



Figure 4 - Recommended Areas at Soldiers Creek

7.2 Native grassland

The restoration of native *Poa* on Muttonbird Point has been identified in both the Lord Howe Island Board Weed Management Strategy as a High Priority and the Permanent Park Preserve Plan of Management (1986).

Muttonbird Point is a significant seabird nesting area, hosting a population of Masked Boobies and Wedgetailed Shearwaters.

Aim: Restore native *Poa poiformis* grassland on Muttonbird Point

Impacts: Kikuyu grass is outcompeting native grass and there is only a narrow strip of native grass remaining on Muttonbird Point. The thick Kikuyu grass is impeding the nesting of the Wedgetail Shearwaters. Muttonbird Point is a significant habitat area for the Masked Booby.

Vegetation formation: short grass

Significance of vegetation type: This vegetation type was only ever restricted to 14ha or 0.9% of Island (Hunter). Largest remaining stands are on the Admiralty Islands and Muttonbird Island (Pickard). This vegetation type has been significantly degraded on the main Island due to cattle grazing and the planting of exotic Kikuyu grass on Muttonbird Point.

Dominant species: *Poa poiformis*

Common species:

Shrubs:

Cassinia tenuifolia

Melaleuca howeana

Twiners:

Commelina cyanea

Grasses and sedges:

Cyperus lucidus

Poa poiformis

Scirpus nodosus

Justification: C, D, E

Recreational use: No formal walking track access. Infrequently accessed by researchers and locals.

Management Strategy:

Grassland restoration projects are difficult due to the absence of canopy vegetation, that can shade out weeds. As Kikuyu is significantly faster growing than the native *Poa* grass, the planting of advanced thick clumps of native *Poa* is recommended.

Poa poiformis has been propagated at the Board nursery for a number of years and now thick clumps of grass are ready for planting.

Stage 1:

Spray edge of native grass (a couple of metres at a time) after juvenile shearwaters leave Muttonbird Point. When exotic grass dies, clump plant native grass. Follow-up spray Kikuyu.

Stage 2:

Continue to expand native grassland by repeating Stage 1.

Follow-up maintenance is essential due to the highly invasive nature of Kikuyu and the lack of canopy to shade out weed species.

Management issues:

Care should be taken when undertaking herbicide spraying due to the number of seabirds that nest on Muttonbird Point. Do not spray herbicide when Wedgetail shearwaters are nesting on the headland or when the Masked Boobies have young chicks. The spray area should be partitioned off so birds cannot access the site for at least 24 hours.

Care should be taken not to damage burrows when walking on the headland during the Shearwater nesting season. Do not try to spray too large an area at one time. Plant mature *Poa poiformis* in clumps to prevent the faster growing Kikuyu from out competing the poa.

Propagation of *Poa poiformis*. The grass is very slow growing and will take longer to get to planting stage than other natives.

Due to the site's remote location (no vehicle access) logistical planning is required to determine the most effective way to undertake the planting and follow-up watering.

Performance Measure: Area of native grassland on Muttonbird Point expanded on an annual basis.

Duration of project: This project could be on-going if the ultimate aim was to eradicate Kikuyu from Muttonbird Point. However, a 5 year restoration project will expand the current poa strip, that extends north-south, by approximately 10-15 metres in width.

Resources required (estimate only):

Year 1

Pre planting preparation:

Labour: spray and construct water catchments: 4 people X 1 day

Planting

Labour: 4 people X 1 days

Plants: 100-200 mature plants

Maintenance

Labour: 2 people X 1 days.

