

Joint Management Plan for the Egg Islands Reserve and Egg Islands Conservation Area 2009

Huon River Estuary, Franklin



**Joint Management Plan for the
Egg Islands Reserve and
Egg Islands Conservation Area
2009**

Process to finalising the Plan

This management plan has been developed by the Tasmanian Land Conservancy (TLC) and Parks and Wildlife Service (PWS) using existing written knowledge of the land at the Egg Islands, and following consultations with many people who have an interest in the islands. These included previous owners of land on the islands, those with a long association with the islands, local field naturalists and historians, along with State government experts in nature conservation, cultural heritage, land management, geoheritage and fire management. The key points of the preliminary draft were displayed at a public event in March 2009, encouraging the community to comment and provide further information. These comments and information were incorporated into a draft management plan in July 2009.

The draft management plan was made available for public comment for a period of six weeks, until 28 August 2009. Following consideration of the received public comments this final management plan was produced and approved by the General Manager of the PWS and the Board of the TLC.

Acknowledgements

This draft management plan for the Egg Islands Reserve (owned and managed by the TLC) and the Egg Islands Conservation Area (managed by the PWS) has been prepared by Max Kitchell and Denna Kingdom (TLC), with assistance from Lynne Sparrow (PWS) and Sue Chapple (DPIPWE).

The TLC greatly appreciates the assistance of its supporters in the general public, who provided overwhelming support via donations towards the purchase of their Egg Islands Reserve. TLC supporters continue to assist towards management of the reserve, both as volunteers and through financial donations.

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Cover photo: Aerial view of the Egg Islands, looking south over black gum woodland and wetlands
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Executive Summary

Background

The Egg Islands consist of two estuarine islands covering a combined 443 ha. Almost two-thirds of this area is publicly-owned land, known as the Egg Islands Conservation Area, which is managed by the Parks and Wildlife Service. The Tasmanian Land Conservancy, a non-profit, non-government organisation, own and manage just over one-third of the islands in their Egg Islands Reserve, which is held in freehold title. This draft management plan covers all the Parks and Wildlife Service and Tasmanian Land Conservancy and excludes the remaining freehold title of 25 ha.

Most of the Egg Islands are in a natural or near-natural condition and incorporate significant nature conservation values. Important wetland and rushland vegetation communities occupy much of the southern part of the islands. In addition to this, the northern sections of the islands support rare and endangered *Eucalyptus ovata* forest and woodland, being the largest remnant in south-east Tasmania.

The relatively intact vegetation communities of the islands comprise valuable habitat for a range of fauna, especially waterbirds. There is evidence that the Egg Islands provide habitat for seven threatened or significant bird species, one threatened fish, one threatened amphibian and two threatened invertebrates.

The Egg Islands are a relatively recent landform having been created by the accumulation of fine sediment in the lower reaches of the Huon River. They are considered to be the most important and least disturbed of this class of estuarine depositional landform in Tasmania, and they are still growing with expansion of the mud flats in the south.

Even though they are now in a largely natural condition, the Egg Islands cannot be considered an untouched wilderness. Indeed, they have played an important part in the history and development of the Huon Valley. While there is no known evidence of Aboriginal occupation, the islands would almost certainly have provided a food source, principally swan eggs, for the local indigenous people. Since the early days of European settlement the islands were used for various forms of primary production and recreation including stock grazing, orchards, vegetable growing, timber harvesting, duck hunting and greyhound training. Little evidence of this use remains on the islands today, with the most significant heritage feature being a canal across the south island, first built by early-settlers in 1838.

The only access to the islands is by boat and there are no formal landing facilities. The difficulty of access coupled with the swampy terrain has meant that visitation to the islands is very low.

Management

This plan proposes that the Egg Islands be managed primarily for conservation purposes. It adopts the following overarching objective for the islands.

To identify, conserve, protect, assist people to appreciate and where necessary, restore the natural and cultural heritage values of the islands, and to ensure those values are passed on to future generations in as good or better condition than at present.

In support of this objective the management plan proposes a number of management actions aimed at:

- protecting and maintaining the existing vegetation communities;
- keeping the island predator free;
- controlling existing weed populations and preventing new weeds establishing;
- developing and implementing a fire management plan;
- conserving the integrity of the island's geoheritage;
- protecting and managing populations of threatened species;
- maintaining cultural heritage values;
- undertaking and documenting flora, fauna and cultural heritage surveys; and monitoring;
- working with the Aboriginal community to investigate Aboriginal heritage values and cultural perspectives;
- encouraging education about and interpretation of the island's natural and cultural heritage values; and
- allowing low-impact recreation and tourism where it does not compromise the conservation objective.

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Abbreviations

DPIPWE	Department of Primary Industries, Parks, Water and Environment
PWS	Parks and Wildlife Service (DPIPWE)
TLC	Tasmanian Land Conservancy

1. Background Report

1.1. Introduction

The Egg Islands are two low-lying islands situated mid-stream of the Huon River in south-east Tasmania. In total they occupy 443 ha, 64% of which is publicly-owned land, with the remaining 36% being held in freehold title.

This management plan covers all of the Egg Islands except for one freehold title of 25 ha not owned by the Tasmanian Land Conservancy (TLC), which is located on South Egg Island and presently owned by David and Tony Griggs.

This draft plan has been compiled following individual consultations with many people who have an interest in the islands. These included previous owners of land on the islands, those with a long association with the islands, local field naturalists and historians, State government experts in nature conservation, cultural heritage, land management, geoheritage and fire management.

Community feedback and information was also received from hundreds of interested people who visited the joint Parks and Wildlife Service (PWS) and TLC stall at the Focus on Franklin Festival on 29 March 2009.

1.2. Location and tenure

The northernmost point of the Egg Islands is approximately two kilometres south of Huonville, with the islands' southern extremity petering out in the shallow mud flats near Glaziers Bay. The north island is around three kilometres long and 500 metres wide and is separated from the south island by a narrow and shallow channel. The south island is approximately seven kilometres long and, at its widest, one kilometre across.

There are a number of different land tenures on the islands involving two public land managers and two private landholders. These tenures are:

i. Egg Island Conservation Area occupies land on both the north and south islands, being 163.5 ha in total. Managed by the PWS, most of this land was acquired from private landholders in 1975 in recognition of the value of the islands as an estuarine wetland, particularly as habitat and nesting sites for large numbers of water birds. It was proclaimed a conservation area in February 2000.

ii. Crown land (Public Reserves) covers 31 ha in a number of small blocks, including a recreation reserve of 5.8 ha on the south island, initially set aside for "the inhabitants of Franklin", Crown foreshore reserves of between 20 and 30 m width (above high water mark) at a number of locations on both north and south islands and a canal reserve that crosses the south island opposite Franklin.

iii. Unallocated Crown land that occupies 88 ha, almost all of which is in the southern parts of the south island. There is also a narrow 20 m strip (originally surveyed as a road reserve) across the top of the north island.

Both the reserved and unreserved areas of Crown land are administered by Crown Land Services within the Department of Primary Industries, Parks, Water and Environment (DPIPWE).

The Crown Land Assessment and Classification Project Team recommended in 2005 that all the Crown land on the Egg Islands be transferred to the management of PWS

and be added to the Egg Islands Conservation Area. At the time of publication this transfer had not occurred.

iv. Freehold land owned by the TLC which covers 136 ha on both the north and south islands. This land was purchased in 2007 from three separate landholders using funds provided by public donations and the Australian Government's National Reserve System Program.

It is the TLC's intention to retain this land as a permanent reserve for conservation purposes. To this end, the TLC has registered a conservation covenant under the *Nature Conservation Act 2002* over the land which requires it to maintain the property's conservation values. It also intends to seek proclamation of the area as a private sanctuary under the Act, thus ensuring that it and the adjoining Egg Island Conservation Area have consistent management objectives into the future.

v. Freehold land (in 2009 owned by members of the Griggs family) consisting of one title of 25 ha in the south-western part of the south island. This land has been in the Griggs family for three generations. The management plan does not apply to this land.

These different land tenures are shown in Map 1.

1.3. Access

Access to the Egg Islands is only possible by water. There are no longer any jetties or other landing infrastructure to facilitate such access.

1.3.1. TLC PUBLIC ACCESS POLICY STATEMENT

As a community-based organisation, the TLC strongly supports public involvement in the management of the Reserve and will not unreasonably refuse public access in future where such access preserves or enhances the natural values of the Reserve. However, the TLC will refuse access where this may result in a detrimental impact on the values of the Reserve.

1.4. Background to the Egg Islands

1.4.1. MANAGEMENT HISTORY

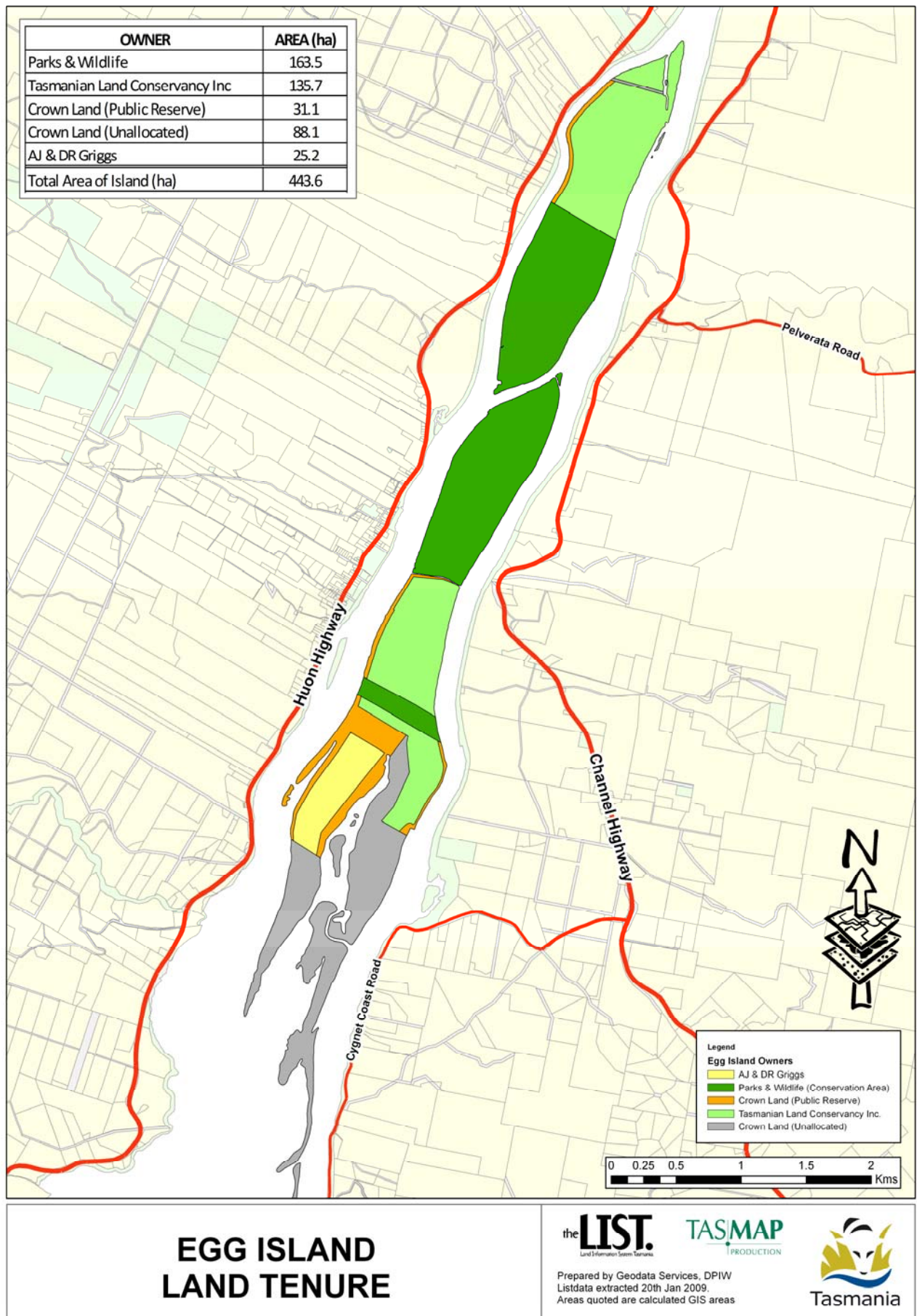
While the Egg Islands currently appear to be in a natural or near-natural condition, they could not be considered to be pristine. Significant parts of both islands have been subject to various uses over many years.

During the initial settlement of the Huon Valley in the 19th century, most of the land on the islands was subdivided and sold into private ownership. In every case these owners had landholdings on either the eastern or western sides of the Huon River opposite the islands. Therefore, the islands were used as an adjunct to their principal properties and not as their primary enterprise.

Much of the land was too swampy for agricultural purposes so many drains were dug, almost all by hand, across the better areas to "improve" the land. Some clearing was done at the northern ends of both islands where vegetables were grown pre-World War II. There was also a substantial apple and pear orchard on the northern end of the south island. Indeed, between the 1930s and 40s, a family lived in a house on this site.

Cattle and sheep have been grazed on both islands over many years. Much of this was rough bush grazing but there were areas that were ploughed to improve pasture growth.

