# Appendix 1: GIS Model Input Layer Descriptions

The following appendices are a resource for further understanding the GIS model developed for the Strzelecki IMS. Each input layer is explained individually giving a description of the data source it was derived from, and outlining the rules and assumptions made in applying the data.

The development of each input layer was scrutinised and refined over the life of the project through the involvement of the project Steering Committee and a Technical Reference Group. Several limitations to the data and how it is used were identified through this process. Potential opportunities for future improvements to data for improving the robustness of the layers were also suggested. Limitations of the GIS model input layers and possible improvements to the data sources are also described in each of the individual layer descriptions (Appendix 1.1 – 1.11).

### Appendix 1 Quick Reference

# Appendix 1.1: Surface Water Courses Layer

The Surface Water Course layer was developed to provide quantitative values for major river reaches. Data informing this layer was derived from the River Values and Environmental Risk System (RiVERS) database. The Surface Water Course layer was created to assist in spatially representing the environmental ecosystem service values for natural ecological systems supported by the landscape. Natural ecological systems occurring in the landscape are also spatially represented by two other layers; a Wetlands layer and a Native Vegetation layer.

## What is the RiVERS database?

The RiVERS database is a resource that stores values and threat information for the major river reaches found within the WGCMA region. The database was developed by the Department of Sustainability and Environment and the Victorian Waterways Managers Forum for use by each of the Victorian Catchment Management Authorities (WGCMA 2005).

- RiVERS collates values for the major river reaches identified for the region, recognising various Triple Bottom Line (TBL) value attributes for each reach. In total there are 30 attributes against which each reach is valued (15 environmental, 9 social, and 6 economic attributes). Each attribute is scored between one (1) to five (5) which are then be added together to give an overall value for each river reach. Table 6 lists all of the value attributes that each river reach is scored against. It should be noted that the attributes associated with plantation forestry are not described in the RiVERS database. The appendices of the West Gippsland River Health Strategy 2005 (WGCMA 2005) provide details of the value rating scale for the environmental, social and economic attributes.

**Table 6: RiVERS database river reach valuation attributes (adapted from West Gippsland River Health Strategy 2005 (WGCMA 2005)**

| Environmental Attributes | Social Attributes | Economic Attributes |
|---|---|---|
| Significant Flora | Recreational fishing | Irrigation water supply |
| Significant EVC | Non-motor boat use | Proclaimed water supply catchment |
| Significant Fauna | Motor boat use | Public infrastructure |
| Invertebrates observed/expected | Camping | Land value |
| Width of vegetation | Swimming | Tourism |
| Longitudinal continuity | Recreation | Power generation |
| Structural intactness | Heritage (Indigenous and European) | |
| Fish observed/expected | Listed landscape | |
| Fish proportion introduced | Flagship species | |
| Native fish migration | | |
| Wetland significance | | |
| Wetland rarity | | |
| Heritage/representative river | | |
| Sites of significance | | |
| Ecologically healthy river | | |

## How RiVERS was used to create the Surface Water Course layer

The RiVERS database compiles a large range of values associated with rivers and the surrounding riparian land. The exclusion of certain components of the data was required to ensure the Surface Water Courses layer is an indicator of environmental ecosystem service values only, and does not double count any ecosystem service values being represented in other layers.

Social and Economic attribute values were excluded to ensure that the data was valuing the capacity of the river reaches to support or provide for biodiversity and ecological resilience. Five environmental attributes were also excluded as they directly overlapped with values being captured in the Native Vegetation, Wetlands and Significant Species layers. The ten remaining attribute values of the RiVERS database were used for creating the Surface Water Course layer, the combined value score being converted to a zero (0) to one (1) scale. The attribute values used were:

- Invertebrates – observed vs. expected
- Width of vegetation (indicator of structural resilience)
- Longitudinal connectivity
- Structural intactness
- Fish – observed vs. expected
- Fish – proportion introduced
- Native fish migration
- Heritage/representative river
- Sites of significance
- Ecologically healthy river

A description of the score scale applied for the river reaches is shown in Table 7. The highest Surface Water Course value achieved in the Strzelecki Landscape was 0.82, the maximum possible not being achieved. Much of the landscape receives a zero (0) score because of the limited spatial extent of the data. The Surface Water Course layer is presented as Figure 6 in the body of this document.

**Table 7: Description of Score Scale applied to Surface Water Courses layer**

| Score Scale | Description |
|---|---|
| 0-1 | Summed value of ten applicable environmental attributes of the RiVERS database per river reach, converted to 0-1 scale |

Table 8 provides a summary of the major rules and assumptions associated with the development of the Surface Water Course layer using information stored in the RiVERS database. The table also highlights identified limitations to the application of the data.

**Table 8: Rules, assumptions and limitations associated with the Surface Water Course layer**

| |
|---|
| Rules<br><br>- RiVERS Database values were used in developing this layer. RiVERS data was collected for major river reaches in the West Gippsland CMA region as outlined in the West Gippsland River Health Strategy 2005.<br>- RiVERS Environmental values are the only values considered in this layer. RiVERS values related to Social or Economic values are excluded to avoid double counting in the GIS model.<br>- Environmental values recorded in the RiVERS database related to significant flora and fauna, significant EVCs and wetlands have been excluded to avoid double counting in the GIS model.<br>- A 50m buffer is applied to all river reaches where RiVERS data applies. |
| Assumptions<br><br>- That the RiVERS database is relevant and reflective of the current values of river reaches at the time of Strzelecki IMS development. RiVERS data is the best available data for the intent of developing the GIS model.<br>- That the RiVERS data can be applied as individual triple bottom line components.<br>- That the Environmental values component can be modified (exclude values) without compromising the intent of the data.<br>- A 50m buffer provides an appropriate representation of river reaches at the landscape scale. 50m provides a spatial area and presence in the mapping and analysis, and generally represents all riparian zone values. |
| Limitations<br><br>- RiVERS value data is not available for any streams other than those assessed during the collection of data for the West Gippsland River Health Strategy. This excludes all tributaries to the reaches that have been valued.<br>- RiVERS value data can not be extrapolated to a sub-catchment score. The scores and data are only applicable to the reach they were collected for.<br>- Some level of subjectivity by stakeholders is required in assigning values to some of the RiVERS Database attributes |

## Potential Improvements in Data – Surface Water Courses layer

The data captured in the RiVERS database is a useful index of surface water course value. It is a multi-layered valuation of major river reaches based on several key characteristics. However, the data is limited by the level of spatial detail that can be represented. The data stored in RiVERS is specific to each river reach and is not suitable for extrapolation to represent values of tributaries or the general sub-catchment area.

A potential improvement in data that would help overcome this limitation would be to develop an additional attribute that indicates the general environmental value of the sub-catchment in terms of influence on the values of each river reach. To best suit the Strzelecki IMS GIS model, this attribute would be a value judgement of the sub-catchment in terms of general health and condition, and the subsequent effect on river values. This would provide the opportunity for greater spatial representation of Surface Water Course values within the landscape.

The development or improvement of any data related to Surface Water Course values should be conducted through collaboration by experts from the relevant fields of natural resource management.

# Appendix 1.2: Wetlands Layer

The Wetlands layer was developed to provide quantitative values derived from wetland rarity classifications for wetlands greater than one hectare in size. Data informing this layer was derived from wetland rarity values based on wetland category as described in the Corrick and Norman (1980) wetland classification scheme (as cited in the West Gippsland Wetlands Plan 2007).

The Wetlands layer was created to assist in spatially representing the environmental ecosystem service values for natural ecological systems supported by the landscape. Natural ecological systems occurring in the landscape are also spatially represented by two other layers; a Surface Water Course layer and a Native Vegetation layer.

## What is the wetlands data that is available?

The wetlands data informing the development of the Wetlands spatial layer is extracted from the Wetlands_WGCMA_2005 digital shape file stored in the WGCMA corporate GIS library.

This spatial layer was developed as a component of the WGCMA Wetland Mapping Project and the Wetland Inventory Project to provide up to date data for wetlands across the region. Data in this layer includes a classification of the wetland category based on the categories outlined by the Corrick and Norman wetland classification scheme, which uses water regime and vegetation communities to assign categories to wetlands (WGCMA 2008a).

A Wetland Database exists for the WGCMA region storing detailed value data collected through the West Gippsland Wetland Inventory Project, which assessed a proportional sample of wetlands across the region (Greening Australia 2006). Due to sample size, the current dataset available for wetlands in the Strzelecki Landscape is too restricted for use of the Database in the Strzelecki IMS. Wetland rarity was deemed the best alternative to using the Wetland Database for valuing wetland assets.

## How was the data used to create the Wetlands layer?

Wetland rarity classifications were assigned to mapped wetlands based on current extent versus pre-European extent by wetland category. The wetland rarity classification parameters are consistent with those used in the development of the WGCMA Wetlands Plan 2007.

All wetlands greater than one hectare mapped for the Strzelecki Landscape were included in the development of the Wetlands layer. Natural and constructed wetland types were included in the Wetlands layer. Wetlands smaller than one hectare were excluded from the layer to keep consistency with the method employed in the Wetland Inventory Project, and with the data used in the West Gippsland Wetlands Plan 2007.

A description of the score scale applied to wetland categories based on rarity is shown in Table 9. The highest Wetland value achieved in the Strzelecki Landscape was 0.8 (Vulnerable, wetland category Deep freshwater marsh). Much of the landscape receives a zero (0) score, although the majority of these areas are likely to contain wetlands smaller

than one hectare (natural or constructed). The Wetlands layer is presented as Figure 7 in the body of this document.

**Table 9: Description of Score Scale applied to Wetlands layer**

| Score Scale | Description |
|---|---|
| 0 | **No Wetlands** or Islands or Wetlands <1ha. |
| 0.2 | **Constructed Wetlands**.<br>Categories: Farm Dams |
| 0.4 | **Least Concern** wetland types (>50% pre-European extent remains in Victoria).<br>Categories: Permanent open freshwater, Semi permanent saline, Permanent saline |
| 0.6 | **Rare or Depleted** wetland types (30-50% pre-European extent remains in Victoria, or >50% pre-European extent remains and moderately degraded)<br>Categories: Freshwater meadow, Shallow freshwater marsh |
| 0.8 | **Vulnerable** wetland types (10-30% pre-European extent remains in Victoria)<br>Categories: Deep freshwater marsh |
| 1 | **Endangered or Presumed Extinct** wetland type (less than 10% pre-European extent remains in Victoria, or probably no longer present in Victoria) |

Table 10 provides a summary of the major rules and assumptions associated with the development of the Wetlands layer. The table also highlights identified limitations to the application of the data.

**Table 10: Rules, assumptions and limitations associated with the Wetlands layer**

| |
|---|
| Rules<br><br>- Wetland rarity has been used as the criteria for scoring wetlands.<br>- Wetlands are scored from most rare (highest) to least rare (lowest).<br>- Only wetlands and farm dams greater than 1ha are included. Smaller wetlands and farm dams (<1ha) are excluded from the GIS model due to scale and lack of data.<br>- 50m buffers are applied to the perimeter of all wetlands. |
| Assumptions<br><br>- That the level of occurrence (rarity) of a wetland type is a suitable surrogate for ecosystem service value in the absence of more comprehensive value data.<br>- That the rarest wetlands have the highest value in terms of wetlands contributing to natural ecological systems in the landscape.<br>- That small wetlands and farm dams (<1ha) have an ecosystem service value, but are more appropriately considered and represented at site level planning.<br>- A 50m buffer will provide an appropriate representation of each wetland at the landscape scale. 50m provides a spatial area and presence in the mapping and analysis, and generally represents all riparian zone values, without over representing the wetland in the landscape. |
| Limitations<br><br>- Sample size used to develop Wetlands database is too small to apply to the scale of the Strzelecki Landscape.<br>- The size of wetlands that occur in the Strzelecki Landscape is a limiting factor. There are many small wetlands and farm dams that are not accounted for as they are less than 1ha, but there are few natural wetlands greater than 1ha due to the topography of the landscape. |

## Potential Improvements in Data – Wetlands layer

The Wetlands layer was created to indicate natural ecosystem values based on the relative rarity of the different wetland types as they occur in the landscape. This layer provides values for discrete components of the landscape in terms of quantity remaining, but does not incorporate any indicator of quality or health of wetlands. This layer would be improved if qualitative information from the Wetlands Database was built in to the values.

Supplementary sampling of wetlands in the Strzelecki's would be required to expand the wetlands database so that it could be applied confidently in the Strzelecki Landscape. This would bring more comprehensive valuation to the wetlands, providing better information than rarity alone. Further field work to collect a useable sample size would be required before data could be extrapolated to apply to the Bioregion.

Additional ground truthing and sampling may also provide the opportunity to incorporate wetlands smaller than one hectare into the layer. This could assist in building greater spatial complexity into the layer. It would also allow the inclusion of the majority share of wetlands, small farm dams. Although these dams generally have lower natural ecological value, their cumulative value in the landscape could be significant.

The development or improvement of any data related to Wetland values should be conducted through collaboration by experts from the relevant fields of natural resource management.

# Appendix 1.3: Native Vegetation Layer

The Native Vegetation layer was developed to provide quantitative values derived from modelled conservation significance ratings for patches of native vegetation and plantation forestry greater than one hectare in size. Data informing this layer was derived from the Department of Sustainability and Environment (DSE) revised native vegetation dataset.

The Native Vegetation layer was created to assist in spatially representing the environmental ecosystem service values for natural ecological systems supported by the landscape. Natural ecological systems occurring in the landscape are also spatially represented by two other layers; a Surface Water Course layer and a Wetlands layer.

## What native vegetation data is available?

In early 2008 the DSE released a revised native vegetation dataset, updating the previously available EVC mapping. The revised dataset included a Pre-1750 EVC layer, an EVC Bioregional Conservation Status (BCS) layer, a native vegetation extent layer, and a native vegetation quality layer. An additional composite layer was developed and included in the dataset, the Native Vegetation Landscape Scale Importance and Connectivity dataset.

The Native Vegetation Landscape Scale Importance and Connectivity dataset (NV2005_LSIMP) has two functions. Firstly it describes the Conservation Significance of native vegetation that currently exists in the landscape. This is based on the BCS of the different vegetation types and the modelled vegetation quality. The second function describes Connectivity potential, rating the intervening landscape (between existing native vegetation) on its potential for connectivity for a range of mobile species.

## How was the data used to create the Native Vegetation layer?

The NV2005_LSIMP dataset is essentially two map layers combined; a Conservation Significance layer, and a Connectivity layer. Only the Conservation Significance component has been used in the Strzelecki IMS GIS model.

This decision was made recognising that the Conservation Significance layer is relevant to natural assets that currently exist in the landscape. The dataset was developed based on best science by DSE and is appropriate to the intent of the project.

The Connectivity component was excluded from use in the GIS model as it is an indicator of potential and does not describe an actual physical entity. The layer describes the potential suitability for a physical entity to occur but is limited because:

- it does not include barriers to movement of individual species
- it does not assess the potential recoverability of the landscape
- it does not consider the current landuse of intervening land
- it does not assess the potential willingness of landholders to change current landuse practices to increase connectivity on their properties

Although the Connectivity component is not used in the GIS model, the layer can be utilised at a later stage to assist in planning and target setting. In addition, attributes of the NV2005_LSIMP layer that are replicated in other input datasets were excluded. These

include Artificial Impoundments and Wetland Habitat (accounted for in the Wetland layer) and Predominantly Urban (accounted for in the Landuse layer).

The Conservation Significance component of the NV2005_LSIMP dataset assigns four ratings of significance to native vegetation, ranging from Low to Very High, according to Appendix 3 of "Victoria's Native Vegetation Management – A Framework for Action" (NRE 2002). The modelled conservation significance ratings were assigned to all patches of native vegetation greater than one hectare. Areas of native vegetation smaller than one hectare were excluded from the layer to reduce the level of "noise" in the data layer.

A description of the score scale applied to native vegetation based on modelled conservation significance is shown in Table 11. Much of the landscape receives a zero (0) score as these areas contain no native vegetation, or small patches less than one hectare in size. The Native Vegetation layer is presented as Figure 8 in the body of this document.

**Table 11: Description of Score Scale applied to Native Vegetation layer**

| Score Scale | Description |
|---|---|
| 0 | Artificial Impoundment or Predominantly Urban or Wetland Habitat or No Native Vegetation |
| 0.25 | Conservation Significance - Low |
| 0.50 | Conservation Significance - Medium |
| 0.75 | Conservation Significance - High |
| 1 | Conservation Significance - Very High |

Table 12 provides a summary of the major rules and assumptions associated with the development of the Native Vegetation layer. The table also highlights identified limitations to the application of the data.

**Table 12: Rules, assumptions and limitations associated with the Native Vegetation layer**

| |
|---|
| Rules<br><br>- The Conservation Significance component of the DSE developed NV2005_LSIMP layer is used to value native vegetation.<br>- The Connectivity component of the NV2005_LSIMP layer is excluded from use in the GIS model. This data was created to describe potential value, not actual existing value.<br>- Attributes that are duplicated in other datasets (wetland habitat, artificial impoundments, predominantly urban) have been excluded from the GIS model as these are not native vegetation, and to avoid the potential for double counting assets. |
| Assumptions<br><br>- That all components of the layer have been developed using best science with the intent of recording the biodiversity value of native vegetation.<br>- That the Conservation Significance component can be used independently of the Connectivity component<br>- That attributes that are excluded due to duplication are adequately represented in their respective datasets. |
| Limitations<br><br>- Conservation Significance is a relatively new modelled dataset prepared by DSE at a State level. It is an indicator of conservation status and modelled vegetation quality. The dataset is expected to be refined over time. |

## Potential Improvements in Data – Native Vegetation layer

The Conservation Significance component of the NV2005_LSIMP layer is a useful index of native vegetation value. It is a multi-layered valuation of native vegetation as it occurs in the landscape based on several key characteristics. The data is a good fit for the Strzelecki IMS GIS model and no major suggestions for improvement have been identified.

The only significant issue that was identified when applying this data was related to the Predominantly Urban classification. The areas disseminated as Predominantly Urban do not appear to be proportional to the size of many of the towns. This causes areas of native vegetation surrounding some towns to be excluded from the model. In regards to towns contained in the Strzelecki Landscape the impact of this issue is very low. This issue was raised with the DSE project officers who developed the layer.

The NV2005_LSIMP spatial layer is a DSE dataset, any improvements made to the layer would be the responsibility of the DSE. The development or improvement of any data related to Native Vegetation values should involve collaboration with experts from the relevant fields of natural resource management.

# Appendix 1.4: Significant Species Layer

The Significant Species layer was developed to provide quantitative values derived from spatial analysis of occurrence of species within the landsape. Data informing this layer was derived from the datasets used to develop the four WGCMA Strzelecki Ranges Bioregion Biodiversity Landscape Plans.

The Significant Species layer was created to assist in spatially representing the environmental ecosystem service values for flora and fauna supported by the landscape. A surrogate index using ecologically significant species records was developed and modelled in the absence of a comprehensive index for all known species of flora and fauna.

## What significant species data is available?

The WGCMA Strzelecki Ranges Bioregion Biodiversity Landscape Plans define ecologically significant species as occurring at four levels. These are National significance, State significance, Regional significance, and Local significance. The level of significance of a species is related to it being listing in an Act of Parliament or in a relevant action plan (WGCMA unpub.). A full description of the definitions for these levels of significance can be found in the appendices of the Biodiversity Landscape Plans.

