

# Vegetation Management Plan

Woolnorth Bluff Point Wind Farm and Woolnorth  
Studland Bay Wind Farm

**Prepared in accordance with Permit Conditions WG4 issued under *the Environmental Management and Pollution Control Act 1994* and Condition 3(b) issued under the *Environment Protection and Biodiversity Conservation Act 1999***

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## 1 Background

Hydro Tasmania has created two subsidiary companies, Woolnorth Bluff Point Wind Farm Pty Ltd (Lot 1) and Woolnorth Studland Bay Wind Farm Pty Ltd (Lot 2) as the asset owners and managers of the two wind farm sites previously referred to as Woolnorth Lot 1 and Woolnorth Lot 2.

This management plan details the vegetation management measures to be undertaken on each wind farm site, and clearly delineates each subsidiary company's responsibilities with regard to the ongoing vegetation management program for each site.

## 2 Objectives of Vegetation Management

The overall objectives of the vegetation management plan are as follows:

1. To reduce the attractiveness of feeding and roosting habitat for Orange-bellied Parrots (OBPs) on Bluff Point and Studland Bay, and to create attractive off-site feeding and roosting habitat for OBPs elsewhere, in order to achieve the following objectives:
  - no detected *Neophemas* feeding for greater than one day within 200 metres of any Wind Turbine Area on Bluff Point (Lot 1) or Studland Bay (Lot 2); and
  - The average ground cover of known *Neophema* food species flowering or producing seed will not exceed an average of 10% by area and will not exceed a density of greater than 30% within any Wind Turbine Area on Bluff Point or Studland Bay during the Autumn migration
2. To protect areas of native vegetation from stock, particularly those of high conservation value.
3. To control significant weeds, particularly gorse.

## 3 Works Program

### 3.1 PROTECTION OF REMNANT VEGETATION ON BLUFF POINT AND STUDLAND BAY

Fencing of native vegetation at Bluff Point and Studland Bay was proposed to exclude stock from degrading remnants on both sites. On Studland Bay, cattle were degrading the heath and herbaceous plants, and weeds were developing that may have attracted OBPs. Areas of heath that were sufficiently intact to enable the areas to regenerate have been fenced off.

All fencing for Bluff Point and Studland Bay has now been completed. Figures 1 and 2 show the fenced areas on each site. Approximately 15 kilometres of fencing has been constructed on Bluff Point, and 18 kilometres on Studland Bay, protecting a total (combined) 175 hectares of remnant vegetation on both sites.

Note that the 175 hectares does not include the large southern remnant on the Bluff Point site. This area was not directly compromised by grazing, but has been fenced to exclude stock from the edges of the remnant.

As each wind farm site is used for agricultural production, contract fertiliser spreaders have been instructed not to allow any fertiliser to enter the fenced off areas.

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Figure 1. Fence Lines on Bluff Point

