



FALL 2016

Friends of Ironwood Forest

An Earth Day Surprise: Turk's Head Cactus

One of Ironwood Forest National Monument's trademark plants, the Nichol's Turk's head cactus, was discovered on a restoration site on April 22, Earth Day. The appearance of this endangered species marks a victory for efforts to return native plants to damaged landscapes in the Monument.

John Scheuring and Ries Lindley sent this report to volunteers who helped with the restoration:

While mapping young trees on the Waterman Restoration site this morning, Ries Lindley discovered a young Nichol's Turk's head cactus growing on the restoration site right smack in the former illegal runway. We have been anticipating this day for years—and it happened today on Earth Day!

After six years of diligent buffelgrass removal, seeding of desert trees, building water harvest features, and hauling tons of brush to bare spots on the site—this federally endangered species has finally taken root and joins the 120+ other native species now growing on the site. It won't be long before we start sighting dozens of Turk's heads across the restored area.

Today is a MAJOR milestone.

It has been pure pleasure experiencing the Sonoran desert heal itself!

Together we have dedicated over 4,500 volunteer hours to this endeavor. Thank you for your hard work and support.



Read John Scheuring's article on restoration efforts in IFNM beginning on page 5.

Schedules Change for Friends of Ironwood Forest Events

Many of you may be wondering about Hike the Monument and Meet the Monument. The Board has decided to change the time of year we hold both events.

Hike the Monument will be in the fall to allow hikes to the peaks of the mountains that can't be conducted in the spring due to bighorn lambing season. Meet the Monument will be in early spring when it is cooler and less likely to rain.

Gaile James, president

Hike the Monument

Saturday, November 5, 2016

Save The Date!

Don't miss your chance to join us at Ironwood Forest National Monument for our first Hike the Monument (HTM) event being conducted in the fall. This is our second HTM event this year, as we move the event from spring to fall.

Hikes are still being planned. All hikes are interpretive with experienced and knowledgeable leaders.

Hikes will be diverse and range from easy/moderate nature walks to strenuous hikes to rugged peaks.

Dress appropriately for cross-country, no-trail hiking. Bring plenty of water, snacks, and lunch. Don't forget the sunscreen!

You'll need to register for this event. Each hike has a maximum number of participants and fills up fast.

Hikers will meet leaders at the Marana Airport on Avra Valley Road at 8:00 a.m. and carpool to their starting points. High-clearance vehicles may be required depending on the trailhead. Hike locations are about 45 minutes from the airport.

Look for our detailed hike descriptions and sign-up notice, which will go out as soon as we get the planning done. For more information, contact Jim Avramis jim@ironwoodforest.org.

Meet the Monument

Meet the Monument (MTM) will be held next spring, most likely in March.

MTM is our signature event and allows supporters and members of the public who want to learn about the Monument to enjoy a day with many educational speakers, hikes and walkabouts, and other events.

We are excited about the event this spring and offer all an opportunity to be involved. If you have a suggestion or idea or would like to be involved in the planning or volunteer the day of the event, please let me know.

You can reach me at gaile@ironwoodforest.org.

Any help or suggestions would be most welcome.

Get involved, the Ironwood Forest National Monument will be a better place because of your participation.



In the Backyard with Monument Manager Claire Crow

The Sonoran Desert catches me off guard all the time. Sometimes, it's nothing more than noticing the angle and intensity of the sun as it strikes our desert cities. Sometimes, it's nothing short of revelation inspired by an artifact, animal, or landscape. Our desert gives us physical exercise, spiritual recharge, contemplative relaxation, creative inspiration, and adventure.

Implementing the IFNM Resource Management Plan and Travel Management Plan gives back to the desert by protecting resources, fostering sustainable ecological health, and providing appropriate access for recreation and enjoyment. Working together with volunteers, partners, and neighbors to accomplish these implementation projects seems to magically enhance all the gifts the desert provides.