The WGCMA Strzelecki Ranges Bioregion Biodiversity Landscape Plans were developed to provide the foundation to assist in local scale biodiversity planning for the Strzelecki Ranges Bioregion (WGCMA unpub.). The data used in the plans was originally sourced from DSE threatened species records. The data was adapted to exclude any significant species recorded prior to 1970, and exclude marine and vagrant species. The resulting data is available as a spatial layer stored in the WGCMA corporate spatial library.

## How was the data used to create the Significant Species layer?

Much of the filtering required to create a reliable dataset had been completed through the development of the Biodiversity Landscape Plans. A review of the dataset found that several pelagic species had not been excluded. These were removed from the data used to create the Significant Species layer. Pelagic species rarely, if ever, come to shore, and their presence in the data was not considered representative of the values of the Strzelecki Landscape.

Using the refined data, a 16-cell offset grid multiplier model was used to value the landscape based on the number of unique species recorded in any one area. The purpose of this was to create a representative index of the occurrence of significant species that provides better spatial context than the point records. The method is also an attempt to compensate for the uneven survey effort that may have been afforded some species but not others, and the level of opportunistic sampling that informs the dataset.

A 2km grid was offset 16 times (at four even intervals on the north axis and on the east axis) and the number of unique species per cell counted for each offset layer. The 16 offset layers were then overlayed and summed to create an output layer with 500m grid cells showing where the highest and lowest occurrence of significant species records occurs.

A description of the score scale applied to Significant Species based on occurrence is shown in Table 13. Much of the landscape receives a zero (0) score as these areas contain no known significant species records. This does not imply that significant species do not occur there; but that they have not been recorded there. The Significant Species layer is presented as Figure 9 in the body of this document.

**Table 13: Description of Score Scale applied to Significant Species layer**

| Score Scale | Description |
|---|---|
| 0-1 | Quantitative value derived from spatial analysis of occurrence of National, State or Regionally recognised significant species recorded across the study area |

Table 14 provides a summary of the major rules and assumptions associated with the development of the Significant Species layer. The table also highlights identified limitations to the application of the data.

**Table 14: Rules, assumptions and limitations associated with developing the Significant Species layer**

Rules

- Occurrence of significant species is used as an indicator of the value of the landscape for supporting significant species. A 16-cell offset grid multiplier was used to value the landscape based on the number of unique species recorded in any one area.
- The significant species data utilised was that used in the Strzelecki Biodiversity Landscape Plans.
- Anecdotal evidence was not used. All available data has been recorded and verified on the appropriate database by the relevant authority.
- Significant species recorded prior to 1970 were excluded.
- Marine, pelagic and vagrant species were excluded.
- Flora and fauna records were combined in the one layer.
- Value is based on occurrence only. Conservation status was not considered in the creation of this layer.
- A 2km grid was offset 16 times (at four even intervals on the north axis and on the east axis) and the number of unique species per cell counted. The 16 offset layers were then overlayed and summed to create an output layer with 500m grid cells showing where the highest and lowest occurrence of significant species records occurs.
- High value areas are areas where the highest numbers of unique significant species have been recorded.
- Low value areas (few or no records) do not mean that significant species do not occur in the area, but that they are currently not known to have occurred.

Assumptions

- That the occurrence of species is the best available surrogate indicator for significant species habitat modelling. That is, that a landscape area where many unique species are recorded has an implied value for significant species that may not be as prevalent in other parts of the landscape.
- That all known significant species records are registered on the relevant databases.
- That all records registered are accurate and complete, and have been verified by the relevant authority.

Limitations

- Data is only relevant to existing registered significant species records
- Data is recorded as a point in the landscape only, and has been extrapolated to model an indicator of landscape value based on occurrence.
- Significant species record locations may be wholly or partially a function of sampling intensity and opportunistic sampling that are biased to certain localities (eg parks/reserves, places of interest, roads, etc).

## Potential Improvements in Data – Significant Species layer

Several opportunities exist for improving the data used in creating the Significant Species layer. These were not explored further in the Strzelecki IMS due to time constraints associated with the project. Developing this layer also went beyond the scope of the project as it created a completely new dataset through modelling based on existing data.

Ideally a modelled layer that creates an index of landscape value in terms of all flora and fauna species, not just listed threatened species, would best suit the needs of the Strzelecki IMS GIS model. However, this would require a many layered model and its development may never be feasible as critical and preferred habitat values for all known species would need to be developed and built into the model. At the time of writing, detail around critical and preferred habitat is not available for all listed threatened species alone, thus the use of significant species records.

To improve the use of the significant species records, future effort could be put into refining the model to create a layer that recognises the different levels of significance. There are two components of this that could potentially be built into the model for significant species. The first component would recognise the different level of significance of the species, whether it is nationally listed, state listed, or regionally listed. The second component would recognise the status of the species depending on what level of significance it fell under, distinguishing if it is critically endangered, endangered, vulnerable, rare or extinct.

Collection of more data would also assist in informing the Significant Species layer, as well as assisting biodiversity management in general. More comprehensive and systematic sampling across the landscape would produce a more even sampling intensity. It would also potentially reduce the effect of opportunistic sampling, which is often correlated to roads and easily accessible locations.

The development or improvement of any data related to Significant Species values should be conducted through collaboration by experts from the relevant fields of natural resource management.

# Appendix 1.5: Public Access Layer

The Public Access layer was developed to provide quantitative values derived from the presence/absence of freely available and publicly accessible recreation based on the type of land management within the landscape. Data informing this layer was derived from a combination of land tenure layers.

The Public Access layer was created to assist in spatially representing the social ecosystem service values for access to recreation supported by the landscape. In the absence of a comprehensive index of recreation values across the landscape, a surrogate index based on public access to recreation informed by land tenure was developed.

## What public access data is available?

Three spatial layers related to landuse and land tenure were available to the WGCMA to assist in developing this public access layer. These layers are the Bureau of Rural Sciences Landuse in Gippsland 1996-7 layer, the Victorian Government's Public land with simplified current management status (plmmt100ply) layer, and a layer containing the Parks and Conservation Reserves in East and West Gippsland.

A large portion of land in the western end of the Strzelecki Landscape is Crown land leased to HVP Plantations for commercial plantation forestry, and as such is managed as private land. Early analysis of the datasets available identified difficulty in separating these areas from Crown land managed as public land. A request was put to HVP Plantations for assistance in distinguishing these areas, and a fourth spatial layer was made available to the WGCMA showing the land tenure boundary of the HVP Plantations estate.

## How was the data used to create the Public Access layer?

The Public Access layer developed for the Strzelecki IMS GIS model combined data from the plmmt100ply layer with the HVP Plantations land tenure boundary layer to establish the large land areas that are either private land or privately managed public land. This information was then overlayed with the Parks and Conservation Reserves layer to ensure that small parks and reserves had not been accidentally excluded from the data.

The final step in creating the Public Access layer was to include major river frontages. For reasons of consistency, the river frontages value was assigned to the major river reaches identified for the Surface Water Courses only. Through consideration by the Technical Reference Group it was agreed that major river frontages in the Strzelecki Landscape should be given an indicative value of 0.5. This judgement was made because although full public access is legally available to the river frontages, often access is constrained by surrounding private land.

A description of the score scale applied to Public Access based on land tenure is shown in Table 15. Much of the landscape receives a zero (0) score as around 84% of the land is freehold land (DSE 2004b), or leased Crown land managed by a private entity. The Public Access layer is presented as Figure 10 in the body of this document.

**Table 15: Description of Score Scale applied to Public Access layer**

| Score Scale | Description |
|---|---|
| 0 | Private land or Crown Land managed by Private entity |
| 0.5 | River Frontages to major river reaches |
| 1 | Crown Land managed as Parks, Conservation Reserves or State Forest |

Table 16 provides a summary of the major rules and assumptions associated with the development of the Public Access layer. The table also highlights identified limitations to the application of the data.

**Table 16: Rules, assumptions and limitations associated with developing the Public Access layer**

| |
|---|
| Rules<br><br>- The Public Access layer is valued based on current land management that provides the opportunity for freely available and publicly accessible recreation. For this layer, access is used as a surrogate indicator of recreational value.<br>- Crown Land such as Parks, reserves and State Forests are considered as full public access value (1).<br>- River frontages are assigned partial value (0.5) as they are Crown Land but access is partially restricted due to private property interfaces. This value was conferred and agreed upon by the project Technical Reference Group for the Strzelecki Landscape.<br>- All private land, or Crown Land managed as private land, is considered as having no freely available public access. |
| Assumptions<br><br>- That all Crown Land is 100% accessible to the public for recreational purposes, unless managed by a private enterprise or as restricted access (eg. forestry plantation estate, quarry/mine, etc).<br>- That approximately 50% of all river frontages are not accessible to the public due to private land interface. |
| Limitations<br><br>- This layer does not distinguish between access to different types of recreation.<br>- 50% access to river frontages was applied with consideration to the Strzelecki Landscape. This amount may require review if the model is applied to a different landscape area.<br>- Private land was considered a limiting factor for access to river frontages, however no other limiting factors (eg. vehicular access, walking track access, etc) were considered for other Crown Land.<br>- Crown land is managed for a variety of values, not just public access. Areas where Crown land managers strategically promote or discourage access have not been delineated.<br>- Valuing public access to recreation based on Crown Land tenure alone creates a spatially discrete dataset that contains a large proportion of land with no recognised value. |

## Potential Improvements in Data – Public Access layer

The Public Access layer is a simple layer based on simple principles to provide a surrogate value for access to recreation within the landscape. The ideal improvement that could be made to represent this ecosystem service would be to create an index of recreation value. An index of recreation value would need to distinguishing different types of recreation, and value the landscape on its capacity to support the various types of recreation.

Distinguishing between different types of recreation that occur within the landscape would provide an opportunity to give greater spatial context and variety to the value range of the Public Access layer. Recreational activities such as sightseeing and bird watching are activities that do not require public land to be realised. Activities such as fishing or camping have specific parameters, such as access to water or access to campsites, which are required for these activities to be fulfilled. An index of recreation value would negate the need for the Public Access layer to be used as a surrogate indicator of recreation value.

The development of an index of recreation value would be a complex process. A simpler improvement to the Public Access layer that could provide more detail in the data would be to incorporate the strategic priorities of public land managers such as Parks Victoria and the DSE.

A wide array of management plans and strategies exist for all areas of public land in Victoria. These plans and strategies set out the objectives and priorities for managing each parcel of public land for purposes such as conservation, recreation and productivity. Building broad management objectives and priorities into the valuation scale could provide more detail to the Public Access layer.

The development or improvement of any data related to Public Access values should be conducted through collaboration by experts from the relevant fields of natural resource management.

# Appendix 1.6: Indigenous Heritage Layer

The Indigenous Heritage layer was developed to provide quantitative values derived from the presence or absence of Registered Aboriginal Places within the landscape. Data informing this layer was applied directly from the Aboriginal Affairs Victoria (AAV) spatial layer, Aboriginal Cultural Heritage Place Overview Grid.

The Indigenous Heritage layer was created to assist in spatially representing the social ecosystem service values for cultural heritage supported by the landscape. Cultural heritage occurring in the landscape is also spatially represented by the Non-Indigenous Heritage layer.

## What Indigenous Heritage data is available?

Two spatial layers were available to the WGCMA at the time of developing the Indigenous Heritage layer. Both layers were provided by AAV to assist in Indigenous cultural heritage awareness for planning and on-ground works.

The Areas of Cultural Heritage Sensitivity layer identifies areas that have the potential for containing Aboriginal cultural heritage places and object. This layer uses existing records and knowledge to depict places where Aboriginal cultural heritage places and objects are most likely to be discovered.

The Aboriginal Cultural Heritage Place Overview Grid layer provides a generalised depiction of where Aboriginal Places have been identified in the landscape. The layer uses a 1km grid overlay to provide the general location of sites, with often one cell depicting multiple Aboriginal Place sites. This layer uses existing records to raise awareness of general areas where Registered Aboriginal Places have been recorded.

## How was the data used to create the Indigenous Heritage layer?

The Areas of Cultural Heritage Sensitivity layer was not used in the creation of the Strzelecki IMS GIS model Indigenous Heritage layer. This decision was made because the Areas of Cultural Heritage Sensitivity layer expresses potential and does not necessarily represent an actual physical entity. This decision is consistent with the reasoning for excluding the Connectivity potential component of the DSE Native Vegetation Landscape Scale Importance and Connectivity layer from the Native Vegetation layer.

The Aboriginal Cultural Heritage Place Overview Grid layer was used to create the Strzelecki IMS GIS model Indigenous Heritage layer, creating a layer that described either the presence or absence of Registered Aboriginal Places within the landscape.

A description of the score scale applied to Indigenous Heritage based on Registered Aboriginal Place records is shown in Table 17. Much of the landscape receives a zero (0) score as these areas contain no known Registered Aboriginal Place records. This does not imply that Indigenous heritage sites do not occur there; but that they have not been discovered there yet. The Indigenous Heritage layer is presented as Figure 11 in the body of this document.

**Table 17: Description of Score Scale applied to Indigenous Heritage layer**

| Score Scale | Description |
|---|---|
| 0 | Absence of Registered Aboriginal Place records |
| 1 | Presence of Registered Aboriginal Place records |

Table 18 provides a summary of the major rules and assumptions associated with the development of the Indigenous Heritage layer. The table also highlights identified limitations to the application of the data.

**Table 18: Rules, assumptions and limitations associated with developing the Indigenous Heritage layer**

| |
|---|
| Rules<br><br>- AAV registered sites, available to the WGCMA as 1km grid cells, are used to represent the Indigenous heritage values recorded in the landscape.<br>- All cells are treated as having equal value regardless of the number of sites recorded within them. |
| Assumptions<br><br>- That all Indigenous heritage sites are of equal value.<br>- That cells where no sites are recorded have potential to contain Indigenous heritage sites, but at time of development no known sites are recorded. |
| Limitations<br><br>- The exact location of sites within the cell is not known.<br>- A single Indigenous heritage site may be represented by up to 4 cells when overlayed to create the GIS layer, depending on where the Indigenous heritage site grid cell occurs in relation to the GIS model 1km x 1km grid.<br>- Valuing Indigenous Heritage based on the presence or absence of Aboriginal Cultural Place records alone creates a spatially discrete dataset that contains a large proportion of land with no recognised value. |

## Potential Improvements in Data – Indigenous Heritage layer

The Indigenous Heritage layer was created to indicate Indigenous Heritage values based on the location of Aboriginal Cultural Place Sites within the landscape. This layer provides values for relatively discrete areas within the landscape. As with most of the input layers to the Strzelecki IMS GIS model, any updates that could provide values for broader spatial areas based on actual data would improve the Indigenous Heritage layer.

The Aboriginal Cultural Heritage Place Overview Grid spatial layer is an AAV dataset, any improvements made to the layer would be the responsibility of Aboriginal Affairs Victoria.

# Appendix 1.7: Non-Indigenous Heritage Layer

The Non-Indigenous Heritage layer was developed to provide quantitative values derived from the presence or absence of non-Indigenous heritage sites within the landscape. Data informing this layer was applied directly from the "HIST100" spatial layer stored in the WGCMA corporate spatial data library.

The Non-Indigenous Heritage layer was created to assist in spatially representing the social ecosystem service values for cultural heritage supported by the landscape. Cultural heritage occurring in the landscape is also spatially represented by the Indigenous Heritage layer.

## What non-Indigenous heritage data is available?

Data available to the WGCMA during the development of the Non-Indigenous Heritage layer was in the form of the "HIST100" spatial layer stored in the WGCMA corporate spatial library. This spatial layer identifies historic sites across East and West Gippsland associated with non-Indigenous heritage, such as former towns, mines and sawmill sites. Sites are represented as point records in the spatial layer.

## How was the data used to create the Non-Indigenous Heritage layer?

Each recorded site in the "HIST100" layer was buffered with a 1km x 1km cell buffer to provide a generalised location, a similar approach to that applied in the Aboriginal Cultural Heritage Place Overview Grid layer used for developing the Indigenous Heritage layer. Any overlap between buffers was treated as a single value, not cumulative, for the presence or absence of non-Indigenous heritage records.

A description of the score scale applied to non-Indigenous heritage based on non-Indigenous heritage site records is shown in Table 19. Much of the landscape receives a zero (0) score as these areas contain no known records. This does not imply that heritage sites do not occur there; but that they have not been discovered there yet. The Non-Indigenous Heritage layer is presented as Figure 12 in the body of this document.

**Table 19: Description of Score Scale applied to Non-Indigenous Heritage layer**

| Score Scale | Description |
|---|---|
| 0 | Absence of non-Indigenous heritage records |
| 1 | Presence of non-Indigenous heritage records |

Table 20 provides a summary of the major rules and assumptions associated with the development of the Indigenous Heritage layer. The table also highlights identified limitations to the application of the data.

**Table 20: Rules, assumptions and limitations associated with developing the Non-Indigenous Heritage layer**

| |
|---|
| Rules<br><br>- Non-Indigenous heritage sites are recorded as point records in a spatial layer. For the GIS model 1km cell buffers are applied to each record, centred on the point record. This gives non-Indigenous site records the same spatial significance as Indigenous heritage sites.<br>- Any areas of overlap between site record buffers is treated as a single value, not cumulative. |
| Assumptions<br><br>- That all non-Indigenous heritage sites are of equal value.<br>- That cells where no sites are recorded have potential to contain non-Indigenous heritage sites, but at time of development no known sites are recorded. |
| Limitations<br><br>- A single non-Indigenous heritage site may be represented by up to 4 cells when overlayed to create the GIS layer, depending on where the non-Indigenous heritage site grid cell occurs in relation to the GIS model 1km x 1km grid.<br>- Data appears to be missing some cultural sites that are known to exist in the landscape. Additional data recorded at a local scale may expand the dataset.<br>- Valuing Non-Indigenous Heritage based on the presence or absence of Non-Indigenous heritage records alone creates a spatially discrete dataset that contains a large proportion of land with no recognised value. |

## Potential Improvements in Data – Non-Indigenous Heritage layer

The Non-Indigenous Heritage layer was created to indicate the non-Indigenous heritage values of the landscape. This layer is based on data recorded in the WGCMA corporate spatial data library. It has been recognised that the data could be missing some cultural heritage sites that are known to exist in the landscape at a local scale. Data informing the Non-Indigenous Heritage layer could potentially be improved through reviewing cultural heritage records at National, State, Regional and Local levels, and updating the dataset as appropriate.

The development or improvement of any data related to Public Access values should be conducted through collaboration by experts from the relevant fields of cultural heritage management and natural resource management.

# Appendix 1.8: Significant Landscape Layer

The Significant Landscape layer was developed to provide quantitative values derived from the presence or absence of Significant Landscape Overlays for the landscape. Data informing this layer was applied directly from Significant Landscape Overlays as prepared by Local Councils through the Local Planning Scheme. The Significant Landscape layer was created to assist in spatially representing the social ecosystem service values for visual amenity supported by the landscape.

## What significant landscape data is available?

Ready to use significant landscape information is of fairly limited availability. Social ecosystem service values are often very subjective and difficult to accurately represent. Features of a landscape that one individual finds pleasing to look at doe not necessarily correspond with another individual's preference. For this reason, limited data is available.

The Victorian Planning and Environment Act 1987, and the subsequent Victorian Planning Provisions and local planning schemes set out the way land may be developed in the present and long-term interests of all Victorians (DPCD 2008a). Significant Landscape Overlays can be created through the local planning schemes developed by each local shire council. Significant Landscape Overlays are implemented to conserve and enhance the character of significant landscapes as identified by local councils (DPCD 2008b).

