

Forest Education Foundation

National Forest Learning Centre

The stories behind our trees

Warra Tall Eucalypt - Australian Supersite!



Long term research

Hidden away in the depths of the Southern Forests of Tasmania, lies an area of wet eucalypt forest that has for many years been the focus of long term research into our forest management processes.

The huge quantities of data gathered here has helped direct the sustainable management of wet eucalypt forests across Australia, so now the Warra has taken its place as one of ten key locations in the Australian Supersites Network (ASN).

The Warra itself has been a Long Term Ecological Research site since 1998, and has proved to one of the most scientifically productive. As part of its ground area is in State forest, much of the research has focused at ways on which multipurpose management can have better outcomes for biodiversity as well as wood production.



Silvicultural systems trial

The traditional harvesting method of clear-fell, burn and sow in wet eucalypt forests has for many years been under intense scrutiny, as even though the economic outcomes are maximized, the biodiversity ones are not. This also has implications for the successful regeneration of the site in the long term. The silvicultural system trial was set up in Warra with the aim of finding an acceptable alternative to clear-felling.

The trial is still on-going, but results so far have indicated that the aggregated retention method, leaving small islands of mature forest around which the rest is harvested, can be adopted as a successful working model. This has also proved to be the case on the ground, where the majority of wet eucalypt coupes in Tasmania are now harvested using this system.

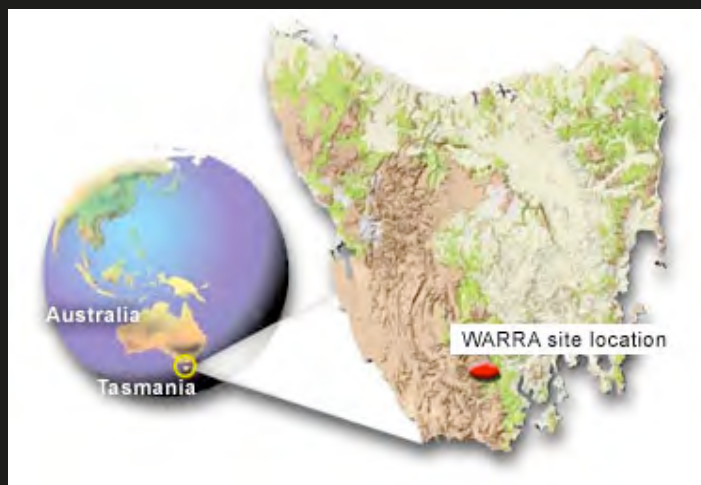


It might have taken many years of trials, data collection and research, but understanding the science of the system has led to better sustainable management of the wet eucalypt forests. And the science continues, as the Warra now takes its place as in the ASN as monitor of environmental change, with a new carbon flux tower ready to start data collection from 2013 onwards.

Australian Supersites Network

The aim of the ASN is to understand how key ecosystems across Australia will respond to environmental change. This has been addressed by setting up a nationally consistent network of ecosystem observatories, each representing a key Australian biome and spanning a wide range of environmental conditions.

Details of the ASN and the other Supersites can be found at: www.tern-supersites.net.au/



More information on the Warra site can be found here: www.tern-supersites.net.au/index.php/warra

The FEF can arrange trips into the Warra research area for older groups (grade 9 and above) - please contact us for details.

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Deep in the forests of southern Tasmania is an enormous open-air laboratory. Long-term research at Warra helps scientists understand the complex ecology of forests.