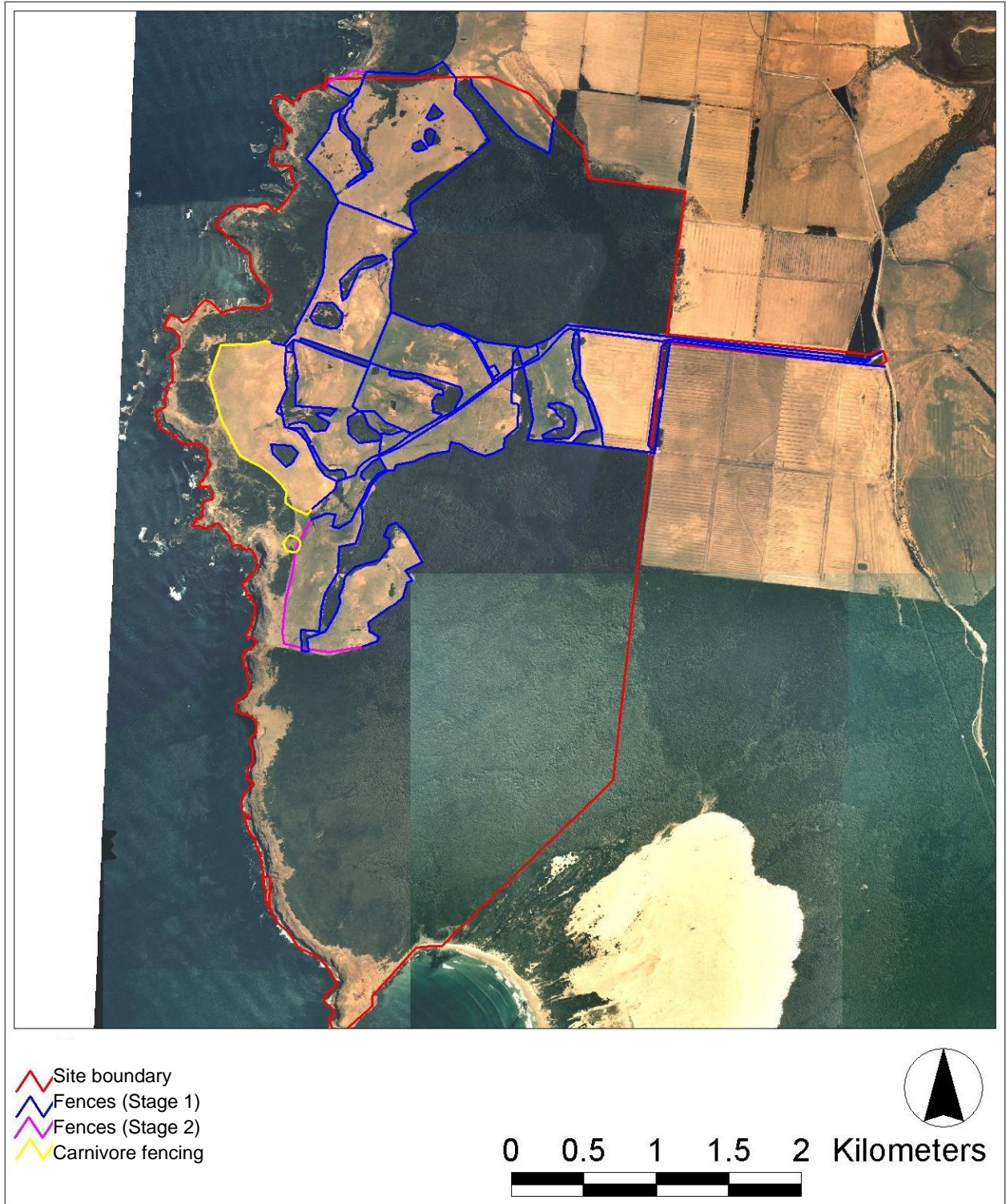


Figure 2. Fence Lines on Studland Bay





## 3.2 OBP HABITAT MANIPULATION - BLUFF POINT AND STUDLAND BAY

There are two main components of the habitat manipulation programme. The first is to reduce the attractiveness to OBPs of the Bluff Point and Studland Bay sites, particularly Studland Bay where *Neophemas* are known to feed. The second is to create attractive feeding and roosting habitat elsewhere in order to attract the birds away from Bluff Point and Studland Bay, and to compensate for habitat lost from the wind farm sites.

The plant species considered most likely to attract OBPs are wireweed on grazing land, and herbaceous plants associated with the degraded heath on Studland Bay. Wireweed is a weed of disturbance. It often occurs where cattle or sheep have pugged an area. This results in an area with a high density of wireweed that is attractive to flocks of *Neophemas*. These areas can be easily identified. Staff involved with the operation of both Bluff Point and Studland Bay Wind Farms will be asked to report any such areas. Wireweed can be controlled by herbicide, although heavy grazing with cattle will also remove wireweed seed heads. Other control methods may include ripping to alleviate compaction or resowing pasture. The results of an inspection and assessment of the weed status within the wind turbine area will be provided to the Director one month prior to commencement of wind turbine commissioning.

The weed management programme has been implemented at Bluff Point wind farm and is described below. The weed programme was commenced at Studland Bay with the survey in March/April 2005. The Studland Bay weed management programme for 2006 is shown in Table 2 and will continue in accordance with Table 1.

A programme has been implemented to create OBP roosting habitat in an area in close proximity to a known OBP food resource. The majority of the habitat plot will be revegetated with species consistent with local habitat in order to create roosting habitat with a small area maintained as feed resource.

