Friends of Ironwood Forest Fall 2024

Stinknet: Not Just Another Invasive Plant

by Christine Flanagan, Ph.D.
FIF Science Advisor

There is a slow-motion ecological crisis unfolding in Pima County. Stinknet, *Oncosiphon piluliferum*, a plant from South Africa, has invaded vast areas of Maricopa and Pinal Counties, and is rapidly spreading north, south, east and west. It is enroute to a vacant lot, roadway, or park near you, and notably, to our public lands, state parks, hiking trails, and recreation areas.

A thought experiment

Imagine it is the 1870s and you are in Bonhomme County, South Dakota. Farmers are starting to notice a new weed called Russian thistle with irritating spiny hairs. Its seed likely arrived in a container of flax seed imported from the Russian steppes. Finding fertile, disturbed soil, its seeds germinated and grew. Some farmers were concerned, others preoccupied, but few were inclined to mount an effort to contain its spread. Now considered one of the fastest plant invasions in U.S. history, Russian thistle is found in all states except Alaska and Florida. Now imagine it is 1860, and Arizona is without tumbleweeds. Can you?

So what is stinknet?

A member of the sunflower family, stinknet is also called globe chamomile. It is an oddly attractive but deleterious, distant relative of the familiar medicinal herb. Stinknet, an annual plant, grows here in winter and, like many of our native winter wildflowers, its approximately 7-month growth cycle begins with germination to form a basal rosette following the onset of winter rains in October-December. The leaves have small oil glands and hairs, likely the source of the volatile chemicals and pungent turpentine-like smell that inspired its common name. Growth continues until flowering, seed set, and eventual death in April/May. Flowers are likely self-fertile, but

Pssst....

There's gonna be a BIG party next year!

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little is known about pollination and few pollinators have been observed visiting it. Seed germinates readily in disturbed soil. After gaining a foothold, a founding population is capable of spreading rapidly, especially in places that receive runoff from winter rainfall or escaped irrigation. Upon death, the flowers fade to tan and remain attached until dislodged. The foliage, 6-24" in height, fades to brown, but remains erect and is highly flammable. Large populations can form low, dense drifts over wide areas just waiting for a spark or discarded cigarette.

A problem in Arizona and beyond

A herbarium specimen of stinknet from 1997 collected from the Tres Rios constructed wetland in Phoenix is the earliest documented occurrence in Arizona. Its source is unknown, but it may have been introduced elsewhere in Maricopa County as a cultivated specimen. The spread of stinknet was rapid: herbarium specimens from 2003-2005 document numerous sites widespread over areas of Maricopa, Pinal, and Pima counties. It was declared a noxious weed in Arizona in 2020 and is now subject to regulations including those governing use of "weed-free" as a label for hay, straw, or seed. It has been observed germinating from seeds in straw at a private residence, suggesting the worrisome possibility of spread by straw used in erosion control. Despite the requirement for use of weed-free straw in construction, contamination with stinknet would be difficult to detect in practice. It was first seen in Tucson in 2015 at a construction equipment storage site. Stinknet now extends north to Sedona (at 4,200 ft. elevation), south to the border with Mexico, and into Sonora. It is limited by freezing temperatures but appears to tolerate moderate cold. Much remains unknown about the biology of stinknet.

Winter growth (top) and summer stinknet (bottom)

A winter carpet of stinknet. Photo: Don Pike

Stinknet is native to the Cape Region of South Africa and found across a variety of habitats and disturbed areas that receive winter rainfall. It has earned a reputation there for weediness in agricultural areas. Stinknet is invasive in Western Australia, likely introduced by contaminated fodder during the drought of 1922 or later in contaminated seed. Contaminated seed is

also the probable source of an independent introduction around Melbourne, Victoria, before 1920, but stinknet has not been found there for 50 years and is considered extirpated. More recently, stinknet appeared in South Australia in 2022, but immediate intervention stopped its spread.

Stinknet was first found in North America in 1981 in Riverside County in Southern California. The source of the founder population is unknown. It was documented in San Diego County in 1997, Orange County in 2003, and subsequently in Santa Clara County. No connection between the California and Arizona populations has been documented but imported, contaminated feed or straw is the most likely culprit.

