



Applied Spatial Data Collection Engages Tribal Youth in Conservation

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GIS Field Supervisor

- Conservation Legacy
- Southwest Conservation Corps
- Ancestral Lands

Southwest Conservation Corps enters its third season integrating spatial data collection into its programs.

Conducting invasive species mapping and vegetation community assessments using tablets and ArcCollector.

Tribal youth in the southwest have the opportunity to gain and apply skills in GIS and ecological data collection.

Invasive species removal and restoration crews are increasingly being trained in mapping achievements resulting in better representation of the conservation work completed.

Who We Are?

- Non-profit organizations
- Conservation Legacy started in 1998.
- Based on Franklin D. Roosevelt's New Deal to get America back into the working environment after the Great Depression
- Southwest Conservation Corps – Durango, CO
- Ancestral Lands (2008)- Gallup, NM
 - Other offices located in Acoma, Zuni, Hopi reservations.

Ancestral Lands- Gallup, NM

“Leading our Nations back to ecological and cultural well-being”

- Who do we hire?
 - Local Native youths and young adults.
 - Trainings in GIS, chainsaw, invasive removal, fencing, restoration. No need in prior experience, no education level.
 - GIS projects started 3 years ago.
 - Countless youth, young adults living within the region that wants to make a positive impact in their community-SCC, AL helps them by motivation, teaching a new skill, prepare them in a career.

Ancestral Lands- Gallup, NM

“Leading our Nations back to ecological and cultural well-being”

- GIS trainings also incorporates.
 - Mentorship and leadership.
 - Leave no trace.
 - To be better land stewardships.
 - Botany and plant identification.
 - Cultural awareness, preservation of lands.



GIS projects

- Partnered with the BIA, BOR, NPS, NPL
 - BIA-Western Navajo Agency-Invasive Weeds
Roadsides, stream corridors, rangelands
 - Ft Defiance Agency-Invasive Weeds
 - Navajo Partitioned Lands
- NPS-Invasive Weeds
 - Cataract Canyon
 - Glen Canyon and Canyonlands NP
- BOR-Veg. Monitoring
 - Navajo-Gallup water project- San Juan basin, CO to Gallup, NM and surrounding cities.

GIS projects- BIA, NPS, NPL

- Invasive weed inventory
 - Weed Management Plan-Natural Resources Dept.
 - Most recent data on invasive species from 2009
- Want kind of data?
 - Treatments effective?
 - Early detection
 - Future mitigation
 - Shapefiles, Maps, Reports.



GIS projects- BOR Navajo-Gallup Water Project

- Plant and Vegetation Monitoring
 - Both invasive and Native vegetation are inventoried for reclamation.
 - About 280 miles of water pipeline to provide water needs to AZ and New Mexico.



Materials

- Weed Inventory
 - Samsung Tablets with Collector app and Garmin GLO Bluetooth.
 - Hardcopy data of attributes of each weed species feature.



Along with ArcGIS desktop and online.



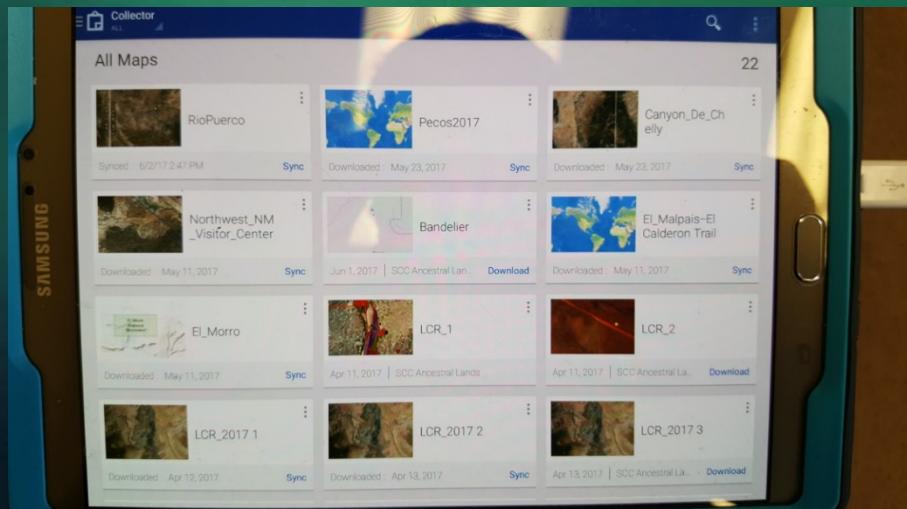
DataSheets

Site Name
Initials
Latitude
Longitude
Infestation ID
Latin Name
Common Name
Area (square meters)
Canopy Cover
Phenology
Plant height (ft)
Photo taken?
Collected?
Feature type
COMMENTS

- Example of the hard copy datasheet that is written alongside another person that's using Collector to record the same attributes of the weed species.
- Point, line, and Polygon is used based on the weed infestations.
- Protocols and mapping standards are used based on other invasive mapping procedures.