Year 2 – 5 Repeat year 1

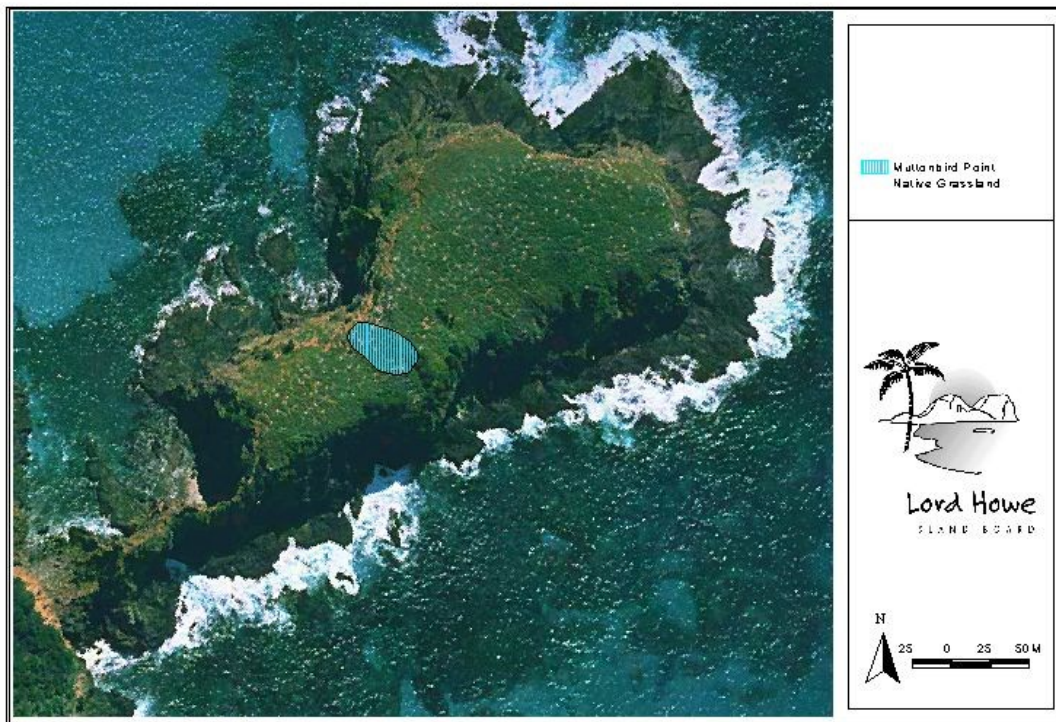


Figure 5 - Recommended Area on Muttonbird Point

7.3 Bushland corridors

The eastern boundary of Moseley Park (along the western facing dune of Blinky Beach) and Middle Beach Common along the Transit Hill walking track have been identified as key locations where the forest is fragmented between the northern and southern sections of the PPP.

Linking forest corridors in the Settlement Area will enhance the habitat for the endangered landsnail *Placostylus bivaricosus*.

Aim: To establish and expand bushland corridors linking the northern and southern areas of the PPP.

Impacts: Weed invasion (predominately Kikuyu grass) and cattle grazing.

Blinky dune
(lower western facing slope only)

Community type:
Coral sand beach and dune

Common species:

Small trees:

Ochrosia elliptica

Shrubs:

Cassinia tenuifolia

Herbs:

Crinum pedunculatum

Twiners:

Ipomoea pes-caprae subsp. *brasiliensis*

Wollastonia biflora

Muehlenbeckia complexa

Vigna marina

Grasses:

Spinifex sericeus

Isolepis nodosa

Middle Beach common site

Community type:

Lowland mixed forest

Common species:

Trees:

Cryptocarya triplinervis

Syzigium fullageri

Euodia polybotrya

Guioa coriacea

Howea belmoreana

Olea paniculata

Pandanus forsteri

Drypetes deplanchei

Small trees:

Rapanea platystigma

Geniostoma petiolosum

Dodonaea viscosa

Zygogynum howeanum

Coprosoma putida

Shrubs:

Cassinia tenuifolia

Dodonaea viscosa

Myoporum insulare

Xylosma maidenii

Sophora howinsula

Dysoxylon pachyphyllum

Lianes:

Flagellaria indica

Malaisia scandens

Sedges

Carex hattoriana

Ferns

Adiantum hispidulum

Nephrolepis cordifolia

Pteris microptera

Justification: D, F, J

Recreational use: The Transit Hill walking track traverses the Middle Beach Common site. The restoration of this site will improve the visual aspects of the walk as currently trees in this area are showing signs of dieback and weeds (such as Cherry Guava) are obvious. The scenic views over the lower paddocks and lagoon from the track will not be lost as revegetation will occur above the existing walking track.

While locals access the southern sections of Blinky Dune for recreational activities (such as fishing), public access across the length of the dune is not encouraged due to the presence of the endangered herb, past revegetation works and the fragile nature of the dune.

Management Strategy:

Stage 1:

Fence off an area of paddock along the Transit Hill walking track (between the Bowker Avenue bushland area and the south-western corner of Transit Hill) from cattle access. This area will be approximately 20 metres in width and will incorporate areas of remnant vegetation which are currently unfenced.