Not a pretty picture

Stinknet seeds travel in tire treads, behind bumpers and in other cavities in vehicles, construction equipment, and farm machinery, that, along with air currents, are the principal vectors moving stinknet along roadways. Now easily observed, its dry, rust-brown drifts sweep through the medians, roadsides, and fallow areas along I-10 between Phoenix and Tucson. They will be replaced in December/January with bright, green foliage that grows, eventually bearing many bright, yellow, pencil-eraser-sized, spherical flowers at stem tips. In bloom along roadsides, the beguiling drifts glow brightly alongside the taller, yellow brittlebush. Each flower may contain 250 seeds and a single plant may produce more than 3,000 seeds. To get a sense of the astounding spread of stinknet in southern Arizona since 1997, maps of its occurrence can be found at www.stinknet.org. For its wider distribution, see https://www.eddmaps.org/distribution/viewmap.cfm?sub=50728.

Immature stinknet

Small seeds, big consequences

Once established, stinknet is extremely difficult to eradicate and portends significant and costly efforts to control its spread. Seeds can remain viable in the soil for years, waiting for a favorable period of winter rain. Its seeds and attached dried petals are about 1/16" (2 mm) in length, are carried along interstates, roadways, and hiking trails in urban, suburban, and remote areas. They lack burrs or hooks, but cling electrostatically to paws, footwear, clothing, and plastic, are carried aloft by wind, and swept along by moving water. After successful colonization of disturbed soil, under favorable conditions, it is capable of overwhelming and displacing adjacent annual grasses or wildflowers. Stinknet apparently is unpalatable, for no animals are known to eat its foliage or seeds except during starvation. Consequently, large stinknet populations can reduce the local carrying capacity of natural areas for wildlife. Besides its ecological impact and flammability, stinknet also has human health concerns. In close contact, it can cause skin rashes, lung irritation, and headaches, and is particularly worrisome for those with pre-existing health issues.

Like a contagion that escapes control, stinknet has serious implications for health, recreation, and the economy. There is already a record of disruption and crisis management from established populations of stinknet.

Some recent examples include:

- Due to concerns about health and facilitating further spread of stinknet, National Park Service officials closed the Casa Grande Ruins National Monument picnic area last spring from March 28-April 30 due to invasion of stinknet.
- A school in Tucson whose students were experiencing headaches and other ill effects, requested assistance from the city to address a dense population of stinknet on two vacant lots bordering the school. Volunteers were gathered on at least three different occasions to remove stinknet and herbicide was applied. But the population was well established and both efforts will be repeated for two or more years.
- Stinknet has been classified as a ladder-fuel and was an accelerant in the spread of the 2020 Aquila Fire in the Desert Hills area of north Phoenix that caused evacuations and destroyed structures.
- Established expanses of stinknet may invade or overwhelm stands of desert wildflowers that attract visitors and dollars to our economy. Hikers and bikers inadvertently spread stinknet along trails, impacting their desirability for recreation. Shoe brushes to remove seeds are being installed at popular trailheads on a priority basis.
- One day before the 2024 Pima County Fair, an emergency strike force was marshalled to clear the parking area of a large population of stinknet in hopes of avoiding a countywide spreader event. The site has been flagged for evaluation and likely repeat visits once the winter rains start.

Defense and Intervention

The best time to take action against stinknet is from germination until flowering begins. Stinknet plants can be manually pulled, bagged, and disposed of in a landfill, an ecologically benign but labor-intensive method. Even large stands can be effectively removed with sufficient volunteers, but they signal the presence of a considerable seedbank, so repeat visits in succeeding years are required. Spraying by a professional licensed applicator is another strategy, but glyphosate and other herbicides are effective only up to the onset of flowering. Prior to winter rain, spraying of a pre-emergent herbicide can be an enhanced level of intervention but has

Your Financial Contributions at Work

We rely on the financial support of people like you to help us with our mission to protect the natural and cultural resources of Ironwood Forest National Monument. We also work to increase awareness of the monument and improve visitor experience there. Please consider donating to support our work. We couldn't do this without you. You can donate online at https://ironwoodforest.org/donate

collateral harm from its indiscriminate killing of all seeds in the seedbank where it is applied.

Join the effort!

Stinknet interventions, media placements, surveys, neighborhood meetings, flyer distributions, festival information booths, volunteer training, and other grass-roots actions are being organized by Pima County, the City of Tucson, the Arizona-Sonora Desert Museum, Tucson Audubon Society, Saguaro National Park, Arizona Native Plant Society, and other groups cooperating under the auspices of the Sonoran Desert-Cooperative Weed Management Area (SD-CWMA). Involved are federal land managers, city and county workers, ADOT representatives, NGO staff and volunteers, neighborhood organizers, concerned citizens, elected officials, and others who appreciate the threat presented by stinknet and are concerned about preserving the Sonoran Desert.

