

# Wedge and Tyenna Block Hydrobiid Snail Study: Pre- vs. Post-Logging survey. Progress Report

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P Davies and S Munks

Freshwater Systems and Forest Practices Authority

## Background

This report describes the status of a survey assessing pre-post logging trends in Hydrobiid snail abundances, particular of *Phrantela pupiformis*, a listed species), in headwater streams in the Wedge and Tyenna blocks. The project commenced in 2003, was originally planned for 6 years (2-3 years pre-logging and 3-post), and has been extended due to changes in timing of harvesting operations in several of the study coupes. Interim results are described here based on trends. No formal analysis has been conducted to date, as the study is recommended to run for two more years (see Project Status below).

A primary aim is to establish whether harvesting operations are having an impact on the species, and to what extent the populations are sustained after operations cease.

## Methods

A total of nine streams from three coupes and three control catchments have been surveyed annually for Hydrobiid snails since February 2003. Site details are shown in Table 1. Surveys consist of standardised timed and unit-area active searches with counting of snails on stream substrate. Species are identified and numbers recorded, with differentiation between juveniles and adults.

Table 2 shows the number of sites and sampling history since project commencement. All sites were sampled for 2 – 3 times pre-logging. Several sites were also burnt as part of or within 1 year of the logging operation. One control site (Control 2) was cable-logged in 2006/07. The stream then became inaccessible for sampling and sampling then ceased. Control site 3 in the Tyenna block was originally scheduled for logging during the study but this has been deferred to date. It therefore serves as a third control stream.

## Interim Results

Three snail genera, *Phrantela* (listed species), *Austropyrgus* and *Nanocochlea*, have been recorded from the study streams. Only the results for *Phrantela*, the focus species for the study are discussed here.

*Phrantela* was generally present in sufficient, though variable, numbers for ongoing monitoring. Densities across all sites and sampling events ranged from 1.8 to 4219 per 100 m of stream.

Trends are shown in Figures 1 to 3 for all sites. Marked trends were observed. A general decline occurred in *Phrantela* numbers in Control sites in the Tyenna block associated with sustained drying conditions and reducing flows over the study period (Figure 3). This decline was not observed in Control 3 in the Tyenna area, despite all control streams having similar catchment areas (92 to 114 km<sup>2</sup>).

Three of the Wedge block sites showed a decline in numbers over the study period, while one (site I) did not. Stream sites in coupes WE038A or TN036B showed substantial fluctuations in numbers, but no consistent declines that could be associated with drying conditions.

There is some evidence for a short-term decline in *Phrantela* numbers immediately post- or during logging in four of the six sites. Five of the treatment sites have sufficient post-logging data to assess longer term changes. Of these, three show a post-logging recovery, and one showed no effect of logging (WE0038E site F). All sites, except sites WE0038E site I and TN036B, show a longer term decline which we believe is associated with drying climatic conditions (as per control sites 1 and 2).

Results to date therefore indicate a transient impact post-logging in several sites, but not all. Population levels after logging either recover and/or follow trends shown in control streams which appear to be affected by the sustained reduced catchment yields observed in southern Tasmania since ca. 2004/05.

**Table 1. Site details.**

Site	Coupe	Easting	Northing	Catchment Area km <sup>2</sup>	Stream Class	Distance from source km	Elevation m	Slope %
Control 1		443080	5266340	0.092	4	0.16	495	36
Control 2		442770	5266630	0.114	4	0.21	485	31
Control 3	TN036D	463515	5262840	0.106	4	0.19	368	18
D	WE008E	443280	5265870	0.054	4	0.09	550	42
F	WE008E	443150	5266090	0.061	4	0.13	530	38
H	WE008E	442890	5265580	0.154	4	0.49	435	38
I	WE008E	442780	5265840	0.296	4	0.61	410	17
A	WE038 A	440060	5272080	0.165	4	0.35	325	19
B	TN036B	462790	5262270	0.282	4	0.75	355	9

**Table 2. Sampling history of survey sites. \*, site discontinued after logging.**

Type	Block	Coupe	N Sites	N sample events (years)			Still required
				Pre-logging	Pre-burning	Post-treatment	
Control 1	Wedge		1	8			2
Control 2	Wedge		1	6*			
Control 3	Tyenna	TN036D	1	8			2
Treatment 1	Wedge	WE008E	4	2	1	3	
Treatment 2	Wedge	WE038A	1	7		1	2
Treatment 3	Tyenna	TN036B	1	4	2	2	1

