

Insect biological control for spotted knapweed

Ottawa National Forest Botany Program

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In 2009 the botany program of the Ottawa National Forest began use of biological control insects for spotted knapweed. Two insects, *Larinus minutus* and *Cyphocleonus achates* were approved for use on knapweed as part of the Ottawa National Forest Non-Native Invasive Plant Control Project (Decision Notice signed April 4, 2005). On March 20, 2009, we received an APHIS permit to release these weevils within the ONF (Permit #P526P-09-00748). Previously, these weevils were released in many western states in the 1990s, Minnesota in 1994, and Wisconsin in 2003. *Cyphocleonus achates* feeds on knapweed roots and *Larinus minutus* attacks knapweed flowers.



Larinus minutus
Lesser knapweed flower weevil



Cyphocleonus achates
Knapweed root weevil

Cyphocleonus achates adults emerge mid-July to early September and live eight to fifteen weeks, feeding on young knapweed leaves but not causing much damage. Peak emergence is in mid-August. Adults are large, slow-moving and poor flyers. Females lay eggs throughout their adult life on the soil surface below the plant. Larvae hatch in 10 to 12 days and mine into the root cortex, eventually causing the formation of a conspicuous root gall (Story 2002). Root larvae can be found year-round.

Larinus minutus overwinter as adults and emerge from the soil in early June, feeding on young knapweed leaves. Adults are good flyers and disperse better than *Cyphocleonus achates*. Eggs are deposited into freshly opened flower heads during late July through early September, after which the adults die off. Larvae hatch in about three days and immediately feed downwards into the flower head, where they eat the seeds and pappus hairs. Larvae feed for about 28 days, followed by a one- to two-week pupation period. New adults emerge from the seed heads in late September and October, feed on knapweed leaves for a short period before entering the soil to overwinter.

We released the weevils at five sites in 2009. The weevils were provided by Tom Barbouletos, a US Forest Service, Forest Health Protection employee stationed on the Flathead National Forest in Montana. Additional releases were made in 2010, 2011, and 2013. Monitoring has shown both species surviving our winters. The *Larinus* have increased in numbers and can now be easily found at all five sites. *Cyphocleonus* have been collected at two of the five sites. Eventually we hope to collect both species from our release sites and move them to other knapweed infestations on the Ottawa NF.

More information:

Wilson & Randall. 2003. [Biology and Biological Control of Knapweed](#). USDA-Forest Service FHTET-2001-07.

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Release sites for knapweed biological control weevils.

Weed Site	County	District	Location	Knapweed Abundance	Knapweed Cover 2009
3239	Iron	Kenton	Six Mile Pit	11.9 acres	20%
3242	Houghton	Kenton	Kenton highway mitigation site	9.6 acres	20%
3244	Gogebic	Watersmeet	Old Damon Lake Pit	6.0 acres	30%
3247	Houghton	Kenton	Jumbo Pit	11.9 acres	30%
3374	Gogebic	Watersmeet	US 2 Pit	5.8 acres	15%