NATIVE PLANT SOCIETY OF NEW MEXICO
NEWSLETTER

November/December 1994 Volume XIX Number 6

THE RIO GRANDE BOSQUE:

FROM NATIVE TO ALMOST EXOTIC

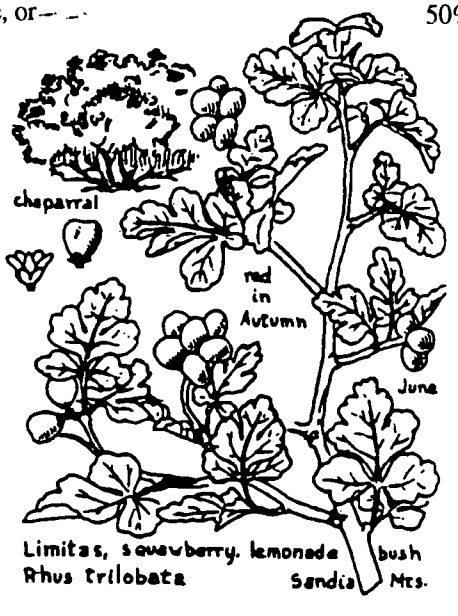
By Dan Scurlock
reprinted from NPSNM Newsletter, Nov./Dec. 1986

Cottonwoods (Populus fremontii) and a cottonwood bosque probably have been around from the beginning of the Pleistocene, or for almost one million years. This species is obviously adaptive, but can it survive the on-going and future environmental impacts on the bosque?

Historically, the Rio Grande was a relatively wide (up to a mile), meandering and shallow river with numerous islands and sandbars. Late spring or summer floods were frequent, and periodically some inundated the entire floodplain. The bosque, or riparian communities were maintained in part, by this flooding. One obvious beneficial aspect of flooding on riparion vegetation, especially the shallow-rooted cottonwood, is an increase in available moisture. Another benefit was the deposition of rich, silt alluvium as a prime habitat for the establishment of seedlings of pioneer tree species (1).

The first detailed botanical description of the Rio Grande bosque was published by J. R. Watson. For the Rio Grande floodplain he described two major floristic associations: nearly pure stands of valley cottonwood with a scattering of willows, Baccharis, senna, and sedge; and a wet meadow-like community of sedge, yerba mansa, Baccharis, (Helianthus annuus) common sunflower, and canaigre (Rumex sp.). Watson did not mention salt cedar (Tamarix pentandra) or Russian olive (Elaeagnus angustifolia) as components of the bosque, but does state that tamarisk was being planted in Albuquerque as an ornamental (2).

With the arrival of Anglo farmers, irrigated lands had increased to about 125,000 acres by 1880. Within a decade, this acreage began to sharply decrease as the floodplain became waterlogged from the extensive irrigation, recurring floods and an aggrading riverbed, which not only periodically saturated the floodplain surface but raised the water table as well. This latter phenomena was caused by an increasing sediment load derived from overgrazed and intensively farmed areas upstream being carried by a flow of the Rio Grande which had been decreased by 50% by 1930. Thus, the channel of the Rio Grande began to aggrade, or build up, rather than downcut. As the bed of the river rose in elevation above the farmlands on the floodplain, the associated water table rose to the surface in many locations. Increased alkalinity of the soil, a condition which commonly develops in the Southwest as a result of intensive irrigation, also had become a serious problem by the late 1800s. By 1896 the cultivated acreage had decreased to 50,000 acres, and by 1925, to 40,000 acres (3). By the end of World War I, approximately two-thirds of the valley was classified as either alkaline, marsh, or sand hills domanated by sagebrush (Artemisia spp.) (4).



To alleviate these problems, the Middle Rio Grande Conservancy District was established in 1923. Construction of flood control structures, drainage canals, levees, and a more complex irrigation system was soon begun in the district, which extended from present Cochiti Dam downriver to the north boundary of the Bosque del Apache National Wildlife Refuge. Included in the district is a total of 277,760 acres of which

Inside...

there are 128,787 acres of irrigable land (5). Major flooding, drainage problems and soil alkalinity generally were mitigated through the efforts of the MRCD; but other environmental problems resulted due to changes in the hydrologic dynamics of the region.

