The Plant Press

THE ARIZONA NATIVE PLANT SOCIETY

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Tonto Basin Agave: A Living Relic of Pre-Columbian Cultures?

by Balbir Backhaus

High above Tonto Basin in the foothills of the Sierra Ancha Mountains in central Arizona, scattered clusters of agave thrust their woody flower stalks upward against the blue sky. In the late 1920's and early 1930's, amidst this rocky, hilly terrain dotted with juniper, prickly pear and jojoba, botanist Susan D. McKelvey discovered these agave populations and, probably not completely beknownst to her, stumbled upon a mystery of sorts whose pieces are still being put together today.

The story of Tonto Basin agave -- a rather tangled botanical web -- doesn't really start with McKelvey's "discovery" but goes back much farther in time. Researchers today believe this species may be a link to civilizations past and, in fact, constitute a living relic of pre-Columbian peoples that inhabited this area centuries ago.

McKelvey collected plant specimens and sent them to William Trelease, a botanist with some expertise on the genus, for identification. Alluding to the s-shaped leaves of this species, Trelease tentatively named it *Agave repanda*, but never formally described it. Years later, upon examining McKelvey's specimens, Howard Scott Gentry labeled one as *A. parryi* var. *parryi* and others as *A. palmeri*..

It wasn't until the late 1980's that this agave was rediscovered. Hiking through the area in 1988, Rick DeLamater, a graduate student in botany at Arizona State University, came across "*A. repanda*" and once again, it became the focus of investigation as to its true identity. DeLamater teamed up with Wendy Hodgson, research botanist and herbarium curator at the Desert Botanical Garden, and Liz Slauson, also a research botanist and curator of collections at the garden. Together, they documented approximately 90 sites where this species occurs. It was Hodgson and Slauson who subsequently described "*A. repanda*" and renamed it *A. delamateri* after their friend and colleague who unfortunately passed away.

The genus *Agave* has long confounded botanists, beginning with Linnaeus himself. Howard Scott Gentry, the well-known agave authority and author of the comprehensive *Agaves of Continental North America*, commented on the difficulty of differentiating agave species in that landmark work. Hodgson and Slauson agree.

"Agaves are problematic and nobody wants to work on them," says Slauson. "This is because they aren't reproductively isolated."

According to Slauson, agaves hybridize easily and have done so probably since the

(AGAVES - CONTINUED ON PAGE 4)

NOTES FROM THE PRESIDENT

It has now been five years since I became President of the ANPS, and in many ways, I believe that we are doing quite well in realizing our Mission: **to increase awareness and appreciation of Arizona's native plants, to work towards protection and restoration of native plants and their habitats, and to promote the use of low water use landscaping, with emphasis on the use of native plants.**

I do have some concerns though. In my first "note" of March, 1991 I wrote:

"Our Society has been very fortunate over the years in having a core of highly dedicated, talented and hardworking members who make the important things happen: local and state meetings and field trips; regular and special publications; environmental conservation, education and advocacy; and instiling in people an appreciation of plants and... living communities... They also watch over the fiscal and organizational health of the Society itself so that we can continue to grow and be ever more effective in addressing the needs of native plants, native plant communities and plant-related conservation issues in this diverse and wonderful state of Arizona."

So, what's my concern? I'm worried that our "core of highly dedicated, talented and hard-working members who make the important things happen" is not being replenished as it undergoes natural attrition.

People move, people pass on, people get tired, people change. Although our membership numbers have remained steady-- would that they were increasing-- it has become more and more difficult to find people willing to take on the responsibilities of caring for the organization itself. As of this writing, our biggest chapter, Tucson, will soon be without a president; our Phoenix chapter has depended on the same devoted people to do its work for years; and we all lean too heavily on a wonderful 82 year old gentleman to look after virtually all of the critical fiduciary and financial details of our Society.

As President for these past five years, I obviously bear much of the responsibility for this situation in having failed to exhibit dynamic and inspiring leadership to the ANPS. But, even as I ask you to forgive my shortcomings, I sincerely ask you to consider stepping forward and undertaking a leadership role in your local ANPS chapter. Now, more than ever before the Mission and Goals of the ANPS are vital and important. Please become part of the solution.