Significant Landscape Overlays have been developed by Baw Baw Shire Council and Bass Coast Shire Council for areas contained within the Strzelecki Landscape. Latrobe City Council, South Gippsland Shire Council and Wellington Shire Council have not developed Significant Landscape Overlays for the areas of the Strzelecki Landscape contained within their constituency.

## How was the data used to create the Significant Landscape layer?

Significant Landscape Overlays are statutory planning tools that are created through thorough planning. They are developed by local government planners and require endorsement by the Minister for Planning before taking effect. Where they have been created, Significant Landscape Overlays provide an opportunity to value the landscape for its significance as important for visual amenity. The presence or absence of a Significant Landscape Overlay was used to create the Significant Landscape layer for the Strzelecki IMS.

A description of the score scale applied to landscape significance based on Significant Landscape Overlays is shown in Table 21. Much of the landscape receives a zero (0) score as only two Significant Landscape Overlays have been created that overlap with the Strzelecki Landscape area. The Significant Landscape layer is presented as Figure 13 in the body of this document.

**Table 21: Description of Score Scale applied to Significant Landscape layer**

| Score Scale | Description |
|---|---|
| 0 | Absence of Local Planning Scheme Significant Landscape Overlay |
| 1 | Presence of Local Planning Scheme Significant Landscape Overlay |

Table 22 provides a summary of the major rules and assumptions associated with the development of the Significant Landscape layer. The table also highlights identified limitations to the application of the data.

**Table 22: Rules, assumptions and limitations associated with developing the Significant Landscape layer**

| |
|---|
| Rules<br><br>- Local government Significant Landscape Overlays (created under the Victorian Planning Provisions) are used to define Significant Landscapes.<br>- Significant Landscapes are used as a surrogate value to describe visual amenity value of the landscape.<br>- The lack of a Significant Landscape Overlay does not imply that a landscape has no visual amenity values, rather that the values are not formally recognised.<br>- |
| Assumptions<br><br>- That Significant Landscape Overlays were created to protect visual amenity values of the landscape.<br>- That the lack of a Significant Landscape Overlay indicates an area where society does not value visual amenity as highly as in an area where a Significant Landscape Overlay is in place.<br>- |
| Limitations<br><br>- Significant Landscape Overlays do not exist in all Local Government areas. Planning overlays are selected by the local government authority to align with the content of their planning scheme.<br>- There is risk of subjectivity influencing local council decisions to assign a Significant Landscape Overlay to one area over another.<br>- Valuing landscape significance for visual amenity based on the presence or absence of Significant Landscape Overlays alone creates a spatially discrete dataset that contains a large proportion of land with no recognised value. |

## Potential Improvements in Data – Significant Landscape layer

The Significant Landscape layer developed for the Strzelecki IMS is limited by the fact that Significant Landscape Overlays have not been developed by all local government authorities. As a result, a very small proportion of a highly visible landscape has been formally recorded as having visual amenity values to be conserved or enhanced.

A potential improvement in the Significant Landscape layer could be achieved through a study of sight lines. Some areas of the landscape are more visible than other areas from vantage points such as major highways, tourist roads and lookouts. The creation of a scaled index of landscape visibility could provide a more accurate and transparent data set for the purposes of developing this Significant Landscape layer.

The development or improvement of any data related to significant landscape and visual amenity values should be conducted through collaboration by experts from the relevant fields of natural resource management.

# Appendix 1.9: Landuse Layer

The Landuse layer was developed to provide quantitative values derived from the relative value of different landuses as they occur across the landscape. Data informing this layer was applied directly from the Economic Landuse Values used in the development of the Land Use Impact Model for the West Gippsland CMA Soil Erosion Management Plan 2008. The Landuse layer was created to assist in spatially representing the economic ecosystem service values for productive landuse supported by the landscape.

## What landuse data is available?

The Land Use Impact Model (LUIM) was applied to the West Gippsland CMA Region to assess the risk of soil erosion across the landscape. This data was developed to inform the West Gippsland CMA Soil Erosion Management Plan 2008. LUIM considers the relationships between land qualities and landuse activities, and provides spatial representation of these relationships (WGCMA 2008b).

One of the components of the LUIM developed for West Gippsland was an asset value rating for the various different landuses categories mapped for the region. Landuse categories were adapted from Bureau of Rural Science definitions and mapped data to provide more relevant regional context (WGCMA 2008b). Regional stakeholders were involved in assigning Triple Bottom Line values to each landuse category identified. The LUIM landuse values developed are an indicator of relative landuse values.

The West Gippsland CMA Soil Erosion Management Plan 2008 provides additional detail regarding the LUIM and the development of the data. Table 23 lists the criteria that each landuse was valued against, scoring between zero (0) to three (3) for each criteria. Table 24 shows the Triple Bottom Line value scores assigned to each landuse through the regional stakeholder consultation process.

**Table 23: LUIM landuse valuation criteria (adapted from West Gippsland CMA Soil Erosion Management Plan 2008)**

| Environmental Criteria | Social Criteria | Economic Criteria |
|---|---|---|
| Asset/service is of international, national or regional significance | Heritage value (the asset has high cultural significance) | Asset/service element directly generates substantial economic activity |
| Asset is in excellent (environmental) condition | Asset or its use contribute to maintenance of community (provides significant direct or indirect employment) | Asset/service element has a high capital value (cost of purchase, construction or establishment) |
| Asset is rare | Visual amenity | Asset/service element facilities significant economic activity |
| | Social amenity (the asse/service provides substantial amenity to users eg. shelter, landscape value/personal wellbeing) | |

**Table 24: LUIM landuse values scores compiled through stakeholder consultation (adapted from West Gippsland CMA Soil Erosion Management Plan 2008)**

| Land Use Category | Environmental | Social | Economic | Total |
|---|---|---|---|---|
| Cropping | 0 | 4 | 4 | 8 |
| Dryland Dairy | 2 | 7 | 9 | 18 |
| Grazing of Native Vegetation | 7 | 5 | 3 | 15 |
| Hardwood Plantations | 3 | 7 | 7 | 17 |
| High-rainfall Mixed Dairy/Beef | 2 | 7 | 6 | 15 |
| Horticulture | 0 | 5 | 8 | 13 |
| Irrigated Crop/Pasture Rotations | 0 | 6 | 7 | 13 |
| Irrigated Dairy | 1 | 5 | 9 | 15 |
| Irrigated Horticulture | 0 | 5 | 8 | 13 |
| Irrigated Permanent Cropping | 0 | 6 | 7 | 13 |
| Low Rainfall Beef/Sheep | 2 | 5 | 3 | 10 |
| Mining | 0 | 6 | 9 | 15 |
| Native Vegetation | 9 | 11 | 5 | 25 |
| Other | 3 | 9 | 9 | 21 |
| Permanent Cropping | 0 | 6 | 7 | 13 |
| Production Forests | 6 | 10 | 7 | 23 |
| Quarries | 0 | 3 | 5 | 8 |
| Softwood Plantations | 1 | 6 | 7 | 14 |
| Unknown | 0 | 0 | 0 | 0 |
| Water | 0 | 0 | 0 | 0 |

## How the data was used to create the Landuse layer

The Landuse layer for the Strzelecki IMS GIS model was developed to describe the economic ecosystem service values provided by different landuses in the Strzelecki Landscape. For this reason, only the economic values listed in Table 24 were used to inform the Landuse layer.

A description of the score scale applied to the Landuse layer based on the LUIM landuse values is shown in Table 25. The Landuse layer is presented as Figure 14 in the body of this document.

**Table 25: Description of Score Scale applied to Landuse layer**

| Score Scale | Description |
|---|---|
| 0-1 | Total economic value component of the LUIM landuse values per landuse type converted to 0-1 scale |

Table 26 provides a summary of the major rules and assumptions associated with the development of the Landuse layer. The table also highlights identified limitations to the application of the data.

**Table 26: Rules, assumptions and limitations associated with developing the Landuse layer**

| |
|---|
| Rules<br><br>- Landuse value is derived from the Land Use Impact Model (LUIM) data used in developing the WGCMA Soil Erosion Management Plan (WGCMA 2008).<br>- Economic landuse values are the only values considered in this layer. Landuse values related to Social or Environmental values are excluded to avoid potential double counting in the GIS model. |
| Assumptions<br><br>- That the landuse values data can be applied as individual triple bottom line components without compromising the validity of the data.<br>- That landuse valuation criteria used in the WGCMA Soil Erosion Management Plan 2008 were selected as the best criteria for valuing landuse as an asset, and that landuse assets are accurately valued in the Plan.<br>- That the data has passed the scrutiny of peer review and is the best available data for valuing landuse in the WGCMA region. |
| Limitations<br><br>- The landuse categories used in developing the LUIM data do not necessarily recognise all landuses occurring in the landscape. Landuses described and valued are a broad generalised grouping of landuses that occur.<br>- Some level of subjectivity by stakeholders is required in assigning values to the LUIM landuse valuation criteria. |

## Potential Improvements in Data – Landuse layer

The data captured in the LUIM landuse valuation is a useful and well developed index of relative landuse value. It is a multi-layered valuation of major landuses based on several key characteristics. However, several of the valuation criteria have the potential to introduce a level of subjectivity to the valuation. This is a limitation that could not be avoided at the time of developing the Soil Erosion Management Plan caused by the lack of objective data available.

The development of more objective landuse valuation data (across the full triple bottom line) could potentially remove any perceived subjectivity in the LUIM, and ultimately improve the Strzelecki IMS GIS model Landuse layer. As with most of the input data used in the Strzelecki IMS GIS model, this would require a thorough and time consuming study taking in not only economic and environmental values of the various landuses, but also the more complex and perplexing social values attributed to the different landuses.

Another potential improvement would be to further refine the landuse categories identified for the landscape. This could provide a more accurate delineation of where landuses occur in the landscape, and provide a more detailed representation of values as they occur. However, the addition of a greater level of detail may also add a greater level of complexity, and reduce the usefulness and interpretability of the data layer when applied at a broad scale.

The development or improvement of any data related to landuse values should be conducted through collaboration by experts from the relevant fields of natural resource management.

# Appendix 1.10: Surface Water Supply Layer

The Surface Water Supply layer was developed to provide quantitative values derived from the presence or absence of proclaimed water supply catchments within the landscape. Data informing this layer was applied directly from the "PWSC100" spatial layer stored in the WGCMA corporate spatial data library. The Surface Water Supply layer was created to assist in spatially representing the economic ecosystem service values for surface water supply supported by the landscape.

## What Surface Water Supply data is available?

Data available to the WGCMA during the development of the Surface Water Supply layer was in the form of the "PWSC100" spatial layer stored in the WGCMA corporate spatial library. This spatial layer locates water supply catchments, proclaimed for domestic supply, across Victoria. Data is expressed as polygons spatially representing the geographic area of surface water supply catchments within the landscape.

## How was the data used to create the Surface Water Supply layer?

A score scale of zero (0) to one (1) was applied directly to the "PWSC100" spatial layer. A description of the score scale applied to the Surface Water Supply layer is shown in Table 27. The Surface Water Supply layer is presented as Figure 15 in the body of this document.

**Table 27: Description of Score Scale applied to Surface Water Supply layer**

| Score Scale | Description |
|---|---|
| 0 | Absence of proclaimed water supply catchment |
| 1 | Presence of proclaimed water supply catchment |

Table 28 provides a summary of the major rules and assumptions associated with the development of the Surface Water Supply layer. The table also highlights identified limitations to the application of the data.

**Table 28: Rules, assumptions and limitations associated with developing the Surface Water Supply layer**

| |
|---|
| Rules<br><br>- Surface Water Supply value is derived from the presence or absence of a Proclaimed Water Supply Catchment (PWSC).<br>- All known PWSCs are valued equally.<br>- Individual property interceptions (dams) and off-takes are not considered in this layer.<br>- Groundwater supply is treated as a separate ecosystem service value. |
| Assumptions<br><br>- That individual property interceptions and off-takes are more appropriately considered and represented at site level planning.<br>- That it is appropriate to separate Surface Water Supply and Groundwater supply in the GIS model as they are treated as two separate entities by Regulators. |
| Limitations<br><br>- This layer only considers surface water catchments, generally for domestic supply.<br>- Individual property interceptions and off-takes have an economic value that is not captured at this time.<br>- The available data considers surface water only. There is little recognition of the interaction between groundwater and surface water. |

## Potential Improvements in Data – Surface Water Supply layer

The data utilised in developing the Surface Water Supply layer is prepared and made available for use by the DSE. For this reason it is an accurate and current spatial representation of where proclaimed water supply catchments occur in the landscape.

A potential improvement to the layer that could be achieved through further detail in the data would be to identify a relative value between water supply catchments. This would require a quantifiable parameter that could be used to compare and rank the value of each catchment. Parameters such as the number of people supplied by the proclaimed catchment, or the average number of litres supplied annually, could be used as valuation parameters to better represent economic ecosystem services provided by the proclaimed catchments. This would allow more sensitivity to enter the layer, showing not only where proclaimed water supply catchments occur, but a relative comparison of values between the catchments that exist.

The development or improvement of any data related to Surface Water Supply values should be conducted through collaboration by experts from the relevant fields of natural resource management.

# Appendix 1.11: Groundwater Supply Layer

The Groundwater Supply layer was developed to provide quantitative values derived from the presence or absence of Groundwater Management Areas within the landscape. Data informing this layer was applied directly from the DSE Groundwater Management Areas spatial layer and the Water Supply Protection Areas spatial layer. The Groundwater Supply layer was created to assist in spatially representing the economic ecosystem service values for groundwater supply supported by the landscape.

## What Groundwater Supply data is available?

Data available to the WGCMA during the development of the Groundwater Supply layer was in the form of the Groundwater Management Areas spatial layer and the Water Supply Protection Areas spatial layer. This data is stored in the WGCMA corporate spatial library, sourced from the DSE MapShare database.

The Groundwater Management Areas spatial layer identifies groundwater resources that have been, or have the potential to be, developed for extractive use across Victoria. Data is expressed as polygons representing the location of Groundwater Management Areas within the landscape.

The Water Supply Protection Areas spatial layer identifies groundwater and surface water resources that are proclaimed for the purpose of preparing a management plan for stressed systems, to manage the resource equitably and ensure long-term sustainability of the resource. In terms of groundwater, a Water supply Protection Area is generally a Groundwater Management Area where the resource has been over-allocated and requires management to minimise negative effects. Data is expressed as polygons representing the location of Groundwater Management Areas within the landscape.

## How was the data used to create the Groundwater Supply layer?

A score scale of zero (0) to one (1) was applied directly to the Groundwater Management Areas spatial layer. The same scale was applied to the groundwater component of the Water Supply Protection Areas spatial layer. The two layers were combined, with any overlap between the layers treated as a single value, not a cumulative score.

A description of the score scale applied to the Groundwater Supply layer is shown in Table 29. The Groundwater Supply layer is presented as Figure 16 in the body of this document.

**Table 29: Description of Score Scale applied to Groundwater Supply layer**

| Score Scale | Description |
|---|---|
| 0 | Absence of Groundwater Management Areas (GMAs) and/or Groundwater Water Supply Protection Areas (WSPAs) |
| 1 | Presence of Groundwater Management Areas (GMAs) and/or Groundwater Water Supply Protection Areas (WSPAs) |

Table 30 provides a summary of the major rules and assumptions associated with the development of the Groundwater Supply layer. The table also highlights identified limitations to the application of the data.

**Table 30: Rules, assumptions and limitations associated with developing the Groundwater Supply layer**

| |
|---|
| Rules<br><br>- Groundwater Supply value is derived from the presence or absence of Groundwater Management Areas (GMAs) and/or Groundwater Water Supply Protection Areas (WSPAs).<br>- GMAs and Groundwater WSPAs are valued equally. However, distinguishing between the two is important if developing Management Actions.<br>- Surface Water Supply is treated as a separate ecosystem service value. |
| Assumptions<br><br>- That the GMAs and Groundwater WSPAs are areas in which groundwater has been intensively developed or has the potential to be developed to provide an economic benefit.<br>- That groundwater in Unincorporated Areas (where GMAs and Groundwater WSPAs are not present) has little realised economic value or is not utilised for consumptive or productive purposes.<br>- That it is appropriate to separate Surface Water Supply and Groundwater supply in the GIS model as they are treated as two separate entities by Regulators. |
| Limitations<br><br>- Current level of demand pressure on Unincorporated Areas is unknown. GMAs can be declared by DSE to manage demand pressure if deemed too high. Unincorporated Areas could be anticipated to undergo increased demand due to sustained drought and climate change.<br>- The available data considers groundwater only. There is little recognition of the interaction between groundwater and surface water. |

## Potential Improvements in Data – Groundwater Supply layer

The data utilised in developing the Groundwater Supply layer is prepared and made available for use by the DSE. For this reason the data is an accurate and current spatial representation of where Groundwater Management Areas and Groundwater Water Supply Protection Areas occur in the landscape.

A potential improvement to the layer that could be achieved through further detail in the data would be to identify a relative value between identified locations. This would require a quantifiable parameter that could be used to compare and rank the value of each catchment. Parameters such as the economic activity supported by the groundwater system could provide opportunity to better represent economic ecosystem services provided by the groundwater systems.

The development of an indicator for the economic ecosystem service value of Groundwater Supply in unincorporated groundwater areas would also add a greater level of detail to the layer. This would allow more sensitivity to enter the layer, showing not only where proclaimed water supply catchments are having an economic benefit, but a relative comparison of how much benefit each groundwater system is having regardless of it's status.

The development or improvement of any data related to Groundwater Supply values should be conducted through collaboration by experts from the relevant fields of natural resource management.

# Appendix 2: Priority Asset Area Descriptions

## Appendix 2.1: Priority Asset Area A – Mt Worth

### General Description

Priority Asset Area A is approximately 3,300 hectares in area, the major feature being Mt Worth State Park. This Crown Reserve of 1,025 hectares is important for preserving a significant area of Wet Forest EVC and sites of Indigenous and non-Indigenous Heritage significance. The reserve also surrounds the headwaters of the Tarwin River West Branch. The surrounding landuse is predominantly hardwood and softwood plantation forestry and cleared grazing land. Several smaller Crown Reserves also exist in the local area.

The majority of the area drains to the south, to the Tarwin River West Branch catchment of the Bunurong Coast Catchment Ecosystem, terminating in Andersons Inlet. A small proportion of Priority Asset Area A falls to the north via the relatively short steep northern slopes of the Strzelecki Ranges, draining to the Moe River sub-catchment of the Latrobe River Catchment Ecosystem.

### Ecosystem Service Values Identified

Ecosystem service values identified for the Priority Asset Area are summarised in Table 31. In considering these values it is important to recognise that these values are relative, not absolute, and are based on identified ecosystem service values. These values provide an indication of the relative value of the Priority Asset Area as a whole, and should not be relied on alone as justification for the development of local area plans.

