Biological Control of Purple Loosestrife

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Purple Loosestrife in North America

- L. *salicaria* biology
- Arrival in North America
  - Early 1800's
  - Ballast, wool, medicinal
- Spread
  - Natural
  - Ornamental
  - Honey plant

The Problem

- Reduction in plant biodiversity
- Degradation of wildlife habitat
- Alteration of wetland function

Blossey et al. 2001

Options for Managing Purple Loosestrife

- Digging, hand pulling
- Clipping
- Water level management
- Herbicides
- Burning
- Tillage

History of Purple Loosestrife Biological Control

- Wildlife concerns 1950-60's
- USFWS - USDA collaboration, mid 1980's
- Exploration for natural enemies 1985-6
  - Commonwealth International Institute of Biological Control, Delemont, Switzerland
  - 120 insects feed on PL
  - 15 believed likely to be host-specific
  - 6 most promising selected for further testing

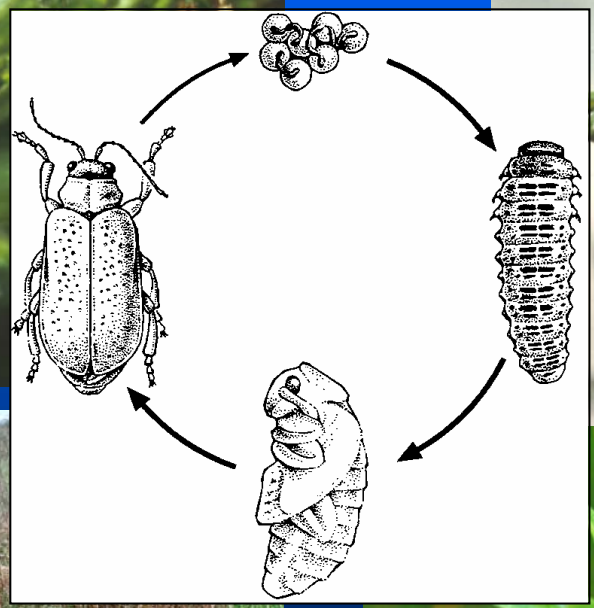
Galerucella calmariensis, G. pusilla (Coleoptera: Chrysomelidae)