-Bill Feldman

1996 ANPS ANNUAL MEETING TO FOCUS ON COLORADO PLATEAU/RIM REGION

The 1996 ANPS Annual Meeting will be held in Flagstaff on August 24th-25th. The meeting, tentatively scheduled to be held at the Hulapai room of the Student Union Building at Northern Arizona University, will focus on the Colorado Plateau and the Mogollan Rim area.Scheduled speakers include:

*Gwen Waring, a reclamation specialist and owner of the new nursery, Flagstaff Native Plant and Seed;
*Nancy Brian of the U.S. Park Service;
*John Spence from the Glen Canyon Recreation area, and;
*Peter Fule of the Pearson Experimental Forest.

The Flagstaff Chapter is busy lining up a field trip itinerary as well. The annual meeting once again promises to be a very educational and enlightening weekend. Registration materials will be sent out in early July.

***NOTE:** Make sure to send in your registration form right away in order to receive prompt information on lodging.*

Editor's Comments

Fire is the story on the minds of many Arizonans this year as summer approaches. With meager snow and rainfall amounts throughout the state, tinder dry conditions have sparked an early fire season. By mid-May, the Lone Fire northeast of Phoenix, the Mt. Graham fire and the Horseshoe Fire near Flagstaff had scorched tens of thousands of acres.

As the Lone Fire roared down the slopes of Four Peaks towards Tonto Basin, taking Ponderosa Pine forest and wildlife with it, I wondered what the threat would be too to the Tonto Basin agave populations I had visited just weeks earlier. Wendy Hodgson and Liz Slauson of the Desert Botanical Garden recently described this new species as *Agave delamateri* and unearthed some intriguing evidence as to its origins. (See our feature story, "Tonto Basin Agave...").

Those of you who like to enjoy the beauty of our native plants in your own backyards will be glad to find that our "Gardening with Natives" column is back, thanks to Greg Starr. As many of you know, Starr is founder and owner of Starr Nursery in Tucson, and has spent many years researching and growing native plants of the Southwest. In this issue, he shares his expertise on everyone's favorites, penstemons. We also plan to have some contributions in the future from Gwen Waring of the newly-opened Flagstaff Native Plant and Seed for the high-altitude perspective on native plant gardening.

If you're trying to figure out where to get native plant material, be sure to hang onto "Sources for Native Plants." We acknowledge this is not a *complete* listing and urge anyone we have left out (unintentionally, of course) to send us their info.

Finally, I'd like to thank Dean Brennan for his assistance in typesetting and design these past few years. Wrestling with the final minutiae of getting this issue out makes me appreciate his work all the more. Thanks, Dean!

Balbir

ANPS 1996 Publication Grants Program:

Call for Grant Proposals

The Arizona Native Plant Society has available through its Publication Fund $3,000 for assisting with the funding of publications or communications-related projects during the 1996 grant cycle. The grant program is open to individuals, groups or organizations. Individual membership in the Society is not required, nor does it preclude application. Proposals from ANPS chapters or committees are not eligible for this program and should be submitted to the Publications Committee for consideration separately.

The deadline for proposal submission is September 15, 1996. Awards will be made on a competitive basis by the Publications Committee of the ANPS and will be announced by November 15, 1996. The total funding available is $3,000 and may be awarded as one or more grants.

Proposals should consist of a brief (one or two pages) summary outlining:

-the project's subject, audience and relevance to the Purpose of the ANPS: "To increase awareness and appreciation of Arizona's native plants, to work towards protection and restoration of native plants and their habitats and to promote the use of low water use landscaping, with emphasis on the use of native plants."

-the applicant's background and a statement of qualifications or resume.

