Landscape Notes

UC CE James Downer

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Interim Sabbatical Report

Greetings from Arizona. With three quarters of my sabbatical complete, I am starting to focus on outputs, what has come from my time of study here. While I am required by the University of provide a report of my activities, I thought it would be nice for my cleintele to know what I have been up to while away from my regular extension duties at the Cooperative Extension office in Ventura County. So here is an interim sabbatical report, a short article on plant materials and the schedule of the upcoming Trees of the Chiricahua's course in Arizona.

Figure 1: Street trees struggle in Chiang Mai, Thailand with infrastructure conflicts

Much of my time has been spent writing articles, papers and blogs. These have been in peer-reviewed journals, trade magazines (Western Arborist) and on the net. You can see my blogs at the Gardenprofessors.com blog site where there are ten of these that have come out since the start of my sabbatical in October (the end of it is coming up in October, when I return to Ventura about the end of the month). I concluded the Botany for Arborists series this month with an article co-authored by Dr. Kevin Smith and myself about Energy in trees. I am working with the Britton fund to convert these articles into a book. There are some meetings I have been planning while on sabbatical, one is "Soil School for Arborists" which is sold out for August in the White Mountains of California. The other meeting is the SWRS trees course (formerly the Chiricahua Rendezvous) which will be the first week of October in Portal, Arizona (see schedule at the end of the newsletter). These are both field courses and are strongly recommended if you want to get out and see trees in natural settings. We may run another soil school again due to demand.

I spent some time earlier in the year in Thailand (Chiang Mai) to observe the annual flower festival and enjoy the horticulture there. It was an eye opener to see street trees struggle in a tropical land about as much as they do here in California. I also traveled to Texas in June to see trees there and speak at a conference. Finally, I will attended American Soc. of Horticultural Science meetings in Las Vegas in July and gave a presentation. Sabbaticals are a time of renewal and exploration, skill strengthening and growth. Certainly this has been all of that for me plus more. I look forward to my return and the work that awaits in California.

Arid land plants that may have horticultural value in California

Part 1 in a Multi-Part Series

Figure 2: Dasylirion wheeleri covered in snow with Emory oak in the background.

Another purpose of my sabbatical has been to study arid land plants that may be suitable for California culture. I just returned from conferences in Texas and made observations of several promising dry growing plants that may be very useful in California. I am also involved in the Climate Ready Tree study started by Greg McPherson and Alison Berry and some of the plants in that study come form the desert southwest. The part of Arizona I am staying in has summer rainfall, the so called "monsoon" season starts in July, and goes usually till sometime in late September. June is the hottest month and plants are in a state of drought induced dormancy here. This year we received above average winter rains and the creek still runs behind my house, so water is not too far down in the ground. Plants here are adapted to warm summer rains and a kind of rebirth and a summer growth spurt. In many ways this is the culture we provide to our plants in Southern California. We have winter rains and we help our landscape plants through the long hot summer with irrigation. It is very likely that monsoon adapted Arizona native plants will thrive in many California landscapes.

I find the Arizona landscape spectacular because of the amazing monocotyledon plants that grow and are blooming here in early summer. The three that come most to mind are *Agave*, *Yucca* and *Dasylrion*. These low growth plants are fine specimens or accent plants that can beautify many gardens, they are highly drought tolerant and require little care.

Dasylirion wheeleri S.Watson ex Rothr. is native to Mexico and Arizona particularly the Chiricahua mountains. It forms a dense rosette of serrated leaves generally with a blue-grey glaucous covering. These plants are striking specimens that send up ten to 15 foot inflorescences. These plants are members of the asparagus family. Unlike some of the agaves, they are not monocarpic and will continue to grow and often will branch after flowering. Clumps may attain 4-5' in height and attain a circumference of ten feet as very mature specimens. There are several species of *Dasylirion* that occur in Mexico and Texas. Many of the species are very cold tolerant.

Recent Journal Publications:

Takeuchi, T. and ***A.J. Downer.*** *2019. Lead absorption by radish is affected by soil texture and cultivar. Open J. Soil Sci. 9: 65-74.*

Downer, A.J. *and J.F. Karlik. 2019. "A Comparison of Two Horsechestnut Street Tree Plantings in Kiev and Pripyat, Ukraine." Open J. Forestry:255-263.*

Downer, J., Faber, B. 2019. Non-chemical control of *Armillaria mellea* infection of *Prunus persica.* J Plant Sci. Phytopathol. 3: 50-55.

