

# Warra LTER Charter

## Introduction

The Warra Long Term Ecological Research (LTER) site has been established to improve understanding of the ecology of Tasmanian wet forests. These forests are part of the southern cool temperate wet forest biome. The area contains forests managed both for wood production and for conservation. A range of management prescriptions and practices prevail in the different parts of the area.

The goal of research at the site is to describe the ecology of the cool temperate (*Eucalyptus obliqua*) wet forest ecosystem in relation to forest management practices, natural disturbance and global change. It is intended to foster multi-disciplinary research within a long term (5 year or longer) framework. The site combines infrastructure and background information for researchers with ease of access and surety of long term maintenance.

## What is the Charter for?

This charter sets out the philosophy behind the establishment of the Warra site, the way in which the site is to be managed and the roles and responsibilities of managers and researchers

## What is in the Charter?

This charter provides information on:

- the role and aims of the Warra research site
- the management structure for the site
- a brief description of the site and why it is needed
- site infrastructure
- research appropriate to the site
- how to undertake research there
- researchers' commitments
- other information

## The Role and Aims of LTER Studies at Warra

### What is Warra for?

The mission statement for the Warra LTER site is:

*To foster long-term ecological research and monitoring in Tasmanian forests and the development and demonstration of sustainable forest management practices.*

The overall goal of studies in the Warra LTER site is to describe the ecology of the cool temperate (*E. obliqua*) wet forest ecosystem, through multi-disciplinary research programs aimed at the forests and their component biota, streams, terrestrial environments, soils and land-water-soil interactions. The research methods may

include descriptive, temporal and chronosequence studies as well as experimental manipulation. This information is to be used to inform the management of the forests both for wood production and for conservation.

The main aims are as follows:

- To understand fundamental ecological processes in *E. obliqua* wet forests
- To assess and monitor biodiversity
- To determine the effects of different forest management regimes on biodiversity, and ecological processes and thus assess the sustainability of those regimes
- Where necessary, to develop alternative management regimes
- To provide an integrated multi-disciplinary focus which complements research programs elsewhere in Australia and overseas
- To link Tasmanian forest research with national and international programs having a long term ecological focus.

### **The Management Structure for the Site**

Partner Organisations involved in the management of the Site comprise:

- Land managers – Parks and Wildlife Service (Parks), Sustainable Timber Tasmania (STT)
- Agencies responsible for forest policy – Department of State Growth (SG), Australian Bureau of Agricultural and Resource Economics and Science (ABARES)
- Agencies responsible for regulating forest management – Department of Primary Industries, Water and the Environment (DPIPWE), Forest Practices Authority
- Research organisations – University of Tasmania (UTas), CSIRO, Terrestrial Ecosystem Research Network (TERN)

The LTER functions of the Site are managed by the Warra Policy Committee. The Policy committee delegates operational management of the Site, within the agreed LTER parameters approved by the Committee, to the Warra Management Group.

The Warra Policy Committee is comprised of representatives from each of the Partner Organisations. This Committee meets face-to-face once each year and has responsibilities to:

- liaise with the Parks and STT District managers
- directing the development of, and endorsing, the Warra Policy document
- liaison with the land managers - Parks and STT – to develop and maintain the necessary authorisations to operate the Warra Long-Term Ecological Research Site
- directing the review and endorsement of the research and use policy,
- direct the formulation and endorsement of research priorities
- endorsing the Terms of Reference and the appointment of members of the Warra Management Group
- appoint members of the Warra Management Group
- vet proposed activities (e.g. clearfelling within Icon Research Sites) beyond the parameters of currently delegated authority of the Warra Management Group

The Warra Management Group draws a small number of individuals from organisations represented on the Warra Policy Committee.