Vegetative changes due to lowering of the high water table in the Rio Grande Valley was one of the notable impacts. This draw down of the water table was due to drainage projects undertaken by the Middle Rio Grande Conservancy District (MRCD) following its legislative creation in 1926. All of the five types of plant communities identified on the floodplain by Marjorie Van Cleave experienced varying degrees of environmental changes between 1926 and 1935. Two of these communities, lakes and swamps, virtually disappeared; but remnant components survived along ditches and drainage canals. Another association, wet meadows, were drying up; cottonwood and willow in the bosque and "fringing woodlands" (along the edge of the river) were decreasing, while the recently introduced salt cedar (Tamarix pentandra) and Russian Olive (Elaeagnus angustifolia) were increasing, especially in the southern portion of the area. These two species, exotic phreatophytes, have deeper root systems and can tolerate higher soil alkalinity. Increased alkalinity resulted from the lowering of the water table which increased evaporation and thus caused increasing accumulations of alkali in valley soils. Cessation of periodic flooding due to dams and channelization which flushed out the alkalai from these soils, compounded the problem (6).

Tamarisk was introduced from EuroAsia into the eastern United States by nurserymen in the 1800's. The U.S. Department of Agriculture began growing tamarisk in the mid-nineteenth century and by 1868 listed six species that had been established at the arboretum in Washington D.C. By this time Tamarix was offered for sale in nurseries in California and had escaped from cultivation in the 1870's (7).

The earliest report of salt cedar growth in New Mexico was in 1910 near Mesilla Park. A few seedlings were reported growing on the delta of Lake McMillan on the Pecos River. Some tamarisks were included in a shipment of exotic plants which the City of Albuquerque and the U.S. Forest Service purchased from the Stark Bros. Nursery in Missouri in 1919. Within a few years

The **Newsletter** is published six times per year by the Native Plant Society of New Mexico. The Society is composed of professional and amateur botanists and others with an interest in the flora of New Mexico.
Articles from the Newsletter may be reprinted if fully cited to author and attributed to the Newsletter.

Membership in the Native Plant Society of New Mexico is open to anyone supporting our goals. We are dedicated to promoting a greater appreciation of native plants and their environment, and to the preservation of endangered species.

Members benefit from chapter meetings, field trips, publications, plant and seed exchanges and a wide selection of books available at discount.

We encourage the use of suitable native plants in landscaping to preserve the state's unique character and as a water conservation measure.

We maintain a register of business and professional people who are members and can supply information and services related to native plants. To be added to this roster or to request information, contact the Membership Secretary.

Advertising Schedule
Approved advertisements will cost $40 per year.

Schedule of Membership Fees
Dues are $10.00 annually for individuals or families. "Friends of the Society" include organizations, businesses, and individuals, whose dues of $25.00 or more provide support for long range goals. To join us, send your dues to Membership Secretary, 10800 Griffith Park Drive, Albuquerque, NM 87122

Newsletter Contributions
Please direct all contributions for the newsletter to Tim McKimmie, editor. See address below or email to tmckimmi@lib.nmsu.edu
Deadline for the next newsletter is Dec. 1

the first specimens were growing along the city's irrigation ditches. Thriving on an increasing soil salinity and silt load into the Rio Grande, and helped by planting along canal banks as erosion control, the salt cedar spread dramatically. By 1947, this species covered 60,640 acres of the Rio Grande Valley and was consuming an estimated 238,700 acrefeet of water (8).

In recent years tamarisk has become the dominant species on portions of the Rio Grande floodplain, especially south of Bernardo. Russian olive has become a major understory component of the valley woodlands from Corrales to Belen. Salt cedar does not appear to be increasing in the Albuquerque area except where cottonwoods are cleared or die out due to flooding. On the other hand, Russian olive continues to increase on the Rio Grande floodplain throughout the middle Rio Grande Valley (9). Another introduced species which has spread and invaded portions of the floodplain and uplands from plantings in towns and cities in the region is the Siberian elm (Ulmus pumila). In Albuquerque, the Chamber of Commerce, the U.S. Forest Service and the city purchased several hundred exotic trees—among them American elms—for planting in residential areas and public parks in 1919. The first Siberian elms soon followed, championed by Mayor Clyde Tingley, in the late 1920's and this species quickly became a prominent part of Albuquerque's treescape (10).

