

# The Role of a State Insectary in Weed Biocontrol

Dan Bean, Director  
Palisade Insectary  
Colorado Department of Agriculture  
Conservation Services





Commissioner's Office



7 Divisions



Plant Industry

Brands

Inspection and Consumer Services

Conservation Services

Markets

State Fair

Animal Industries



Commissioner's Office



7 Divisions



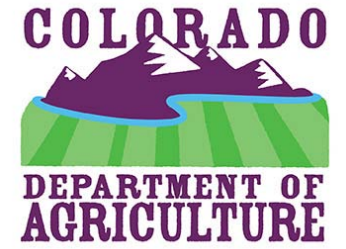
**Conservation Services**



Commissioner's Office



7 Divisions



**Conservation Services**



4 Programs



Commissioner's Office



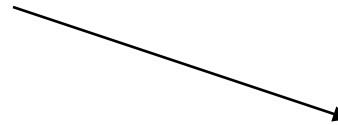
7 Divisions



**Conservation Services**



4 Programs



Conservation Districts



Commissioner's Office



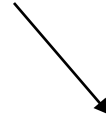
7 Divisions



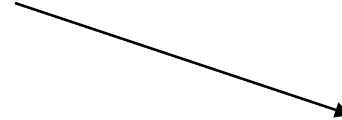
## Conservation Services



4 Programs



Groundwater



Conservation Districts



Commissioner's Office



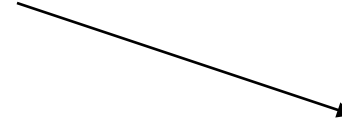
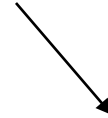
7 Divisions



## Conservation Services



4 Programs



Noxious Weeds

Groundwater

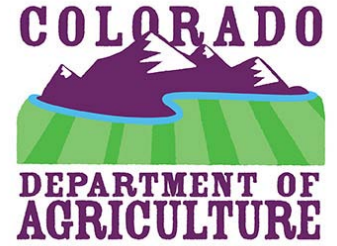
Conservation Districts



Commissioner's Office



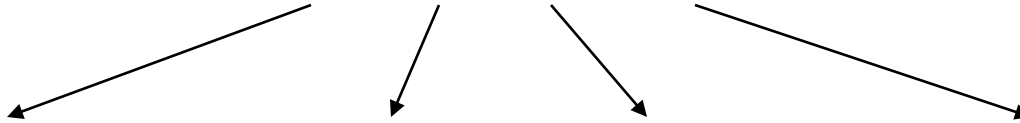
7 Divisions



## Conservation Services



4 Programs



Biological Pest Control

Noxious Weeds

Groundwater

Conservation Districts





Commissioner's Office



7 Divisions



**Conservation Services**



4 Programs



Biological Pest Control

Palisade Insectary  
Palisade, Colorado

# Palisade Insectary

- Began in the 1940's to fight Oriental fruit moth, a project that helped peach farmers and is still going
- Moved to new 14,000 sq ft facility in 1992
- Distributes over 30 biocontrol agents for the control of insect pests and weeds
- Is a partner in pest management on a local, state, tribal and federal level



The Program mission is to provide biological control agents and expertise to the citizens of Colorado in order to assist in achieving their land and resource management objectives



Leafy spurge infestation near Pine, CO



Eric Lane, Director of Conservation Services, collecting tamarisk leaf beetles

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Leafy spurge infestation near Pine, CO

**Must Work at  
Regional/National/International  
Levels Too!**



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<b>Fees, gifts</b>	<b>5%</b>
<b>Grants, Coop Agreements</b>	<b>30%</b>
<b>State of Colorado</b>	<b>65%</b>



Eric Lane, Director of Conservation Services, collecting tamarisk leaf beetles

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## 1. Provide biocontrol agents

- A. New agents are free (establish field insectaries)
- B. Research projects = free agents (acquire information)
- C. Well-established agents come with a fee



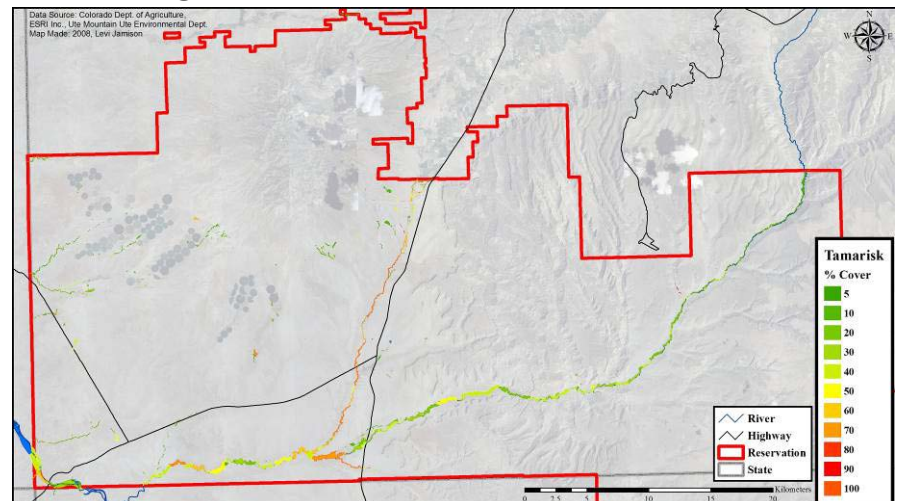
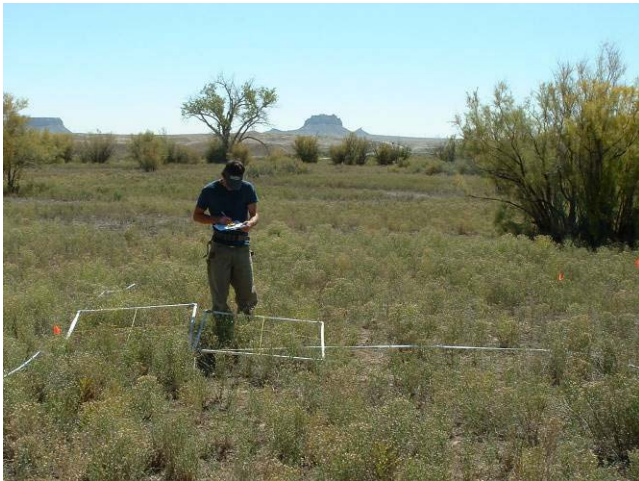
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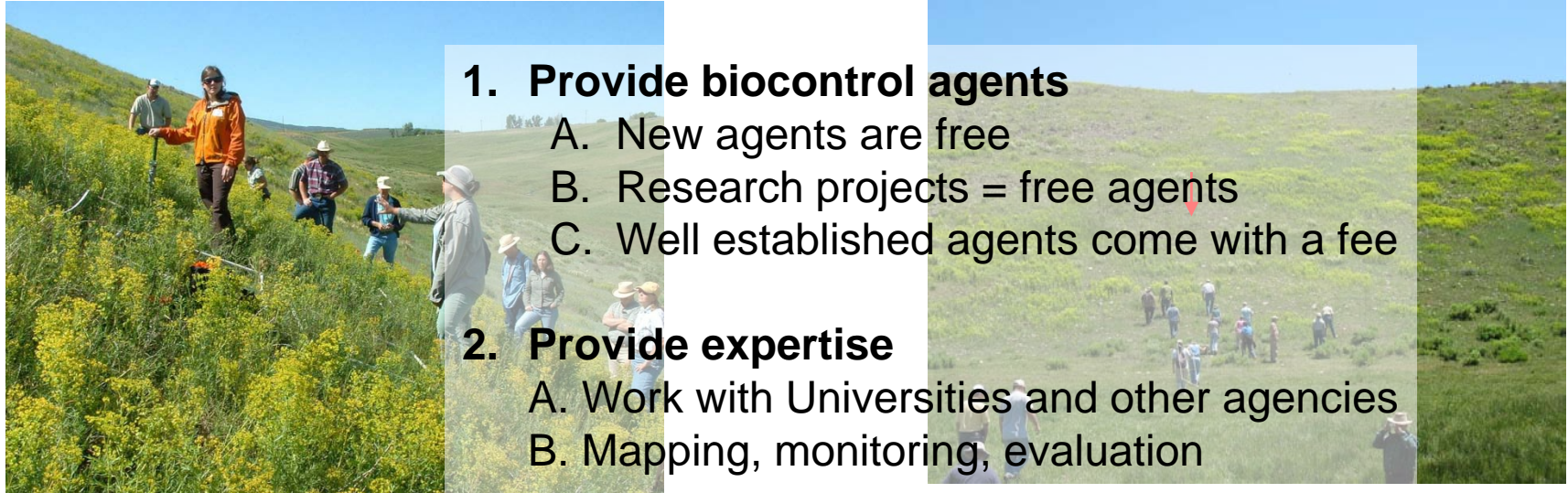
- A. New agents are free
- B. Research projects = free agents
- C. Well established agents come with a fee