**Table 31: Average ecosystem service values for Priority Asset Area A**

| Ecosystem Service Layer / Value | Surface Water Courses | Wetlands | Native Vegetation | Significant Species | Public Access | Indigenous Heritage | Non-Indigenous Heritage | Significant Landscapes | Landuse | Surface Water Supply | Groundwater Supply | Environmental Layer | Social Layer | Economic Layer | Final Model Output Layer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.6 | 1.00 | 0.00 | 0.13 | 0.25 | 0.53 | 0.37 |
| Maximum | 0.40 | 0.00 | 0.80 | 0.70 | 1.00 | 1.00 | 1.00 | 1.00 | 0.80 | 1.00 | 0.00 | 0.40 | 0.75 | 0.60 | 0.57 |
| **Average** | **0.17** | **0.00** | **0.51** | **0.29** | **0.91** | **0.24** | **0.67** | **0.24** | **0.75** | **1.00** | **0.00** | **0.24** | **0.52** | **0.58** | **0.45** |

## Biophysical Assets identified within Priority Asset Area A

Biophysical assets contained within the Priority Asset Area have been identified through the analysis of GIS data and other available resources. A description of these biophysical assets is presented in Table 32. Biophysical assets identified within the Priority Asset Area are intended to inform local area planning, and were identified through a desktop analysis. The information in Table 32 provides a general understanding of the biophysical assets that interact to give rise to the high combined ecosystem service values identified through the Strzelecki IMS GIS model.

**Table 32: Description of biophysical assets identified correlating with ecosystem service values for the Priority Asset Area A**

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Surface Water Courses** | Low to Moderate environmental ecosystem service value recorded for the main river reach – Tarwin River West Branch/Moonlight Creek. Approx 9.5km of the reach intercepts the Priority Asset Area, the majority inside the State Park. Many smaller tributaries within the Priority Asset Area drain to the main river reach. |
| **Wetlands** | No natural wetlands or farm dams > 1ha identified within the Priority Asset Area.<br>Two constructed farm dams >1ha within 2km of asset area. Small (<1ha) farm dams occur on cleared agricultural land.<br>Fire dams <1ha occur on plantation estate. |
| **Native Vegetation** | Mt Worth State Park is high conservation value native vegetation intercepting the Priority Asset Area, the Park's EVC mapped as Wet Forest (depleted).<br>Surrounding land is a combination of forestry plantations and cleared farmland interspersed with high to very high conservation value native vegetation (combination of Damp Forest (endangered) and Wet Forest EVCs). |
| **Significant Species** | Forty significant species records intercept the Priority Asset Area.<br>Species recorded: Giant Gippsland Earthworm (national), Narracan Burrowing Cray (state), Japanese Lady-fern (state), Barking Owl (state), Powerful Owl (state), Skirted Tree Fern (state), Hybrid Pittosporum (state), Lace Goanna (state), Filmy Maidenhair (state). |
| **Public Access** | Mt Worth State Park and Allambee East Bushland Reserve intercept the Priority Asset Area.<br>A 46ha State Forest Special Protection Zone has been identified on Deadlock Creek for EVC Protection - Wet Forest, Powerful Owl habitat and Victorian Rare Or Threatened (VROT) Flora - Filmy Maidenhair (DSE 2004a). This area is also within the Priority Asset Area. |
| **Indigenous Heritage** | Two Indigenous Heritage site records intercept the Priority Asset Area.<br>No other known Indigenous Heritage sites are recorded within 6.5km of the asset area. |
| **Non-Indigenous Heritage** | Seventeen Non-Indigenous Heritage sites are recorded within the Priority Asset Area.<br>Two sites are recorded within 2km of the asset area.<br>All sites are related to sawmilling or farm dwellings. |
| **Significant Landscapes** | Baw Baw Shire Significant Landscape Overlay intercepts priority cells in the north-east section of the Priority Asset Area. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Landuse** | The Priority Asset Area is centred on moderate productive landuse value State Park, but also intersecting high value hardwood plantation, softwood plantation and high-rainfall dairy/beef grazing land. Generally, the Priority Asset Area is high landuse value. |
| **Surface Water Supply** | The majority of the Priority Asset Area is contained within the declared surface water supply catchment for the Tarwin River supply to Meeniyan. |
| **Groundwater Supply** | No Groundwater Management Areas (GMAs) intercept the Priority Asset Area. Moe GMA is within 3km to the north of the asset area. |

## Links to existing Plans and Strategies

A desktop analysis has been conducted to identify links between the Priority Asset Area and the management priorities identified in existing management plans and strategies. Table 33 identifies relevant plans and strategies, and briefly describes the link to the Priority Asset Area.

**Table 33: Links to existing Plans and Strategies – Priority Asset Area A**

| Plan / Strategy | Link? Y/N | Direct/ Indirect | Description of Link |
|---|---|---|---|
| WGCMA Soil Erosion Management Plan (WGCMA 2008b) | Y | Direct | Priority Asset Area occurs within the West Strzelecki Management Area, one of three highest priority Soil Erosion Management Areas identified for the WGCMA region. |
| WGCMA Biodiversity Action Planning: Narracan Landscape Plan (WGCMA unpub.) | Y | Direct | Priority Asset Area directly intercepts biodiversity Management Area A as identified for the Narracan Landscape Zone. |
| WGCMA Native Vegetation Management Plan 2003 (WGCMA 2003) | Y | Direct | The Strzelecki Ranges Bioregion is classified as a Fragmented Bioregion with the following targets.<br>The EVC Protection Target is 797 Ha/Yr.<br>The EVC Extent Target is 336 Ha/Yr. |
| WGCMA Salinity Management Plan 2005 (WGCMA 2005b) | Y | Direct | Priority Asset Area is located in the Foster Salinity Management Area.<br>Priority 1 actions identified for irrigation and dryland salinity management (14 of the possible 15 priority one programs have been identified). Furthermore, 18 out of the possible 23 Salinity Management Programs are set as a priority. |
| DPI Shallow Groundwater Flow Systems of the West Gippsland Region and the Implications for Salinity Management (DPI 2005) | Y | Direct | Priority Asset Area is located on a shallow Groundwater Flow System identified as Low priority for management to reduce effects of dryland salinity. |
| WGCMA River Health Strategy 2005 (WGCMA 2005a) | Y | Indirect | The Priority Asset Area is located in the Tarwin River (upper west branch) sub-catchment.<br>This sub-catchment forms part of the headwater to the Tarwin River (lower west branch) sub-catchment which is a River Health Strategy Management Program A sub-catchment. |
| Gippsland's Water Quality Action Plan 2005 (EGCMA and WGCMA 2005) | N | | No specific Management Action Targets have been identified for river reaches in the Tarwin River (upper west branch). |
| WGCMA Wetlands Management Plan 2008 (WGCMA 2008a) | Y | Indirect | Indirect link to Wetlands Plan Management Program A – Protecting highest value significant wetlands. Surface water from the Priority Asset Area contributes to the catchment to Anderson Inlet. |

# Appendix 2.2: Priority Asset Area B – Narracan Creek

## General Description

Priority Asset Area B is approximately 1,200 hectares in area, located along the Narracan Creek approximately 3.5km south of the town of Moe, and approximately 5.5km north-east of the town of Thorpdale. In the land area defined by the Priority Asset Area, Narracan Creek is predominantly bounded by cleared agricultural land; a combination of irrigated cropping/pasture rotation and high-rainfall dairy/beef grazing. Patches of native vegetation are scattered in the landscape, interspersed between agricultural land and forestry plantations.

Priority Asset Area B is characterised by steep short slopes draining into Narracan Creek. The Little Narracan Creek sub-catchment forms part of the Latrobe Catchment Ecosystem.

## Ecosystem Service Values Identified

Ecosystem service values identified for the Priority Asset Area are summarised in Table 34. In considering these values it is important to recognise that these values are relative, not absolute, and are based on identified ecosystem service values. These values provide an indication of the relative value of the Priority Asset Area as a whole.

**Table 34: Average ecosystem service values for Priority Asset Area B**

| Ecosystem Service Layer / Value | Surface Water Courses | Wetlands | Native Vegetation | Significant Species | Public Access | Indigenous Heritage | Non-Indigenous Heritage | Significant Landscapes | Landuse | Surface Water Supply | Groundwater Supply | Environmental Layer | Social Layer | Economic Layer | Final Model Output Layer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 0.00 | 0.13 | 0.13 | 0.53 | 0.37 |
| Maximum | 0.60 | 0.00 | 0.50 | 0.40 | 1.00 | 1.00 | 1.00 | 1.00 | 0.80 | 1.00 | 1.00 | 0.38 | 0.63 | 0.60 | 0.53 |
| **Average** | **0.35** | **0.00** | **0.50** | **0.16** | **0.46** | **0.33** | **0.42** | **0.92** | **0.75** | **0.08** | **0.92** | **0.25** | **0.49** | **0.58** | **0.45** |

## Biophysical Assets identified within Priority Asset Area B

Biophysical assets contained within the Priority Asset Area have been identified through the analysis of GIS data and other available resources. A description of these biophysical assets is presented in Table 35. Biophysical assets identified within the Priority Asset Area are intended to inform local area planning, and were identified through a desktop analysis. The information in Table 35 provides a general understanding of the biophysical assets that interact to give rise to the high combined ecosystem service values identified through the Strzelecki IMS GIS model.

**Table 35: Description of biophysical assets identified correlating with ecosystem service values for the Priority Asset Area B**

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Surface Water Courses** | Moderate environmental ecosystem service value recorded for the main river reach – Narracan Creek. Approx 6km of the reach intercepts the Priority Asset Area.<br>Several short steep tributaries within the Priority Asset Area drain to the main river reach.<br>The majority of reach is bounded by cleared agricultural land. |
| **Wetlands** | No natural wetlands or farm dams > 1ha identified within the Priority Asset Area.<br>A large number of large constructed farm dams (>1ha) and smaller farm dams (<1ha) are scattered throughout the Little Narracan Creek sub-catchment above the Priority Asset Area. |
| **Native Vegetation** | Fragmented small patches of native vegetation of very high conservation significance occur along the Narracan Creek and its larger tributaries within the Priority Asset Area.<br>The level of native vegetation cover is lowest in the upper catchment above the Priority Asset Area. |
| **Significant Species** | Four significant species records intercept the Priority Asset Area.<br>Species recorded: Strzelecki Gum (national), Narracan Burrowing Cray (state), River Blackfish (regional).<br>Sixteen significant species records are within 2km of the Priority Asset Area.<br>Species recorded: Royal Spoonbill (state), Hardhead (state), Nankeen Night Heron (regional).<br>Occurrence of significant species records appear to correlate with areas of greater native vegetation coverage. |
| **Public Access** | Narracan Creek is moderately accessible to the public, the majority bounded by private land.<br>Coalville Bushland Reserve (approx 22ha) occurs within the Priority Asset Area. |
| **Indigenous Heritage** | Three known Indigenous Heritage site records intercept the Priority Asset Area at the Strzelecki Ranges Bioregion boundary.<br>A large area containing several known records occurs to the south of the Priority Asset Area. |
| **Non-Indigenous Heritage** | One known Non-Indigenous Heritage site record intercepts the Priority Asset Area, the town settlement site for Coalville.<br>One additional record occurs within 2km of the Priority Asset Area, for the town settlement site for Narracan. |
| **Significant Landscapes** | Baw Baw Shire Significant Landscape Overlay intercepts a large proportion of the Priority Asset Area. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Landuse** | The majority of the Priority Asset Area is intercepted by high to very high value irrigated cropping/pasture rotation landuse, and moderate to high value beef/dairy grazing. |
| **Surface Water Supply** | A very small proportion of the Narracan Creek declared surface water supply catchment intercepts the Priority Asset Area. Generally, the Priority Asset Area is downstream of the water supply catchment off take point. |
| **Groundwater Supply** | The declared Rosedale and Stratford Groundwater Management Areas (GMA) intercept the Priority Asset Area. Narracan Creek enters the Moe GMA within 2km of asset area. |

## Links to existing Plans and Strategies

A desktop analysis has been conducted to identify links between the Priority Asset Area and the management priorities identified in existing management plans and strategies. Table 36 identifies relevant plans and strategies, and outlines the link to the Priority Asset Area.

**Table 36: Links to existing Plans and Strategies – Priority Asset Area B**

| Plan / Strategy | Link? Y/N | Direct/ Indirect | How? |
|---|---|---|---|
| WGCMA Soil Erosion Management Plan (WGCMA 2008b) | Y | Direct | Priority Asset Area occurs within the North Strzelecki Management Area, one of three highest priority Soil Erosion Management Areas identified for the WGCMA region. |
| WGCMA Biodiversity Action Planning: Narracan Landscape Plan (WGCMA unpub.) | Y | Direct | Priority Asset Area directly intercepts biodiversity Management Area C as identified for the Narracan Landscape Zone. |
| WGCMA Native Vegetation Management Plan 2003 (WGCMA 2003) | Y | Direct | The Strzelecki Ranges Bioregion is classified as a Fragmented Bioregion with the following targets.<br>The EVC Protection Target is 797 Ha/Yr.<br>The EVC Extent Target is 336 Ha/Yr. |
| WGCMA Salinity Management Plan 2005 (WGCMA 2005b) | Y | Direct | Priority Asset Area is located in the Trafalgar Salinity Management Area.<br><br>Priority 1 actions identified for irrigation and dryland salinity management (5 of the possible 15 priority one programs have been identified). Furthermore, 9 out of the possible 23 Salinity Management Programs are set as a priority. |
| DPI Shallow Groundwater Flow Systems of the West Gippsland Region and the Implications for Salinity Management (DPI 2005) | Y | Direct | Priority Asset Area is partially located on a shallow Groundwater Flow System (GFS) identified as High priority for management to reduce contribution to dryland salinity.<br><br>High priority area is located along Narracan Creek, identified as GFS 12 – Recent Alluvials. |
| WGCMA River Health Strategy 2005 (WGCMA 2005a) | Y | Direct | The Priority Asset Area is located in the Moe River sub-catchment.<br>This sub-catchment is a River Health Strategy Management Program C sub-catchment.<br>Reach 26, a section of the Narracan Creek, is identified as a priority reach in the Moe River sub-catchment that intercepts the Priority Asset Area. |
| Gippsland's Water Quality Action Plan 2005 (EGCMA and WGCMA 2005) | Y | Direct | Management Action Targets (MAT) have been identified for the following reaches intercepting the Priority Asset Area:<br>WG12.26 (Moe River sub-catchment, Reach 26) |
| WGCMA Wetlands Management Plan 2008 (WGCMA 2008a) | Y | Indirect | Indirect link to Wetlands Plan Management Program A – Protecting highest value significant wetlands. Narracan Creek contributes to the catchment to Lake Wellington. |

# Appendix 2.3: Priority Asset Area C – Mirboo North Regional Park/Darlimurla State Forest

## General Description

Priority Asset Area C is approximately 1,300 hectares in area, located approximately 3.5km north of the town of Mirboo North. The Priority Asset Area is a combination of State Forest, Regional Park and high value productive landuses. No major river reaches are contained within the Priority Asset Area, though the area is contained within declared surface and groundwater catchments.

Priority Asset Area C is located on a major tributary to the Little Morwell River in the upper Morwell River sub-catchment. The Morwell River sub-catchment forms part of the Latrobe Catchment Ecosystem.

## Ecosystem Service Values Identified

Ecosystem service values identified for the Priority Asset Area are summarised in Table 37. In considering these values it is important to recognise that these values are relative, not absolute, and are based on identified ecosystem service values. These values provide an indication of the relative value of the Priority Asset Area as a whole.

**Table 37: Average ecosystem service values for Priority Asset Area C**

| Ecosystem Service Layer / Value | Surface Water Courses | Wetlands | Native Vegetation | Significant Species | Public Access | Indigenous Heritage | Non-Indigenous Heritage | Significant Landscapes | Landuse | Surface Water Supply | Groundwater Supply | Environmental Layer | Social Layer | Economic Layer | Final Model Output Layer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum | 0.00 | 0.00 | 0.50 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 1.00 | 0.15 | 0.00 | 0.60 | 0.37 |
| Maximum | 0.00 | 0.80 | 1.00 | 0.30 | 1.00 | 0.00 | 0.00 | 0.00 | 0.80 | 1.00 | 1.00 | 0.28 | 0.25 | 0.93 | 0.50 |
| **Average** | **0.00** | **0.13** | **0.54** | **0.21** | **0.69** | **0.00** | **0.00** | **0.00** | **0.78** | **0.92** | **1.00** | **0.20** | **0.17** | **0.90** | **0.43** |

## Biophysical Assets identified within Priority Asset Area C

Biophysical assets contained within the Priority Asset Area have been identified through the analysis of GIS data and other available resources. A description of these biophysical assets is presented in Table 38. Biophysical assets identified within the Priority Asset Area are intended to inform local area planning, and were identified through a desktop analysis. The information in Table 38 provides a general understanding of the biophysical assets that interact to give rise to the high combined ecosystem service values identified through the Strzelecki IMS GIS model.

**Table 38: Description of primary assets identified correlating with ecosystem service values for the Priority Asset Area C**

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Surface Water Courses** | No environmental ecosystem service value recorded for surface water courses in the Priority Asset Area.<br>Several short steep tributaries within the Priority Asset Area drain to the Little Morwell River, part of the Morwell River sub-catchment. |
| **Wetlands** | No natural wetlands > 1ha identified within the Priority Asset Area.<br>Two constructed farm dams >1ha identified on agricultural land within the Priority Asset Area.<br>One large natural wetland (Shallow freshwater marsh) >1ha identified adjacent to the east of the Priority Asset Area.<br>A large number of large constructed farm dams (>1ha) and smaller farm dams (<1ha) are scattered throughout the agricultural land to the north and south of the Priority Asset Area. |
| **Native Vegetation** | The Darlimurla State Forest and Mirboo North Regional Park component of the Priority Asset Area constitute a relatively large patch of high and very high conservation value native vegetation.<br>The level of native vegetation cover is lowest in the agricultural land surrounding the Priority Asset Area, though this remnant vegetation is also identified as being high and very high value.<br>Mirboo North Regional Park is comprised of two additional large patches of native vegetation, separated from the area of Regional Park contained within the Priority Asset Area. These areas are to the west of the Priority Asset Area, the cleared land between them modelled by DSE as having high connectivity potential. |
| **Significant Species** | Nine significant species records intercept the Priority Asset Area.<br>Species recorded: Growling Grass Frog (national), Powerful Owl (state).<br>Fourteen significant species records are within 2km of the Priority Asset Area.<br>Species recorded: Eastern Great Egret (state), Swamp Sun Orchid (state), Narracan Burrowing Cray (state), Rush Lily (state), Pied Cormorant (regional), River Blackfish (regional).<br>Occurrence of significant species records appear to correlate with areas of native vegetation or forestry plantation coverage. |
| **Public Access** | Darlimurla State Forest and Mirboo North Regional Park have been identified as being accessible to the public for recreational purposes. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Indigenous Heritage** | No known Indigenous Heritage site records intercept the Priority Asset Area.<br>No known records exist within 2km of the Priority Asset Area. |
| **Non-Indigenous Heritage** | No known Non-Indigenous Heritage site records intercept the Priority Asset Area.<br>No known records exist within 2km of the Priority Asset Area. |
| **Significant Landscapes** | Baw Baw Shire Significant Landscape Overlay intercepts a large proportion of the Priority Asset Area. |
| **Landuse** | A high ecosystem service value has been identified for the Priority Asset Area.<br>The agricultural area in the north of the Priority Asset Area has been recorded as high value irrigated crop/pasture rotation landuse. The area of State Forest also scores a relatively high economic value, while the Regional Park scores only a moderate score. High value plantation forests occur in the eastern end of the Priority Asset Area. |
| **Surface Water Supply** | The Mirboo North declared surface water supply catchment closely corresponds to the Priority Asset Area. |
| **Groundwater Supply** | The declared Rosedale and Stratford Groundwater Management Areas (GMA) intercept the Priority Asset Area. |

## Links to existing Plans and Strategies

A desktop analysis has been conducted to identify links between the Priority Asset Area and the management priorities identified in existing management plans and strategies. Table 39 identifies relevant plans and strategies, and outlines the link to the Priority Asset Area.