With the intermittent initial signs of autumn comes the change of the federal fiscal year. We are working on plans for the new year, which will include continuation of closing and restoring routes designated for decommissioning (over seven miles closed in FY2016) and of installing barriers to keep motorized traffic from traveling off of Manville and Cocoraque roads (2,000 ft. installed in FY2016).

You, the Friends of Ironwood Forest, recently began working with the Arizona Native Plant Society to create a small native plant demonstration garden at the Watermans restoration site (also known informally as the Allyson Kumataka restoration site). This meaningful work will continue into the coming fiscal year and will eventually be part of a larger interpretive effort to share the site's success story, in which many of you have played a role. Thank you!

Which leads me to a reminder that BLM Volunteer Service Agreements expire at the end of every fiscal year. If you would like to participate in any volunteer service project on the IFNM this year, please contact our volunteer coordinator Laura at lolais@blm.gov.

With gratitude, Claire



Become a member of Friends of Ironwood Forest Today

We care about IFNM. We hope you do, too. We rely on the financial support of members to help us with our mission of protecting the resources of IFNM, enhancing the visitor experience there, and creating awareness.

Please join FIF today.

Basic membership is \$35, but additional contributions help us with our efforts.

Contribute online with a credit card or PayPal at:

www.ironwoodforest.org

From the President

Our members and supporters are exceptional folk! Thank you for all you do. The board is encouraged to work harder (and hopefully smarter!) because of your caring and support. The Ironwood Forest National Monument (IFNM) will remain a great place because of you.

Much has happened over the year. We have new board members, Tom Hannagan, Leona Lansing, and Lindy Sheehey. Their dedication to the Ironwood and to helping us move forward is unparalleled. We are so happy the three of you are with us! Additionally, there is another potential member we hope to have on board soon.

The Friends of Ironwood Forest (FIF) recently granted \$1,800 to the Arizona Native Plant Society to build an educational garden supported by a water catchment area on the Waterman Restoration Site. John Scheuring is the architect and guiding force on this huge restoration project, and we are proud to be a part of this successful endeavor.

The Friends will soon be accepting applications for small grants for Bureau of Land Management-approved projects on the IFNM. Watch the website (www.ironwoodforest.org) for an announcement.

The Bureau of Land Management (BLM) is working hard on projects related to the implementation of the Resource Management Plan. The Friends are a part of this process, and the board is working with the BLM to identify those projects we can complete or help in completing.

Remember that Hike the Monument is now in November. Jim Avramis (jim@ironwoodforest.org) has all the information. Email him if you are interested and want more information on the hikes. There will be hikes for all skill levels. Also, check the website for more information, to be posted soon.

The FIF is working on upgrading and changing our webpage. We were fortunate to

receive a grant of \$8,200 from the Conservation Lands Foundation for this project. It is heartening to have their support. They support Friends' groups all over the west. Thank you Conservation Lands!

FIF could use your help. If you have some spare time or a special skill or knowledge base and would like to help, please let us know. There is still much to do on IFNM, and the more folks who help, the lighter the work becomes and the faster results are realized. We have heard from many of the Friends who would like to help on projects but can't do physically intensive outdoor projects. We have worked with the BLM in identifying projects that can be accomplished indoors using a computer or analyzing pictures and other data. Contact us to find out about projects you can help with.

Public Lands Day is officially celebrated the last Saturday in September, and you may have noted that nothing was done on the Ironwood to celebrate this special day. That's because organizations can schedule events on alternate days more suited to their circumstances. The BLM wanted to set up a Public Lands Day event for the Ironwood in December to take advantage of the cooler weather. A work day is scheduled for Dec. 10. More information will follow on our website and through our email notifications. In the meantime, save the date!

Additionally check the website for more information on Meet the Monument, which will be coming up this spring, most likely in March 2017. We are working to have another wonderful event that will be both educational and fun. Hope to see you there.