Map 1 – Context and tenure of the Egg Islands



A sawmill operated for a time on the drier banks in the north of the north island. A greyhound training track was also constructed on the north-western part of the north island and apparently a lease was taken out by the Commonwealth Government during either the Boer War or the First World War for a rifle range on the south island. It is not clear whether the range was ever constructed or used.

Sometime around the 1850s, a canal was built across the south island to facilitate travel between the east and west sides of the Huon River. Some records suggest that the canal may have been dug using convict labour in 1838, although close scrutiny of original documents do not show the existence of a canal until the 1850s. For many years a ferryman operated a service across the river and through the canal, taking people to and from Franklin, which was then the major population centre in the Huon Valley.

In the memories of a few of the descendents of early settler families is discussion of the Franklin recreation ground being located on the south island, possibly on the Crown recreation reserve. Franklin was built on the side of a hill and in those days the only nearby flat land for sporting activities was on the islands. Whether or not a recreation ground was ever constructed is unclear. However, there is no evidence of such a facility on the islands at the present time.

Most of the abovementioned uses were historical with all horticulture ending after WWII and livestock grazing ending prior to the 1980s.

1.4.2. GEOLOGY, GEOMORPHOLOGY AND SOILS

The Egg Islands are a depositional landform created by the accumulation of fine sediment in the lower reaches of the Huon River. The Late Quaternary marine transgression flooded the possibly braided channel of the river, which until then was a deglaciated gravel outwash stream and alluvial plain. Sea level reached approximately its current level some 6000 years ago, so the Egg Islands are relatively recent in geological terms, and consist of actively evolving landscape features. Indeed, it would appear that the south island has grown significantly since the time of first European settlement. Comparison of current aerial photography with the earliest Crown surveyors maps indicate that the mud flats at the southern tip of the islands have expanded substantially over the past 160+ years.

The Egg Islands are listed on the Tasmanian Geoconservation Database as a feature of significance. This significance led to them being nominated for listing on the Register of the National Estate, but before the nomination could be assessed, amendments to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* led to the Register being frozen. No further additions to the Register will occur.

Despite the fact that the Egg Islands have received no formal, statutory recognition of their geoheritage significance, they are regarded as the premier and least disturbed example of this class of estuarine depositional landform in Tasmania.

The underlying geology of the Egg Islands comprises dolerite and related rocks of the Jurassic age. These are overlain by undifferentiated Quaternary sediments and sand, gravel and mud of alluvial, lacustrine and littoral origin.

There is no record of any soil mapping having been done on the islands. It would be expected that the soils would be light in nature with low clay content, possibly with acidic top layers and alkaline sub-layers. At least in some areas the soils were deep

and friable enough to have grown good root crops (carrots, parsnips, potatoes, etc) in the 1930s and 40s. There are also significant areas of peat soils.

1.4.3. LANDSCAPE

The Egg Islands are the major landscape feature to the east of the main highway south of Huonville. They are visible from this major tourist route for their full 10 km length and also form an important part of the scenery for most of the many residents living on the hillsides between Huonville and Castle Forbes Bay.

The islands are an integral part of the landscape in the lower Huon Valley, an area renowned for its scenic beauty.

1.4.4. CLIMATE

Being land masses in the middle of an estuary, the Egg Islands enjoy a maritime climate with prevailing winds from the south-west. The islands are around mid-way between the Bureau of Meteorology's recording stations at Geeveston, to the south, and Grove, to the north. Local experience would indicate climatic conditions on the Egg Islands would be closer to those experienced at Grove which has mean annual rainfall of 743 mm, well distributed throughout the year but with the wettest month being August at 76.7mm and the driest February with 46.9mm. February is also the hottest month with mean maximum temperature being 22.4°C and July the coldest at 11.8°C. Unlike Grove, the islands do not suffer severe frosts or the same extremes of cold temperatures due to the buffering effect of the surrounding estuary.

1.4.5. HYDROLOGY

The dominant hydrological feature of the Egg Islands is the periodic inundation of all or parts of their land mass. Some of the lowest-lying of the mud flats at the southern end of the south island go under water on an almost daily basis at high tide. The degree of inundation varies according to the height of the tides and the level of the river. The most extensive flooding of the islands occurs when high tides correspond with strong southerly winds and high flows in the Huon River.

Floods in the Huon River have been significantly mitigated since construction of the Lake Pedder dam in 1972, such that the last event that led to the complete inundation of the islands occurred 42 years ago in 1967, following the catastrophic fires of earlier that year.

Water tables on the islands are naturally high. Early landholders dug large numbers of drains to depress the water table and to clear floodwaters to better enable them to grow crops and provide feed for stock. At the end of these drains were tide-weights that prevented water flowing in at high tide and then opened to allow water out at low tide.

Climate change and resultant sea level rise will have a significant impact on the islands over the long-term. The most authoritative source for estimates of sea level rise is the United Nations' Intergovernmental Panel on Climate Change (IPCC). In its third and fourth assessment reports the IPCC's most pessimistic estimates of the magnitude of sea level rise between 1990 and 2100, range from a minimum of 18 cm to a maximum of 88 cm. Recent analysis of observed sea level change since 1990 indicates that sea levels are currently rising along the uppermost trajectory of the IPCC's projections. In the event that sea levels were to rise by 88cm over the course of this century, then most of the Egg Islands would be permanently under water.

Water salinity of the Huon River around the islands varies substantially throughout the year, with winter and spring bringing high volumes of fresh water down the river and forcing sea water further down the estuary. During summer and autumn, low flows down the river result in more brackish water flowing around the islands, with salinity increasing to that of sea water during king tides. An increase in sea level may see saltier water covering areas currently only flooded by fresh water. This, in turn, will impact on the presence and distribution of those vegetation communities and individual flora and fauna species intolerant of saline conditions.

1.4.6. VEGETATION

Seven native vegetation communities have been identified on the Egg Islands. In addition there are small areas of regenerating farm land on both the north and south islands. The distribution of these communities is described below, outlined in Table 1 and shown in Map 2.

Table 1: Vegetation communities recorded on the Egg Islands

Vegetation community	TasVeg code	Area (ha)	Threat status*
Saline sedgeland/rushland	ARS	114	Vulnerable
Freshwater aquatic herbland	AHF	5	Vulnerable
Freshwater aquatic sedgeland and rushland	ASF	1	Vulnerable
Restionaceae rushland	MRR	8	
Black gum (<i>Eucalyptus ovata</i>) forest and woodland	DOV	172	Rare, Endangered
Wet heathland	SHW	7	
<i>Melaleuca squarrosa</i> scrub	SMR	121	
Regenerating farmland	FRG	15	

* As listed under the *Tasmanian Nature Conservation Act 2002*

Wetland and rushland vegetation communities

Four of the seven native vegetation communities on the Egg Islands can be classified as wetlands or rushlands,

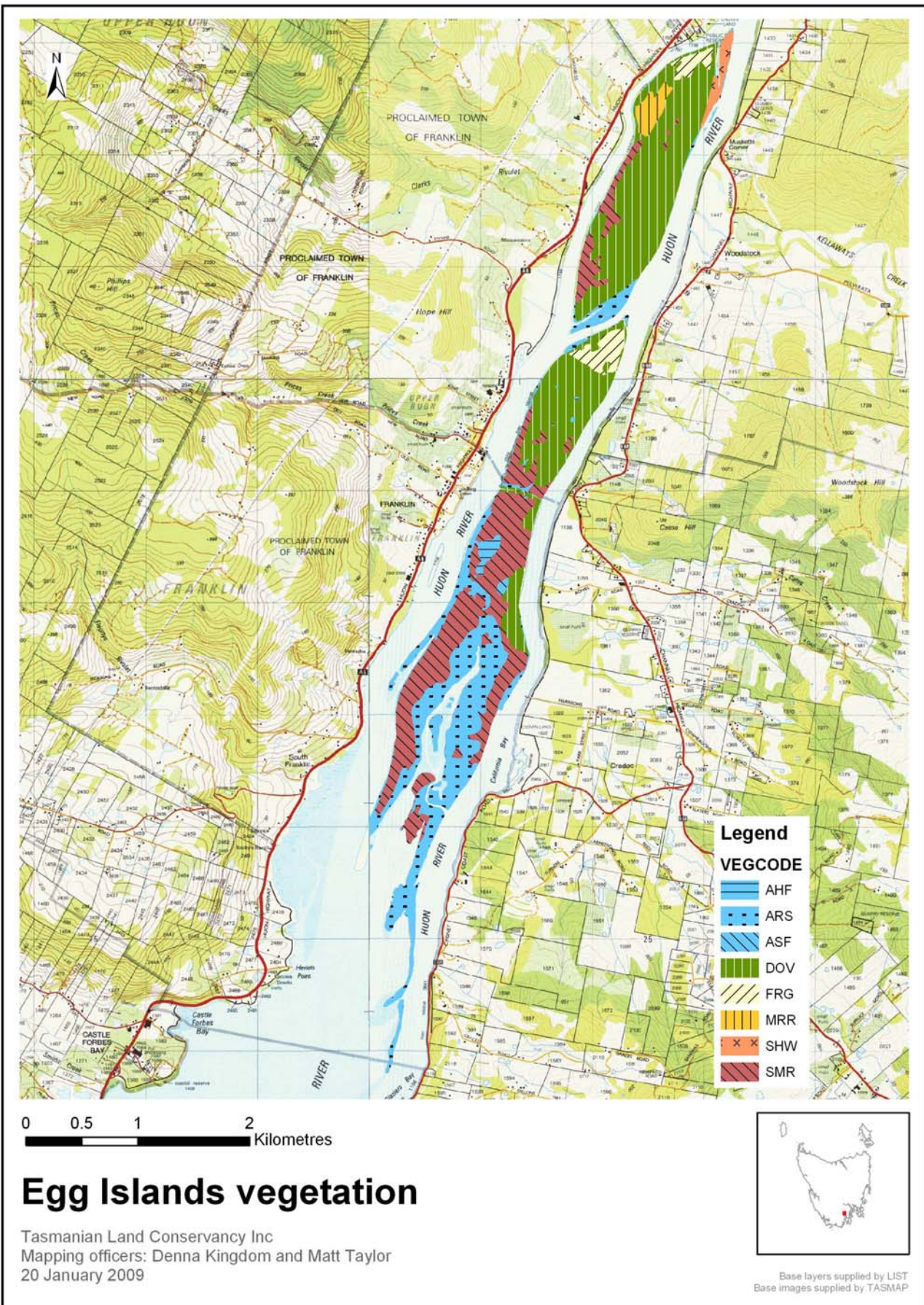
- Saline sedgeland/rushland or saltmarshes
- Freshwater aquatic herbland
- Freshwater aquatic sedgeland and rushland
- Restionaceae rushland.

Saltmarshes on the Egg Islands have developed on the lowest-lying areas of the islands, most of which are subject to periodic inundation. They occur predominantly on the southern part of the south island and have colonized the most recently-formed sections of the islands, including those actively-developing areas that have appeared since European settlement. Typically they consist of saline sedgeland/rushland dominated by *Gahnia filum* and *Juncus kraussii*.

Saltmarsh vegetation communities are highly productive systems as a result of the nutrient inputs from both land and sea. They create important habitat, providing breeding grounds for many species of fish, water birds, amphibians and insects.

Saltmarsh communities also provide a significant ecological function, filtering water and dispersing heavy flow in times of flood. Indeed, it has been demonstrated that the Egg Island saltmarshes act as a sink for both agricultural nutrient run-off and for silt loads generated by upstream activities.

Map 2 – Vegetation communities of the Egg Islands



Saltmarsh communities are very susceptible to damage by physical disturbance and elsewhere in Tasmania have been severely impacted by drainage, grazing and vehicle activity. While fire is not common in saltmarshes, if burnt when very dry rehabilitation is very slow. The saltmarshes on the Egg Islands have not suffered from these threatening processes and are, as a consequence, in very good ecological condition.

The other three freshwater wetland and rushland communities are much more restricted in extent than the saltmarshes occurring in relatively small patches across both islands. Like the saltmarshes, they are highly productive ecosystems, in good condition and providing important habitat for a range of native fauna species.

The freshwater herbland includes permanent or semi-permanent freshwater with floating or emergent herbaceous vegetation. The sedgeland and rushlands include sedges and rushes of a number of species (including those in the genera *Juncus* and *Carex*), and vary in height from 0.5 m to 1m. standing in fresh to brackish water.

Black gum (Eucalyptus ovata) forest and woodland

Black gum (*Eucalyptus ovata*) forest and woodland (DOV) occupies the majority of the north island and most of the top third of the south island. *Eucalyptus ovata* is the dominant overstorey species with an understorey of shrubby species including *Leptospermum scoparium* and species of *Lepidosperma*, *Melaleuca*, *Juncus* and *Carex*.

Elsewhere in Tasmania this vegetation community occupied relatively flat and moist sites and was, therefore, cleared extensively for agriculture. Only 11,500 ha of black gum forest and woodland remains in Tasmania from a pre-1750 estimate of 232,000 ha. In the south-east bioregion, less than 10% of the remaining area of this vegetation community is reserved for conservation. The remnant community on the Egg Islands is the largest in south-east Tasmania.

Notwithstanding the clearance of small sections of black gum forest and woodland in the 19th century, on the Egg Islands this vegetation community is in good condition. There is little evidence of either weed invasion or of the impacts of fire or disease.

In addition to its intrinsic significance, black gum forest has very important habitat value, especially for the endangered swift parrot that has been observed foraging on the islands.