**2. Provide expertise (how to work with agents and what to expect)**

- A. Work with Universities, federal, state and local govt. agencies, tribes etc
- B. Mapping, monitoring, evaluation



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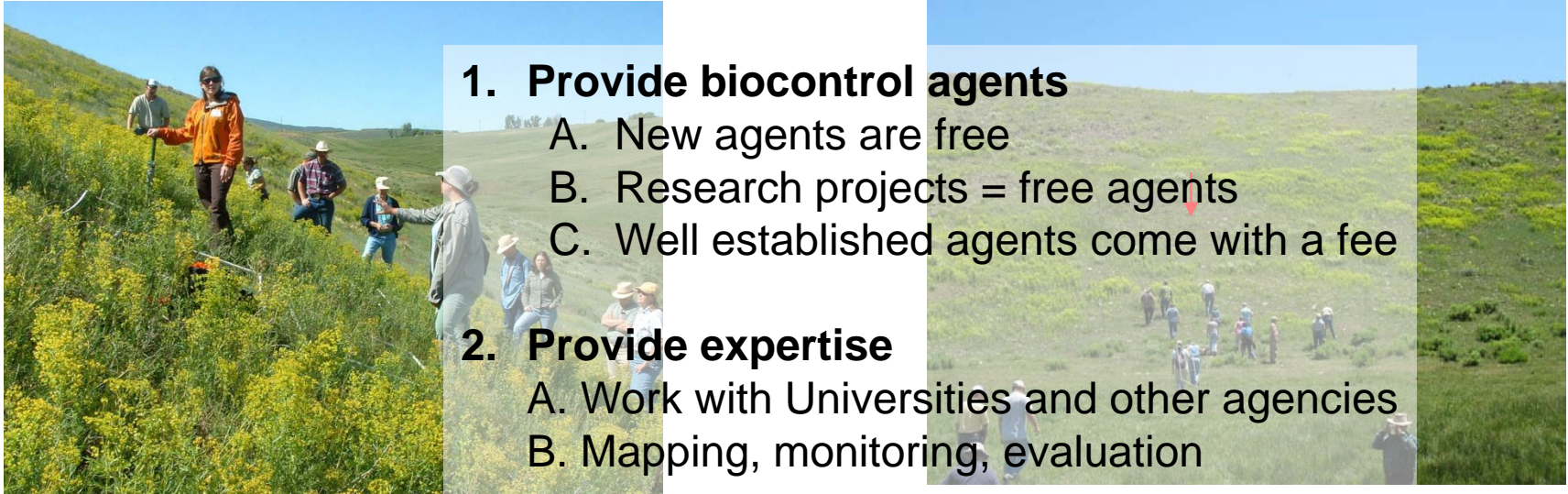
- A. Work with Universities and other agencies
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**3. Provide educational materials**

- A. Press, public presentations, brochures
- B. Demonstration projects



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**Work at Regional/National/International Levels Too!**

# Provide Biocontrol Agents



Leafy Spurge

*Aphthona* spp

200,000

*Oberea erythrocephala*

1000



1996



2006

The Program mission is to provide biological control agents and expertise to the citizens of Colorado in order to assist in achieving their land and resource management objectives

Leafy Spurge

*Aphthona* spp

200,000

*Oberea erythrocephala*

1000

Field Bindweed

*Aceria malherbae*

900,000 (est)

*Tyta luctuosa*

27,410



The Program mission is to provide biological control agents and expertise to the citizens of Colorado in order to assist in achieving their land and resource management objectives

Leafy Spurge	<i>Aphthona</i> spp	200,000
	<i>Oberea erythrocephala</i>	1000
Field Bindweed	<i>Aceria malherbae</i>	900,000 (est)
	<i>Tyta luctuosa</i>	27,410
Dalmatian toadflax	<i>Mecinus janthinus</i>	11,115
	<i>Calophasia lunula</i>	6806



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Yellow toadflax	<i>Rhinusa linariae</i>	300



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Puncturevine	<i>Microlarinus</i> spp	4300
Tamarisk	<i>Diorhabda elongata</i>	100,000