A little early, I know, but I hope your holidays are peaceful and enjoyable! Enjoy our lovely fall. Hope to see all of you on the Ironwood soon.

Gaile James
gaile@ironwoodforest.org

Our Mission: Friends of Ironwood Forest is a local non-profit organization that works for the permanent protection of the biological, geological, archaeological, and historical resources and values for which the Ironwood Forest National Monument was established. The Friends provides critical volunteer labor for projects on the Monument, works with the Bureau of Land Management and many other partners, and strives to increase community awareness through education, public outreach, and advocacy.

The AZNPS-Led Waterman Restoration Project: Helping the Sonoran Upland Desert to Heal Itself

by John Scheuring
Arizona Native Plant Society, Tucson Chapter

The Setting

The Waterman Mountains are a rare limestone desert uplift 30 miles northwest of Central Tucson within the confines of the Ironwood Forest National Monument (IFNM) and administered by the Bureau of Land Management (BLM). The Watermans are home to several alkali-loving plants, including the federally listed endangered species the Nichol's Turk's head cactus (*Echinocactus horzonthalonius* var. *nicholi*), elephant tree (*Bursera microphylla*), ocotillo (*Fouqueria splendens*), and desert agave (*Agave deserti*).

The Waterman bajadas are dominated by saguaros (*Carnegiea gigantea*), foothill palo verdes (*Parkinsonia microphyllum*), and ironwood trees (*Olnea tesote*) with an understory of diverse grasses, forbs, and cacti. Desert bighorn sheep (*Ovis canadensis* ssp. *nelsoni*), and desert tortoise (*Gopherus morafkai*), as well as many species of desert birds, thrive in the Watermans.

Land Disturbance and Invasive Introduction

In March 1981 Harlow Jones, a mining entrepreneur and small aircraft salesman, illegally bulldozed 18 acres of undisturbed desert bajada on the northwest side of the Watermans. The disturbance included a one-kilometer airstrip.

Starting in 1982 Mr. Jones lived on-site with his family, until he was declared a trespasser by BLM in 1997 and forced to leave. The BLM requested that Mr. Jones plant vegetation on the disturbed land. Mr. Jones responded by planting buffelgrass (*Pennisetum ciliare*).

By 2005 the entire 18 acres, as well as 10 acres of peripheral desert, were heavily infested with buffelgrass.

Initial Attempts To Control Buffelgrass

There were recurrent efforts to control the buffelgrass. Sierra Club volunteers manually removed plants (2005-2009), and BLM contracted for annual herbicide sprayings (2008-2009). But the soil remained charged with seed, and there was regrowth whenever there was sufficient rainfall and warm weather (February-March and July-October).

In June 2010, the Tucson BLM field office organized heavy-equipment to reshape and contour the entire site. In July 2010, the Arizona Native Plant Society (AZNPS) began a volunteer restoration effort and the recovery of the site began in earnest.

Tree Seeding

In the summer of 2010 AZNPS volunteers harvested palo verde and ironwood pods, along with whitethorn acacia (*Vachellia constricta*)



seeds. In August and September of 2010 they planted the pods and seeds directly without any chemical treatment or seed scarification. By mid-September well over 2000 tree seedlings emerged.

During the following six years, there has been an ongoing effort to plant seeds in gaps where trees have not emerged. In addition to the tree species, volunteers harvested and planted seed of ocotillo, prickly pear (*Opuntia engelmannii*), and triangleleaf bursage (*Ambrosia deltoidea*).



BLM has given ANPS permission to harvest saguaro seeds annually and broadcast those onto the drip lines of growing palo verde and ironwood trees. No irrigation or supplemental water has been brought to any plants on the restoration site since the beginning of the project. By 2016, some of the trees seeded in 2010 exceed 6 feet in height and are bearing seed.

A tree inventory made in May 2016 resulted in a count of over 2,500 trees. Tree seedlings are culled where their density is greater than trees in adjacent desert.

