



Southern Tasmania  
Regional Land Use Strategy  
Background Report No.5: Natural Values

September 2010



This document is detailed supporting information for the Regional Land Use Strategy for Southern Tasmania.

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# Contents

1.	Water Resources	1
1.1	Background	1
1.2	Legislative & Governance Context	4
1.3	Planning Implications	6
2.	Coastline	7
2.1	Background	7
2.2	Legislative & Governance Context	9
2.3	Planning Implications	10
3.	Vegetation Management and Biodiversity	12
3.1	Background	12
3.2	Management of Protected Flora and Fauna Species	13
3.3	Management of Native Vegetation Communities	16
3.4	Weed Management	24
4.	Geoheritage	26
4.1	Background	26
4.2	Legislative & Governance Context	26
4.3	Planning Implications	26
5.	References	28

## Figure Index

Figure 1: Water Catchments within Southern Tasmania (map available separately)	2
Figure 2: Special Natural Values in Southern Tasmania (map available separately)	20
Figure 3: Remnant Vegetation on Private Land in Southern Tasmania (map available separately)	21

# 1. Water Resources

## 1.1 Background

Tasmania's river systems not only provide a high degree of terrestrial estuarine and marine biodiversity; they are also integral to the social and economic health of the State and its regions. Water resources provide potable water for urban areas and water supply for irrigation. Water resources are the source for the most dominant form of energy production in the State (hydro electric power) which is the main land use for most of these lakes, they are essential to many tourism and recreational opportunities (i.e. fishing, boating), are often at the heart of many existing settlements, are important stormwater outlets in urban environments and are a prominent visual and cultural element in the landscape.

Water catchments are defined as geographical areas within which all runoff water flows to the same discharge point. Major water catchments in the Southern Region include:

- Derwent (commonly divided into the upper Derwent, lower Derwent and the Derwent estuary, with its main tributaries including the Clarence, Little Pine, Nive, Pine, Shannon, Dee, Florentine, Ouse, Broad and Clyde Rivers),
- Gordon- Franklin Catchment,
- Great Lake,
- Pitt Water – Coal River Valley,
- Huon,
- Jordan,
- Prosser,
- Tasman,
- Coal,
- Little Swanport,
- Macquarie
- Swan
- Apsley.

Within these catchments, the region encompasses three major river and estuarine systems (Derwent, Huon and Gordon Rivers) as well as parts of the north-flowing Macquarie and Esk Rivers and numerous smaller and coastal catchments and estuaries. Most rivers begin in the Central Highlands and flow out to the coast. The most prominent river in the south is the Derwent River which drains much of the Central Highlands and flows southeast reaching the coast at Hobart. It has a catchment area of 1427 km<sup>2</sup> with a length of 187km.



**Figure 1: Water Catchments within Southern Tasmania (map available separately)**

Water quality is particularly important for the maintenance of healthy ecosystems and can be used as a surrogate indicator of catchment health in general (GHD 2007). Many complex factors affect water quality that are influenced by land use and development including flows, inadequately maintained septic and wastewater systems, stormwater runoff, sedimentation, soil erosion, clearance of riparian vegetation, chemical and toxic runoff (from fertilisers, pesticides, herbicides, household and garden chemicals and industrial processes) and dumping of solid waste.

#### **1.1.1 Maintaining Healthy Riparian zones**

Healthy riparian zones are essential for maintaining healthy ecosystems and economic productivity. Some riparian zones in rural and urban landscapes are degraded and need rehabilitation. The key to preserving the value of a riparian zone is maintenance of a diverse vegetation cover. In many areas the only healthy riparian zones are patches of remnant vegetation. Many of these areas are threatened by human activities, including vegetation clearance, non-compliant forestry practices, inadequate water regulation, fire, weeds, cattle grazing and changes to ground-water conditions. While the overall health of riparian vegetation in the Southern Region is good, it is in decline (NRM South, 2005) and efforts to remediate the problem are generally localised solutions.

#### **1.1.2 Managing increasing salinity**

Another water quality concern is increasing salinity in waterways that constitutes a threat to infrastructure and freshwater dependent ecosystems across the region. Salt enters surface waterways by either groundwater or run-off from soils with high salinity. There is increased reporting of salinity in the Derwent Catchment upstream of New Norfolk (the Derwent River is tidal to New Norfolk) which has potential consequences for the future water supply of the greater Hobart area (NRM South 2005). Test levels for salinity above World Health Organisation standards for drinking water have been recorded on occasions and rivers at threat include the Coal, Prosser, Jordan, Clyde and Little Swanport. The major impact of saline waterways is that the water becomes redundant as a resource as it can no longer be used for drinking or agricultural irrigation purposes.

#### **1.1.3 Wetlands in the Southern Region**

The Southern region contains over 25 wetlands of national importance with a wide range of wetland types due to Tasmania's varied topography and rainfall. Alpine wetlands occur in the highland regions where multiple glaciations have left thousands of lakes and small tarns. Rare wetland types such as sphagnum bogs, string bogs and staircase ponds can be found in these areas. Tasmania's south contains large areas of buttongrass moorland which is based on peat soils. The Southern Region also has a number of coastal lagoons and estuaries that are especially rich in plant and animal life, as well as inland saline wetlands in the drier parts of the midlands. The region contains four Ramsar listed wetlands of international significance - Pittwater/Orielton Lagoon, Moulting Lagoon, Apsley Marshes and the northwest corner of Lake Crescent. Important wetland features include naturally saline as well as freshwater wetlands (especially those in the southern part of the midlands) providing an important habitats for migratory bird species (CSIRO, 2009).

#### **1.1.4 Managing Freshwater ecosystems**

The former Department of Primary Industry and Water (now the Department of Primary Industry, Parks, Water & Environment) has conducted a comprehensive audit of the State's freshwater dependent

ecosystems, called the Conservation of Freshwater Ecosystems Values (CFEV) Project. This project's aims were to ensure that priority freshwater values were appropriately considered in the development, management and conservation of the State's water resources (Department of Primary Industries Parks, Water and Environment, 2009) by assessing the conservation management priorities of all freshwater ecosystems throughout the state.

The CFEV project has completed a statewide audit and conservation evaluation of Tasmania's freshwater dependent ecosystems. The project involved the use of existing environmental information to develop data sets to identify where aquatic values existed and their overall priority for management. The scope of the audit included an assessment of rivers (including riparian vegetation), wetlands, lakes and waterbodies, saltmarshes, estuaries, karst systems and groundwater dependent ecosystem values (Department of Primary Industries, Parks, Water and Environment, 2009) .

#### **1.1.5 Groundwater in the region**

The region also encompasses extensive but poorly understood groundwater resources. These are important contributors to the base flow of streams and rivers in the region and provide a source of fresh water for agricultural and domestic use, although aquifers provide varying yield and capacity. Bores are widespread across the landscape and are often used by landowners in an informal way without established monitoring. To date there is little data available on the extent of aquifers and with little ground truthing to support geographical mapping. However, 12 groundwater flow systems have been identified (NRM South, 2009). Unlike some parts of the mainland where very large geological structures have created groundwater flow systems extending over enormous areas, Tasmania's aquifers are very localised both in quantity and extent. Groundwater use is considered to be relatively small when compared to total potential available groundwater resources (Commonwealth of Australia, 2000). Within the region in the period of time from 1924 to 2007, groundwater extraction has represented 5% of the groundwater recharge for that time (CSIRO, 2009). Despite this, there are a number of specific areas where groundwater development is relatively intense, and the demand for larger bores to provide irrigation supplies is increasing. These areas include Cygnet-Cradoc (31%) and Sorell Tertiary Basalt (14%) groundwater assessment areas, with other indicators pointing to the Dolphin Sands and Huonville areas as well.