# Support for USDA APHIS northern states tamarisk leaf beetle distribution program



Palisade Insectary: holding, sorting, distribution



collecting crew, 2006



Rich Hansen



# Support for USDA APHIS northern states tamarisk leaf beetle distribution program

CDA

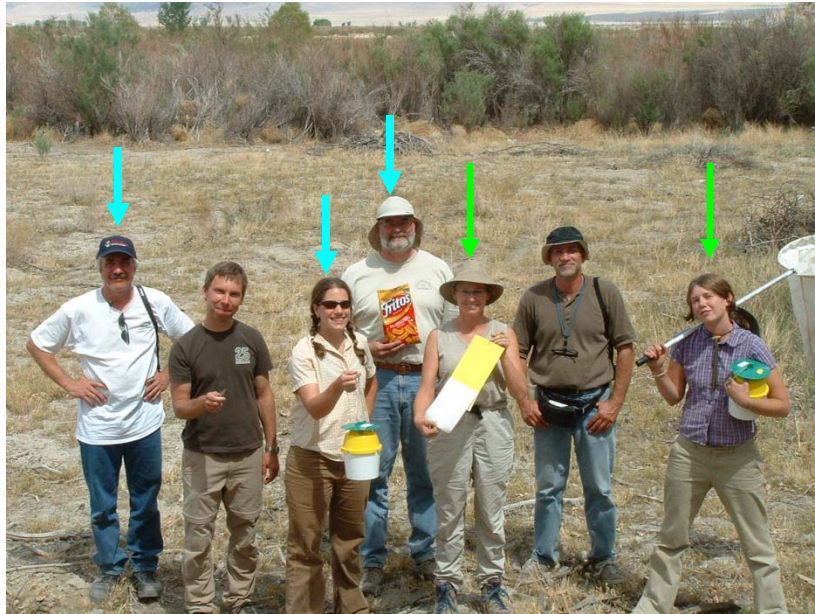


Rich Hansen



# Support for USDA APHIS northern states tamarisk leaf beetle distribution program

USDA APHIS



Rich Hansen

Tamarisk

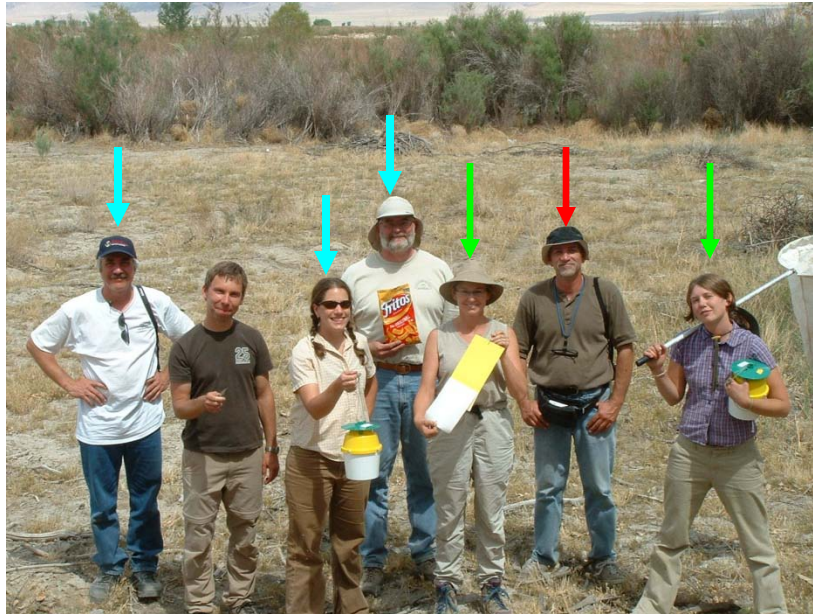
*Diorhabda elongata*

300,000



# Support for USDA APHIS northern states tamarisk leaf beetle distribution program

USDA ARS

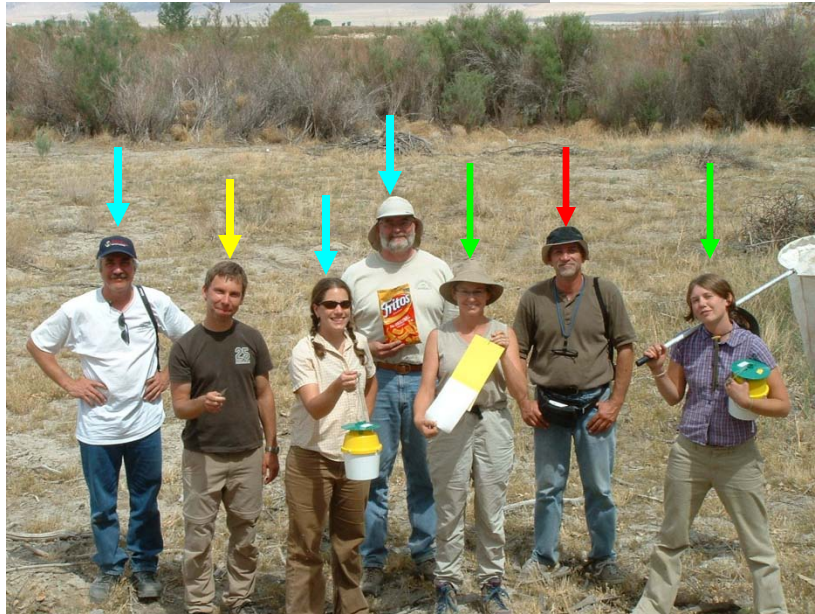


Rich Hansen



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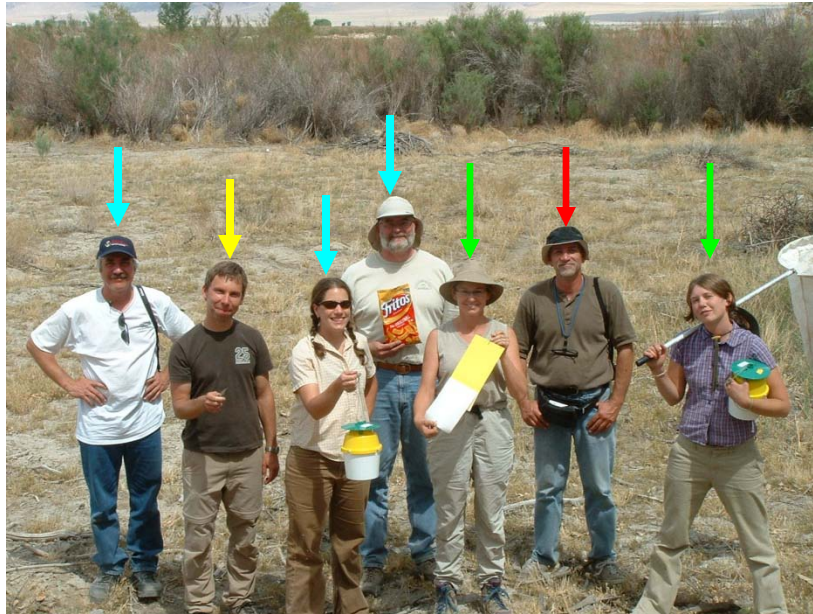
University



Rich Hansen



# Support for USDA APHIS northern states tamarisk leaf beetle distribution program



Rich Hansen

Over 300,000 distributed in 10 western states





# Utilizing the Palisade Insectary as a production facility





*Hylobius transversovittatus*



purple loosestrife

The Insectary currently rears over 1,000 adult purple loosestrife weevils per season for use in other states.

Purple loosestrife is a “List A” species scheduled for eradication in Colorado. We ship beetles to other states.



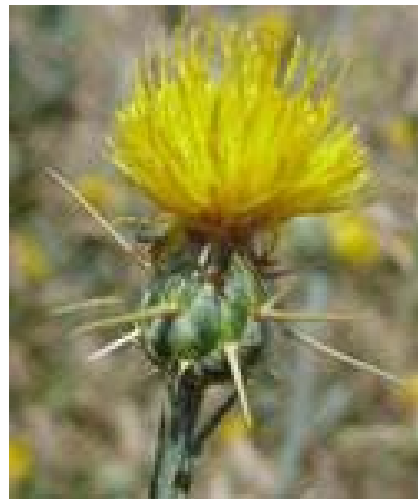
Hylobius artificial diet  
Nada Carruthers, USDA APHIS

Yellow starthistle project: mass production of the YST rosette and root feeding weevil for release in western states.



*Ceratapion basicorne*

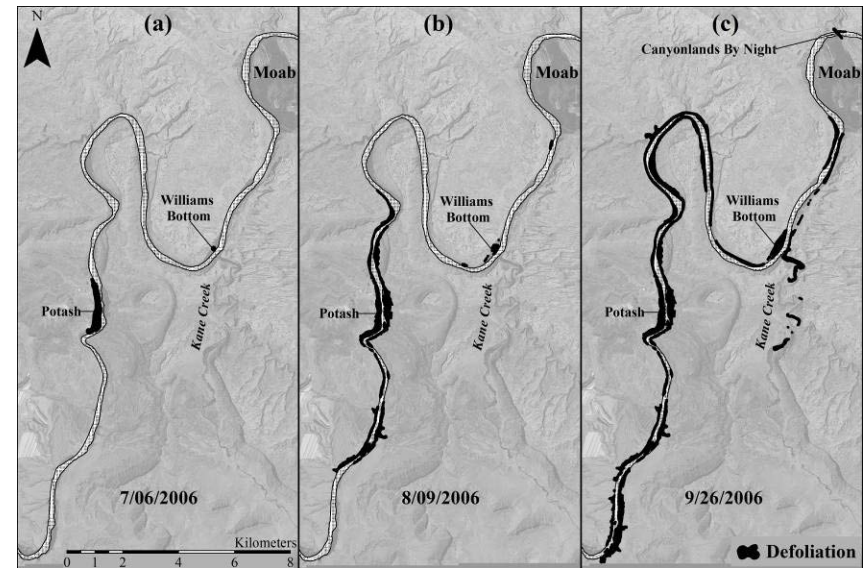
In cooperation with USDA ARS (Lincoln Smith, EIW Albany)  
Supported by USDA APHIS