An extensive hot fire in the late 1970s or early 1980s burnt much of the southern half of the south island. It is likely that most of the area that supported black gum vegetation that burnt in this fire regenerated as *Leptospermum* and *Melaleuca* scrub, as these shrubby species are far more competitive after fire than *Eucalyptus ovata*. However, young black gum trees have been observed growing within the areas burnt by this fire and it is likely that in the absence of further fire these areas will revert to woodland dominated by black gum.

Scrub and heathland

The scrub and heathland vegetation communities on the Egg Islands occur on areas of poor drainage and are comprised of two separate vegetation communities. The most widespread of these communities is *Melaleuca squarrosa* scrub (SMR) that occupies large areas on the south island with smaller stands occurring on the western side of the

north island. This community forms a closed canopy that includes *Leptospermum scoparium* and *Acacia verticillata*.

Wet heathland (SHW) occupies small areas on both islands and contains *Leptospermum* and *Melaleuca* species with *Gahnia grandis* and a mixture of rushes, sedges and herbs.

These communities form parts of successional pathways with wet heath expected to succeed to scrub over time. Similarly *Melaleuca squarrosa* scrub may become black gum forest as it gains height and loses diversity. This appears to have happened near the canal on the south island.

Both of the scrub and heathland vegetation communities on the islands appear to be in excellent condition and provide significant habitat, especially for birds.

1.4.7. FLORA

A detailed flora survey of the Egg Islands has not been conducted although visits by TLC staff and volunteers since February 2008 have enabled the compilation of the flora species list at Appendix 1. No threatened flora species have been recorded to date.

1.4.8. FAUNA

A formal, rigorously-conducted fauna survey of the Egg Islands has not yet been conducted. There has, however, been considerable documentation of bird species recorded by PWS officers when visiting the area between 1973 and 1986. These records, combined with the observations of local field naturalists and recent visits to the islands by TLC staff and volunteers, has enabled the compilation of the fauna species list at Appendix 2.

The islands' relatively intact vegetation communities and absence of introduced predators make the area valuable habitat for water birds in particular. The islands have been recognized as one of the state's most important breeding grounds for black swan and chestnut teal. They are also used for nesting by a range of other bird species, including the swamp harrier (*Circus approximans*).

There is evidence that the Egg Islands serve as habitat for seven threatened or significant bird species, one threatened fish, one threatened amphibian and two threatened invertebrates. These species are listed in Table 2.

Table 2: Threatened and significant species recorded or with potential habitat on the Egg Islands

Species name	Common name	TSPA*	EPBCA**	Comments
<i>Botaurus poiciloptilus</i>	Australasian bittern	-	-	Listed by the International Union for the Conservation of Nature as endangered globally, though recognition of its threat status under either Tasmanian or Commonwealth legislation has been hampered by lack of knowledge of its population or extent. This species has been observed in the rushland sections of the islands and is presumed to nest there.

<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle	v	-	Also protected as a migratory species under the China-Australia Migratory Bird Agreement by the EPBCA. This species is often observed patrolling over the Egg Islands which provides habitat for prey species. There is no evidence of nesting on the islands, although there are some areas with suitable nesting habitat.
<i>Accipiter novae-hollandiae</i>	grey goshawk	e	-	Has been observed roosting, but not nesting, on the islands. As for the sea eagle, it is likely to hunt for prey on the islands.
<i>Aquila audax</i>	wedge-tailed eagle	e	EN	This species is often observed patrolling over the Egg Islands which provides habitat for prey species. There is no evidence of nesting on the islands, although there are some areas with suitable nesting habitat.
<i>Lathamus discolor</i>	swift parrot	e	EN	This migratory species has been sighted on and near the islands and is known to utilize stands of black gum and blue gum (<i>E. globulus</i>) for feeding and nesting.
<i>Tyto novae-hollandiae</i>	masked owl	e	-	The islands are likely to support breeding and feeding habitat. This species has not been observed on the Egg Islands, although has been recorded nearby.
<i>Gallinago hardwickii</i>	Latham's snipe	-	-	Subject to the Japan-Australia Migratory Birds Agreement and the Republic of Korea-Australia Migratory Birds Agreement. This species has been sighted on both islands.
<i>Prototroctes maraena</i>	Australian grayling	v	VU	This fish species has been recorded in the Huon River. Listed as threatened due to a decline in the population resulting in rarity across its range.
<i>Litoria raniformis</i>	green and gold frog	v	VU	This species has not been observed on the Egg Islands, although has been recorded nearby.
<i>Lissotes menalcas</i>	Mt. Mangana stag beetle	v	-	Potential habitat may occur on the Egg Islands, although the species has not been observed.
<i>Antipodia chaostola leucophaea</i>	chaostola skipper	e	-	Listed as threatened due to due to a restricted distribution, low population density, and habitat loss. The larvae of this moth species live and feed exclusively on the sedge <i>Gahnia radula</i> , which may occur on the Egg Islands.

* Tasmanian Threatened Species Protection Act 1995 e=endangered, v=vulnerable

** Commonwealth Environment Protection and Biodiversity Conservation Act 1999

EN=Endangered, VU=Vulnerable

There are no records of any work having been done on invertebrates and few observations of amphibians although the wetland habitats in particular are likely to be rich in this fauna. Likewise there are few records of reptiles other than tiger snakes, for which the islands are infamous. Indeed, many locals refer to the islands not as Egg

Islands but as Snake Islands. At one stage snakes were collected from the islands for the production of antivenin.

It is also possible that further species of conservation significance may be present at the Egg Islands, and that species that are not currently of conservation significance may become so in the future.

1.4.9. CULTURAL HERITAGE

The Tasmanian Aboriginal Site Index has no listing for the Egg Islands, though there has been no investigation or surveys of indigenous heritage undertaken on the islands. The lack of formal identification of Aboriginal relics does not, in itself, demonstrate that the islands played no part in the lives of the local indigenous peoples. Isolated artefacts have been recorded on the eastern side of the Huon River, close to the islands and it seems highly likely that swan eggs would have been collected from the islands. The original Protector of Aborigines, George Augustus Robinson, noted in his journal of 25 September 1830, "...on one occasion when the natives came down to the Huon to collect eggs...". As the islands were a rich source of swan eggs which were an important element of the Aboriginal diet, it is likely that they were used as a food larder by the local tribes.

While it is probable that the islands were utilised as a food source, it seems unlikely that the indigenous people spent much time living there given the swampy nature of the terrain, although this suggestion is only speculative.

As indicated in the earlier section on Management History, there has been considerable use of the islands since European settlement of the Huon Valley. Most of this activity related to primary production and recreation. To summarise the islands have been used for:

- grazing of dairy and beef cattle, sheep and goats;
- apple and pear orchards;
- vegetable growing;
- timber harvesting;
- greyhound training;
- recreation ground (possible);
- rifle range (possible); and
- duck hunting.

Very little evidence of these activities remain today although there are some signs of past uses, for instance:

- cleared areas in the northern sections of both islands indicate where orchards and vegetables were grown;
- remains of hand-dug drains;
- house site on north-east tip of the south island;
- some derelict stock fencing; and
- remains of jetties.

Perhaps the most significant remaining European heritage feature is the man-made canal through the south island. During the early days of settlement the islands formed an effective barrier between Cradoc and Franklin, then the major industrial and

population centres in the Huon Valley. There was a natural channel between the islands but it was not navigable, hence a ferry service was instituted across the south island. In the initial period the ferry boat was carried across the island by the unfortunate passengers. Sometime around the 1850s, the first canal was dug across the south island opposite Franklin, with records showing it to have been ten feet wide and four feet deep.

At some point in subsequent years the canal silted up and became un-navigable, leading the government to allocate the sum of 300 pounds for the construction of a new canal. This was to be double the width and depth of the original and followed the original route for around 160 metres before slightly diverging from this first route. The work was undertaken using a team of horses dragging a dredge, by Henry Clark, whose descendants still live in the area. The work took 45 weeks and was completed in April 1885. The canal remains navigable for small craft to this day.

None of the above evidence of European occupation is recognized on Tasmanian or Commonwealth heritage registers.

1.4.10. ENVIRONMENTAL DEGRADATION

Introduced species

A comprehensive survey to identify the nature and extent of weed infestation on the Eggs Islands was conducted in 2008. This was a joint project between the TLC and PWS and led to the development of a weed management strategy for the islands. A copy of the strategy is included in Appendix 3.

The survey revealed that, for the most part, the islands were not severely impacted by weeds. However, a total of 24 exotic species were identified. Of these, nine species were identified as a high priority for control – boneseed, willow, gorse, Scotch broom, canary broom, Spanish heath, sweet briar, blackberry and pampas grass. These species are all highly invasive, disperse easily and heavily impact on ecosystem processes. Blackberry, willows, gorse and boneseed are all classified as weeds of national significance, and pampas grass is a declared weed in the Huon Valley municipality under the *Tasmanian Weed Management Act 1999*.

The majority of weeds were recorded in, or close to, areas that had been cleared or otherwise physically disturbed in the past. New Zealand flax was the only one of the recorded weed species where mature plants were regularly recorded in relatively natural areas.

No similar survey work has been undertaken to identify introduced animal species. While rats have been observed on both the islands and there is anecdotal evidence of rabbits, the likelihood of feral animals becoming established on the Egg Islands may be low due to the islands being surrounded by water.

Deforestation

Relatively small areas, principally in the north of both islands, were cleared in the early 20th century for horticulture. Some timber harvesting occurred in the north-east section of the north island and individual eucalypts were taken for various farming and domestic purposes over the years.

Some ploughing took place under and around trees on the south island in order to encourage native pasture growth, but this did not involve felling the overstorey.

There has been no clearing or ploughing since before the 1960s.

Disease

No diseases of either native plants or animals have been recorded on the islands. However, potential exists for the introduction of *Phytophthora cinnamomi*, which causes dieback and/or death of a wide range of native plant species. *P. cinnamomi* is transported via the transfer of infected soil from one place to another, which can be prevented by simply ensuring that items that may carry soil, including boots, tents and camera tripods, be washed prior to entering the reserve.

Potential also exists for the introduction of chytrid fungus (*Batrachochytrium dendrobatidis*), which currently threatens Tasmania's native amphibians. The fungus infects the skin of frogs destroying its structure and function, and can ultimately cause death. Introduction of this disease can be prevented by ensuring that no frogs or tadpoles are brought to the islands, and ensuring that items that may carry mud or have been in other water bodies are cleaned and dried prior to being brought to the islands.

Erosion and sedimentation

The only soil erosion evident on the islands is some very minor river bank erosion, probably caused by flood events. There is the potential for bank erosion to be exacerbated in the event of sea level rise or if there was a significant increase in power boat activity in the Huon River.

As a depositional landform, sedimentation is not a degradational process on the Egg Islands; it is, in fact, the life-force of the islands. Sedimentation formed the islands and continues to actively expand the islands to the south.

Inappropriate fire regime

The fire history of the islands is relatively unknown, although many locals can recall significant fires on the islands that burnt for several weeks in the mid 1980s. Evidence of these fires are apparent in the black gum woodland on the south island, including fire scars on trees and 'steps' in the soil surface indicating where peat soils have been burnt. Peat soils are very slow to form and are particularly susceptible to fire when dry, with fires burning slowly through the soils for long periods of time.

1.4.11. VISITATION

With the exception of those who owned the land, the Egg Islands have received very few visitors over the years. Difficulty of access and the wet and marshy nature of the land have not encouraged people to visit. Furthermore, the islands reputation for high numbers of venomous snakes has deterred all but the most curious.

In the past, the most common visitors were duck hunters who made regular use of the islands during the hunting season. Some rough duck hides were built but most hunting occurred from boats, shooting across the islands.

Game bird numbers were significant enough for the PWS, in the late 1980s, to contemplate creating a game reserve over the islands. This proposal did not proceed and hunting virtually ceased when large parts of the islands were declared a Conservation Area in 2000.

1.4.12. ADJACENT LAND USE

The Egg Islands are surrounded by the Huon River tidal estuary, the bed of which is unallocated Crown land. The government has recently accepted a recommendation from the Resource Planning and Development Commission for the creation of a marine protected area over all those waters adjacent to the islands. The principal reasons for the creation of the marine protected area were to protect the estuarine ecosystem and the habitat of the endangered grayling.

The Huon Estuary Marine Conservation Area surrounds the Egg Islands, and extends north to the Huon River bridge at Huonville. This area is reserved under the *Nature Conservation Act 2002* and managed according to the provisions of the *National Parks and Reserves Management Act 2002*.

1.5. Legal Requirements for Management

There are a number of local, state and national statutory and policy instruments that apply to the Egg Islands and, therefore, influence the way they can be used and managed. A brief summary of each of these follows.

i. *Tasmanian National Parks and Reserves Management Act 2002* establishes the purposes for which a Conservation Area and Private Nature Reserve are reserved and the management objectives for such an area. The provisions of the Act apply to the existing Egg Islands Conservation Area and will apply to the Crown land once it is transferred to Conservation Area status. The provisions of this Act will also apply if TLC is successful in its application for Private Nature Reserve status over their land.

ii. *Tasmanian Threatened Species Protection Act 1995* provides protection to all listed threatened species of which there are nine known on or around the islands. It is an offence to knowingly disturb or destroy a listed species without a permit.

iii. *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* provides protection to nominated matters of national environmental significance including listed threatened species and species subject to international agreements. Four listed species are known on or around the islands, of which one (Latham's snipe) is subject to the Japan-Australia Migratory Birds Agreement and to the Republic of Korea-Australia Migratory Birds Agreement, and another (white-bellied sea-eagle) is subject to the China-Australia Migratory Birds Agreement.