Water resource matters associated with potable water supply, stormwater and wastewater are discussed in the Infrastructure Topic Paper. Use of water resources for irrigation purposes and its value to agricultural production is discussed in the Productive Resources Topic Paper

## **1.2 Legislative & Governance Context**

The management of water resources and the maintenance of water quality are governed under a complex state based system. The *Water Management Act 1999* provides for the management of Tasmania's freshwater resources through controlling their use and management. Water Management Plans, prepared in accordance with the *Water Management Act 1999*, can be developed in consultation with stakeholders to ensure the sustainable development and management of a water resource through allocation of water rights. Water Management Plans relevant to the Southern region are the Little Swanport, River Clyde and Lakes Sorell & Crescent Management Plans.

Actual responsibility for the management of water resources within Tasmania is primarily the responsibility of the Department of Primary Industries, Parks, Water & Environment, although Hydro Tasmania constitutes the major water resource manager within the State in practice.

Hydro Tasmania is conferred a Special Licence under Division 6 of the *Water Management Act 1999* for the purposes of hydro-electric generation and the transfer of water rights in accordance with the licence. Hydro Tasmania is responsible for catchment areas equating to nearly 33% of the land mass of Tasmania (Edgar et al 1999) and as a consequence it is a water manager as well as an energy provider through release of water from storage lakes for use downstream. Within the Southern Region, the most dominant downstream use of water managed by Hydro Tasmania is irrigation. As a water manager it is responsible for the quality of water released from storage lakes. However, use and development on land outside its control around the storage lakes affects the water quality, for which it is responsible. Hydro Tasmania as a land manager has a strong interest in how use and development is controlled through those water catchments.

The *Water Management Act 1999* also provides for the assessment and approval of dam work by the Assessment Committee for Dam Construction (ACDC). Where a permit has been issued for dam work, a permit is not required under the *Land Use Planning and Approvals Act 1993*. It should be noted that the assessment of dam works under the *Water Management Act 1999* broadly mirrors that of the *Land Use Planning and Approvals Act 1993* to allow for public comment. Development of major hydro-electric schemes has ceased in Tasmania and assessments by the ACDC relate almost entirely to dams proposed for irrigation purposes.

The high level policy, the *State Policy on Water Quality Management 1997*, sets the objectives and outcomes for the sustainable management of Tasmania's surface water and groundwater resources. As a formal State Policy prepared under the *State Policies and Projects Act 1995*, use and development within the State must be undertaken in a manner that does not prejudice the attainment of the Policy's objectives. The Policy refers to key issues affecting water quality, and introduces a system of classifying the water-quality values and uses of surface and ground waters, known as Protected Environmental Values (PEVs). It provides that PEVs must be taken into account in strategic planning studies and may be shown in draft planning schemes or equivalent draft planning instruments.

Five categories of PEVs are set by the Policy: - Protection of Aquatic Ecosystems; Recreational Water Quality and Aesthetics; Raw Water for Drinking Water Supply; Agricultural Water Uses; and Industrial Water Supply. The Board of Environmental Management & Pollution Control, in consultation with stakeholders, sets PEVs for discrete catchments or municipal areas. To date, PEVs have been set for the following areas completed for southern Tasmania:

- Derwent Estuary land based surface water and Derwent Estuary
- Glamorgan-Spring Bay Catchment
- Great Lake & Brumby's Creek Catchments, Lower Macquarie and South Esk Rivers
- Huon Valley
- Kingborough Municipal Area and D'Entrecasteaux Channel
- South East Coastal Catchments
- Southern Midlands Council Municipality
- Upper Derwent River

### 1.3 Planning Implications

Water resources are vitally important to the region and planning needs to ensure that waterways and wetlands, as dynamic environments susceptible to damage, are protected from poorly planned or managed development. Such damage can extend beyond the immediate physical area of the development and can affect upstream or downstream areas and resources.

The greatest threat to water quality and management is the establishment of land uses adjacent to water bodies and waterways that have the potential to adversely impact aquatic values. While recognising that some activities that impact upon water resources exist outside the control and scope of the land use planning system, the system nevertheless, extends jurisdiction over the majority of activities that impact on water resources. Industry, mining, forestry, intensive agriculture, road works and urban development all have the potential to pollute waterways, if poorly managed. The pollution can affect streams and lakes, groundwater and wetlands, estuaries and the coastal marine environment.

Considering the importance of the water resource, planning must also provide the conditions to maintain appropriate water supply and quality. To achieve this it is necessary to identify areas suitable for different land uses ensuring those uses which have the greatest potential impact on water quality and supply are located away from catchment and aquifer recharge points. The control of land clearance in line with the Permanent Native Forest Estate Policy managed in association with the Forest Practices Authority is an important consideration (discussed in more detail in the Productive Resources Topic Paper).

The CFEV project provides a useful tool for planning land use and development by utilising the five assessment components that can be considered when looking at an ecosystem, site or location. These are:

- **Conservation Management Priority (CMP)** The importance (or priority) of each site is displayed using colours where Blue = Very High; Green = High; Orange = Moderate and Red = Lower Conservation Management Priority.
- **Representative Conservation Value (RCV)** and associated important biophysical class (as predicted under pristine conditions) gives an indication of how representative each site is of the biophysical classes to which it belongs.
- **Integrated Conservation Value (ICV)** and associated Special Values. This value combines RCV with a measure of the Special Values (e.g. threatened species) present at a site.
- **Naturalness score (N-score)** and associated Naturalness drivers. These provide an indication of the condition of a site, using pre-European settlement condition as a baseline.
- **Land Tenure Security (LTS)**. This provides an indication of the land tenure associated with a site, and this is used to infer a rough assessment of current conservation management.

Groundwater is an integral part of the hydrological system and needs to be carefully considered as part of surface water and land use management strategies. There is a need for improving the community's understanding of the values and requirements of groundwater systems, and the connections between land use, groundwater and surface water.

## 2. Coastline

### 2.1 Background

The coastline of the southern region, a total of 3263 km, constitutes 39% of Tasmania's entire coastline. This includes estuaries up to freshwater and all islands and inlets (NRM South 2005). Coastal areas represent the lifestyle choice of the region as the major population base is located in and around the south-eastern coastal areas of Tasmania. Consequently, the coastal areas of the Region are highly valued in terms of its scenic, cultural, recreational and environmental values.

Tasmania's marine environments contain some of the most distinctive flora and fauna in the world in terms of composition and diversity. This is mainly due to: the long coastline (relative to the landmass); the variety of coastal and marine habitats and oceanographic conditions; and Tasmania's geographical location at the southern-most extremity of Australia. Tasmania's diversity and uniqueness are enhanced by sub-Antarctic influences in the biota, the effect of oceanographic barriers in Bass Strait, and the presence of large drowned river valleys and estuaries (e.g. Bathurst Harbour–Port Davey, Derwent, Huon, Tamar, Macquarie Harbour) (Edgar et al 1999).

The coastal environment has a high concentration of sites of cultural and natural significance. This includes sensitive Aboriginal sites and landscapes, historic European settlement sites, high priority vegetation communities, threatened flora and fauna and sites of geological significance. The loss or destruction of coastal habitat is a significant threat to marine, coastal and estuarine life. Many species are dependent on estuarine and coastal habitats that can be adversely impacted through coastal residential and industrial development, rural land use and landfill. At the same time protection of coastal vegetation has not been afforded as high a level of protection (i.e. through Schedule 3A of *the Nature Conservation Act*) as other non-coastal vegetation communities.

Loss of natural coastal vegetation within the region is significant across the south-eastern areas, in particular the Derwent Estuary. This loss has included significant damage to wetlands from draining, filling and clearing of vegetation. Changes to coastal processes in the region have largely been the consequence of interference with natural processes.

