

Control of the Highly Invasive Curly leaved pondweed (*Lagarosiphon major*) in a Lake in the River Shannon Catchment, Ireland

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Introduction

Lagarosiphon major is a highly invasive, submerged macrophyte that was introduced to Irish garden centres for use as an oxygenating plant in ornamental ponds. This plant is present in a large number of Irish artificial ponds and lakes. However, its observed distribution in natural watercourses is limited. It was first recorded in the wild in Lough Corrib, one of the ecologically unique Great Western Lakes, in 2005. It has since dramatically expanded its range within this large watercourse (180 km²). The weed spreads rapidly by fragmentation, with small plant fragments being capable of establishing new populations in suitable habitats. In areas colonised by the weed, it competitively excludes most indigenous plant species. It also creates a habitat that favours pike, perch and cyprinid species over salmonid species, for which the lake is internationally renowned. Efforts to control the spread of *Lagarosiphon* within the lake have met with limited success and there is serious concern that it will escape to colonise other natural watercourses in the country.



Shannonhill Lake – before spraying



Shannonhill Lake – after spraying



Location of Shannonhill Lake in relation to Lough Derg

In March 2008 an infestation with *Lagarosiphon* was reported in Shannonhill Lake, an artificial lake (0.4 ha) within the River Shannon catchment. The lake was constructed on private land in 1996 to provide a habitat for wildlife. It was filled from a small stream that ultimately discharges to Lough Derg, the lowermost of three major lakes on the River Shannon, Ireland's largest river. Emerging from the lake, the narrow stream meanders for circa 5.9 km to discharge directly into Lough Derg. As the crow flies, the lake is 4 km from Lough Derg.

In 1998, 12 small fragments of *Lagarosiphon* (circa 30 gm wet weight) were introduced into the artificial lake. These established successfully and rapidly expanded to totally overgrow the artificial lake.

Aim

The primary objective of the study was to assess the efficacy of the broad-spectrum herbicide, dichlobenil, in controlling or eradicating *Lagarosiphon* from this artificial lake.

Materials & Methods

In 2008 a survey was conducted to quantitatively assess the status of the invasive weed in the lake. The vegetation from ten random 1 sq m quadrats was removed and weighed to provide a wet weight measure. Because of the serious risk of infestation that the *Lagarosiphon* posed to Lough Derg and to the whole River Shannon catchment, immediate measures to eradicate it from the lake and from the tributary stream were undertaken. The supply stream was diverted from the lake, thus isolating it from Lough Derg. In April 2008 dichlobenil granules were applied at the rate of 200kg/ha to the whole lake area, as no fish or native plant species that required protection were present. Sections of the tributary stream were also treated chemically, as a precaution. Prior to applying the granular herbicide, a large fraction of the dense canopy vegetation was removed using a long-reach excavator. The excavated weed was retained on site. It was covered with black polythene and sealed with earth.



Lagarosiphon removal, herbicide application and weed storage beneath polythene at Shannonhill Lake in 2008



Shannonhill Lake – before spraying



Shannonhill Lake – after spraying

Results & Discussion

A vegetation survey conducted in March 2008 revealed that the lake contained 64.4 tonnes of *Lagarosiphon*. This occupied the full water column and created a dense canopy on the water surface. The full length of the outflow stream, to its confluence with Lough Derg, was surveyed and no *Lagarosiphon* plants were recorded.

A quantitative survey of the lake and the emerging stream section that had been chemically treated was conducted in August 2008. This revealed that practically all of the *Lagarosiphon* was dying or dead. Very little green tissue remained. A subsequent survey in January 2009 could not detect any live *Lagarosiphon*. Even the roots that were recovered using the 8-pronged grapnel were in the process of rotting. This result demonstrates that *Lagarosiphon* is susceptible to the chemical activity of dichlobenil and that this herbicidal product has the capacity to provide effective control of infestations of this highly invasive species under Irish conditions.

Monitoring will continue in this artificial lake over the 2009 season and a programme of replanting with indigenous aquatic plant species will be undertaken.



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