The implication of the application of the *EPBC Act* is that management actions that will have, or are likely to have, a significant impact on a listed species cannot occur without the written approval of the Australian Government Minister for Environment, Water, Heritage and the Arts.

iv. Covenant under the ***Tasmanian Nature Conservation Act 2002*** has been taken out by the TLC over its land. The covenant is aimed at ensuring the protection of the conservation values of the TLC's land and has the force of a statutory document that binds the TLC to its provisions.

v. *Tasmanian State Coastal Policy* applies to the islands. The three main principles of the policy are:

- natural and coastal values of the coast shall be protected;
- the coast shall be used and developed in a sustainable way; and

- integrated management and protection of the coastal zone is a shared responsibility.

vi. Huon Planning Scheme 1979 is administered by the Huon Valley Council and is the local government planning instrument that covers the Egg Islands. The scheme has three zones that apply to the islands:

- a conservation zone that covers almost all of the privately-owned land as well as that part of the Egg Island Conservation Area on the north island
- a nature reserve zone that incorporates portion of the TLC land on the north island and that part of the Egg Islands Conservation Area on the south island
- a public purposes zone that includes all the Crown land, both reserved and unallocated.

The scheme is currently under review by the Huon Valley Council.

vii. Potential future legal requirements for management In addition to the Conservation Covenant that has been placed on TLC's land, application will be made to the State to have this land declared a Private Nature Reserve under the *Nature Conservation Act 2002*. This status does not impose any restrictions on the TLC, but imposes restrictions upon the public that are enforceable by law. The objective is to ensure that the Egg Islands Conservation Area and the Egg Islands Reserve can be managed in a consistent manner for conservation.

2. Reserve Management

2.1. Overarching Objective

This plan covers land of three basic tenures in total covering all except 25 ha of the land mass of the Egg Islands. They are:

- **Egg Islands Conservation Area managed by the PWS.** Under the *Nature Conservation Act 2002*, the purpose for which a Conservation Area is reserved is “the protection and maintenance of the natural and cultural values of the area of land and the sustainable use of that area of land”.
- **Reserved and unallocated Crown land administered by Crown Land Services within DPIPWE.** As all the reserved and unallocated Crown land has been recommended by the Crown Land Assessment and Classification Program for addition to the Egg Islands Conservation Area, for the purposes of this section of the plan it will be considered to be part of the Conservation Area.
- **Freehold land owned by the TLC.** The land was acquired with the intention that it be managed in a way that ensures the protection of its natural and cultural heritage values. This was the expectation of donors who contributed to the land’s purchase. Funding provided from the Australian Government’s National Reserve System Program was conditional on management of the land being consistent with an IUCN Category IV reserve: that is, a Habitat/Species Management Area which is managed mainly for conservation through management which ensures the maintenance of habitats for specific species.

Taking account of the above requirements for management of the different tenures and the intrinsic values of the islands themselves, the following overall objective has been adopted for the Egg Islands.

To identify, conserve, protect, assist people to appreciate and, where necessary, restore the islands’ natural and cultural heritage values, and to ensure those values are passed on to future generations in as good or better condition than at present.

This objective will guide all future management of the Reserve and provides a basis from which more detailed management objectives and prescriptions have been derived.

2.2. Identification, conservation and restoration of values

This plan uses the Conservation by Design assessment model, developed and extensively used by The Nature Conservancy across the world, to determine the priority of conservation values and assess the threats to these values. The process determines which values are recognized as conservation targets and these become the focal points for management.

Conservation targets are prioritized on their regional, state or national significance, habitat value, ecological function and threat status (statewide and/or national). Table 3 outlines the priorities allocated to each natural and cultural heritage value identified for the islands and provides justification.

Table 3: Prioritisation of conservation values

Value	Priority	Justification
Wetland and rushland vegetation communities	High	<ul style="list-style-type: none"> – highly productive environments – habitat for large numbers of waterbirds; – performs key ecological function in maintaining water quality in Huon River; – 3 of 4 communities are listed as vulnerable.
Black gum forest and woodland	High	<ul style="list-style-type: none"> – community severely depleted elsewhere; – largest remnant in southern Tasmania; – listed as endangered; – important habitat for endangered fauna species.
Scrub and heathland communities	Low	<ul style="list-style-type: none"> – widely distributed throughout the state; – under no current threat.
Geoheritage	High	<ul style="list-style-type: none"> – best example of an estuarine depositional landform in Tasmania; – listed on Tasmanian Geoconservation Database.
Threatened species	High	<ul style="list-style-type: none"> – habitat for seven threatened or otherwise significant bird species, one threatened fish, one threatened amphibian and two threatened invertebrates
Cultural heritage	Moderate	<ul style="list-style-type: none"> – interesting history of European land use; – probably, but unknown, Aboriginal use.

2.2.1. WETLAND VEGETATION COMMUNITIES

*Conservation priority: **HIGH***

The four wetland/rushland vegetation communities (saltmarshes, freshwater herblands, sedgeland and rushlands) cover 128 ha or 29% of the Egg Islands. They are highly productive environments supporting a diverse range of fauna, providing habitat for large numbers of water birds and performing the key ecological function of maintaining good water quality in the Huon River by acting as a sink for nutrients and sediments.

Three of the four wetland/rushland vegetation communities on the islands are listed as vulnerable under the *Nature Conservation Act 2002*. The vulnerable communities cover 120 ha.

Key threatening processes and sources of threats

Processes that threaten wetland communities may lead to the loss of natural biological diversity. There are a number of mechanisms that could lead to such an outcome.

Sea level rise poses the greatest threat to the islands' wetland communities in the long term. With climate change expected by the Intergovernmental Panel on Climate Change (IPCC) to result in sea level rises of more than 80cm by the end of the century, most of the wetlands will be affected. This may include a change in the extent of the wetlands (increase or decrease) and a change in the mix of species making up the wetlands vegetation communities. Climate change is, of course, a global issue and there are no specific management actions that could be undertaken on the islands that would halt or reduce the impact of this threat. Neither is it realistic to anticipate any local adaptation measures, such as the building of barrages that could protect the wetlands from inundation. Support for local, state and national initiatives to combat climate change as part of an international effort is the best response available to managers of the islands.

Wetlands are well adapted to high levels of native animal grazing but not to the hard hoofs of domestic livestock which break up vegetation layers and pug the underlying substrate. Weeds, which otherwise might be at innocuous levels and having little impact, can spread rapidly as a result of livestock grazing. Indeed, any disturbance to the vegetation and soil, such as vehicular use and fire, can lead to compounding impacts through the invasion of weeds. Fortunately, vehicular use is not an issue on the islands and livestock have not been grazed on the islands since before the 1980s.

Intense hunting of ducks under certain extreme circumstances could potentially have an impact on water bird numbers and create disturbance to non-target species. There has been little hunting on the islands for some years and there is no evidence that past hunting activity has adversely affected the wetland communities.

Chytrid fungus could have an impact on frog species diversity and populations if it were introduced to the islands. A change in frog populations could have a resultant impact on invertebrate diversity.

Lack of information on the biodiversity wetland communities could itself lead to adverse outcomes. It is important to determine the full extent and nature of the area's biodiversity in order to be confident in making long-term management decisions. The response to change will need to be monitored to inform management and data arising from survey and monitoring will need to be managed for the long-term, e.g. through entry into DPIPWE's Natural Values Atlas.

Conservation Objective

Maintain the natural biological diversity of the wetland vegetation communities.

Management Actions

Threatening process	Source of threat	Management Action (priority)
Loss of natural biological diversity	Weed invasion	Prohibit the importation of non-indigenous plant species to the islands (High)
		Implement the Egg Islands Weed Strategy 2008-2013, including: - prevention of weed establishment in high priority areas; - removal of significant weed species in high priority areas; - monitoring and mapping of weed extent (High)
	Disease prevention	Implement hygiene procedures to prevent the introduction of chytrid fungus (High)
	Stock grazing	Maintain grazing-free status of the islands (High)
	Inappropriate fire regime	Develop and implement a fire management plan for the islands, using controlled fire only for the purpose of biodiversity maintenance (Moderate)
	Duck hunting	Prohibit hunting on or over the islands (Moderate)
	Sea level rise	Support relevant local, Tasmanian and national initiatives to mitigate climate change and its impacts (Moderate)
	Lack of biodiversity data	Undertake flora and fauna surveys of wetland ecosystems to establish baseline data, monitor response to change, and document results for: - the extent, nature and distribution of the communities and species; - habitat quality for threatened species (Moderate)

2.2.2. BLACK GUM FOREST AND WOODLAND

*Conservation priority: **HIGH***

The black gum forest and woodland vegetation covers 172 ha, representing 39% of the land mass of the Egg Islands. The community has been listed as threatened under the *Nature Conservation Act 2002*, as the distribution statewide has been reduced by 95% since European settlement. Less than 10% of the community's current distribution in the south-east bioregion is reserved and the Egg Island stands are the largest remaining remnants in south-east Tasmania.

The stands are important as foraging and, potentially, nesting sites for the endangered swift parrot.

Key threatening processes and source of threats

Processes that threaten the black gum woodland vegetation community risk the loss of natural biological diversity. There are a number of mechanisms that could lead to such an outcome.

In the past, around 15 ha of this community was cleared for agricultural purposes and some small areas were harvested for timber products. No clearing or timber harvesting have occurred for many decades and the cleared areas are now showing signs of natural regeneration.

Grazing of domestic livestock could lower species density in the understorey, restrict regeneration and lead to the introduction and spread of weeds. Ploughing to encourage native pastures, which occurred in some parts of the black gum vegetation community in the early part of the 20th century, would seriously compromise the community.

Rabbits, which were noted on the islands in the 1960s but have not been observed in recent times, would impact on nature conservation values if they were to become established. The introduction of non-indigenous predators, such as foxes or cats, would have a catastrophic impact on the islands' fauna, especially the ground-nesting birds. Rats may also have a similar impact on bird fauna.

Dry sclerophyll eucalypt communities are generally well-adapted to fire. However, fires that are too frequent or too hot could result in low species diversity, low ground cover, weed invasion and loss of soil-stored seed. Furthermore, the peat soils that support large areas of the black gum forest and woodland are highly susceptible to fire when dry and take very long periods to redevelop.

Phytophthora cinnamomi, if it were to become established in the *E. ovata* community, could seriously deplete biodiversity, especially in those areas where drainage is more restricted. There is no evidence of its presence on the islands, although no specific investigations have been carried out.

Lack of information on the biological diversity of the black gum forest and woodland could itself lead to adverse outcomes. It is important to determine the full extent and nature of the area's biodiversity in order to be confident in making long-term management decisions. The response to change will need to be monitored to inform management and data arising from survey and monitoring will need to be managed for the long-term, e.g. through entry into DPIPW's Natural Values Atlas.

Sea level rise poses a threat to the black gum vegetation communities in the long term. With climate change expected to result in sea level rises of more than 80cm by

the end of the century, some or all of the black gum community would be inundated permanently. Regular inundation by salt water would also increase the stress on this vegetation community and result in changes in its species composition. Climate change is, of course, a global issue and there are no specific management actions that could be undertaken on the islands that would halt or reduce the impact of this threat. Support for local, state and national initiatives to combat climate change as part of an international effort is the best response available to managers of the islands.

Conservation Objective

Maintain and enhance the natural biological diversity, extent and condition of the black gum forest and woodland community.

Management Actions

Threatening process	Source of threat	Management Action (priority)
Loss of natural biological diversity	Vegetation clearance	Undertake no further clearing, except that needed for high priority management purposes (High)
		Encourage natural revegetation of previously cleared areas, supplemented by planting of local provenance seed where necessary (Moderate)
	Weed invasion	Prohibit the importation of non-indigenous plant species to the islands (High)
		Implement the Egg Islands Weed Strategy 2008-2013, including: <ul style="list-style-type: none"> – prevention of weed establishment in high priority areas; – removal of significant weed species in high priority areas; – monitor and map weed extent (High)
	Feral animals	Monitor for the presence of rabbits, and if present, develop and implement a strategy aiming to eradicate them from the islands (Moderate)
		Determine whether rats are impacting adversely on species of concern (Moderate)
		Prohibit the importation of non-indigenous animal species to the islands (High)
	Stock grazing	Maintain grazing-free status of the islands (High)
	Inappropriate fire regime	Develop and implement a fire management plan for the islands, using controlled fire only for the purpose of biodiversity maintenance (Moderate)
	Disease	Monitor for evidence of <i>Phytophthora cinnamomi</i> (Moderate)
		Ensure appropriate hygiene practices are followed to prevent the introduction of infected soil to the islands, i.e. ensure all tools, equipment and other items are cleaned of soil before taking them to the islands (High)
	Sea level rise	Support relevant local, Tasmanian and national initiatives to mitigate climate change and its impacts (Moderate)
	Lack of biodiversity data	Undertake flora and fauna surveys of black gum forest and woodland ecosystems to establish baseline data, monitor response to change, and document results for: <ul style="list-style-type: none"> - extent, nature and distribution of the communities and species; - habitat quality for threatened species (Moderate)

2.2.3. GEOHERITAGE VALUES

*Conservation priority: **HIGH***

The Egg Islands are the premier and least disturbed example of an estuarine depositional landform in Tasmania. Their geoheritage significance has been recognized by their inclusion on the Tasmanian Geoconservation Database and by their previous nomination for listing on the Register of the National Estate.