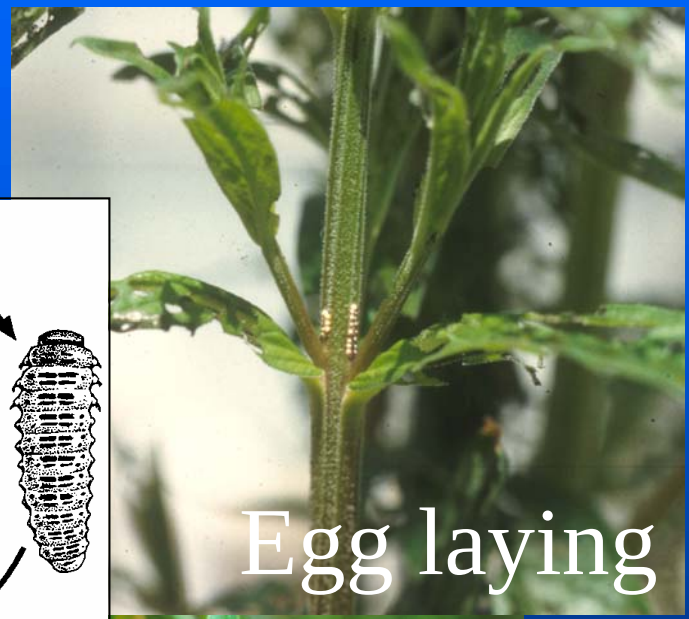
Photos: K. Stepnitz MSU

Objectives of the PLP@MSU

- Rearing and release
- Evaluation and monitoring
- Research