Currently, approximately 2200 km or about 67% of the coastline of the region is dedicated to public reserve in one form or another (LIST Data, 2009).

Water quality within the estuaries on the south and west coasts is generally very good due to the lack of modification in these catchments. Water quality in the Huon Estuary is also generally good, despite some concerns regarding discharges from all three sewerage treatment plants within the area. In regard to south-east and east coastal waters, water quality is poorer in comparison to remaining areas of the region, due to the effects of land and water management activities associated with a higher population density and greater proportion of rural farmed land. These areas tend to show signs of stress such as elevated chlorophyll and faecal coliform concentrations and high turbidity and nutrient levels (Derwent Estuary Program ([www.derwentestuary.org.au](http://www.derwentestuary.org.au)), accessed 22 September 2009).

The Derwent Estuary has long been regarded as seriously degraded and a number of issues pose ongoing management challenges including historic heavy metal pollution, intermittent faecal contamination, depressed oxygen levels, and elevated nutrient concentrations. Community concern exists regarding marine pollution in the estuary particularly relating to increased nutrients around marine farms, and oil and sewerage pollution from boats.

There are also specific threats to Tasmania's coastline that are briefly outlined below:

### **Canal Estates**

In late 2007, Walker Corporation applied to the State Parliament to construct a canal estate at Lauderdale. Parliament directed the then Resource Planning and Development Commission (now Tasmanian Planning Commission) to undertake the assessment of a canal estate at Ralphs Bay as a project of State Significance. In early 2010, this application was refused. The reasons for refusal were quite specific to site conditions, including impact on migratory bird species, potential impact on a nearby RAMSAR listed wetland, general site suitability and proposed environmental management responses.

There are however other broader issues relating to canal estates which include concerns that financial benefits to the community as compared to the social and environmental costs were not clear; that the development was not consistent with the objectives of the RMPS; the development is inherently unsustainable with no demonstrated need for this type of housing to be provided for. On balance the recommendation under the Draft Assessment Report was for refusal.

Considerable evidence through Australia exists recommending against the existence of Canal Estates. In other mainland jurisdictions canal estates are prohibited excepting Queensland and Western Australia. Considering the impacts on plants and animals, the known risks of sea level rise and impacts of storm surge as well as the social impacts on the community, a further regional policy should be to prohibit Canal estates within the region.

### **Coastal structures**

Around the southern region's coastline, there are numerous private jetties and boat ramps, some of which have been in existence for many tens of years, others are more recent. Some planning schemes are silent on the acceptability or otherwise of jetties and boat ramps and the assessment process is left primarily up to Marine and Safety Tasmania with limited consideration of the planning implications. Allowing the continual construction of private boat ramps will have a number of impacts on the broader community and the natural environment. It further reduces the accessibility to the foreshore by the community and reduces the likelihood of achieving public access along the foreshore as the norm. There are undoubtedly flow on impacts from the construction of marina's and jetties to the coastline elsewhere, not helped by the fact many of these structures are built on mobile land forms. Planning Schemes should reflect that jetties and boat ramps should only be constructed in the instances where they are used by the broader community, not just by an individual. This would more accurately reflect the communities perception and attitude towards access of the foreshore areas as well as providing a level of protection to the delicate dune and coastal systems of the area.

### **Sea Level Rise and Storm Surge**

The Southern Tasmania Regional Planning Project, in conjunction with the other two regions and the Tasmanian Planning Commission, has commissioned work into mapping predicted levels of sea level rise under certain events into the future. This has given the region greater knowledge of those areas likely to be at threat, and those where inundation will have less of an impact. It is important to acknowledge that this work is in the initial stages and considerably more work must be done not only in improving the accuracy of the spatial data, but also in the drafting of Climate Change Policies looking at both mitigation and adaption. Consideration must also be given to the level of risk that the community is

willing to accept,, as well as liability, and cost sharing by the community, for existing and future developments.

It is important that this data and mapping is reflected within the Planning Scheme zonings and documents to ensure that we are adequately planning for sea level rise into the future. It is also important that landward retreat of coastal habitats and species is allowed to occur, so zonings should not only reflect communities expectations with regard to housing and associated development, but also consideration of the natural processes existent along coastal areas.

Sea Level Rise and Storm Surge issues are discussed in greater detail under Background Report No. 6: Land Hazards.

## 2.2 Legislative & Governance Context

Responsibility for coastal management issues falls across a range of state agencies and local government functions. *The State Coastal Policy 1996* (a policy prepared in accordance with the *State Policies and Projects Act 1995*) is intended to provide a consistent, state-wide approach to coastal management and applies to all State waters and land within the 'coastal area' which is currently defined as all land within one kilometre of the high water mark. It is proposed that this definition will be altered under the review of the *State Coastal Policy* (currently with the Tasmanian Planning Commission) to the following:

- (a) *State waters and the area of land identified in a planning scheme or any other instrument required to manage or control use or development, which encompasses the coastal assets, values and processes which are to be conserved, used or developed; or in the absence of an area so identified;*
- (b) *All land to a distance of one kilometre inland from high water mark and State waters.*

The policy is intended to provide guidance for local government regarding coastal management issues that should be taken into account in decision-making, in particular the planning processes set out under the *Land Use Planning and Approvals Act 1993*. As required by legislation, all planning schemes are required to be prepared in accordance with the *State Coastal Policy*.

The policy is based upon the principle of sustainable development as embodied within the objectives of the RMPS. It has specific principles with a range of outcomes identified against each principle. These principles are:

- Natural and cultural values of the coast shall be protected;
- The coast shall be used and developed in a sustainable manner; and
- Integrated management and protection of the coastal zone is a shared responsibility.

The policy in general requires that the coastal zone will be managed to protect the features and environments of conservation value and that coastal development be directed to locations which will minimise their environmental impact. The Policy requires suitable urban and residential areas, areas of special value, important wetlands and coastal transport routes to be identified in planning schemes. The design and siting of development must also be subject to planning controls "*to ensure compatibility with natural landscapes*".

In addition, the Policy also provides for the identification and management of coastal based hazards, in particular those arising from climate change effects.

Also relevant to the coast is the State Policy on *Water Quality Management 1997* (discussed in Section 1.2.2 above).

As such a large percentage of the region's coastline is within public ownership, the various management arrangements of public agencies are particularly relevant to the management and protection of the region's coastline (LIST Data, 2009). The Department of Primary Industries, Parks, Water and Environment (Crown Land Services Branch) is responsible, under the *Crown Lands Act 1976*, for the leasing and licensing of coastal Crown Land. Uses may include jetties, boat ramps, holiday shacks and aquaculture shore facilities (Department of Primary Industries, Parks, Water & Environment 2009).

The *Living Marine Resources Management Act 1995*, the *Marine Farming Planning Act 1995*, and the *National Parks and Wildlife Act 1970* are part of the Resource Management and Planning System. While these Acts are part of the system by the common objective of sustainable development, each Act establishes a planning process specific to the activities or areas it regulates.

## 2.3 Planning Implications

From a land use planning perspective, the planning processes and scope of planning controls set out under LUPAA, and other relevant legislation, have limited applicability to marine areas and planning issues relevant to the Regional Land Use Strategy primarily relate to land based coastal activities and structures extending from the land across water such as jetties and boat ramps. However the wording of section 7(d) of the *Land Use Planning and Approvals Act 1993* states:

7. *Municipalities may exercise powers in respect of accretions from sea, ...*  
*A municipality may exercise its powers under this Act in respect of –*  
*d) any area of the sea directly adjoining its municipal district in, on, over or under which any use or development is related to, or affects, the use of any adjacent land, subject to section 20(7)(c)(d).*

This being the case, there is an argument to suggest that developments such as offshore wind farms, or tidal and wave energy projects would have to be assessed under the *Land Use Planning and Approvals Act 1993* in accordance with that provision.