Spreading in disturbed areas in the bosque, but as yet, with less severe ecological-economic consequences than salt cedar and Russian olive, is the tree of heaven (Ailanthus altissima). When it was introduced into New Mexico has not been documented, but this native of China was brought to Philadelphia in 1784 and to New York City in the early 1800's (11). Spreading from both seeds and root suckers and a rapid grower, it is common around older homesites, abandoned farmland, and irrigation ditches.

With continued incursion of these exotics, continued development on and along the floodplain and increased recreational use, what is the future of the bosque in Central New Mexico? In recent years a growing government and public concern over this riparian greenbelt, especially in and around Albuquerque, has resulted in establishment of the Rio Grande State Park, Rio Grande Nature Center and the Corrales Bosque Preserve. This is a good beginning, but how should these and other areas of the bosque be managed, especially the vegetation? Should the planting of exotics like Russian olive, which has been the recent policy at the Rio Grande Nature Center, be continued? Or should the exotics be removed and the indigenous species be "helped" by simulated flooding through irrigation of selected areas? Others might suggest that environmental change by humans is inevitable and "natural" and that the exotics and the bosque as a whole should be left as is. But whatever management decisions are made, the bosque will continue to change in botanical composition as it has for over a million years.

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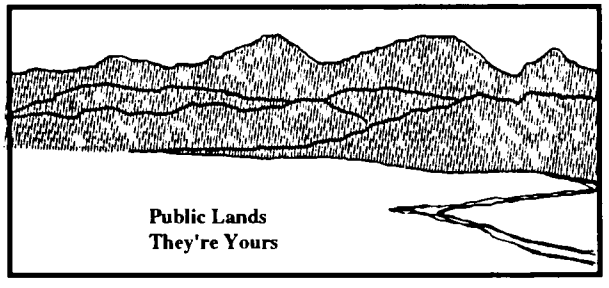
Many thanks to Robert Dewitt Ivey for permission to use his wonderful drawings from *Flowering Plants of New Mexico*, second edition, in our *Newsletter.*



CALENDAR

ALBUQUERQUE

Nov. 3 "Rare Plants in Bernalillo and Surrounding Counties" by Karen Lightfoot. Albuquerque Garden Center 10120 Lomas, 7:30.

Dec. 8 Christmas Potluck.

OTERO

Nov. 5 Potluck and 1995 planning meeting at Hanawalt's home near Tularosa.

LAS CRUCES

Nov. 9 Potluck. 6 p.m. St. James Church, just south of University Ave on Main.

Dec. 7 1995 Planning Meeting. 7:30. Southwest Environmental Center. 1494 S. Solano.

CHAPTER REPORTS

Albuquerque - Lu Bennett

At our regular June meeting, Carolyn Dodson, University of New Mexico Librarian and Botanist, gave a slide presentation on plant identification in different zones in New Mexico. She presented cactus, mesquite, creosote bush in the Desert zone. In Pinyon-Juniper there were Western Wallflower, Spectaclepod, Bladderwort, Windmills, Skyflower, Mexican Hat or Coneflower, Gaillardia and Chocolate Flower to illustrate Mustard family. Examples of Pea family were Golden Pea, Locoweed, New Mexico Locust and Lupine. In the Ponderosa Pine zone there were Coral Bells and White Shooting Star. Farther up in the Spruce zone there was Wild Oregano as an example of the Mint family. Scarlet Bugler Penstemon was also in this zone. Penstemons sometimes may be confused with Mint. One distinction is that Penstemons are not aromatic. Higher up in Spruce/Fir there is less light and parasitic plants are common in this area. Pinedrops and Orchids are found in this zone. In the Alpine zone, Sky Pilot can be found, usually next to some rocks which provide heat and protection. Other flowers in this zone are Alpine Blue Bells, Rock Jasmine, alpine Phlox and Forget-me-Not.