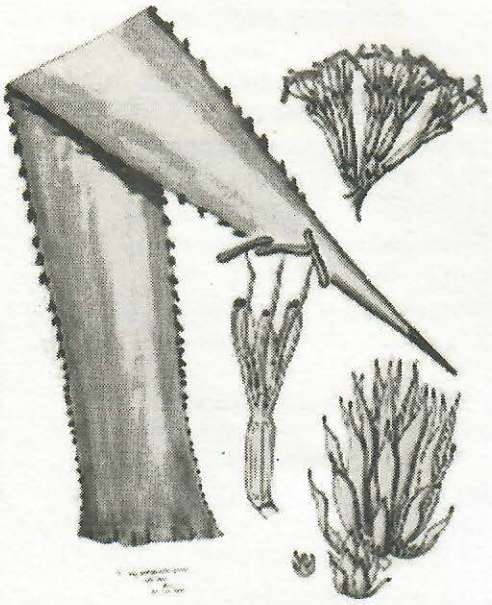
Proposals should be submitted by September 15, 1996 to:

Arizona Native Plant Society
1996 Publication Grants Program
Box 41206 Sun Station
Tucson, Arizona 85717

(**AGAVES** - CONTINUED FROM PAGE 1)

Pleistocene Epoch. Climate changes that occurred over thousands of years altered species distribution, bringing previously isolated species together. Thus, species could exchange genes because they were not isolated long enough to produce reproductive barriers. Gene exchange has produced not only similarities among species but also variations within species.

The genus *Agave* is divided into two subgenera (Agave and Littaea) which are in turn divided into numerous groups. With its deep floral tube with short, leathery, unequal tepals that are persistently erect, *A. delamateri* belongs within the group Ditepalae (subgenus Agave). It grows to about 1 m high and about as wide with an erect rosette of broadly lanceolate, glaucous purple-tinged leaves that are apically incurved. Tonto Basin agave is thought to be closely related to *A. fortiflora* and *A. palmeri*. Distinguishing features include its easily cut leaves, production of many rhizomatous offsets and one series of filaments, instead of two. Its glaucous purple-tinged leaves, light greenish-yellow tepals with rusty-maroon tips and somewhat rounded, maroon (instead of yellow, strap-shaped) filaments distinguish it from *A. fortiflora*. Unlike *A. palmeri*, it has broadly lanceolate, apically incurved as opposed to linear-acuminate, straight leaves. Also, *A. delamateri* has more lateral branching in its inflorescence, a wider perianth tube and longer tepals. Hodgson and Slauson were additionally able to distinguish type specimens from hybrids of *A. chrysantha* and *A. parryi*.



Agave delamateri. Illustration by Wendy C. Hodgson.

If the Tonto Basin agave was at last correctly classified, its origin still remained a mystery. About 90 sites in Central Arizona have yielded populations of this species. This area includes Gila County from near Coolidge Dam and Globe north to Young and west to Sunflower in Maricopa County. Some plants were also found in Yavapai County near Oak Creek. Tonto Basin, northwest of the Roosevelt Reservoir and located between the Sierra Ancha and Mazatzal Mountains, contains the greatest number of sites.

The Sierra Anchas rise some 3,000 to 4,000 feet above Tonto Basin, and the foothills that adjoin mountains and basin were formed as alluvial terraces -- steep-sided, flat-topped hills. Tonto Basin agave is found on many of these terraces overlooking drainageways into Tonto Creek. The soil is rocky and well-drained.

Driving north on State Route 87 through the Mazatzals, even the untrained eye notices the rock piles sitting atop mounds and hills alongside the road -- assemblages created by early inhabitants. Archaeological artifacts can be found throughout the region and evidence of pre-Columbian cultures has been well-documented. Standing amidst a batch of *A. delamateri* overlooking the Tonto Basin rich with archaeological sites below got Hodgson to wondering. Was *A. delamateri* cultivated by pre-Columbian peoples?

The special relationship of agave and man goes back centuries. Gentry even called this

relationship a "symbiosis" -- implying a vital interdependence between one and the other. Agaves have been an important source of food, drink and fiber for ancient cultures as well as some modern ones. In turn, these cultures apparently assured the survival and spread of many agave species through cultivation and migration.

Agave applanata is one example cited by Gentry. Endemic to the highlands around Veracruz, Mexico, it appears to have been dispersed northward into Chihuahua by man and is often found growing near old villages.