**Table 39: Links to existing Plans and Strategies – Priority Asset Area C**

| Plan / Strategy | Link? Y/N | Direct/ Indirect | How? |
|---|---|---|---|
| WGCMA Soil Erosion Management Plan (WGCMA 2008b) | Y | Direct | Priority Asset Area occurs within the North Strzelecki Management Area, one of three highest priority Soil Erosion Management Areas identified for the WGCMA region. |
| WGCMA Biodiversity Action Planning: Grand Ridge Landscape Plan (WGCMA unpub.) | Y | Direct | Priority Asset Area directly intercepts biodiversity Management Area B as identified for the Grand Ridge Landscape Zone. |
| WGCMA Native Vegetation Management Plan 2003 (WGCMA 2003) | Y | Direct | The Strzelecki Ranges Bioregion is classified as a Fragmented Bioregion with the following targets.<br>The EVC Protection Target is 797 Ha/Yr.<br>The EVC Extent Target is 336 Ha/Yr. |
| WGCMA Salinity Management Plan 2005 (WGCMA 2005b) | Y | Direct | Priority Asset Area is located in the Trafalgar Salinity Management Area.<br><br>Priority 1 actions identified for irrigation and dryland salinity management (5 of the possible 15 priority one programs have been identified). Furthermore, 9 out of the possible 23 Salinity Management Programs are set as a priority. |
| DPI Shallow Groundwater Flow Systems of the West Gippsland Region and the Implications for Salinity Management (DPI 2005) | Y | Direct | Priority Asset Area is partially located on a shallow Groundwater Flow System (GFS) identified as High priority for management to reduce contribution to dryland salinity.<br><br>High priority area is located to the north of Priority Asset Area C, identified as GFS 4 – Tertiary Sediments (Rosedale area including Sale to Moe). |
| WGCMA River Health Strategy 2005 (WGCMA 2005a) | Y | Indirect | The Priority Asset Area is located in the Morwell River and Traralgon Creek sub-catchment. This sub-catchment is a River Health Strategy Management Program A sub-catchment.<br>The Priority Asset Area does not intercept a priority river reach identified in Management Program A. |
| Gippsland's Water Quality Action Plan 2005 (EGCMA and WGCMA 2005) | Y | Indirect | No specific Management Action Targets (MAT) have been identified for water courses intercepting the Priority Asset Area.<br>The Little Morwell River drains to WG13.19 (Morwell River and Traralgon sub-catchment, Reach 19) which has several identified MATs. |
| WGCMA Wetlands Management Plan 2008 (WGCMA 2008a) | Y | Indirect | Indirect link to Wetlands Plan Management Program A – Protecting highest value significant wetlands. Little Morwell River contributes to the catchment to Lake Wellington. |

# Appendix 2.4: Priority Asset Area D – Billy's Creek/Morwell National Park

## General Description

Priority Asset Area D is approximately 3,200 hectares, centred on Billy's Creek catchment to the Morwell National Park. Billy's Creek is a declared water supply catchment, supplying water to the areas of Yinnar and Churchill. Located around the off-take for the water supply catchment is Morwell National Park. Billy's Creek catchment is characterised by steep slopes, with plantation forestry landuse interspersed with native vegetation in the upper half of the catchment and cleared agricultural landing the lower half of the catchment.

The majority of Priority Asset Area D is located around Billy's Creek, which drains into the Middle Creek sub-catchment. The Middle Creek sub-catchment forms part of the Latrobe Catchment Ecosystem.

## Ecosystem Service Values Identified

Ecosystem service values identified for the Priority Asset Area are summarised in Table 40. In considering these values it is important to recognise that these values are relative, not absolute, and are based on identified ecosystem service values. These values provide an indication of the relative value of the Priority Asset Area as a whole.

**Table 40: Average ecosystem service values for Priority Asset Area D**

| Ecosystem Service Layer / Value | Surface Water Courses | Wetlands | Native Vegetation | Significant Species | Public Access | Indigenous Heritage | Non-Indigenous Heritage | Significant Landscapes | Landuse | Surface Water Supply | Groundwater Supply | Environmental Layer | Social Layer | Economic Layer | Final Model Output Layer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 1.00 | 0.13 | 0.00 | 0.57 | 0.37 |
| Maximum | 0.70 | 0.00 | 0.50 | 0.60 | 1.00 | 0.00 | 0.00 | 0.00 | 0.90 | 1.00 | 1.00 | 0.30 | 0.25 | 0.97 | 0.47 |
| **Average** | **0.02** | **0.00** | **0.50** | **0.16** | **0.42** | **0.00** | **0.00** | **0.00** | **0.78** | **0.88** | **1.00** | **0.17** | **0.11** | **0.88** | **0.40** |

## Biophysical Assets identified within Priority Asset Area D

Biophysical assets contained within the Priority Asset Area have been identified through the analysis of GIS data and other available resources. A description of these biophysical assets is presented in Table 41. Biophysical assets identified within the Priority Asset Area are intended to inform local area planning, and were identified through a desktop analysis. The information in Table 41 provides a general understanding of the biophysical assets that interact to give rise to the high combined ecosystem service values identified through the Strzelecki IMS GIS model.

**Table 41: Description of primary assets identified correlating with ecosystem service values for the Priority Asset Area D**

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Surface Water Courses** | No environmental ecosystem service value recorded for surface water courses in the Priority Asset Area.<br>Billy's Creek is the only named surface water course running through the Priority Asset Area.<br>Several tributaries within the Priority Asset Area drain to Billy's Creek, part of the Middle Creek sub-catchment. |
| **Wetlands** | No natural or constructed wetlands > 1ha identified within the Priority Asset Area.<br>Smaller farm dams (<1ha) are scattered throughout the agricultural land within the Priority Asset Area. |
| **Native Vegetation** | The Morwell National Park component of the Priority Asset Area constitutes a relatively large patch of very high conservation value native vegetation, a combination of Herb-rich Foothill Forest and Damp Forest, both Endangered EVC's.<br>The upper half of the Billy's Creek catchment is identified as Wet Forest, a Depleted EVC. Hardwood plantations exhibiting Wet Forest EVC characteristics has been mapped as Wet Forest EVC despite being private commercial plantation.<br>The level of native vegetation cover is lowest in the agricultural land within the Priority Asset Area. Native vegetation in the agricultural land is of moderate to very high conservation significance value, cleared land modelled by DSE as having high connectivity potential. |
| **Significant Species** | Twelve significant species records intercept the Priority Asset Area.<br>Species recorded: Strzelecki Burrowing Cray (state), Powerful Owl (state), Slender Tick-trefoil (state), Oval Fork-fern (state), Lace Goanna (state).<br>Three significant species records are within 2km of the Priority Asset Area.<br>Species recorded: Slender Tick-trefoil (state), Little Egret (state).<br>Occurrence of significant species records appear to correlate with areas of greater native vegetation coverage. |
| **Public Access** | Morwell National Park has been identified as being accessible to the public for recreational purposes.<br>Yinnar Bushland Reserve (approx 1ha) also intercepts the Priority Asset Area in the northern end close to Morwell National Park. |
| **Indigenous Heritage** | No known Indigenous Heritage site records intercept the Priority Asset Area.<br>No known records exist within 2km of the Priority Asset Area. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Non-Indigenous Heritage** | No known Non-Indigenous Heritage site records intercept the Priority Asset Area.<br>No known records exist within 2km of the Priority Asset Area. |
| **Significant Landscapes** | No Shire Significant Landscape Overlays intercept the Priority Asset Area. |
| **Landuse** | A high ecosystem service value has been identified for productive landuse in the Priority Asset Area.<br>The agricultural component of the Priority Asset Area has been recorded as high value High-rainfall mixed dairy/beef grazing landuse. The areas of National Park and other native vegetation score a moderate productive landuse value. High value plantation forests occur in the south-eastern end of the Priority Asset Area. |
| **Surface Water Supply** | The Billy's Creek declared surface water supply catchment closely corresponds to the Priority Asset Area. |
| **Groundwater Supply** | The declared Rosedale and Stratford Groundwater Management Areas (GMA) intercept the Priority Asset Area. |

## Links to existing Plans and Strategies

A desktop analysis has been conducted to identify links between the Priority Asset Area and the management priorities identified in existing management plans and strategies. Table 42 identifies relevant plans and strategies, and outlines the link to the Priority Asset Area.

**Table 42: Links to existing Plans and Strategies – Priority Asset Area D**

| Plan / Strategy | Link? Y/N | Direct/ Indirect | How? |
|---|---|---|---|
| WGCMA Soil Erosion Management Plan (WGCMA 2008b) | Y | Direct | Priority Asset Area occurs within the North Strzelecki Management Area, one of three highest priority Soil Erosion Management Areas identified for the WGCMA region. |
| WGCMA Biodiversity Action Planning: Grand Ridge Landscape Plan (WGCMA unpub.) | Y | Direct | Priority Asset Area directly intercepts biodiversity Management Area A as identified for the Grand Ridge Landscape Zone. |
| WGCMA Native Vegetation Management Plan 2003 (WGCMA 2003) | Y | Direct | The Strzelecki Ranges Bioregion is classified as a Fragmented Bioregion with the following targets.<br>The EVC Protection Target is 797 Ha/Yr.<br>The EVC Extent Target is 336 Ha/Yr. |
| WGCMA Salinity Management Plan 2005 (WGCMA 2005b) | Y | Direct | Priority Asset Area is located in the Trafalgar Salinity Management Area.<br><br>Priority 1 actions identified for irrigation and dryland salinity management (5 of the possible 15 priority one programs have been identified). Furthermore, 9 out of the possible 23 Salinity Management Programs are set as a priority. |
| DPI Shallow Groundwater Flow Systems of the West Gippsland Region and the Implications for Salinity Management (DPI 2005) | Y | Direct | Priority Asset Area is located on a shallow Groundwater Flow System identified as Low priority for management to reduce effects of dryland salinity. |
| WGCMA River Health Strategy 2005 (WGCMA 2005a) | Y | Indirect | The Priority Asset Area is located in the Morwell River and Traralgon Creek sub-catchment. This sub-catchment is a River Health Strategy Management Program A sub-catchment.<br>The Priority Asset Area does not intercept a priority river reach identified in Management Program A. |
| Gippsland's Water Quality Action Plan 2005 (EGCMA and WGCMA 2005) | Y | Indirect | No specific Management Action Targets (MAT) have been identified for water courses intercepting the Priority Asset Area.<br>Billy's Creek drains to WG13.21 (Morwell River and Traralgon sub-catchment, Reach 21) which has several identified MATs. |
| WGCMA Wetlands Management Plan 2008 (WGCMA 2008a) | Y | Indirect | Indirect link to Wetlands Plan Management Program A – Protecting highest value significant wetlands. Billy's Creek contributes to the Latrobe River catchment to Lake Wellington. |

# Appendix 2.5: Priority Asset Area E – Merrimans Creek/Tarra Bulga National Park/Tarra River

## General Description

Priority Asset Area E is the largest priority area identified through the Strzelecki IMS, at approximately 15,100ha. The area contains Tarra Bulga National Park, and covers almost the full extent of the Tarra River Upper sub-catchment, and the portion of the Merrimans Creek sub-catchment that occurs within the Strzelecki Landscape.

The Merrimans Creek sub-catchment portion is close to 60% of Priority Asset Area E. Much of the sub-catchment area is forested with a combination of native vegetation, hardwood plantation, softwood plantation and cleared grazing land. The Merrimans Creek sub-catchment supplies surface water to the Seaspray area, and is within the Ninety Mile Beach Catchment Ecosystem.

Tarra Bulga National Park is a conservation reserve for native vegetation of different age classes, reflecting the historical logging and land clearing that took place in the area prior to declaration of the National Park. The town of Balook adjoins the National Park, with other landuse in the surrounding landscape being predominantly hardwood and softwood plantation, and some cleared grazing land. The Tarra Bulga National Park is majority contained within the Tarra River sub-catchment around the headwaters to the Tarra River and Macks Creek.

The Tarra River sub-catchment section of Priority Asset Area E starts below the Tarra Bulga National Park following the Tarra River for approximately 12km to the Strzelecki Ranges Bioregion boundary. The catchment to this section of the river is dominated by cleared grazing land on the flatter areas, and forestry plantations on the steeper upper slopes. Native vegetation is highly fragmented in this portion of the Priority Asset Area, dispersed amongst the plantation and grazing land. The Tarra River sub-catchment drains directly to Corner Inlet.

## Ecosystem Service Values Identified

Ecosystem service values identified for the Priority Asset Area are summarised in Table 43. In considering these values it is important to recognise that these values are relative, not absolute, and are based on identified ecosystem service values. These values provide an indication of the relative value of the Priority Asset Area as a whole.

**Table 43: Average ecosystem service values for Priority Asset Area E**

| Ecosystem Service Layer / Value | Surface Water Courses | Wetlands | Native Vegetation | Significant Species | Public Access | Indigenous Heritage | Non-Indigenous Heritage | Significant Landscapes | Landuse | Surface Water Supply | Groundwater Supply | Environmental Layer | Social Layer | Economic Layer | Final Model Output Layer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 | 1.00 | 0.08 | 0.00 | 0.53 | 0.37 |
| Maximum | 0.80 | 0.00 | 1.00 | 0.90 | 1.00 | 0.00 | 1.00 | 0.00 | 0.90 | 1.00 | 1.00 | 0.60 | 0.50 | 0.97 | 0.67 |
| **Average** | **0.16** | **0.00** | **0.53** | **0.16** | **0.41** | **0.00** | **0.17** | **0.00** | **0.79** | **0.90** | **1.00** | **0.22** | **0.14** | **0.89** | **0.42** |

## Biophysical Assets identified within Priority Asset Area E

Biophysical assets contained within the Priority Asset Area have been identified through the analysis of GIS data and other available resources. A description of these biophysical assets is presented in Table 44. Biophysical assets identified within the Priority Asset Area are intended to inform local area planning, and were identified through a desktop analysis. The information in Table 44 provides a general understanding of the biophysical assets that interact to give rise to the high combined ecosystem service values identified through the Strzelecki IMS GIS model.

**Table 44: Description of primary assets identified correlating with ecosystem service values for the Priority Asset Area E**

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Surface Water Courses** | Moderate environmental ecosystem service value recorded for Merrimans Creek. The catchment to this section of river is predominantly vegetated with a combination of plantations and native forest. Some cleared agricultural land, predominantly in lower catchment area.<br><br>High environmental ecosystem service value recorded for the main river reach – Tarra River. The Tarra Bulga National Park is located around the headwaters of the Tarra River and Macks Creek catchments. Macks Creek is a major tributary to the Tarra River. These upper catchment areas are predominantly contained within the National Park.<br>The lower section of the Tarra River sub-catchment is dominated by plantation forestry and grazing land. |
| **Wetlands** | No natural or constructed wetlands > 1ha identified within the Priority Asset Area.<br>Smaller farm dams and fire dams (<1ha) are scattered throughout the agricultural and forestry plantation land within the Priority Asset Area. |
| **Native Vegetation** | The main EVCs mapped for the upper half of the Merrimans Creek sub-catchment are predominantly Wet Forest (depleted), with small patches of Cool Temperate Rainforest (endangered). This upper half of the sub-catchment is mapped as medium to high value conservation significance. Native vegetation in the lower half of the Merrimans Creek sub-catchment is mapped as high to very high conservation significance, the main EVCs are Damp Forest (endangered), Shrubby Foothill Forest (endangered) and Wet Forest (depleted).<br>In the Merrimans Creek sub-catchment, a significant proportion of what is mapped as having native vegetation characteristics is actually commercial hardwood plantation forestry. Cleared land in this sub-catchment is modelled by DSE as having high connectivity potential.<br><br>Tarra Bulga National Park is an area of approximately 2,000ha of protected native vegetation. EVCs are predominantly Wet Forest (depleted) with several gullies containing Cool Temperate Rainforest (endangered), an area of high to very high conservation significance. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Native Vegetation** (Continued) | The main EVCs mapped for the Tarra River sub-catchment below the National Park are Damp Forest (Endangered) and Wet Forest (Depleted), with isolated patches of Cool Temperate Rainforest (Endangered), Warm Temperate Rainforest (Endangered) and Riparian Forest (Vulnerable). Native vegetation in this section of the Priority Asset Area is fragmented by intervening landuses, but considered of high to very high conservation significance. Cleared land in this sub-catchment is modelled by DSE as having high connectivity potential.<br>In the Tarra River sub-catchment, a significant proportion of what is mapped as having native vegetation characteristics is legally managed as hardwood plantation for production forestry. |
| **Significant Species** | The Tarra Bulga National Park was modelled as the second highest ecosystem service value area within the Strzelecki Landscape for Significant Species (second to Gunya Rainforest Scenic Reserve). The Priority Asset Area intercepted by the National Park contains the second highest count of unique species records, eight different listed species in total.<br><br>101 significant species records intercept the Priority Asset Area.<br>Species recorded: Slender Tree-fern (state), Skirted Tree-fern (state), Strzelecki Burrowing Cray (state), South Gippsland Spiny Cray (state), Swan-neck Moss (state), Neverless Pocket-moss (state), Trachyloma (state), Sticky Wattle (state), Fringed Helmet-orchid (state), Arc Moss (state), Southern Blue Gum (state).<br>21 significant species records are within 2km of the Priority Asset Area. |
| **Public Access** | Tarra Bulga National Park, Callignee Wildlife Reserve, and four small unnamed reserves have been identified as being accessible to the public for recreational purposes.<br>Merrimans Creek and Tarra River have been identified as having moderate value for public access to recreation. |
| **Indigenous Heritage** | No known Indigenous Heritage site records intercept the Priority Asset Area.<br>No known records exist within 2km of the Priority Asset Area. |
| **Non-Indigenous Heritage** | Eight known Non-Indigenous Heritage site records intercept the Priority Asset Area.<br>One known record exists within 2km of the Priority Asset Area. |
| **Significant Landscapes** | No Shire Significant Landscape Overlays intercept the Priority Asset Area. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Landuse** | Overall, a high ecosystem service value has been identified for landuse in Priority Asset Area E.<br><br>The Merrimans Creek sub-catchment section of the Priority Asset Area is predominantly characterised by high productive value softwood and hardwood plantations interspersed with areas of native vegetation and high productive value High-rainfall mixed dairy/beef grazing. In the lower half of the sub-catchment area agriculture becomes a more prominent landuse.<br><br>The Tarra Bulga National Park section of Priority Asset Area E is predominantly native vegetation of moderate productive landuse value. The town of Balook is located directly adjacent to the northern boundary of the Park. Other landuses bounding the National Park are predominantly hardwood and softwood plantation.<br><br>Productive landuse value of the Tarra River sub-catchment below the National Park is high, with the majority of the priority cells identified as productive hardwood and softwood forest, or cleared agricultural land for high-rainfall beef/dairy grazing. Very high productive value irrigated dairy occurs on the river flats of the Tarra River. Fragmented native vegetation also exists in the asset area. |
| **Surface Water Supply** | The Merrimans Creek declared surface water supply catchment closely corresponds to the Priority Asset Area in the north. This declared catchment supplies water to the Seaspray area.<br>The Tarra River declared surface water supply catchment closely corresponds to the Priority Asset Area in the south-west. This declared catchment supplies water to the Yarram area. |
| **Groundwater Supply** | The declared Rosedale and Stratford Groundwater Management Areas (GMA) intercept the Merrimans Creek section of Priority Asset Area E.<br>The declared Yarram Water Supply Protection Area (WSPA) intercepts the Tarra Bulga National Park and Tarra River sections of Priority Asset Area E. WSPAs are significant aquifers identified as capable of yielding suitable volumes and quality of groundwater for commercial use, but are in a state of over allocation where management is required to minimise the impacts of extraction on the system. |

## Links to existing Plans and Strategies

A desktop analysis has been conducted to identify links between the Priority Asset Area and the management priorities identified in existing management plans and strategies. Table 45 identifies relevant plans and strategies, and outlines the link to the Priority Asset Area.