In July, Steve Cary showed many slides of beautiful butterflies from his collection. He has been studying and photographing butterflies for about fifteen years. His collection includes Skippers, Western Tiger Swallowtail, Black Swallowtails, Whites and Sulfurs and Coppers. In addition to showing his fantastic collection, he led a field trip the following Sunday to see butterflies in Kiwanis Meadow at Sandia Crest.

Las Cruces-Paul & Betty Shelford

8/10/94 Our guest speaker was Dr. Tom Todsen, discoverer of Todsen's Pennyroyal in 1971. Dr. Todson is a retired chief chemist at the White Sands Missile Range, and has also been on the NMSU faculty as an Associate Professor of Biology for many years. As one of the co-authors of RARE AND ENDEMIC PLANTS OF NEW MEXICO, he showed slides he had taken of many of those plants and discussed their locations and present status.

8/14/94 The field trip to Blue Mesa was cancelled due to the drought which has discouraged the flowering of native plants in that area. We went instead to the Fabian Garcia University Garden at NMSU. Bob Reeves led the tour of many native plants, grasses, shrubs and trees as well as exotics brought in from elsewhere to see how well they can be cultivated in our environment. We are fortunate to have such an extensive collection available right here in Las Cruces.

9/14/94 The chapter voted to donate $100. from our treasury to the Las Cruces Museum of Natural History to help in their creation of a native plant garden, and another $100. toward the support of the Southwest Environmental Center in appreciation of our use of their facility for our meetings. We also voted to co-sponsor, with the local chapter of the Sierra Club, a January 26th meeting to discuss the environmental concerns of new projects planned for the Lincoln National Forest.

Dr. Craig Liddell, a mycologist on the faculty of NMSU and a member of the Australian Native Plant Society, gave a presentation on soil-borne fungi. Fungi are everywhere as an essential part of plant growth and nurturing. Most plants will not grow without fungi gathering and bringing essential phosphates to their roots. This is a mycotrophic interaction. Fungi do not use chlorophyll. Rather than spreading by seeds, they release microscopic spores which are everywhere. Fungi are also an essential part of natures recycling in that they break down the fibers of all dead plant life, returning it to the soil as nurturing humus. The entire family of penicillin drugs are manufactured from fungi. "Toadstools" are toxic and can kill people; "Mushrooms" are benign and some taste very good.

9/18/94 Dr. Liddell accompanied four members on a camping field trip led by Tim McKimmie to Willie White Canyon off the road from Cloudcroft to Sunspot in the Lincoln National Forest. They identified several orders of fungi including lichens, wood rotters, edible mushrooms, toadstools and leaf disease pathogens (eg., *Cercospora*).

CHAPTER REPORTS

Otero-Jean Dodd

Joy Carter led the Otero Chapter from her home to the Yates Ranch in McDonald Flat, back along the same road to her house again. The Carter home turned out to be one of the high points of the trip, as was the courteous welcome we received from some of the staff at the Yates Ranch, home of the PAY-JAY Arabian horses. We toured some of the barns, looked at individual horses, and got some small idea of all the knowledge needed to care for, race, show, and breed some of the finest Polish Arabian horses in the world. One at a time 3 horses put a show on for us. The Manager explained all of the awards the particular horse has won while we admired the grace and beauty of the performing horse. **The** 7,000 acre ranch is in the foothills of the Sacramento Mountains. These PAY-JAY Arabians are on public display once a year in April so if you are interested in seeing them, keep an eye out for notices of this event.

Along the way to the ranch we assured our new members that we didn't usually drive on down the road to a destination. After seeing the horses, we returned to our usual behavior stopping along the road to admire the flora of the area. Saw lots of yellow composites, some asters,red skyrockets,small cosmos, red Indian paintbrush, Chocolate flower, *Zinnia grandiflora*, Crag lily, and the little, blue salvia-*Salvia reflexa*. Back at Carters' home we admired a very tall salvia with straight stems,opposite leaves, and a cluster of blue blossoms at the top of each stem.