A more compelling example closer to home may be that of *Agave murpheyi*. Archaeologist Suzanne K. Fish and others from the University of Arizona have linked *A. murpheyi* populations with archaeological sites in southern Arizona. Charred plant remains from roasting pits were consistently found in association with features such as rock piles constructed by prehistoric people -- probably the Hohokam -- for irrigation purposes. Rockpiles consisted of mounds of stones that collected natural runoff and also acted as a mulch to conserve soil moisture. Agave, or mescal knives, stone implements used to harvest plants, are also found throughout rockpile fields. Whereas *A. murpheyi* is found in lower elevation areas of the Sonoran Desert usually on bajadas, *A. delamateri* grows at elevations up to 5,000 feet. There are no rockpiles found on the terraces. Temperatures are cooler and precipitation is higher.

"When you look at the drainageways below the terraces, you find checkdams and linear alignments associated with pre-Columbian agriculture. The agaves are almost always on top of the terraces," notes Hodgson. "These people may have grown more water-loving crops such as beans, maize and squash down below."

Hodgson and Slauson reason that Tonto Basin agave may have been selected and grown for its desirable physical attributes-- large, easily cut leaves, prolific production of offsets and a big head, or cabeza, which was cooked and eaten. Like *A. murpheyi*, Tonto Basin agave's distribution is sporadic. Hodgson believes that it may have originated in Mexico, and with its heavy offset production, it could have easily been used as a trade item and eventually was dispersed to the north.

Unlike *A. murpheyi* which is better adapted to heat, *A. delamateri* prefers a cooler, moister environment and thus may have been cultivated on the terraces where higher precipitation and cooler temperatures probably precluded the need for irrigation devices.

Other factors point to cultivation as well. Little genetic variation occurs among individual plants, suggesting that they are clones originating from one or a few mother plants. In fact, these plants do not reproduce sexually (only one fruiting plant has been detected). Slauson, in her pollination studies, rules out the possibility of a lack of pollinators as has been suggested for other species. If indeed, they are clones, they would be incompatible and unable to produce fruit and seed. If they migrated northward, climate may play an important role. The change from a warmer climate from a possible place of origin in Mexico to a cooler one in the Arizona Upland subdivision of the Sonoran Desert could inhibit fruit and seed production. Centuries of asexual reproduction would certainly deem this species a living relic from pre-Columbian cultures that cultivated it.

Hodgson recently found a yet unknown agave species that seems to be closely related to Tonto Basin agave growing in Deer Creek Canyon in Grand Canyon National Park near an archaeological site. Another living relic? Perhaps. Hodgson is the first to acknowledge the mountain of work that remains to be done on agaves.

Gentry remarked that one of the main reasons the taxonomy on this group has been so difficult is because good herbarium specimens haven't been made, Hodgson says.

Fortunately, Hodgson and Slauson aim to do something about that.

Penstemons--Hummingbirds' Delight

by Greg Starr

Plants from the genus *Penstemon* are great for attracting hummingbirds. If you like to see the iridescence of an Anna's or Black Chin (who doesn't?), then you ought to consider planting some *Penstemon*, or planting more if you already have some.

There are numerous species to choose from. However, I have found that not all perform well in the hot, low deserts of southern Arizona. Undoubtedly, somebody will tell you "I've been able to grow all species of *Penstemon*.." For those of us you do not necessarily have the touch it takes to grow the high elevation species, I have outlined some of the easiest species to grow. Remember, most of the following plants grow best in full sun, a fast draining soil and in an area with good air circulation.

Penstemon eatoni
Firecracker Penstemon

Description: This penstemon is a low growing perennial or subshrub that stays green through the summer, fall and winter, then blooms in late winter and spring. Plants (without flower spike) will grow to 1 foot high and 2 feet across. The rich, dark green leaves are 1 inch wide and 4-5 inches long. Flower spikes first appear in February or early March and continue through April or into May. The spikes can grow up to 2 feet long. The scarlet-red flowers are about 1 inch long, densely clustered along the spike and attract hummingbirds.

