



Restoration of Disturbed Lands

Background

One of the reasons for establishing national parks is to “preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations.” Saguaro National Park was established in 1933 “for the proper protection of the so called giant [saguaro] cactus”. Preserving natural resources and saguaros means not only protecting pristine desert habitat but also rehabilitating areas that have been damaged. The Sonoran Desert, like most deserts, is slow to recover from disturbance, so Saguaro National Park utilizes restoration practices to accelerate this process. The objectives of disturbed land restoration are to help the desert heal quickly and provide habitat for animals while creating a more aesthetically pleasing experience for visitors.



Before and after photos illustrate the use of locally available materials to close and restore an old road.



Disturbed Lands

Disturbances can be caused by nature, such as a fire or flood, or by human activities. Several of the human activities are discussed below.

- *Unauthorized trails and roads.* These trails and roads were identified in the 2009 Comprehensive Trails Management Plan and were prioritized for restoration. Trails can be narrowed or closed. Closing unauthorized trails and roads decreases incidents of visitors becoming lost, reduces duplicate routes, mitigates the impacts on resources, and increases native habitat.
- *Construction projects.* Construction, such as a new parking lot or trailhead, creates a disturbance by removing the native vegetation, compacting the soil, and altering nature drainage flows. To mitigate the impacts, plants are removed or cut flush with the ground prior to construction.
- *Vehicular accidents.* Accidents can cause a large scar of trampled and severely damaged vegetation, damaged animal nests, and downed fences and signs. This is an unpleasant site within a national park and rapid revegetation response is needed.

Restoration Methods

Restoration techniques used at Saguaro National Park include:

- *Salvaging.* Collecting plants and rocks from the surroundings to fill in the area disturbed. This provides a natural look that is contiguous with the desert around it. Cactus like prickly pear or cholla, are salvaged by cutting several pads from the larger plant and planting the cut edge in the ground. Many cacti are protected by law, like the saguaro, and are not used for salvage restoration.
- *Mulching.* Dead tree limbs, prickly pear pads and cholla skeletons from the surroundings are used to disguise the site, reduce erosion, and to foster seed germination by providing fertile islands. Horizontal mulching involves laying the dead material on the ground as if the plant had died in place. Vertical mulching means digging a hole and planting dead plant material upright to create the look of a standing dead plant.
- *Planting.* From seeds collected in the park, native plants are grown in a local nursery for about one year. The plants are then out-planted in a disturbed site, caged to protect them from being eaten, and watered for up to 2 years.



Salvaging and relocating a prickly pear cactus.



Rock step terrace with hydromulch and seed.

- **Seeding.** Native seeds collected in the park are spread over a disturbed site that has been raked or scarified. Hydromulching or seeding, a slurry of seeds mixed with mulch and a natural glue, has also been used on disturbed site. Hydromulching helps reduce soil erosion and enhances the chances of seeds staying on the site and not being carried away by small animals and insects.
- **Erosion control.** Straw or alder shaving wattles and stones are used in steep areas to create terracing along the slope, slowing water flow, and preventing washouts.

Accomplishments

- The Cactus Forest Loop Road was resurfaced in 2007 and 104 sites needed restoration. During pre-construction native plants and cacti were salvaged and replanted after construction. Over 1500 nursery grown trees, shrubs, grasses, and forbs were planted, caged and watered. The survival rate of the trees was 61.1% after two years.
- During the winters of 2010 and 2011, five acres of unauthorized trails and roads was restored by park staff with the assistance of many dedicated volunteers and youth corps members.

More Information

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Saguaro Site: <http://www.nps.gov/sagu>
NRInfo Portal: <http://nrinfo.nps.gov/>
IRMA SharePoint site: <http://nrpcsharepoint/irma/>



Wattles used to slow and retain water, prevent erosion, and stabilize soil to promote plant establishment.