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Animal and Plant Health Inspection Service

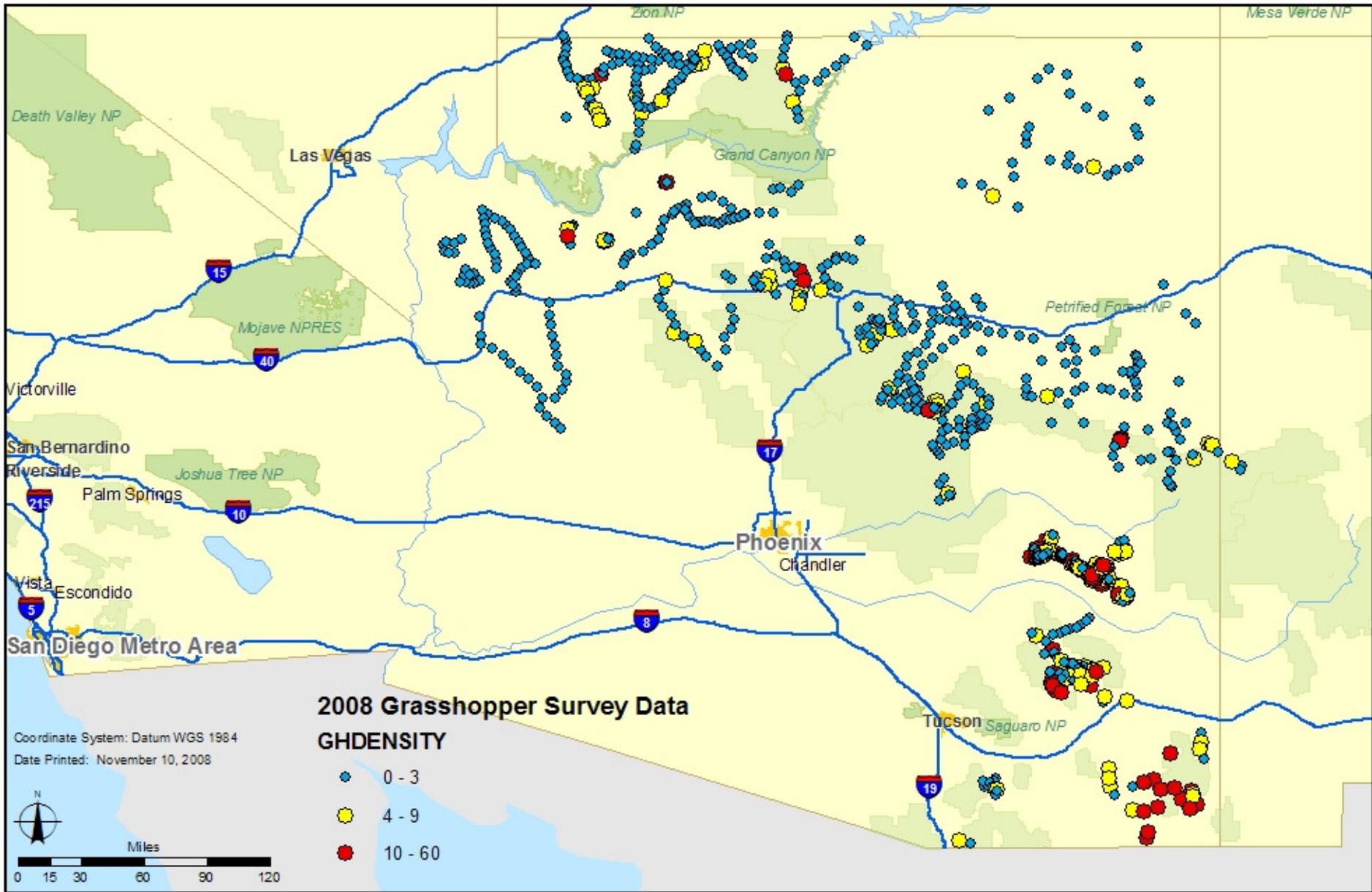
Plant Protection and Quarantine



APHIS Programs in Arizona

- Rangeland Grasshopper and Mormon Cricket Suppression Program
- Biological Control Programs

2008 Rangeland Grasshopper Program





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2008 Rangeland Grasshopper Program

Land Owner	Acres Surveyed	# of Surveys	Max # gh/sqyd
FS	110,720	173	35
BLM	90,880	142	12
Tribal Lands	193,280	302	60
NPS	3,200	5	1
State	66,560	104	25
Private	119,040	186	25
TOTAL	585,600	915	



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Suppression Program Summary

- Five Treatment Programs
 - San Carlos Apache Nation (R-100 Tribal Ranch)
 - Actual Acres Treated – 1,232
 - Protected Acres – 3,360