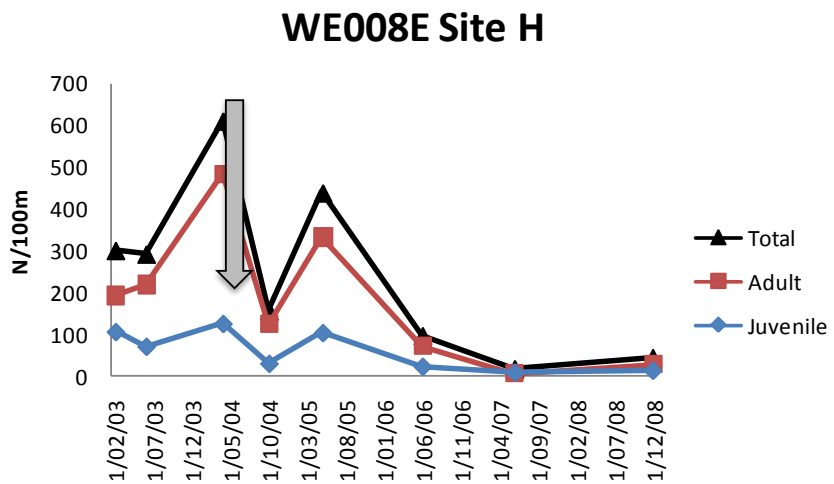
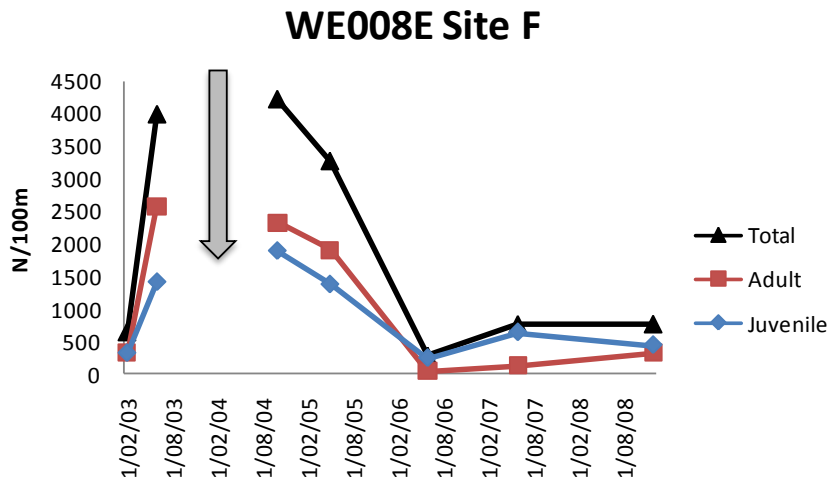
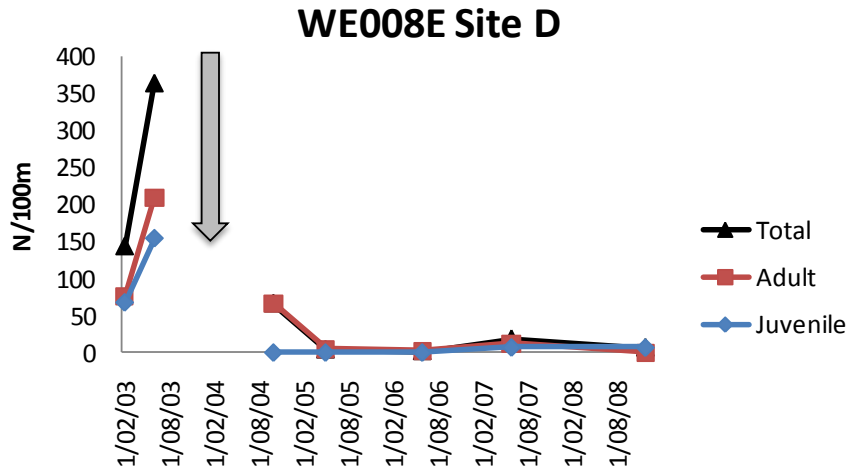
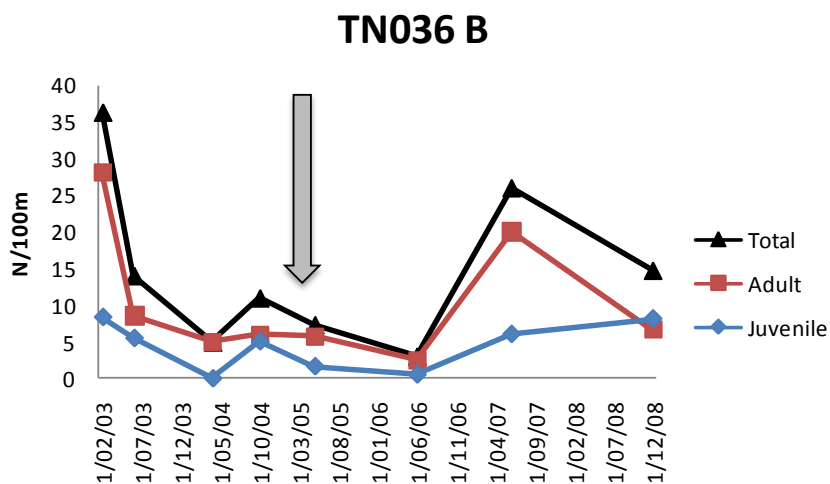