- Education

Galerucella Life Cycle

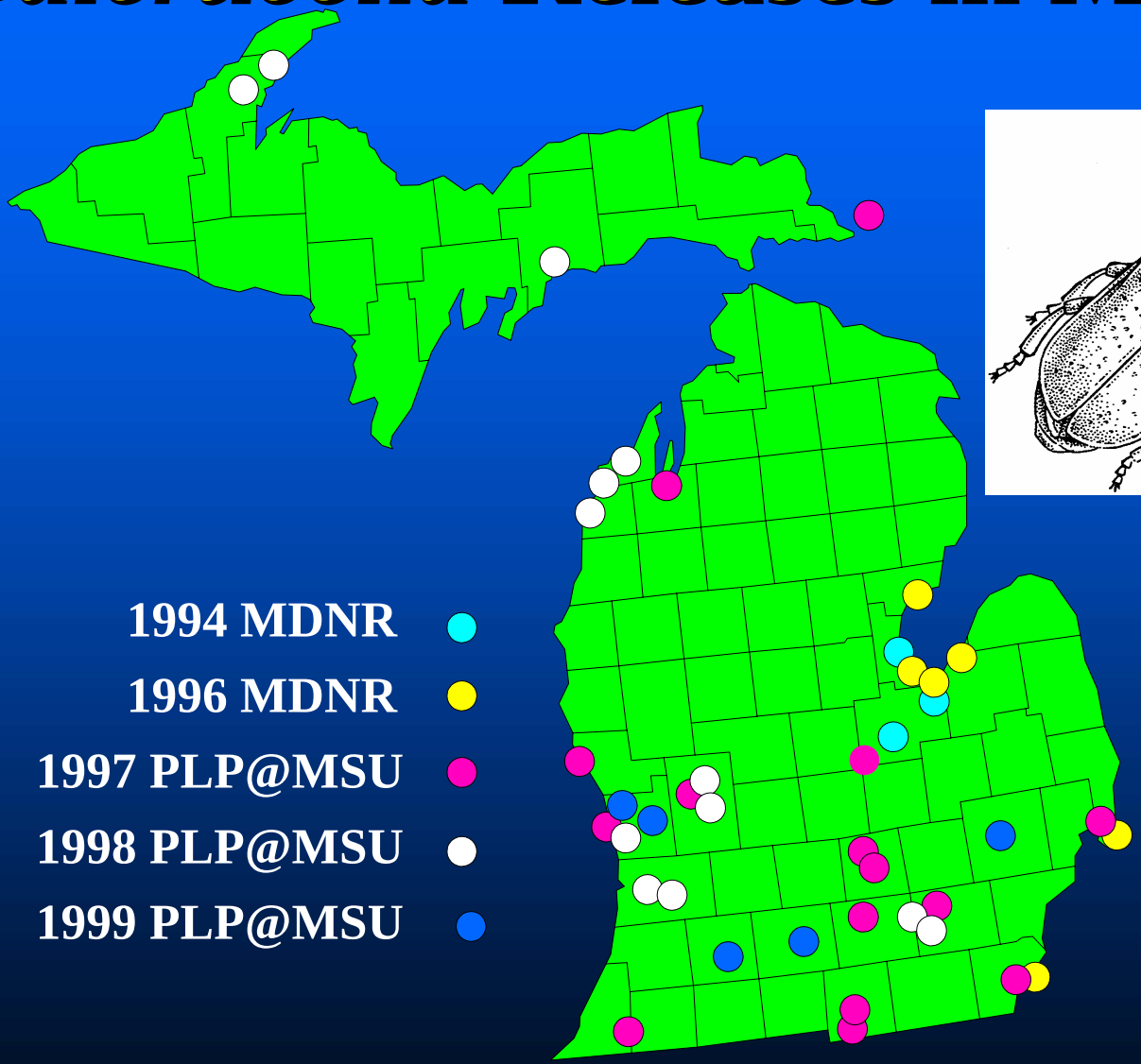


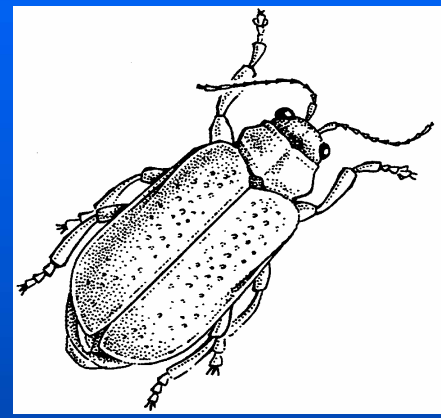


Impacts on *L. salicaria*