No matter your skills or physical capabilities, you can help. Start with https://sdcwma.org/ to find out what is happening in our area. Learn to recognize stinknet and report sitings at www.stinknet.org. Join the Sonoran Desert Weedwackers, https://www.pima.gov/3105/Sonoran-Desert-Weedwackers who focus on invasive weeds in Tucson Mountain Park. Go to https://www.nps.gov/sagu/learn/news/2024-03-28-invasive-stinknet.htm to learn about stinknet efforts in Saguaro National Park. And check in at https://ironwoodforest.org/ to learn how you can help in our own Ironwood Forest National Monument. Volunteers from the Friends of Ironwood Forest will be organizing this fall to conduct surveillance for early detection and removal along roadways into the monument and adjacent documented sites. Contact John Holzemer at Holzemer@comcast.net if you would like to get involved.

We can win this battle for IFNM

A lone stinknet plant in flower was found in Ironwood Forest National Monument in 2023 in the Waterman Mountains. It was removed. Only by deliberate and diligent efforts of people who value its natural beauty will the Monument remain free of stinknet.

Next year will be a monumental year for the IFNM!

Ironwood Forest National Monument turns 25 next year! Established on June 9, 2000, IFNM protects vital ecosystems, diverse wildlife, and rich cultural sites on land once inhabited by the indigenous Hohokam people, and more recently by the Tohono O'odham Nation. Join us in celebrating this milestone through a series of events and activities next year, highlighting the monument's natural beauty and significance. Stay tuned for more details on outings, educational programs, volunteer opportunities, and more, as we commemorate 25 years of Ironwood Forest National Monument!

Save these dates (more to be added later):

2024

December 14 Hike the Monument – Waterman Mountain

2025

January 11 Hike the Monument – Elephant trees, rare cacti, and maybe bighorn sheep

February 15 Hike the Monument – Cocoraque Butte archeology site

March 15-16 Tucson Festival of Books

March 22 Meet the Monument (see below)

Also, please join us for volunteer workdays, doing tasks like **maintaining trails** in the Monument or **removing legacy barbed wire fencing** with Desert Fence Busters. Watch our website for dates and details.

Meet the Monument returns by popular demand! This one-day event introduces the Ironwood Forest National Monument to the public and allows folks to come out and experience this nearby national treasure. The Friends realize that there are many people in the greater Tucson area who have no idea what the Ironwood Forest is or where it is located. As one of our nation's oldest national monuments, the rugged and scenic beauty of the area safeguards some of our rarest flora, fauna, and culturally significant history, and we want to share it with you!

Meet the Monument is structured to be a learning experience, not a festival. The annual event began in 2012 but has not been held since COVID. It will be revived next year, however, in honor of the monument's 25th anniversary. The 2025 event will be held on March 22 at the El Tiro Gliderport, which is more accessible

and offers more space and parking than the past location. More details about speakers and interpretive displays will be provided on the Friends website over the coming months.

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 Ironwood Forest National Monument was established.

FIF 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

According to the June 2000 presidential proclamation establishing the Ironwood Forest National Monument, the area contains the highest density of desert ironwood trees recorded in the Sonoran Desert. But according to the Arizona-Sonora Desert Museum, the monument was not so named because of the density of ironwood trees; rather, it got its name because ironwoods in this area "have more ecological associates than anywhere else this phenomenon was measured" (*Desert Ironwood Primer*, ASDM 2000).

The following narrative is excerpted from *Natural History of the Ironwood Forest National Monument: A Sonoran Desert Primer*, a wonderful book by Royce Ballinger and Young Cage published in 2014. A complete digital edition of the book will be made available in conjunction the 25th anniversary of the monument.

