

Uplands Monitoring in the Rincon Mountain District, Saguaro National Park

PROJECT SUMMARY

Importance

Generating more than 99.9% of Earth's biomass, plants are the primary producers of life on our planet. Vegetation represents much of the biological foundation of terrestrial ecosystems, and it comprises or interacts with all primary structural and functional components of these systems. Vegetation dynamics can indicate the integrity of ecological processes, productivity trends, and ecosystem interactions that can otherwise be difficult to monitor. In the Sonoran Desert and Apache Highlands ecoregions, vegetation composition, distribution, and production are highly influenced by factors that include soil texture, mineralogy depth, and landform type. As such, a fundamental understanding of soils and landforms is essential for evaluating vegetation patterns and processes.

Monitoring Goals

The overall goal of the Sonoran Desert Network (SODN) terrestrial vegetation and soils ("uplands") monitoring program is to detect broad-scale changes in vegetation and soils within the context of changes in other ecological drivers, stressors, processes, and resources of interest.

Specific, measurable objectives for uplands monitoring at Saguaro National Park are to determine the status of and detect trends, over five-year intervals, in:

1. Terrestrial *vegetation cover* for common ($\geq 10\%$ absolute canopy cover) perennial species, including non-native plants, and all plant lifeforms.
2. Terrestrial *vegetation frequency* of uncommon ($< 10\%$ absolute canopy cover) perennial species, including non-native plants.
3. Terrestrial *soil cover* by substrate classes (bare soil, litter, vegetation, biological soil crust, rock fragments of several size classes) that influence resistance to erosion.
4. Terrestrial *soil stability* of surface aggregates by stability class (1–6).



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5. *Biological soil crust cover and frequency* by morphological group (lichen, moss, light cyanobacteria, dark cyanobacteria).

Status of the Effort

In December 2010, SODN published a report summarizing provisional data collected during the first two seasons of terrestrial vegetation and soils monitoring in Saguaro National Park's Rincon Mountain District, in southern Arizona (Hubbard et al. 2010). Twenty-five permanent monitoring sites were sampled, with another 35 planned for 2010–2012, after which time a detailed status and trend report will be produced. The report also evaluated the sampling design in the context of monitoring objectives and suggested modifications to the design.

It was concluded that the sampling and response designs are efficient and effective, and should provide data that meet SODN monitoring objectives. We will continue to evaluate and adjust our sampling strategy annually, culminating in the full analysis for the comprehensive status and trends reports after the 2012 season.

Contact

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Hubbard, J. A., S. E. Studd, and C. L. McIntye. 2010. Terrestrial vegetation and soils monitoring in the Rincon Mountain District, Saguaro National Park, 2008–2009. NPS/SODN/NRDS—2010/118. National Park Service, Fort Collins, Colorado.

