

WATER AVAILABILITY AND FOREST LANDUSE PLANNING TOOL. (WAFL)

An Assessment of Forestry Interception in the Ringarooma River Catchment

Bryce Graham

Department of Primary Industries, Parks, Water and Environment



What is WAFL

WAFL is a planning and advisory tool that was developed to evaluate the potential risks of impacts on water availability to downstream users and ecosystems resulting from large-scale changes in landuse.

WAFL Components

The tool incorporates the surface water hydrological models developed for DPIPWE, and the Conservation of Freshwater Ecosystem Values (CFEV) database, to allow evaluation of the impacts of changes in water availability at the sub-catchment scale on current water allocation and environmental assets.

WAFL Components

The tool uses the TasLUCaS equations developed by CSIRO as the underlying method for assessing the stream-flow from an area associated with a particular land-use.

These equations have been developed on a yearly time-step, and for the purposes of this tool, the impacts were disaggregated to a daily time-step in the surface water models.

WAFL Assessment

The impact on water availability to downstream users is investigated using the results of the TasLUCaS equations which become inputs to surface water hydrological models.

The impact on ecosystem values is evaluated by calculating changes to indices in the existing CFEV due to stream-flow change resulting from change in land-use.

WAFL Assessment in the Ringarooma Catchment

Hydrological model developed for Ringarooma

Water use determined from survey and WIMS data base

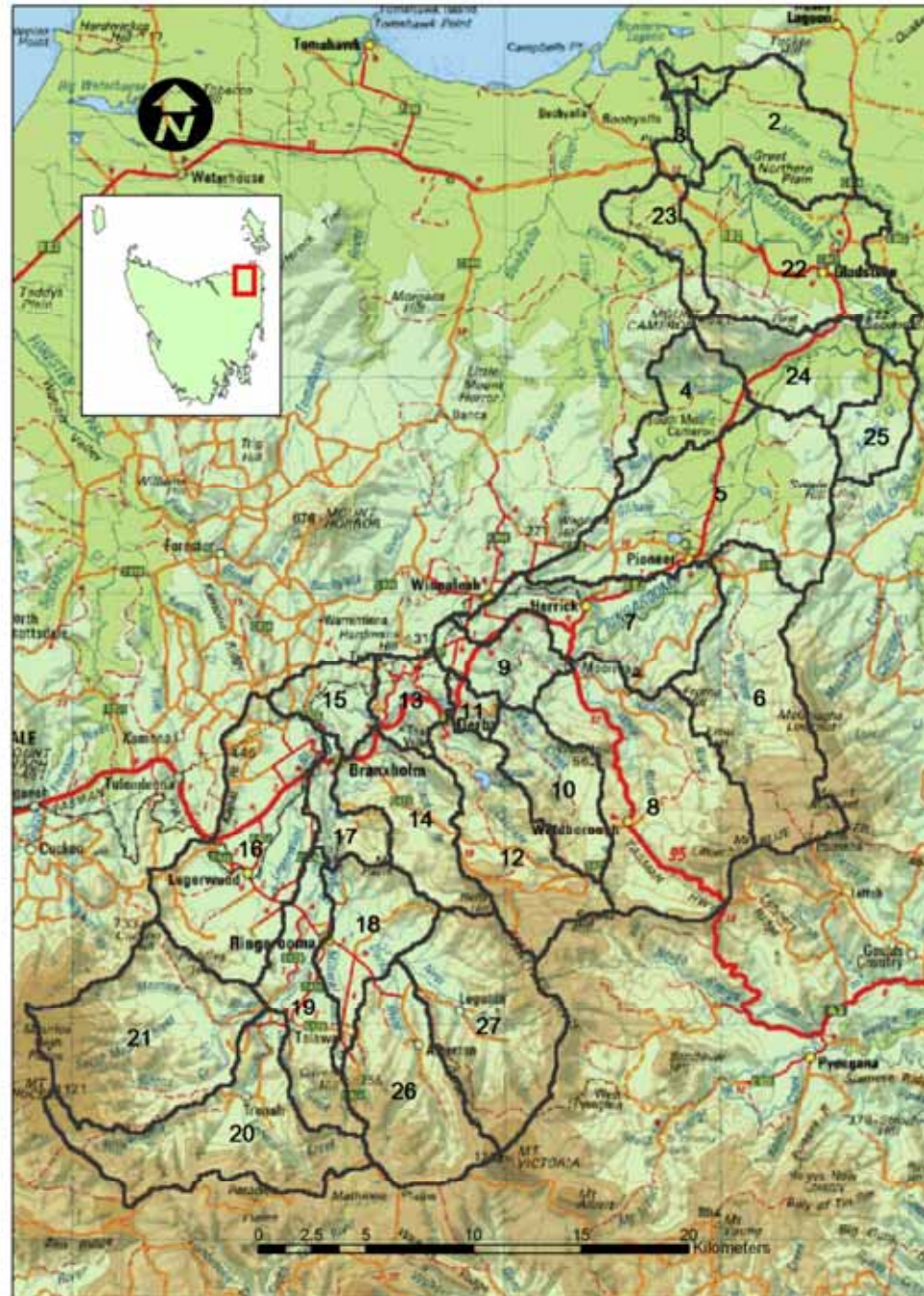
Model calibrated to actual stream flow record of Ringarooma @ Moorina Bridge