### 3.2.1 On-site works program

#### Objectives, monitoring and compliance

The on-site works program must achieve the following objectives:

- (i) No detected *Neophemas* feeding for greater than one day within the Wind Turbine Area on Bluff Point or Studland Bay; and
- (ii) The average ground cover of known *Neophema* food species flowering or producing seed will not exceed an average of 10% by area and will not exceed a density of greater than 30% within any Wind Turbine Area on Bluff Point or Studland Bay during the period of the Orange-bellied Parrot northern migration.

In late January of each year a search will be conducted on Bluff Point and Studland Bay to identify any areas that may attract OBPs. The search will concentrate on two broad areas:

1. low lying areas and around gateways, fence lines and stock trails for wireweed and other potential food plants, and
2. on the interface between heath and pasture for food sources.

Areas that are identified will be treated.

All wind turbine areas will be visually checked for potential feed source and appropriate treatment applied where necessary prior to the Autumn migration.

In addition, prior to the Autumn migration, the following will be undertaken:

- 20% of wind turbines on Bluff Point and Studland Bay will be sampled.
- Sampling will involve taking 20 randomly selected 1m x 1m quadrats within each Wind Turbine Area.
- In each quadrat, the percentage ground cover of a known *Neophema* food species flowering or producing seed will be determined. An average percentage ground cover of food plant species in each Wind Turbine Area will be calculated. If this average exceeds 10%, mitigation measures will be implemented.
- In each quadrat, the percentage ground cover will not exceed 30%.

Quadrat sampling in the wind turbine area of Studland Bay, described above, will commence immediately following commissioning of wind turbines or prior to the Autumn 2007 OBP migration, whichever comes first.

The following table summarises the on-site works program for Bluff Point and Studland Bay.

**Table 1: Summary of the on-site works program for Bluff Point and Studland Bay**

Activity	Location	Implementation
Identification of areas attractive to OBPs	Bluff Point and Studland Bay	Late January and one month prior to commissioning
<p>All wind turbine areas will be visually checked for potential feed source and appropriate treatment applied where necessary prior to the Autumn migration.</p> <p>Quadrat sampling in the wind turbine area.</p>	Bluff Point and Studland Bay	<p>Before Autumn</p> <p>After quadrat surveys</p>

In the event that the results of the quadrat surveys not comply with the above written objectives the following process will be implemented. A further 20% of turbines will be sampled, not including those that have already been found to comply. If again, there is a non-compliance, the process is repeated.

### 3.2.2 On-Site Vegetation Works Specific to Studland Bay

The Studland Bay site was surveyed in March and April 2005 to determine pasture quality and to evaluate the extent of weed infestations. In general, the survey found that there has been an improvement in the quality of the pasture across the site over the last few years due to refined pasture management practices. During the survey, five seed resource categories were identified at Studland Bay:

- General pasture
- Undeveloped areas
- Poor pasture
- Bracken fern
- Fenced remnants

A brief description of each of these resource categories is given below, as well as the proposed weed treatment regime.

Note that weed infestations in the 'Bracken fern' and 'Fenced remnants' categories were found to be minimal and do not require treatment.

### General pasture

'General pasture' totals 579 hectares. Of this, herbicide control will be required for dandelion, wireweed, fat hen (*Chenopodium* sp.) and various other broad-leafed weeds over 149 hectares. An insecticide will also be applied to control the black-headed cockchafer beetle, which attacks pasture species and encourages weed growth.

Recommended timeframe:

- Treat the affected paddocks (i.e. those with an average weed cover of 10% or more) with herbicide and insecticide in Autumn 2006.

### Undeveloped Areas

'Undeveloped areas' refers to sites where initial clearing for pasture establishment has not been completed and includes areas of degraded heath. Many of these areas become waterlogged over the winter period due to poor drainage. In spring when these sites dry out, the ground-stored weed seeds germinate and thrive in the damp areas with no competition from pasture species. These areas need to be converted to pasture.

