SUMMARY:

The Regional Ecosystem Model of Tasmanian Biodiversity and the method underlying the Natural Assets Code Overlay

In order to manage our landscape well, we need to make sense of it. This takes more than interpreting dots on maps that represent the location of particular species or proposed developments – we need tools that are able to draw together all the relevant information we need to make decisions about where development has little impact, and where greater management of natural assets is required.

The Priority Vegetation map in the Natural Assets Code is one of those tools. It uses spatial information provided by the Regional Ecosystem Model of Tasmanian Biodiversity (REM) to evaluate biodiversity issues across our landscape, but this is more than just a map. It's a model built on scientific data, analysis and principles.

The REM – the science behind the natural assets mapping process

The REM, developed by Natural Resource Planning Pty Ltd, identifies broad biodiversity issues (that is, those biodiversity values we agree are important for consideration, such as threatened or priority species, vegetation intactness to protect important habitat etc.) based on the strategic frameworks for biodiversity management in Tasmania and on the scientific information available for these. Because issues are often related to each other, they are placed into a conceptual framework that allows for study of these relationships and analysis of two key aspects of each issue. These key aspects are:
space

1. The *biological significance* of the issue e.g. the habitat needs of threatened species, species distribution, vegetation type etc.
2. The *landscape-scale ecological context*, or how the issue relates to others across the landscape e.g. past clearing of vegetation, the size of remaining patches of vegetation, connectivity between patches of vegetation etc.

Based on this, issues are mapped and modelled systematically across the entire landscape using the best data that is available. This data can then guide decision-making about what development or management action should be taken at any particular location, relevant to its potential impact to the biodiversity issues at the site, and other matters connected to it throughout the surrounding area. This can be presented spatially in a map or in table form. As new data becomes available following changes in the landscape, it can be added into the model to keep it updated.

Photo: The habitat value of a stand of native vegetation can vary with a number of factors such as the size of the patch, whether it provides an 'island' for connectivity across open spaces, and what condition it is in. The REM seeks to include this level of detail. Understanding these factors helps us make better decisions about where development is most appropriate, rather than applying a 'broad-brush' approach. (Photo credit: J. Voller, NRM North)

How the REM treats priority species

Tasmania's flora and fauna include some very unique and special species, with a number of these found only in our island State, due to evolutionary isolation or mainland extinction. The REM spatially models the habitat of as many priority species as possible. Priority species include all listed threatened species, and some non-listed fauna species that are nevertheless of particular concern (e.g. Tasmanian Bettong).

Previous planning approaches for protecting these species have involved individual vegetation communities (as a substitute for specific habitat requirements of target species) and have not been successful in achieving their goal, because of the need to take a range of factors into consideration, including landscape context. Therefore, the REM uses two approaches to incorporate information for priority species into the model:

1 *Generic* – This approach relies on a small number of habitat features for all priority species, based on known information drawn from reliable records and observations in the Tasmanian Natural Values Atlas.

2 *Detailed* – The detailed species approach seeks to develop more comprehensive habitat profiles for priority species that can be represented spatially, based on information such as a species core range, known range, potential range, potential habitat, significant habitat and other habitat definitions. This is needed because known location records in the Natural Values Atlas do not provide sufficient data to understand how a species uses its habitat, and rely on someone having been to a given location to record the presence or absence of a species only. For fauna species that move around, this is particularly problematic. Detailed spatial habitat models have been developed for approximately 100 fauna species.

This means that there is a greater level of detail to mapping the habitat of priority species, helping make better informed decisions for development across the landscape. Better planning tools mean better information for property development as well as improved protection of our iconic natural values.

Eastern Barred Bandicoots – a case in point

Photo credit: H & A Wapstra

Eastern Barred Bandicoots (or EBBs to their friends) are only found in Tasmania, after the extinction in the wild of the related mainland subspecies. While predation by cats and infection by *toxoplasmosis* are large factors in their decline, changes in their grassland habitat in Tasmania have also affected their population here. This is compounded by the seasonal impact of drought on their population. However, despite their need for native lowland grassland for habitat, EBBs can also be found in agricultural farmland. This is because they prefer mosaics of vegetation, which can include a mix of paddocks and even weedy sites, provided there is adequate, suitable groundcover. Some threatened species such as the EBB can be compatible with farming or outer urban activities, provided that connected vegetation elements are retained in the landscape. This is where a detailed spatial analysis of habitat can provide better tools for landscape planning than a more generalised approach.