

Detection of alligator weed using an unmanned aerial vehicle

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Summary A key impediment to the successful eradication of high priority aquatic weeds (State Prohibited Weeds in Victoria) is the ability to detect them so that control can be enacted. Currently, the sole method used to detect State Prohibited Weeds (SPWs) is on-ground human surveillance.

Advances in unmanned aerial vehicle (UAV) technology offer an opportunity to gain high resolution aerial images of areas known, or suspected, to contain SPWs. This project used a UAV coupled with a camera to gain aerial imagery of an urban stream to detect alligator weed (*Alternanthera philoxeroides* (Mart.) Griseb.), which is currently being targeted for eradication from Victoria.

The ability of three methods to detect patches of alligator weed was compared: intensive on-ground surveys; visual assessment of images collected by

the UAV; and using an automated algorithm to search images for the spectral signature of alligator weed.

The automated algorithm was able to detect and delineate patches of alligator weed growing along the urban stream between >2.5 and 4 m² (area cover metric), while visual assessment of the images collected with the UAV could detect patches of alligator weed >0.06 m².

Using a UAV to collect images provides a potential tool to detect patches of alligator weed at a scale useful for alligator weed eradication programs. Further refinement of the algorithm is required before it is useful for improved detection. If successful the method could also be used to detect large infestations of key aquatic SPWs from existing aerial photography (orthophotos) or satellite imagery.