

National Fish and Wildlife Foundation, Three Uncommon Penstemons (2006-2007)

The Arboretum and the Ecological Restoration Institute of Northern Arizona University collaborated to conduct baseline data surveys for three Penstemon species found in Arizona, *Penstemon nudiflorus*, *P. ophianthus*, and *P. pinifolius*. Specialists and volunteers examined recorded locations and potential habitat and assessed species status, potential threats and management needs.



Penstemon pinifolius

Kristin Haskins

Endangered Species Act, Section 6 Funds, Verde Valley Endemics (2006-2007)

The Arboretum monitored the status of *Tetranneuris verdiensis*, a recently described species with only four known populations. Specifically, we aimed to determine the current status of this rare plant since the severe drought of 2002. Long-term monitoring plots were established and seeds were collected for germination trials.



Tetranneuris verdiensis in the field

Sheila Murray

Endangered Species Act, Section 6 Funds, *Astragalus* Germination (2006-2007)

The Arboretum partnered with Grand Canyon National Park to germinate seeds of *Astragalus cremnophylax* var. *cremnophylax* for the establishment of an ex-situ seed source for this rare plant.



Astragalus cremnophylax var. *cremnophylax* in the greenhouse

Sheila Murray

National Park Service, Rare Plants (2004-2007)

A grant through the Center for Plant Conservation enabled The Arboretum to study eight rare plants at five National Parks, Monuments and Recreation Areas. Habitat data and seed collections will be used by the Park Service in restoration efforts. Plants included in this effort include: *Arctomecon californica* (Lake Mead NRA), *Astragalus cremnophylax* var. *cremnophylax* (Grand Canyon NP), *Coryphantha sneedii* var. *sneedii* and *leei* (Carlsbad Caverns NP), *Cycladenia humilis* var. *jonesii* (Glen Canyon NRA), *Erigeron maguirei* (Capitol Reef NP), and *Pediocactus bradyi* (Glen Canyon NRA).



Arctomecon californica in the field

Sheila Murray

National Fish and Wildlife Foundation, Drought and Rare Plants (2005-2006)

Examining the effects of drought on eight rare plant taxa in Arizona was combined with developing a team of "lay" botanists to assist in data collection for this project. The rare plants in the study spanned an elevation and habitat range characteristic of the Southwestern US. Plants included in this effort were: *Astragalus beathii*, *Astragalus cremnophylax* var. *cremnophylax*, *Castilleja kaibabensis*, *Cimicifuga arizonica*, *Salix arizonica*, *Salvia dorrii* ssp. *mearnsii*, *Senecio franciscanus*, and *Silene rectiramea*.



Collecting data on *Astragalus beathii*

Sheila Murray

New Mexico Oil Shale Project (2006)

The Arboretum, with funding from the CPC, collected seed from imperiled plant species occurring in areas where oil shale, tar sands, and natural gas development were expected to increase on Bureau of Land Management (BLM) lands. The BLM Special Status Species Program had high priority as oil and gas exploration and development in the West is expected to increase in coming years. This project enabled the collection of seed from species in these developing areas (Utah, Colorado, and New Mexico). Seed is stored *ex situ* and will be used for restoration work in the event that oil and gas development cause a need for restoration efforts. Seed was collected from *Astragalus humillimus*, *Aliciella formosa*, and *Sclerocactus cloveriae* ssp. *brackii*.



Collecting seeds of *Astragalus humillimus* on the Hogback Formation

Sheila Murray

Arboretum Weed Eradication (2005-2006)

A grant from the University of Arizona Cooperative Extension Service helped The Arboretum to map and eradicate noxious weeds on our 200 acres.



Linaria dalmatICA near The Arboretum

Sheila Murray

Endangered Species Act, Section 6 Funds, North Kaibab (2005-2006)

A grant from the State of Arizona enabled The Arboretum to work with four rare taxa on the North Kaibab Plateau of Arizona. The work included surveying populations to determine effects of drought, establishing long-term monitoring plots, and collecting seed to be stored. Plants included in this effort were: *Astragalus cremnophylax* var. *myriorrhaphis*, *Castilleja kaibabensis*, *Eremogone aberrans*, and *Lesquerella kaibabensis*.



Castilleja kaibabensis in the field

Sheila Murray