Receive direction from the Warra Policy and scope from the Terms of Reference

The functions of the Warra Management Group are to:

- attract appropriate research projects and funds for the site
- facilitate interdisciplinary research
- coordinate research proposals and allocate funding where appropriate or available
- approve research projects within guidelines set by the Policy Committee
- advise the Warra Policy Committee on research needs
- keep the work done in Warra consistent with the overall objectives of the site
- ensure new projects conform with overall site management
- track and report activity of projects
- coordinate a coherent approach to site and research management
- engaging with end users (stakeholders) to assist in their capturing of value from research from Warra
- oversee maintenance of Warra infrastructure
- ensure all IP outputs (data sets) from Warra are properly curated and lodged in secure data repositories
- manage the safety and environmental aspects of the site consistent with that of the land managers
- meet 6-monthly (once prior to Policy committee, once 6 months later)
- report Warra activities and outputs to the Policy Committee in a timely way
- report issues to Policy Committee in a timely way with recommended corrective actions
- manage the promotion of Warra including maintaining the Warra web page.

## **A Brief Description of Warra**

The Warra LTER site occupies 15,900 ha between the Huon and Weld Rivers, approximately 60 km west south-west of Hobart. The site includes Mt Weld and Mt Frederick, and ranges in altitude from 37 m to 1260 m. It is geologically diverse but dominated by Jurassic dolerite. Much of the area is forested, but it also includes button-grass moorlands, alpine moors and scrub. The most common forest type is *Eucalyptus obliqua* wet forest which is the most widespread forest community in Tasmania.

The eastern edge of the site is within the Permanent Timber Production Zone managed for multiple-uses including sustainable wood production by Sustainable Timbers Tasmania. The remainder is in The Tasmanian Wilderness World Heritage Area and is managed for conservation by the Department of Primary Industries, Parks, Water and the Environment.

### **Why a Forested LTER Site in Tasmania?**

Tasmania has more forest, as a proportion of its total area, than any other State in Australia. Fifty percent of its forest area of 3.39 million ha is reserved for conservation purposes. It also has a major sawn timber industry based largely on native forest outside reserves.

Temperate *E. obliqua* wet forests are a major resource within Tasmania's wood production forests. They are also a characteristic component of the eastern forested ecosystem of the Tasmanian Wilderness World Heritage Area. The Warra LTER site contains an integral and representative sample of these forests, both in wood production areas and in conservation reserves. The Warra LTER site was established to provide the strong experimental research base necessary to underpin an ecological approach to management whether for conservation, sustainable wood production or for the other multiplicity of human needs and values that the forests provide.

An understanding of the ecology of these forests is needed to assist in the conservation of biodiversity, to understand the impacts of disturbance on ecological process and so contribute information on the effects of the different components of global change. Thus, the Warra LTER site contributes to national and international programs on long term ecological research and monitoring. The site is part of Australia's Terrestrial Ecosystem Research Network (TERN) and through TERN has links with the international long term ecological research (ILTER) network, and the Terrestrial Ecosystem Monitoring Sites (TEMS) database and the Global Terrestrial Observing System (GTOS) established under the United Nations Environment Program (UNEP).

### **Infrastructure:**

#### *Access*

The Warra LTER Site is within 1 ½ hours drive from Hobart and has several major roads within its boundaries providing access in the eastern half. The western half of the site is effectively wilderness with access only by foot, helicopter or by river.

Several permanent tracks have been established for long term monitoring within the area, both within the working forest and in the wilderness forest areas.

### *On-site facilities*

Currently there are no on-site accommodation facilities or field stations within Warra but there are toilet, restaurant and accommodation facilities at the Tahune Airwalk at the entrance to Warra. The Huon District Forestry Office is located at Geeveston 40 minutes from the site.

### *Climate and hydrology*

The site has an automatic climate station managed by the Bureau of Meteorology (Warra 097024). This station has been operating since September 2004. Three gauged weirs for hydrological studies in small unlogged catchments have been operating since 1998. One of the catchments is within the World Heritage Area and two in adjacent production forests. The Warra Flux Site, part of the OzFlux Network, hosts an 80-m tall instrumented tower that measures a suite of climate variables and the exchanges of CO<sub>2</sub>, water and energy between the forest and atmosphere. This site has been operating since March 2013.