# Providing expertise: mapping, monitoring, evaluation

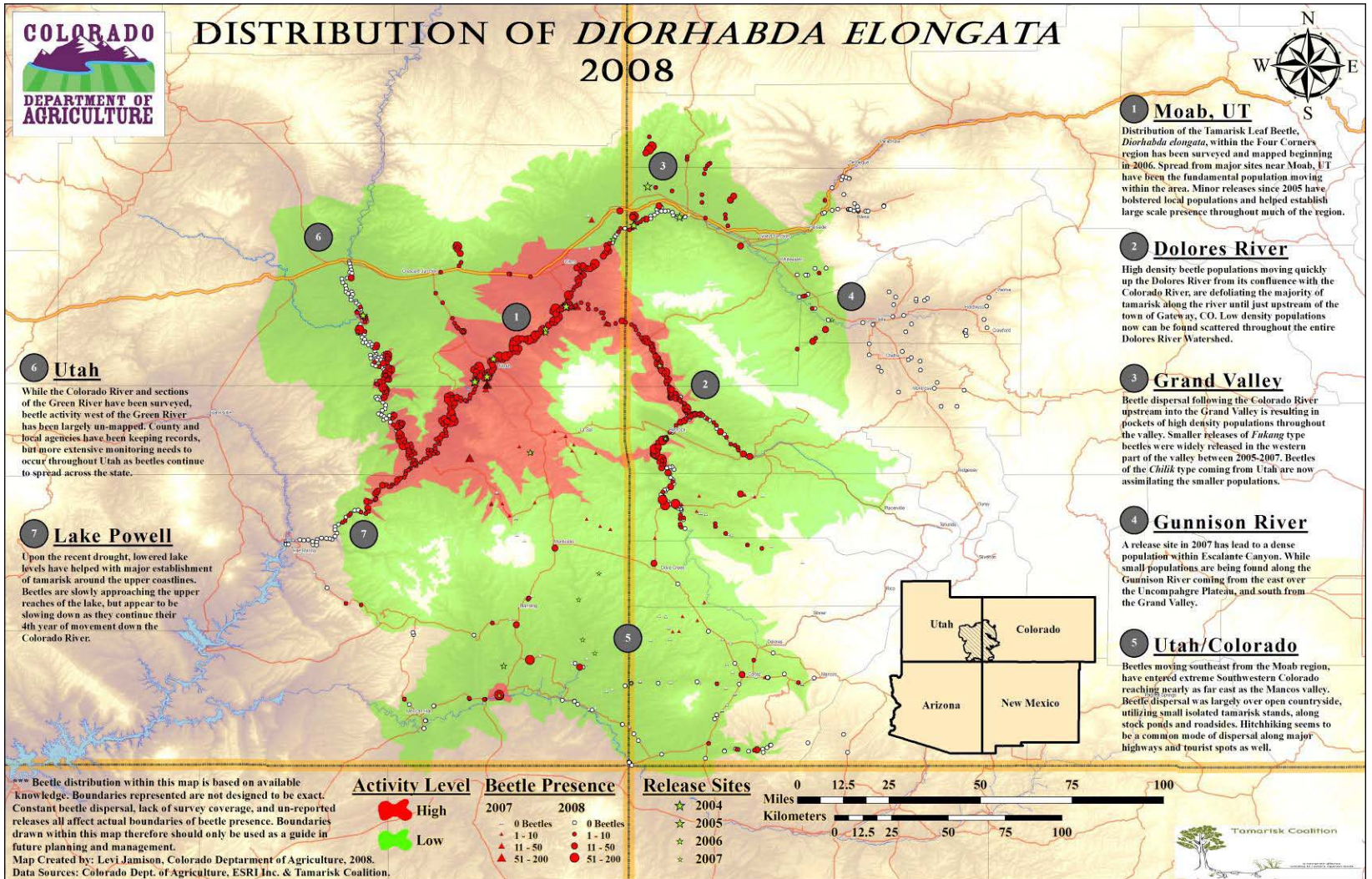


Mapping in the field using GPS/GIS



Expansion of the area of defoliated tamarisk in the Moab area, 2006 (defoliation shown in black).