Habitat and Distribution: The species ranges from southwestern Colorado to central Arizona and California, growing in sandy or clay soils from 2,000-7,000 feet elevation. Plants can be found on mesas, in fields and along roadsides.

Culture: Firecracker Penstemon is hardy to at least 10° F and probably lower. It is low water-using, surviving on 10-12 inches of annual rainfall. However, it grows faster and flowers better if given supplemental water in fall and spring. If summer rains are sparse, plants should be given extra water in summer to keep them from going dormant. They have a fast growth rate, reaching a size of 1 foot high (without flower spikes) and 2 feet across in two growing seasons. The flowering spikes should be allowed to go to seed, then cut and the seed can be scattered around to encourage new plants.

Uses: Use Firecracker Penstemon for a splash of color in late winter, spring and early summer. Place in full sun or filtered light in the transition or outer zones.

Penstemon parryi
Parry's Penstemon

Description: A spring flowering perennial with light to dark pink flowers. The rosette of leaves is low, only 6-10 inches high, but the flower spikes may reach 3-5 feet tall. Flowering starts as early as February and continues as late as May.

Habitat and Distribution: Parry's Penstemon is native from central Arizona south into Sonora, Mexico at elevations from 1,500-5,000 feet.

Culture: Plants are hardy to at least 15° F and probably lower. Because plants go dormant in summer they are low water-using, surviving on less than 10 inches of annual rainfall. They are fast growing, sometimes flowering the first year from seed. Parry's Penstemon requires little maintenance. Allow the flower spikes to go to seed, cut and scatter around your landscape to naturalize.

Uses: Parry's Penstemon should be used for its incredible spring flower display. Plant with accents like *Yucca rigida, Yucca rostrata, Nolina nelsoni, Dasylirion wheeleri*

or many *Agave* species. ***The best planting time is in the fall.***

Penstemon pseudospectabilis
Canyon Penstemon

Description: Canyon Penstemon is a small shrubby plant that grows to about 3 feet tall and 3 feet across. Leaves are about 2 inches long, glabrous, mostly oval in outline and toothed on the margins. The upper pairs of leaves just below the flowers are connate around the stem. Flowering may start as early as March and can continue on into summer. Flowers are pink and about 1.5 inches long.

Habitat and Distribution: This species can be found on dry, rocky slopes and canyon walls from 6,000-7,000 feet in Arizona and New Mexico.

Culture: Canyon Penstemon is hardy to at least 5° F and probably lower. Plants are moderately drought tolerant, requiring some supplemental during the hottest parts of the year. They are somewhat fast growing, achieving a mature size in 3 or 4 years. The only maintenance required is to prune off seed stalks.

Uses: Canyon Penstemon can be used in full or filtered sun in just about any area of a landscape. Plants work well in a bird garden or in a cactus or succulent garden.

Penstemon superbus
Coral Penstemon

Description: Coral Penstemon looks very much like Parry's Penstemon. It too has a basal rosette of leaves, but in spring it shoots out a 4-6 foot tall spike of dark coral-red flowers. Flowering may begin as early as late February and last until May or even June if the conditions are right.

Habitat and Distribution: Coral Penstemon is native from southeastern Arizona, south into Sonora and Chihuahua, Mexico at elevations between 4,000-5,000 feet.

Culture: Plants are hardy to 5-10° F. They are low water-using because they are dormant in summer. The growth rate is fast with plants flowering the first year from seed. Virtually no maintenance is needed except to collect and scatter seed to naturalize.

Uses: Coral Penstemon can be placed in full sun or filtered light. Start plants from seed scattered in late summer or mass plant for a great spring flower show. Use with accents as you would Parry's Penstemon, or interplant with *Penstemon parryi* for an interesting combination. ***Fall is the best time to plant this species.***

Greg Starr is owner of Starr Nursery in Tucson, specializing in native and arid-adapted plants.

Illustration by Jeanne R. Janish, *Flowers of the Southwest Deserts*, courtesy Southwest Parks and Monuments Association.