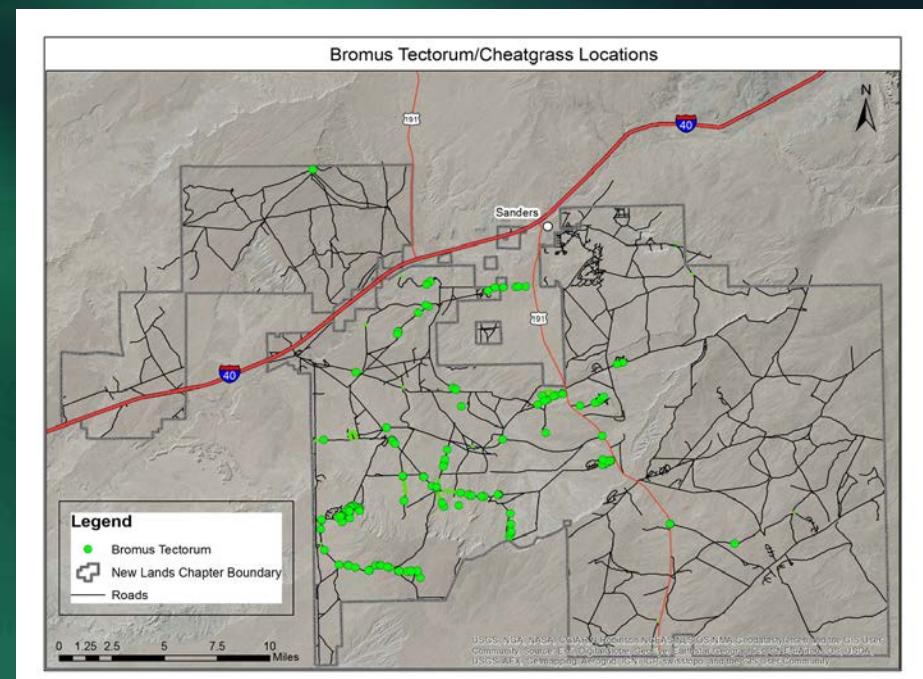
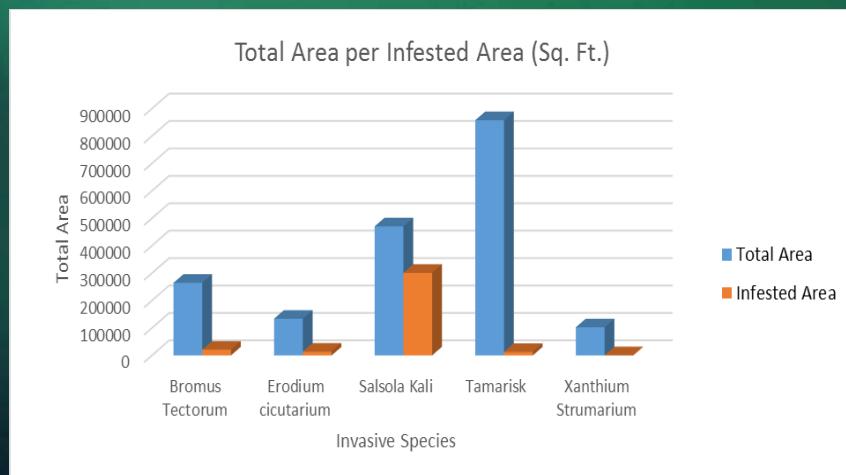
Post Process-After the Field.

- ✓ Sync all of our field collected data to ArcGIS online.
- ✓ The crew leaders and crew members correct attributes, edit features, fix lines, etc. if needed.
- ✓ In conjunction with the hardcopy datasheets each feature is looked over one at a time and edited if needed aka quality Control or QC.



Post Process-After the Field.

- Further editing is done using ArcGIS desktop by GIS staff.
 - Analysis, charts, graphs, most encountered species, maps, are created.
 - Final Reports



COMMON NAME	SPECIES
African rue	<i>Peganum harmala</i>
Blue mustard	<i>Chorispora tenella</i> (Pall.) DC.
Bull thistle	<i>Cirsium vulgare</i>
California burclover	<i>Medicago polymorpha</i>
Canada thistle	<i>Cirsium arvense</i>
Camelthorn	<i>Alhagi Camelorum</i>
Dalmatian toadflax	<i>Linaria dalmatica</i>
Field brome	<i>Bromus arvensis</i>
Cheatgrass	<i>Bromus Tectorum</i>
Horehound	<i>Marrubium vulgare</i>
Japanese brome	<i>Bromus japonicus</i>
Kochia	<i>Bassia scoparia</i>
Leafy spurge	<i>Euphorbia esula</i>
Musk thistle	<i>Carduus nutans</i>
Perennial pepperweed	<i>Lepidium latifolium</i>
Ravenna grass	<i>Saccharum ravennae</i>
Russian thistle	<i>Salsola kali</i>
Sahara mustard	<i>Brassica tournefortii</i>
Scotch thistle	<i>Onopordum acanthium</i>
Spotted knapweed	<i>Centaurea maculosa</i>
Squarrose knapweed	<i>Centaurea virgata</i>
Sulphur cinquefoil	<i>Potentilla rect L.</i>
Tall Whitetop	<i>Cardaria draba</i>
Tamarisk, Saltcedar	<i>Tamarix</i> spp., including hybrids
Tree of Heaven	<i>Ailanthus altissima</i>
Uruguayan pampas grass	<i>Cortaderia selloniana</i>

Our Field Work

- B.O.R.- Navajo-Gallup Water Project



- Line features of pipeline route on collector for field use.
- About a section (every 1km) of route is a point feature created using ArcGIS random point generator.
- From these locations a baseline and meter tape of 100 meters is laid out along the route of pipeline.
- Using a compass, bearings are recorded and 10 transects lines are created perpendicular of the baseline.
- Along these transects line-point intercept is used (random), every plant (genus), bare soil, rock, litter are recorded on hardcopy and on collector.



Benefits

"I am glad to be part of SCC it has taught me a new experience in mapping, learning about GIS, and plant life." B.Hoover



Benefits

Members learn from hands on experience, experiential learning , on the field training.

Not from the textbook, classroom teachings, disciplinary approach.

Each individual has a unique way of learning a new skill, SCC incorporates different teaching approaches to our members.