Rearing and Release of *Galerucella*

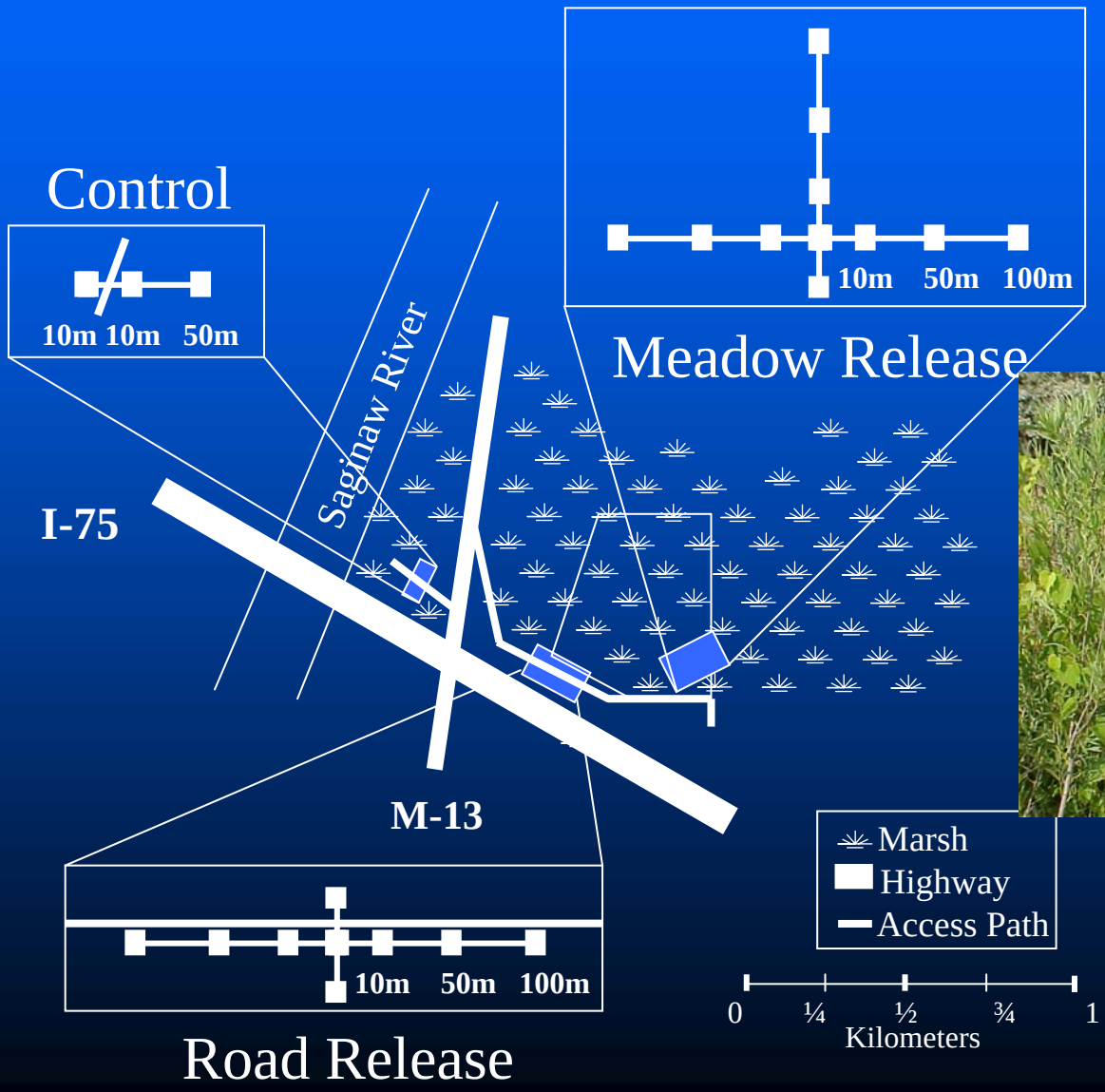
Galerucella Releases in MI



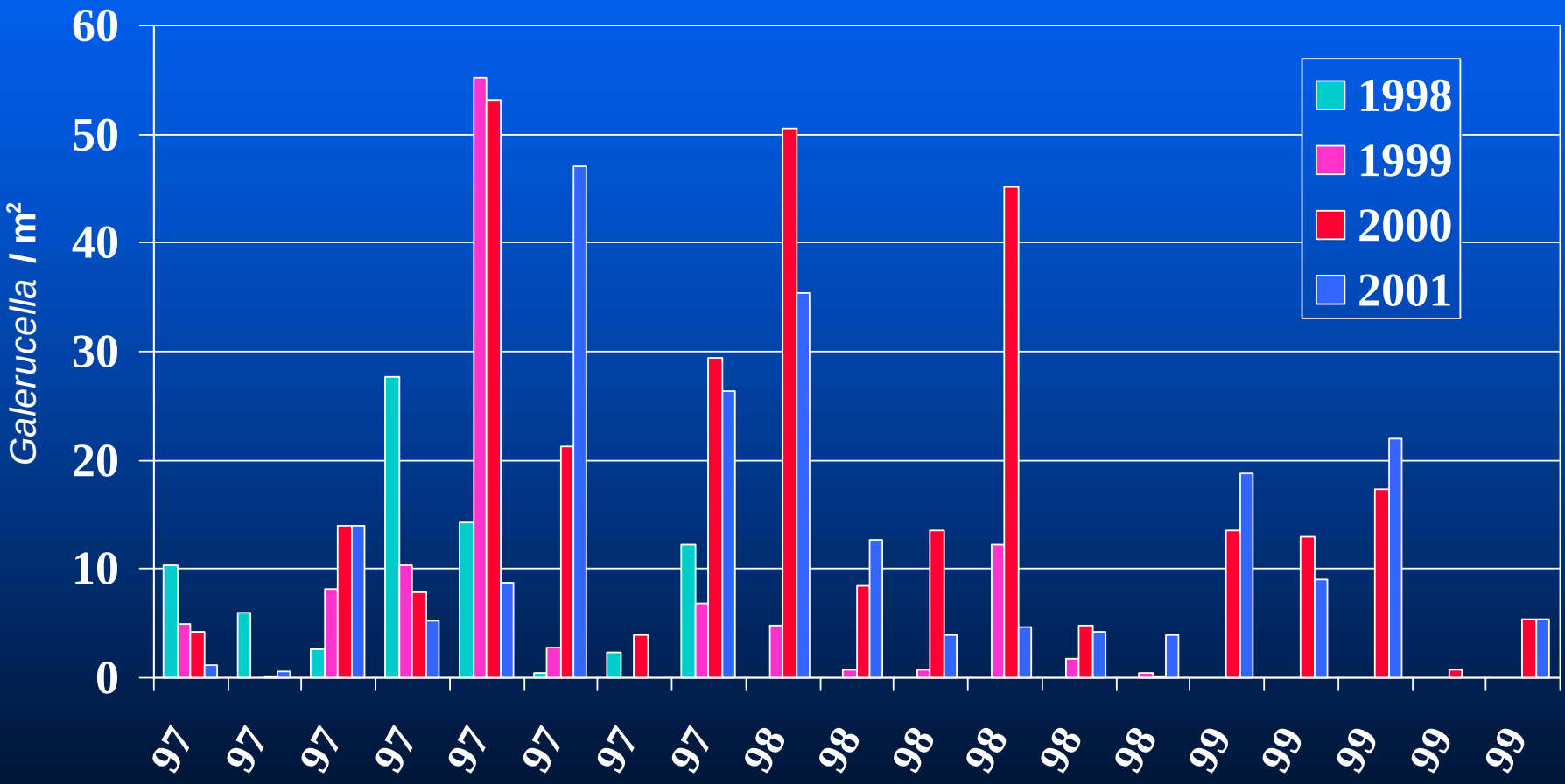


PLP@MSU 2004