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Biological Control Programs in Arizona



Dewey W. Murray

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06.22.2005 10:40
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Special Acknowledgements

- Coconino NF
 - Laura Moser, Debra Crisp, Barb Phillips
- Kaibab NF
 - Karlynn Hurling, Clare Haydock
- Prescott NF
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 - Paul Bruceman
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 - Scott Harger
- City of Flagstaff
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- APHIS
 - Arizona
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 - Colorado
 - Rich Hansen
 - Washington
 - George Bruno, Larry Skillestad, Deborah Jepson, Mark Batchelor, Jordan Krug
 - Montana
 - Gary Adams, Joe Merenz



Cooperators with APHIS Biocontrol Programs

- **Giant Salvinia**
 - Quechan Tribe -- Lower Colorado River Giant Salvinia Taskforce
 - BLM
 - BOR
 - Fish & Wildlife Service
 - State of Arizona & California Governments
 - County Governments

- **Dalmatian Toadflax**
 - Coconino National Forest -- San Francisco Peaks Weed Management Area
 - Prescott National Forest
 - Kaibab National Forest

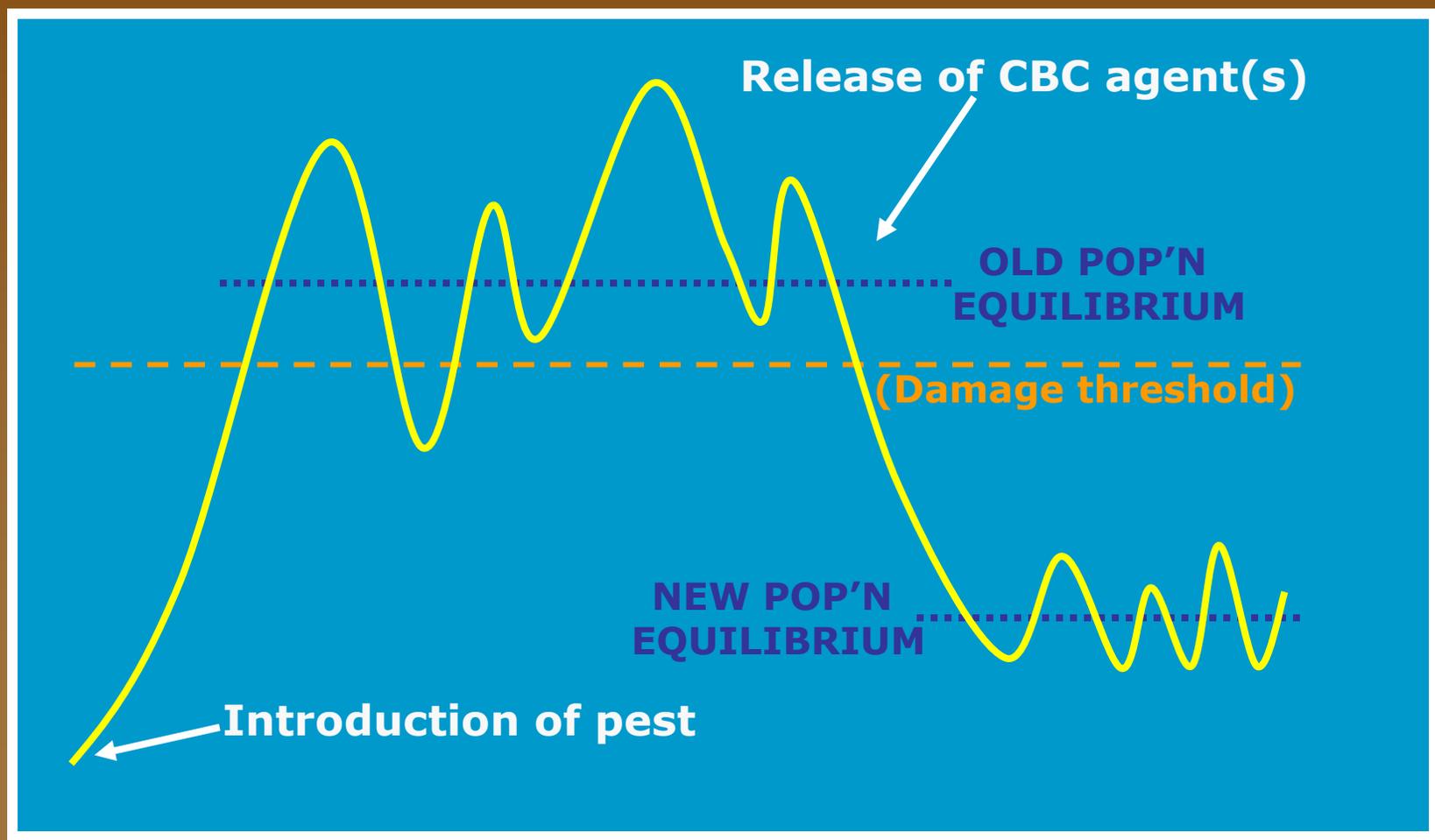
- **Diffused & Spotted Knapweed**
 - Coconino National Forest -- San Francisco Peaks Weed Management Area
 - Kaibab National Forest
 - City of Flagstaff
 - San Carlos Apache Nation