**Table 45: Links to existing Plans and Strategies – Priority Asset Area E**

| Plan / Strategy | Link? Y/N | Direct/ Indirect | How? |
|---|---|---|---|
| WGCMA Soil Erosion Management Plan (WGCMA 2008b) | Y | Direct | Priority Asset Area occurs within the Giffard Management Area. Giffard Soil Erosion Management Area was identified as sixth priority out of the seven management areas for the WGCMA region. |
| WGCMA Biodiversity Action Planning: Grand Ridge Landscape Plan (WGCMA unpub.) | Y | Direct | Priority Asset Area directly intercepts biodiversity Management Area A as identified for the Grand Ridge Landscape Zone. |
| WGCMA Native Vegetation Management Plan 2003 (WGCMA 2003) | Y | Direct | The Strzelecki Ranges Bioregion is classified as a Fragmented Bioregion with the following targets.<br>The EVC Protection Target is 797 Ha/Yr.<br>The EVC Extent Target is 336 Ha/Yr. |
| WGCMA Salinity Management Plan 2005 (WGCMA 2005b) | Y | Direct | Priority Asset Area is located in the Port Albert Salinity Management Area.<br><br>Priority 1 actions identified for irrigation and dryland salinity management (14 of the possible 15 priority one programs have been identified). Further 19 out of the possible 23 Dryland Salinity Management Programs are set as a priority. |
| DPI Shallow Groundwater Flow Systems of the West Gippsland Region and the Implications for Salinity Management (DPI 2005) | Y | Direct | Priority Asset Area is located on a shallow Groundwater Flow System identified as Low priority for management to reduce effects of dryland salinity. |
| WGCMA River Health Strategy 2005 (WGCMA 2005a) | Y | Direct | The Priority Asset Area is located in the Merrimans Creek sub-catchment, the Upper Tarra sub-catchment, and the Middle Tarra River sub-catchment.<br>The Upper Tarra and Middle Tarra River sub-catchments are River Health Strategy Management Program B sub-catchments.<br>Reaches 34 and 35, sections of the Tarra River, are identified as priority reaches in these sub-catchments that intercept the Priority Asset Area.<br>The Merrimans Creek sub-catchment is a River Health Strategy Management Program C sub-catchments.<br>The Priority Asset Area does not intercept a priority river reach identified the Merrimans Creek sub-catchment. |

| Plan / Strategy | Link? Y/N | Direct/ Indirect | How? |
|---|---|---|---|
| Gippsland's Water Quality Action Plan 2005 (EGCMA and WGCMA 2005) | Y | Direct | Management Action Targets (MAT) have been identified for the following reaches intercepting the Priority Asset Area:<br>WG15.40 and WG15.41 (Merrimans Creek sub-catchment, Reaches 40 and 41)<br>WG19.34 (Middle Tarra River sub-catchment, Reach 34)<br>WG20.35 (Upper Tarra River sub-catchment, Reach 35) |
| WGCMA Wetlands Management Plan 2008 (WGCMA 2008a) | Y | Indirect | Tarra River indirect link to Wetlands Plan Management Program A – Protecting highest value significant wetlands. Tarra River contributes to the catchment to Corner Inlet.<br>Merrimans Creek indirect link to Wetlands Plan Management Program E – Maintaining and enhancing wetlands in the South Gippsland Basin. |

# Appendix 2.6: Priority Asset Area F – Alberton West State Forest

## General Description

Priority Asset Area F is centred on Alberton West State Forest, approximately 7km west of Gelliondale. Alberton West State Forest is located in the south east of the Bioregion, the eastern end of the forest partially crossing into the Gippsland Plains Bioregion. The State Forest is Approx 2,300ha forest of very high conservation significance forest, predominantly surrounded by grazing agriculture and scattered remnant patches of native vegetation. State significant Powerful Owl has been recorded in the forest.

The majority of the State Forest drains to the north via tributaries to the Albert River. Alberton West State Forest is predominantly on a northerly aspect, but straddles the ridgeline dividing Albert River and 9 Mile Creek sub-catchments. Both the Albert River and 9 Mile Creek sub-catchments drain directly into Corner Inlet.

## Ecosystem Service Values Identified

Ecosystem service values identified for the Priority Asset Area are summarised in Table 46. In considering these values it is important to recognise that these values are relative, not absolute, and are based on identified ecosystem service values. These values provide an indication of the relative value of the Priority Asset Area as a whole.

**Table 46: Average ecosystem service values for Priority Asset Area F**

| Ecosystem Service Layer / Value | Surface Water Courses | Wetlands | Native Vegetation | Significant Species | Public Access | Indigenous Heritage | Non-Indigenous Heritage | Significant Landscapes | Landuse | Surface Water Supply | Groundwater Supply | Environmental Layer | Social Layer | Economic Layer | Final Model Output Layer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum | 0.00 | 0.00 | 0.50 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 1.00 | 0.15 | 0.25 | 0.53 | 0.37 |
| Maximum | 0.00 | 0.00 | 1.00 | 0.20 | 1.00 | 0.00 | 1.00 | 0.00 | 0.90 | 0.00 | 1.00 | 0.30 | 0.50 | 0.63 | 0.47 |
| **Average** | **0.00** | **0.00** | **0.80** | **0.10** | **1.00** | **0.00** | **0.80** | **0.00** | **0.84** | **0.00** | **1.00** | **0.23** | **0.45** | **0.61** | **0.43** |

## Biophysical Assets identified within Priority Asset Area F

Biophysical assets contained within the Priority Asset Area have been identified through the analysis of GIS data and other available resources. A description of these biophysical assets is presented in Table 47. Biophysical assets identified within the Priority Asset Area are intended to inform local area planning, and were identified through a desktop analysis. The information in Table 47 provides a general understanding of the biophysical assets that interact to give rise to the high combined ecosystem service values identified through the Strzelecki IMS GIS model.

**Table 47: Description of biophysical assets identified correlating with ecosystem service values for the Priority Asset Area F**

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Surface Water Courses** | No major river reaches intercept Priority Asset Area F.<br>Tributaries flow from Alberton West State Forest via agricultural land to the Albert River. |
| **Wetlands** | No natural or constructed wetlands > 1ha identified within the Priority Asset Area.<br>Smaller fire dams (<1ha) are scattered throughout the Alberton West State Forest.<br>Smaller constructed dams (<1ha) are scattered throughout the surrounding agricultural landscape. |
| **Native Vegetation** | Alberton West State Forest is a locally large unbroken area of native vegetation.<br>The State Forest is modelled as very high conservation significance value to the Bioregion.<br>EVCs mapped for Alberton West State Forest include Lowland Forest (vulnerable), Herb-rich Foothill Forest (endangered), Warm Temperate Rainforest (endangered), Damp Forest (endangered), Swamp Scrub (endangered) and Plains Grassy Forest (vulnerable in Gippsland Plains Bioregion, endangered in Strzelecki Ranges Bioregion).<br>Fragmented native vegetation in the surrounding landscape is of Very High Conservation Significance to the Bioregion. |
| **Significant Species** | One significant species record intercepts the Priority Asset Area.<br>Species recorded: Powerful Owl (state).<br>Eighteen significant species records are within 2km of the Priority Asset Area. |
| **Public Access** | Alberton West State Forest is publicly accessible for recreational use.<br>A Special Protection Zone exists at the north of the State Forest for EVC protection and Powerful Owl habitat (DSE 2004a). |
| **Indigenous Heritage** | No known Indigenous Heritage site records intercept the Priority Asset Area.<br>No known records exist within 2km of the Priority Asset Area, however a large grouping of records exists approximately 4km to the north-west, and one record approximately 3km to the east. |
| **Non-Indigenous Heritage** | One known Non-Indigenous Heritage site record intercepts the Priority Asset Area.<br>No known records exist within 2km of the Priority Asset Area. |
| **Significant Landscapes** | No Shire Significant Landscape Overlays intercept the Priority Asset Area. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Landuse** | A high ecosystem service value has been identified for productive landuse in the Priority Asset Area. The area is State Forest which has a history of logging and sawmilling. |
| **Surface Water Supply** | No declared surface water supply catchments intercept Priority Asset Area F. |
| **Groundwater Supply** | The declared Yarram Water Supply Protection Area (WSPA) intercepts Priority Asset Area F. WSPAs are significant aquifers identified as capable of yielding suitable volumes and quality of groundwater for commercial use, but are in a state of over allocation where management is required to minimise the impacts of extraction on the system. |

## Links to existing Plans and Strategies

A desktop analysis has been conducted to identify links between the Priority Asset Area and the management priorities identified in existing management plans and strategies. Table 48 identifies relevant plans and strategies, and outlines the link to the Priority Asset Area.

**Table 48: Links to existing Plans and Strategies – Priority Asset Area F**

| Plan / Strategy | Link? Y/N | Direct/ Indirect | How? |
|---|---|---|---|
| WGCMA Soil Erosion Management Plan (WGCMA 2008b) | Y | Direct | Priority Asset Area occurs within the Corner Inlet Management Area, one of three highest priority Soil Erosion Management Areas identified for the WGCMA region. |
| WGCMA Biodiversity Action Planning: Grand Ridge Landscape Plan (WGCMA unpub.) | Y | Direct | Priority Asset Area directly intercepts biodiversity Management Area C as identified for the Grand Ridge Landscape Zone. |
| WGCMA Native Vegetation Management Plan 2003 (WGCMA 2003) | Y | Direct | The Strzelecki Ranges Bioregion is classified as a Fragmented Bioregion with the following targets.<br>The EVC Protection Target is 797 Ha/Yr.<br>The EVC Extent Target is 336 Ha/Yr. |
| WGCMA Salinity Management Plan 2005 (WGCMA 2005b) | Y | Direct | Priority Asset Area is located in the Port Albert Salinity Management Area.<br><br>Priority 1 actions identified for irrigation and dryland salinity management (14 of the possible 15 priority one programs have been identified). Further 19 out of the possible 23 Dryland Salinity Management Programs are set as a priority. |
| DPI Shallow Groundwater Flow Systems of the West Gippsland Region and the Implications for Salinity Management (DPI 2005) | Y | Direct | Priority Asset Area is located on a shallow Groundwater Flow System identified as Low priority for management to reduce effects of dryland salinity. |
| WGCMA River Health Strategy 2005 (WGCMA 2005a) | Y | Indirect | The Priority Asset Area is located in the Albert River sub-catchment.<br>The Albert River sub-catchment is a River Health Strategy Management Program C sub-catchments.<br>The Priority Asset Area does not intercept a priority river reach identified for the Albert River sub-catchment. |
| Gippsland's Water Quality Action Plan 2005 (EGCMA and WGCMA 2005) | Y | Indirect | No Management Action Targets (MAT) have been identified for water courses intercepting the Priority Asset Area.<br>The Alberton West State Forest is located in the Albert River sub-catchment, tributaries to WG21.29 (Albert River sub-catchment, Reach 29) draining from the State Forest. |
| WGCMA Wetlands Management Plan 2008 (WGCMA 2008a) | Y | Indirect | Indirect link to Wetlands Plan Management Program A – Protecting highest value significant wetlands. Priority Asset Area located within the Albert River sub-catchment, a catchment to Corner Inlet. |

# Appendix 2.7: Priority Asset Area G – Agnes River

## General Description

Priority Asset Area G is approximately 6,300 hectares in area, located on the Agnes River and Dingo Creek. The Priority Asset Area extends across the upper Agnes River sub-catchment to include the upper catchment of the Franklin River around Gunyah Rainforest Scenic Reserve. Priority Asset Area G also includes the small Agnes Falls Scenic Reserve, a short distance from the townships of Toora and Welshpool.

Priority Asset Area G has two distinct landuse areas. Forestry plantations and native vegetation dominate the northern section (Dingo Creek, Agnes River Upper, Gunyah Rainforest Scenic Reserve), and predominantly cleared agricultural land in the south (Agnes River Lower sub-catchment).

Dingo Creek is a major tributary to the Agnes River. The Agnes River sub-catchment and the Franklin River sub-catchment both drain directly into Corner Inlet.

## Ecosystem Service Values Identified

Ecosystem service values identified for the Priority Asset Area are summarised in Table 49. In considering these values it is important to recognise that these values are relative, not absolute, and are based on identified ecosystem service values. These values provide an indication of the relative value of the Priority Asset Area as a whole.

**Table 49: Average ecosystem service values for Priority Asset Area G**

| Ecosystem Service Layer / Value | Surface Water Courses | Wetlands | Native Vegetation | Significant Species | Public Access | Indigenous Heritage | Non-Indigenous Heritage | Significant Landscapes | Landuse | Surface Water Supply | Groundwater Supply | Environmental Layer | Social Layer | Economic Layer | Final Model Output Layer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 0.00 | 0.08 | 0.00 | 0.27 | 0.37 |
| Maximum | 0.70 | 0.30 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.90 | 1.00 | 1.00 | 0.63 | 0.50 | 0.97 | 0.53 |
| **Average** | **0.33** | **0.01** | **0.52** | **0.30** | **0.44** | **0.11** | **0.00** | **0.00** | **0.79** | **0.95** | **0.79** | **0.28** | **0.13** | **0.84** | **0.42** |

## Biophysical Assets identified within Priority Asset Area G

Biophysical assets contained within the Priority Asset Area have been identified through the analysis of GIS data and other available resources. A description of these biophysical assets is presented in Table 50. Biophysical assets identified within the Priority Asset Area are intended to inform local area planning, and were identified through a desktop analysis. The information in Table 50 provides a general understanding of the biophysical assets that interact to give rise to the high combined ecosystem service values identified through the Strzelecki IMS GIS model.

**Table 50: Description of primary assets identified correlating with ecosystem service values for the Priority Asset Area G**

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Surface Water Courses** | Moderate to high environmental ecosystem service value recorded for the major river reaches in the Priority Asset Area.<br><br>Moderate environmental ecosystem service value recorded for Agnes River (Upper). Many smaller tributaries feed the upper section of this medium size river, the majority bounded by a combination of plantation forests and native forest.<br><br>High environmental ecosystem service value recorded for Agnes River (Lower). The lower section of this river terminates in Corner Inlet which is a Ramsar listed wetland. The majority of minor tributaries to the Agnes River (Lower) reach are short steep gullies cleared for agriculture.<br><br>Moderate environmental ecosystem service value recorded for the section of the Franklin River that intercepts the Priority Asset Area. This section of the Franklin River is majority contained within the Gunyah Rainforest Scenic Reserve. |
| **Wetlands** | No natural wetlands > 1ha identified within the Priority Asset Area.<br>One constructed farm dams >1ha identified on agricultural land within the Priority Asset Area.<br>A large number of smaller farm dams (<1ha) are scattered throughout the agricultural component of the Priority Asset Area.<br>Corner Inlet, a Ramsar listed wetland, is approximately 4km south of the southernmost section of the Priority Asset Area. |
| **Native Vegetation** | In the northern section of Priority Asset Area G, native vegetation characteristics are predominantly high conservation significance with small patches of very high conservation significance.<br>EVCs are predominantly Wet Forest (depleted), with scattered patches of Cool Temperate Rainforest (endangered) and Damp Forest (endangered).<br>Hardwood plantations exhibiting Wet Forest EVC characteristics has been mapped as Wet Forest EVC despite being private commercial plantation. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Native Vegetation** (Continued) | In the southern section of Priority Asset Area G, fragmented patches of native vegetation are scattered through the landscape.<br>Native vegetation in this section is modelled as high to very high conservation significance.<br>EVCs are mapped as Riparian Forest/Warm Temperate Rainforest (endangered), Herb-rich Foothill Forest (endangered), Damp Forest (endangered), Lowland Forest (vulnerable), Heathy Woodland (depleted), Grassy Forest (endangered), Wet Forest (depleted) and Wet Sands Thicket (rare). |
| **Significant Species** | The Gunyah Rainforest Scenic Reserve was modelled as the highest ecosystem service value area within the Strzelecki Landscape for Significant Species. The Priority Asset Area intercepted by the Reserve contains the highest count of unique species records, nine listed species in the Scenic Reserve alone.<br><br>Sixty-two significant species records intercept the Priority Asset Area.<br>Species recorded: Australian Grayling (national), Spot-tailed Quoll (national), Toothed Leionema (state), Powerful Owl (state), Slender Tree-fern (state), Skirted Tree-fern (state), River Hook-sedge (state), Notched Leionema (state), Slender Fork-fern (state), Strzelecki Burrowing Cray (state), Masked Owl (state), Fairy Orchid (state), Currant-wood (state), Spurred Helmet-orchid (state), Orange-tip Finger-orchid (state), South Gippsland Spiny Crayfish (state), Eastern Pygmy Possum (regional).<br>Thirty significant species records are within 2km of the Priority Asset Area. |
| **Public Access** | Gunyah Rainforest Scenic Reserve, Agnes Falls Scenic Reserve, Toora Bushland Reserve, and an unnamed area of State Forest have been identified within the Priority Asset Area as being publicly accessible for recreational use.<br>The Agnes River has been identified as having moderate recreational value, access to the river partly restricted by surrounding private land. |
| **Indigenous Heritage** | Two known Indigenous Heritage site records intercept the Priority Asset Area.<br>One known record exists within 2km of the Priority Asset Area. |
| **Non-Indigenous Heritage** | No known Non-Indigenous Heritage site records intercept the Priority Asset Area.<br>One known record exists within 2km of the Priority Asset Area. |
| **Significant Landscapes** | No Shire Significant Landscape Overlays intercept the Priority Asset Area. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Landuse** | A high ecosystem service value has been identified for productive landuse in the Priority Asset Area.<br>Landuse in the northern section is identified as high economic ecosystem service value hardwood and softwood plantation, with small areas of native vegetation and high-rainfall beef/dairy grazing land occurring.<br>Landuse in the southern section has slightly lower economic ecosystem service value high-rainfall beef/dairy grazing dominating the landscape, with scattered areas of native vegetation and cropping. |
| **Surface Water Supply** | The Agnes River declared surface water supply catchment is closely correlated to Priority Asset Area F. |
| **Groundwater Supply** | The declared Yarram Water Supply Protection Area (WSPA) intercepts the eastern end of Priority Asset Area F. WSPAs are significant aquifers identified as capable of yielding suitable volumes and quality of groundwater for commercial use, but are in a state of over allocation where management is required to minimise the impacts of extraction on the system. |

## Links to existing Plans and Strategies

A desktop analysis has been conducted to identify links between the Priority Asset Area and the management priorities identified in existing management plans and strategies. Table 51 identifies relevant plans and strategies, and outlines the link to the Priority Asset Area.