As a result of the survey, four sub-types of undeveloped areas were identified for treatment:

1. Waterholes ( total area 6.4 hectares)
2. Taller degraded vegetation (total area 5.6 hectares)
3. Shorter degraded vegetation (total area 7.9 hectares)
4. Areas requiring draining and levelling (total area 8 hectares)

Overall, almost 28 hectares requires conversion to improved pasture. The following treatments are planned:

1. **Waterholes:** waterholes will be levelled using a grader and drained. Disturbed ground will be direct-drilled with pasture seed and fertiliser, or broadcast with a small spreader, and rolled.

2. **Taller degraded vegetation:** remnants will be pushed into heaps with a bulldozer and burnt. The ground will be disc-ploughed, and pasture seed and fertiliser broadcast and rolled in.

3. **Shorter degraded vegetation:** The ground will be disc-ploughed, and pasture seed and fertiliser broadcast and rolled in.

4. **Areas requiring draining and levelling:** Holes will be levelled and drainage corrected using a grader, and the ground disc-ploughed. Pasture seed and fertiliser will be broadcast and rolled in.

Recommended timeframe:

- No works of any kind can occur on Undeveloped areas between June and December due to wet conditions
- Levelling, grading and bulldozing works can occur between January and May 2006
- Seed sowing and fertiliser application can occur from the middle of March to the end of May 2006

#### Poor pasture

‘Poor pasture’ refers to areas which were originally sown with pasture species, but germination has been poor, and/or the pasture has been heavily grazed by native wildlife or destroyed by cockchafer beetles. Poor pasture totals 5.7 hectares and is confined to the border between native/remnant vegetation and pastoral land.

These areas may contain many small native grasses and herbs which may be favoured by *Neophemas* as food, and are susceptible to weed establishment.

A one-off herbicide treatment is required, followed by direct-drilling of pasture seed and fertiliser. Once this has been done, the seed and fertiliser are rolled in.

Recommended timeframe:

- Herbicide treatment and subsequent seeding is recommended for Autumn 2006.

The following table summarises the vegetation works to be carried out at Studland Bay.

**Table 2: On-site vegetation works for Studland Bay**

Resource Category	Treatment	Area to be Treated	Implementation
General pasture	Treat weeds and cockchafer beetles	149 hectares	Autumn 2006
Undeveloped areas	Draining, levelling, seeding and fertilising	28 hectares	January – May 2006
Poor pasture	Treat weeds, seeding and fertilising	5.7 hectares	Autumn 2006