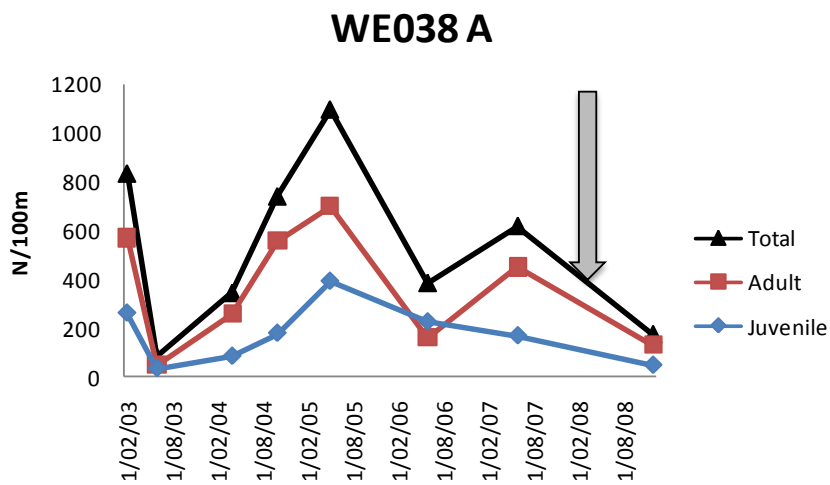
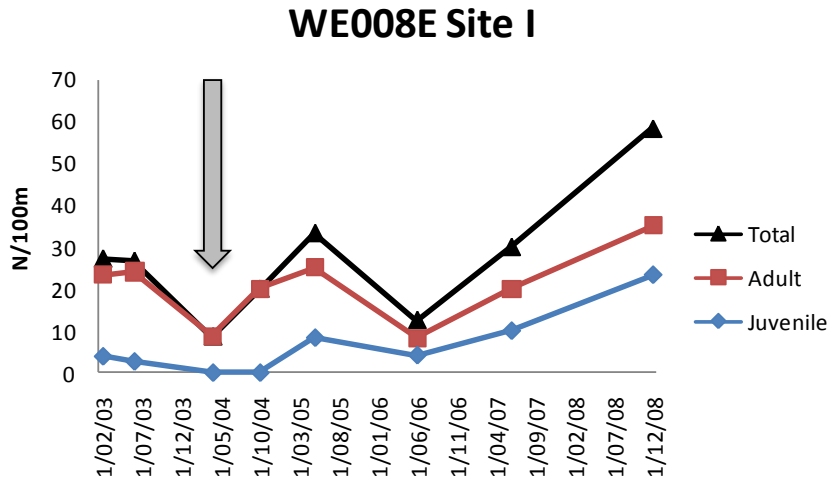
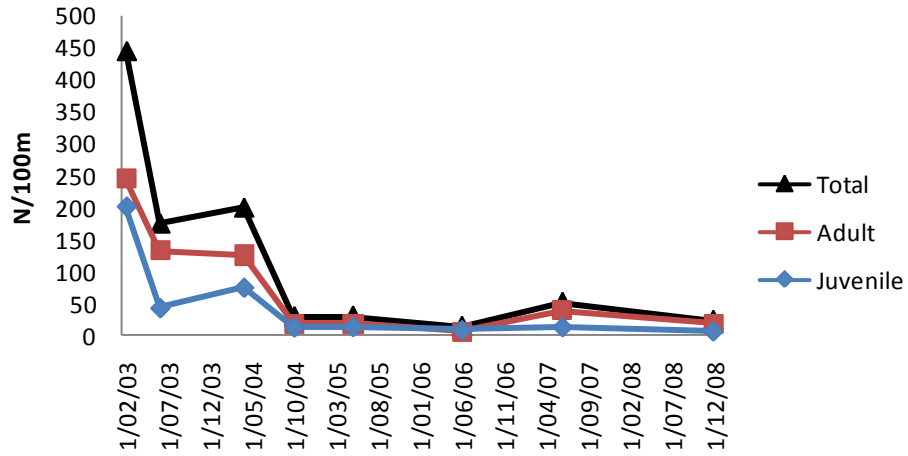