On a beautiful, sunny day in October Otero members were given a tour of three ecosystems- Chihuahuan Desert Scrub, Chihuahuan Desert Grasslands on the mesa, and the Pinyon-Juniper belt in the hills on the McGregor Range by Tim Murphy and Miles Brown of the BLM. Along Road 506 typical vegetation consisted of sand sage, ocotillo, mesquite, yucca, 4 wing saltbush, creosote, and golden-eye (*Viguiera stenoloba*). Tarbush was in bloom as was Winterfat and desert zinnia. The slimlobe Globeberry vine-*Iberville tenuisecta* (Gourd Family) was draped all over a shrub showing off its bright red, round fruits. The creosote bushes were very small-on the way out to be replaced by grasses. The BLM is keeping a collection of trend pictures as a history of the range as it changes over time. The grasslands are mainly grasses and clumps of yuccas scattered in the region. Some of the grasses are black grama, blue grama, hairy grama, 3 kinds of threeawn, Mexican needlegrass, Mesa dropseed, Muhlenbergia. Main concerns are to keep the soil covered and to have grass plants that green up at different times of the year for grazing. The BLM furnishes everything-water distribution,fences, etc. and auctions off grazing land permits on a regular basis. Cattle were being brought in for a grazing allotment while we were there. As we drove through the grasslands a badger scurried out of our way, hawks glided overhead, and prairie dogs headed for their holes.

After lunch driving back through the grasslands and the desert scrub we started climbing up toward the pinyon-juniper belt. The vegetation changed to very large Apache plume next to dry riverbeds, little leaf sumac,whitethorn acacia, algerita, Morman Tea, soltol, *Yucca elata*, Mt. Mahogany and eventually the pinyons and pines. Once again we were surrounded by vast vistas of layers of hills. Our destination was a former sheep camp where rancher Charlie Lee lived with his parents in 1931 when he was a small boy. After his marriage Charlie and Jean lived there for a time. Both Charlie and Jean are well know across the state especially in the ranching community. Oliver Lee State Park is named after Charlie's grandfather.

Our hosts made coffee for us as we explored our surroundings and admired the view before heading home, stopping to admire the antelope outlined against the sky as they walked up the hillside.

Road 506 is a public road however if you want to explore the BLM land, you need a permit. The military will then notify you when roads are to be closed. One year permits are available at McGregor Range Headquarters 15 miles south of Orogrande. Ask for George Bankston.

List of Societies, Native Plant Bibliography, and Information Library available at the New England Wild Flower Society.

The New England Wild Flower Society has undertaken a leading role in maintaining materials, lists, and contacts for Botanical Clubs and Native Plant Societies of the United States and Canada. Their Lawrence Newcomb Library is attempting to collect all of the publications of the Native Plant Societies in the U.S. The library contains more than 3,000 volumes dedicated to literature on native plants.

The Society publishes two works of interest to native plant enthusiasts:

1. *Gardening With Native Plants: A Comprehensive Bibliography, with Annotations*, by Mary Walker, 1994. 22pp. Price by mail $6.50.

2. *Botanical Clubs and Native Plant Societies of the United States and Canada*, by Mary Walker. 1994. 5pp. Price by mail $2.50.

These publications can be ordered from:

New England Wild Flower Society
Garden in the Woods
180 Hememway Road
Framingham, MA 01701-2699

Views from the South

(One Members Opinion)

The program at our chapter's next meeting (October 12) will be devoted to discussion of noxious weeds and the proposed "Noxious Weed Management Act" to be introduced to the New Mexico legislature next year. Personally, I am most anxious to learn more about the proposed act. (Unfortunately the deadline for this article precludes my waiting until that meeting before reporting.) I am aware of a very serious problem with some weeds and the potential for more problems. I would love to see the horrible expansion of Tree of Heaven, *Ailanthus alttissima,* in the Black Range addressed. I would love to see the horrible expansion of Siberian Elm, *Ulmus pumila,* in the Lincoln National Forest addressed, as well as many others. This said, I have grave reservations about the proposed new act based on the draft I have read.