- **Yellow Starthistle**
 - City of Flagstaff -- San Francisco Peaks Weed Management Area
 - Coconino National Forest



Classical biological control

Weed population/impacts



Time

(from Hansen 2007, USDA, APHIS, CPHST)



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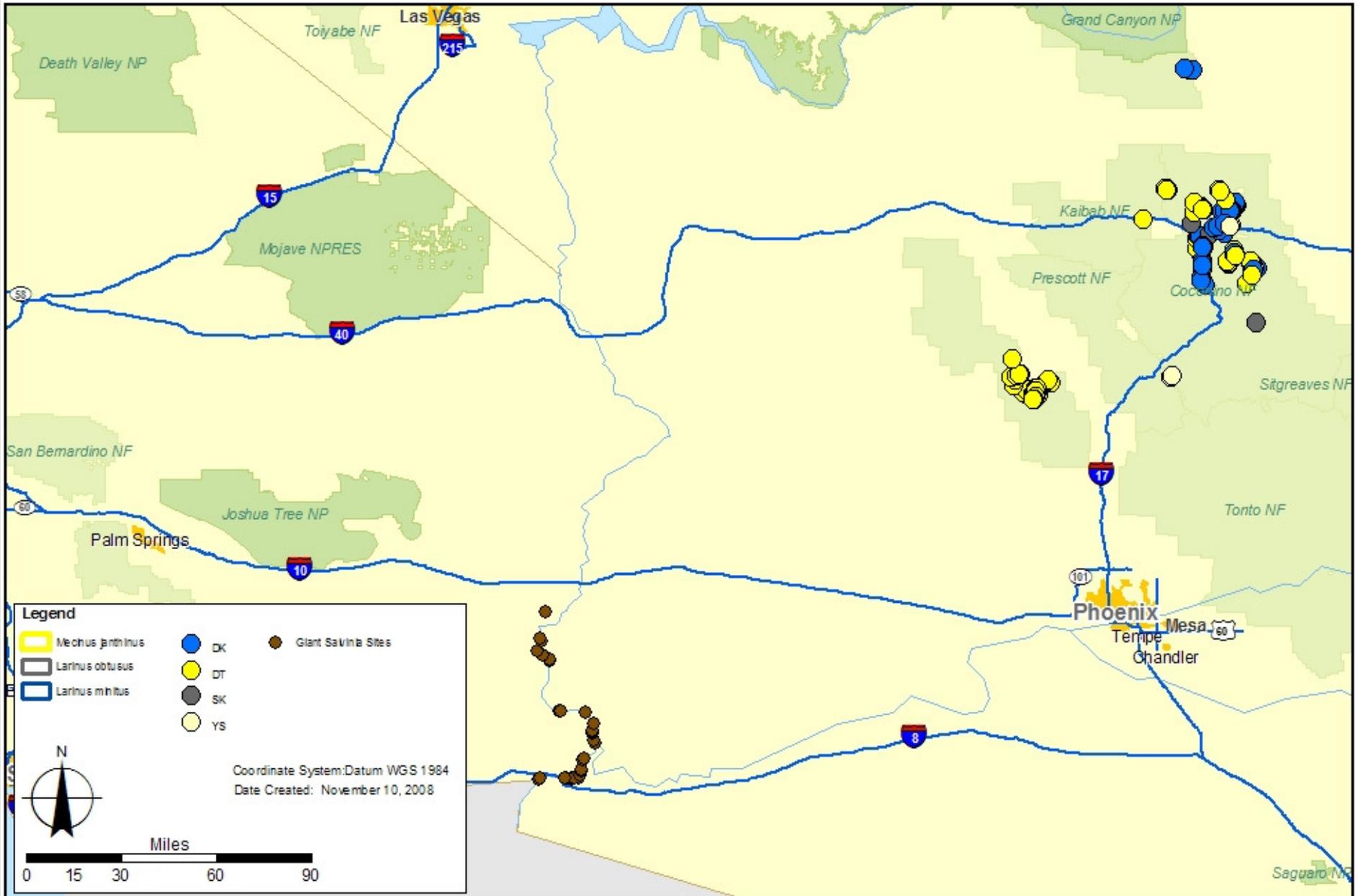
“Success” in biocontrol projects

