



## Progress with Weed Biocontrol projects

**CABI in the UK**

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Since April 2011, Defra has provided funding for research into the potential for the biological control of invasive non-native weeds that are having an impact on aquatic and riparian habitats. This is to achieve the requirements of the Water Framework Directive. The use of chemical and mechanical control methods in such situations is often difficult, expensive or impossible, so alternatives are needed. We are targeting **Australian swamp stonecrop** (*Crassula helmsii*), **Himalayan balsam** (*Impatiens glandulifera*) and **floating pennywort** (*Hydrocotyle ranunculoides*). These projects join CABI's on-going work on the biocontrol of **Japanese knotweed** (*Fallopia japonica*) and **floating fairy fern** *Azolla filiculoides*. This is the first of a series of annual summary notes on progress made.

## Japanese knotweed



After eight years of research the release of the specialist knotweed psyllid *Aphalara itadori* was granted in 2010. After some successful overwintering from the original limited releases we decided that a larger effort was required in 2012, so around 10,000 adult psyllids were released at each of the eight approved sites in May 2012. These sites, and their local pairs, at which no psyllids have been released, continue to be monitored for any adverse effects on the receiving environment and a contingency plan remains in place. We hope that these larger releases, and a good summer, will result in good establishment of the psyllid in the UK and allow populations to grow large enough to damage the knotweed.

In parallel, a two year project has begun aimed at completing the study of the leafspot fungus *Mycosphaerella polygوني-cuspidati*, another natural enemy of Japanese knotweed with high potential as a biocontrol agent. In 2008 assessment of this agent was put on hold while the psyllid research was completed. Current research into the leafspot fungus is being carried out both in the UK and Japan and is focussed on life-cycle studies and safety testing using non-target plants species that were not yet assessed.

The knotweed project began in 2003 thanks to a consortium of funders including Defra, Environment Agency, Welsh Assembly Government, Network Rail, South West Regional Development Agency, British Waterways (now Canal and River Trust), coordinated by Cornwall Council.

## Himalayan balsam



The Himalayan balsam project has been on-going since 2006 and during that time considerable research has been conducted on the prioritisation and safety testing of the natural enemies that damage the plant in its native range of the Himalayas. The project is now reaching its conclusion with the assessment of the rust fungus *Puccinia komarovii* against an agreed test plant list. With the bulk of the testing complete this rust is showing remarkable specificity and very good potential for the control of Himalayan balsam in its exotic range. We have managed to fully reveal the life-cycle of the fungus and we will be preparing a pest risk analysis once the final host range data have been generated.

Previous funders include Environment Agency, Scottish Executive and British Waterways (now Canal and River Trust)

## Crassula



Despite unusually heavy rains after many years of drought we managed to undertake successful surveys in the Australian states of Victoria and Tasmania, and are focussing on two stem mining insects, a weevil, *Steriphus* sp. and a fly, *Hydrellia* sp. we suspect that the weevil will fail the stringent safety testing based on current feeding and development results. However, we have managed to establish a culture of the fly in our quarantine facility and work is now focussing on host range studies with this agent. Meanwhile, our plant pathologists are studying the infection parameters of potentially four fungal pathogens which damage the plant in its native range.

## Floating pennywort



Earlier field surveys and studies carried out with Argentinian collaborators revealed the wide range of natural enemies present in the native range of this invasive floating weed. The most promising species at that time was a weevil, *Listronotus elongatus*, which was subjected to limited safety testing with promising results. We have since broadened our collaborative field research to the native ranges of both Argentina and Brazil whilst permissions for export of the agents for quarantine studies in the UK are being secured. It is clear the weevil, a stem-mining fly, and a recently-observed rust fungus have good potential for controlling this invader. The test plants and quarantine chambers are ready and waiting for their arrival whilst valuable field observations continue.

## Azolla



The production and distribution of the azolla weevil, *Stenopelmus rufinasus*, has been on-going for some years with many satisfied customers. We are fortunate that this weevil is “ordinarily resident” in the UK and much of mainland Europe so can be moved around legally. After release it is able to completely control the weed, often in just a few weeks. This year, the early warm spell followed by late frosts set back our outdoor production facility so there has been a difficulty in meeting high demand. We have responded by increasing our weevil rearing facilities and hope to meet all current requests. Azolla will be one of the demonstration projects for the recently awarded RINSE project.

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