Key threatening processes and source of threats

The key threatening process to the islands' geoheritage features is erosion of the foreshore.

The most significant, albeit longer-term, threat to the islands' geoheritage comes from climate change and the resultant sea level rise and increase in storm surge frequency. These would impact first on the lowest-lying southernmost parts of the islands, but by the end of the century they could fundamentally change the nature and extent of the Egg Islands.

Climate change is a global phenomenon and, as such, there are no specific management actions that could be undertaken on the islands to halt or reduce the impact of this threat. Support for local, state and national initiatives to combat climate change as part of an international effort is the best response available to managers of the islands.

Theoretically the islands could be exposed to soil erosion through a number of threats such as overgrazing, too-frequent fires, vehicular use and clearing. However, given the current absence of these threats, erosion of the islands' broad land surface is not likely.

The more realistic threat is erosion of the islands' banks around the foreshore. While these banks are presently quite stable, an increase in intensity and type of boating activity in the Huon River could lead to increased wave activity and, as a consequence, destabilisation of some of the banks. At the moment the main boating activities are rowing and small recreational fishing boats. Were there to be an increase in the numbers, size and speed of power boats using the area, then it may be necessary to investigate measures to restrict boat speeds.

Conservation Objective

Conserve the integrity of the islands' geoheritage.

Management Actions

Threatening process	Source of threat	Management Action (priority)
Riverbank erosion	Increased power boat usage	Consult with Marine and Safety Tasmania and the manager of the Huon Estuary Marine Conservation Area with a view to imposing boat speed restrictions within the vicinity of the Egg Islands (Moderate)
	Sea level rise	Support relevant local, Tasmanian and national initiatives to mitigate climate change and its impacts (Moderate)

2.2.4. THREATENED SPECIES

*Conservation priority: **HIGH***

Six threatened or significant bird species have been identified as either permanent residents of the Egg Islands or as itinerant visitors to the islands that nonetheless play an important part in their habitat requirements. These species are the swift parrot, Latham's snipe, white-bellied sea eagle, wedge-tailed eagle, grey goshawk and Australasian bittern.

A further five threatened fauna species may also occur on or around the islands, due to the presence of suitable habitat. These are the masked owl, green and gold frog, Australian grayling, Mt Mangana stag beetle and *Chaostola* skipper.

Managers of the islands have a legal obligation to protect these species and their habitats.

Key threatening processes and source of threats

The key threatening process for threatened species is habitat degradation or loss which can be caused by a number of factors including clearing, inappropriate fire regimes, weed invasion and introduced diseases, predators and competitors. Retention and enhancement of existing native vegetation communities will largely ensure habitats are protected. Hence, management actions to combat these threats are identical to those outlined in previous sections of the plan dealing with vegetation communities. They are repeated here for completeness.

Chytrid fungus could have an impact on frog species diversity and populations if it were introduced to the islands. A change in frog populations could have a resultant impact on invertebrate diversity.

There are a number of documents that specify the management requirements for most of the above mentioned threatened species. These include the white-bellied sea-eagle Recovery Plan, the Swift Parrot Recovery Plan and the National Action Plan for Raptors (refer to www.dpipwe.tas.gov.au/threatenedspecieslists). The provisions of these plans will guide management for threatened species on the islands.

Conservation Objective

Maintain and, where necessary, enhance the distribution and abundance of threatened species populations.

Management Actions

Threatening process	Source of threat	Management Action (priority)
Habitat loss	Vegetation clearance	Undertake no further clearing, except that needed for high priority management purposes (High)
	Weed invasion	Prohibit the importation of non-indigenous plant species to the islands (High)
		Implement the Egg Islands Weed Strategy 2008-2013, including: prevention of weed establishment in high priority areas; - removal of significant weed species in high priority areas; - monitor and map weed extent (High)

	Stock grazing	Maintain grazing-free status of the islands (High)
	Inappropriate fire regime	Develop and implement a fire management plan for the islands, using controlled fire only for the purpose of biodiversity maintenance (Moderate)
	Disease prevention	Implement hygiene procedures to prevent the introduction of chytrid fungus (High)
	Feral animals	Prohibit the importation of non-indigenous animal species to the islands (High)
		Monitor for introduced species (i.e. rats) and, if present, develop and implement a strategy aiming to eradicate from the islands, or otherwise minimise their impact on threatened species (Moderate)
	Lack of biodiversity data	Undertake flora and fauna surveys for threatened species to establish baseline data, monitor response to change, and document results for: - extent, nature and distribution of their habitat; - habitat quality (Moderate)
General		Implement threatened species recovery or action plans where relevant to the Egg Islands (Moderate)

2.2.5. CULTURAL HERITAGE

*Conservation priority: **MODERATE***

Little is known of Aboriginal use of the Egg Islands. However, it is almost certain that Aboriginal people would have utilized swan eggs from the islands as a critical part of their diet at certain times of the year. No Aboriginal heritage survey has been conducted on the islands to assist in determining their significance to indigenous communities.

Following European settlement of the Huon Valley, the islands were soon taken up by local farmers and used predominantly for agricultural purposes. Few remnants of this early use remain with perhaps the most significant feature being the canal, built first in the 1850s and later enhanced by local farmers, that crosses the south island.

Key threatening processes and source of threats

The principal threat to the islands cultural heritage is the lack of knowledge of this heritage. No Aboriginal or historic heritage surveys have been conducted on the islands and that which is known of European occupation is almost exclusively anecdotal.

The main threat to any remaining, but unidentified, heritage fabric is probably well-intentioned nature conservation management. Activities such as revegetation and weed control could inadvertently damage cultural heritage features that had not been properly identified.

Knowledge of European use of the islands could be lost with the passing of those whose families owned and used land on the islands. The loss of the stories of these people, including members of the only family ever to have lived on the islands, represents a considerable threat to the understanding of the importance of the Egg Islands in the history of the Huon Valley.

Conservation Objective

To conserve and document the significance of the islands' Aboriginal and European cultural heritage.

Management Actions

Threatening process	Source of threat	Management Action (priority)
Loss of cultural heritage knowledge and assets	Absence of cultural heritage surveys	Collaborate with the Aboriginal community with a view to jointly investigating Aboriginal heritage values and cultural perspectives on the islands (Moderate)
		Undertake targeted historic heritage surveys (Low)
		Document oral histories of families associated with early use of the islands (Moderate)
	Conservation management activities	Ensure that conservation management activities do not damage cultural heritage assets (High)
		Encourage the relevant government authority to retain the early-settler built canal in a condition navigable for small craft (Moderate)

2.3. Assist people to appreciate

2.3.1. EDUCATION AND INTERPRETATION

The Egg Islands have an interesting history and contain a suite of very important nature conservation values. However, given the difficulty in accessing and getting around on the islands, coupled with the fact that significant numbers of visitors will not be encouraged, it is unlikely that many people will directly experience the Egg Islands. The majority of educational and interpretation opportunities will, therefore, be off-site. Proposals for activities on the islands will be assessed according to a process approved by the relevant land manager.

Conservation Objective

To encourage education and interpretation of the islands' natural and cultural heritage values.

Management Actions

- i. Install interpretation boards at the western entrance to the early settler-built canal across the south island.
- ii. Encourage the erection of interpretation facilities opposite the south island on the Franklin foreshore and at points along the proposed Huon River Foreshore Trail (when constructed, this trail will run along the western bank of the Huon River, looking directly onto all the north island and part of the south island).
- iii. Utilize the expertise and resources of organisations such as universities and local interest groups to develop education products for the islands.
- iv. Provide access to any interpretative or educational material that is developed in relation to the islands on both the PWS and TLC websites.
- v. Make available oral histories from family members having long association with the islands.

vi. Encourage school and tertiary education groups to use parts of the islands to assist their understanding of the Huon Valley's history and natural values.

2.3.2. RECREATION AND TOURISM

The Egg Islands could be of great interest to a number of people, especially field naturalists and, within that group, particularly bird watchers. However, there are no facilities to cater for visitors on the islands nor any safe landing spots to access the islands.

Moving around on the islands is a difficult proposition because of the swampy nature of much of the terrain. The islands do not lend themselves to even moderate-scale recreation or tourism activities. Furthermore, such high intensity uses could severely compromise the conservation values of the islands. It is not intended to risk such damage.

This does not preclude, however, small-scale, low-impact public use that does not conflict with the fundamental conservation objectives of management. It is not expected that, in the foreseeable future, the islands' managers will be constructing any visitor facilities. Proposals from third parties to develop low-key visitor infrastructure will be considered by the land managers. The type of proposals likely to be viewed sympathetically would be those that aided a better appreciation of the islands' natural or cultural heritage features and provided non-intrusive access for relatively small numbers of visitors. Bird watching hides and low-impact boardwalks are examples of uses that could be considered for the islands. Such enterprises would need to demonstrate little or no adverse impacts on natural or cultural heritage values and must not leave the land managers with costs associated with infrastructure maintenance or vulnerable to unmanageable public liability risk. Any commercial venture would be required to enter into a business agreement with the relevant land manager. Proposals for any development or for activities on the islands will be assessed according to a process approved by the relevant land manager.

Conservation Objective

Allow limited recreation use, and consider low-impact tourism, subject to such uses not compromising the conservation objectives for managing the islands.

Management Actions

i. Assess any proposals for recreation or tourism operations on the islands, ensuring that any accepted proposals do not impact on the conservation values of the islands.

2.4 Management Responsibilities

All of the publicly-owned land on the islands is managed by the PWS with staff based locally at Huonville. The 136 ha owned in freehold title by the TLC is the responsibility of the TLC, with staff based in Hobart. As neighbours with consistent objectives and principles for land management, the TLC and PWS intend to work co-operatively to manage their lands. There is also potential for the local community to assist the land managers in their stewardship of the land, including through volunteer programs.

Collaboration and coordination between the two organisations will ensure consistent and coherent management of the Egg Islands as complete ecological communities.

3. Plan Review

Progress towards meeting the objectives of this plan will be reviewed at regular intervals not exceeding every five years from the approval of this plan. Such reviews may lead to minor amendments to the plan.

A full review of the plan is expected to occur at a time no earlier than seven years and no later than ten years from the date of publication of this plan. This full review will involve public input and result in the publication of a new management plan.

Appendix 1: Flora species list

Family	Species	Common name ¹	Status ²
AGAVACEAE	<i>Cordyline australis</i>	cabbage tree	i
AGAVACEAE	<i>Phormium tenax</i>	New Zealand flax	i
AMARANTHACEAE	<i>Atriplex prostrata</i>	Austral seablight	i
AMARANTHACEAE	<i>Chenopodium glaucum</i>	glaucous goosefoot	
APIACEAE	<i>Apium prostratum</i>	creeping sea-celery	
APIACEAE	<i>Lilaeopsis polyantha</i>	jointed swampstalks	
ASTERACEAE	<i>Chrysanthemoides monilifera</i>	boneseed	i
ASTERACEAE	<i>Leontodon taraxacoides</i>	lesser hawkbit	i
ASTERACEAE	<i>Olearia lirata</i>	forest daisybush	
ASTERACEAE	<i>Onopordum acanthium</i>	scotch thistle	i
ASTERACEAE	<i>Paquerina graminea</i>	grass daisy	
ASTERACEAE	<i>Sonchus</i> sp.	sow thistle	i
ASTERACEAE	<i>Taraxacum officinale</i>	dandelion, flat weed	i
CAMPANULACEAE	<i>Lobelia anceps</i>	angled lobelia	
CUPRESSACEAE	<i>Cupressus macrocarpa</i>	macrocarpa	i
CUPRESSACEAE	<i>Cupressus</i> sp.	unidentified cypress	i
CYPERACEAE	<i>Carex appressa</i>	longleaf tall sedge	
CYPERACEAE	<i>Gahnia filum</i>	chaffy sawsedge	
CYPERACEAE	<i>Gahnia grandis</i>	cutting grass	
CYPERACEAE	<i>Gahnia trifida</i>	coast sawsedge	
CYPERACEAE	<i>Lepidosperma elatius</i>	tall swordedge	
CYPERACEAE	<i>Schoenus nitens</i>	shiny bogsedge	
DENNSTAEDTIACEAE	<i>Pteridium esculentum</i>	bracken	
DICKSONIACEAE	<i>Dicksonia antarctica</i>	tree fern	
ELATINACEAE	<i>Elatine gratioloides</i>	waterwort	
EPACRIDACEAE	<i>Monotoca glauca</i>	goldey wood	
ERICACEAE	<i>Erica lusitanica</i>	Spanish heath	i
FABACEAE	<i>Acacia verticillata</i> subsp. <i>verticillata</i>	prickly moses	
FABACEAE	<i>Cytisus scoparius</i>	scotch broom, english broom	i
FABACEAE	<i>Genista canariensis</i>	canary broom	i
FABACEAE	<i>Genista monspessulana</i>	montpelier broom	i
FABACEAE	<i>Ulex europaeus</i>	gorse	i
GOODENIACEAE	<i>Goodenia ovata</i>	hop native-primrose	
GOODENIACEAE	<i>Selliera radicans</i>	shiny swampmat	
IRIDACEAE	<i>Crocasmia</i> X <i>croxomiiflora</i>	montbretia	i
JUNCACEAE	<i>Juncus astreptus</i>	southern rush	
JUNCACEAE	<i>Juncus effusus</i>	soft rush	i
JUNCACEAE	<i>Juncus kraussii</i> subsp. <i>australiensis</i>	sea rush	
LAURACEAE	<i>Cassytha pubescens</i>	downy dodderlaurel	
LAURACEAE	<i>Laurus nobilis</i>	bay laurel	i
LILIACEAE	<i>Dianella tasmanica</i>	forest flaxlily	
MELIANTHACEAE	<i>Melianthus major</i>	cape honey flower	i
MYRTACEAE	<i>Eucalyptus globulus</i>	blue gum	
MYRTACEAE	<i>Eucalyptus ovata</i>	black gum	
MYRTACEAE	<i>Leptospermum lanigerum</i>	woolly teatree	

¹ Wapstra, H., et. al. (2005) *Little Book of Common Names for Tasmanian Plants*. Department of Primary Industries, Parks, Water and Primary Industries. Hobart: Tasmania.