- **Recovery** – successful collection of CBC agents after release
- **Establishment** – permanent occurrence of CBC agents after release, without additional intervention
- **Partial control** – some impact; other control tactics necessary
- **Substantial control** – major impact; other control tactics used but have a reduced role
- **Complete control** – major impact; no other control tactics needed in area of biocontrol agent release



- Active Programs in Arizona:
 - Giant Salvinia
 - Dalmatian Toadflax
 - Yellow Starthistle
 - Diffused Knapweed
 - Spotted Knapweed
- Potential Programs:
 - Leafy Spurge
 - Question on host specificity of native spurges

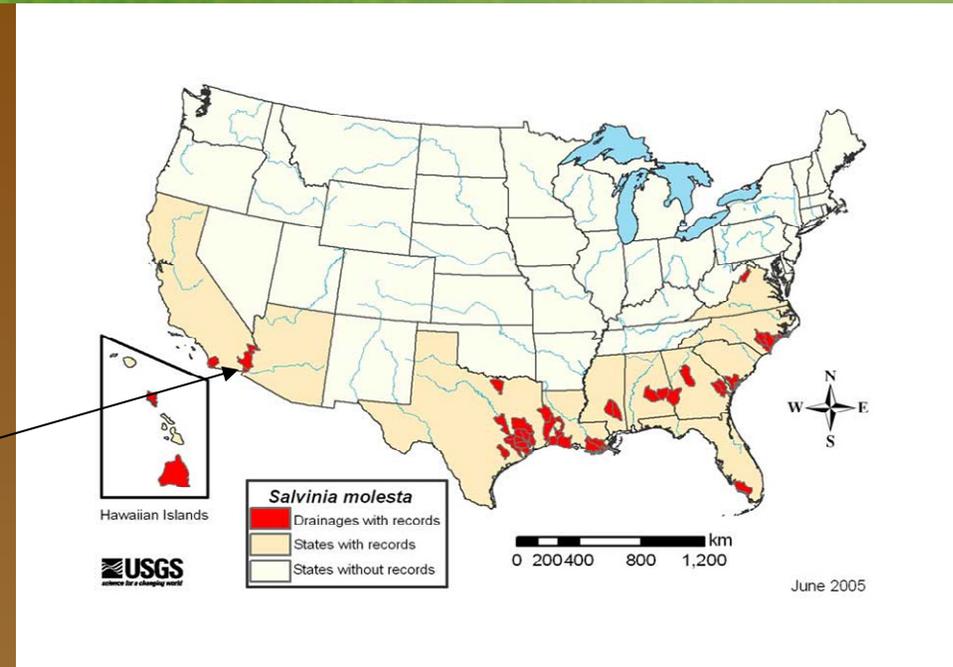
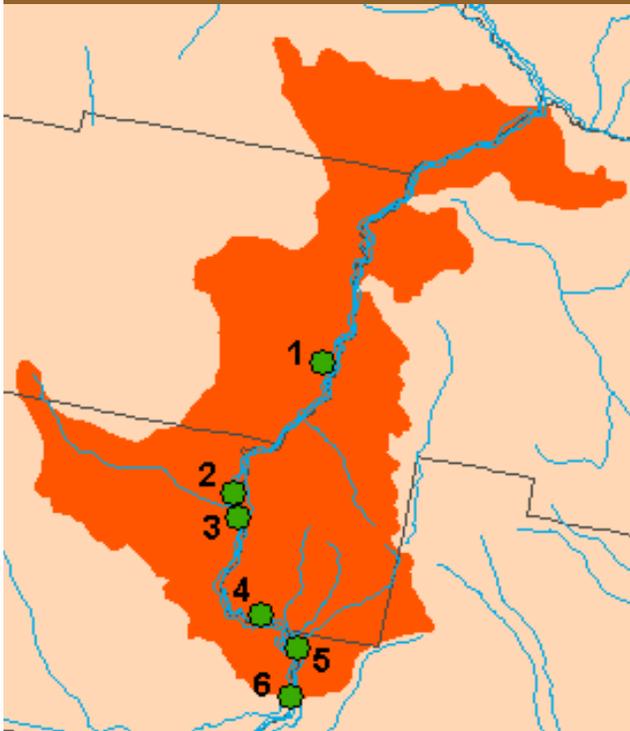
Biocontrol Programs in Arizona



Giant Salvinia

Salvinia molesta

- Introduced into the Lower Colorado River near Blythe, CA



Imperial Co. / Riverside Co., CA

- 1) Palo Verde Irrigation Drain, from Blythe to Walters camp.

