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The Hon Ingrid Stitt MLC Minister for Environment

By email

Dear Ms Stitt

Unrestrained tree fern destruction breaches the RFA, the Code and the FFG Act

It is now approaching two months since we wrote to you on the above matter (16/1), and 4½ months since we raised the matter with your predecessor Ms D'Ambrosio. Such a long delay in responding to such a critical issue involving the loss of both biodiversity and ecological resilience is disappointing.

In preparing your response, I draw your attention to a document prepared in 2000 by the former Department of Natural Resources and Environment that dealt with the consequence of loss of treeferns from our forests. The document to which I refer is the *Draft Victorian Tree Fern Management Plan – Background Paper 2001-2006*. It was removed, long ago I believe, from your Department's website but is still available in the State Library.

Section 3 on p.3 of the document, *Tree-Ferns as a Keystone Species* (attached), highlights the variety of ecological features that make treeferns so ecologically critical, many of which I identified in my letters to you and Ms D'Ambrosio.

Below are other key extracts from the Report:

Research in the wet forests of Victoria's Central Highlands also indicates that clear-fell timber harvesting has led to the loss of tree-ferns from the understorey, with no evidence to date that they have the potential to recover their previous numbers or ecosystem function (Ough and Murphy 1996,1998, Ough⁸ pers comm).

There are several aspects of this research that needs to be considered. These include the survival of tree-ferns in a coupe post logging, the efficacy of understorey islands, recruitment in regrowth forest and the impact of past forestry on tree-fern range and/or geographic variation.

The survival of Soft Tree-ferns post logging varies from 0-40%, the average being 15%. Of this percentage, most of these are relatively small (less than 1.5m) and non- epiphyte supporting. Furthermore, initial survival rates are not a reliable indicator of the impact of clear-felling. Tree-fern mortality has been seen to continue after the initial year of clearfelling (Ough pers comm.).

Soft Tree-ferns have characteristically slow death rates (Neyland 1986, Robin 1985). It is not clear what factors lead to this mortality. Undisturbed moist forests provide adequate moisture for Soft Tree-ferns for most of the year. However, logged forests and regenerating forests have a drier microclimate (Ashton 1975, Adams *et al* 1991 cited by Blake 1995). Photosynthesis in Soft Tree-ferns is unable to occur when atmospheric humidity is low.

Soft Tree-ferns prefer microclimates with high humidity and intermediate and transient light conditions (Unwin and Hunt pers comm, cited by Blake 1995). The Understorey Islands need monitoring to gauge the survival of tree-ferns as well as the vegetative resprouting species.

The establishment of the original population density relies heavily upon recruitment. Recruitment of progeny from spores is not expected for a considerable period after logging (Ough pers comm).

Relatively little is known of recruitment rates of tree-ferns. Research into recruitment comparing unharvested to clearfelled areas was commenced in 1994 as part of a three year program but was not "completed due to lack of funding. However, in plots monitoring tree-fern survival, long term studies have noted that very little recruitment occurred in the Central Highland coupes up to 7 years after logging. Some recruitment has been observed in forests in Powelltown ten years post logging (Ough pers comm).

Recruitment may not necessarily be related to any particular time since logging. Rather, recruitment may be more site dependent than age-related. Substrate and microclimate may both play a significant role. In terms of substrate it has been observed that fallen unburnt stags may create suitable rotting plant material for recruitment. This substrate is relatively uncommon in logged coupes. Preliminary experiments have indicated that spores won't grow on burnt substrate (Ough pers comm).

Unwin and Hunt (1996) found that free moisture and high levels of atmospheric humidity are likely to be critical for establishment of young tree-ferns. Peck *et al* (1990) found that dessication and exposure contribute substantially to fern gametophyte mortality. Anecdotal evidence from Tasmania suggests that shade and moisture regimes suitable for tree-fern regeneration do not occur until about 40 years after clearfelling (¹⁰ D. Cook pers comm).

The impact of both land clearance and timber harvesting on the range and geographic variation for tree-ferns or the ecological ramifications needs assessment. Research is lacking however in this area and needs addressing in order to appraise the impact that timber harvesting operations may have had from a landscape perspective. The impact should be evaluated as a function of the size of the area harvested in relation to overall area covered by the tree-fern population and that retained as Special Protection Zones, the Code of Forest Practice for Timber Production and other areas not available for harvesting.

These observations should have sounded the alarm 23 years ago – how much more alarming they are now with logging having decimated another 31,000 ha of the Central Highlands, much of it once treefern-rich.

Minister, we urge you to respect the evidence we have presented, and the evidence of your own experts, and adopt our recommendations as a matter of urgency.

Yours sincerely,

Bev Dick,

Vice President, Rubicon Forest Protection Group

(ATT: Page 3 of Background Paper)

3 Tree-ferns as a keystone species

The trunks of tree-ferns, particularly the Soft Tree-fern, when it exceeds about 1.5 m height, are important substrates for obligate epiphytes such as orchids, ferns and bryophytes (mosses and liverworts). The trunks are also the nursery sites for some tree and shrub species, which are facultative epiphytes and are important for the re-establishment of these species in, forests (¹Cameron pers. comm.). For some epiphytic species, including both facultative and obligate epiphytes, the trunks provide the major substrate for germination. Some of obligate epiphytes such as Fork Ferns (*Tmesipteris* species) are virtually restricted to the trunks of tree-fern species (Cameron pers. comm.). Fork Ferns have a high phylogenetic significance since they provide an important evolutionary link to the early colonisation of freshwater and terrestrial habitats by advanced vascular plants some 400 million years ago (²Drinnan pers comm.) These plants have changed little over this period, and are an example of what may be referred to as living fossils. Sites with tree-ferns supporting threatened *Tmesipteris* species are of National Significance under the National Estate Criteria and should be protected.

In undisturbed Wet Forest the trunks of Soft tree-ferns also act as a nursery site for the establishment of seedlings of some tree and shrub species such as Banyalla (*Pittosporum bicolour*), Prickly Currant Bush (*Coprosma quadrifida*), Mountain Pepper (*Tasmannia lanceolata*) and the Musk Daisy Bush (*Olearia argophylla*) (Ough and Murphy, 1996).

Animals have also been shown to be reliant on tree-ferns ranging from invertebrates to mammals. The genus of native bees, *Exoneura*, which utilises a wide range of flowering plants collecting nectar and pollen, nests in the tree-fern fronds that accumulate around the trunks (Sugden 1988, Blows and Schwarz 1991). Colonies of *Exoneura bicolor* are rarely found in substrates other than tree-fern and are distributed according to tree-fern occurrence (Blows and Schwarz 1991).

Mountain Brushtail Possums (*Trichosurus caninus*) are known to feed on tree-ferns (Seebeck *et al* 1984). Although the reason is not clear, there is a positive correlation with the numbers of these possums and vegetation with high numbers of tree-ferns (Lindenmayer *et al* 1994). Another food source, hypogeal fungi, is highest in such vegetation as well.

Crimson Rosellas, *Platycercus elegans*, commonly feed on tree-fern spores. Furthermore, Rufous Fantails, *Rhipidura rufifrons*, have been observed foraging on invertebrates on the fronds and around tree-ferns (Loyn pers comm).