² i = introduced

MYRTACEAE	<i>Leptospermum scoparium</i> var. <i>scoparium</i>	common teatree	
MYRTACEAE	<i>Melaleuca squarrosa</i>	scented paperbark	
OLEACEAE	<i>Ligustrum</i> sp.	variegated privet	i
PITTOSPORACEAE	<i>Pittosporum bicolor</i>	cheesewood	
POACEAE	<i>Cortaderia</i> spp.	pampas	i
POACEAE	<i>Lachnagrostis filiformis</i>	common blown-grass	
POACEAE	<i>Notodanthonia semiannularis</i>	marsh wallaby grass	
POACEAE	<i>Phragmites australis</i>	southern reed	
POACEAE	<i>Poa sieberiana</i>	grey tussockgrass	
POLYGONACEAE	<i>Rumex crispus</i>	dock, sorrel, curled dock	i
PRIMULACEAE	<i>Samolus repens</i>	creeping brookweed	
RANUNCULACEAE	<i>Clematis aristata</i>	mountain clematis	
RESTIONACEAE	<i>Leptocarpus tenax</i>	seeded rush	
RHAMNACEAE	<i>Pomaderris apetala</i> subsp. <i>apetala</i>	common dogwood	
ROSACEAE	<i>Rosa rubiginosa</i>	sweet briar	i
ROSACEAE	<i>Rubus</i> sp. agg.	blackberry	i
RUBIACEAE	<i>Coprosma repens</i>	mirror bush	i
SALICACEAE	<i>Salix</i> spp.	willow, crack willow	i
SANTALACEAE	<i>Exocarpos cupressiformis</i>	common native-cherry	
SCROPHULARACEAE	<i>Mimulus repens</i>	creeping monkeyflower	
SOLANACEAE	<i>Solanum laciniatum</i>	kangaroo apple	
SPHAGNACEAE	<i>Sphagnum</i> sp.	peat moss	
THYMELAEACEAE	<i>Pimelea drupacea</i>	cherry riceflower	
THYMELAEACEAE	<i>Pimelea nivea</i>	bushmans bootlace	

Appendix 2: Fauna species list

Class	Family	Species	Common name	Status ³
FISHES				
	RETROPINNIDAE	<i>Prototroctes maraena</i>	Australian grayling	v, VU
AMPHIBIANS				
	MYOBATRACHIDAE	Unidentified frog species		
MAMMALS				
	MACROPODIDAE	<i>Macropus rufogriseus rufogriseus</i>	Bennett's wallaby	
	MACROPODIDAE	<i>Thylogale billardi</i>	pademelon	
	MURIDAE	<i>Rattus rattus</i>	black rat (introduced)	
	ORNITHORHYNCHIDAE	<i>Ornithorhynchus anatinus</i>	platypus	
	PHALANGERIDAE	<i>Trichosurus vulpecula</i>	common brushtail possum	
	PSEUDOCHEIRIDAE	<i>Pseudocheirus peregrinus</i>	ring-tailed possum	
BIRDS				
	ACCIPITRIDAE	<i>Accipiter novae-hollandiae</i>	grey goshawk	e
	ACCIPITRIDAE	<i>Aquila audax</i> subsp. <i>audax</i>	wedge-tailed eagle	e, EN
	ACCIPITRIDAE	<i>Circus approximans</i>	swamp harrier	
	ACCIPITRIDAE	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle	v
	ANATIDAE	<i>Anas castanea</i>	chestnut teal	
	ANATIDAE	<i>Anas platyrhynchos</i>	mallard	
	ANATIDAE	<i>Anas superciliosa</i>	Pacific black duck	
	ANATIDAE	<i>Cygnus atratus</i>	black swan	
	ARDEIDAE	<i>Botaurus poiciloptilus</i>	Australasian bittern	GE
	CAMPEPHAGIDAE	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike	
	CHARADRIIDAE	<i>Vanellus miles</i>	masked lapwing	
	CORVIDAE	<i>Corvus tasmanicus</i>	forest raven	
	CUCULIDAE	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo	
	HALCYONIDAE	<i>Dacelo novaeguineae</i>	laughing kookaburra	
	LARIDAE	<i>Larus novaehollandiae</i>	silver gull	
	LARIDAE	<i>Larus pacificus</i>	Pacific gull	
	MALURIDAE	<i>Malurus cyaneus</i>	superb fairy-wren	
	MALURIDAE	<i>Stipiturus malachurus intermedius</i>	southern emu-wren	
	MELIPHAGIDAE	<i>Acanthorhynchus tenuirostris</i>	eastern spinebill	
	MELIPHAGIDAE	<i>Anthochaera paradoxa</i>	yellow wattlebird	
	MELIPHAGIDAE	<i>Lichenostomus flavicollis</i>	yellow-throated honeyeater	
	MELIPHAGIDAE	<i>Melithreptus affinis</i>	black-headed honeyeater	
	MELIPHAGIDAE	<i>Melithreptus validirostris</i>	strong-billed honeyeater	
	MELIPHAGIDAE	<i>Phylidonyris novaehollandiae</i>	new-holland honeyeater	
	MELIPHAGIDAE	<i>Phylidonyris pyrrhopterus</i>	crescent honeyeater	
	PACHYCEPHALIDAE	<i>Colluricincla harmonica</i>	grey shrike-thrush	
	PACHYCEPHALIDAE	<i>Pachycephala olivacea</i>	olive whistler	
	PARDALOTIDAE	<i>Pardalotus punctatus</i>	spotted pardalote	
	PARDALOTIDAE	<i>Pardalotus striatus</i>	striated pardalote	
	PARDALOTIDAE	<i>Sericornis humilis</i>	Tasmanian scrubwren	
	PHALACROCORACIDAE	<i>Phalacrocorax sulcirostris</i>	little black cormorant	
	PHALACROCORACIDAE	<i>Phalacrocorax varius</i>	pied cormorant	

³ Tasmanian *Threatened Species Protection Act 1995* – r = rare, v = vulnerable, e = endangered; Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* – VU = vulnerable, EN = endangered; JAMBA – Japan/Australia Migratory Bird Agreement; ROKAMBA – Republic of Korea/Australia Migratory Bird Agreement; GE = Globally Endangered – IUCN Red List.

Class	Family	Species	Common name	Status ³
	PHASIANIDAE	<i>Coturnix ypsilophora</i>	brown quail	
	PSITTASIDAE	<i>Lathamus discolor</i>	swift parrot	e, EN
	PSITTASIDAE	<i>Platycercus caledonicus</i>	green rosella	
	RHIPIDURIDAE	<i>Rhipidura fuliginosa</i>	grey fantail	
	SCOLOPACIDAE	<i>Gallinago hardwickii</i>	Latham's snipe	JAMBA, ROKAMBA
REPTILES				
	ELAPIDAE	<i>Notechis scutatus</i>	tiger snake	

Appendix 3: Egg Islands Weed Management Strategy 2008 - 2013

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Tasmanian Land Conservancy
November 2008



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Introduction

This Weed Management Strategy was developed by the Tasmanian Land Conservancy (TLC) in partnership with the Parks and Wildlife Service (PWS), in order to effectively co-ordinate the identification and management of weeds that may threaten the conservation values present on the Egg Islands.

Weeds may alter the structure and diversity within vegetation communities, disrupt the natural balances required for ecosystem functioning, affect natural regeneration potential, change animal habitat and result in changed fire regimes. In order to maintain or enhance the conservation values of the islands, the threat of weeds on conservation values needs to be assessed and, if necessary, effectively managed into the future.

Tasmania's *Weed Management Act 1999* also provides for the control or eradication of declared weeds from private and public land in certain municipalities. This strategy works towards a strategic and sustainable approach to weed management on the Egg Islands, in reference to the provisions of the Act.

A co-operative management approach has been used to develop this strategy, in recognition of the continuous conservation values across the different tenures and managers of the island. To the greatest extent possible, this co-operative management approach will also be used to control any weeds present on the islands. Such co-operative management also maximises the efficiency of required resources and reduces the potential for weeds to reinvade following control.

Strategy Area

This weed strategy covers all of the Egg Islands, located in the Huon River estuary at Franklin, 40km southwest of Hobart. The Egg Islands consists of two estuarine islands, separated by a natural channel. The southern island is colloquially known as Snake Island, which features an artificial canal effectively divides this island into two. Much of the area is between 1 and 2 metres above the general estuary high tide level. This results in significant water effects on many of the habitats.

The islands cover approximately 445 ha, with most of this area managed for conservation. The TLC own and manage 136 ha, known as the Egg Islands Reserve, whilst a further 164 ha of Crown Land is managed by PWS as the Egg Islands Conservation Area. In the south of the islands, 25 ha remain in private ownership not managed for conservation. The remaining 120 ha is Crown Land of various tenures, all of which has been recommended for inclusion within the Egg Islands Conservation Area by the Crown Land Assessment and Classification Project.

The location and ownership of the Egg Islands is shown in Map 1 of the Egg Islands Management Plan.

Objectives

The objectives of this strategy are to identify the extent of weeds on the Egg Islands, and to recommend prioritised actions to minimise the impact of weeds on the conservation values present on the islands.

Background

The Egg Islands have been used for a variety of agricultural purposes since the area was first settled in the mid 1800s. Primary among these uses was bush-run cattle grazing,

although some areas were also cleared and utilised for crop production⁴. No agricultural activities have been undertaken on the islands since sometime before the mid-1980s.

Limited weed survey work has been conducted previously on the Egg Islands. However, some opportunistic weed identification and control work has been undertaken in the Conservation Area by the PWS, including removal of an isolated infestation of approximately 50 boneseed (*Chrysanthemoides monilifera*) plants in 2005.

A preliminary water-based weed survey of the Egg Islands was undertaken in October 2007, as part of the Huon Valley Weed Strategy. This preliminary survey identified the presence of six weed species along the banks of the islands, including gorse (*Ulex europaeus*), Canary broom (*Genista monspessulana*), blackberry (*Rubus fruticosus* spp. agg.), New Zealand flax (*Phormium tenax*), montbretia (*Crocasmia x crocosmiiflora*) and sweet briar (*Rosa rubiginosa*). The majority of weed infestations identified during this preliminary survey were located within close proximity to areas that are known to be previously disturbed in the past due to agricultural practices or canal dredging.

Suitable habitat and environmental conditions also exist on the islands for other weeds known to be present in the surrounding area, including Spanish heath, boneseed, pampas grass (*Cortaderia* sp.), African feather grass (*Pennisetum macrourum*) and willows (*Salix* sp.).

CONSERVATION VALUES AFFECTED

The Egg Islands predominantly comprise of three vegetation communities:

- *Eucalyptus ovata* (black gum) forest and woodland, which is listed on State legislation as endangered;
- *Melaleuca squarrosa* and *Leptospermum* shrubland
- Wetland vegetation communities, including saline wetlands, saline grasslands and Restionaceae rushland

The grassland on the islands provide critical habitat for the globally endangered Australasian bittern⁵ (IUCN). The forest communities provides feeding and possible nesting habitat for the endangered swift parrot (*Tasmanian Threatened Species Protection Act 2002* and *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*).

METHODOLOGY

An extensive terrestrial survey was undertaken on the Egg Islands as a part of the development of this strategy. A survey methodology was devised to identify the relative extent of individual weed species in each of the mapped vegetation communities and previously disturbed areas (see Map 2 of the Egg Islands Management Plan). Weed mapping of the entire island was not possible due to the size of the islands and the limited time available; as such a sampling method was used.

Five general sectors of the islands were selected for surveying, ensuring that each of the mapped vegetation communities was included in at least two sectors. In each sector, up to

⁴ Blackhall, S. (1987) A Report on the Proposed Game Reserve at Egg Islands.

⁵ IUCN Red List. (2008) www.iucnredlist.org Accessed on 26 May 2008.

nine east-west transects were calculated, with each transect 20m wide and crossing the entire width of the island.

Teams of between two and five people able to identify common environmental weeds used GPS units to follow the transects across the islands, recording the presence or absence of weeds every 20 m along the transect. Where weeds were present, the extent of each weed species was recorded. This method produced a close to 100% visual inspection of each 20m x 20m square.