The coastal environment is the most dynamic and changeable of all landforms and is particularly sensitive to potentially damaging uses including: ribbon development; removal of native vegetation; invasive weeds; certain recreational activities; wastewater disposal; septic leachate and rubbish dumping. The pressures on both public and private coastal areas from: tourism; recreation; residential development; farming and forestry are considerable with wide ranging impacts. Of particular concern is the increasing number of development applications on land contained within the coastal zone. Foreshore development is a particularly sensitive issue as it often involves development on active landforms.

Any shoreline construction such as reclamation or marinas will cause some subsequent changes to the foreshore elsewhere. For instance, beaches may eventually be destroyed by inadequately designed engineering structures, such as sea walls, that are intended to protect the coastal environment (GHD 2007).

Protected areas, conservation areas and nature reserves are also not immune from coastal degradation as increasingly private vehicles, access paths and undesignated camping on beaches are causing major

disruptions to coastal foreshore ecosystems. The coastal zone has suffered from fragmented management resulting in poor integration and lack of coordination of planning and management. The potential threat of sea level rise is a significant issue for future planning and management of coastal areas.

The *State Coastal Policy 1996* can be implemented through planning schemes and other instruments that manage and control use or development in coastal areas, which means that schemes will need to be reviewed to ensure that the objectives are met. This task is however complicated at present, by the review of the Policy, the status of which is unclear.

Planning and management will need to focus on developing and implementing policies and actions to protect areas of natural value, improve water quality, rehabilitate areas and manage threats to key species. Threats to coastal values can be managed through development control processes. All of this can be achieved through integrating information and knowledge between differing state agencies, community groups and independent bodies to improve management practices and ultimately reduce the effects on marine, coastal and estuarine ecosystems.

## 3. Vegetation Management and Biodiversity

### 3.1 Background

The region contains large expanses of native vegetation on both private and public land. For its small size, the diversity of vegetation is surprising, including mosaics of alpine herb fields and colourful heathland, ancient rainforests, tracts of native grasslands and dry windswept coastal vegetation (DPIPWE 2009). Tasmania has very diverse habitats created by the large variation in altitude, water availability and soil types. As a result, Tasmania has varied and interesting vegetation communities that broadly reflect an east to west change in climate conditions from the dry east coast to the wet west coast and in geology from dolerite and granites in the east to quartzites in the west.

In Tasmania, there are many broad vegetation types which include: alpine vegetation; temperate rainforest; wet sclerophyll forest; dry sclerophyll forest; heathlands; wetlands and moorlands. These broad vegetation types are further divided into vegetation communities, of which there may be many within each vegetation type. These vegetation communities are described in the book *From Forest to Fjaeldmark*, which was developed to support the Tasmanian Vegetation Map (TASVEG).

There are three distinct bioregions across Southern Tasmania:

- The West;
- The Southern Ranges; and
- The South-East.

The bioregion in the west of Southern Tasmania solely comprises of protected and conserved land and is a significant contributor to the extent of native vegetation cover not only in the region, but the State. The other two bioregions, while still retaining high levels of native vegetation cover are under considerable pressure from land use changes and urban development. Native vegetation is often fragmented and degraded, restricting ecosystem connectivity, biodiversity and habitat.

Tasmania has a high level of native vegetation retention, as a percentage of its total area, with nearly 80% native vegetation cover in the Southern region (NRM South 2005). Vegetation removal is occurring for a variety of reasons including subdivisions, urban, industrial and public infrastructure development, agriculture and forestry tree plantations, domestic fuel wood collection and farm dam construction. Areas within the region that have been cleared at a significant rate include: the Midlands; Coastal and nearby coastal areas; the Huon and Derwent Valleys; wetland and riparian vegetation; and catchments that provide water storages. There is concern within some parts of the community that vegetation clearance could in fact exceed thresholds for ecosystem services.

In parts of the region, extensive clearing of native vegetation has left isolated islands of preserved native vegetation, which inhibits wildlife movement. Many species need to move across large areas of bush searching for food, nesting sites and mates. Corridors of vegetation linking areas of bushland are valuable as they allow movement of wildlife and also provide useful habitat in themselves. They provide young animals with the ability to move out seeking new territories, thus avoiding the overcrowding of existing habitats and allowing recolonising of areas from which animals have disappeared. Over long time periods, corridors also provide plant species the ability to migrate, an important protection mechanism against climate change.

## 3.2 Management of Protected Flora and Fauna Species

### 3.2.1 Overview

The diversity of vegetation communities across the region provides habitat for a wide range of native fauna including a number of iconic Tasmanian species such as the Tasmanian devil (*Sarcophilus harrisi*) and wedged-tailed eagle (*Aquila audax fleayi*). Tasmania, having fewer introduced predators, and a relatively large amount of intact habitat on the island, is a final refuge for many species.

Since European settlement, there has been a notable decline in species numbers, leading to a number of indigenous flora and fauna species being extinct, and many more endangered, vulnerable or rare. This has come about through a number of actions having considerable impact, including; clearance of native vegetation; impacts of pests, weeds and diseases; degradation of water systems; inappropriate use of fire; inappropriate and illegal harvesting and impacts of stock (DPIPWE, 2010).

The region has fauna resources that have been identified as significant at either a regional, State and national level in accordance with the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* and the Tasmanian *Threatened Species Protection Act 1995*. A total of 26 animal species in the region are listed as threatened at the Federal level alone (NRM South 2005).

One of the biggest challenges in the protection of threatened fauna species is that they will often occupy non-threatened vegetation communities and as such are not afforded a significant level of protection. Whilst this habitat is crucial to the survival of a threatened fauna species, its lack of protection in some cases can see the resource significantly depleted. Further work is required in identifying the vegetation communities. Once this work is completed the appropriate legislation must be reconsidered to ensure the effective protection of various threatened fauna species.

Significant flora resources have also been identified under this legislation, with 57 'threatened' plant species located in the Southern region alone.

Throughout Tasmania there are more than 600 species of plants and animals that are listed as threatened with the list being updated regularly (Parks and Wildlife Service, 2010).

### 3.2.2 Legislation & Governance

The *Threatened Species Act 1995* provides a level of protection and management of threatened native flora and fauna and enables the promotion of native flora and fauna. The act is drafted with the objectives of the Resource Management and Planning System and the Threatened Species Protection System as underlying principles, and aims to:

- To ensure that threatened species can survive and flourish in the wild;
- To ensure that threatened species and their habitats retain their genetic diversity and potential for evolutionary development;
- Prevent further species becoming threatened.

The act lists species which are presumed to be extinct, endangered, vulnerable and rare and specifies a process through which additional species can be included.

The *Environmental Protection and Biodiversity Conservation Act 1999* is the Australian Government's key piece of legislation for protection and management of the environment. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and

heritage places (Department of the Environment, Water, Heritage and the Arts, 2010). The objectives of the Act are to:

- provide for the protection of the environment, especially matters of national environmental significance
- conserve Australian biodiversity
- provide a streamlined national environmental assessment and approvals process
- enhance the protection and management of important natural and cultural places
- control the international movement of plants and animals (wildlife), wildlife specimens and products made or derived from wildlife
- promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources

The Act provides guidance on when projects require assessment and what is involved in an environmental assessment, as well as governance responsibilities of Commonwealth Ministers and State agencies.