These are publications produced while on sabbatical but the research was done some time ago. Each are open access and can be found in their entirety at each journal and are free for viewing.

Figure 3: Dasylirion in-situ in the Chiricahua foothills, showing a typical infloresence.

Arid Land Plants

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Yuccas come with and without trunks and are common all through Southern California, Arizona, Mexico and beyond, into Texas. One of the most lovely species I have encountered grows right in my yard. It is caespitose or clumping and trunkless. Unlike our common roman candle in California this one does not die after flowering but simply widens it clump with new offsets. The bunches of white flowers form in late spring and are exception in display. The emergent bud on the one in my yard is pink and is a display all of its own. *Yucca baccata* has a bit of a colored taxonomy with various authors calling it by differing terms such as Y. arizonica. There is some speculation that it is a hybrid species. It grows without care or irrigation here in Southern Arizona and becomes more impressive over the years. It would make a great accent or specimen in a California landscape. Since it does not form a trunk the worn out flower stalks are easily removed after flowering.

Finally, in the monocotyledon group we also have the agavaes. Here in Southern Arizona the native *Agave palmeri (*also known as Palmer's Century Plant) is the largest agave native to the United States. It has a variety of forms and colors as well as sizes. Palmer's century plant is monocarpic; it dies after flowering but may leave behind pups that continue on the life cycle and certainly seeds. The spikes are tall, up to 20 feet in height are are home to the rare ladder-back woodpecker. The plant also hosts a variety of invertebrates that feed on it or pollinate the flowers.

Figure 4: Yucca baccata with an emerging inflorescense.

Each of these rosette forming monocots grow easily with minimal water, have showy flowers and provide excellent specimen accents to landscapes. What many may not appreciate however, is that they grow in and around the native oaks as part of the oak woodland plant community. It is not uncommon to see these plants growing beside and under oaks, pines and cypress in the canyons of the Chiricahua mountains.

A big part of the Desert Southwest flora are the cactus, ocotillo, and of course mesquite. But for me, the trees are most amazing here, especially the oaks. All across the southeastern part of Arizona the mountains rise from the desert to

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form an archipelago of plant and animal life. The madrean sky islands are named after the Sierra Madre Occidental, a floristic region within the desert southwest that is a combination of the Great Basin floristic Province, the Californian Province, the Sonoran Province, and the Mexican Highlands Province. This is an area where the the tail end of the Rocky mountains, the great plains, the Mexican highlands, and the California deserts all mix together. As a result, the plant life is unique. Oaks from the Chiricahua mountains take intermediate forms from their Texan and Mexican and California cousins. The oaks here in Southern Arizona tolerate the high heat of summer but also are reliant on summer (monsoon) rainstorms.

Figure 5: Agave palmeri displays an intense and green rosette growing in rocky soils of the Chiricahua mountains.

According to the Arizona Desert Museum the four most common oaks in Southern Arizona are the Emory (*Quercus emoryi*) , Silverleaf (*Q. hypoleucoides*), Shrub Live (*Q. turbinella*) and Arizona White oak (*Q. arizonica*). Many of the desert oaks have an interesting habit of dropping leaves in the spring in a blaze of orange color, the Emory and Arizona white oak both go through striking color changes in March when their new growth and flowers appear. They are very similar in size and shape, large trees up to 50 feet, and have great landscape value. Another interesting species is the Silverleaf oak, that has a very white undercoating on its leaves. *Q. turbinella* has many forms and shapes of leaves--some the blue/grey forms of this small tree are striking. I will continue this plant discussion in the next issue.

For those interested in the flora of Southern Arizona, we are having the Trees of the Chiricahua Mountains course here at the South Western Research Station in October of 2019. There are 26 hours of CEU's approved for Arborists.

Figure 6: Arizona oaks often drop their leaves in later winter or early spring during flowering, sometimes with dramatic color changes.

Trees of the Chiricahua Mountains—
Biology, Ecology and Drought Adaptations.