WAFL Assessment in the Ringarooma Catchment

Hydrological model developed for Ringarooma

Water use determined from survey and WIMS data base

Model calibrated to actual stream flow record of Ringarooma @ Moorina Bridge



Department of Prii

WAFL Assessment in the Ringarooma Catchment

Forestry data for the Ringarooma catchment was obtained from

Forestry Tasmania,
Private Forests Tasmania and
Rayonier (now under Timberlands)

WAFL Assessment in the Ringarooma Catchment

Forest Type	Catchment Area km ²
Plantation Softwood	25.5
Plantation Hardwood	59.5
Native Forest	
Other Tenure	57.63
All Reserves	210.83
Production Forest Only	226.67
All Non Forest	308.71
Total	888.84

WAFL Assessment in the Ringarooma Catchment Reference Land-use Condition

The forestry data provided establishes the reference condition for assessment.

For comparison a future condition is produced that allows an assessment of land use change to be made.

The reference condition used is the 2007 forestry levels

WAFL Assessment in the Ringarooma Catchment

Land-use Scenarios Assessed

land-use in 1995

no change in 2007 land-use levels

50% increase in 2007 levels

100% increase in 2007 levels

All scenarios were analysed by comparing to the 2007 land-use levels and running the model for 22 years

WAFL Assessment in the Ringarooma Catchment

Refer to results presentation

WAFL Assessment in the Ringarooma Catchment Summary

At the outlet, SC1, annual average flows potentially change by 8% if 2007 plantation levels in the catchment are doubled.

This is reduced to 5% if the plantation is increased by 50%

There is no significant change at the outlet comparing land-use in 1995 to present.

WAFL Assessment in the Ringarooma Catchment Summary

Some sub-catchments modelled, show a potential reduction in annual average flow by 5% to 16%. Note that this is in cases where forestry is increased by 50% and 100%, and it is unlikely that such an expansion would be possible.

If the 2007 level of plantation was to remain, there would be no significant reduction in the current stream flows. Outside of natural climate variability and climate change impacts.

WAFL Assessment in the Ringarooma Catchment

Further information

<http://www.dpipwe.tas.gov.au/inter.nsf/WebPages/CGRM-7KL4RA?open>

Ling FLN, Gupta V, Willis M, Bennett JC, Robinson KA, Paudel K, Post DA and Marvanek S (2009) River modelling for Tasmania. Volume 3: the Pipers-Ringarooma region. A report to the Australian Government from the CSIRO Tasmania Sustainable Yields Project, CSIRO Water for a Healthy Country Flagship, Australia.

WAFL Assessment in the Ringarooma Catchment

Thank-you

&

Questions ?