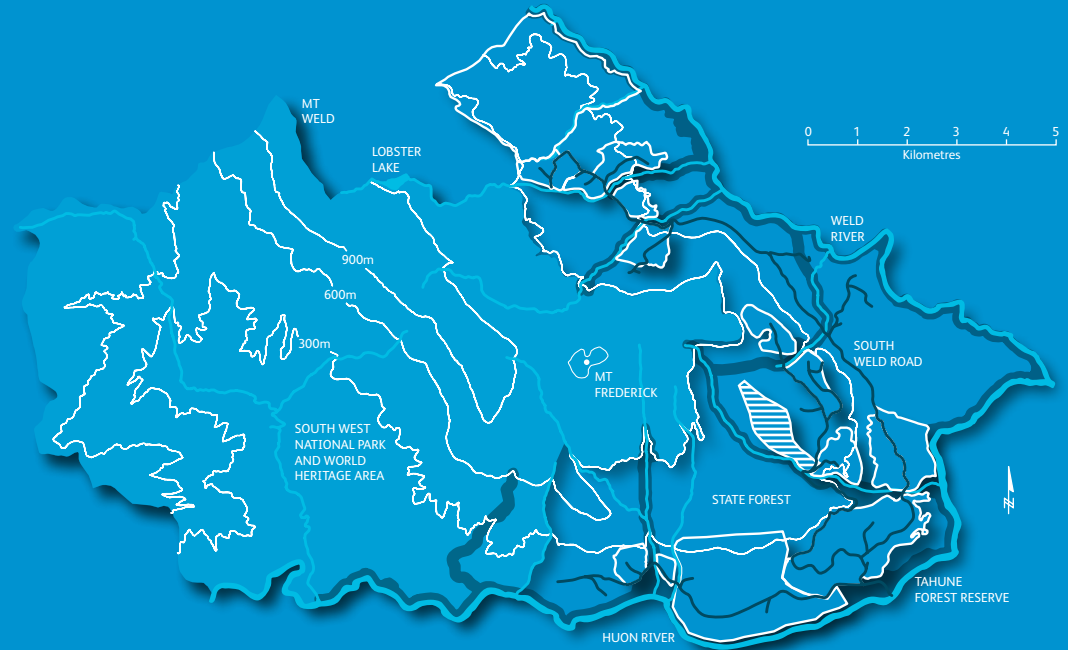
The Warra Long Term Ecological Research (LTER) site covers almost 16,000 hectares, straddling the Tasmanian Wilderness World Heritage Area and the wet eucalypt production forests that are managed for multiple-use forestry.

It's just one of dozens of other LTER sites around the world. Scientists working at Warra can link their studies into national and international forest research programs with a long-term ecological focus.

At Warra, researchers in a variety of scientific areas work together on joint projects and share their

findings. The aim is to gain a better understanding of ecological processes in forests so that they can be managed sustainably into the future.

Warra LTER Site



Warra is supported by Forestry Tasmania along with a range of other site partners from Tasmanian and national research agencies. They include:

- Australian Bureau of Rural Sciences
- Cooperative Research Centre for Forestry
- CSIRO Sustainable Ecosystems
- Forest Practices Authority
- Department of Primary Industries, Parks, Water and Environment
- Forests and Forest Industry Council
- University of Tasmania

Key

- Legislative Reserves
- Administrative Reserves
- Logged Coupes
- Hydrology Control Area
- Silvicultural Systems Trial Area

Locality Map



Warra LTER Site

These are a few of the
research projects under
way at Warra

Log Emergence Traps

Fallen logs rotting on the forest floor provide essential habitat for many species of insects and other invertebrates. In this Warra study, specially-made traps collect insects living in rotting logs of different sizes.



Alternative Silvicultural Systems

Silviculture is the science of managing forests for wood production. A 200 hectare trial at Warra compares six different silvicultural systems and monitors their economic, environmental and social sustainability.



Canopy Invertebrate Sampling

Traps suspended high in the forest canopy collect insects that live there – it's one of the techniques scientists use to study biodiversity in wet eucalypt forests.



Water Studies

Weirs constructed on different water courses help hydrologists compare water quality in catchments with different forest profiles.

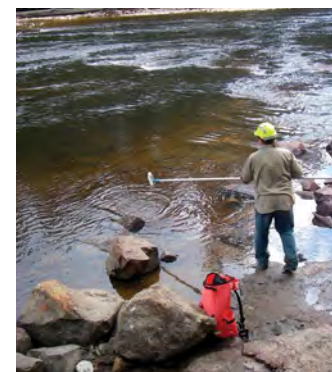


Photo: Richard Bennett

Wildfire Reference Sites

Study plots have been established in forests regenerating after wildfire and in harvested stands of different ages. Scientists record the plants and animals living at the plots and study differences in biodiversity.