Imperial Co., CA

- 2) Old Colorado River channel.
- 3) Three Fingers Lake.
- 4) Colorado River, from the Old River channel to Imperial Dam.
- 6) Imperial Dam.

Yuma Co., AZ

- 5) Imperial National Wildlife Refuge, Colorado River to Mexican Border.



APHIS's Goal

- Release salvinia weevil *Cyrtobagous salvinia*
- Establish insectaries for future distribution
 - 4 insectaries in Arizona
 - 4 insectaries in California



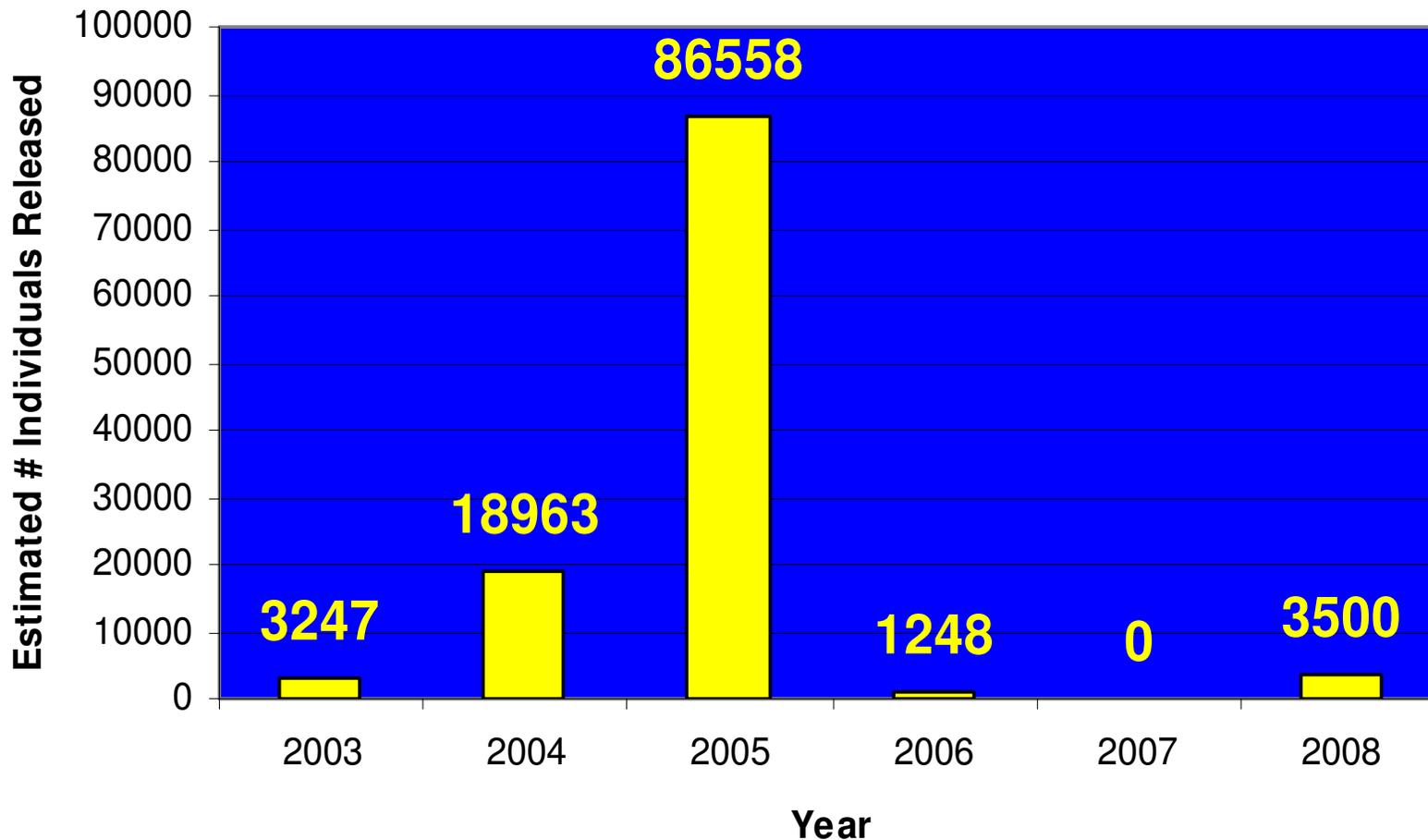


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Annual Totals of *Cyrtobagous salvinia* Released on the Lower Colorado River



River mile 33 August of 2004.



August 2007



River mile 33 in summer of 2005.

Salvinia population infested with *Cyrtobagous salvinia*. Notice the brown coloration from decaying plant biomass.

