

## 18. AQUATIC VEGETATION MANAGEMENT (EGERIA DENSA UPDATE)

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The purpose of this report is to update Board members on progress with egeria management, the outcome of the stakeholders meeting held during May, and report on the diquat trials that took place in Kerrs Reach, Avon River, over the summer. Future waterway management strategies for Egeria are noted and related issues discussed.

### BACKGROUND

*Egeria densa*, an invasive aquatic weed originally from South America, was found in the Avon River, Kerrs Reach, in mid-1998. It was recognised by the various authorities involved in environmental management within the Christchurch region that the establishment of this species has significant potential for modifying waterway habitat, impacting on recreational use and increasing land drainage costs locally and regionally.

An attempt was made during the summer of 1998/99 to eradicate egeria using suction dredging. This action reduced the extent of the infestation but it also indicated that eradication was unlikely to be achieved. The future management strategy for egeria was reviewed during mid-2000 and a meeting of stakeholders involved in waterway management in Christchurch was held in September 2000.

The Christchurch City Council, in consultation with stakeholders and supported by specialist advice, decided to attempt a high level of control to ensure containment of egeria, and to trial the use of diquat herbicide over the summer of 2000/01.

The purpose of the stakeholders meeting on 8 May 2001 was to consider the outcomes from the summer trials and discuss future waterway management strategies.

### TRIALS UNDERTAKEN

Trials undertaken in conjunction with the National Institute of Water and Atmospheric Research Limited (NIWA) (who have extensive experience in aquatic weed management and research) were designed to test the effectiveness of diquat on egeria and other aquatic plant species, determine the amount of diquat required, and refine management strategies.

Two applications were made over the summer. The initial trial on 15 January 2001 involved applying diquat to two one-hectare sites where egeria concentrations were high. The main purpose of this trial was to confirm that diquat would work on egeria in the Avon River.

A second trial, on 19 February 2001, involved applying diquat to most of Kerrs Reach. This was designed to test some of the practicalities of diquat application, to check for possible effects on the other aquatic plant species, and to confirm the results from the first trial.

The trials were heavily publicised to explain the reasons for river closure, as required by a condition of the discharge consent. The length of river that was closed for 24 hours extended from the Wainoni Road bridge upstream to the Dudley Creek confluence, McBratneys Road. Signs were placed at frequent intervals along the riverbank, at jetties and on bridges. A letterbox drop was made to surrounding residents and schools and rowing clubs were contacted.

A number of studies were carried out in conjunction with both of the applications to monitor the persistence of the diquat in the river and to detect any effects on aquatic plants, invertebrates, and fish. The intention of these studies was to confirm other widely publicised research and literature that stated diquat had little effect on non-target species.

The diquat applications were carried out by the City Council's contractor, City Care Ltd, without major problems.

The major component of the diquat trials proved to be patrolling and enforcing the associated river closure that was required, rather than the herbicide application itself.

## **TRIAL RESULTS**

The Avon River differs from other water bodies in New Zealand where diquat discharges have been monitored, because of its rate of flow, sediment levels and the tidal nature of Kerrs Reach.

Diquat applications were targeted at slack tide periods to reduce these problems and concentrations monitored for up to ten hours at control locations. The test results showed diquat concentrations were well within guidelines noted in overseas publications and set by the resource consent and also confirmed the predicted length of river closure required. Regional Council staff carried out compliance monitoring of the second application and confirmed that all activities met consent conditions.

Monitoring by NIWA found that the diquat effectively controlled egeria and Canadian pondweed, but only effected the potamogetons located in immediate vicinity of the application site.

No adverse effects were noted on invertebrates and eels from the monitoring studies undertaken in conjunction with the applications although some monitoring is continuing to confirm that there are no long-term effects on the more sensitive invertebrates.

## **FUTURE MANAGEMENT STRATEGY**

In summary the following egeria management strategy, which was endorsed by the stakeholders present at the May 2001 meeting, will be used in the Avon River for Kerrs Reach.

- Continue with a high level of control to minimise spread of *Egeria densa*.
- Carry out regular underwater surveys to monitor plant species.
- Continue the use of diquat and refine techniques to minimise quantities required.
- Continue with harvesting of excessive weed growth (mainly native species) to maintain current service levels but ensure strict sanitising regime for harvester to prevent transfer of egeria plant fragments.
- Continue with regular publicity and education about exotic weeds and importance of cleaning all equipment used in Kerrs Reach.
- Continue with regular meetings of the Action Plan monitoring team with an annual newsletter to other interested parties.

It is anticipated that the cost of this management strategy will be contained within the current budget for egeria control (\$80,000 - 2001/02 fiscal year).

In addition to the Christchurch City Council activities, Environment Canterbury will be responsible for monitoring the presence of egeria at other locations, carrying out or facilitating control operations to destroy egeria, and all regional publicity on the threat from egeria and other exotic weed species.

## **DISCUSSION**

The trials have shown diquat to be an effective tool for control of egeria and the best option for continuing a high level control to minimise the spread of this species. Alternative management tools such as suction dredging, hand weeding, bottom lining, grass carp and using common salt all involve significant cost or environmental impacts.

Although limited infestations of egeria were found in follow up surveys this is no time for complacency - egeria will regrow. Continuous vigilance and a high level of control will be needed to manage this species in the Avon and to limit its spread elsewhere.

The timing of future diquat application is important. In addition to the amount of plant growth, other activities in the Avon River have significant impact on timing for diquat application. These activities include the whitebait season (15 August to 30 November), inanga spawning times, periods of high recreational river use (for example prior to the Coast to Coast event), and the conditions of the resource consent<sup>1</sup>. The most acceptable period for any future diquat applications will be during summer from mid-November to December or mid-January through to early February). It is intended that the diquat application will normally precede the harvesting operation to decrease the risk of cutting egeria plants and reduce the cost of harvesting.

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<sup>1</sup> "There shall be no diquat discharge of herbicide: (1) between the months of July to October inclusive, and (b) between 24 December to 7 January inclusive, and (c) between Good Friday and Easter Monday inclusive."

Unfortunately diquat has shown only limited effectiveness in controlling most of the other aquatic species that the Council currently manages in the Avon River. As a result, mechanical harvesting will need to continue in Kerrs Reach to enable full recreational use and to maintain channel flow capacity. The revised timing of the harvesting operation to accommodate diquat use will have significant impact on the current harvesting regime and studies currently underway with City Care suggest that a second harvesting boat will be required. There will be additional costs incurred from expanding the harvesting operation but it is believed that these costs can be contained within the currently budgeted amount for egeria control. It should also be recognised that a second boat will have benefits for the city wide harvesting capacity and provide operational support for mechanical breakdowns.

It will be important to monitor egeria growth and the overall distribution of aquatic plants in Kerrs Reach. As a minimum an annual underwater survey is required. This will be carried out in late spring/early summer to determine the extent of any diquat applications that may be required.

**Recommendation:** That the Community Board support the proposed management strategy to control Egeria densa in Kerrs Reach, Avon River.

**Chairperson's Recommendation:** That the abovementioned recommendation be adopted.