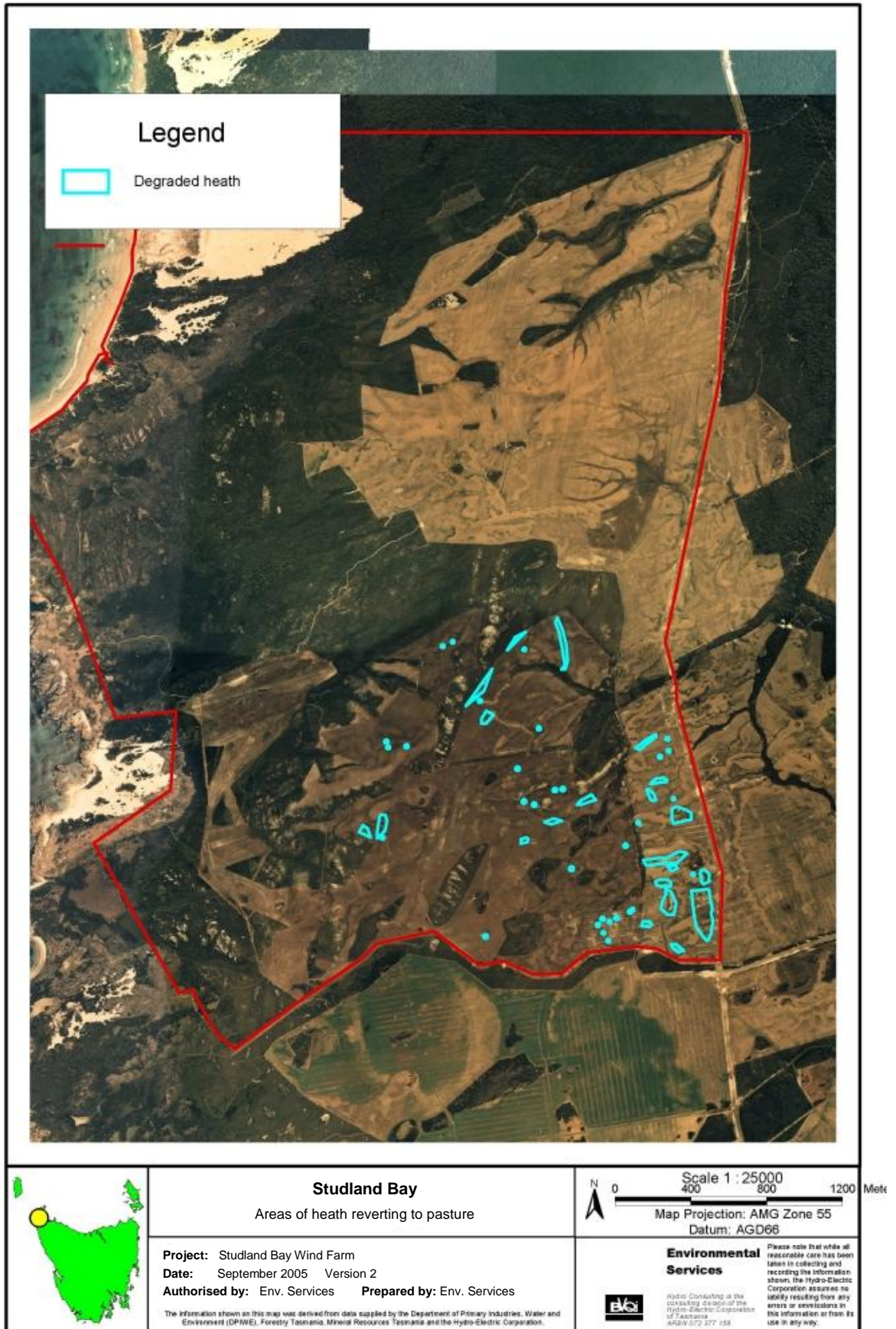
A follow-up survey on Studland Bay replicating the weed survey work done in March/April 2005 shall be done prior to the wind farm being commissioned to determine whether the vegetation management objectives have been met and reported to the Director.

### 3.2.3 Pasture Management at Bluff Point and Studland Bay

If during the course of monitoring undertaken pursuant to the Bird and Bat Monitoring Plan, *Neophemas* are found to be foraging in areas of improved pasture on either wind farm site, the following steps will be taken:

- **Grazing management:** assess current grazing strategy and pasture composition. Implement the most appropriate grazing management regime (eg. rotational grazing or cell grazing) to reduce the weed density of a pasture.
- **Fertiliser management:** review soil test data held by VDL and fertiliser application rates. Determine appropriate rates to increase productivity and competitiveness of the pasture.
- **Pasture species:** if necessary, some sections of the pasture may need to be re-sown.
- A pasture monitoring program will be established to determine the effectiveness of the strategy that is developed.

**Figure 3. Areas of degraded heath on Studland Bay to be converted to pasture**





**Figure 4.** An example of severely degraded heath on Studland Bay that is slowly reverting to pasture



**Figure 5.** An example of weed species growing in a drainage area on Studland Bay which fills with water during winter.

### 3.2.4 Off-Site OBP Habitat Plots

Hydro Tasmania has previously established two 1.5 hectare feed plots of vegetation designed to attract OBPs away from Bluff Point and Studland Bay (Figure 5). It has been identified additional habitat works are required in order to create OBP roosting habitat, in accordance with the Permit condition WF2. In order to address this short coming the lots will be co-located (so as to create a larger habitat) to an area in close proximity to a known OBP food resource such as the salt marsh areas on Swan Bay Plain, to the east of the current trial plot locations (Figure 5). The majority of the habitat plot will be revegetated with species consistent with local habitat in order to create roosting habitat with a small area maintained as feed resource.

The habitat feed plots have been operating since 2001 and the range of crops planted each year has gradually reduced based on the success of each planting and the crop's attractiveness as a food resource for foraging *Neophema* parrots. This approach is consistent with the original intention of the study, with factors such as the plant species to be sown, the date of sowing, sowing density and the location of the plots to be reviewed following the monitoring program each year. These changes have been documented in each of the Annual Environmental Reports prepared since the Bluff Point wind farm commenced operation.