Stage 2:

Planting a buffer strip (approximately 5 metres in width) along the western side of Blinky dune. Plantings will be on the lower slopes only (near Moseley Park fenceline) and will be consistent with the requirements from Civil Aviation Safety Authority (CASA) relating to the environs surrounding airstrips. Plantings will commence near the PPP boundary in the south and expand northwards towards the Palm forest (and existing plantings) near the entrance to Blinky beach.

Management issues:

Stage 1 will require negotiations with the Special Leaseholder and changes to the Special Lease Conditions may be required.

Performance Measure:

Bushland corridors linking the northern and southern sections of the PPP.

Duration of project: 5 years, with a reduced rate of on-going maintenance.

Resources required (estimate only):

Middle Beach common site

Year 1

Fencing

Materials: <500m of fencing

Labour: 2 people X 1 day

Pre planting preparation:

Labour: spray: 4 people X 1 day

Planting

Labour: 4 people X 4 days

Materials: 1500 plants

Maintenance

Labour: 2 people X 6 days

Year 2 – 5

Maintenance

Labour: 2 people X 4 days

Blinky beach dune site

Year 1

Pre planting preparation:

Labour: spray: 4 people X 2 days

Planting

Labour: 4 people X 8 days

Materials: 2500 plants

Maintenance

Labour: 4 people X 6 days

Year 2 – 5

Maintenance

Labour: 4 people X 4 days

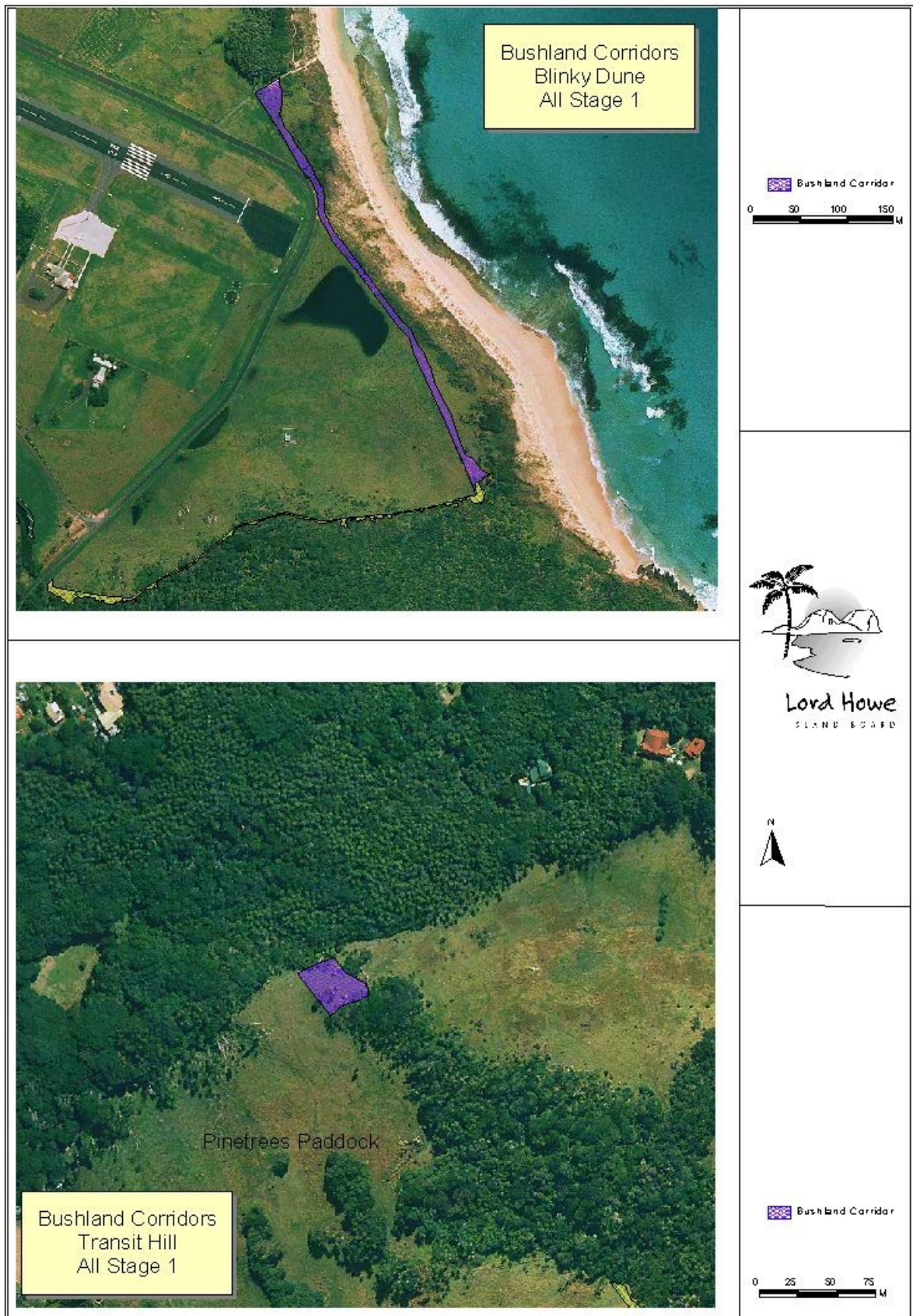


Figure 6 - Recommended Areas for Bushland Corridors

7.4 Dieback of PPP and Transit Hill boundary

Aim: To prevent further canopy dieback along the PPP and Transit Hill boundary.

Impacts: Kikuyu grass and wind.

Recreational use: Due to the long grass along the edge of the bushland, these areas are not utilised for recreational purposes.

Vegetation formation:

Evergreen Closed Forest – Rainforest

Species which are fast growing and resistant to salt spray:

(suitable for buffer planting)

Cassinia tenuifolia

Myoporum insulare

Dodonaea viscosa

Justification: D, E, F, J

Management Strategy:

Stage 1:

To prevent further dieback of the canopy, thin incursions of cleared vegetation (see Figure 2) along the edge of the bushland boundary should be managed. These incursions can be created by disturbance from dead trees, cattle or weed invasion. The prevailing winds can increase the size of these incursions. Management of the incursions will involve controlling the weeds (predominantly Kikuyu) to allow for natural regeneration.