Evaluation and Monitoring



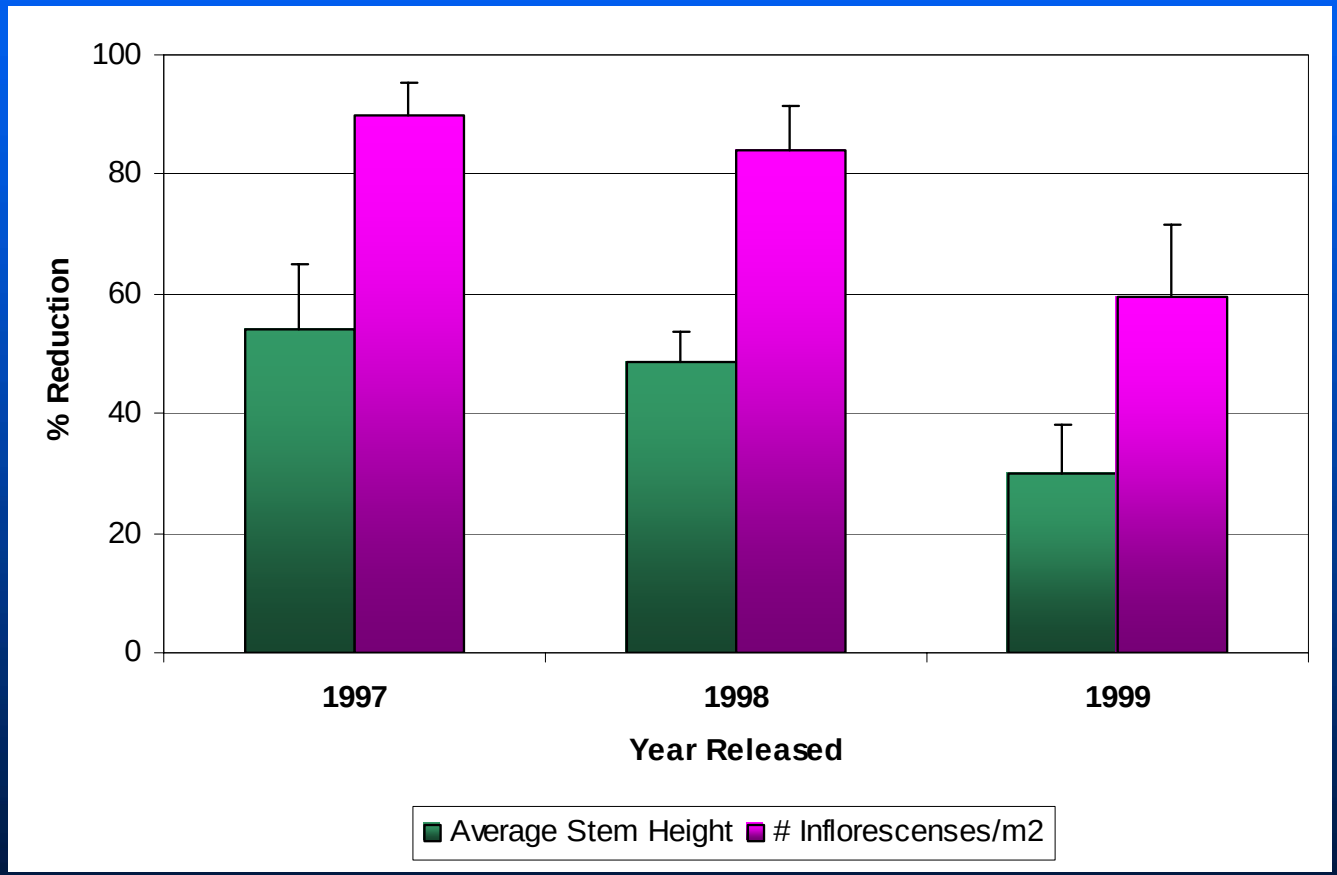
Establishment of *G. calmariensis*: 1997-99 releases



Landis et al. 2003. Biological Control.