The most recent habitat trials in 2004 and the ongoing management of the plots are discussed below. Please note that monitoring data from the 2005 habitat trails (from March to June) were not available at the time of writing.

The co-located plots are to be re-established in to one plot of 3ha as close to the salt marsh areas that are frequented by *Neophema*. The plot will be planted in accordance with the previously described feed species with additional planting of appropriate species to create OBP roosting habitat. Approximately 80% of the plot area will be established as roosting habitat with the remaining 20% to be maintained as a feed resource. The species and structure for this revegetation will be based on current knowledge of OBP roosting and as identified during roosting survey. Other than activities required to ensure the establishment of the vegetation no monitoring is associated with this activity.

The habitat plot will be implemented prior to commissioning of Studland Bay. A report demonstrating the implementation of the habitat plot will be provided to the Director one month before commissioning commences.

#### 3.2.4.1 2004 OBP Trial Habitat Plot Results

A variety of crops were planted at both habitat plot sites in mid-late October 2003, in anticipation of the 2004 Autumn migration. The grain crops chosen and sown were based upon their success in Autumn 2003 and the observed attractiveness of their seeds as a food resource for foraging *Neophema* parrots.

Each plot area was sown with a mixture of three seed species (sunflower, linseed and fat hen), compared to the previous season when nine species were sown. The three seed types were mixed together and broadcast over each plot site.

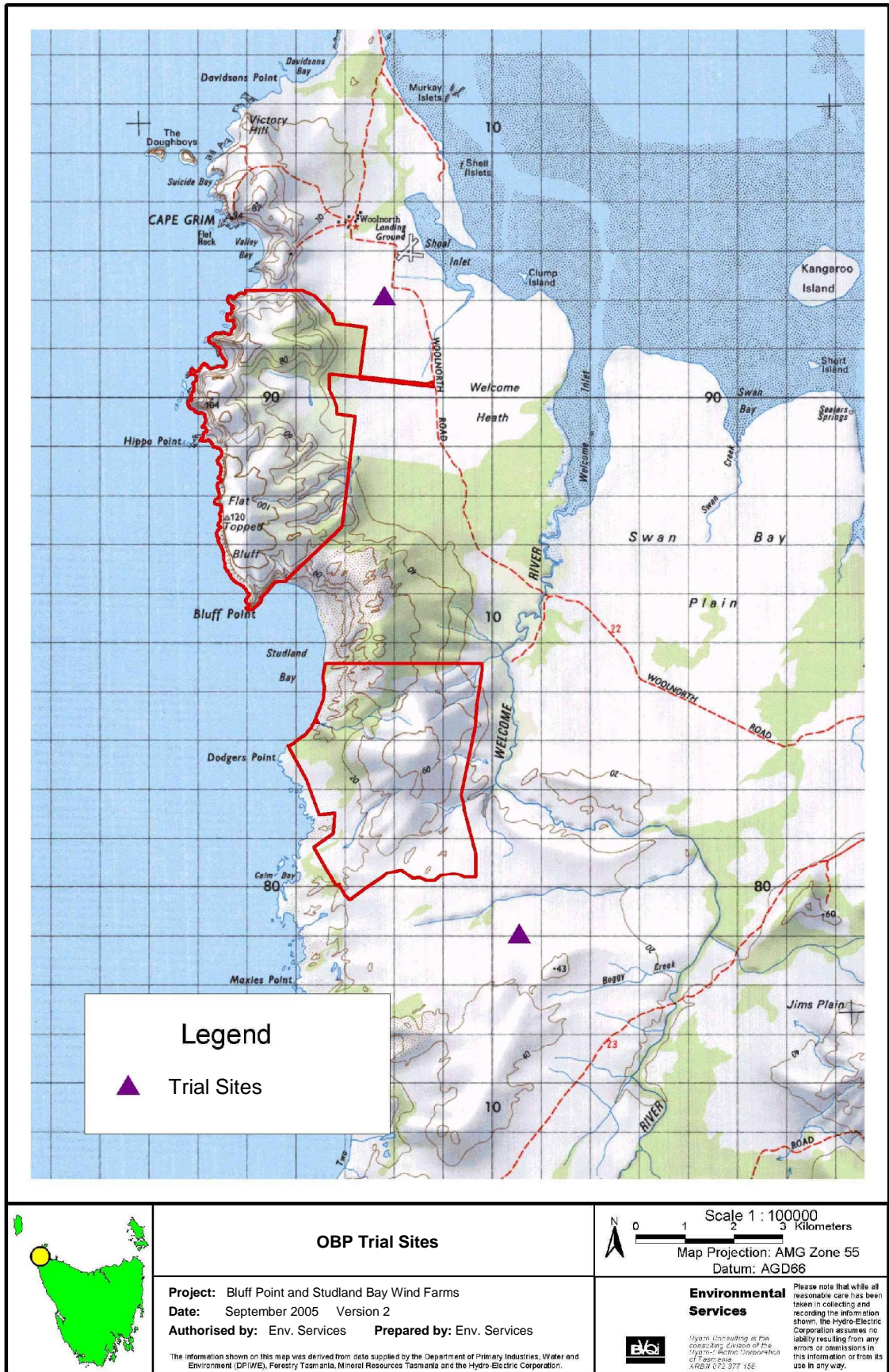
The results of the monitoring were detailed in the *Assessment of Neophema Parrot Activity, Woolnorth, Tasmania, Autumn 2004* (prepared by Plowright and Foale) which was included in the Woolnorth Wind Farm Annual Environmental Report 2004, previously provided. Monitoring was carried out from early March to late June 2004.