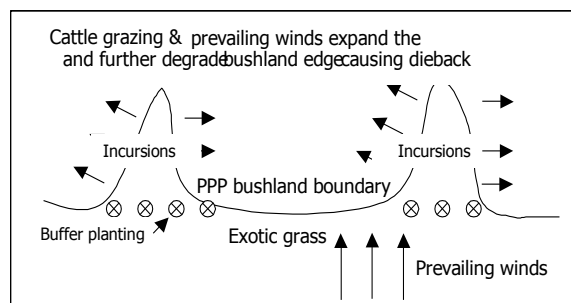


Figure 7 – Impact of Prevailing Winds on Bushland Edges

Stage 2: buffer plant in front of incursions to reduce negative impact of prevailing winds

Stage 3: spray approximately 2 metres into exotic grass along PPP boundary to allow for the natural expansion of the forest boundary. Continue program each year until eventually forest boundary is back to the fence line. The Kikuyu may encroach into the bush at a quicker rate than the forest can naturally regenerate. If this happens buffer plant using the method described in Stage 1.

Management issues:

Do not spray too wide an area along the edge of the forest, for this will result in future maintenance problems, as pasture weeds begin to colonise sprayed areas. A narrow strip of 2 metres at a time is preferable.

Performance Measure:

No further expansion of evidence of canopy dieback along forest edge. Reduction of weeds growing in incursion along forest edge.

Duration of project: 5 years, with a reduced rate of on-going maintenance.

Resources required (estimate only):

Spraying

Labour: 4 people X 6 days/ year

Materials: herbicide costs will be considerably more than other sites due to large area to be covered.

Planting (as required)

7.5 Threatened Species Recovery Actions

The following are specific revegetation actions from approved Recovery Plans. Blackburn Island. It is likely that additional recommendations will be adopted in Recovery Plans to be adopted in the future.

Aim: Restore an area of approximately 1 hectare of Greybark-Blackbutt forest on the northern side of Blackburn Island. This is an action of the Lord Howe Island Placostylus Recovery Plan 2001.

Impacts: Exotic grasses and the extent of vegetation clearing prevents natural regeneration and likely restricts nesting areas for the Wedgetail Shearwaters.

Recreational use: Occasional bird sightseeing tour and visitor access to beach.

Vegetation formation: Evergreen Closed forest – Rainforest.

The Island currently hosts a few mature Banyan trees that provide habitat for various invertebrates. The planting of additional Banyans is a recommendation of the Landsnail Recovery Plan.