Specific permit processes to 'remove' or 'destroy' protected flora or fauna resources are provided for under both the *Threatened Species Act 1995* and *Environmental Protection and Biodiversity Conservation Act 1999*. The integration of these permit processes into the broader approval processes for activities which require the removal or destruction of a threatened species is dependent upon the legislation under which it is referred. Potential referral legislation includes:

- *Forest Practices Act 1985* (forestry activities);
- *Water Management Act 1999* (Irrigation and dam construction);
- *Marine Farming Act 1995* (marine farms);
- *Land Use Planning and Approvals Act 1993* (Level 1 Activities including Projects of Regional Significance);
- *Land Use Planning and Approvals Act 1993* with the Environmental Management & Pollution Control Act 1993 (Level 2 Activities including Projects of Regional Significance); and
- *State Policies and Projects Act 1995* (Projects of State Significance).

### **3.2.3 Planning Implications**

The trigger for the permit process to 'remove' or 'destroy' a threatened species under both the State and Commonwealth legislation is in the initial identification of the presence of a threatened species on land to be disturbed by an activity (whichever legislation that activity is approved under).

Existing spatial data is generally unreliable in determining with any accuracy the presence of a threatened species on a site. For threatened fauna, spatial data is based upon 'observations' of animal species and therefore shows high occurrence of observations along roadways and near urban areas, with very few observations in protected and conserved areas. The spatial data does not assist in providing information on the likely habitat of threatened fauna.

With regard to the spatial data on threatened flora, this is again dependent upon recorded 'observations' of specific species. While spatially accurate when an observation has been recorded, the data is only

reflective of those instances when detail on-ground data has been passed along to the data managers in the Department of Primary Industries, Parks, Water & Environment.

The lack of available data has meant that in the past, that data has only become available when there has been a head of power to request an assessment be undertaken at the Planning Application stage.

With approval applications relating to forestry, irrigation, dam construction, Level 2 activities and Projects of State Significance, an onsite assessment is a usual element in the preparation of an application by the proponent. The specific legislation relevant to that activity provides sufficient power to the regulator to require such an assessment.

With standard level 1 applications assessed under the *Land Use Planning and Approvals Act 1993*, the ability of the regulator to require as part of the development application an on-site flora and fauna assessment depends upon the head power provided to it under the relevant planning scheme. At present in many instances within the region, existing planning schemes do not provide the relevant head of power. Consequently the removal or destruction of threatened species can go undetected and uncontrolled.

There is however a more efficient way of managing threatened species to ensure their protection that until now has not been utilised adequately. If areas of vegetation where threatened species exist were identified prior to a Planning Scheme and associated maps being finalised, then it could be more appropriately zoned (ie. As Environmental Management as an example) to reduce the likelihood of complex planning applications being received for that site. It would also mean any applicant would be aware of the restrictions on the site early in the process, thereby being informed before making a decision to purchase the site. This does have implications in terms of significant ground truthing work to be undertaken to ensure the data is adequate, however this is likely to reduce land use conflicts in the future if areas are appropriately zoned in the first instance.

If this cannot be achieved, ensuring planning schemes provide a head of power to require such information from the applicant is the next step. This is not a straight forward matter. It would require, at the regional level, the inclusion of requirements, most likely in the form of a Code which specify the instances when onsite flora and fauna assessments would be necessary. It would also specify the instances when a development is not appropriate because of the significance of the disturbance of vegetation and the impact on threatened species. Threatened species, particularly flora species, can exist on any site, whether it is bush, rural or peri-urban land. Indeed some specifically listed flora species thrive on land which has been disturbed or cleared (i.e. native orchids and some grass species).

To require on-site flora and fauna assessments for applications, which relate to land, other than well established and intensively developed urban land, would result in a significant increase in the cost of a planning approval. The instances of when an on-site flora and fauna assessment will be required as part of a development application therefore needs to be carefully considered and implemented through planning schemes. This further supports the argument that sensitive areas should be identified prior to the zoning of land for development, to ensure that these potential conflicts with development applications are minimised wherever possible.

### 3.3 Management of Native Vegetation Communities

#### 3.3.1 Overview

Tasmania's diverse native vegetation has been classified into 158 different ecological vegetation communities (Harris S and Kitchener A, 2005), which forms the basis for mapping of vegetation communities across the State (TasVeg). These different vegetation communities can be broadly categorised into forest and non-forest vegetation.

The State of Tasmania is signatory to a Regional Forest Agreement (RFA) with the Commonwealth Government (originally signed in November 1997 and renewed in 2005). RFAs are 20 year plans for the conservation and sustainable management of Australia's native forests. They are intended to provide certainty for forest-based industries, forest-dependent communities and conservation and are based upon scientific study and consultation.

As part of meeting the State's obligations under the RFA, the Policy for Maintaining a Permanent Native Forest Estate was developed. Originally developed in 1997, the policy was revised in 2005, following the renewal of the RFA and further refined in December 2009.

The policy is to ensure that sustainably managing Tasmania's native forests and is aimed at:

- Phasing out broad scale conversion of native forest on private land by 2015;
- Retaining a minimum of 95% of 1996-level native forest area across the State.

The policy is given effect through the *Forest Practices Act 1985*, with all clearing and conversion undertaken in accordance with a certified Forest Practices Plan counting toward the achieving of maintaining 95% of the 1996-level native forest area.

#### 3.3.2 Threatened Native Vegetation Communities

Clause 48 of the RFA requires Tasmania to introduce statutory mechanism to prevent clearing and conversion of rare, vulnerable and endangered non-forest vegetation communities. To give effect to this commitment, the Government:

- Introduced a schedule of threatened native vegetation communities as an amendment to the *Nature Conservation Act 2002* (Schedule 3A);
- Required any clearing and conversion of listed threatened native vegetation to be carried out in accordance with a Forest Practices Plan with the conditions restricting under which an FPP would be certified (*Forest Practices Amendment (Threatened Native Vegetation Communities) Act 2006*).

The second element is now reflected in Section 19 (1AA) of the *Forest Practices Act 1985* which states:

*...the Authority [Forest Practices Authority] is not to certify a forest practices plan involving the clearance and conversion of a threatened native vegetation community unless the Authority is satisfied of one or more of the following:*

- (a) the clearance and conversion is justified by exceptional circumstances;*
- (b) the activities authorised by the forest practices plan are likely to have an overall environmental benefit;*

- (c) *the clearance and conversion is unlikely to detract substantially from the conservation of the threatened native vegetation community;*
- (d) *the clearance and conversion is unlikely to detract substantially from the conservation values in the vicinity of the threatened native vegetation community.*

### **3.3.3 Habitat for Threatened Species**

Clearly native vegetation communities provide habitat for threatened fauna species. Many vegetation communities providing habitat for threatened species are however not identified as threatened vegetation communities under Schedule 3A of the *Nature Conservation Act 2002* and therefore afforded the potentially high level of protection that threatened vegetation communities are. For example the wet forest vegetation communities based upon *Eucalyptus Delegatensis* and *Eucalyptus Obliqua* both provide important habitat for threatened bird species such as the Wedge Tailed Eagle and Grey Goshawk, while the dry forest and woodland communities based upon *Eucalyptus amygdalina* provides habitat for the threatened Spotted Tailed Quoll. None of these communities are specific identified as threatened vegetation communities.

In all instances the permit processes relating to threatened fauna species under the *Threatened Species Act 1995*, is not invoked until there is a direct intention to destroy an animal. Therefore the long term destruction of threatened species through loss of habitat is a significant issue which is potentially left under regulated through existing management processes.

### **3.3.4 Clearance and Conversion of Native Vegetation**

As indicated above, native vegetation clearance is primarily controlled through the *Forest Practices Act 1985*. Under this legislation, a certified Forest Practices Plan is required for the harvesting of timber or clearing of trees on any land:

- greater than 1ha in area or;
- 100 tonnes in volume (whichever is the lesser) AND;
- providing the land is not identified as threatened (i.e. listed under Schedule 3A of the *Nature Conservation Act 2002*), unless the Forest Practices Regulations specifically exempts that activity from requiring a certified Forest Practices Plan.