**Table 51: Links to existing Plans and Strategies – Priority Asset Area G**

| Plan / Strategy | Link? Y/N | Direct/ Indirect | How? |
|---|---|---|---|
| WGCMA Soil Erosion Management Plan (WGCMA 2008b) | Y | Direct | Priority Asset Area occurs within the Corner Inlet Management Area, one of three highest priority Soil Erosion Management Areas identified for the WGCMA region. |
| WGCMA Biodiversity Action Planning: Grand Ridge Landscape Plan (WGCMA unpub.) | Y | Direct | Northern end of the Priority Asset Area directly intercepts biodiversity Management Area A as identified for the Grand Ridge Landscape Zone.<br><br>Southern end of the Priority Asset Area partially intercepts biodiversity Management Area C as identified for the Grand Ridge Landscape Zone. |
| WGCMA Native Vegetation Management Plan 2003 (WGCMA 2003) | Y | Direct | The Strzelecki Ranges Bioregion is classified as a Fragmented Bioregion with the following targets.<br>The EVC Protection Target is 797 Ha/Yr.<br>The EVC Extent Target is 336 Ha/Yr. |
| WGCMA Salinity Management Plan 2005 (WGCMA 2005b) | Y | Direct | Priority Asset Area is located in the Port Albert Salinity Management Area.<br><br>Priority 1 actions identified for irrigation and dryland salinity management (14 of the possible 15 priority one programs have been identified). Further 19 out of the possible 23 Dryland Salinity Management Programs are set as a priority. |
| DPI Shallow Groundwater Flow Systems of the West Gippsland Region and the Implications for Salinity Management (DPI 2005) | Y | Direct | Priority Asset Area is partially located on two shallow Groundwater Flow Systems (GFS) identified as High priority for management to reduce contribution to dryland salinity.<br><br>High priority areas are located along the lower half of the Agnes River, identified as GFS 5 – Tertiary Sediments (general) and GFS 12 – Recent Alluvials. |
| WGCMA River Health Strategy 2005 (WGCMA 2005a) | Y | Direct | The Priority Asset Area is located in the Upper Agnes River sub-catchment, the Lower Agnes River sub-catchment, and the Franklin River sub-catchment.<br><br>The Lower Agnes River and Franklin River sub-catchments are River Health Strategy Management Program A sub-catchments.<br>Reach 25, a section of the Agnes River, is identified as priority reach in the Lower Agnes River sub-catchment that intercepts the Priority Asset Area. |

| Plan / Strategy | Link? Y/N | Direct/ Indirect | How? |
|---|---|---|---|
| Gippsland's Water Quality Action Plan 2005 (EGCMA and WGCMA 2005) | Y | Direct | Management Action Targets (MAT) have been identified for the following reaches intercepting the Priority Asset Area:<br>WG24.25 (Lower Agnes River sub-catchment, Reach 25) |
| WGCMA Wetlands Management Plan 2008 (WGCMA 2008a) | Y | Indirect | Agnes River indirect link to Wetlands Plan Management Program A – Protecting highest value significant wetlands. Agnes River contributes to the catchment to Corner Inlet.<br><br>Upper Franklin River indirect link to Wetlands Plan Management Program D – Restoring and enhancing connectivity with West Gippsland's Ramsar Sites. |

# Appendix 2.8: Priority Asset Area H – Korumburra /Leongatha

## General Description

Priority Asset Area H is approximately 8,700ha in area, located on the cleared hill country between Korumburra and Leongatha. This area of the Strzelecki Landscape is predominantly a dairy grazing area, with some beef grazing and cropping also present in the landscape. Native vegetation in Priority Asset Area H is very fragmented, small areas scattered throughout the agricultural landscape.

Priority Asset Area H contains sections of Coalition Creek, Coal Creek, and Little Ruby Creek which are all tributaries to the Tarwin River West Branch sub-catchment. The Tarwin River West Branch sub-catchment is a major catchment area of the Bunurong Coast Catchment Ecosystem.

## Ecosystem Service Values Identified

Ecosystem service values identified for the Priority Asset Area are summarised in Table 52. In considering these values it is important to recognise that these values are relative, not absolute, and are based on identified ecosystem service values. These values provide an indication of the relative value of the Priority Asset Area as a whole.

**Table 52: Average ecosystem service values for Priority Asset Area H**

| Ecosystem Service Layer / Value | Surface Water Courses | Wetlands | Native Vegetation | Significant Species | Public Access | Indigenous Heritage | Non-Indigenous Heritage | Significant Landscapes | Landuse | Surface Water Supply | Groundwater Supply | Environmental Layer | Social Layer | Economic Layer | Final Model Output Layer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 | 1.00 | 0.00 | 0.00 | 0.00 | 0.53 | 0.37 |
| Maximum | 0.50 | 0.80 | 0.50 | 0.30 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.30 | 0.63 | 1.00 | 0.53 |
| **Average** | **0.15** | **0.06** | **0.44** | **0.06** | **0.25** | **0.37** | **0.19** | **0.00** | **0.84** | **1.00** | **0.83** | **0.17** | **0.19** | **0.89** | **0.42** |

## Biophysical Assets identified within Priority Asset Area H

Biophysical assets contained within the Priority Asset Area have been identified through the analysis of GIS data and other available resources. A description of these biophysical assets is presented in Table 53. Biophysical assets identified within the Priority Asset Area are intended to inform local area planning, and were identified through a desktop analysis. The information in Table 53 provides a general understanding of the biophysical assets that interact to give rise to the high combined ecosystem service values identified through the Strzelecki IMS GIS model.

**Table 53: Description of primary assets identified correlating with ecosystem service values for Priority Asset Area H**

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Surface Water Courses** | Moderate environmental ecosystem service value recorded for the main river reach – Coalition Creek. This reach intercepts the Priority Asset Area north of Korrumburra and north of Leongatha.<br>Approximately 380ha of the upper catchment to the Powlett River intercepts the Priority Asset Area. The Powlett River is modelled as having moderate environmental ecosystem service value.<br>Many tributaries to Coalition Creek and the Tarwin River West Branch intercept the Priority Asset Area, including Coal Creek and Little Ruby Creek. |
| **Wetlands** | One natural wetland >1ha is identified as occurring within the Priority Asset Area. This wetland is mapped as a Deep Freshwater Marsh, of high environmental ecosystem service value. This is a vulnerable wetland type.<br>Eight constructed wetlands >1ha are identified within the Priority Asset Area.<br>Many small (<1ha) farm dams occur throughout the Priority Asset Area. |
| **Native Vegetation** | Small patches of medium to very high conservation significance native vegetation are contained within the Priority Asset Area. EVC's mapped include Damp Forest (endangered), Riparian Forest (endangered), Warm Temperate Rainforest (endangered) and Wet Forest (depleted).<br>More generally there are very fragmented small patches of vegetation scattered across the majority of the landscape, ranging from medium to very high conservation significance. Varying levels of connectivity potential have been modelled for the agricultural land between patches of native vegetation. |
| **Significant Species** | Thirteen significant species records intercept the Priority Asset Area.<br>Species recorded: Strzelecki Gum (national), Southern Brown Bandicoot (national), Giant Gippsland Earthworm (national), Filmy Maidenhair (state), Blue-billed Duck (state), Swamp Antechinus (state).<br>Five significant species records identified within 2km of the Priority Asset Area. |
| **Public Access** | Coal Creek Historic Reserve, Coal Creek Streamside Reserve, and the golf course and recreation reserve in the north of the Leongatha township have been identified as being accessible to the public for recreational purposes.<br>Coalition Creek has been identified as having moderate value for public access to recreation. |

| Ecosystem Service Value | Biophysical Asset Characteristics |
|---|---|
| **Indigenous Heritage** | Up to sixteen known Indigenous Heritage site records are mapped as intercepting the Priority Asset Area.<br>Four known records exist within 2km of the Priority Asset Area. |
| **Non-Indigenous Heritage** | Nine known non-Indigenous Heritage site records intercept the Priority Asset Area. These records are related to the township of Korumburra, or coal mining in the area.<br>No additional known records exist within 2km of the Priority Asset Area. |
| **Significant Landscapes** | No Shire Significant Landscape Overlays intercept the Priority Asset Area. |
| **Landuse** | A very high economic ecosystem service value has been identified for landuse in the Priority Asset Area.<br>The majority of the Priority Asset Area has been identified as very high value dryland dairy landuse. Small areas of lower value cropping land and native vegetation are scattered through the area identified as predominantly dryland dairy. High value high-rainfall dairy/beef grazing land is identified in the eastern end of the Priority Asset Area.<br>Two urban areas are identified within the Priority Asset Area, around Korumburra and Leongatha. |
| **Surface Water Supply** | The Tarwin River declared surface water supply catchment intercepts the majority of the Priority Asset Area. This declared catchment supplies water to the Meeniyan area. |
| **Groundwater Supply** | The declared Leongatha Groundwater Management Area intercepts the eastern end of the Priority Asset Area. |

## Links to existing Plans and Strategies

A desktop analysis has been conducted to identify links between the Priority Asset Area and the management priorities identified in existing management plans and strategies. Table 54 identifies relevant plans and strategies, and outlines the link to the Priority Asset Area.

**Table 54: Links to existing Plans and Strategies – Priority Asset Area H**

| Plan / Strategy | Link? Y/N | Direct/ Indirect | How? |
|---|---|---|---|
| WGCMA Soil Erosion Management Plan (WGCMA 2008b) | Y | Direct | Priority Asset Area occurs within the West Strzelecki Management Area, one of three highest priority Soil Erosion Management Areas identified for the WGCMA region. |
| WGCMA Biodiversity Action Planning: Strzelecki West Landscape Plan (WGCMA unpub.) | Y | Direct | Priority Asset Area partially intercepts biodiversity Management Area A as identified for the Strzelecki West Landscape Zone. |
| WGCMA Native Vegetation Management Plan 2003 (WGCMA 2003) | Y | Direct | The Strzelecki Ranges Bioregion is classified as a Fragmented Bioregion with the following targets.<br>The EVC Protection Target is 797 Ha/Yr.<br>The EVC Extent Target is 336 Ha/Yr. |
| WGCMA Salinity Management Plan 2005 (WGCMA 2005b) | Y | Direct | Priority Asset Area is located in the Foster Salinity Management Area.<br><br>Priority 1 actions identified for irrigation and dryland salinity management (14 of the possible 15 priority one programs have been identified). Furthermore, 18 out of the possible 23 Salinity Management Programs are set as a priority. |
| DPI Shallow Groundwater Flow Systems of the West Gippsland Region and the Implications for Salinity Management (DPI 2005) | Y | Direct | Priority Asset Area is partially located on two shallow Groundwater Flow Systems (GFS) identified as High priority for management to reduce contribution to dryland salinity.<br><br>High priority areas are located along the lower half of the Agnes River, identified as GFS 5 – Tertiary Sediments (general) and GFS 12 – Recent Alluvials. |
| WGCMA River Health Strategy 2005 (WGCMA 2005a) | Y | Direct | The Priority Asset Area is located in the Tarwin River (lower west branch) sub-catchment.<br>The Tarwin River (lower west branch) sub-catchment is a River Health Strategy Management Program A sub-catchments.<br>Reaches 17, a section of Coalition Creek, is identified as priority reach in this sub-catchment that intercepts the Priority Asset Area. |
| Gippsland's Water Quality Action Plan 2005 (EGCMA and WGCMA 2005) | Y | Direct | Management Action Targets (MAT) have been identified for the following reaches intercepting the Priority Asset Area:<br>WG32.17 (Tarwin River lower west branch sub-catchment, Reach 17) |
| WGCMA Wetlands Management Plan 2008 (WGCMA 2008a) | Y | Indirect | Indirect link to Wetlands Plan Management Program A – Protecting highest value significant wetlands. Coalition Creek contributes to the Tarwin River catchment to Andersons Inlet. |

# Appendix 3: Consolidated Threats List

Threats identified in a variety of regional asset based plans and strategies have been compiled and consolidated for use in the development of local area plans for Priority Asset Areas identified through the Strzelecki Integrated Management Strategy. Table 55 provides detail of the threats compiled to create the consolidated threats list.

**Table 55: Threats compiled to create the Strzelecki IMS consolidated threats list**

| Threats identified in existing plans* | Consolidated Threats List |
|---|---|
| Pest plants<br>Weed infestation<br>Exotic flora<br>Weed invasion<br>Weeds | Pest plants |
| Pest animals<br>Pest animal infestation<br>Introduced fauna<br>Stock access | Pest animals |
| Native vegetation decline<br>Degradation or removal of native vegetation<br>Habitat loss<br>Habitat loss and fragmentation<br>Loss of important habitat features<br>Incremental loss/depletion<br>Genetic decline<br>Firewood collection<br>Illegal taking by humans (illegal collecting, trampling) | Habitat loss – terrestrial biodiversity |
| Native vegetation decline<br>Degradation or removal of native vegetation<br>Habitat loss and fragmentation<br>Fragmentation<br>Genetic decline<br>Firewood collection<br>Illegal taking by humans (illegal collecting, trampling) | Fragmentation of native vegetation |
| Fire regime<br>Alteration in natural fire regime<br>Altered fire regimes | Altered fire regimes |
| Salinity<br>Salinity and waterlogging | Salinity and waterlogging |
| Soil acidification | Soil acidification |
| Erosion<br>Soil erosion and disturbance | Soil erosion and disturbance |
| Livestock/crop disease and bacterial outbreaks<br>Disease<br>Disease (cinnamon fungus) | Disease |
| Urban development<br>Urban encroachment<br>Residential and industrial development | Urban encroachment |
| Land contamination<br>Excessive fertilizer application<br>Pollution and toxins | Land contamination |
| Poor water quality (including nutrients)<br>Algal blooms<br>Excessive fertilizer application<br>Pollution and toxins | Poor water quality (including nutrients) |
| Water resources<br>Over-utilisation of water resources | Over-utilisation of water resources |

| Threats identified in existing plans* | Consolidated Threats List |
|---|---|
| Degraded riparian vegetation<br>Bank erosion<br>Changed stream and bank conditions<br>Channel modifications<br>Bed instability<br>Barriers<br>Loss of in stream habitat<br>Temperature | Changed stream and bank conditions |
| Flow deviation<br>Altered hydrology<br>Altered hydrological regimes<br>Alteration to the natural flooding regime | Altered hydrological regimes |
| Loss of wetland connectivity<br>Wetland connectivity | Loss of natural wetland habitat and connectivity |
| Climate change<br>Enhanced Greenhouse Effect | Climate change |
| | Extreme events – Wildfire and Flooding |

***** Note: Threats identified in existing plans compiled from West Gippsland Wetlands Plan 2007 (WGCMA 2008a), West Gippsland River Health Strategy 2005 (WGCMA 2005a), West Gippsland Native Vegetation Plan 2003 (WGCMA 2003), Macalister Land and Water Management Plan 2008 (WGCMA 2008c), West Gippsland Biodiversity Action Plans: Strzelecki Ranges Bioregion (WGCMA unpub.).

# Appendix 4: Opportunities for Local Area Planning

Table 56 identifies suggested natural resource management opportunities that could assist local area planning for the Strzelecki Landscape. Benefits to biophysical assets, and threats that may be addressed, from the suggested management options are identified.

**Table 56: Natural resource management opportunities for local area planning within the Strzelecki Landscape**

| Natural Resource Management Opportunities | Potential Benefits | Threats Addressed |
|---|---|---|
| Create a more sustainable landscape ***within Priority Asset Areas*** through:<br>- Coordinated and strategic local scale conservation management planning to protect, enhance and restore biodiversity assets within the Priority Asset Areas.<br>- Coordinated and strategic local scale soil management plans within the Priority Asset Area | <u>Environmental</u><br>Protect, enhance and restore:<br>- endangered EVCs<br>- habitat for native flora and fauna species<br>Protect and create sustainable soil and land health.<br>Protect and enhance water quality.<br><br><u>Social</u><br>Enhance visual amenity values of the Priority Asset Area.<br>Encourage more sensitive land management in regards to biodiversity values within the Priority Asset Area.<br>Promote the Priority Asset Area as a recognised sustainable landscape.<br><br><u>Economic</u><br>Protect productive landuse values within the Priority Asset Area. | Habitat loss<br>Fragmentation of native vegetation<br>Soil erosion<br>Poor water quality<br>Changed stream and bank conditions<br>Pest plants and animals<br>Salinity and waterlogging<br>Land contamination<br>Disease |
| Create a more sustainable landscape by ***linking Priority Asset Areas*** through:<br>- Coordinated and strategic local scale conservation management planning to protect, enhance and restore biodiversity assets linking Priority Asset Areas.<br>- Coordinated and strategic local scale soil management plans developed and implemented for properties linking Priority Asset Areas | <u>Environmental</u><br>Protect, enhance and restore:<br>- endangered EVCs<br>- habitat for native flora and fauna species<br>Protect and create sustainable soil and land health.<br>Protect and enhance water quality.<br><br><u>Social</u><br>Enhance visual amenity values of the Strzelecki Landscape.<br>Encourage more sensitive land management in regards to biodiversity values on land linking Priority Asset Areas.<br>Promote the Strzelecki Landscape as a sustainable landscape.<br><br><u>Economic</u><br>Protect productive landuse values within and between Priority Asset Areas. | Habitat loss<br>Fragmentation of native vegetation<br>Soil erosion<br>Poor water quality<br>Changed stream and bank conditions<br>Pest plants and animals<br>Salinity and waterlogging<br>Land contamination<br>Disease |

# Appendix 5: Example Integrated Management Strategy Implementation Proposal

The following information is a hypothetical project proposal for implementing on-ground delivery of natural resource management activities guided by the Strzelecki Integrated Management Strategy for a period of twelve months. Budget figures are indicative of costs as at February 2009.

**Project Title:** Implementing the Strzelecki Integrated Management Strategy

**Project Type:** On-ground implementation/delivery

### Short Description:

This project will deliver integrated on-ground activities in the upper-catchments to Corner Inlet and Gippsland Lakes, forming part of a larger strategic initiative for sustainably managing Corner Inlet. Activities will target the protection and enhancement of valuable soil assets, the protection and enhancement of high value biodiversity assets, and the reduction of sediment loads entering waterways that drain to Corner Inlet and the Gippsland Lakes. Action will target priority areas of the Strzelecki Ranges as identified through the Strzelecki Integrated Management Strategy. Activities will include conservation management planning, soil management planning, strategic revegetation, permanent remnant vegetation protection, and targeted pest plant and animal control.

### Detailed Description:

The Strzelecki Integrated Management Strategy identifies Priority Asset Areas within the Strzelecki Ranges based on combined environmental, social and economic ecosystem service values. A total of eight Priority Asset Areas are identified through the Strzelecki Integrated Management Strategy. Priority Asset Areas are identified as the highest relative locations, based on ecosystem service value, where collaborative natural resource management initiatives have the opportunity to maximise multiple benefits to the landscape, including to land, water and biodiversity assets.

Six discreet Priority Asset Areas have been identified for delivery of natural resource management initiatives through Implementing the Strzelecki IMS in the 2009/10 financial year. These Priority Asset Areas are located in the proximity of the Agnes River sub-catchment, Alberton West State Forest, Tarra River sub-catchment, Mt Worth State Park, Narracan Creek sub-catchment, and the landscape area between Korumburra to Leongatha. Each of these Priority Asset Areas contains assets of high ecosystem service value to the Strzelecki Ranges. Natural resource management initiatives that protect and enhance the values of these Priority Asset Areas will not only have a benefit to the local area, but will also provide benefits to the sustainable management of Corner Inlet, the Gippsland Lakes and the Bunurong Coast Catchment Ecosystem.

Natural resource management initiatives identified for each Priority Asset Area have been guided by the highest management priorities identified through RCS Sub-Strategies as relevant to each Priority Asset Area. Activities are aimed at supporting and enhancing the ecological resilience of Priority Asset Areas whilst recognising and conserving the productive capacity of the land. In keeping with the intent of the asset based approach,

delivery of activities will be primarily guided by protecting and enhancing values within Priority Asset Areas, with the secondary objective of protecting and enhancing values between Priority Asset Areas.