Dominant species: *Drypetes-Cryptocarya*

Common species:

Trees:

Cryptocarya triplinervis

Drypetes australasica

Howea belmoreana

Howea forsteriana

Lagunaria patersonia

Olea paniculate

Pandanus forsteri

Ficus macrophylla subsp. *columnaris*

Shrubs:

Cassinia tenuifolia
Myoporum insulare
Rapanea platystigma

Lianes:

Malaisia scandens
Smilax australis

Herbs:

Commelina cyanea

Sedges:

Carex hattoriana

Ferns:

Adiantum hispidulum
Asplenium milnei

Justification: A, B, D, E

Management Strategy: Work outwards from remnant vegetation (mature Sallywoods, Tea Tree and the Banyan) on northern side of Island. Treat exotic grasses under remnant trees and supplement planting.

Management issues:

Spray herbicide when Wedgetail shearwaters have left Island.

Performance Measure: Habitat suitable for release of landnsail. Improvement of nesting habitat for Wedgetail Shearwaters.

Duration of project: 5 years (with a reduced rate of on-going maintenance required after this time).

Resources required (estimate only):

Year 1

Pre planting preparation

Labour: spray: 4 people X 1 day

Planting

Labour: 4 people X 8 days

Materials: 2500 plants

Maintenance

Labour: 4 people X 8 days

Year 2

Repeat Year 1

Year 3: Maintenance

Labour: 4 people X 6 days

Year 4-6: Maintenance

Labour: 4 people X 4 days

7.5.1 *Calystegia affinis* site, Old Settlement

Aim: Improve habitat for endangered plant *Calystegia affinis* within the Settlement Area

Impacts: Kikuyu grass and loss of native habitat. Dieback of vegetation on boundary of PPP.

Recreational use: Max Nichols track goes through the site.

Vegetation formation: Evergreen Closed forest - Rainforest

Dominant species: *Drypetes-Cryptocarya*

Common species:

Trees:

Cryptocarya triplinervis
Drypetes australasica
Elaeodendron curtispiculum
Howea belmoreana
Howea forsterana
Lagunaria Patersonia
Olea paniculate
Pandanus forsteri

Shrubs:

Cassinia tenuifolia
Myoporum insulare
Dodonaea viscosa
Rapanea spp.
Xylosma maidenii

Lianes:

Malaisia scandens
Smilax australis
Parsonsia howeanum
Jasminum simplicifolium

Herbs:

Commelina cyanea

Sedges:

Carex hattoriana

Ferns:

Adiantum hispidulum
Asplenium oblongifolium

Justification: A, B, D, E, J

Management Strategy:

Stage 1:

Undertake weed control (predominantly Kikuyu grass) along the edge of the forest to prevent further dieback and degradation of native vegetation. If the *Calystegia* in this area does not naturally increase its size as a result of the weed control, then supplementary planting should be considered.

Stage 2:

Once the *Calystegia* is well established in the forest area, undertake a strip of weed control along the forest edge, working slowly across the grassed paddock along the PPP fenceline. Individual *Calystegia* plants encountered in the treatment area should be cut back prior to herbicide spraying to minimise the foliage that is exposed to the spray. *Calystegia* is susceptible to the low concentrations of Glyphosate, used to control Kikuyu.

Management issues:

The Board nursery have successfully propagated *Calystegia affinis* and plants are already available at the Nursery for replanting if required.

Performance Measure: Habitat suitable for long term conservation of *Calystegia affinis* in the Settlement Area.

Duration of project: 5 years

The area for this project is shown in the map provided for Old Settlement beach riparian area.

Resources required (estimate only):

Year 1

Labour: spray: 2 people X 1 day

Maintenance

Labour: 2 people X 4 days/ year

Year 2

Planting (as required)

Maintenance

Labour: 2 people X 4 days/ year

Year 3- 5

Maintenance

Labour: 2 people X 4 days/ year
(and volunteers to help with trials)

7.5.2 Seabird nesting areas

Aim: Improve the habitat for threatened seabirds, such as the Flesh-footed Shearwaters.

Impacts: Kikuyu grass, Climbing Asparagus, Coastal Morning Glory and native vines are threatening the lowland rainforest above Ned's Beach (between Lorhiti and Ebbitide) and Middle Beach, which are significant habitat areas for the threatened Flesh-footed Shearwater. These areas are only narrow strips of forest and as such are vulnerable to wind, erosion and invasion by weeds.