# Tamarisk leaf beetle distribution, fall 2008



# Monitoring Biocontrol



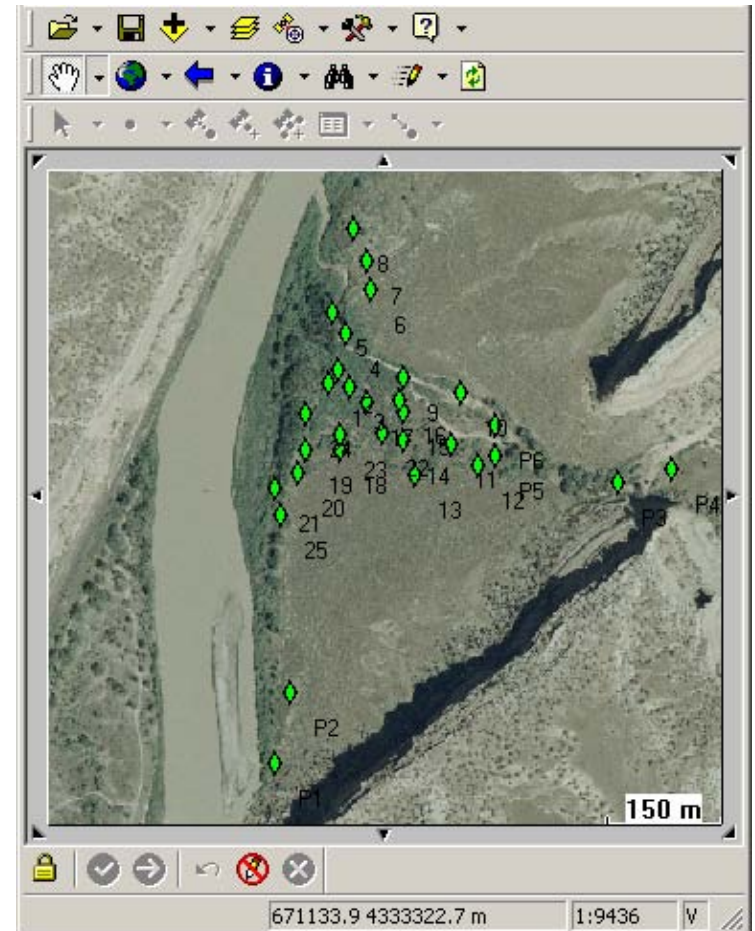
Tamarisk monitoring Dolores River



Vegetation monitoring Ute Mtn Ute  
Reservation

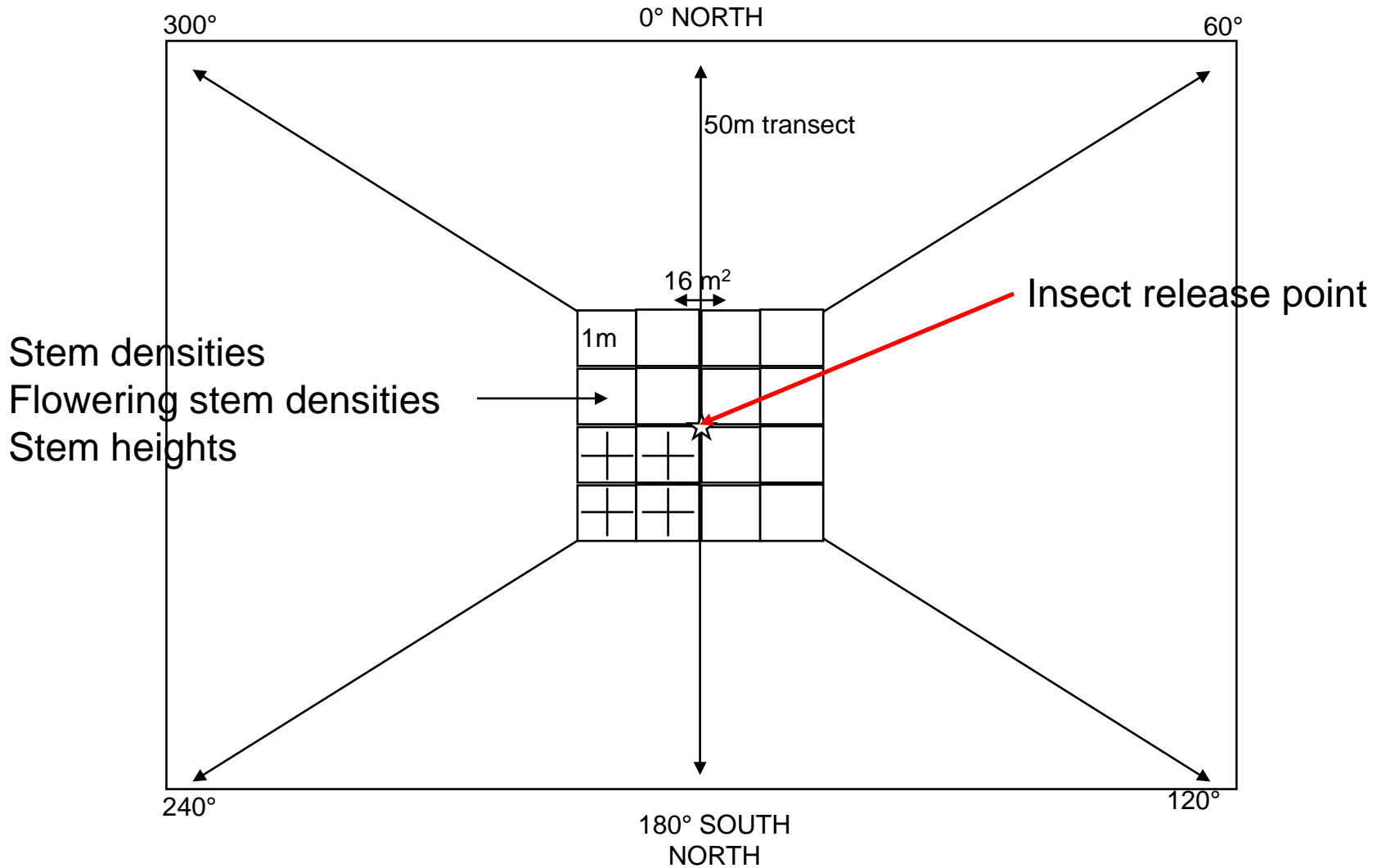
# Monitoring Protocol Tamarisk

- Site layout:
  - 25 marked trees
    - Release Tree
    - 12 trees 0-100 meter radius
    - 12 trees 100-200 meter radius
    - Height, width, tree health, beetle/larval/egg presence, predators, date, person recording data, and a comment field



GPS screen – Knowles Canyon

# Protocol from Sound Science LLC used for rangeland weeds





# Dalmatian toadflax biocontrol monitoring in Western Colorado

(Colleen Jandreau)



# Initial Release 2000 - Sally's



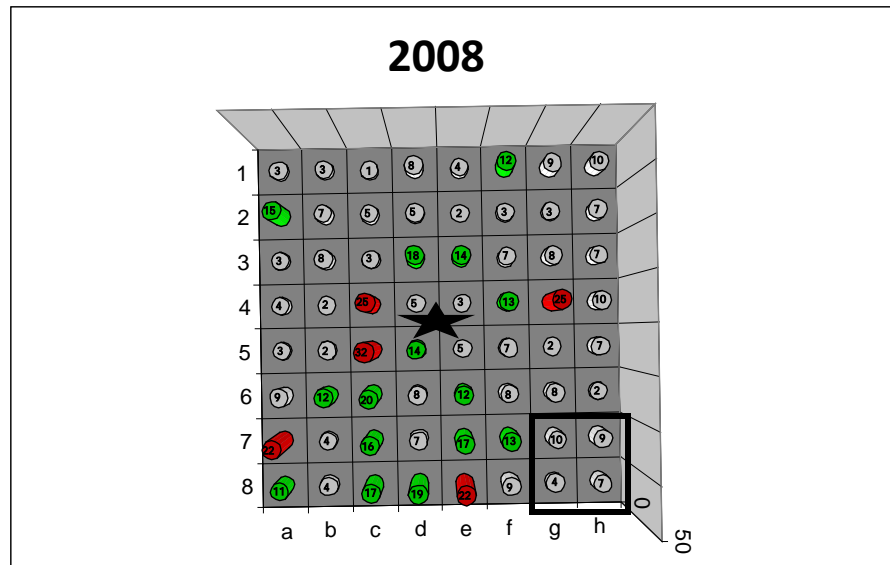
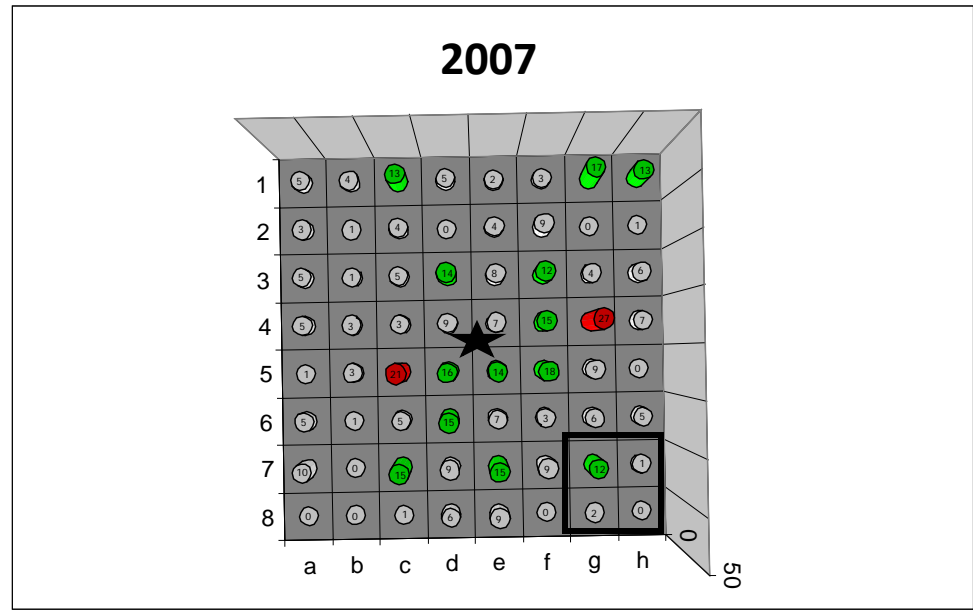
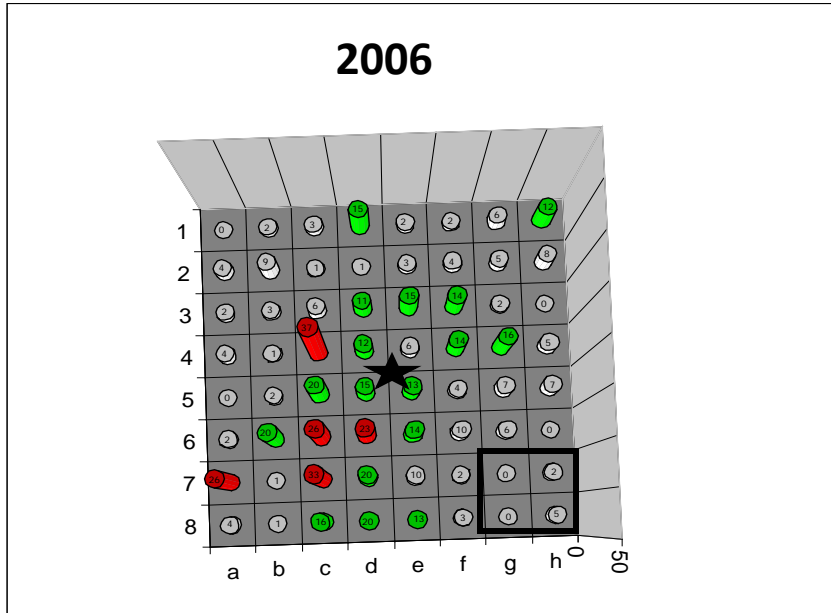
2008