Where technological and/or terrain issues prevented following straight line transects, teams walked approximately east to west (or vice versa) with several GPS units logging their tracks as they walked. These teams recorded the geographical co-ordinates and extent of any weed species that they encountered, with no weed record along a track indicating the absence of weeds. GPS track data were downloaded into GIS software, enabling calculation of the area surveyed, and weed extent recorded, using this method.

WEED CONTROL PRIORITIES

The priority of individual weed species for control was adopted from a weed risk assessment undertaken by Rudman⁶ (2003), who used factors including a weed species' invasiveness, dispersal ability, impact on ecosystem processes and rate of population change to identify weed control priorities for PWS Southern Region. Table 1 shows the control priority of weeds likely to be present, or that have suitable habitat, on the Egg Islands.

Table 1: Control priorities for weeds recorded on the Egg Islands

Species	Common name	Situation affected on Egg Islands	Manageability [^]	Control priority
<i>Chrysanthemoides monilifera</i> [#]	boneseed	Disturbed, dry sites – northern areas of both islands, artificial canal banks	2	High
<i>Salix</i> sp. [#]	willow, crack willow	Damp areas - entire islands	2	High
<i>Ulex europaeus</i>	Gorse	Disturbed, dry sites – northern areas of both islands	2	High
<i>Cytisus scoparius</i>	scotch broom, English broom	Disturbed, dry sites – northern areas of both islands, artificial canal banks	2	High
<i>Genista monspessulana</i>	Canary or Montpellier broom	Disturbed, dry sites – northern areas of both islands, artificial canal banks	2	High
<i>Erica lusitanica</i>	Spanish heath	Disturbed, dry to partly wet sites, areas previously cleared/cropped – northern areas of both islands	2	High
<i>Rosa rubiginosa</i>	sweet briar	Disturbed, dry sites – northwestern tip of north	2	High

⁶ Rudman, T. (2003) Parks and Wildlife Service Southern District Weed Management Plan (WHA excluded) 2003 – 2006. Nature Conservation Branch, Department of Primary Industries, Water and Environment.

		island		
<i>Rubus fruticosus</i> agg.	blackberry, bramble	Disturbed, dry to partly wet sites – northwestern tip of north island	2	High
<i>Cortaderia</i> sp.	pampas	Disturbed sites – artificial drain banks in previously cropped areas, northern areas of both islands	4	High
<i>Crocsmia X croxomiiflora</i>	montbretia	Damp, disturbed sites – northwestern tip of north island	0	Moderate
<i>Phormium tenax</i>	New Zealand flax	Damp areas - entire islands	4	Moderate
<i>Juncus effusus</i> [#]	soft rush	Damp, disturbed sites – northern areas of both islands	2	Low
<i>Sonchus</i> sp.	Sow thistle	<i>Eucalypt</i> woodland	0	Low
<i>Taraxacum officinale</i>	dandelion, flat weed	<i>Eucalypt</i> woodland	0	Low
<i>Rumex crispus</i>	dock, sorrel, curled dock	Damp, disturbed sites – northern areas of both islands	2	Low
<i>Chenopodium glaucum</i>	fat hen, pale goosefoot	Damp areas - entire islands	0	Low
<i>Cupressus macrocarpa</i>	macrocarpa	Damp, disturbed sites – northern areas of both islands	4	Low
<i>Coprosma repens</i> *	mirror bush	<i>Eucalypt</i> woodland	4	Low
<i>Ligustrum</i> sp.*	variegated privet	<i>Eucalypt</i> woodland	4	Low
<i>Onopordum acanthium</i> *	scotch thistle	<i>Eucalypt</i> woodland	0	Low
<i>Cordyline australis</i> *	cordyline	Disturbed sites – artificial drain banks in previously cropped areas, northern areas of both islands	4	Low
<i>Laurus nobilis</i> *	bay tree	<i>Eucalypt</i> woodland	4	Low
<i>Melianthus major</i> *	Cape honey flower	Dry, grassy sites	4	Low

Information for the Manageability and Control Priority has been adapted from: Rudman (2003) ^
Manageability ratings = 4 – easy to kill, plants do not readily re-invade; 2 – moderate, average control difficulty, seedbanks; 0 – difficult to kill or reinvasion problem. * Not listed in Rudman (2003).
[#] Not recorded in the 2008 weed survey despite focussed efforts in previously identified locations of weed species.

WEED DISTRIBUTION

Analysis of the weed survey results and previous records identified 24 exotic species observed on the Egg Islands. Of these, nine species were assessed as a high priority for control – these species are typically highly invasive in the habitat types present here, disperse easily and impact heavily on ecosystem processes. Two species were assessed as moderate priorities for control, being less able to disperse and dominate natural vegetation. The remaining species were assessed as either low priorities for control, or were not assessed by Rudman (2003) because they are not typically identified as weed species.

The majority of weeds were predominantly recorded in, or in close proximity to, areas that have been cleared or otherwise physically disturbed in the past (Map 1A and 1B). Also, all of the high priority weed species recorded in the 2008 weed survey – gorse, Spanish heath, blackberries and briar rose – were nearly always noted to be spreading infestations rather than individual plants.

New Zealand flax was the only weed species where mature plants were regularly recorded in relatively natural areas, occurring in every vegetation community in low densities (typically < 3% cover).

The Egg Islands have been divided into three weed 'Zones', based on the priority, extent of infestation and manageability of weeds present in these areas. Each of the zones are discussed below and shown in Map 1C.

- Zone 1: High priority for control, high priority for monitoring: Small infestations of greater than three high priority weed species
- Zone 2: Moderate priority for control, moderate priority for monitoring: Large infestations of up to three high priority weed species
- Zone 3: Low priority for weed control, moderate priority for monitoring: Low densities of low to moderate priority weeds

Recommended Actions

Prevention of new weed establishment and prevention of expansion are the highest priorities. Where weed species are established in small, isolated infestations, these should be eradicated, with follow-up control ensuring that these species do not re-establish. Those weeds that are widely established should be contained where possible, with a view to future eradication if practical. Specific recommended actions are listed in Table 2 below, however it should be noted that neither PWS or TLC have adequate current resources to conduct such controls. The above actions are the desired ones, for which resourcing should be sought, rather than an agreed list of commitments.

Table 2: Specific recommended actions for weed management on the Egg Islands.

Focal area	Recommended Action	How?	Priority of Action	Who?	Frequency and/or date
Management co-ordination	TLC and PWS to work co-operatively to manage weeds on the Egg Islands.	TLC and PWS to share weed data and resources to implement this strategy	High	TLC/PWS	Continuous
		TLC and PWS to co-ordinate joint surveys, mapping, monitoring and control efforts	Moderate	TLC/PWS	Continuous
Weed mapping and monitoring	Monitor and map weed extent in Zone 1 bi-annually after control	Survey boundaries of weed infestations in Zone 1	High	TLC	Initial mapping by Dec 2008, monitoring bi-annually (2010 & 2012)
	Map large, high priority weed infestations in Zone 2, map weed extent bi-annually	Survey boundaries of weed infestations in Zone 2	Moderate	TLC/PWS	Initial mapping by Dec 2008, monitoring bi-annually (2010 & 2012)

	Monitor and map the extent of all weeds in Zone 3 every 5 years, noting particularly any changes in density of <i>Phormium tenax</i> (New Zealand flax).	Conduct sampling surveys in Zone 3 areas, map changes in weed extent or density	Low	TLC/ PWS	Dec 2013 (every 5 years)
Weed control	Zone 1: Remove small isolated infestations of high and moderate priority weed species. Follow-up control annually after initial control.	Best practice weed control method dependent on species (refer to Section 6: Control methods)	High	TLC	By Dec 2008
			High		Annually, in late Spring
	Zone 2: Remove outlying individual or patches of high and moderate priority weed species. Control main infestation of high and moderate priority weed species. Follow-up control annually after initial control.	As above	High	TLC/ PWS	By Dec 2009
			Moderate		Annually in late Spring, complete by Dec 2012
			High		Annually, in late Spring
	Zone 3: Upon observation of any moderate or high priority weed species, record location using GPS and remove all individuals as soon as possible. Follow-up control annually after initial control.	As above	Moderate	TLC/ PWS	Opportunistic
			High	TLC/ PWS	Annually, in late Spring
Weed awareness	Encourage near neighbours to control high and moderate priority weeds on their land.	Reserve manager/Parks rangers to discuss weed priorities with near neighbours, where opportunities arise.	Low	TLC/ PWS	Opportunistic
	Encourage locals to participate in weed management on the Egg Islands	Advertise volunteer weed-related activities in the Huon region, including through existing networks	Moderate	TLC/ PWS	Continuous

Weed prevention	Ensure weed seeds are not brought on to the islands, moved around the islands or taken off the islands	Wash seeds and soil from tools, equipment and personal belongings (including shoes) before and after undertaking weed control work on Egg Islands	High	ALL	Continuous
	Best practice land management	Minimise disturbance and rehabilitate disturbed areas and weed control areas	High	ALL	Continuous
		Develop operational control program to record weed control actions: herbicide type and application rates, methods, timing, resources, safety gear, etc	High	TLC/ PWS	As required
Resourcing	Seek grant funding for undertaking weed mapping, monitoring and control	Regularly assess grant availability and suitability, develop applications focused on activities identified in this strategy	High	TLC/ PWS	Continuous
	Encourage volunteers to assist with on-ground activities	Maintain a volunteer register to alert potential volunteers of future activities	Moderate	TLC	Continuous
Strategy review	Review and update strategy every 5 years, adapting actions to suit any relevant changes over time	Review and update weed strategy	High	TLC/ PWS	By Dec 2013

Weed control methods

Control of each weed species should be determined using current national best practice guidelines and expert and local knowledge, where possible using the Bradley method for controlling invasive plants in natural woodland. The Weeds CRC provides useful information on best practice weed management of individual weed species (see www.weeds.crc.org.au).

Methods of physical, chemical and biological weed control all have potential for use on the Egg Islands, although this potential may be limited due to the proximity of wetlands and water and the physical constraints of transporting equipment, machinery or chemicals to the islands.

Where several options for control may exist for each weed species; these should be chosen based on the biology and susceptibility of the target species, the site conditions and the potential impact on native species.

Where chemical use is a possible control method, the herbicide characteristics (including application methodology and persistence) should also be considered.

Furthermore:

- Only those herbicides registered for use in aquatic situations should be used.
- No spraying of herbicides with a moderate to high persistence (refer to herbicide label).
- No spraying where drift may enter standing water (minimum of 10 m buffer zone in calm conditions). Spraying in light wind conditions may be conducted where weeds are within 10 meters of standing water by using wind to move spray drift away from standing water.

Management recommendations are given in Table 3 below, focused on integrated weed management for each of the three zones identified in Map 1C of this weed strategy. Table 3 only identifies the control of weeds that are classified as high or moderate priority, or are otherwise of concern due to their current distribution and extent in undisturbed native vegetation.

Table 3 shows the recommended weed management for each high and moderate priority weed species.

Table 3: Recommended weed management for each high and moderate priority weed species

Species recorded	Common name	Primary control method	Secondary control method
<i>Chrysanthemoides monilifera</i>	Boneseed #	Hand pull plants where possible, including large infestations	Cut and paint with glyphosate any plants too difficult to hand pull
<i>Salix</i> spp.	willow, crack willow #	Cut and paint smaller plants using glyphosate	Drill and frill with glyphosate any larger plants too large to cut and paint
<i>Ulex europaeus</i>	Gorse	Cut and paint with glyphosate small to moderate infestations	Spray any large infestations using low persistence herbicide
<i>Cytisus scoparius</i>	scotch broom, English broom	Hand pull any plants in small to moderate infestations	Cut and paint with glyphosate any plants too difficult to hand pull
<i>Genista monspessulana</i>	Montpelier broom	Hand pull any plants where possible	Cut and paint with glyphosate any plants too difficult to hand pull
<i>Erica lusitanica</i>	Spanish heath	Hand pull any plants where possible, including large infestations	Cut and paint with glyphosate any plants too difficult to hand pull
<i>Rosa rubiginosa</i>	sweet briar	Cut and paint with glyphosate	
<i>Rubus fruticosus</i> spp. agg.	blackberry, bramble	Cut and paint with glyphosate	
<i>Crocasmia X croxomiflora</i>	montbretia	Dig out clumps, ensuring all corms are removed	
<i>Cortaderia</i> spp.	pampas	Carefully remove any seed heads and place in a plastic bag, then dig out the entire plant, ensuring its roots do not remain in contact with the soil	Carefully remove any seed heads and place in a plastic bag, then spray/wipe foliage with glyphosate
<i>Phormium tenax</i>	New Zealand flax	Dig out smaller plants	Spray/wipe foliage with glyphosate any plants too large to dig out