August 2007

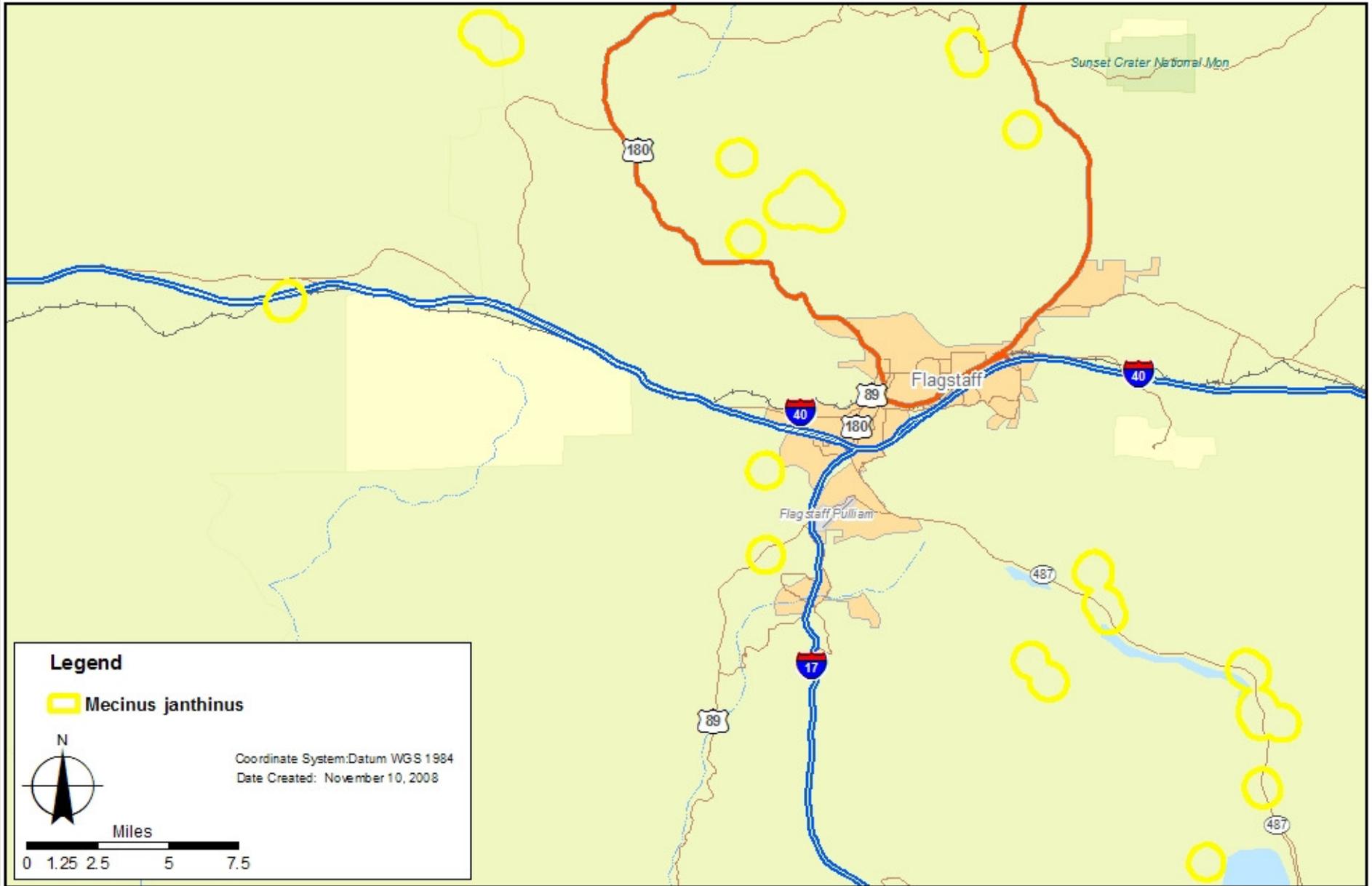


August 2004

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Dalmatian Toadflax Biocontrol Program Distribution of *Mecinus janthinus*





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Dalmatian Toadflax

Control Agents- *Mecinus janthinus*

2005

- CNF 4,000 agents

2006 (25,310 agents)

- CNF 19,950 agents
- PNF 13,860 agents
- KNF 4,000 agents

2007 (15,085 agents)

- CNF 6,840 agents
- PNF 6,720 agents
- KNF 1,525 agents

2008 (11,025 agents)

- CNF 9,025 agents
- KNF 2,500 agents



(Photo by Bob Richard, USDA, APHIS, PPQ)