# Upper Molina BLM Site (initial release 2006)



APPENDIX : Example 3-D graph generated from stem counts at a weevil (*Mecinus janthinus*) release site at time zero.

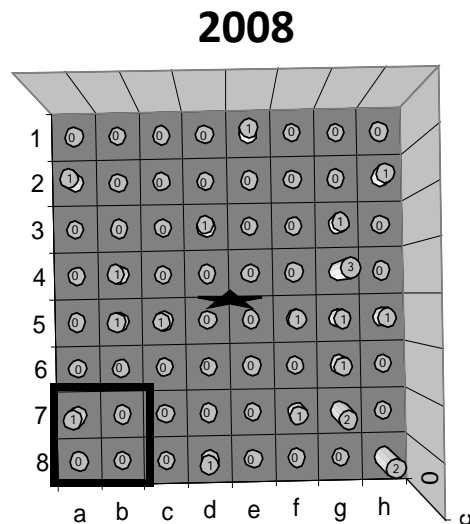
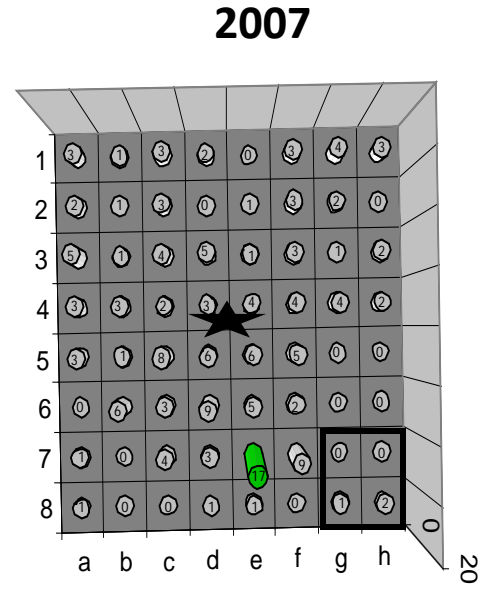
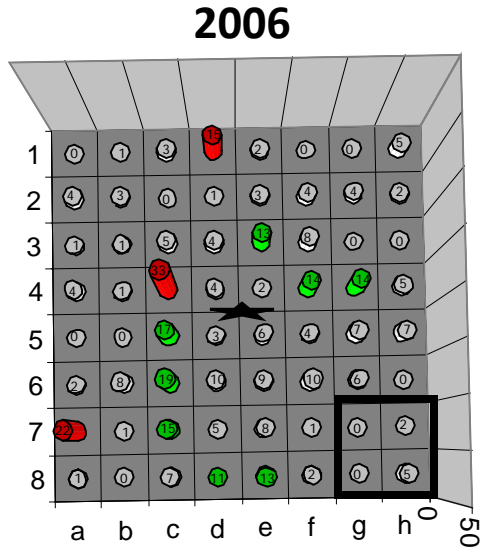
TOTAL STEM DENSITY IN A 16 m<sup>2</sup> PLOT



○	0 to 10 stems
●	11 to 20 stems
●	21 plus stems
★	Initial Point of Release (POR)
□	Area of 1m <sup>2</sup>

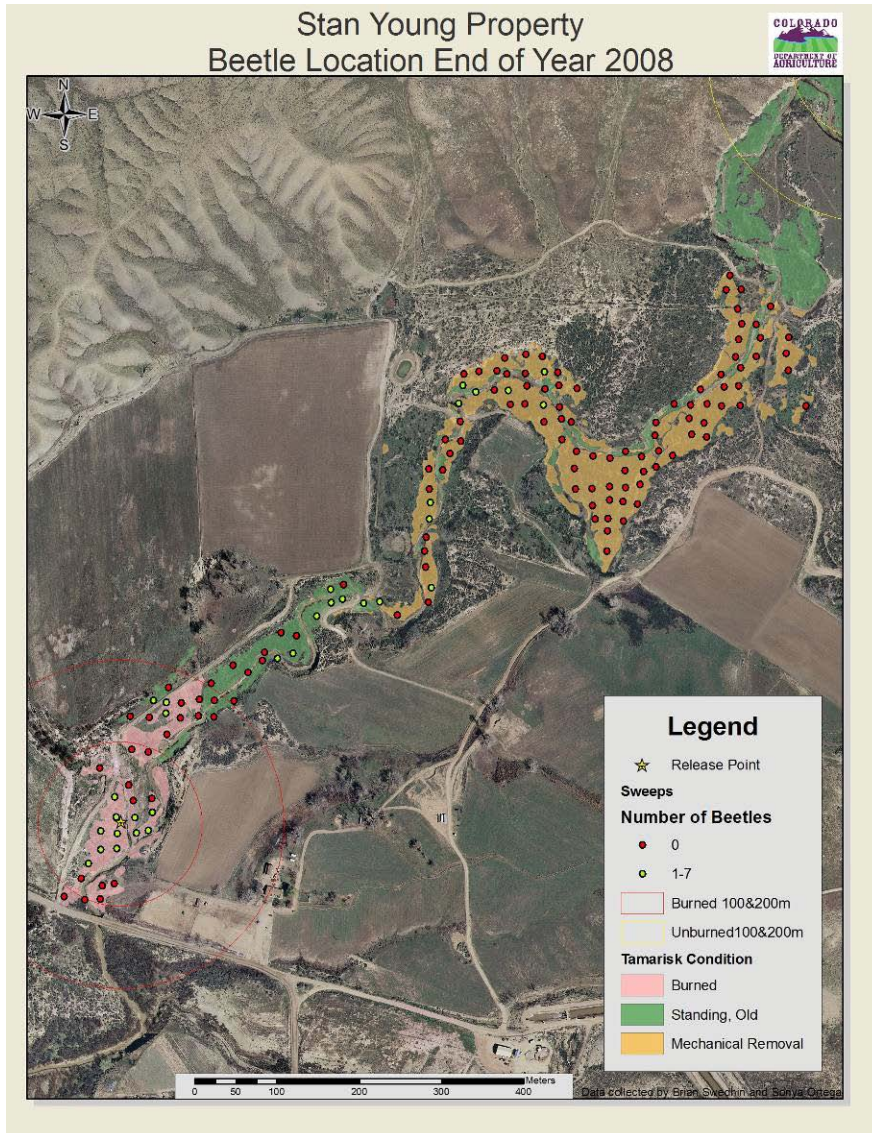
APPENDIX : Example 3-D graph generated from stem counts at a weevil (*Mecinus janthinus*) release site at time zero.