Bringing Buffelgrass Under Control

BLM provided backpack sprayers and glyphosate herbicide to AZNPS for buffelgrass control on IFNM. By mid-August 2010, after the site had been contoured with heavy equipment, the entire restoration site had sprouted in buffelgrass seedlings.

AZNPS-led volunteers spot-sprayed young buffelgrass plants three times weekly from August through October. No buffelgrass plants were allowed to flower. Volunteers were trained to identify look-alike native grasses so they could carefully direct spraying only at buffelgrass plants.

Buffelgrass spraying continued every year with a sharp drop-off of buffelgrass plants emerging each year. Total herbicide applied in 2010 was 234 gallons and by 2014 the total applied was only three gallons for the same area. By 2016 only a few plants are still found and have been easy to identify and pull out manually.

Fixing Problem Areas

Four major problem areas covering two out of the total 18 acres were identified with little or no

plant growth. Soil analyses were conducted on the recommendation of a University of Arizona soil scientist. The conclusion was that there was no soil toxicity problem but rather a soil moisture-holding limitation.

This limitation could be corrected with the construction of bermed terraces and one-rock dams to capture and retain runoff water. During a five-year period, over 150 structures were built with over 2,000 hours of volunteer manpower.

There was a dramatic plant establishment and growth response to the enhanced moisture in and adjacent to the bermed terraces and one-rock dams.

Volunteers made sure that runoff water would spread and soak in rather than pool in one area. In areas where water was allowed to pool, there was poor plant emergence and growth.

There were large upland bare ground patches across the site where no plants emerged. According to an infrared thermometer on a mid-June afternoon, soil temperatures averaged 145° F. Bare areas overlayed with tree and brush cuttings averaged 115° F.

Based on that difference, and also the fact that shaded soil dries out more slowly after rainfall than soil in the full sun, project leaders decided to amend the bare soil with tree and brush cuttings. Over a five year period approximately 300 pickup truck loads of tree branches were hauled onto bare areas with a marked increase in plant establishment within 24 months.

Native Species and Vegetative Coverage

Plant species on the site were routinely noted. Vegetative coverage, other than the planted tree seeds, resulted from seed coming from adjacent desert areas. Currently, 102 native species have been identified. This list includes 20 native grass



species and one spontaneously occurring Nichol's Turk's head cactus discovered in April 2016.

At the outset of the project in 2010, seven 50-meter transects were established. Vegetative coverage and species counts are made each year in mid-October.

By 2016 the vegetative coverage had plateaued at 61%, with little change in the overall coverage from year-to-year as numerous small grasses were replaced by larger perennial plants. Five photo-points were established and a set of repeat photographs have been taken annually in mid-October.



Plant Establishment and Succession

A few species were noteworthy in their rapidity and extent of early establishment: woody crinklemat (*Tiquilia canescens*), brittlebush (*Encelia farinosa*), purple and six-weeks threeawn grass (*Aristida purpurea* and *A. adscencionis*), fluffgrass (*Dasyochloa pulchella*), and globemallow (*Sphaeralcea ambigua*).

In spring 2016 two Nichol's Turk's head cacti had established in the runway area of the site. All of the seed was either in situ or blown in from the adjacent desert.

Two species were notable for their contribution of copious amounts of plant litter to the bare soil, fluffgrass and trailing four-o'clock (*Allionia incarnata*). Both of those species germinated and grew all year long whenever there was sufficient moisture available. Both species regularly died off and provided litter and ground cover, allowing for germination of successional species such as hoary abutilon (*Abutilon incanum*) and triangle-leaf bursage (*Ambrosia deltoidea*).

By 2016 there was an obvious succession of

brittlebush yielding to triangleleaf bursage. This succession was expected as triangleleaf bursage is a dominant shrub and brittlebush is rare in adjacent undisturbed deserts.

