



## **FLORA MONITORING**

**Research Forum November 2009**





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### **Flora Monitoring Transects Within the Wungong Catchment**

#### **Background**

The Wungong proposal aims to investigate the integration of a range of treatments within one catchment so as to measure the yield and water quality in an operational scale trial and to use the water that is produced. Thinning will be used to convert exotic plantations, plots with exotic species and bauxite rehabilitation areas back to native forest, thus enhancing the biodiversity and reducing the further spread of exotic species through the forest. Areas of native forest that will not be treated will permanently remain as buffers (e.g. swamps, rock outcrops and ecotones, non-forest and fauna habitat areas). In addition, a review of the prescribed burning programs with Department of Environment and Conservation was proposed.

As part of the proposal, a monitoring program was designed to quantify the effects of forest management on the flora and vegetation biodiversity values in the Wungong Catchment Area. In December 2005, Mattiske Consulting Pty Ltd was commissioned to establish the baseline vegetation monitoring in the Wungong catchment area. The vegetation monitoring program involved the establishment of monitoring transects within the Wungong Catchment Area. Four of these transects, referred to as Stream Zone transects were established across stream zones within the Wungong Catchment Area and are designed to monitor the effect of thinning of the adjacent forest on water run-off and water quality and associated extent and condition of streamline communities. Four duplicate sets of transects, referred to as Upland Transects, were established upslope from the stream zone transects to monitor the effect of selective thinning (notching and poisoning) of trees, selective logging, and prescribed burning. In addition two pairs of control upland transects were established in nearby forest which lie outside the Wungong Catchment Area.

Mattiske Consulting Pty. Ltd. carried out both the establishment of transects and initial flora assessment of the transects in the spring months of 2006 and more recently in 2008. Subsequent to this survey, areas of forest in which the upland transects are located, underwent specific treatments to thin the forest canopy.

#### **Results and Conclusions**

During the initial survey of all stream zone and upland transects in 2006 a total of 227 taxa (including subspecies and varieties) representing 108 genera and 45 families were recorded. During the survey in 2008 a total of 211 taxa (including subspecies and varieties) representing 102 genera and 44 families were recorded across all stream zones and upland transects. The total number of taxa recorded in the 2008 survey represented 93% of the number of taxa recorded during the initial survey in 2006. The most prevalent families recorded across all stream zone and upland transects in the 2006 survey were the Papilionaceae (22 taxa), Proteaceae (19 taxa), Dasypogonaceae (14 taxa), Cyperaceae (14 taxa), Mimosaceae (12 taxa)

and Poaceae (10 taxa). The most prevalent families recorded across all stream zone and upland transects in the 2008 survey were the Papilionaceae (19 taxa), Proteaceae (18 taxa), Dasypogonaceae (13 taxa), Cyperaceae (12 taxa), Mimosaceae (14 taxa), Myrtaceae (10 taxa) and Asteraceae (10 taxa).

The results of the 2008 flora assessment, when compared to the initial assessment in 2006 indicate that:

- There has been a decrease in average tree health along the stream zone transects;
- There has been no change in the pattern of species growing along the stream zone transects, particularly with respect to the indicator species, suggesting little change in water flow patterns between the two survey periods;
- Forest thinning along Upland Transects 1 and 2 has not resulted in increased run-off, as measured by the distribution of stream zone indicator species;
- The various thinning methods used in the Upland Transects have resulted in decreases in tree representation as would be expected. Longer term studies are required to determine the long term impacts of these methods on both the forest structure and water run-off.

### **Future Considerations**

The number of flora survey transects and vegetation types (Havel Site-Vegetation Types) is restricted, both in terms of geographical area represented, and replication. Consideration should be given to the following:

- Increasing the sampling regime;
- Increasing replication in representative sit-vegetation types (types S, P, SP & T) represented within the catchment area;
- Given the fires that occurred near stream zones, are more transects needed in steams not being influenced by thinning?;
- Is there a need to map site-vegetation types within the catchment area;
- Conduct sampling in both dieback affected and non-affected areas.