Sources for Native Plants

by Dean Brennan

Although native plants are becoming readily available, it can be frustrating when searching for a particular plant that you may need for your landscape. Many retail nurseries, and even discount stores such as WalMart, now carry a selection of native plants. But because of demand and limited supply, you sometimes need to be in the right place at the right time The native plants you see at the nursery this weekend will probably be gone next weekend and chances are the retailer won't get any more of that variety before the next growing season. So what are some of the best, and most consistent, sources of native plants?

Kent Newland, Phoenix Chapter President, agreed that native plants are becoming more available and much easier to find. One of his suggestions: when you find native plants at a retailer, buy all you need assuming the supply is limited and they'll be gone if you wait. If you can't find a specific plant, ask your retail nursery to contact one of the local wholesalers.

Another suggestion: visit a local botanical garden or arboretum for plant sales. These sales provide the opportunity to be exposed to a broad selection of native plants as well as other plants suitable for our environment. In addition to a wide variety, there is often a large quantity of each plant available. The Desert Botanical Garden holds plant sales twice a year, generally in October and in March. The Boyce Thompson Arboretum near Superior and the Tucson Botanical Gardens generally have plants for sale on a regular basis in addition to major plant sales and frequently have native plants that are difficult to find at the retail nursery. The Arboretum at Flagstaff has a plant sale every June.

If you are really ambitious and want to try growing native plants from seeds, it can sometimes be just as frustrating finding a good source. Although seeds are primarily available from growers such as Wild Seed in Tempe via mail order, many of the sources listed here also have seeds available. Or why not collect your own? Check with friends or neighbors who have native plants in their landscape to see if you can harvest seeds once the blooms are spent.

The following is a list of nurseries, primarily wholesale, that specialize in native plants (if we've left anyone out, our apologies; drop us a line and we'll be sure to include you next time).

Phoenix Area

Arid Zone Trees
(Germann & Ellsworth)
P.O. Box 167
Queen Creek, AZ 85242
(602) 987-9094

Arizona Cactus Sales
1619 S. Arizona Ave.
Chandler, AZ 85248
(602) 963-1061

Desierto Verde Nursery
1011 S. McClintock Rd.
Tempe, AZ 85281
(602) 820-2970

Desert Tree Farms
2744 E. Utopia Rd.
Phoenix, AZ 85024
(602) 569-6604

Desert Tree Nursery (retail)
18610 N. Cave Creek Rd.
Phoenix, AZ 85024
(602) 569-1300

Mountain States Wholesale Nursery
(10020 W. Glendale Ave.)
P.O. Box 33982
Phoenix, AZ 85067
(602) 247-8509

V & P Nurseries, Inc.
(629 N. Roosevelt Rd.)
P.O. Box 4221
Mesa, AZ 85211
(602) 967-7913

Wild Seed
P.O. Box 27751
Tempe, AZ 85284
(602) 276-3536

Flagstaff Area

Flagstaff Native Plant & Seed
1816 N. Second St.
Flagstaff, AZ 86001
(520) 773-9406

Tucson Area

B & B Cactus Farm
11550 E. Speedway Blvd.
Tucson, AZ 85748
(520) 721-4687

Desert Survivors Nursery
1020 W. 22nd St.
Tucson, AZ 85713
(520) 791-9309

Desert Trees
9559 N. Camino del Plata
Tucson, AZ 85741
(520) 297-5664

Keller Nursery
9350 N. Shannon Rd.
Tucson, AZ 85741
(520) 742-1945

Mesquite Valley Growers
8005 E. Speedway Blvd.
Tucson, AZ 85710
(520) 721-8600

Native Seeds/SEARCH
2150 N. Alvernon Way
Tucson, AZ 85712
(520) 327-9123

Plants for the Southwest
50 E. Blacklidge Dr.
Tucson, AZ 85705
(520) 628-8773

Starr Nursery
3340 W. Ruth Ann
Tucson, AZ 85745
(520) 743-7052

Wildlands Project
1955 W. Grant Rd.
Tucson, AZ 85745
(520) 884-0875

The Howard Scott Gentry Research Fund

The Howard Scott Gentry Research Fund has been established to further the advancement of botanical exploration and research in the North American desert region and in other arid and semiarid regions of the world. Through annual awards of grants, the Fund will support botanical studies that will contribute to our understanding of arid and semiarid habitats, whether as stable natural environments, as areas of change over time, or in relation to human activities.

