

Unchecked growth of aquatic alligator weed (*Alternanthera philoxeroides*) over a 5 year period in a Melbourne pond

Daniel Clements¹, Tony M. Dugdale² and Trevor D. Hunt¹

¹ Department of Primary Industries Victoria, 40 Ballarto Road, Frankston, Vic 3199, Australia

² Department of Primary Industries Victoria, 600 Sneydes Road, Werribee, Vic 3030, Australia

Corresponding author: daniel.clements@dpi.vic.gov.au

Summary Alligator weed, *Alternanthera philoxeroides* (Mart.) Griseb., is a serious weed that has invaded a wide range of habitats in Australia. It poses a significant threat to Australia's waterways, wetlands, floodplains and irrigation systems and has the potential to become far more widespread. Alligator weed is a stoloniferous and rhizomatous perennial that grows rapidly in both terrestrial and aquatic habitats (Sainty *et al.* 1998).

The largest known infestation of alligator weed in Victoria was reported in January 2009 in a 2.2 ha urban pond used for irrigation purposes. Site characteristics included stable and slow moving water conditions, high nutrient input from urban stormwater runoff (total nitrogen and phosphorus averaged 1.48 mg L⁻¹ and 0.073 mg L⁻¹, respectively, from monthly low flow sampling between 2004–2009) and low interspecific competition with minimal marginal over story vegetation. These provided good growing conditions for alligator weed at the site.

To determine how long the infestation had been present, high quality digital aerial images (orthophotos) were gathered for the site. Unchecked growth rates of alligator weed are unknown in Victoria, as all known infestations are subject to control measures. These orthophotos provided a unique opportunity to calculate and report on the uncontrolled growth rate of aquatic alligator weed over consecutive years.

Orthophotos were analysed using a GIS application to determine the area occupied by alligator weed

for each year, from which annual increases in area were calculated. The infestation increased from *c.* 0.029 ha in December 2004 to *c.* 0.61 ha in January 2009, to cover 27% of the 2.2 ha water body. The annual area growth rate was 205% for the first year of record and at the end of the 5 year period was 45%. Biomass sampling was conducted in May 2009 and showed an average dry weight biomass of 4269 g m⁻² or 40.9 kg m⁻² wet weight. Results of this sampling were used to estimate the total biomass of alligator weed occupying the water body.

Using the area of infestation from the January 2009 orthophoto, it was estimated that *c.* 250 tonnes wet weight or 26 tonnes dry weight of alligator weed occupied the water body at the time of the infestation report.

Keywords *Alternanthera philoxeroides*, alligator weed, biomass, growth rate.

ACKNOWLEDGMENTS

This research was funded by Melbourne Water and Department of Primary Industries Victoria.

REFERENCES

- Sainty, G., McCorkelle, G. and Julien, M. (1998). Control and spread of alligator weed *Alternanthera philoxeroides* (Mart.) Griseb, in Australia: lessons for other regions. *Wetlands Ecology and Management* 5, 195–201.