

Geospatial Collaboration

Geospatial Collaboration for Buffelgrass Control on the Santa Rita Experimental Range

Aaryn Olsson¹, Kristin Wisneski¹, Mitch McClaran²

¹ Arizona Remote Sensing Center, Office of Arid Lands Studies, University of Arizona
² School of Natural Resources, University of Arizona

Abstract

Exotic plant invasions have become a problem for land managers worldwide, yet there are very few success stories for control and management of invasive species. Frequently, invasions are poorly documented in their early stages and poorly managed across jurisdictional boundaries. Here, we present a collaborative framework for training, mapping, planning, and treating exotic plant invasions. The Santa Rita Experimental Range (SRER), encompassing 53,000 acres, is being invaded by buffelgrass (*Pennisetum ciliare*). Mapping is key to every aspect of invasive species control: from assessment to treatment to monitoring, but knowledge of mapping technology and protocols vary significantly across jurisdictional boundaries. Bootstrapping mapping skills and integrating methods from each stakeholder stakeholder through interactive group training exercises instills a common sense of purpose and shared techniques.

Recognition

Buffelgrass (*Pennisetum ciliare*) was intentionally planted on the SRER in the 1940s, but early plantings failed. Subsequent introductions elsewhere in southern Arizona took firmly: buffelgrass became widely naturalized, and quietly became a ubiquitous invader. It wasn't until the late 1990s that buffelgrass was widely recognized as invasive, and only in 2006 did buffelgrass appear to be a problem on the SRER.



Training

Agencies throughout southern Arizona are interested in invasive species mapping, but capacity for mapping is lacking. The Geospatial Extension



Program at the University of Arizona held a geospatial technology training event that doubled as a mapping event on the SRER for a number of agencies. The training featured the Geospatial Toolkit, or GTK, for integrating GPS and GIS



Mapping

The geospatial toolkit training led directly into mapping on the SRER. For the second half of Day 1, three teams of 3 drove most major roads on the SRER, mapping infestations along the way. On Day 2, three teams mapped "hot spots" based on Day 1 mapping results. During the spring, Dr. Mitch McClaran opportunistically mapped buffelgrass while revisiting permanent transects. Later, unfinished roads were mapped for buffelgrass. The data was processed at the Arizona Remote Sensing Center (ARSC).



Planning



The buffelgrass maps were used to generate estimates of total acreage in order to secure treatment funds. Infestations were divided into 12 geographically distinct groups and a team of 11 from American Conservation Experience was hired to do the treatments. Teams of five included a driver, a navigator, and three sprayers. Statistics were generated for the geographic buffelgrass groups to aid in-the-field estimates of workload. Each team would be responsible for treating a single group at a time.

Treatment

For six days, teams of three to five used the mapped data to identify work assignments while each team's navigator was responsible for locating the infestations, some of which were quite remote. During treatment, the navigator would record treatment and newly located infestations using the GTK. Data was post-processed at ARSC and will be used for future fundraising and long-term monitoring.



Geospatial Extension Program



Arizona Remote Sensing Center



NRC Natural Resources Conservation Service



Arizona Cooperative Extension



Clark University



Southwest Watershed Research Center Tucson, Arizona



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Time

Acknowledgements: Brian Aragon, Lisa Benton, Jacob Brenner, Michelle Cavanaugh, Don Carter, Locana de Souza, Tiernan Erickson, Yajaira Gray, Chris Hannum, Mark Heitinger, John L. Williams, Malcolm MacGregor, Cheryl McIntyre, Michelle Moran, Barron Orr, Ashley Shephard, Sarah Studd, Ben Wilder contributed in some way to the mapping component of the project; either as an initial mapper, by processing data at the ARSC lab, or as a navigator during treatment.