In keeping with the broad range of Howard Scott Gentry's contribution to science and agriculture and in order to facilitate participation in a wide range of projects, few stipulations are made regarding the focus of researchers' requests for assistance. Studies in botany, paleobotany, paleoecology, ecology, ethnobotany and economic botany are in keeping with the Fund's mission to further the understanding of the role of plants in the stability and change of desert regions around the world.

The Fund is administered by the Fund's Executive Committee and its Board of Advisors. The Fund was initiated by the family and colleagues of the late botanical explorer and naturalist Howard Scott Gentry, who over a period of seven decades contributed to the fields of vertebrate zoology, paleontology, entomology, ecology, genetics, pharmacology, anthropology, and especially botany, ethnobotany and economic botany.

Gentry's passion for plants and the natural world affected all who came to know him or read his works. When he died in 1993, Gentry left a remarkable body of achievements that serves as both foundation and inspiration for the work of other botanists, ecologists and researchers in the natural sciences in the coming decades.

In acknowledging his example, the Fund will provide assistance for the advancement of science in the same spirit. Amounts of grants will range from as small as $350 for ancillary assistance to projects nearing completion, to as much as $2,500 to aid the launch or continuation of major projects.

For more information please write:

The Howard Scott Gentry Research Fund
The Desert Laboratory
University of Arizona
Department of Geosciences
Tucson, AZ 85721

Linnea Gentry
Executive Committee
The Howard Scott Gentry Research Fund
(520) 742-4758

Jan Price
Administrative Assistant
The Desert Laboratory
(520) 629-9455

CONSERVATION UPDATE

Editor's notes: This is the second in a series on plant conservation strategies.

Conservation Activities Along the Bill Williams River

The Bill Williams River is one of Arizona's finest desert streams. "The Bill" originates in west-central Arizona and flows into the Colorado River at Lake Havasu. Whereas cottonwoods are rare today along the Colorado River due to dam construction, the Bill Williams has both cottonwoods and willows in abundance. It also has beaver! The river is incised into colorful canyons and is bordered by Sonoran Desert vegetation.

Much of the river has been recently set aside as either wilderness or a wildlife refuge, thanks to the 1990 Arizona wilderness bill and recent land acquisitions by U.S. Fish and Wildlife. These actions close the river to new mines and restrict construction of new roads, which have historically fragmented the river corridor.

Flooding is a type of natural disturbance to which most native riparian plants are adapted. Despite the presence of Alamo Dam on the Bill Williams River, the lower canyon receives floods from its tributaries. In early 1993, a major flood swept the river, tearing out some roads and abandoned farm fields and replacing them with a mosaic of sloughs, sand bars and channels which were promptly colonized with cottonwoods and cattails.

That same year, the Bureau of Land Management constructed barriers on several tributary canyons to prevent off-road vehicles from damaging young trees and shrubs in the floodplain. Concrete-filled pipes spaced several feet apart were also installed to let water flow through but prevent pickup trucks and sand rails from entering. This design has proven more effective than barriers which depend on cables or barbed wire fencing. Now that trees and marshes have become established, the landscape itself effectively limits off-road vehicular use. Beaver dams further obstruct the river in some places, contributing to the diversity of habitats.

An interagency committee recently recommended that the Corps of Engineers release water from Alamo Dam throughout the year and provide short-duration high flows in late winter and late summer to mimic a natural environment. Let's hope that the Corps changes how it operates Alamo Dam and other dams in the state to allow the river to spread the seeds, soil, water and nutrients that riparian areas need to flourish.

Conservation in the Sierra Madre

A system of reserves in Mexico's Sierra Madre is being proposed to preserve old-growth forests from illegal logging and to protect Tarahumara and Tepehuan communities from being destroyed. The Sierra Madre Program of CASMAC (Advisory Council of the Sierra Madre, based in Chihuahua) has gained the interest of local indigenous communities. The proposed core reserves include winter roosting habitat for thick-billed parrots as well as medicinal plants important to these communities. Tucson's Native Seed/Search is assisting by inventorying old-growth forests using satellite imagery and aerial overflights. Farmers are learning biodynamic practices to improve productivity and relieve pressure on forestlands.