Control Agent *Mecinus janthinus* Stem mining weevil

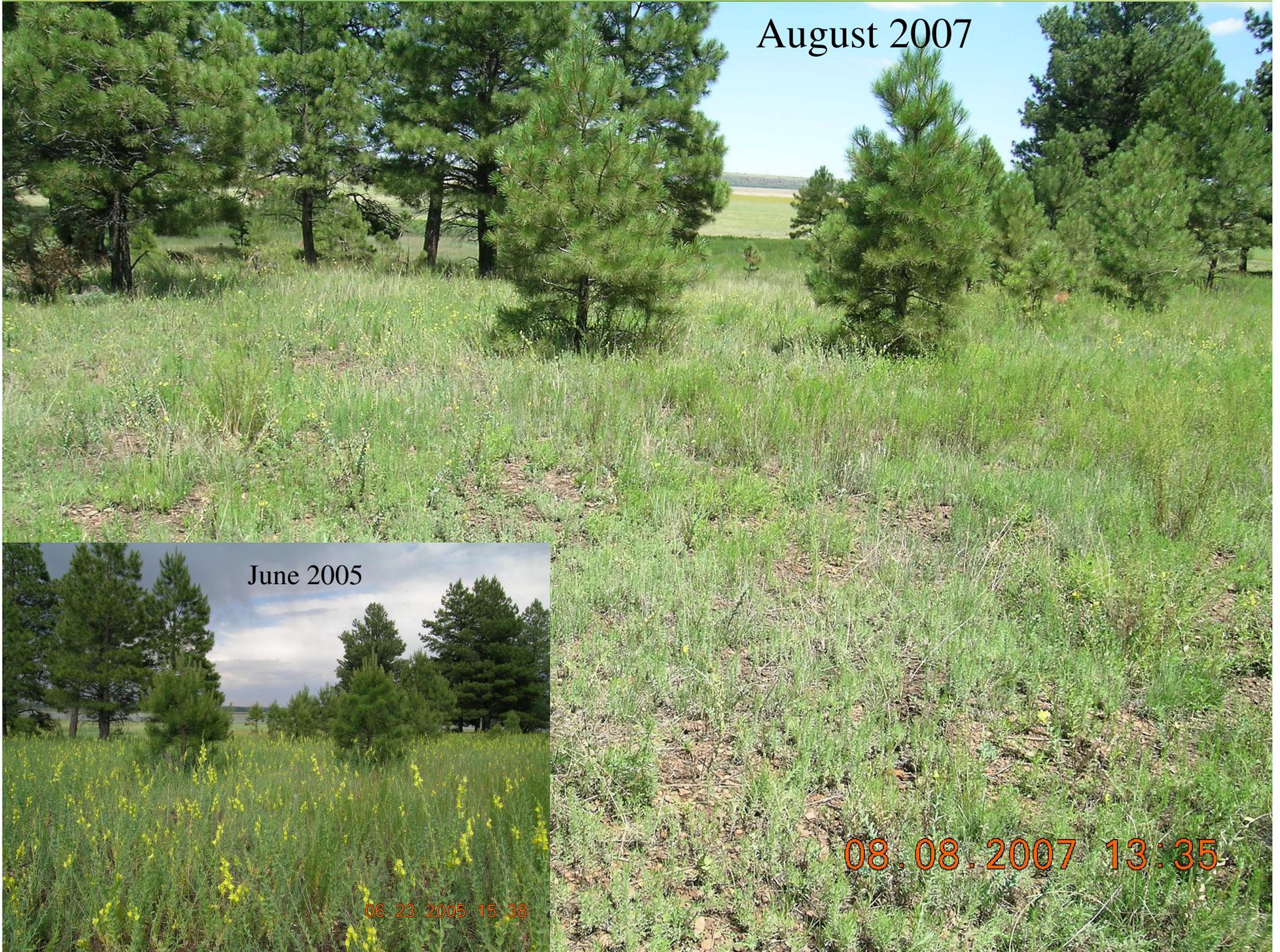
- Primary damage caused from feeding of larvae
- Secondary damage caused from adults feeding on young shoots



(Photo by Bob Richard, USDA, APHIS, PPQ)



(Photo by Rich Hansen, USDA, APHIS, PPQ)