During the years of 1997 to 2001 the island experienced very dry summers, which has had an impact on the lowland rainforest, particularly on forest growing on elevated sandy calcarenite soil. The dominant tree species on this soil type is *Cryptocarya triplinervis*, which has a dense network of fine roots that are very close to the surface. In the successive dry summers experienced recently the stress on the trees growing on this porous sandy soil where water seeps down below the roots has caused many trees to die.

The dead trees allow sunlight into the ground and so open up the area for invasion by plant species which prefer high light levels. Such native pioneer plants are the vines *Parsonsia howeana*, *Stephania japonica*, *Jasminum didymium* and *Geitonoplesium cymosum*. Introduced plant species such as *Ipomoea cairica*, Climbing Asparagus, Kikuyu grass and Cape Gooseberry (*Physalis peruviana*) also invade these clearings, inhibiting the natural regeneration process.

Vegetation formation:

Evergreen closed forest – rainforest

Dominant species:

Tree species most suitable for planting to promote succession in gaps in the canopy include:

Cryptocarya triplinervis (dominant)
Drypetes deplanchei
Olea paniculate
Celtis conferta
Pisonia brunoniana
Howea forsteriana

Justification: B, E, F, I

Management Strategy:

Undertake weed control of scattered infestations of invasive weed species such as Climbing Asparagus. Allow natural regeneration to occur in these areas.

Cut-back native vines that are strangling young native trees to encourage these trees to fill the gaps in the canopy.

Management issues: consider potential impacts to Shearwaters prior to commencing work. Undertake planting and herbicide spraying when birds are off the island.

Performance measure: Closing the gaps in the canopy and improving the habitat for the Flesh-footed Shearwaters.

Duration of project: 5-10 years

The locations where vines were cut back to promote the growth of canopy tree species, should be maintained for a number of years until the trees begin to close the gap in the canopy.

Resources required (estimate only):

Year 1

Labour: sweep through both areas (above Neds Beach to Ebbtide and above Middle Beach) and systemically cut-back vines which are strangling young native trees in areas where the canopy is open.

Control spot infestations of Climbing Asparagus, Kikuyu grass, Coastal Morning Glory and other invasive weeds.

Year 2 - 8

If natural regeneration does not occur in some of the more degraded areas planting of canopy tree species should be considered. Planting maybe required along the cliff edge where gaps in the canopy allow the winds to penetrate into the forest.

Sites where weeds or vines have been treated will require maintenance for a number of years until the gap in the canopy is closed.

7.6 Maintenance sites

The following is a list of revegetation sites that require on-going maintenance.

As this maintenance schedule is not onerous, the Board should endeavour to fund these works internally and thereby retaining external grant funding for commencing new rehabilitation projects.

Sites are listed in geographical location from north to south. Note that only sites that are currently maintained by the Board are listed. Some old revegetation sites have, as mentioned above, been left for many years without any maintenance and hence have returned to weeds requiring more than maintenance weeding to revive them. The tree guards for old revegetation sites that are not being maintained should be removed.

List of current revegetation sites that require maintenance:

Old Settlement creek (both sides west of bridge)

Neds Common (above Neds beach)

Neds Beach (northern BBQ area)

Roadside beautification: Lagoon Rd (near boat sheds/opposite Wilsons Hire)

Big Muttonbird Ground (nth Middle Beach track to sth Middle Beach seat)

Clear Place

Lagoon foreshore: (between Flagstaff and the oval). The project to recolonise this hind dune area with native plants commenced around the early 1980's. This area needs continued weed control treatment and replenishment planting in bare areas. Weeds of concern are exotic grasses, Norfolk Island Pines and Ground Asparagus. Recently new infestations of Bridal Creeper and Climbing Asparagus have been recorded in the area, which is of concern.

Young Norfolk Island Pines, under six metres, should be strategically removed. In areas where these young trees are providing wind protection, a system of retaining some for protection until the native plants are established will be developed in consultation with adjoining leaseholders. Some of the larger trees (if preventing growth of native species and if supported by the direct neighbours) may be selected to be culled after trees are flagged and the local community is given an opportunity to comment. The emergent canopy Pine trees will not be cut-down unless considered dangerous (as per current Board program).