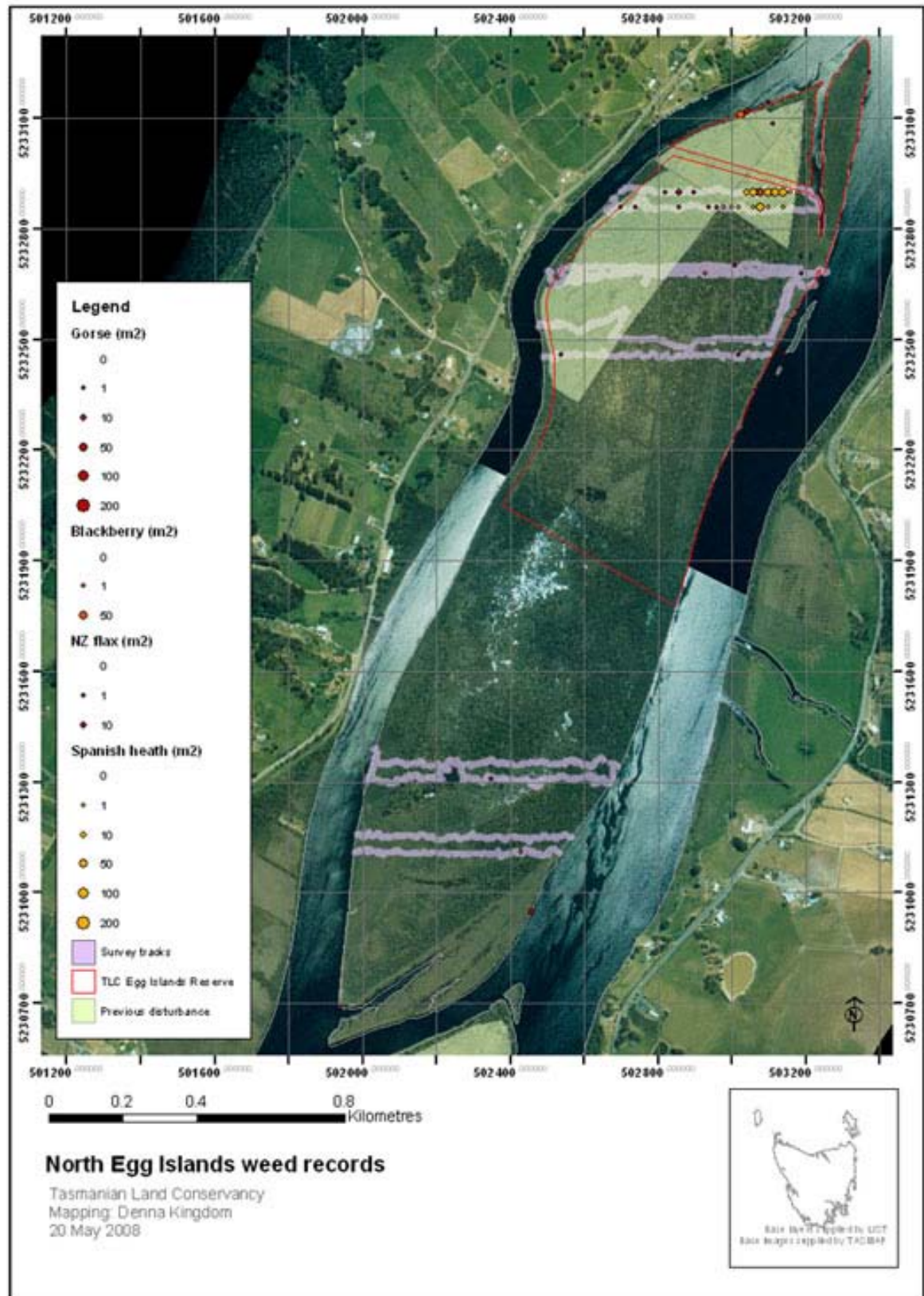
Strategy review

This strategy will be reviewed and updated every five years, with the first review occurring by December 2013.

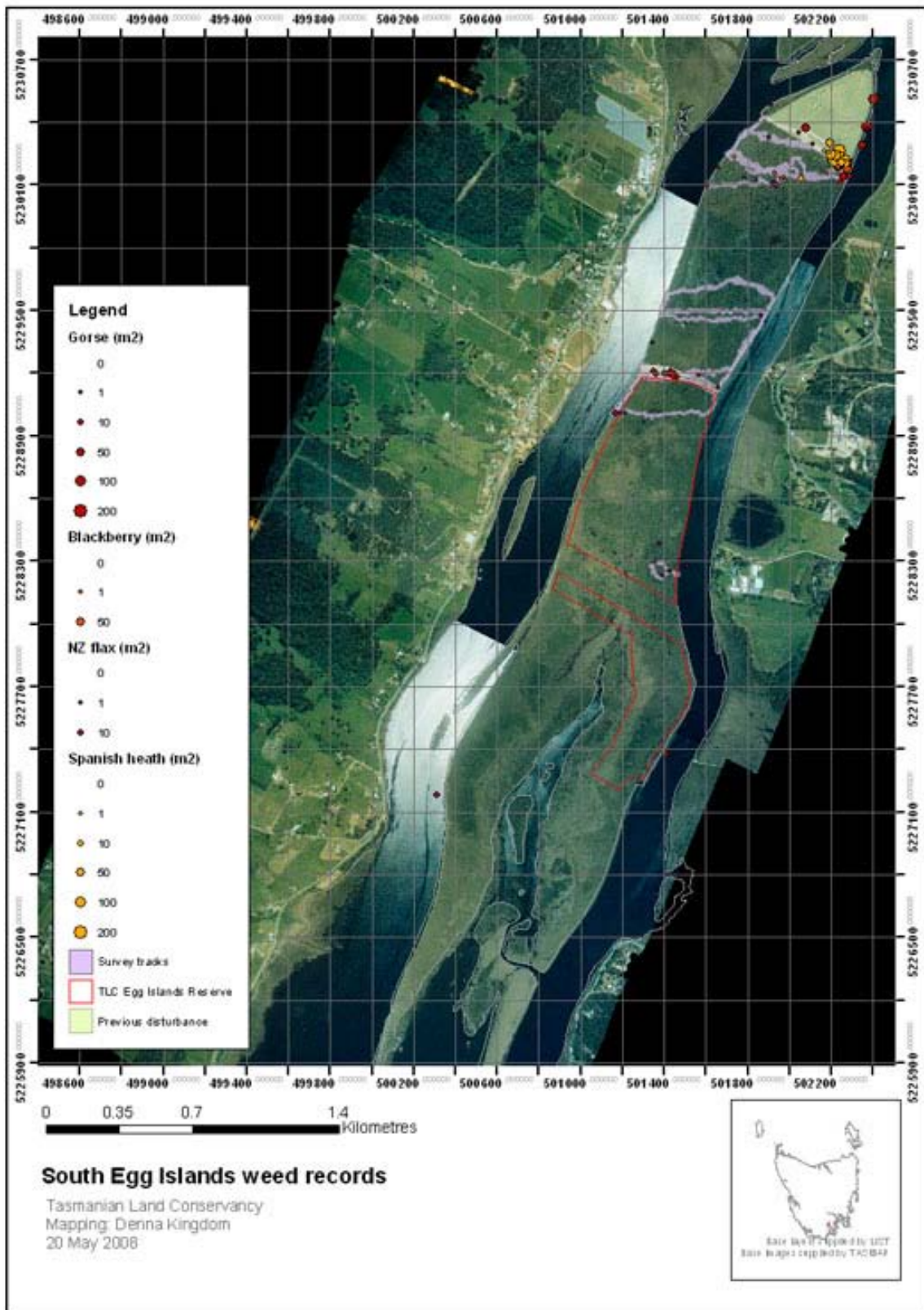
The strategy review will update information on the weed presence, extent and distribution at the Egg Islands, and will adapt actions to suit any changes, as well as accounting for any variations in best practice management of weeds.

Both the TLC and PWS will be jointly responsible for initiating and undertaking the weed strategy review.

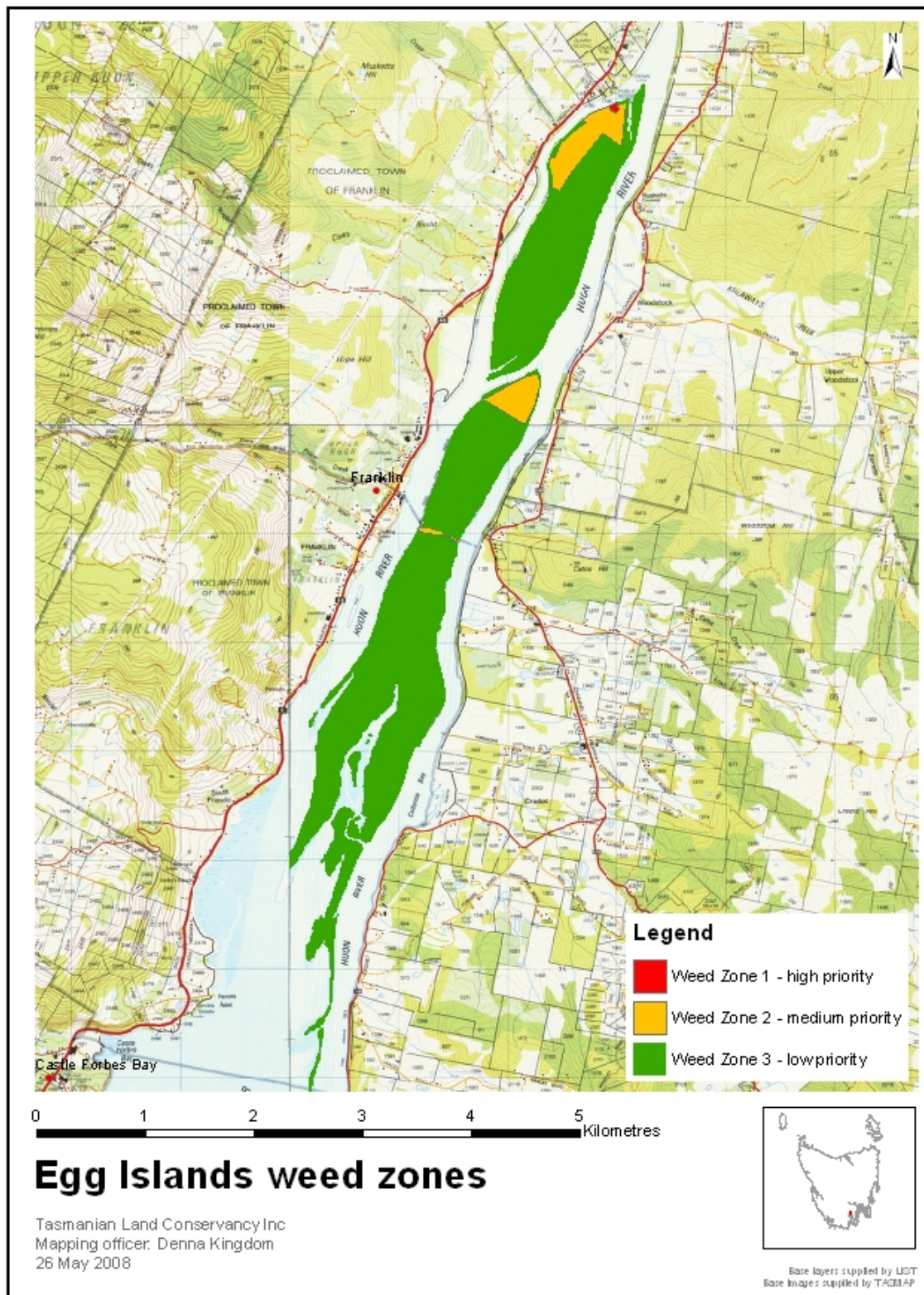
Map 1A: Weed records – North Egg Island



Map 1B: Weed records – South Egg Island



Map 1C: Weed zones



the 1990s, the number of people in the UK who are employed in the public sector has increased by 1.5 million, from 2.5 million in 1980 to 4 million in 1995. The public sector has also become an important employer of women, with 50% of public sector employees being women in 1995, compared with 40% in 1980.

There are a number of reasons why the public sector has become an important employer of women. One reason is that the public sector has a high proportion of jobs that are traditionally held by women, such as teaching, nursing, and social work. Another reason is that the public sector has a high proportion of jobs that are part-time or flexible, which are more likely to be held by women. A third reason is that the public sector has a high proportion of jobs that are in the service sector, which is also a sector that is traditionally held by women.

The public sector has also become an important employer of women because of the increasing demand for public services. As the population ages, there is a growing need for services such as health care, social care, and education. This has led to an increase in the number of people employed in the public sector, and a corresponding increase in the number of women employed in the public sector.

The public sector has also become an important employer of women because of the increasing demand for flexible working arrangements. Many women have to juggle their work and family commitments, and the public sector has been able to provide a range of flexible working arrangements to meet their needs. This has made the public sector a more attractive employer for women.

The public sector has also become an important employer of women because of the increasing demand for high-quality public services. The public sector has been able to attract and retain a high proportion of women who are highly qualified and motivated. This has helped to ensure that the public sector is able to provide high-quality services to the public.

The public sector has also become an important employer of women because of the increasing demand for public services that are delivered by women. Many public services, such as health care, social care, and education, are delivered by women. This has led to an increase in the number of women employed in the public sector, and a corresponding increase in the number of women who deliver public services.

The public sector has also become an important employer of women because of the increasing demand for public services that are delivered by women who are also mothers. Many women who are mothers find it difficult to find work that allows them to spend time with their children. The public sector has been able to provide a range of flexible working arrangements to meet their needs, which has made the public sector a more attractive employer for women who are mothers.

The public sector has also become an important employer of women because of the increasing demand for public services that are delivered by women who are also carers. Many women who are carers find it difficult to find work that allows them to spend time with the person they are caring for. The public sector has been able to provide a range of flexible working arrangements to meet their needs, which has made the public sector a more attractive employer for women who are carers.