Fauna Establishment

In 2010 and 2011, only two vertebrate animal species were regularly seen, rock wrens and coachwhip snakes. By 2014 black-throated sparrows were already nesting in prickly pear and young palo verde trees. A few blacktail rattlesnakes were found and whiptail lizards appeared throughout the site. The first Harris's antelope squirrels were sighted. By 2016 there were extensive rodent holes and ant colonies. Desert bighorn sheep regularly began grazing on the site.

Discussion and Conclusions

Within a six-year period, a near monoculture of buffelgrass was eliminated and an Upland Sonoran plant community was well on its way to re-establishment. Repeated and careful spot spraying of the buffelgrass made room and available moisture to native plants without further ground disturbance.

By the fourth year, herbicide application was negligible. Woody-tree species planting from seedpods proved to be very effective. While there was never any hand watering or artificial irrigation, the trees and shrubs have benefited from the extensive water harvesting effort that resulted in keeping most of the rainfall and incoming runoff on the site itself. No seed mixes were planted. All of the species now growing on the disturbed area share the same genetics (not just species commonality) as native plants in adjacent deserts.



Bulldozing and scraping of the soil by Mr. Jones resulted in a depletion of organic matter and soil surface litter. The soil disturbance also resulted in poor water permeability. The accumulation of plant litter, especially from native grasses, has resulted in gradually growing plant associations and enhanced water penetration. The extensive amendment of tree brush, as well as an amendment of significant litter from the woody degradation, has enhanced plant growth.

It took six years before widespread rodent, lizard, and ant holes appeared. Those holes will continue to enhance water penetration and retention in future years. Newly established palo verde trees started bearing seedpods in 2015, and that seed pod and tree litter production will increase in multiples over future years, providing habitat for nurse plants and fauna.

This effort has spanned six years and included approximately 5,000 dedicated volunteer hours. Had the effort followed the typical two- or three-year project life cycle without sustained continued effort, the land would have reverted to buffelgrass, and erosion channeling would have left most of the area dry and barren.

Year after year, buffelgrass seedlings were removed, erosion channels were rocked as they appeared, berm terraces were repaired and reinforced, and bare areas were covered with brush and replanted with tree seed.

This project demonstrates that timely interventions can indeed reclaim the desert from buffelgrass invasions and other disturbances and put in place the essential ingredients for desert regeneration. But focused attention, hard work, and multiple years are required.

Acknowledgments

I thank colleagues from the Arizona Native Plant Society for guidance, consensus agreement, and support. Exceptional contributions have been made by Ries Lindley for floristic contributions, Dennis LeBlond for his leadership in the water harvesting effort, and Chuck LeFevre for his assistance in harvesting and conditioning native seed.

I thank the BLM Tucson Field office for administrative and tool support. Several UA professors, especially Dr. Jim Walworth, provided technical guidance. Dr. Emilio Carrillo from NRCS provided technical advice. Mr. Harlow Jones' personal interview was informative.

Finally, thanks are due for the volunteer support from the Arizona Native Plant Society, Sierra Club Arizona, the Dove Mountain Hikers, the UA SWES Student Club, Catalina Council, Boy Scouts of America, the Desert Museum Youth Earth Club, and numerous BLM Tucson Field Office interns.



Note: This article is reprinted with permission of the Arizona Native Plant Society.

The Arizona Native Plant Society is a nonprofit organization devoted to Arizona's native plants. Its mission is to promote knowledge, appreciation, conservation, and restoration of Arizona native plants and their habitats.

For more information, visit the Society's website:

<http://www.aznps.com>

2016 Members and Supporters

Thank you to everyone who donated to Friends of Ironwood Forest for fiscal year 2016.

Because we are an all-volunteer organization, your generosity and love of Ironwood Forest National Monument are doubly appreciated.

The people and organizations listed here donated this past year. If your name should have been on this list and isn't, please let Gaile James, Board President, know at gaile@ironwoodforest.org

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