Progress Report SP 2006-003

FORESTCHECK: Integrated site-based monitoring of the effects of timber harvesting and silviculture in the jarrah forest

Ecosystem Science

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Project status as of July 11, 2016, 10:50 a.m.

Approved and active

Document endorsements and approvals as of July 11, 2016, 10:50 a.m.

Project Team	granted
Program Leader	granted
Directorate	granted

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Context

Forestcheck is a long-term monitoring program and results will be used by forest managers to report against Montreal Process criteria and indicators for ecologically sustainable forest management. Initiated as a Ministerial Condition on the *Forest Management Plan 1994-2003*, Forestcheck has continued to be incorporated in the *Forest Management Plan 2014-2023* as a strategy for increasing knowledge on the maintenance of biodiversity and management effectiveness in Western Australian forests.

Aims

Quantify the effects of current timber harvesting and silvicultural practices in the jarrah forest (gap creation, shelterwood, post-harvest burning) on forest structural attributes, soil and foliar nutrients, soil compaction and the composition of the major biodiversity groups including: macrofungi, cryptogams, vascular plants, invertebrates, terrestrial vertebrates and birds.

Progress

- A progress report on monitoring undertaken in Blackwood and Perth Hills Districts during 2014 was finalised, following the completion of specimen identification and curation.
- Work continued on the preparation of scientific papers reporting the second round of monitoring completed between 2007 and 2012. These papers will examine changes in species assemblages between the first and second rounds of monitoring in relation to climatic factors, changes in forest structure and improved sampling methods.
- Work continued to review the capacity and process for delivering integrated forest monitoring into the future.
- Seven monitoring grids in Wellington District burnt by the large Lower Hotham bushfire in February 2015 were re-sampled. Invertebrate pitfall and light trap sampling was undertaken in spring 2015 and autumn 2016 on burnt sites. Monthly inspections to identify vascular plant species in flower have revealed a number of species not recorded previously at these grids, including a significant range extension and a potential new species. Crown recovery of overstorey trees on burnt grids was assessed in November 2015.
- An analysis of factors affecting the consumption of coarse woody debris was undertaken using data gathered from 20 monitoring grids burnt by prescribed fire and bushfire.
- Stand structure and fuel load were re-sampled in the Nalyerin block external reference grid which is in a fire exclusion reference area last burnt in 1987. Fuel load has been sampled previously at this grid in 2005 and 2011.

Management implications

Forestcheck provides a systematic framework for evaluating the effects of current silvicultural practices across a range of forest types and provides a sound basis for adaptive management. Sixty five monitoring grids have now been established, with 50 of these sampled at least twice.

Findings from the project continue to inform a variety of forest management policies and practices and have been incorporated in periodic revision of silvicultural guidance documents. Monitoring data have been used to verify predictive models for forest growth and species occurrence.

The network of Forestcheck grids also provides a framework for monitoring responses to random disturbance events such as bushfires and extreme droughts, and for examining the impacts of a changing climate over the longer term.

Future directions

- Finalise analysis of data from the 10-year monitoring period (2002-2012) and publication of 10-year results.
- Review monitoring protocols and incorporate new techniques where these will improve efficiency and quality of data collected.
- In consultation with Forest and Ecosystem Management Division and the Forest Products Commission determine a future program of monitoring for 2016 to 2018.
- Prepare manuscripts reporting on consumption of coarse woody debris and the initial response of vascular plants and invertebrates following the 2015 Lower Hotham bushfire.