

Standardized Impact Monitoring Protocol (SIMP) for *Oberea erythrocephala* and Leafy Spurge:



Overview:

A critical part of successful weed biological control programs is a monitoring process to measure populations of biological control agents and the impact that they are having on the target weed. Monitoring should be conducted on an annual basis for a number of years. The Idaho State Department of Agriculture, in conjunction with the University of Idaho, Nez Perce Biocontrol Center, and federal land management agencies, has developed the Standard Impact Monitoring Protocol (SIMP) below to enable land managers to take a more active role in monitoring the progress and weed control ability of the red-headed leafy spurge stem borer, *Oberea erythrocephala* (OBER) in efforts to control leafy spurge, *Euphorbia esula*. This monitoring protocol was designed to be implemented by land managers in a timely manner while providing data which will enable researchers to better quantify the impact of OBER on leafy spurge throughout the state.

Leafy Spurge:

Leafy spurge is a deep-rooted, aggressive, persistent perennial that reproduces vegetatively and by seed. Plants have an extensive root system which grows horizontally and is capable of reaching depths up to 20 ft. Stems are thickly clustered and have narrow, alternate leaves which exude a milky latex when damaged. The flowers are small and yellowish-green and are enclosed in showy yellow-green bracts. Seeds are oblong and occur in clusters of three. When the seeds are dry, the capsules shatter and spread the seeds as far as 15 ft from the plant. Leafy spurge is commonly found in grassland and rangeland habitats, but is also capable of invading forests and riparian areas, displacing native vegetation.

Red-Headed Leafy Spurge Stem Borers (OBER):

Adult OBER have red heads, black eyes, and slender bodies with antennae that are nearly as long as the body. Males emerge several days before females and both sexes are sexually immature for two weeks before they start mating. Females often girdle the upper part of the stem, gnaw a hole into the stem above the girdle, and deposit an egg into the hole from the end of June to mid-July. Each female can produce approximately 60 eggs during her lifetime. Larvae hatch 10 days after eggs are laid and feed in leafy spurge stems on the pith, tunneling downward



to the root crown where they remain during the winter. Mined stems dry, wilt and do not produce flowers or seeds. Crown and root feeding reduces the plant's root reserves and allows pathogenic fungi to enter infested leafy spurge roots. OBER prefers moist areas with trees and can survive subfreezing winter temperatures. Some research suggests that this agent may be biotype specific – only attacking certain biotypes of leafy spurge.

Monitoring:

SIMP is based upon a permanent 20 meter vegetation sampling transect randomly placed in a suitable (at least 1 acre) infestation of leafy spurge and timed counts of OBER adults. Annual vegetation sampling will allow researchers to characterize the plant community and the abundance and vigor of leafy spurge. Sweep net samples of OBER adults will provide researchers with an estimate of OBER population levels.

Permanent Site Set-up:

To set up the vegetation monitoring transect, you will need: 1) a 25 x 50 cm Daubenmire frame made from PVC (preferred) or rebar, 2) a 20 m tape measure for the transect and plant height, 3) 10 permanent markers (road whiskers and 16 penny nails – see picture below), 4) a post (stake or piece of rebar) to monument the site (see pictures for examples of field equipment), and 5) 30-45 minutes at the site during the **last week of June**. To set up the transect, place the 20 m tape randomly within the infestation. Mark the beginning of the transect with a post. Place permanent markers every 2 m (for a total of 10 markers) beginning at the 2 m mark and ending with the 20 m mark on the tape measure. Place the Daubenmire frame parallel to the tape on the 50 cm side with the permanent marker in the upper left corner starting at 2 m (see pictures). **Refer to the data collection sheet for how to conduct monitoring.** Repeat the frame placement at 2 m intervals for a total of 10 measurements (one at each permanent marker).