Silvicultural Systems Trial

What's the best way – the right way
– to harvest a forest?

There are different answers for
different forests.

All the values of a forest are taken into account when selecting the appropriate silvicultural system. The commercial value of the wood resource itself, the safety of people working on the ground and fire management issues are all important factors. As well, foresters consider environmental and ecological values including the impact of the forest operations. In fact, special values such as flora, fauna, soil, geomorphology and

cultural heritage are the first things to be considered and if they are prohibitive, nothing else happens.

In Tasmania, the main types of harvesting methods include a range of partial harvesting systems and the clearfell, burn and sow method.



Clearfell, Burn & Sow

This system is suited to wet eucalypt forests with a dense understorey. All the trees are felled. After the logs are removed, the slash remaining on the forest floor is burned in a controlled but very intense fire (the regeneration burn), which leaves a clear

seedbed, ready for re-sowing with seed collected on-site or from nearby areas of similar forest. The clearfell, burn and sow approach was developed during the late 1950s. The intensity of the regeneration burn mimics the fierceness of wildfire, which removes all the forest-floor debris and exposes mineral soil. The soil heating promotes establishment and growth of seedlings. Seed sown onto burnt ground germinates better, establishes more readily and grows faster than seed sown on unburnt ground.



Photo: Richard Bennett



Silvicultural Systems Trial



Alternatives to Clearfelling

In dry eucalypt forests, where the lower density of vegetation allows operators clear visibility and freedom to move, it is possible to select and fell individual trees. In tall wet eucalypt forests, this is dangerous – that's why clearfelling is preferred. But there are other variable retention systems that can be used in Tasmania's wet eucalypt forests. Several have been trialled in the Warra Long Term Ecological Research site, which encompasses working production forests and the World Heritage Area in southern Tasmania.

These systems have been developed partly in response to public concerns over clearfelling of tall old-growth forests. Research at Warra has shown that variable retention silvicultural systems can be a practical alternative to clearfelling, allowing an economic level of wood production as well as retaining old-growth trees for wildlife habitat and biodiversity.

Variable Retention

Variable retention systems leave more than half the total area of a coupe within one tree height of the base of an old-growth tree or group of trees for at least one rotation.

Dispersed Retention

In the dispersed retention method, individual trees are left standing across the full area of the coupe. Workers in the forest have safety concerns about this system. A preferred approach is aggregated retention, which leaves larger patches of forest rather than individual trees.

Another issue is the management of the slash left on the forest floor. A fierce fire across the whole coupe would kill the retained trees, but a clear seedbed still needs to be created for the regenerated areas of new forest. This can be achieved by limited and careful burning – other options can include recovery and re-use, perhaps for the production of biomass energy.

The retained groups of trees need to be protected while the new forest grows – the rotation period before the next harvest can be as long as 90 years.

2010 & Beyond

These are all issues being actively addressed, because under the Tasmanian Community Forest Agreement (TCFA), 80 per cent of the annual old-growth harvest will be by non-clearfell silviculture from 2010. Scientific research such as the Warra trials are the key to new management and harvesting strategies that balance the environmental, social and economic values of our forests.

Ideas for student questions

Why does the Supersite include World Heritage Area forest?

The Warra Supersites monitor key Australian biomes. What is a biome?

Why would foresters need to study water quality in forest catchments?

Why is clearfell, burn and sow an effective way of harvesting and regenerating wet eucalypt forest ecosystem?

What might be some of the advantages/disadvantages of dispersed (aggregated) retention? Think in terms of environmental, economic and worker safety outcomes.

Ideas for classroom activities

Split the class into groups, each to explore one of the Australian SuperSites and present summary to class.

Investigate and compare other methods of harvesting native forest e.g. clearfell, burn and sow, aggregated retention, single tree selection.

Leave basic pitfall traps (plastic cup buried until rim level with ground) to catch ground-dwelling invertebrates in the school grounds. Sort, classify and record specimens. Monitor changes overtime.

Links to Australian Curriculum - Science

Forest Education opportunities through science - [years 9/10](#)

Links to further information

How do we apply scientific findings? - [further information](#)

Links to further [supporting websites](#)

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