

Recovery of a freshwater wetland following Taro removal

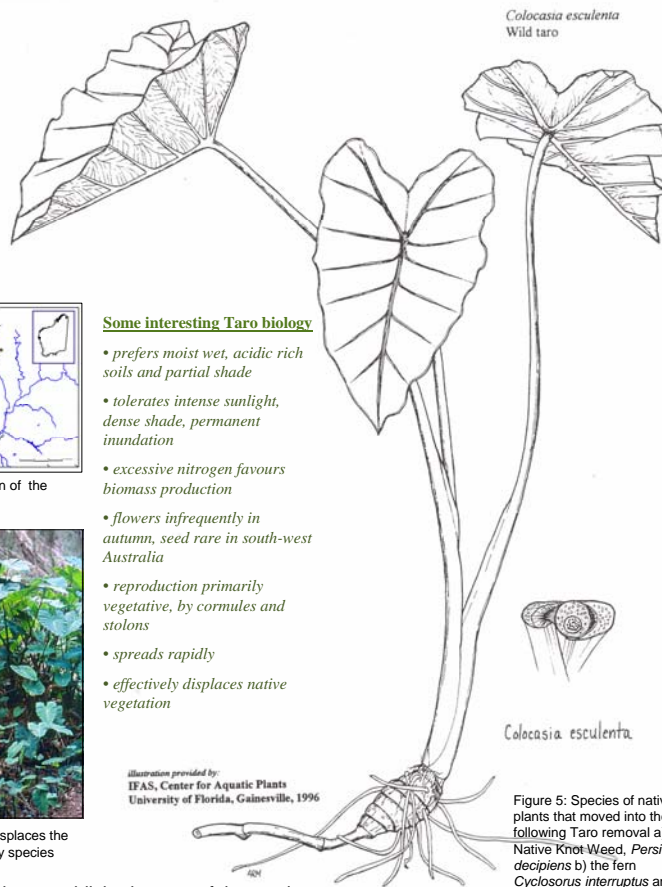


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Introduction

Fed by perennial springs, the Gingin Brook is a permanent freshwater stream located 150 km north of Perth, Western Australia (Fig. 1). Swamp Paperbark (*Melaleuca raphiophylla* Schauer) and Flooded Gum (*Eucalyptus rudis* Endl) are the dominant species in the overstorey of the fringing vegetation and Tall Sedge (*Carex appressa* R.Br), Tassel Sedge (*C. fascicularis* Boott) and the fern *Cyclosorus interruptus* (Willd) H.Ito dominate the understorey (Fig. 2). Where the weed Taro (*Colocasia esculenta* Schott) invades, it completely displaces the native understorey species (Fig. 3).



Some interesting Taro biology

- prefers moist wet, acidic rich soils and partial shade
- tolerates intense sunlight, dense shade, permanent inundation
- excessive nitrogen favours biomass production
- flowers infrequently in autumn, seed rare in south-west Australia
- reproduction primarily vegetative, by cormules and stolons
- spreads rapidly
- effectively displaces native vegetation



Figure 2: Fringing vegetation along the Gingin Brook.



Figure 1: Location of the Gingin Brook



Figure 3: Taro displaces the native understorey species



Figure 5: Species of native plants that moved into the site following Taro removal a) Native Knot Weed, *Persicaria decipiens* b) the fern *Cyclosorus interruptus* and c) Tassel Sedge, *Carex fascicularis*

Previous work in the fringing vegetation of the Gingin Brook has established successful control techniques for Taro (Brown and Brooks 2003) however, removal exposes large areas of bare ground. This current study revisited the fringing vegetation five years after the implementation of the Taro control program to record floristic composition and cover across those areas of bare ground exposed following initial Taro removal. The objective was to gain an understanding of the capacity of the fringing vegetation to regenerate naturally following large scale weed removal.

Methods

Before the initial treatment of the Taro population in December 2000, a permanent 20 m transect was established from native vegetation into the dense infestation of Taro:

- Taro plants in ten 1 m x 1 m quadrats along the transect were counted
- native and introduced species in the plots were assigned a cover value (0, <1% (1); 1 – 5% (2); 6 – 25% (3); 26 – 50% (4); 51 – 75% (5); 76 – 100% (6))
- a series of permanent photo points were established.

Results

Five years after initial control Taro had been eradicated. The native plant community showed a remarkable capacity to regenerate naturally and Taro had been replaced by dense cover of native species including Tall Sedge (*Carex appressa*), Tassel Sedge (*C. fascicularis*), Swamp Paperbark (*Melaleuca raphiophylla*), Flooded Gum (*Eucalyptus rudis*), the fern, *Cyclosorus interruptus* and Native Knot Weed (*Persicaria decipiens* (R.Br) K.L.Wilson). Tall Sedge, Tassel Sedge, Swamp Paperbark and Flooded Gum had germinated from seed released from the canopy or soil stored seed while the fern and the Native Knot Weed had regenerated from vegetative material.



Figure 4: (a) A site along the Gingin Brook shortly after initial Taro control. Note re-sprouting Taro plants in fore ground. (b) The same site 3 years after follow up control. Through a process of natural regeneration, the bare ground exposed following Taro removal is now completely occupied by native plant species.

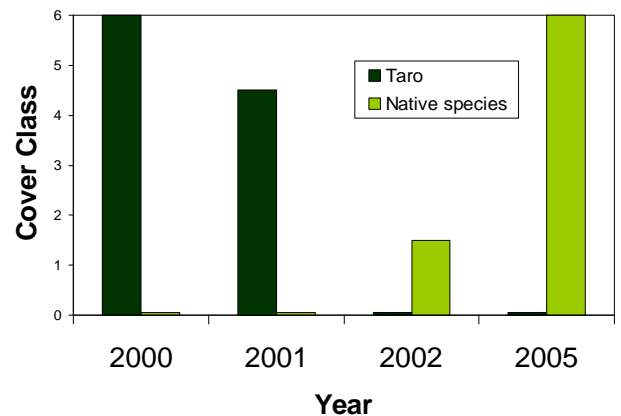


Figure 6: Cover of Taro and native plant species in the fringing vegetation of the Gingin Brook in the five years following initial Taro control.

Discussion

Frequent disturbances that can expose large areas of bare ground, including flood events and fluctuating water levels, are natural processes in riparian systems. As a strategy to cope with these processes, the dominant native plant species are often disturbance opportunists with dispersal mechanisms and other features (eg. rapid growth) that allow for colonisation of exposed ground. The rapid recovery recorded in the fringing vegetation along the Gingin Brook following Taro removal was part of a natural response to a disturbance event.

Conclusions

The results of this study illustrate that some native plant communities of riparian systems of the Swan Coastal Plain have a capacity to recover naturally following large-scale removal of a dominant weed. With such a capacity for rapid natural regeneration, weed management and restoration of these plant communities should be a regional priority.

References

Brown, K. & Brooks, K. (2003). Managing *Colocasia esculenta* invading the fringing vegetation of a fresh water stream north of Perth. *Ecological Management and Restoration* 4 (1), 76-7.



Acknowledgements

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