Clearance of native vegetation below 1ha is solely controlled through the *Land Use Planning and Approvals Act 1993*, in that vegetation removal and soil disturbance is defined as 'development' under the Act.

With regard to clearance and conversion of non-forest vegetation communities above 1ha the only possible legislative control is also through the *Land Use Planning and Approvals Act 1993*, unless the non-forest vegetation communities is specifically identified as threatened under Schedule 3A of the *Nature Conservation Act 2002* or the *Environment Protection and Biodiversity Conservation Act 1993* (Commonwealth) (see Section 3.3.2 below).

In November 2009, the *Forest Practices Regulations 2007*, which outline the circumstances in which a forest practices plan is not required, were amended to provide for further exemptions of the following activities:

*the harvesting of timber or the clearing of trees on any land, or the clearance and conversion of a threatened native vegetation community on any land, in the course of mineral exploration activities, or mining activities, that are authorised under –*

- (i) a permit granted under the Land Use Planning and Approvals Act 1993; or*
- (ii) an exploration licence within the meaning of the Mineral Resources Development Act 1995; or*
- (iii) a retention licence within the meaning of the Mineral Resources Development Act 1995; or*
- (iv) a mining lease within the meaning of the Mineral Resources Development Act 1995;*

AND

*the harvesting of timber or the clearing of trees on any land, or the clearance and conversion of a threatened native vegetation community on any land, for the purpose of enabling –*

- (i) the construction of a building within the meaning of the Land Use Planning and Approvals Act 1993 or of a group of such buildings; or*
- (ii) the carrying out of any associated development –*

*if the construction of the buildings or carrying out of the associated development is authorised by a permit issued under that Act;*

The effect of these changes is that the assessment of vegetation clearance, including that of threatened native vegetation communities listed under the *Nature Conservation Act 2002*, associated with those exempted activities above, are now the responsibility of local Planning Authorities in addition to the clearance and conversion of less than 1ha.

### **3.3.5 Adequacy of the Planning Approval Process**

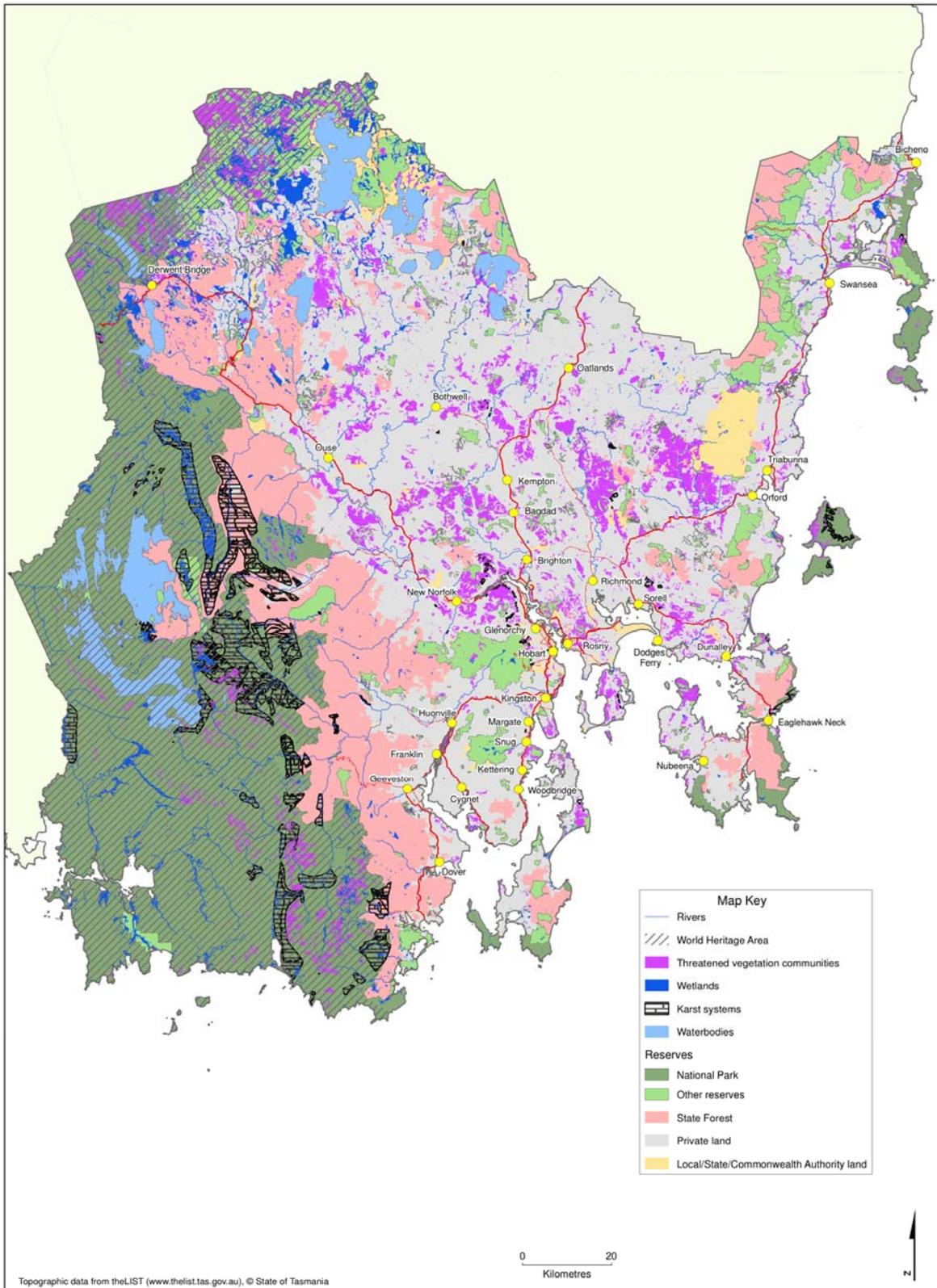
Whilst in theory, the changes to the Forest Practices Regulations could have provided for a more streamlined and systematic approach to assessment, there are significant inadequacies in many current planning schemes and the legislative powers available to Planning Authorities under the *Land Use Planning and Approvals Act 1993*. The impact of these changes and associated ramifications were not adequately considered.

Clearing associated with use and development and subdivision applications is generally small scale, but often involves high conservation value vegetation and threatened communities. In the past where threatened communities were involved, it triggered the requirement for a certified forest practices plan, enabling a more thorough and science based assessment given to the powers of the Forest Practices Authority.

