

# The Contribution of Geospatial Technologies to Buffelgrass Detection and Control at the Santa Rita Experimental Range

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## Problem:

Approximately 1100 acres now support buffelgrass (*Pennisetum ciliare*). This area includes > 400 separate patches of buffelgrass ranging in size from 1 plant to >30 acres. Widely dispersed, discrete populations exist over the large extent of the Santa Rita Experimental Range (SRER). The imminent fire danger and the rapid rate of increase of buffelgrass on the SRER pose a certain urgency for both management and control.



## Detection: (March 2007)

- Initial mapping done with Geospatial Toolkit
- Volunteers split up into groups, traveling by both foot and vehicle
- Using the GTK, both spatial information and attribute data were collected

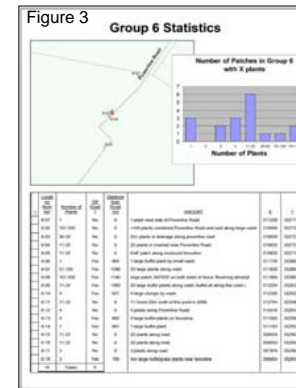
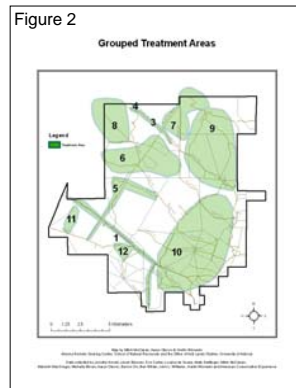
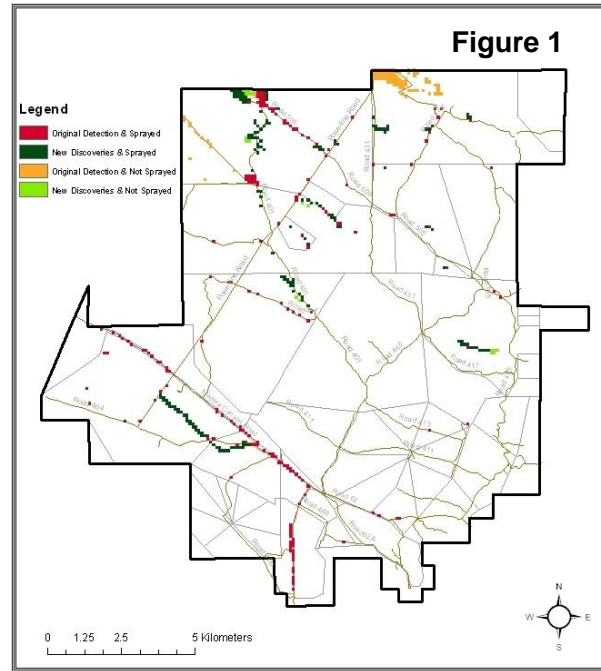


The Geospatial Toolkit (GTK) includes a Garmin GPS Map 60, iPAQ handheld computer, HGIS mapping software, and satellite imagery acquired through [www.terraserver-usa.com](http://www.terraserver-usa.com)



## Strategic Planning:

- Buffelgrass locations grouped and organized into 12 treatment areas
- Packets with detailed maps of the treatment areas and attribute data for each patch (Figures 2 & 3)
- GTKs prepped with shapefiles of buffelgrass locations, treatment areas and new templates to record newly discovered buffelgrass locations and treatment attribute information
- Plan to concentrate efforts on spraying satellite populations to control buffelgrass populations through a strategy of containment

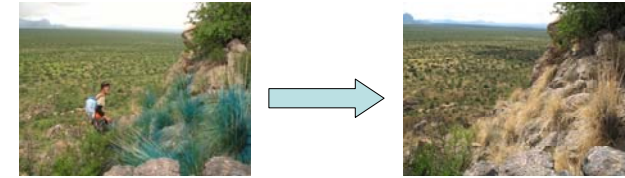


## Control Program (August 2007):

- 12 backpacks filled with 2% glyphosate
- 12 crew members from American Conservation Experience + volunteers and UA participants
- 4 vehicles + "Sergeant Cook" used for transporting sprayers and herbicide
- GTK units loaded with point spatial and attribute data
- Crew divided into 3-4 person teams and systematically sent to grouped treatment areas for herbicidal application

## Accomplishments:

Original Detection & Sprayed: 141.40 acres  
 New Discoveries & Sprayed: 161.80 acres  
 Original Detection & Not sprayed: 111.80 acres  
 New Discoveries & Not sprayed: 16.75 acres  
 Extent of work done in 4.5 days (Aug 2-7, 2007)



## Remap & Replan:

- During August spraying, new populations were mapped and some previously known populations were found beyond initial extent (Figure 1)
- GIS is easy to update
- As new data is collected and acquired the database grows in both size and need for action and resources
- New plans for mapping include a stratified sampling of washes on the SRER

## Conclusions:

- Matching invasive species management with GPS/GIS leads to an effective and efficient treatment strategy
- Utility of a comprehensive database for buffelgrass distribution and intensity is widespread
- GTK allows for simultaneously collection of spatial and attribute data



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