### *Geology, geomorphology and soils.*

The geology of parts of the area have been mapped at 1:25 000 and there is a general 1:250 000 geological map of the site. Some limited geomorphological and soils descriptions of the area are available. Current programs are producing updated maps and descriptions of all three attributes. Full LiDAR coverage of the site is available and a suite of derived surfaces have been produced as GIS products including a digital elevation model, drainage and forest canopy. High resolution LiDAR and hyperspectral imagery has also been acquired for the 5 x 5 km landscape surrounding the Warra Flux Site.

### *Forest Inventory*

The vegetation has been mapped at 1:25 000 both into structural vegetation categories and into floristic units. Historical mapping of structural vegetation types from aerial photography is also available for the 1940s and 1980s. The area includes forests of various successional stages, from recent regeneration through regrowth to oldgrowth. The younger forests result from silvicultural treatment and from wildfire or other natural disturbance and there are excellent records of past treatments and fire histories for most of the managed forests. Several long-term studies using a network of permanently marked plots have been established in and around Warra. The area also contains several Continuous Forest Inventory plots established and measured since the 1960s. Inventories of flora and fauna are held by: Sustainable Timbers Tasmanian (forest inventory plots); DPIPWE (Natural Values Atlas), Tasmanian Museum and Art Gallery (Tasmanian Forest Insect Collection and Tasmanian Herbarium) and TERN. Many of these inventory data are accessible through the Atlas of Living Australia.

### *Data Management*

Databases and GIS themes for the site are held by DPIPWE, TERN and STT. A web site has been established and can be accessed at: <http://www.warra.com>. Data and associated metadata of all long-term studies are being progressively lodged on the TERN Data Portal. Other data can be made available by contacting DPIPWE or STT.

### *Laboratory facilities*

There are no on-site facilities at Warra. Laboratory space at Hobart may be available through negotiation with the Tasmanian land management and research agencies listed under the Policy Committee.

### **Research Appropriate for the Warra LTER Site**

The site offers a wide range of research opportunities in the earth sciences, hydrology, forest productivity and silviculture, biodiversity and ecology from the local scale to landscape level. Research can be descriptive, baseline monitoring studies of ecological processes or experimental manipulations. However approved studies;

- must be in accord with the statutory management objectives for the area
- cannot conflict with other ongoing research or monitoring unless specifically approved by the Policy Committee, or the Management Group
- cannot impact significantly on the potential of the site for other research again unless specifically approved by the Policy Committee, or the Management Group

The Warra web site has a comprehensive list of current and past projects at the Warra LTER site.

### **How to Undertake Research at Warra**

Research projects can be proposed by contacting the Principal Investigator of the Warra LTER site directly at the University of Tasmania or through any of the affiliated research agencies. New project proposals require the proponent completing an application form available on the Warra web site and submitting the proposal to the Principal Investigator for an out-of-session evaluation by the Management Committee; an early response would usually be made.

### **Researcher's Commitments**

In undertaking research at Warra, some commitments need to be made by the researcher:

- researchers are responsible for meeting all statutory requirements for collecting permits etc from relevant authorities and for lodging of any voucher material at a recognised institution;
- researchers agree to respect rights of others and to not impact on the Warra ecosystem except as agreed in the approved research program. Specifically, researchers will not take or leave any materials other than as approved in the research program;

- outcomes of research are to be published promptly wherever possible and data made available for use by others, within a reasonable period after project completion;
- the Principal Investigator of the Warra LTER site should be notified of any publications, theses etc which result from the research;

### **Other Information**

For any further enquiries or information about the site, contact Dr Tim Wardlaw, the Principal Investigator of the Warra LTER Site, in the School of Natural Sciences, University of Tasmania ([timothy.wardlaw@utas.edu.au](mailto:timothy.wardlaw@utas.edu.au)).