### FLOWER STEM DENSITY IN A 16 m<sup>2</sup> PLOT

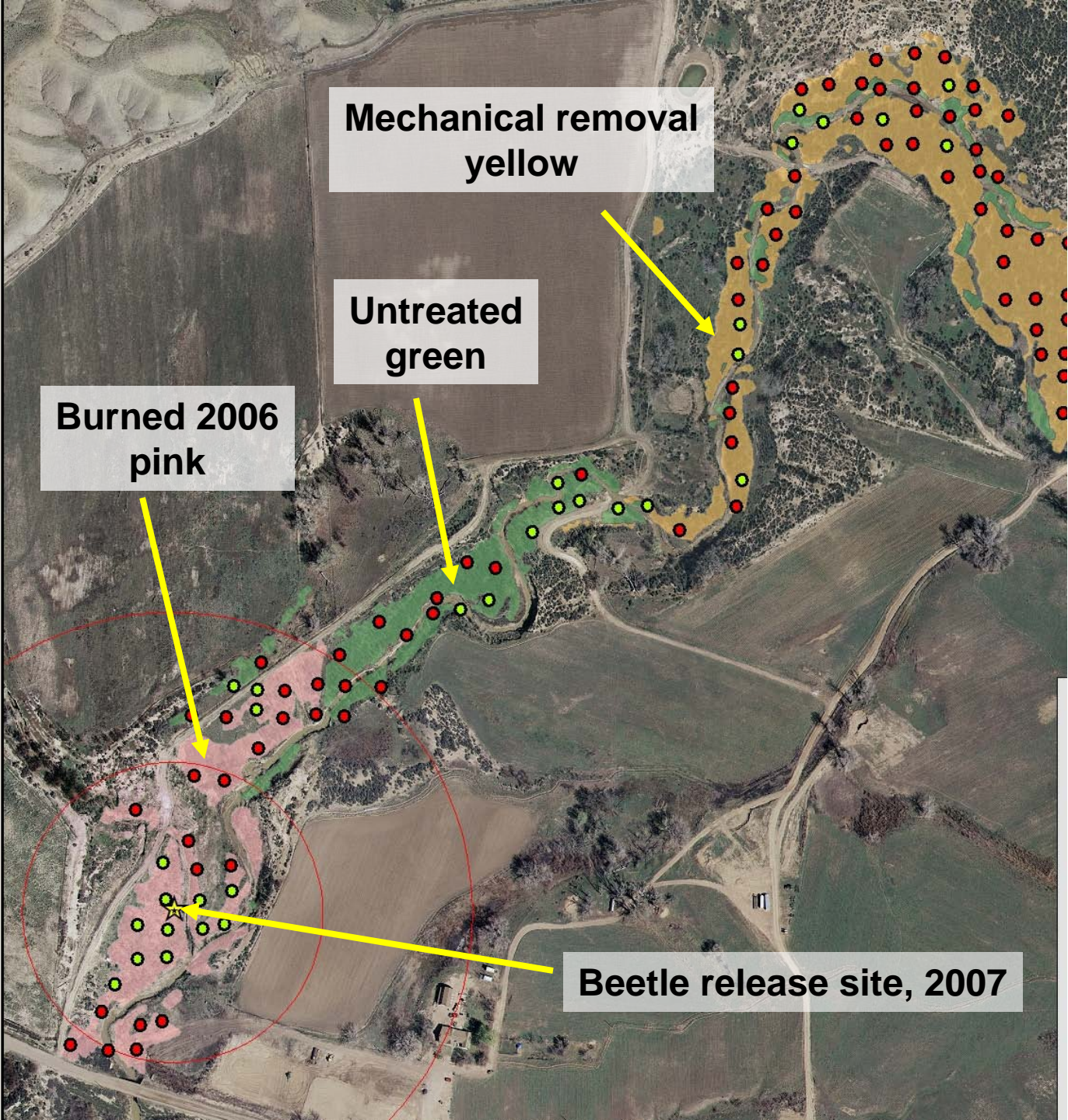


	<b>0 to 10 stems</b>
	<b>11 to 20 stems</b>
	<b>21 plus stems</b>
	<b>Initial Point of Release (POR)</b>
	<b>Area of 1m<sup>2</sup></b>

# Provide Educational Materials Demonstration Projects



Tamarisk removal, biological control and revegetation project (NRCS funded)