Windy Point

Blinky Beach entrance

Airport Rd

Road beautification: Mulley Drive to South Capella (including protection of mature Sallywood canopy trees)

Resources required (estimate only):

4 people X 10-15 days / year

7.7 Special Leases

Special leases are predominantly managed for cattle grazing or agriculture. While cattle grazing is a part of the cultural heritage of the Island, it can prevent or impede the natural regeneration of native vegetation communities on the lease. Cattle can accelerate the process of dieback by grazing and trampling the edge of the forest. They can carry weed seed on their fur, hoofs and in their faeces, and damage riparian vegetation and stream banks while accessing water.

Cooperative projects between the Board and Special Leaseholders to manage selected conservation areas of their lease and the monitoring by the Board of the lessee's compliance to the Conditions of the Special Lease needs to be addressed.

7.7.1 Remnant Palms in paddocks

Generally the Palm Forests are more resilient to weed invasion than other vegetation communities on the Island (LHI Weed Strategy). Palm forests have been heavily cleared in the Settlement Area.

The mature Palm trees growing amongst exotic grass in paddocks should be assessed for suitability for Palm plantations. It is recommended that clumps of remnant mature palms growing in paddocks should be fenced from cattle with the understorey restored by the process of spraying the exotic grass. Supplementary planting of Palms can occur, if required, to create a native understorey which will eventually compete with the exotic grass.

The assessment of the remnant palms suitable for protection, should be undertaken in consultation with the leaseholder, Nursery Manager and a representative from the Board's Environmental Unit.

7.7.2 Landslips and eroded areas

Although landslips are a natural occurrence on Lord Howe Island, the natural process of regeneration of these landslips can be impeded on special leases when cattle are permitted to continue to graze the landslip area. Continued grazing promotes the opportunity for future erosion and prevents the slip being stabilised by vegetation (native or pasture grass).

Landslips on special leases should be fenced off from cattle until vegetation covers the slip and stabilises the slope. In some cases this may involve planting to speed up the natural process.

When signs of erosion are occurring on Special Leases, preventative soil conservation measures should be undertaken to reduce the rate of erosion, such as the planting of strips of native vegetation horizontally across steep slopes and the temporary removal of cattle.

7.7.3 Electric Fencing

In 2002 the Board initiated a Shearwater protection fencing project in response to a number of Shearwaters being killed on the barbed-wire fences surrounding Shearwater nesting areas.

A new condition for Special Leases should restrict leaseholders from erecting barbed wire fences within Shearwater habitat areas.

7.7.4 Special Lease conditions

The Board has developed a list of Conditions for Special Leases. A summary of the conditions that relate to this plan are listed below:

- Condition 11 relates to the lessee being responsible for "controlling Crofton Weed, Asparagus Fern and such plants or weeds as may time to time be required to be destroyed by direction of the Board".
- Condition 18 relates to the protection of all bush, timber, trees, palms or vegetative material on the lease, unless under Board approval.
- Condition 19 states that the lessee must "carefully preserve all bush, timber, trees, palms and vegetative material (excepting noxious plants) on the land leased and ...to erect a substantial stock-proof fence so as to separate the cleared part or parts from the remainder of the land leased".
- Condition 22 relates to lessee's installing soil erosion control structures to mitigate or prevent erosion.
- Condition 23 relates to lessee's refraining from agricultural and/or pastoral practices in any certain areas of the lease, when directed by the Board, in the interests of soil conservation and the mitigation or prevention of erosion.

It is recommended that when the renewal of the Special Leases across the Island occurs at the end of 2003, then the following additions be made to the current conditions:

- Condition 11 should include the removal of noxious weeds.
- Condition 19 should include riparian areas as areas required to be fenced off from cattle, with a 2 year period in which works should be completed.
- A new condition should be included to ensure barbed-wire fencing is not used near Shearwater nesting areas.

The Board's Environmental Unit should monitor the compliance of the Conditions of the Special Leases and seek external funding and investigate alternative incentive mechanisms to assist the lessee in implementing vegetation rehabilitation actions relating to Conditions 11, 19 and 22.

In situations where the environmental problem is too large for the individual leaseholder (as may be the case for some long term weed infestations) then the Board should negotiate a suitable staged outcome over a set number of years.

7.8 Nursery

Local residents should be encouraged to plant native species in their gardens. The Nursery should investigate opportunities to propagate and sell a wider variety of native plants to local residents. This service should be promoted to the Island community.