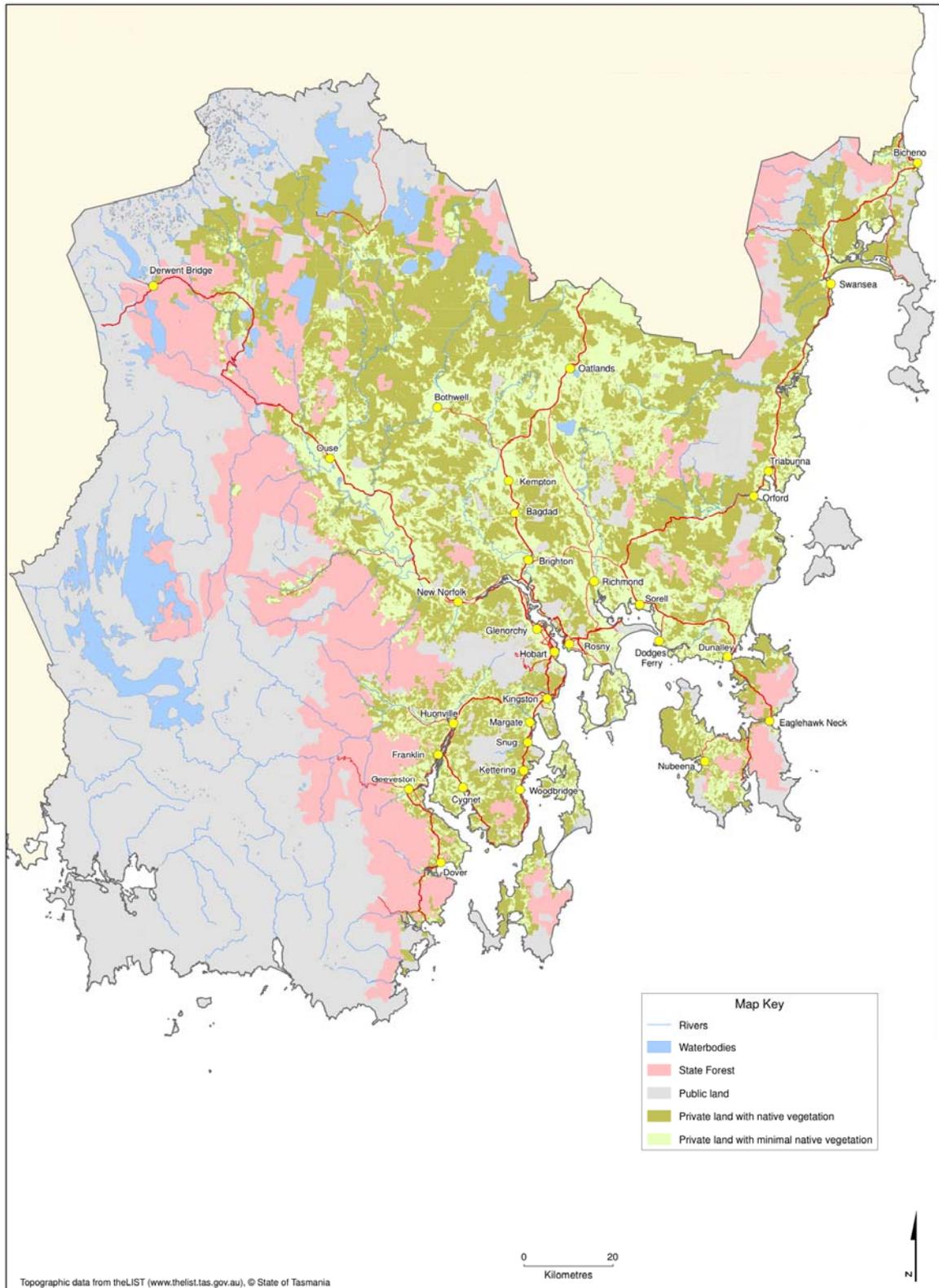
On the other hand, Planning Authorities' power to refuse development or impose conditions through the planning approval process defined by the *Land Use Planning and Approvals Act 1993*, is limited by the provisions of the planning scheme. In many cases throughout the southern region, existing planning schemes do not provide any head of power to assess the impacts of vegetation clearance. Planning schemes that have already been identified as deficient, in terms of the Planning Authorities' abilities to

respond to their additional assessment responsibilities, include over 10 of the existing 16 planning schemes in effect across Southern Tasmania.

In addition, there are also potential deficiencies between the resourcing capability of the Forest Practices Authority and the Planning Authorities to assess clearance and conversion of native vegetation and associated impact (including loss of habitat and biodiversity value). The Forest Practices Authority employs a wide range of experts in environmental management, while in most instances Planning Authorities rely upon planners or para-planners to assess development applications, who lack the specific technical expertise. Well resourced Councils employ some natural resource management officers or environmental scientists, but many others rely upon receiving timely advice from the Department of Primary Industries, Parks, Water and Environment. This in itself has produced problems in the past with Local Government timeframes being considerably tighter than State Government timeframes resulting in delays in the exchange of information between the Government departments.



**Figure 2: Special Natural Values in Southern Tasmania (map available separately)**



**Figure 3: Remnant Vegetation on Private Land in Southern Tasmania (map available separately)**

### 3.3.6 Planning Implications

As the region experiences further development pressure, it is essential that threatened vegetation communities, threatened species and biodiversity is not compromised. The foundation principles for managing natural values through the planning process should be based on the following hierarchy of actions:

- Avoid (achieved through strategic land use planning);
- Minimise;
- Mitigate; then
- Offset (only if there is no net biodiversity loss).

Essential to all aspects of vegetation and biodiversity management, is a state based policy that should identify the conservation value of various communities and species and those values, which should be retained at all costs.

The most significant priority for the Regional Land Use Strategy will therefore be to minimise the potential conflict between urban and residential development and the presence of natural values. The first step in minimising the conflict is to ensure that areas identified for development purposes through the spatial strategy and zoning under new planning schemes, avoid as far as practicable areas where high value conservation and threatened communities and species are located. This requires significant improvement with the data on the location and priority of natural values.

Regional level strategic land use planning also allows for the appropriate planning and protection of biodiversity corridors. Biodiversity corridors however extend across municipal boundaries and, are therefore difficult for a single Local Government authority to maintain in isolation of similar action by neighbouring Councils. Some specific 'biolinks' studies are already well underway within the region (for the Kingborough and Huon areas) the success of which may be able to inform future actions in this area.

It is however recognised that because of the physical characteristics of the region, it will be impossible to entirely avoid clearance and conversion of native vegetation and the loss of threatened species or their habitat by encroaching use and development. The second step then is ensuring comprehensive management of native vegetation and biodiversity through the relevant approval process with subsequent monitoring systems.

There are gaps in the approvals required for vegetation clearance under the current forest practices legislation, however. This is particularly the case where clearance relates to non-forest vegetation or clearance of non-threatened vegetation under one hectare. The clearance of these smaller areas can often lead to 'death by a thousand cuts' sometimes resulting in significant overall impacts to the natural and landscape values of some significant locations. Planning Schemes can provide controls over this type of clearance and there should at the very least, be a standard framework and approach to deliver consistency at a regional level. Establishing an overall monitoring and management system for clearance and conversion of native vegetation across all authorities will be essential not only to delivering on the State's obligations under the RFA but protecting the health and well-being of the ecosystem.

Developing a framework at a regional level will also facilitate a consistent and regional approach to biodiversity offsets. Biodiversity offsets are actions taken to compensate for the loss of biodiversity values associated with development. Such actions usually entail the formal protection of larger areas of

similar types of vegetation or species habitat, but may also include rehabilitation and management of degraded land, management of threats to biodiversity values and scientific research.

A policy approach which encompasses biodiversity offsets can allow development to progress in a manner that will result in an overall improvement in natural values. Biodiversity offset measures are currently being implemented in a limited way by a number of Councils in the region and through their experiences the need for a consistent set of guidelines for applying biodiversity offsets has become apparent. This is being resolved through the Biodiversity Offsets Guidelines Project being managed by the Southern Tasmanian Councils Authority.

#### ***The value of an offsets approach to protecting biodiversity***

##### ***Example 1: On-site local approach to offsets***

In 2009, a development proposal for a retirement village and community centre in Kingston involved the clearance of 1.85 hectares of the vegetation community *Eucalyptus amygdalina* forest on sandstone. This vegetation community is listed as threatened under the *Nature Conservation Act 2002*, is a priority community under the Kingborough Planning Scheme and is recognised as important potential habitat for the endangered *Chaostola Skipper*. This development was approved subject to an on-site offset protecting all the native vegetation in the Environmental Management Zone as 'secure conservation land' under either the *Land Use Planning and Approvals Act 1993* or the *Nature Conservation Act 2002*. In addition, a financial offset of \$15 000 was required to be paid to Kingborough Council to fund research and a management strategy to assist in the recovery of the *Chaostola Skipper* in the municipality.