The first red flag waving in my face is the apparent inclusion of native plants as potential "noxious weeds". The definition of noxious weed in the draft act is:" 'noxious weed' means plant species requiring management or control, because of its negative interference with the management objectives for a given area of land at a given point in time." In my mind this could include such native plants as prickly pear or cholla cactus, shinnery oak, creosote bush, juniper and so on, all of which have been managed from time to time in specific places, but certainly not plants that should be considered "noxious" and eliminated. Does this definition also apply to plants listed as "threatened or endangered" by the state of New Mexico ? As written, it appears so. The Federal Noxious Weed Act of 1974,while not having the best definition, does exclude native plants from the category of "noxious" by stating "....which is of foreign origin....". The objection I have to the federal definition is that the definition is so closely related to just agriculture interests. I believe for clarity purposes a statement that the "noxious" weed is an exotic plant that may replace native plants is preferable.

The second red flag is that this program is to be managed by NM Department of Agriculture apparently with essentially no public input after the proposed act is in place, and all at taxpayer expense. NM Department of Agriculture in my opinion has shown itself to be a very effective promoter and champion of the agriculture industry, but their actions are often not in the interest other members of the public. An example that immediately comes to mind is the very negative robot display at the recent NM State Fair. Not only was the information presented there misleading and biased, but some was also just dead wrong. As reported in the Albuquerque Journal and the Las Cruces Sun News your taxes went to pay for a display that started with a "Grandpa" robot starting to tell a "bawdy"joke. Subsequently another robot referring to the Endangered Species Act asks, "How would you like it if you lost your jobs, your home and communities just because of an animal no one's ever heard of ? That's what I call taking away your private property rights. Is that what America is really about ?" The same robot later states, "We pay a fair price for the use of public lands. We put in at our own expense all the improvements like stock tanks, fences, feed troughs, roads and other things. Most of the public lands can't be used for anything else." I suppose the truthfulness of the statement about fee level depends on the reader, but one only has to look at a statement of improvement expenses from any of the BLM Resource Areas to see that almost never does the livestock operator pay more than 50% of the cost of any "improvement", and most of the time the federal government (including you and me), pays much more than 50%. The "improvements" usually are desirable only from the standpoint of the livestock operator. Biodiversity is almost never helped by these developments. Finally, I resent the idea that our public lands are only good for livestock production.

While I have deep sympathy for the need to attack certain invasive exotic plants that are escaping and threatening our native flora, we must be careful not to open up a can of worms that attempts to eliminate any of our native species. Be alert to announcements or information about this proposed plan.

(Subsequent to the above writing, we are told that this bill will exclude native plants. This is indeed welcome news because I really am most anxious to support a good noxious weed program. This change must be included in the drafting of a bill to get my support, however.)

On a different note, the current issue of Conservation Biology, Volume 8, No.3 has a number of excellent articles. I have just finished reading and strongly recommend to anyone interested in learning more about effects of livestock grazing in the southwest, an article by Thomas J. Fleischner of Prescott College, entitled "Ecological Costs of Livestock Grazing in Western North America". The article is well referenced, with a lengthy bibliography. This is one of the best scientific reviews I have read on the subject. I also recommend the editorial by Dr. Reed Noss and an essay by George Wuerthner entitled "Subdivisions versus Agriculture" . I have not yet read "The Prairie Dog and Biotic Diversity", but am anxious to do so. Great issue !

Tom Wootten

A REPORT FROM THE ANNUAL MEETING IN LAS VEGAS

A three-hour exploration of Wolf Creek Canyon on the Doolittle Ranch near Watrous gave annual meeting attenders experience of a colorful flora including Great Plains and mountain species. Brightest were bottomlands covered with *Coreopsis tinctoria.* New to many was the giant stickleaf (blazing star), *Mentzelia rusbyi.* The 4-page species-list that we carried, due to clerical (Peterson's) error, omitted three of the most conspicuous species: *Dyssodia papposa, Ratibida columnifera,* and R. *tagetes. A* new list including species reported from the walk is available from Roger Peterson, 1750 Camino Corrales, Santa Fe 87505; please send a 29¢ stamp for mailing and another to cover the cost of copying.

Our thanks to the following businesses and individuals who supported the Native Plant Society with donations for the silent auction.