Pointe Mouille: August 1998

Galerucella Impacts 1997-2004

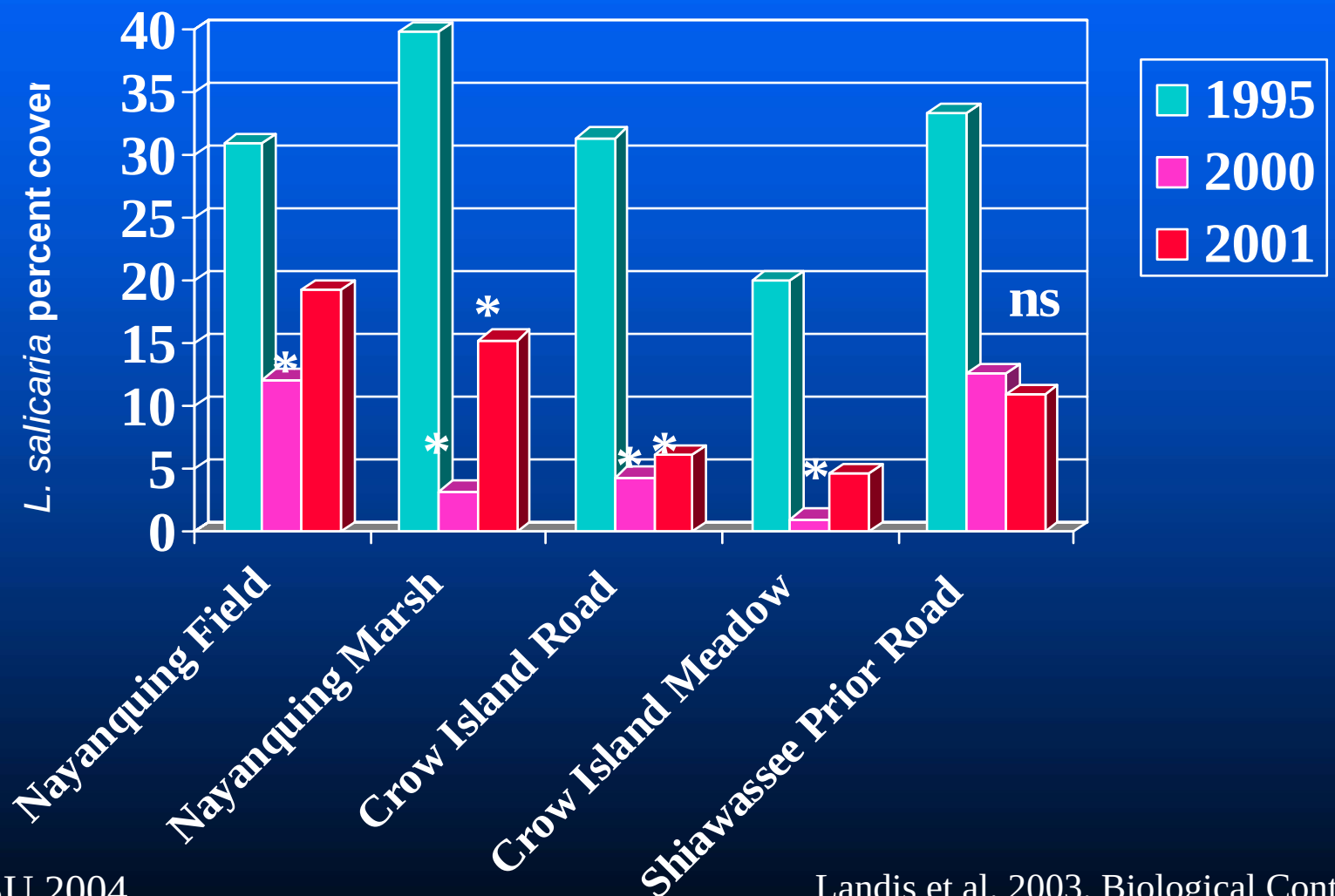


19 Michigan Sites, Landis unpub. data

Crow Island

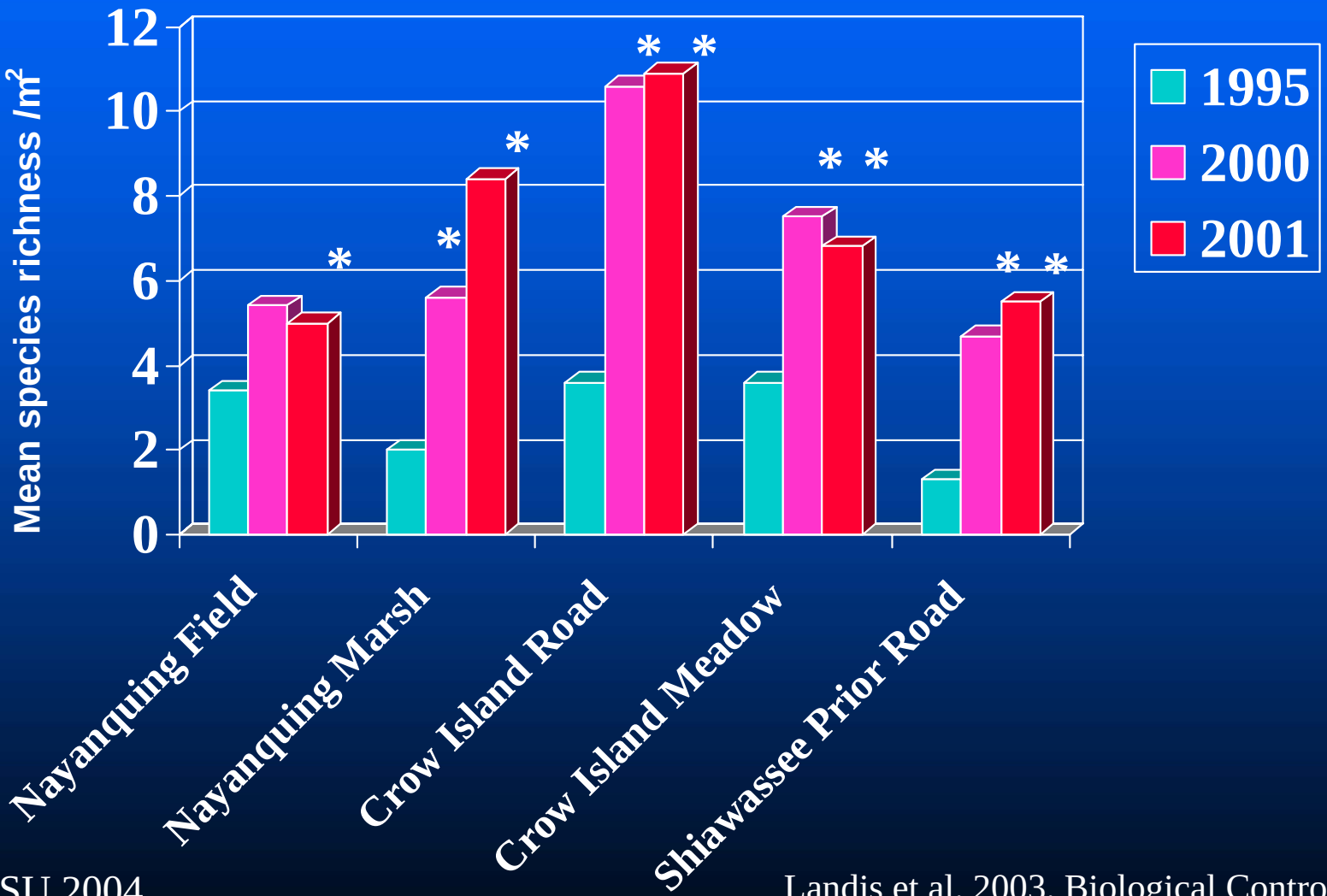
Windmill Island

Percent Cover: 1995-2001



Landis et al. 2003. Biological Control.

Species Richness: 1995-2001



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Landis et al. 2003. Biological Control.

Biological Control in the News

Science News Online - This Week - News Feature - 8/16/97 - Netscape

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SCIENCENEWSONLINE

August 16, 1997

Biological Pest Control Harms Natives

by C.Mlot

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UNL News Releases 8/21/97 - Netscape

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For Release: 3 p.m., Aug. 21
Attn.: News, Science, Education Editors
Contact: Svata Louda, Professor
Biological Sciences
(402) 472-2763

CAUTION URGED IN USE OF BIOLOGICAL CONTROLS

Lincoln (Neb.) - Aug. 21, 1997 - Biological control - the introduction of non-native or to control pests - can be an effective and clean substitute for the use of pesticides and herbicides.

But caution needs to be used in deploying those non-native organisms, University of Nebraska-Lincoln botanist Svata Louda said after making an unexpected discovery in Nebraska's Sandhills.