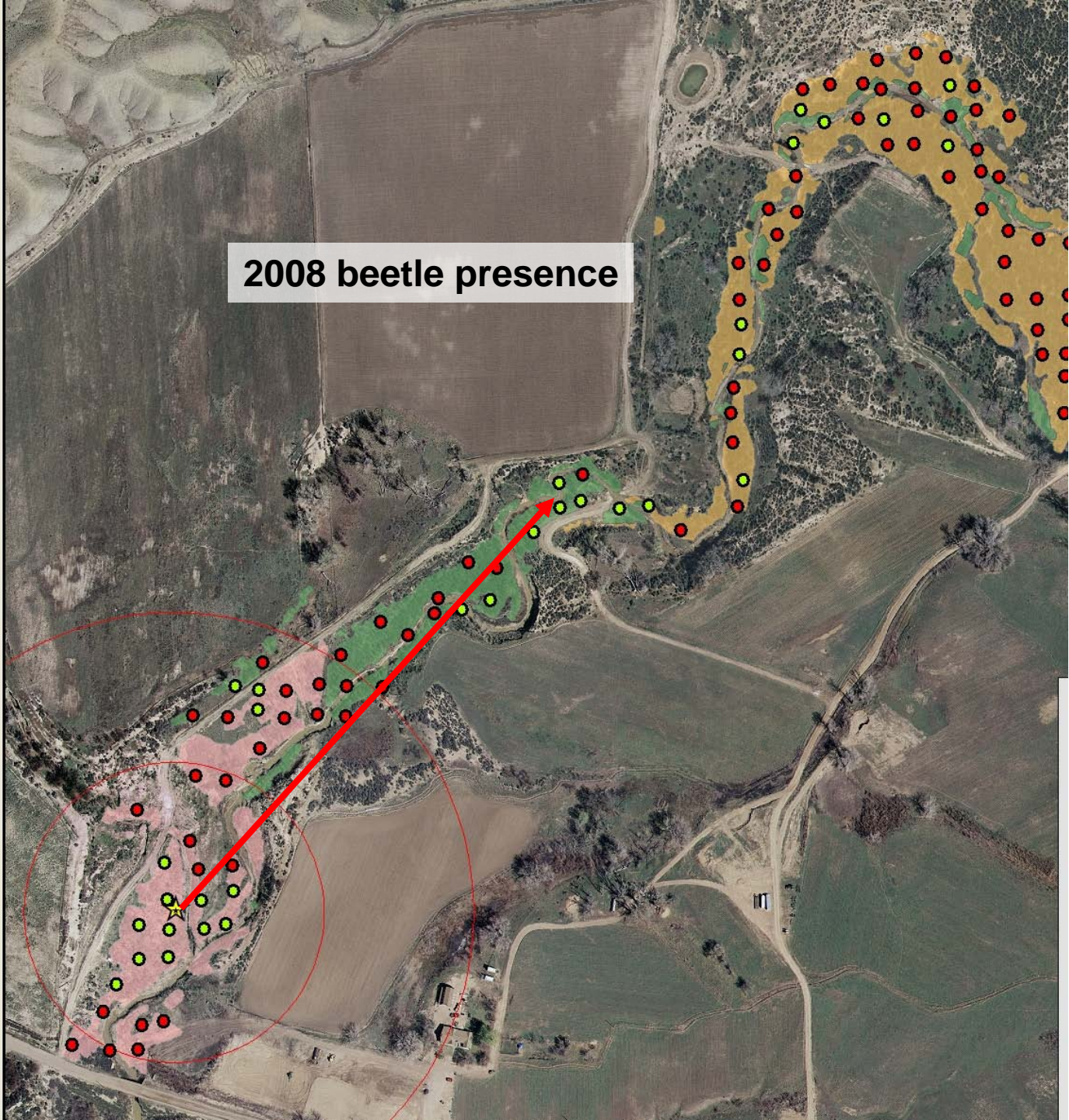
**Mechanical removal  
yellow**

**Untreated  
green**

**Burned 2006  
pink**

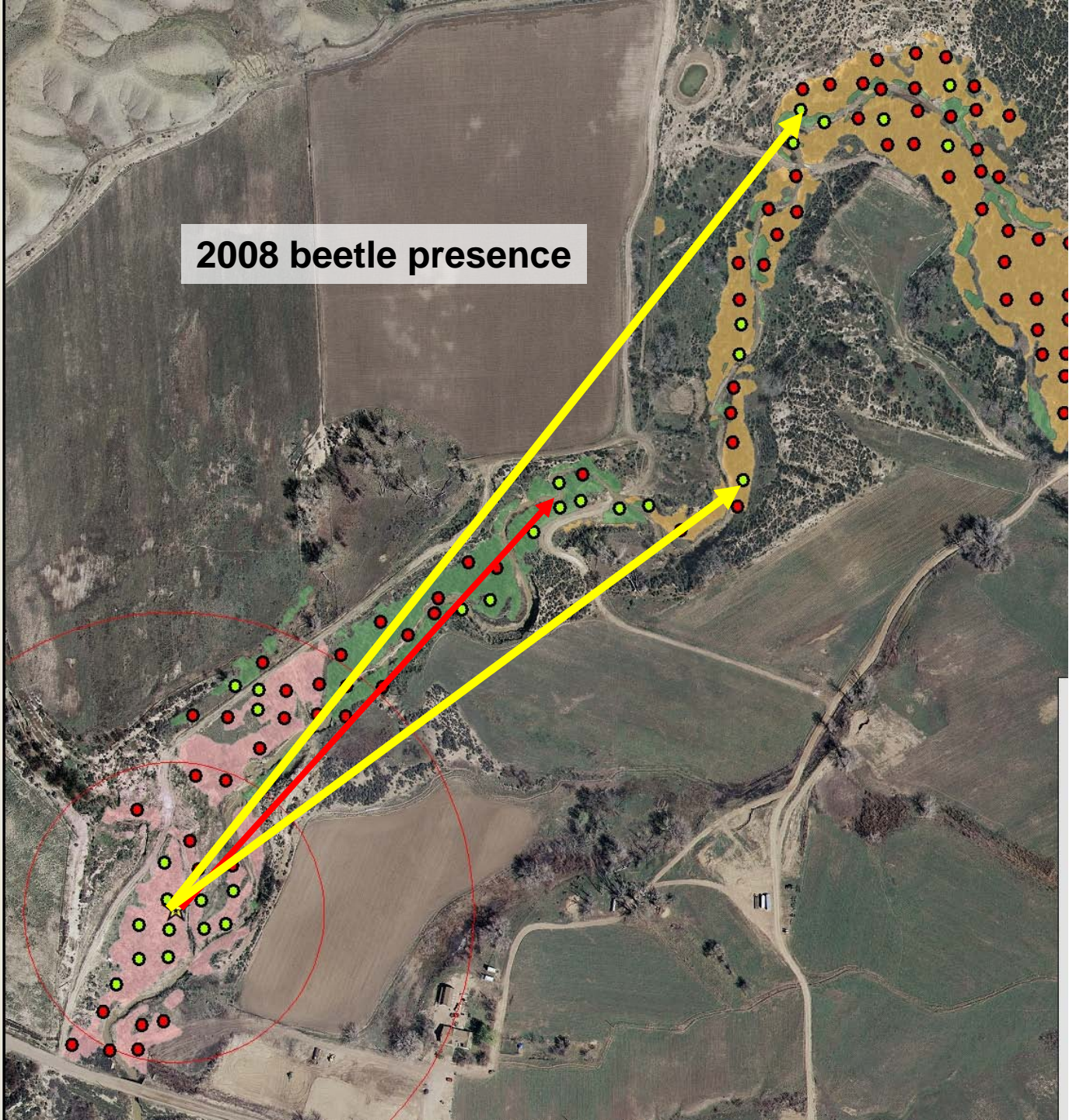
**Beetle release site, 2007**

2008 beetle presence



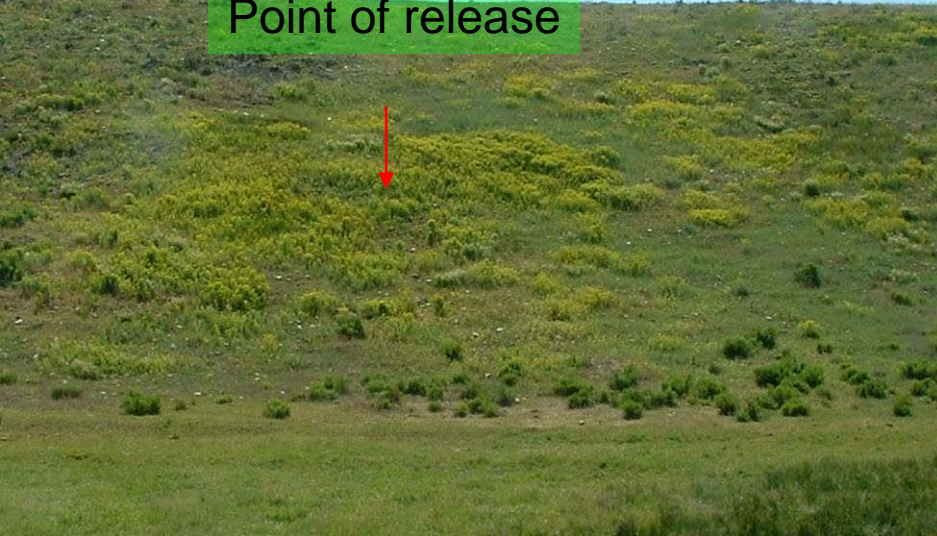


2008 beetle presence





Point of release



2007



2008

Flea beetles were introduced at this demonstration site near Meeker, CO, in 2006. Their population increased in 2007 and a very noticeable and measurable “hole” was seen in the leafy spurge infestation in 2008. We expect this “hole” to expand in 2009, hopefully to take out most of the spurge on this hillside.

# What's wrong with these pictures?



# What's wrong with these pictures?



Russian knapweed



Russian olive

Dan Nees

Colleen Jandreau

Andrea Judson

Terri Locke

Nina Louden

Sonya Ortega

Levi Jamison

Brian Swedhin