In summary, *Neophemas* were not observed to forage at either plot until mid-April, despite the availability of ripened seeds from mid-March onwards. Blue-winged Parrots (BWP) were recorded foraging on the northern plot site on 16 of the 41 occasions surveyed, and on the southern plot site on 42 of the 45 surveys. This suggests that BWPs would use artificial food resources if they were provided away from the wind farm sites. If we assume that the BWP acts as a suitable model for the OBP, the habitat plots could also be expected to be used by the OBP. However, only one OBP was observed on one occasion at the southern plot over the Autumn 2004 period.

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Figure 6. Location of the OBP forage habitat trials



#### 3.2.4.2 Methodology for Habitat Plot

- **Location:** The habitat plot will be established on an area of 3ha and will be located as close as practicable to the coastal salt marsh east of the wind farm sites frequented by *Neophema*. The plot may be established adjoining an existing remnant. The habitat plot site will be selected in consultation with DPIWE.
- **Treatments:** Vegetation to provide roosting habitat shall be established within the plot so as to maximise the size and vegetation density of the roosting habitat. An area of approximately 80% of the 3ha plot will be revegetated utilising tube stock of agreed species consistent with the local habitat. An appropriate local supplier will be contracted to provide the necessary material. The plot will be fenced to prevent stock intrusion. Feed habitat shall comprise up to 20% of the established habitat lot<sup>1</sup>. Sunflower, linseed and fat hen shall be seed sown as feed crop.

Vegetation established to provide roosting habitat for OBPs will be maintained to maximise establishment and the likelihood of long term survival. Maintenance of the replanted area will be conducted as a component of the existing maintenance schedule and will include, where appropriate, replacement of dead or missing plant stock from the roosting habitat for the first three years by which time it is anticipated that the vegetation would be sufficiently established to be self maintaining. In the event that the habitat plot is damaged by fire, vegetation within the plot will be re-established.

#### 3.2.4.3 Ongoing Responsibility for the OBP Habitat Plots

As part of the clarification of each subsidiary company's ongoing responsibilities, it is intended to allocate the management of one half of the habitat plot to Woolnorth Bluff Point Wind Farm Pty Ltd and the other to Woolnorth Studland Bay Wind Farm Pty Ltd.

#### 3.2.4.4 Off-Site Habitat Information

During the implementation of the Vegetation Management Plan and the Bird and Bat Monitoring Plan, it is expected that useful information will arise with respect to OBP feeding and roosting habitat in the Woolnorth region. This information will be passed on to the Trust Management Committee for their consideration as to the protection or enhancement of the areas.