Desert Ironwood Tree

By Royce Ballinger and Young Cage

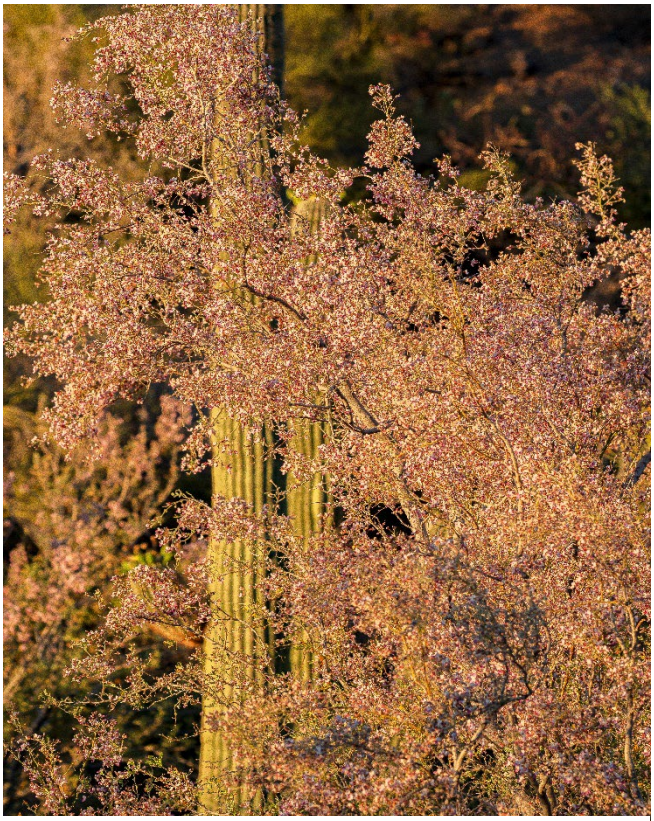
The desert ironwood tree (*Olneya tesota*) has been studied more carefully than perhaps any other species with regard to its importance in the Ironwood Forest National Monument (IFNM). The distribution of the desert ironwood tree almost exactly coincides with the Sonoran Desert. In the IFNM (and the Tucson Mountains nearby) the desert ironwood is near its eastern distributional limit where it is found most commonly along the slopes of the Arizona Upland. However, in most of its southern and western range in hotter and drier areas, for example in the desert east of Yuma, this tree occurs most frequently along washes of the flatland desert.

Desert ironwoods are long-lived (presumably up to 800 years or more), slow-growing, with trunks of extremely dense wood that will not float in water. The wood has been used for beautiful carvings, first started by the Seri Indians of Sonora, Mexico, under the artistic

Arizona Upland is a subdivision of Sonoran Desert Scrub habitat. See Brown and Lowe, 1980. *Biotic Communities of the Southwest*.

tutelage of Jose Astorga. The subsequent industry by Mexican carvers and the practice of making charcoal resulted in near extinction of large, old trees in Sonora. Collection of ironwood for charcoal is now prohibited, and the plant is protected in the United States.[1]

Perhaps no other plant in the Sonoran Desert serves such an important ecosystem role as the desert ironwood. Over 500 species of plants and animals have been documented to be directly impacted by the tree. It produces a microenvironment that shelters many species. It serves as a "nurse plant" for seedlings to germinate under its canopy. Its flowers and foliage provide food for bees and other insects as well as browse for deer, desert bighorn sheep and other herbivores. The seed (a bean) provides food for hundreds of animals ranging from rodents to birds. Its canopy is used as a perch and nesting site for numerous birds. A symbiotic bacterium in its roots produces nitrogen that enriches the soil.



Ironwood in bloom. Photo: Friends of Ironwood Forest

In IFNM, the desert ironwood usually blooms beginning in late May, but earlier in very warm springs. A given tree blooms for about 10-18 days, but the staggered flowering of the forest may extend the bloom period for as much as a month or more. The pea-like flower of this legume (Family Fabaceae) is lavender and cream and much of the landscape in IFNM is blanketed with this color during this period when many of its gray-green leaves are shed. Leaves are also drought-deciduous, falling off during extremely dry periods, and also typically during the flowering period. Seed maturation occurs at the time of the summer monsoon. The beans contain 1-8 hard seeds that are collected by many animals. Some of the seeds germinate from caches in rodent burrows. The seeds can be ground into flour but they contain some bitter chemicals that cause gastric distress in some people. They can also be eaten raw. When mature they are crunchy and have a nutty flavor, but take precautions against insect larvae in the seeds.

[1] Newsletter editor's note: As of October 2024, desert ironwood was not listed as protected by either the laws of the State of Arizona or those of the United States. However, large tracts of desert ironwood in Arizona are protected by administrative rules within preserves such as Ironwood Forest National Monument, Saguaro National Park, Cabeza Prieta National Wildlife Refuge, and Organ Pipe Cactus National Monument.