LOS ALAMOS

Metzger's Texaco 128 State Road 4 White Rock 672-3856 Open Sunday
Sports Bag Inc. Community Center, Los Alamos 662-2454
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Music from Angel Fire Tickets at Tito's Gallery in Las Vegas 425-3745
Meadowland Antiques and Spice Co. 146 Bridge Street Las Vegas 425-9502 Open Sunday
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Native Landscapes 803 Camino Acoma Santa Fe 988-9141
Plants of the Southwest Route 6 Box IIA, 1/4 mile south of Siler on Agua Fria, Santa Fe 438-8888
Agua Fria Nursery 1409 Agua Fria, Santa Fe 983-4831
Paynes's Nurseries 715 St. Michael's Dr. 988-9626, 304 Camino Alire 988-8011 Santa Fe
Jackalope 2820 Cerrillos Rd. Santa Fe 471-8539 Open Sundays
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OTHER

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Bernardo Beach Native Plant Farm 520 Montano NW Alb. 345-6248

Members

Crystal and Augie Pfeiffer, Marguerite Viles, Mary Helen Brunt, Nancy Daniel, Tim McKimmie, Carolyn Keskulla, Gail Haggard, Jean Heflin, Judith Phillips, Bob Pennington, Don Tribble, Lucille Wilson, E. Wilde

Report from the Board

The NPS Board of Directors met at the Annual Meeting in Las Vegas. Among business discussed was the following.

1. The 1995 NPS Annual meeting will be held at Silver City, August 25-27.
2. The 1996 NPS Annual Meeting will be held jointly with the Texas NPS, Oct. 17-20 in the El Paso area.
3. The new officers and directors assumed office; see p. 2 of this newsletter. These positions are for two years.
4. The NPS slide collection was discussed and determined to be a valuable asset, and will be cataloged and enlarged.

FAREWELL PHYLLIS

A very special person to the Native Plant Society and to everyone with whom she came in contact, Phyllis Hughes will be remembered with joy and gratitude for all she was and did. What fun it always was to be with her! An artist and a free spirit from her earliest years, she joyously explored music, drawing, sculpture, painting and dance. She played the flute in a symphony orchestra, danced and did puppet shows at Rockefeller Center, taught sculpture to blind students and travelled the United States and Mexico sketching and painting, enjoying all she found. She touched down in Taos and then settled in Santa Fe where she found work with the Museum of New Mexico, doing illustrations and detailed drawings of museum artifacts, editing "El Palacio", setting up displays and whatever was needed. After her marriage to lawyer Henry Hughes, she took time out to raise two sons, but continued to exercise and develop her talents. She compiled, edited and illustrated the "Pueblo Indian Cookbook" and "Indian Paper Dolls" and explored new interests such as pottery, weaving and furniture carpentry before returning to the Laboratory of Anthropology when the boys were older.

A new interest opened to her after a class with Bill Isaacs on the natural history and native plants of New Mexico and she joined the Native Plant Society soon after it was formed. She loved exploring the countryside in her little brown Subaru, by foot, by helicopter and river raft even into her eighth decade. Because of her association with the Laboratory of Anthropology, she took a special interest in the plants that were used by native people and early settlers of the area. She served as editor of the Newsletter, wrote articles, led field trips, gave talks, did drawings, grew plants and helped in any way she was asked.

Her delight in flowers and the beauty of her world inspired many new members. She contributed knowledge and artwork to several books about plants and taught shadow printing to many children at museum special events. Her most recent book was a charming collection of photographs and notes about flowers seen around Santa Fe called "Santa Fe Bouquet" with Deborah Flynn Post. She was a strong supporter of conservation organizations and an early advocate of a botanical garden for Santa Fe.

A memorial fund for a garden related to her interests has been established in her name at the Santa Fe Botanical Garden, PO Box 23343, Santa Fe, NM 87502 by her friends and admirers.

NOXIOUS WEEDS VIDEO

NPS members who attended the WEED conference in Cloudcroft in October saw a video (Impact of Noxious Weeds on Western Rangelands - An Explosion in Slow Motion) showing examples of some of the problems. If you would like a copy for your chapter write Montana Weed Control Assn, POB 306, Clancy, MT 59634. Enclose $10 plus $3 for postage.

The Native Plant Society of New Mexico
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