### 3.3 GENERAL WEED MANAGEMENT

#### 3.3.1 Bluff Point

Gorse is the main weed of concern on the Bluff Point site, and control measures have been ongoing since the wind farm commenced operation. Works that have been carried out to date include:

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<sup>1</sup> Note that the location of the feed plot may be periodically moved to an adjacent area to allow soils to recover, this may require that the entire area available for use as feed production may not be utilised at the same time.

- Extensive infestations of gorse on the northern boundary, the south west paddock and along Coronation Lane have been pushed up into heaps and burnt. These areas have been sown to pasture and regrowth gorse seedlings have been sprayed each year.
- Gorse in the native vegetation in the south of Bluff Point has been sprayed and monitored.
- Spot spraying of gorse has been carried out in pasture areas.
- The gorse spider mite has been introduced in the Woolnorth area.

With the completion of Stage 2 of the Bluff Point project, weed control within pasture areas is now the responsibility of the Van Diemen's Land Company (VDL). Bluff Point Wind Farm will continue to be responsible for road verges, hardstand areas and remnant vegetation. Given that there are now two parties responsible for weed management, a survey will be undertaken in October of each year to map out weed infested areas requiring treatment. This will ensure that all areas of the site are managed for weeds and no areas are excluded because of miscommunication. Responsibilities for areas will be assigned to either VDL or Bluff Point Wind Farm and the work undertaken.

Gorse infestations will be treated using the standard methods of excavating, burning, spraying regrowth and spot spraying. Treatment of gorse infestations within the native vegetation in the south of the site will be a priority.

There is an extensive gorse infestation on the coastal escarpment in the north of the Bluff Point site, where gorse is growing in and amongst low scrub. Due to the very steep terrain and thick vegetation it is considered next to impossible to control the gorse through herbicide application or cutting and painting. The gorse spider mite has been introduced to the area, but its effect has been limited so far.

Bluff Point Wind Farm plans to contain the gorse in the escarpment area and to prevent it from spreading south along the coastline. There is an area of grassland on the southern edge of the gorse where the escarpment can be traversed relatively easily and yearly cutting and painting or spot spraying of any plants in this zone should prevent the gorse from spreading further south.

Gorse will be removed in accordance with one of the main principles of the Bradley Method i.e. - work will commence in areas with native plants and work towards more weed infested areas.

**Table 3: Summary of general weed management on the Bluff Point Wind Farm site**

<b>Activity</b>	<b>Responsibility</b>	<b>Implementation</b>
Weed control within pasture	VDL	Weed survey in October then treat areas required in November/December
Weed control on road verges, hardstands and remnant vegetation	Bluff Point Wind Farm	Weed survey in October then treat areas required in November/December
Gorse control on escarpment	Bluff Point Wind Farm	In conjunction with the works listed above

### **3.3.2 Studland Bay**

#### **Weed Control Works Proposed for 2006**

The works proposed for 2006 are listed in Table 2. Given that construction at the Studland Bay site is programmed to start in January 2006, close liaison between the weed control contractor and the construction personnel will be essential.

#### **Roadsides and Other Construction Areas**

Following the completion of construction of the Studland Bay Wind Farm, areas suitable for revegetation will be identified and a works program prepared and implemented. During the maintenance period after construction, the contractor will be responsible for controlling weeds along roadways and around all construction areas. After this time Studland Bay Wind Farm Pty Ltd will monitor these areas and control weeds where necessary.

#### **Post-commissioning**

When the wind farm is in operation a general pasture weed control program, similar to that conducted at Bluff Point, will be implemented in accordance with Table 1.



## 4 Reporting

Bluff Point Wind Farm Pty and Studland Bay Wind Farm Pty Ltd will report separately to the Director and the Department of Environment and Heritage once per year. Each report will contain:

### **OBP habitat manipulation**

- the results of the monitoring required under section 3.2.1 and any treatment or management works undertaken in the previous 12 months; and,

### **Weed management**

- the results of gorse management works undertaken in the previous 12 months.

## 5 Review

Bluff Point Wind Farm Pty Ltd and Studland Bay Wind Farm Pty Ltd may in their absolute discretion, undertake a review of this plan at any time. Accordingly, this plan may be amended with the approval of the Minister and the Director.