

**Project Title:**

Developing a GIS Based Mapping Tool for Noxious Weeds in Southeastern Arizona

**Project Leader:**

Kim McReynolds, Area Extension Agent, Natural Resources; Cochise, Graham and Greenlee Counties; Co-Chair, Southeastern Arizona Weed Management Area

**Team Members:**

Theresa Crimmins, Research Specialist, Office of Arid Land Studies  
 Eddie Foster, Soil Conservationist, Natural Resources Conservation Service  
 Members of the Southeastern Arizona Weed Management Area (WMA)

**Location:**

Cochise, Graham and Greenlee Counties

**Critical Issue/situation to be addressed:**

The spread of noxious weeds on public, state trust and private lands continues to be of great concern in southeastern Arizona. Known infestations of several species have been noticeably spreading over the last five years. Noxious weeds species that have been sited in southeastern Arizona are contained in Table 1. There are undoubtedly more infestations that we do not currently know about. In addition, a substantial amount of previously unknown infestations were detected in 2007.

Table 1. Noxious Weed Species Found in Southeastern Arizona by County.

	Cochise	Graham	Greenlee
Russian knapweed	X		X
Malta starthistle	X	X	X
Yellow starthistle	?		X
Onionweed	X		X
Whitetop			X
Sweet resinbush		X	
Saharan mustard	X	X	
Bufflegrass <sup>1</sup>		X	

? means that there has been a report, but it has not been confirmed.

<sup>1</sup> ADOT found and treated one plant along HWY 191 in 2007.

An interagency team has been aggressively addressing step one in the Integrated Weed Management process – Education and Awareness. The team consists of Cooperative Extension, Natural Resources Conservation Service, Arizona Department of Transportation and a private weed consultant. Ten workshops and presentations have been held in Cochise, Graham and Greenlee counties during the last several years. Audiences have included local Natural Resource Conservation Districts, county and state road maintenance workers, watershed associations, a Master Gardener class, Master Watershed Steward classes, and agricultural producers. In addition, presentations to county supervisors were given in these three counties during 2003.

Step two, Prevention and Early Detection, is ongoing among individuals in agencies and institutions concerned about noxious weeds and their spread. Inventory and Mapping – Step 3 – is the next step that needs to occur in southeastern Arizona.

The intent of this project proposal is to begin addressing the lack of coordinated inventory and mapping associated with noxious weeds in the three county area. The project team plans to use the "Geospatial Tool Kit for Field Mapping." The Geospatial Extension programs in Utah and Arizona have brought imagery, GPS and GIS together into one turn-key, field-based, decision support solution, a Geospatial Tool Kit [a Pocket-PC PDA, an inexpensive WAAS-GPS, NASA satellite imagery and/or USGS air photos and topography maps through TerraServer, and simple GIS software (HGIS)], that end users can both obtain and use with relative ease. These tool kits have been field tested and are being successfully used by others in Arizona. Grant funding was secured in 2006 to purchase four geospatial kits for mapping and two additional were funded from local sources. Six members of the WMA were trained by Barron Orr in 2007 to use the equipment and software.

While some of the infestations have been documented using GPS and/or GIS technologies, the data sits in a variety of locations with federal and state agencies, as well as Cooperative Extension. There is a need to consolidate the data into one data base and give us the ability to map and measure current and future infestations. Individuals from the WMA either lack the skills or time to devote to setting up a central system.

Our proposal: Setting up and documenting procedures for downloading, managing, and analyzing noxious weed plant locations and distribution data. We desire the capability to produce print-quality maps by species, to compare species distribution and location change from one season/year to the next, and to summarize infestations by area. The procedures to perform these operations will be documented for both Desktop HGIS and ArcGIS 9.x.

#### **National IPM Program Goals:**

All three National IPM Program environments are involved with this project, i.e., Russian knapweed is found in alfalfa and irrigated livestock pastures, in the Gila River, along county roads, and on residential property in Greenlee County. Survey and mapping are early steps leading toward meeting national goals for control using IPM.

#### **IPM Coordinating Committee Priorities:**

- *2006 Arizona Pest Management Center Summit* - 1) Develop a statewide mapping and distribution database. (This project could contribute to this.), 2) Increase public awareness of, and provide education about, pest plants.
- Projects that will enhance noxious or invasive integrated weed management efforts in the state, particularly those that will increase communication and efficiency among partner organizations involved in weed management and increase our ability to respond to new threats.

#### **Inputs:**

##### Time

Salary for Theresa Crimmins to set up and document procedures and inputs in HGIS/ArcGIS  
McReynolds and Foster time to maintain data base  
Members of the Southeastern Arizona Weed Management Area will do field mapping

##### Equipment

6 Geospatial Tool Kits for mapping (Includes HGIS software)  
Computer with Desktop HGIS and ArcGIS (McReynolds)  
Plotter (NRCS office)

**Outputs:**

1. Gather and input existing shape files for entry into the system from known mapping efforts in the three county area. Known sources include: Cooperative Extension, Natural Resources Conservation Service, USDA Animal and Plant Health Inspection Service, Bureau of Land Management and Arizona Department of Transportation.
2. Continue field surveys and mapping of newly located infestations.
3. Develop program and templates for data entry and produce documented procedures.
4. Produce maps by region, county and species with accompanying acreage for each species.
5. Use maps in community presentations and in reports to County Supervisors to raise awareness and knowledge of noxious weeds. One presentation/workshop will be held in each county.
6. Work with clientele/cooperators to prioritize infestations for treatment.

Expected outcomes and impacts

**Short:** 50 people will increase their knowledge of noxious weeds in their local area and the threat that weeds pose.

**Medium:** Reduction in acreage of noxious weed infestation.

**Long:** Rapid response in control of new infestations as they are discovered.

**Plan for Evaluation:**

1. Number of acres of noxious weed infestation. This will be obtained from the mapping system (currently none).
2. Increase in knowledge about noxious weeds (post workshop evaluation).

**Budget:**

	<u>IPM Funds Requested</u>	<u>Other</u>
Research Specialist, Sr (40 hours)	\$1,500	
Geospatial toolkits		\$7,500