Activities for the six Priority Asset Areas are primarily focused on protecting and enhancing soil health, biodiversity assets and water quality. The main threats to be ameliorated through management will be soil erosion, salinity, fragmentation of native vegetation, habitat loss (terrestrial biodiversity), poor water quality, pest plants and animals and loss of productive capacity.

Soil erosion is a major threat that has a great impact on the West Gippsland region. Large erosion events that liberate large quantities of soil particles to waterways adversely effect water quality, including that entering Corner Inlet and the Gippsland Lakes. The West Gippsland Soil Erosion Management Plan identifies the Strzelecki Ranges as having a high level of risk for various forms of erosion including gully and tunnel, sheet and rill, and landslips. This risk is particularly prevalent on highly productive agricultural land associated with steeper slopes. In the past the area has experience poor water quality, loss of valuable arable land and road closures due to soil erosion caused by high rainfall events. This project will provide technical advice and support for landholders to better manage properties in areas where high priority erosion areas correspond to Priority Asset Areas identified through the Strzelecki Integrated Management Strategy. An incentives component will be used to assist landholders reduce the threat of erosion impacting on natural assets and on the productive capacity of their land.

Dryland salinity has been identified as a major threat in the landscape surrounding Yarram (Port Albert Salinity Management Area) and the Tarwin River floodplains (Foster Salinity Management Area). The West Gippsland Salinity Management Plan has identified both Salinity Management Areas as high priority for salinity mapping and investigation, and for reduction and prevention of further recharge through on-ground works to increase native vegetation extent in recharge areas and perennial pasture in discharge areas. This project will investigate the extent of salinity through EM-38 mapping, and will use data collected to identify key recharge and discharge zones. Knowledge gained will be used to implement on-ground action, in the form of extension and incentives, to appropriately treat identified recharge and discharge zones. Recharge control will be targeted to areas where recharge zones overlap with Priority Asset Areas identified through the Strzelecki Integrated Management Strategy.

Native vegetation in the Strzelecki Ranges landscape is generally fragmented and modified, a result of widespread clearing for agriculture. A large area in the eastern end of the landscape was replanted as a timber resource, providing the largest continuous area of forest cover exhibiting characteristics of natural vegetation. This project will permanently protect 575 hectares of remnant native vegetation, and will increase native vegetation extent by 200 hectares. Where possible, strategic coordination of revegetation works will ensure multiple benefits; increasing the resilience of biodiversity, reduced threat of soil erosion, salinity recharge control. A component of pest plant and animal control will also be delivered to compliment the protection and enhancement of biodiversity assets. All work targeting protection, enhancement and restoration of native vegetation will be aligned to enhancing the ecological resilience in Priority Asset Areas as identified through the Strzelecki Integrated Management Strategy.

The protection and enhancement of the identified assets will be achieved through on-ground activities to improve land management practices and strategically enhance biodiversity values within and between the Priority Asset Areas. All activities will be planned with consideration to protecting and enhancing the resilience of the identified ecosystem service values. Activities will be coordinated by the WGCMA through a committee of key stakeholders to ensure the delivery of collaborative and integrated on-ground outcomes.

This project, Implementing the Strzelecki IMS, has been developed to link to the general priorities of investment streams in the Victorian Investment Framework 2009. Priorities to be addressed:

- Protect and enhance the function, long-term resilience and ecosystem services of valuable soil assets
- Protect high value biodiversity and waterway assets threatened by salinity and soil degradation
- To protect, enhance and restore highly valued native vegetation in areas at risk (Biodiversity)
- To improve the viability of rare species and ecological communities (Biodiversity)
- To minimise the threat of weeds and pests to highly valued biodiversity assets (Biodiversity)
- To protect, enhance and restore soil health in highly valued land at risk (Soil health)
- To reduce the off-site impact of salinity and soil degradation on high value assets (Soil health)

# Justification

### RCS Links

Implementing the Strzelecki IMS is linked closely with the West Gippsland Regional Catchment Strategy (RCS), addressing strategic interventions associated with the Land, Biodiversity, Water, People and Production asset classes. Implementing the Strzelecki IMS integrates the delivery of management actions to support strategic interventions. This project provides an opportunity for coordinated natural resource management to benefit all asset classes, through partnership development and focused action, meeting the aspirational targets outlined in the RCS.

High priority RCS strategic interventions addressed by this project include:

- IC4 – Provide support for coordination and partnership development.
- MEB1 – Develop a systematic approach to the responsible management of the impact of production activities on the environment.
- MEB2 – Protect and improve water quality.
- MEB3 – Ensure the sustainability of production and harvest while securing the protection of assets and minimizing risk.
- MEB6 – Protect and improve coverage of native vegetation.
- CBCS1 – Support and build on existing community capacity to achieve natural resource management outcomes.

- CBCS3 – Develop formal mechanisms for community participation in natural resource management decision making.
- PM4 – Integrate land management and land use.

### RCS Sub-Strategy Links

Strzelecki Integrated Management Strategy

Corner Inlet and Nooramunga Catchment Strategic Directions Statement 2008

West Gippsland Soil Erosion Management Plan 2008

WGCMA Biodiversity Action Planning – Landscape Zone Plans (Draft 2008)

West Gippsland Native Vegetation Management Plan 2003

West Gippsland Salinity Management Plan 2005

West Gippsland River Health Strategy 2005

Gippsland's Water Quality Action Plan 2005

West Gippsland Wetlands Management Plan 2008

# Priorities

### Assets

This project, Implementing the Strzelecki IMS, has been developed with the intent of protecting and enhancing the sustainability and ecosystem resilience of the Strzelecki Ranges, with the multiple outcome benefits of protecting the asset values of catchments to Corner Inlet, the Gippsland Lakes and the Bunurong Coast.

Priority Asset Areas identified through the Strzelecki IMS are landscape areas containing a combination of assets including native vegetation, rivers and streams, and productive agricultural and forestry land. The combined ecosystem services provided by these assets are the reason for the identification of the Priority Asset Areas. The aim through this project is to protect and enhance the value of these multiple assets, impacting in a positive way on the local scale values to create a more resilient landscape. Local action will in turn protect the assets of Corner Inlet and Gippsland Lakes, addressing the source of many of the threats to these larger assets, rather than treating the symptoms.

Specific landscape assets (Priority Asset Areas) where asset values will be protected and enhanced through this project include (refer to Figure 23):

- Mt Worth State Park (Priority Asset Area A)
- Narracan Creek sub-catchment (Priority Asset Area B)
- Tarra River sub-catchment (southern end of Priority Asset Area E)
- Alberton West State Forest (Priority Asset Area F)
- Agnes River sub-catchment (Priority Asset Area G)
- The productive landscape between Korumburra and Leongatha (Priority Asset Area H)

## Threats

Threats to be addressed through the delivery of this project include:

- Soil erosion
- Salinity
- Fragmentation of native vegetation
- Habitat loss (terrestrial biodiversity)
- Poor water quality (impacting on Corner Inlet and Gippsland Lakes)
- Pest plants and animals
- Loss of productive capacity

## Location

Priority Asset Areas for management, identified through the Strzelecki Integrated Management Strategy, are shown in Figure 23. The specific Priority Asset Areas to be targeted for this 2009/10 project are Priority Asset Areas A, B, the southern end of E, F, G and H. Delivery of activities will be primarily guided by protecting and enhancing values within Priority Asset Areas, with the secondary objective of protecting and enhancing values between Priority Asset Areas.

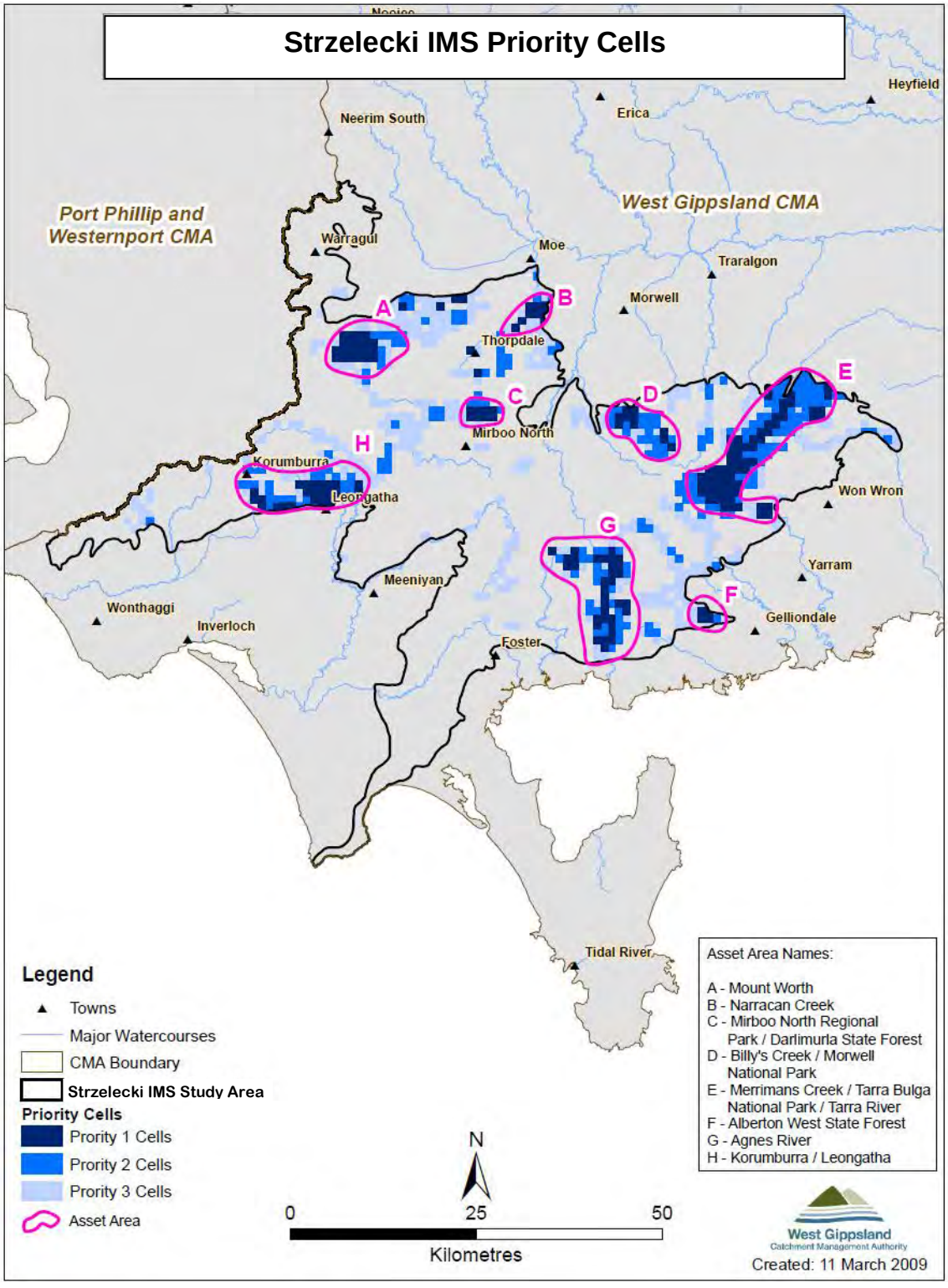


***Figure 23: Implementing the Strzelecki IMS - Priority Asset Areas***

## Resource Condition Targets

Soil Erosion Management Plan – SE-1P, SE-2P, SE-3P, SE-1T, SE-2T, SE-3T

Salinity Management Plan – SM-D1, SM-D2, SM-D6

Native Vegetation Plan – NV-01a, NV-02a, NV-02b, NV-02c, NV-02d

River Health Strategy/Water Quality Action Plan – RH-06/WQ01

Wetlands Plan – WL-01

## Intermediate Outcomes

Program activities and links to Victorian Investment Framework 2009 intermediate outcomes and performance descriptors are outlined in the attached spreadsheet (Table 57). Each activity is linked to the Priority Asset Areas map (Figure 23) where activities will be delivered.

## Table 57: Indicative budget breakdown (GST exclusive, as of February 2009) for the example project proposal - Implementing the Strzelecki IMS

**IMPLEMENTING THE STRZELECKI MOP - PROJECT BREAKDOWN (Example)**

| | | Description of Works | TOTAL FUNDING | | Service Provider | Intermediate Outcome | Performance Descriptor | | Strzelecki MOP Priority Asset Area |
|---|---|---|---|---|---|---|---|---|---|
| | | | GST exclusive | | | | | | |
| | | | Investment Required (2009/10) | In-kind Contributions (estimated) | | | | | |
| 1 | Research | EM-38 mapping of high priority areas (as identified in the West Gippsland Salinity Management Plan) within Corner Inlet- 2000 ha. Focus will be Port Albert and Foster Salinity Management Areas to compliment Strzelecki MOP priority asset areas | 66,000.00 | | WGCMA/DPI | RRS<br>Reducing the risk of salinity on land and water assets | Linked to activity 2, 3 and 4 | - | E (Tarra River), F, G, H |
| 2 | On-ground works | Supporting tree planting (and fencing where appropriate) on private land in recharge areas (as identified through salinity mapping) using appropriate EVC species for the given location (where possible) to ensure a biodiversity outcome. Priority will be given to recharge control located within Strzelecki MOP priority asset areas. | 66,000.00 | | WGCMA /DPI | RRS<br>Reducing the risk of salinity on land and water assets | RRS.1<br>Reduction in recharge and discharge:<br>Additional area of revegetation (indigenous, non-indigenous, pasture) | 20 ha | E (Tarra River), F, G, H |
| 3 | On-ground works | Supporting establishment of perennial pastures in key salinity discharge sites (where impact on waterways and biodiversity is evident) | 22,000.00 | | WGCMA/DPI | RRS<br>Reducing the risk of salinity on land and water assets | RRS.1<br>Reduction in recharge and discharge:<br>Additional area of revegetation (indigenous, non-indigenous, pasture) | 100 ha | E (Tarra River), F, G, H |
| 4 | Capacity building | Education and extension activities- Salinity focused field days, provision of depth to watertable information to landholders, provide advice to landholders as required, technical advice to Gippslandcare and other agencies/industry groups (including those offering farm planning) | 150,000.00 | | DPI | LMC<br>Increased or maintained capacity of individuals and land managers to manage natural resources sustainably. | LMC.2<br>Number of projects/activities/events to increase human capital of individuals and land managers to manage nautral resources sustainably | 5 events/activities/projects plus individual extension support to 20 land managers | E (Tarra River), F, G, H |
| 5 | Monitoring | Monitor 85 groundwater bores monthly (including urban salinity bores in Inverloch, Port Albert and Port Welshpool). | 50,000.00 | | DPI | RRS<br>Reducing the risk of salinity on land and water assets | Linked to activity 2, 3 and 4 | - | |
| 6 | On-ground works | Support for landholders to better manage minor streams/gullies on-farm to improve biodiversity and minimise sediment and nutrient run-off. Priority will be given to properties located within Strzelecki MOP priority asset areas. | 55,000.00 | | WGCMA/DPI | LMC<br>Increased or maintained capacity of individuals and land managers to manage natural resources sustainably. | LMC.1<br>Additional area and number of landholders managing natural resources sustainably | 100ha and 5 landholders | A, B, E (TarraRiver), F, G |
| 7 | Capacity building | Provide technical advice to landholders in high priority erosion areas, including forestry companies and private landholders. Respond to requests for advice and proactively engage community and landholders in target area on how to reduce the occurrence of soil erosion. Complete soil management plans for landholders in high risk target areas. Priority will be given to building capacity of landholders identified within Strzelecki MOP priority asset areas. | 150,000.00 | | DPI | LMC<br>Increased or maintained capacity of individuals and land managers to manage natural resources sustainably. | LMC.2<br>Number of projects/activities/events to increase human capital of individuals and land managers to manage nautral resources sustainably | 5 events/activities/projects plus individual extension support to 20 land managers | A, B, E (TarraRiver), F, G |
| 8 | On-ground works | Onground incentives provided to landholders to reduce threat of erosion in high risk areas. Priority will be given to properties located within Strzelecki MOP priority asset areas. | 66,000.00 | | WGCMA/DPI | SHI<br>Soil health maintained or improved | SHI.1<br>Area of land and number of sites treated for erosion | 20ha, 5 sites | A, B, E (TarraRiver), F, G |
| 9 | On-ground works | Protect, enhance and restore 200ha of high value native vegetation in locations prioritised through the Strzelecki MOP, with additional 20km riparian habitat protected. Planned work targeted to provide multiple-benefits for biodiversity, soil health and water quality.<br>On-ground delivery includes monitoring to ensure achievement of site specific targets and milestones set at planning stage for each of 20 Conservation Plans | 377,808.92 | 214,100.00 | WGCMA/GA | HPB | HPB2.1<br>HPB2.2 | 200ha<br>20km | E (Tarra River), F, G |
| 10 | Capacity building | Develop 20 Conservation Plans for implementation on private land totalling 200ha of high value native vegetation protected, enhanced and restored. Conduct 5 workshops to provide the broader community with information, knowledge and skills to undertake on-ground works. | 52,693.58 | 74,800.00 | WGCMA/GA | LMC<br>CGC | LMC.1<br>LMC.2<br>LMC.3<br>CGC.3 | 200ha, 20 landholders<br>4 activities/events<br>5 activities/events<br>$302,980.01 | E (Tarra River), F, G |
| 11 | Capacity building | Provide technical advice to landholders in Priority Asset Areas as identified through Strzelecki MOP. Respond to requests for advice and proactively engage community and landholders in target area on how to protect and enhance biodiversity assets. Coordinate development and delivery of Conservation Plans. | 23,692.66 | 14,080.00 | WGCMA/GA | HPB<br>LMC<br>CGC | Linked to activity 9 and 10 | - | E (Tarra River), F, G |
| 12 | On-ground works | Identify, promote and negotiate TfN conservation covenants within priority asset zones - 575ha covenanted / permanently protected.<br>Improve the biodiversity condition of covenanted land through adoption of sound ecological principles, allocation of incentives, and development of management plans - 575ha improved | 110,000.00 | | WGCMA/TfN | HPB<br>HIB | HPB1.1 / HIB1.1 | 575ha | A, B, E (Tarra River), F, G |
| 13 | On-ground works | Pest plant and animal activities.<br>Assess/map areas subject to invasive plant populations and rabbit warrens.<br>Undertake fox and other feral animal counts.<br>Undertake control measures and monitor responses. | 28,050.00 | | WGCMA/TfN | API | API.4 | 575ha | A, B, E (Tarra River), F, G |
| 14 | Capacity building | Coordinate development and delivery of management plans to 15 landholders to permanently protect and improve 575ha of native vegetation.<br>Coordinate and attend 4 field days, conduct 4 presentations, compile contact details, follow up with visitations, negotiate protection. | 36,080.00 | 5,308.00 | WGCMA/TfN | LMC<br>CGC | LMC.1<br>CGC.3<br>CGC.9 | 575ha, 15 landholders<br>$5308.00<br>8 activities/events | A, B, E (Tarra River), F, G |
| 15 | Coordination | Employ 1 FTE Project Manager to coordinate and facilitate successful implementation of the Strzelecki MOP program. | 154,000.00 | | WGCMA | ICR | ICR.6 | 1 FTE | - |
| | | **Indicative Budget Total (GST exclusive):** | **1,407,325.15** | **308,288.00** | | | | | |

Acronyms
WGCMA - West Gippsland Catchment Management Authority
DPI - Department of Primary Industries, Victoria
GA - Greening Australia Victoria
TfN - Trust for Nature