A meeting of arborists, naturalists, and biologists to study trees and their adaptations in the Chiricahua Mountains of South East Arizona

October 7-11, 2019

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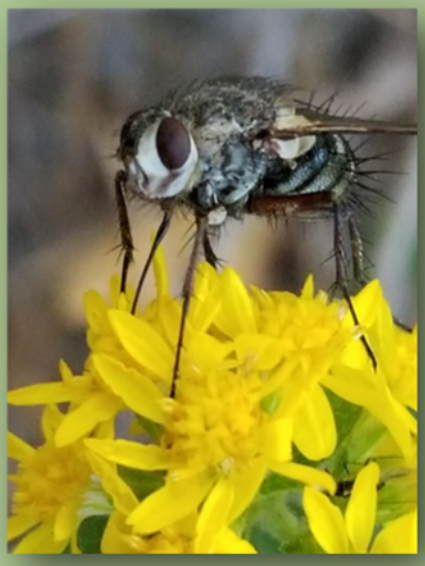
UC CE University of California Agriculture and Natural Resources Cooperative Extension

Arizona College of Agriculture and Life Sciences Cooperative Extension

Purpose: The sky islands are a group of mountain ranges in Southeastern Arizona that are isolated from each other by desert lowland scrub and grassland plant communities. The unique warm and wet climate, relative isolation of these ranges, their unique geological history, and the alternating dry and wet patterns stimulate the development of biodiversity hot spots. The Chiricahua Mountain range is the largest of the sky islands and is the home of the South Western Research Station (SWRS). Trees in these mountains are adapted to hot and dry climates and to heavy summer rain as well as occasional winter rain. These qualities make them ideal for study as candidates for cultivation in arid landscapes. The Chiricahuas also offer us a laboratory to examine tree adaptations and natural history up close. The high species diversity, unique landforms, soils, abundance of insects and animals, and sheer beauty of this part of South Eastern Arizona are unlike anything else in the world.



Registration: Registration includes all meals and lodging (dormitory style), book, seminars, and field trips for five days. The Meeting is held at the SWRS of the American Museum of Natural History, Portal, AZ. **Please fill out the course registration sheet found on the SWRS site https://www.amnh.org/research/southwestern-research-station/education.**

The cost for full registration is $130.00 per day or $680 for the five days. Additional nights can be arranged with the station if you wish to extend your stay with early arrival or late departure. The nearest airport is in Tucson approx. 3 hours drive from the west. We will attempt to coordinate shared

Meeting: Trees of the Chiricahua Mountains

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rides if enough people require pick up. From California, Los Angeles area, plan for a 10-12 hour drive. Local attendees can participate in the full program including meals excluding lodging for $325. There is a slight cost difference for Sunday vs Monday arrivals.

To reserve your spot in the course please contact Alina or Karen at SWRS (520-558-2396) and mail a check made to: Southwestern Research Station, P.O. Box 16553, Portal, AZ 85632.

