

# GILA NATIVE PLANT SOCIETY

A CHAPTER OF THE NATIVE PLANT SOCIETY OF NEW MEXICO



## **BULLETIN**

**JANUARY, FEBRUARY, MARCH 2013**

**Editor: Charles Holmes**

### **PROGRAMS**

All programs are free and open to the public. Meetings are usually the third Friday of the month at 7:00 pm at WNMU's Harlan Hall, with refreshments following the program.

Activity updates and further details will be posted on our website [www.gilanps.org](http://www.gilanps.org). You will also receive a reminder before the date of the program.

**Friday, January 18th - Seth Pilsk will give a talk on "Western Apache Botany."**

**He will present an overview of the deep and personal traditional Western Apache relationships with the natural world, with a special focus on plant life and an emphasis on Apache plant taxonomy. Seth is a botanist for the San Carlos Apache Tribe's Forestry Department.**

**For over twenty years he has worked with traditional Apache elders from each of the Western Apache tribes on a number of cultural preservation projects. Among those projects has been the collection of traditional Apache information regarding the natural world for use by Apache community members.**

**Friday, February 15<sup>th</sup> - Jack Carter will present a program entitled "Charles Darwin," in celebration of Darwin's 204<sup>th</sup> birthday on February 12<sup>th</sup>.**

**Jack will discuss Darwin's life, his numerous contributions, and his theories as contained in "On the Origin of Species by Means of Natural Selection." In that publication, Darwin described the evolution of humankind as a natural process, excluding divine agencies.**

**Botanist extraordinaire, Carter is a professor emeritus of Colorado College, a long-time and very influential member of the Gila Native Plant Society, and the author of numerous books and articles on native flora and conservation. A birthday cake will be shared in commemoration of Darwin's birthday after the program.**

**Friday, March 15<sup>th</sup> - Bill Norris will discuss "The Role of Amateur Botanists in Sustaining the Floristic Tradition in Botany."**

**He will feature amateur botanists with whom he has worked closely in several states (such as Iowa and New Mexico) including a mailman, a printer, a general surgeon, and a high school teacher. These individuals have made outstanding contributions toward knowledge of state flora through their careful plant inventories, websites, and written works.**

**Norris will use their stories as a foundation to suggest projects upon which amateur botanists in New Mexico might embark. Bill holds a PhD in Ecology and Evolutionary Biology (Botany) from Iowa State University and is a Professor of Biology at WNMU as well as director of the herbarium. He has also been active in the Gila Native Plant Society for many years.**

## ANNOUNCEMENTS

### *Plant Your Dream Garden with Native Plants 2013 Native Plant Sale*

Mark your Calendar now! On March 16<sup>th</sup> (No snow please!), the GNPS plant pre-sale will again take place the Silco Theatre. If you are unable to attend and want a preview or prefer to order online, we have the solution as the information regarding the plant sale will be posted on the GNPS website ([www.gilanps.org](http://www.gilanps.org)). The plant pick-up will be on Friday, April 19<sup>th</sup> in the parking lot across from Gough Park. Earth Day will be happening again this year at Gough Park. As always, we're dependent on your purchases and your contributions as volunteers to make the sale successful.

Allison Boyd and Pam Bryant, coordinators

## REPORTS

On October 19<sup>th</sup>, Professor Kelley Allred, author of the newly-published *Flora Neomexicana III*, gave us a very entertaining and beautifully presented talk on "How to Get a Job at a Major University, Feed Your Family for Thirty-Two Years, While Producing Nothing of Any Economic Value." While Kelley may believe there's been limited economic value, his presentation certainly had great educational and scientific value.

Most of his presentation concentrated on his principal focus during his many years of scientific inquiry and educational presentation – the intense study of the *Bothriochloa* genus of grasses. These are referred to by their genus common name—Bluestem grasses.

Dr. Allred presented great photos of all of the *Bothriochloa* species that can be seen in our region. On our local hikes in the weeks following his presentation, we indentified almost all of these species.

**On November 16<sup>th</sup>, Elroy Limmer presented a program on "Insects and Their Relationship with Native Plants." It was a great presentation with marvelous photographs, especially because most of the photos were made at close distances which we rarely see.**

**We are sometimes preoccupied by what we perceive as the destructiveness of many insects, but Elroy, a past president of our society, assured that it is not as much as we think. In addition, think of the great benefit of their pollenizing efforts.**

**He then continued discussing a huge list of many of the types of insects that inhabit our local area. Think of beetles, borers, bugs, cicadas, mantis, dragonflies, damsels, butterflies, bees, wasps, lubbers and grasshoppers, some of which have thousands of species. What a mind-opener!**