##### ***Example2: Off-site regional approach to offsets***

In 2009 the Kingston By-pass development proposed by the State Government required the removal of 4.37 hectares of *Eucalyptus ovata* forest, which is a threatened vegetation community under the *Nature Conservation Act 2002*, a priority community under the Kingborough Planning Scheme and is also important habitat for the endangered Swift Parrot. Despite the proposed loss of this vegetation, it was accepted that the development would also have significant benefits for the community and the economy. Therefore the By-pass was approved on condition that the loss of the vegetation be offset by the protection of 12 hectares of the same vegetation community within the boundaries of the south east bioregion by means of a perpetual covenant under the *Nature Conservation Act 2002*. This regional offset approach was only possible because the development triggered the *State Forest Practices Act 1985* and the Federal *Environment Protection and Biodiversity Conservation Act 1999*. However, the recent amendments to the *Forest Practices Regulations 2007* will make it far more difficult to achieve regional-scale biodiversity offsets without changes to the *Land Use Planning and Approvals Act 1993* and local government planning schemes.

## **3.4 Weed Management**

### **3.4.1 Overview**

Weeds, pests and diseases reduce the value of terrestrial, aquatic and marine ecosystems for both biodiversity conservation and rural resource use. Many of the more than 765 exotic plant species that have become naturalised in Tasmania are now serious threats to Southern Tasmania. Of Tasmania's 109 declared weeds, over 50 are unknown to occur in the Region with 10 of these weeds only recorded from Southern Tasmania (NRM South 2005). Of Australia's Weeds of National Significance, seven are found in Tasmania and all seven are found in the region. These weeds are blackberry, gorse, willow, boneseed, bridal creeper, Chilean needle grass and serrated tussock. In addition there are many other plants that are not declared that have established populations, including environmental weeds. An environmental weed is a plant that reduces environmental values through its ability to invade native plant communities and outcompete native flora. Uncontrolled weeds, pests and diseases have the potential to compromise the integrity and beauty of Southern Tasmania and to threaten the viability of some industries. The *Southern Tasmanian Weed Strategy 2005-2010* (STWS) provides a framework for decision making across the Region and tackles, amongst other things, regional priorities that are consistent with national and state priorities and provides opportunities for partnerships and relationships that encourage coordinated weed management.

### **3.4.2 Legislative Context**

The *Weed Management Act 1999* provides the principal legislative framework for weed management in Tasmania. The Department of Primary Industries, Parks, Water and Environment administer the Act. Three categories of plants threaten Tasmania's economy and environment:

1. Plants that are not naturalised in Tasmania but which have the potential to become weeds, if allowed to enter and establish
2. Plants that are naturalised in Tasmania but in a limited fashion and which have the potential to spread much further and cause great harm
3. Plants which are widespread, have demonstrable weed impacts and for which strategic control can be usefully undertaken

Declared weeds are weeds whose management requires legislative support and direction. The *Weed Management Act 1999* aims to minimise the spread of weeds through preventative measures and eradication programs.

### **3.4.3 Planning Implications**

All declared weeds are required to be controlled as outlined in the *Weed Management Act 1999*. Each declared weed is zoned either A (eradication) or B (containment) for each municipal area. Ideally all Zone A weeds should be controlled as part of a development application which involve land clearance or soil disturbance, which would accordingly require a planning scheme to provide a head of power to enable its consideration. It is illegal to plant or transport declared weeds and weed propagules including via stock, soil or water movement. In addition weed hygiene is an important consideration and essential to minimise weed, pest and disease impacts, both on and off site (refer to *Tasmanian Washdown Guidelines for Weed and Disease Control* DPIWE 2004).

Planning processes need to address minimising the spread of weeds, pests and diseases by

- a) managing the movement of soil, water and plant material
- b) ensuring adequate hygiene during construction
- c) addressing on-site weed control of established weeds

## 4. Geoheritage

### 4.1 Background

Southern Tasmania has a wonderfully varied geology and a wide range of landforms, including: dolerite peaks; plateaux and seacliffs; sedimentary layers of sandstone and mudstone; the distinctive craggy granite peaks of the Freycinet Peninsula; as well as older metamorphic rocks such as schists and quartzite in the south-west (NRM South 2005). Coastal geomorphology has shaped much of the coastal landforms whilst extensive belts of limestone (karst) underlie a significant proportion of the Region. This includes a variety of karst depressions that are characterised by sinkholes, caves, and underground drainage systems.

Geoconservation aims to preserve the natural diversity of the non-living environment (the geodiversity of the region). This means protecting significant examples of bedrock features, landforms and soil features and processes (Department of Primary Industries, Parks, Water and Environment, 2009). The region has 360 sites of geoconservation significance including: the highest sea cliffs in Australia; important karst systems with Tasmania's longest and Australia's deepest caves; a wide range of coastal landforms; and unique rock exposures (NRM South 2005). Fortunately, most of these landforms are contained and protected within declared reserves. However, a proportion of coastal landforms are not protected and remain exposed to the threat of coastal development pressures.

A profusion of complex and well-exposed geological features are included within the Tasmanian Wilderness World Heritage Area including the most significant and extensive glacially modified landscapes in Australia. The area contains Australia's greatest array of landscapes and geological types, including rocks from all but one geological period (Parks and Wildlife 2008). These underlie a great diversity of soil types of high conservation value. For example, the WHA incorporates the most extensive peatlands in the southern hemisphere.

### 4.2 Legislative & Governance Context

Protection of Geological diversity is managed through the *Nature Conservation Act 2002* and the *National Parks and Reserve Management Act 2002*. This is achieved through the identification of values for specific classes of reserved land under the *Nature Conservation Act 2002* and any specific values identified through management plans for particular reserved lands. Geodiversity generally falls under the broader responsibilities of Parks & Wildlife Service (where the area concerned is within a reserved area) and the Department of Primary Industries, Parks, Water & Environment.

### 4.3 Planning Implications

Geodiversity can be impacted upon by some developments and it is important to ensure representative features are conserved or appropriately managed to avoid detracting from the features' integrity. A range of sites has developed under climatic or geological conditions, which are now inactive, and impacts on them can be irreversible, meaning that careful management is essential. Major pressures on the region's geodiversity include tourism, mining and land use. Human activities, such as urbanisation, agricultural practices, water exploitation, and deforestation, can negatively impact karst areas, resulting in subsidence and ground-water contamination.

If the natural values of bedrock, landform and soil systems are to be retained as part of the broader nature conservation estate, it is essential that land management procedures pay specific attention to the sensitivities which many aspects of geodiversity display. Many features of geological significance are highly sensitive to human disturbances and this remains a little known consequence. The vulnerability of these sites makes it necessary that land management takes these values into account.

The need for the Regional Land Use Strategy to address the priorities of geoconservation issues is, however, lessened as the majority of areas of higher geodiversity significance are already contained within protected and conserved areas (in particular the TWWHA).

Conserving the values and sustainability of natural environments requires full integration of geoconservation into broader nature conservation programs. Historically there has been a tendency for geoconservation work in Australia to focus on a 'geological heritage' approach, in which geodiversity has been seen to be important mainly for its value to scientific research and education. More recently there has been a shift from this approach, as it fails to address the intrinsic values and ecological sustainability of landforms.

In order to protect geodiversity an understanding is required of the threats that face it and how these threats can be avoided or minimised. There is a need to have active geoconservation inventories and a commitment to manage and monitor relevant sites. Conservation should include an integrated approach encompassing all natural values and processes.

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Southern Tasmania  
REGIONAL PLANNING PROJECT

The Southern Tasmania Regional Planning Project

is a joint initiative of the State of Tasmania, the Southern Tasmanian Councils Authority,  
the 12 Southern Councils and the Sullivans Cove Waterfront Authority