7.9 Roadside beautification and public amenity plantings

Roadside planting projects can reduce the long term cost to the Board of lawn mowing and can assist in improving biodiversity, visual amenity and habitat.

Management issues to consider:

The full costs of embarking on new roadside revegetation projects should be considered prior to commencement. Assurance that adequate funds are available for the much needed follow-up (very necessary considering these are generally high profile sites) and a commitment that Board funds will still be available for the high priority conservation rehabilitation projects identified in this plan is necessary.

There is a need to assess the recreational value of some open areas prior to determining the suitability for vegetation rehabilitation. The local community should be involved in this process.

7.10 Tree Removal

Under the Lord Howe Island (General) Regulation approval of the Board is required to damage native flora (that is not part of an established garden).

The majority of requests to remove trees are based on the potential risk of damage to property if the tree fell.

The loss of a large tree can cause a significant impact on the floristic structure by allowing more light (and often weed) into the area. Measures to reduce such degradation should be specified as part of the consent process to damage vegetation

and may include strategies such as weed control along the boundary of the area, monitoring (and control if required) weed spread into the area, replanting with native species, avoiding planting newly disturbed areas with exotic garden plants.

8 Review

A review of this plan should be undertaken in 2008 to monitor implementation and update priorities in light of resources available.

This should be the first of a series of five year Rehabilitation Plans.

9 References

Australian Biological Resources Study (1994) *Flora of Australia*, Volume 49 Oceanic Islands 1, Australian Government Publishing Service, Canberra

Hunter, J and Haselden, C. (May 2002) DRAFT document: *Vegetation and habitat of significance within the Settlement Area of Lord Howe Island*, A report to the Lord Howe Island Board, unpublished NPWS Northern Directorate, Coffs Harbour.

Hutton, I (2001) *Rare Plant Survey on Lord Howe Island* – a report prepared for NSW National Parks and Wildlife Service, unpublished.

Lord Howe Island Board (2002) *Weed Management Strategic Plan*, unpublished

Lord Howe Island Board, (1986). *Lord Howe Island Permanent Park Preserve Plan of Management*

Mandis Roberts Consultants (2000) Lord Howe Island Group *World Heritage Property Strategic Plan of Management 2000-2005*. Report prepared by the Lord Howe Island Board.

National Trust of Australia (NSW) (1999). *Bush Regenerators Handbook*. NSW

NPWS, *Proforma for Pest Management Strategy* circulated by Andrew Leys (statewide Pest Coordinator).

Pickard, J. (1983) *Vegetation of Lord Howe Island*, Cunninghamia, Volume 1(2) 1983

Abbreviations

Board = Lord Howe Island Board

LHI = Lord Howe Island

PPP = Permanent Park Preserve

TSC Act = Threatened Species Conservation Act 1995

Common plant names

(in alphabetical order)

Banyan	<i>Ficus macrophylla</i> subsp. <i>columnaris</i> ;
Berrywood	<i>Ochrosia elliptica</i> ;
Blackbutt	<i>Cryptocarya triplinervis</i> ;
Bullybush	<i>Cassinia tenuifolia</i> ;
Bush Cane	<i>Flagellaria indica</i> ;
Curly Palm	<i>Howea belmoreana</i> ;
Cut-grass	<i>Cyperus lucidus</i> ;
Pandanus	<i>Pandanus forsteri</i> ;
Greybark	<i>Drypetes lasiogyna</i> var. <i>australasica</i> ;
Hopwood	<i>Dodonaea viscosa</i> ;
Hotbark	<i>Bubbia howeana</i> ;
Juniper	<i>Myoporum insulare</i> ;
Kentia Palm	<i>Howea forsteriana</i> ;
Mangrove	<i>Aegiceras corniculata</i> ;
Maulwood	<i>Olea paniculata</i> ;
Sallywood	<i>Lagunaria patersonia</i> ;
Scalybark	<i>Syzigium fullagari</i> ;
Scurvey-weed	<i>Commelina cyanea</i> ;
Stinkwood	<i>Coprosma putida</i> ;
Tamana	<i>Elaeodendron curtispendumulum</i> ;
Tea Tree	<i>Melaleuca howeana</i> ;

For further information

please contact the Lord Howe Island Board Environment Section.

Lord Howe Island Board
PO Box 5
Lord Howe Island, NSW, 2898
Ph – 02 6563 2066
Fax – 02 6563 2127
Email – lhib@bigpond.com

Map of all revegetation areas