Since 1984, Louda has studied the Platte thistle, whose range is restricted to the Sandhills, in the Nature Conservancy's Niobrara Valley Preserve in north central Nebraska. In 1993, she and her team of researchers came across an insect species they had not previously seen in the region - the flowerhead weevil (Rhiocyllus conicus), a Eurasian species that had been introduced in

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Observed Non-target Impacts 1997-2001

- 99 species: 73 forbs, 11 grasses, 7 sedges, 6 shrubs, 1 each tree, vine, fern
- Represent 84 genera
- Observed transient adult feeding on 2 species
  - *Potentilla anserina* 1999-2000
  - *Cornus stolonifera* 2000-2001
- No eggs, larvae
- Attack not sustained in subsequent years

Kaufman & Landis. 2000. Biological Control

Conclusions

- *G. calmariensis* is widely established and significantly impacting *L. salicaria* in Michigan/North America.
- Minimal non-target effects have been observed.
- Plant community change and habitat restoration remain as critical research areas.
- The integration of research, implementation and education engages the public in biological control.

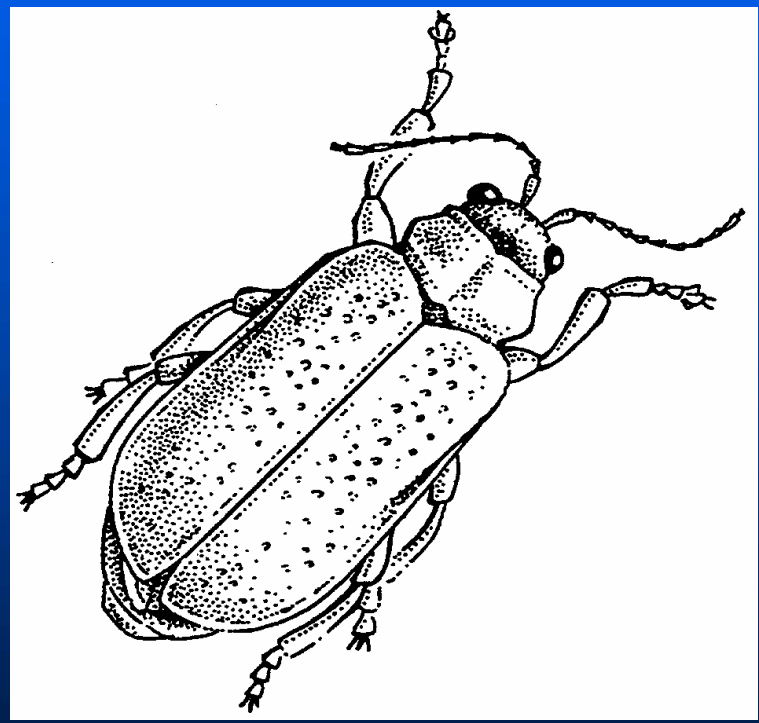
http://www.miseagrant.org/pp/

Project Partners

- Michigan Agricultural Experiment Station
- MSU Extension
- CNS Division of Science & Math Education
- Department of Entomology
- Michigan Sea Grant College Program
- Michigan Department of Agriculture
- Michigan Dept. of Natural Resources
  - Wildlife Division
  - Non-Game Fund
- US Environmental Protection Agency
- Michigan Dept. of Environmental Quality
  - Office of Great lakes
  - Coastal Programs Unit, Land & Water Mgt. Div.

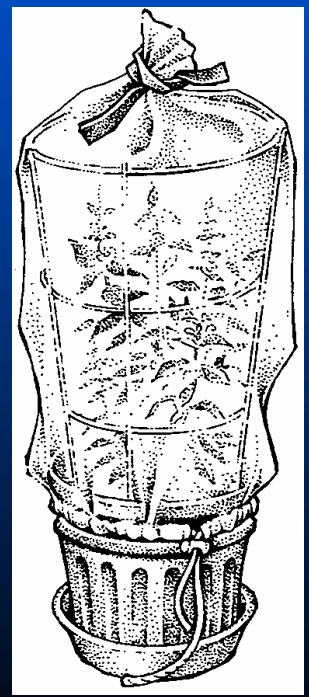
Education & Outreach

- K-12 Teachers/Students
- Cooperative Biological Control Site Network



K-12 Partners

- Upper elementary and secondary schools
- Classroom curriculum / activities
- Rear, release, evaluate natural enemies



Cooperative Biological Control Site Network

- Strategically located
- Local source of support
  - Trained personnel
  - Print material
  - Beetles