



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

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<http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/alligator/alligator-weed-control-manual>

Part 2: Management strategies

Introduction

There are three main management strategies for alligator weed infestations: *immediate eradication*, *suppression leading to eradication* and *ongoing suppression*. The application of the strategies depends largely on the extent of an infestation.

This section outlines the considerations to be made for new infestations (*rapid response measures* and *assessment of new infestations*) and then explains the various strategies for suppression and eradication.

Part 3 outlines the need for *Containment and prevention of spread*, which applies to all infestations.

Types of strategies

Eradication is not feasible in the extensive and long established infestations in core areas. Here management strategies are based on *ongoing suppression*, along with containment and prevention

of spread. All other infestations should be controlled with the aim of eradication in the shortest possible time frame, taking advantage of the high possibility of *immediate eradication* of small, new or isolated infestations yet to spread beyond their point of introduction.

There are two approaches to eradication: *immediate eradication* and *suppression leading to eradication*. The extent of an infestation (the amount of plant growth above and below ground and the area of coverage) will determine which of these strategies should be implemented.



Install containment fences. Photo: Paul O'Connor



Restrict access and install signage. Photo: Brian Worboys

▼ *Eradication is not feasible in long-established, extensive infestations.*
Photo: Graham Prichard





Install floating booms. Photo: Graham Prichard



A small area of infestation ideal for an immediate eradication strategy. Photo: Lalith Gunasekera

Infestations that are already too extensive for immediate eradication should be subjected to the *suppression leading to eradication* control strategy. This strategy aims to gradually deplete the plant's growth reserves over time, and it can bring an infestation to a point where eradication is possible after a number of years.

Containment and prevention of spread are critical for the management of all infestations, and all new infestations should have *rapid response measures* put in place.



Immediate eradication may be feasible for small clumps along a watercourse. John Moorhouse

If not managed quickly, an eradicable infestation will become more extensive and will require suppression for many years before it is possible to reconsider eradication, if it is possible at all.

Rapid response measures

There are a number of measures to be taken by the relevant weed control authority when an infestation is found:

- Notify the appropriate authorities (in most States landholders must notify local government authorities and local government authorities must notify State government authorities).
- Mark out the extent of the infestation, including outlying plants. This can be done with pickets and tape, white pegs, fencing, spray paint, etc. Record the location with mapping coordinates.
- Install containment and quarantine measures (see Part 3):
 - Prevent disturbance to the infestation. Inform land users not to slash, mow, cultivate or graze the area. This is very important, as a number of new infestations have been spread through slashing, cultivating, mowing or grazing.
 - Install fences or floating booms.
 - Restrict access and install signage if necessary.
 - Survey the broader area to determine possible sources of the infestation.



Infestation subjected to immediate eradication: site prepared for physical removal of underground plant material.

Photo: Iain Jamieson

Assessment of new infestations

Assess infestations quickly to maximise chances of successful eradication:

- Assess the number of plants or the area of the infestation, and the depth and development of the root systems. It may be useful to follow a plant's roots by digging down to see how deep and extensive the root system is.

Use the following descriptors as a guide to determine whether immediate eradication is feasible:

Immediate eradication is generally feasible for:

- - small numbers of individual scattered plants (through deep manual digging)
- - areas of infestation up to 5 m × 5 m (through deep manual digging)
- - areas of infestation up to 10 m × 10 m with shallow roots (up to 30 cm deep) (through shallow mechanical excavation).

Immediate eradication may be feasible, depending on resources, for:

- scattered plants or clumps along stretches of watercourse: start *immediate eradication* at the top of the catchment and use the *suppression leading to eradication* strategy downstream or where roots are more than 1 m deep.

Suppression leading to eradication will generally be required for:

- - any area of infestation with roots more than 1 m deep
- - any area of infestation greater than 10 m × 10 m and with roots deeper than 30 cm.



These infestations will require suppression before eradication is feasible. Photos: Lalith Gunasekera, Graham Prichard



This large infestation on a dam was subjected to ongoing suppression with herbicide for a number of years before an eradication strategy was started using manual removal. Photo: Terry Inkson



The infestation after 3 years of treatment with herbicides. Photo: Terry Inkson



Regrowth stems required one further season of herbicide treatment before manual removal techniques commenced. It is hoped that further follow up manual removal for a number of seasons will eradicate this infestation. Photo: Terry Inkson

Immediate eradication

Immediate eradication aims to eradicate a small, new or isolated infestation as quickly as possible by treating the above-ground or above-water growth with herbicide and physically removing the below-ground or underwater plant mass. Immediate eradication is time and labour intensive in the short term but is far more cost effective in the long term.

Because of the ability of meristems (growing points) in the plants' roots to remain viable underground, there is a requirement to physically remove every part of every plant, including the roots and underground stems.

A number of control techniques are used for immediate eradication. The primary technique is physical removal. Shallow mechanical excavation may be required, but deep manual digging is always necessary (see *Removal techniques* in Part 4).

It is very unlikely that immediate eradication will be achieved with herbicides alone; however herbicides are used to help with eradication. (See *Initial herbicide treatments to help with eradication* in Part 4.)

*Always expect regrowth and carry out follow-up inspections regularly. Physical removal of regrowth may need to occur regularly over a period of years until all plant material is removed and no further regrowth can occur. Consider eradication of alligator weed successful only if no regrowth is found for **5 years after the last observed occurrence**. Even when eradication has been achieved, monitoring is required on an ongoing basis. In one case where the infestation was thought to have been eradicated, regrowth occurred 10 years later.*



Extensive infestations should be subjected to ongoing suppression. Photo: Bob Trounce

Suppression leading to eradication

This approach aims to reduce the size and extent of both above- and below-ground plant growth, in conjunction with gradually depleting the plants' underground carbohydrate reserves over time. If this is carried out persistently, control inputs will be reduced over time as the infestation is brought to a greatly suppressed and depleted level. Over an average of 6 years this control strategy can deplete an infestation

so that eradication is possible through physical removal of the remaining below-ground or underwater plant material.

This strategy is based on an *annual treatment program* of three applications of metsulfuron-methyl 600 g/kg at specific times each growing season (see *Metsulfuron-methyl for suppression* in Part 4).

Ongoing suppression

Ongoing suppression is the only realistic approach for the management of some core area infestations. As well as containment and prevention of spread, the main control strategy is the same *annual treatment program* of three applications of metsulfuron-methyl 600g/kg at specific times each growing season.

Alligator weed flea beetle (*Agasicles hygrophila*), a biocontrol agent, also contributes to *ongoing suppression* of aquatic infestations in core areas (see *Biological control* in Part 4). Biocontrol is **not** a control technique for eradication.



*Persistent application of the **annual treatment program** will bring an infestation such as this to a greatly suppressed and depleted level, so that eradication is possible after a number of years.*

Photo: Greg Mifsud