26 International Society of Arboriculture continuing education credits have been applied for.

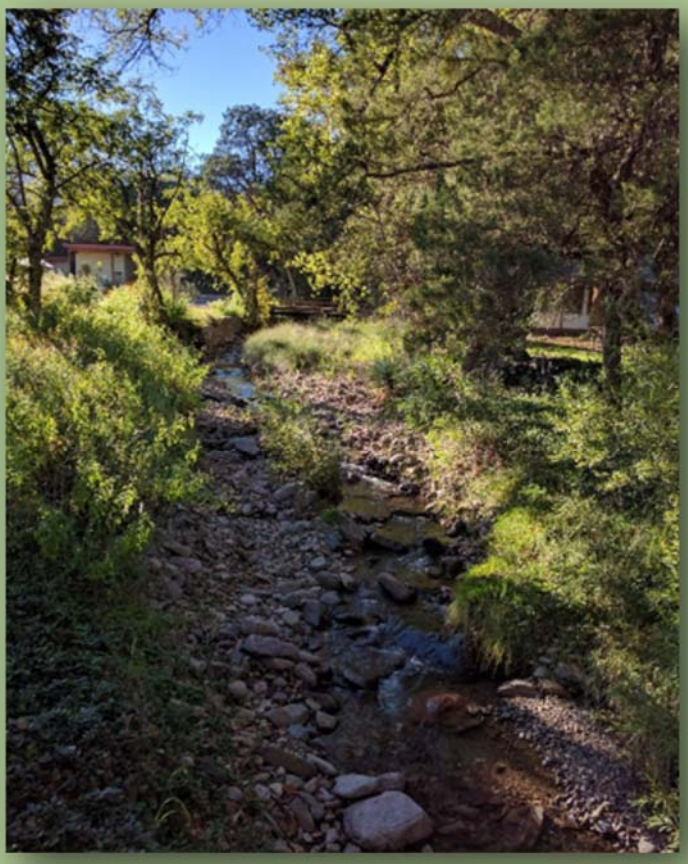
Schedule

Sunday
Early Arrival Day--check in at office for room assignment, Dinner

Monday Arrival Day
7:30 Breakfast/registration/arrival and check in during this period.. *Relax you are at the station!*
12:00 Lunch
1:00 Species diversity in the Chiricahua Mountains. Dr. Howard Topoff and Dr. Carol Simon, Portal, AZ
2:00 SWRS a brief history --what is here: station guidelines, boundaries, hikes and trails. Alina Downer
3:00 Exploring the station grounds, creek drainages, canyons, and riparian woodlands. David B. Kelley, Kelley and Associates Environmental Sciences Inc. and Alina, Jim Downer
4:00 Free Time

6pm Dinner
7pm Seminar: *Soils and landforms of the Chiricahua Mountains* David B. Kelley, Kelley and Associates Environmental Sciences Inc.

Tuesday
7:30am Breakfast



8:30 Morning Seminar: *Insects, Ants and other arthropods associated with Trees in the Chiricahua Mountains*. Dr. Michelle Lanan, Resident Research Scientist, SWRS
10:00 Mid-Morning Seminar: The geology of the sky islands its effects on plants. Ms. Sonia Norman, The Desert Museum, Tucson, AZ
12:00 Lunch
1:00 Field Trip to the South Fork of Cave Creek. Trees of South Fork. 5 mile hike in a creek canyon. Easy walking.
4:00 Return from South Fork and Free Time
6:00 Dinner

Meeting: Trees of the Chiricahua Mountains

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7:00 Evening Seminars: *Drought Adaptation Strategies For Trees In The Chiricahua Mountains* Dr. Ursula Schuch, University of Arizona

8:00 *Fungi of the Chiricahua Mountains and their relationship to trees.* Dr. James Downer, University of California, Ventura County

Wednesday

7:30 Breakfast

8:30 Depart for Granite Gap Field Trip. This is an exploration of the granite gap area 2 miles of walking about to examine tree adaptations. Hilly terrain some climbing and rock scrambling.

9:00-11:15 Hike at granite Gap*: Trees In A Desert Environment: Drought Survival And Monsoon Restoration.*

11:15- noon Travel back to SWRS

12:00 Lunch

1:00 Dendrochronology *workshop and how to use an increment borer to evaluate annular growth increments. What does this mean in a location with a monsoon climate system?* Dr. Kevin T. Smith, US Forest Service

3:00 *Pathogens of the woody support systems of trees.* Dr. Kevin Smith, US Forest Service

6:00 Dinner

7:00 Evening Seminar *The Ecology Of Cavity Nesting Birds In Cave Creek Arizona* (Dave Oleyar, Hawkwatch international

8:00 Night walk with Dave and Owl watching.

Thursday

7:30 Breakfast (pack lunches)

8:30 Morning Seminar: *Fire And Post Fire Adaptation Of Trees In Cochise County*. Dr. James Malusa, University of Arizona

9:30 Caravan to Barfoot Park This is a short hike with elevation 7000-8500 feet.

10:00 *Conifer Biology in Barfoot Park*. Aspen and Conifer regeneration post fire. Smith, Malusa

12:00 Lunch at Rustler Park.

Fungi of conifers (fungal fore) Dr. Kevin Smith and James Downer.

Conifer identification, Dr. Malusa

4:00 Return to SWRS and Free Time

6:00 Dinner

Meeting: Trees of the Chiricahua Mountains

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7:00 Seminar: *Oaks of the Sierra Madre Occidentale* Mr. Adam Black, Director of Horticulture, Peckerwood Gardens, Tx
8:00 -9:00 *Owl walk* with Dr. Dave Oleyar, Hawkwatch International

Friday
7:30 Breakfast
8:30 depart for Chiricahua Monument
Landforms in the Monument, Geology and Tree adaptations: Norman, Malusa, Kelley
12:00 Lunch at the monument
1:00 *Tour the wonderland of rocks and note and study trees of the Chiricahua Monument.* This is a several mile hike inside the monument but mostly down hill.
6:00 Dinner SWRS
7:00 Closing Seminar: *Trees Of The Chiricahua Mountains And The Potential For their Horticultural Selection For Landscape uses.*
Dr. James Downer, University of California

Saturday
7:30 Breakfast and departure.

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