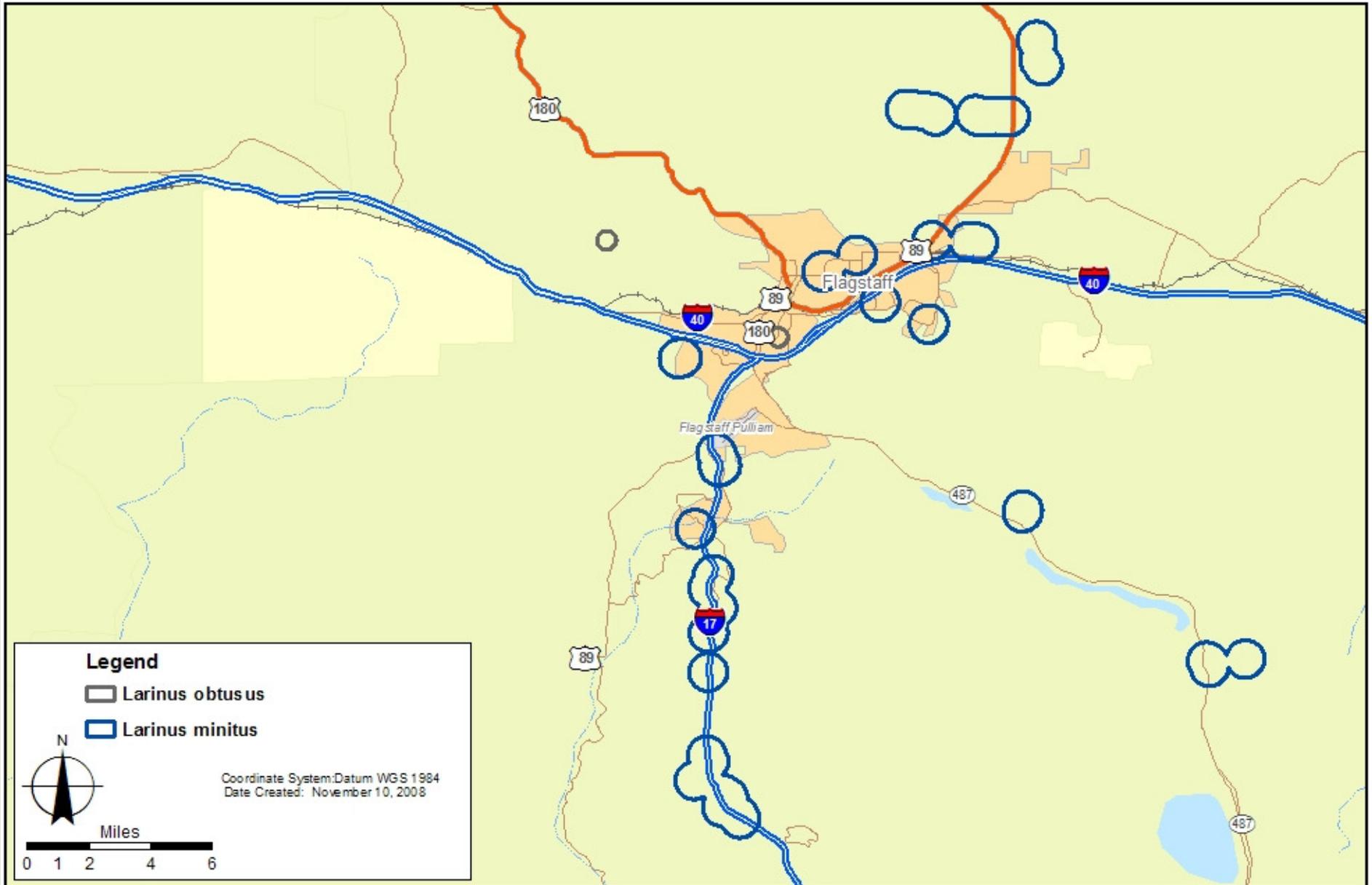
August 2007

June 2005

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Diffused Knapweed Biocontrol Program Distribution of *Larius minutus*





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Diffuse & Spotted Knapweed

- *Larinus minutus* releases
 - 2005 19,420 lami
 - 2006 2,000 lami
 - 2007 10,500 lami
 - 2,000 collected from release sites
 - 2008
 - 4,500 collected from release sites
- Control Agents
 - *Cyphocleonus achates* Knapweed root weevil
 - *Bangasternus fausti* Broad-nosed seed head weevil
 - *Larinus obtusus* Blunt knapweed flower weevil
 - *Larinus minutus* Lesser knapweed flower weevil

Seedhead weevil (*Larinus minutus*) adult



July 2005

07.07.2005 13:18



July 2007

07.31.2007 07:20













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Leafy Spurge Host Specificity Test

- 2008
 - 3 cage release sites
 - Leafy Spurge Flea beetle , *Aphthona nigriscutis*
 - 1 cage native spurge *Euphorbia chamaesula* - 200 *Aphthona* beetles
 - 1 cage native spurge *Euphorbia brachycera* – 200 *Aphthona* beetles
 - 1 cage leafy spurge *Euphorbia esula* – 200 *Aphthona* beetles















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