For more information, contact the Sierra Madre Program at P.O. Box 41416, Tucson, 85717, (520) 326-2511 or sierrag@igc.apc.org.

DG Threatens Ragged Top Area

Decomposed granite, or dg, is a popular landscaping material in the Phoenix and Tucson areas. Where does dg come from? It's mined from near-surface exposures of granite or other red to pink igneous rocks, which are loosened with drilling and blasting

and loaded into rock crushers to create "decomposed" granite.

To profit from a growing urban demand, Jenott Mining has recently proposed to mine public land near Ragged Top, a wilderness area that ANPS worked (unsuccessfully) to protect several years ago. If you've been to the north side of Ragged Top or the south side of the Samaniego Hills, you've been past the area proposed for the mine. BLM describes the landscape at the site as "classic Sonoran desert habitat that contains saguaro, palo verde, ironwood, desert hackberry, white thorn acacia, catclaw acacia, velvet mesquite and triangle-leaf bursage."

The proposed mining permit would allow a total of 160 acres to be mined in five-acre bites. Jenott estimates that it will take them about 20 months to strip a five-acre site of usable material. BLM says the pit would be recontoured and reseeded, "within a few years, the reclaimed acreage will have revegetated with perennials and shrubs and within several years, trees will again be growing...Enough of the original acreage will have been reclaimed so that the cumulative acreage under disturbance will be under 5 acres." The environmental assessment provides very little information on how this will be accomplished or monitored, or how the reclaimed land might differ from what was originally present.

Because dg is not a mineral per se, it may not be covered by the 1872 Mining Law. If so, BLM may have the discretion to prevent mining of the desert for dg. To comment on the proposed mine and reclamation plan, you may write Jesse Juen, BLM, 12661 E. Broadway, Tucson, AZ, 85748.

When viewed biologically, landscaping with dg is doubly sterile. The weed-free look that dg landscaping promotes must be maintained at the expense of preemergent chemicals, black plastic underliners, compaction of the underlying soil, or dint of human labor. Whenever we use dg in yards, parks and public roadway medians, it also means that somewhere, floristically diverse desert landscapes are being destroyed to create depauperate urban ones. Far better to grow your ground cover than to mine it. Try native grasses and other small herbaceous plants instead. To add even more biological value to your urban landscape, allow leaf and twig litter to accumulate.

Help Revegetate Using Sacaton

Volunteers are needed August 10-11 and August 17-18 to help plant sacaton in an abandoned farm field located within the Pima County Flood Control District's Cienega Creek Natural Preserve near Tucson. The field is the site locality for Wright's sacaton and reportedly contained sacaton prior to being cleared in 1974.

Volunteers will plant seedlings grown from seeds collected by ANPS along Cienega Creek. The growouts are being funded by U.S. Fish and Wildlife Service as part of a larger project to create more biologically and structurally diverse wildlife habitat. This site is currently dominated by bermuda and red brome. For more information or to volunteer, contact Julia Fonseca, Pima County at (520) 740-6350 or Marie Sullivan, USFWS, at (602) 640-2720.

Continental Ranch Floodplain Revegetation Field Trip

Join Gary Maskarinec, seedsman and restoration expert, on a visit to one of the Tucson area's largest revegetation projects and evaluate for yourself whether it was a success or not. Gary participated in this project, which involved seeding and imprinting a broad, artificial terrace along the Santa Cruz River, in the late 1980's. This trip also affords a look at the vegetation supported by effluent discharges.

Julia Fonseca, hydrologist, will be on hand to discuss this flood control and revegetation project, why it was required by the Pima County Flood Control District of the developer and future plans the County has for use of the land and water. Meet at the McDonald"s located by Cortaro Road and Interstate 10 on Saturday, July 31 at 6:30 a.m.

Julia Fonseca

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