Figure 1. Time series of *Phrantela* population density in 3 sites associated with the WE008E coupe. Logging indicated by vertical arrow.

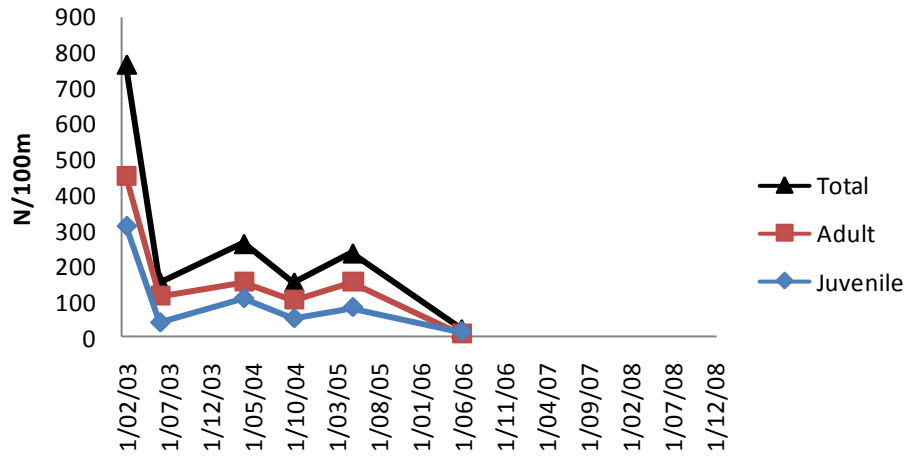


**Figure 2. Time series of *Phrantela* population density in 3 sites associated with the WE008E, WE038A and TN036B coupes. Logging indicated by vertical arrow.**

### Control 1



### Control 2



### Control 3

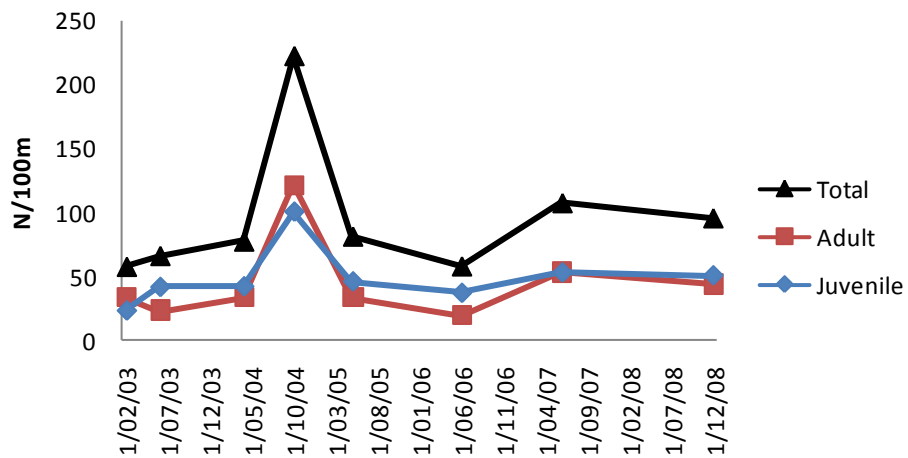


Figure 3. Time series of *Phrantela* population density in 3 control stream sites in the Wedge (Controls 1 and 2) and Tyenna (Control 3) areas. Control 2 not sampled from 6/06 due to logging.

## **Project Status**

The project has continued with annual sampling of all sites (when accessible) despite changes in timing of logging operations. We recommend that two more sampling events (years) are required to complete the time series for all sites to allow a minimum of three years' post logging sampling. At this point the results would be formally analysed and fully written up.

This will require ongoing deferral of logging in coupe TN036D. This site was scheduled for harvesting in 2009, but agreement has been reached between FPA and FT to defer until study completion.