**On Sunday, December 16<sup>th</sup>, nearly 50 of us met at the American Legion Hall on College for our annual Christmas party.**

**It was quite a festive affair with gobs and gobs of GREAT food and drinks. The variety of food was amazing and, we are sure, greatly appreciated, especially by those of us who don't cook much.**

**Special thanks to our new president, Keller Suberkropp, for making the arrangements, to all the marvelous preparers of the tasty dishes, and to all who set up the tables and chairs.**

## **GEOGRAPHIC INFORMATION SYSTEMS AND OUR NATIVE PLANTS -- by Jeff Boyd**

A Geographic Information System (GIS) is an academic discipline and computer-based toolset that is a fairly recent addition to the Information Age. A GIS is defined in Wikipedia as “a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data”. Many people are unaware of its existence, or at least of its capabilities. However, many people have some familiarity with GIS without realizing it. If you have used Google Maps to locate an address, or Google Earth to view an aerial photo of an area you are interested in, then you have used a GIS. In this article, I will explain how a map of the Upper Gila River Valley in Southwest New Mexico, showing potential dam sites was built, and what it tells us. I will then suggest how GIS can be used to increase our knowledge of native plants and better protect them.

The map shown below, titled “Proposed Diversions and Dams on the Gila River and Tributaries” was created for the Upper Gila Watershed Project to analyze the feasibility of various water diversion and storage proposals in the upper Gila River Valley. The proposals were under consideration by the Interstate Water Commission, in evaluating options based on the Arizona Water Settlement Act of 2004. Four dams are shown: Schoolhouse Canyon, Bear Canyon, Mangas Creek, and Duck Creek.

The map shows that there are major flaws with each proposed dam and that the reservoir storage capacities are limited. Bear Canyon, upper right on the map, would have the largest capacity, at 94,000 acre-ft but would require two dams and would flood endangered Loach Minnow Critical Habitat. Duck Creek, left-central, at 2900 acre-ft, would have extremely small capacity, require a very long dam, and would be directly upstream from the significant population center of Cliff. Mangas Creek, lower-center, would, at 69,000 acre-ft., flood US-180 as well as private properties, and would destroy the critical habitat for endangered Loach Minnow and Spikedace. And the Schoolhouse Canyon, lower-left, would only store 29,000 acre-ft.

Most of the spatial data used for the map is all available at various internet sites. The publicly available data includes: the topographic base layer, the endangered species critical habitat, the location of buildings (derived from aerial photography), and the land ownership boundaries. The proposed canal diverting water from the Gila River to Mangas Creek was obtained from an engineering study completed in the 1990's. The canal was hypothetically extended to Schoolhouse Canyon by following the least challenging route. The dam locations and height, and reservoir capacity, surface area, and location were the result of analysis that was done using ArcGIS (product of ESRI, Inc., Redlands, CA). A data layer that is not shown on the map, but is critical to determining the reservoir location, area, and capacity, is the Digital Elevation Model (DEM). This data, created using remote sensing, is available from the same internet site as the topographic data. The DEM consists of square cells of consistent size (such as 30 meters), each cell having a single value representing the surface elevation above sea level. Using these cell values, the surface area and location of a

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specific elevation can be determined. The ArcGIS 3D Analyst product calculates the volume contained in each cell, when provided with the elevation of the water surface. By accumulating the volume of each cell within the reservoir, the total capacity is determined.

So how can GIS be used for the study of native plants? Using the example of the map discussed above, by adding a vegetation or land cover data layer, the map could be used to display the effect of the proposed dams on native riparian vegetation. The analysis could include impact by drowning in stored water (under the reservoirs) or by curtailing natural seasonal flood rhythms downstream. If you are searching for locations of rare plant species, a GIS analysis could help you narrow your search. Plants typically are found in specific soil types, climates, elevations, exposure to sunlight, etc. All of these data layers can be combined to point out likely locations for the subject plant species. Is a disease wiping out colonies of a plant species, or invasive species crowding out the native plants? Map the species and the locations of infections to track the spread of the disease. If methods of control can be devised, use GIS to track the progress. Want to study the effects of fire on native vegetation? The USFS has the maps and data for major fires that shows the locations and intensity of the burn areas. Could climate change be affecting a plant species? Map the changes in species distribution over time. Or just want to track where you have found an unusual plant species? Take a GPS reading at the plant, then plot it on a GIS map.

There are prodigious quantities of spatial data available for free on the web. These data encompass categories such as environmental, climate, political, demographic, transportation, geology, cadastral, historic, to name a few. With a full-functioned GIS program, such as ESRI's ArcGIS (available for an annual license fee costing about the same as a nice dinner out for two), there is virtually no limit to what can be mapped or the kind of geo-spatial analysis that can be performed.