

Three wetland weeds on Great Barrier Island

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Introduction

Great Barrier Island boasts a diverse range of tidal and freshwater wetlands. These wetlands are still largely intact and are amongst the largest remaining in the Auckland region. In contrast to the mainland, many of the wetlands are still largely weed free, and the Kaitoke and Whangapoua wetlands are particularly unusual as willows are absent (Wilson 2001). The Department of Conservation has recently embarked on a project to eradicate a targeted list of weeds from Great Barrier Island. The species chosen for control are those which have a limited distribution on the island, and high potential impact (Wilson 2001). The wetland weed species on this list are grey willow (*Salix cinerea*), reed sweet grass (*Glyceria maxima*), and royal fern (*Osmunda regalis*).

Grey willow (*Salix cinerea*)

Grey willow, native to Europe and Western Asia, is widespread throughout New Zealand, its habitat being described as "swamps, riverbanks, and wet areas behind coastal dunes (Webb et al., 1988). Grey willow is the only willow species in New Zealand that can produce viable seed, and has the ability to tolerate brackish environments (Wilson 2001). Therefore, the species has a large potential habitat area on the island, and the ability to disperse widely. Grey willow, in combination with other willow species such as crack willow (*S. fragilis*), pose a major threat to indigenous wetland vegetation in other areas of the New Zealand conservation estate, for example the Whangamarino wetland in the northern Waikato. In this area willows have displaced over 2770 ha of native rushlands (Wilson 2001). Fortunately, at present grey willow is restricted to c. 8 sites on the island, and is absent from the larger wetlands. Most of the trees are growing in gardens or on farmland (Fig. 1), which suggests that grey willow was introduced to the island as a cultivated plant. The sites are spread throughout the island, from Katherine Bay in the north to Tryphena in the south, and some trees are in close proximity to the Kaitoke wetland. Control at these sites has already begun, and it is a realistic goal to eradicate this species from the island.

Reed sweet grass (*Glyceria maxima*)

Reed sweet grass (Fig. 2) was introduced to the island for winter stock feed (Wilson, 2001). Originally from Europe, this aquatic grass is naturalised throughout New Zealand, being common in the North Island, with scattered occurrences in the South Island. The species is found in "lowland swamps, pools, edges of slow flowing streams, growing in water to c. 1 m deep." (Edgar and Connor 2000). This species is thought to be absent from the Kaitoke and Whangapoua wetlands, the five known sites being at Blind Bay, at Awana, and at three sites in the Okiwi basin. At three of the sites reed sweet grass was well established, dominating the waterway in which it grew. The plants were up to c.

1.2 m in height and were growing along the transition from damp ground to permanent water. Two of the infestations were growing in partial shade from overhanging trees, so the species appears to have some degree of shade tolerance (Fig. 3). At one site (AK 244206), the plants were growing on the banks of a creek which is at least periodically inundated by high tides, and this raises concern over the species' ability to invade tidal wetlands. Reed sweet grass recovers rapidly following grazing (*pers. obs.*) and is able to regenerate from underground rhizomes or seed. Reed sweet grass possesses many of the features of a problem wetland weed species, with its' tolerance of a wide range of environmental conditions, its' ability to quickly recover following damage, and its' dispersal through seed or rhizome fragments. This weed is being successfully eradicated at four of the sites, and it is hoped that permission to control the Blind Bay population can be obtained in the near future.

Royal fern (*Osmunda regalis*)

Royal fern is a widespread species, being naturally found in Europe, Asia, Africa, and North and South America. The species has rhizomes that form thick trunks to 1.5 m tall, and is found sporadically throughout the North Island in moist habitats such as swamps, stream-sides and drains (Webb et al. 1988). Royal fern was first recorded on Great Barrier Island in 1997, when G N Rutherford found a colony of c. 5 plants growing in the Kaitoke swamp (AK 232105). However, searches for this population in April 2000 were unsuccessful. While controlling grey willow at Claris, Great Barrier Island, in January 2002, I discovered a large infestation of royal fern (Fig. 4) (AK 255897 - 98). The plants were growing in a grazed wetland area associated with grey willow, *Leptospermum scoparium*, *Gleichenia dicarpa*, *Rubus fruticosus*, *Typha orientalis*, and *Blechnum novae-zelandiae*. The infestation was estimated to number > 200 individuals, spread throughout an area of approximately 1 ha. The largest plants were c. 2 m tall and producing fertile fronds, but trunks were not yet evident. This population of royal fern is in close proximity to the Kaitoke wetland. It is probable that the population previously found in the Kaitoke originated from here, and the eradication of this population is planned to prevent further spread. Potential agents for the dispersal of spores from this site are by wind, the cattle and feral pigs that frequent the area, water dispersal via the drains, and on the clothing and equipment of workers that will move through the area during the control operation. Further searches showed that royal fern appears to be restricted to this one site, and it is hoped that with care, eradication is possible. It is possible that these royal fern populations arose from spores blown over from the mainland, thus ongoing wetland surveys will be needed to find any new populations that may establish.

Conclusion

Great Barrier Island is at a critical stage of its conservation management history. Several key weed species are at a stage where eradication is feasible, and the implementation of control programmes for these species holds great promise. History has shown that if not dealt with at an early stage, weed species such as grey willow, reed sweet grass, and royal fern

will reach such levels, that ongoing control in high conservation areas is the only option. With the exception of pampas (*Cortaderia selloana* and *C. jubata*), mistflower (*Ageratina riparia*), and Mexican devil (*A. adenophora*), serious wetland weeds on Great Barrier Island are still very limited in distribution and abundance. The control of these species will be a critical step in the long term conservation of the islands' wetlands.

Acknowledgements

I am grateful to George Wilson at the Department of Conservation for the opportunity to do weed surveillance work on the island, to Mei Nee Lee for the provision of Auckland Museum herbarium records, and to Ewen Cameron for his comments on the draft of this article.

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Fig.1 Grey willow growing on a farm at Claris, Great Barrier Island.



Fig.2 Close up of reed sweet grass

Fig.3 Reed sweet grass in a drain at Blind Bay, Great Barrier Island.

Fig.4 Royal fern growing in a wetland, Claris, Great Barrier Island.