From the President

By Tom Hannagan

Thanks Carolyn!

Carolyn Campbell has been a lot more than a "friend" to the Ironwood Forest National Monument. For over twenty-five years, Carolyn has led the Coalition for Sonoran Desert Protection, growing it into a group of over thirty local environmental organizations, including the Friends of Ironwood Forest (FIF). The Coalition played a pivotal role in creating Pima County's landmark Sonoran Desert Conservation Plan (SDCP).

The SDCP identified which areas were most important for plant and animal species and should be protected from development. The Plan was largely centered on critical habitat for the federally endangered ferruginous pygmy owl. The SDCP used biological data, along with a lot of negotiation, to come up with an acceptable roadmap for conservation that multiple agencies and levels of government could accept.

One item on Carolyn's list was the initiative to set aside some lands near the Silverbell Mountains. A group of environmentalists living in the vicinity wanted a county park. Carolyn worked with the area's county supervisor, Sharon Bronson, to see what might be done. Bruce Babbitt, former governor of Arizona and then Secretary of the Interior, attended a county supervisors meeting that discussed the new SDCP, and the county park idea came up.

Using data related to pygmy owl habitat, along with archeological surveys, the Coalition started proposing various maps for a potential national monument, instead of a county park. As it turned out, Secretary Babbitt was interested in adding conservation lands under the auspices of the Bureau of Land Management (BLM). Carolyn's persistent efforts eventually led to a map that both the County and the Interior Department could agree upon – another success in finding "common ground". This led to the creation of the Ironwood Forest National Monument on June 9th, 2000, by then President Clinton.

Photo: Jim Avramis

Carolyn has been a key player on many other conservation initiatives. She assisted with gathering an informal but dedicated IFNM friends group that eventually led to the Conservation Lands Foundation formally creating FIF in 2007. She has been very active with the RTA 20-Year Plan, supporting wildlife crossings as an integral part of new road construction, providing connectivity that is critical for biological diversity. Connectivity also motivated Carolyn to play a founding role in the Desert Fence Busters, supporting the removal of obsolete barbed wire fences in the basins between the sky islands.

Carolyn's retirement party on September 21st was a gathering of longtime friends, as well as key figures in conservation, community organizations, and politics. Both the City of Tucson and Pima County declared that day to be Carolyn Campbell Day. Chris McVie, a close friend and Coalition colleague, declared Carolyn to be the Queen of the Environmentalists. No one argued with that designation.

Introducing new Friends board member

Jackie Craig

Jackie holds a BA in English from the University of Idaho and an MS in National Security Strategy from the National War College. She is a Tucson native and spent intermittent years living in the area before returning permanently to Marana upon retirement in 2013, after twenty-five years in the U.S. Diplomatic Service. In retirement, Jackie became an active hiker and hike leader, a Master Gardener and a community activist. In 2020, she ran for the Marana Town Council and is currently finishing a four-year term, where she has been a voice for conserving open space, allowing for wildlife corridors, and protecting scarce water resources. Jackie has a strong interest in preserving the native Sonoran Desert habitat for humans, animals, and plants.

Introducing new BLM ranger

Michelle Pelley

We were happy to learn in June of this year that a new BLM ranger had been assigned to BLM's Tucson Field Office. The ranger position is indispensable for planning and coordinating various projects between the Friends and BLM.

Michelle is originally from Napa, California, but has been an Arizona resident since 2016. She earned a bachelor's degree in Parks and Recreation, with an emphasis on Park Protection, from Northern Arizona University. While at NAU, Michelle volunteered with the NPS at Walnut Canyon National Monument, where she assisted visitors from all over the world and participated in search & rescue operations for visitors, dealing mostly with altitude sickness or heat-related illnesses. She soon became a seasonal employee and then a full-time ranger at WCNM in 2022. But her

fiancé is originally from Tucson, and they decided to move. She waited several months for an opening before she was hired by the BLM.

Michelle says she is enjoying exploring the IFNM and getting to know the landscape and its history. She is "looking forward to getting to know everyone in the Friends of Ironwood Forest group and accomplishing some amazing work on the Ironwood this year."

Welcome aboard, Michelle!

FIF Partners

Archaeology Southwest
Arizona Desert Bighorn Sheep Society
Arizona Native Plant Society
Arizona Game and Fish Department
Arizona-Sonora Desert Museum
Arizona Wildlife Federation
Avra Valley Coalition
BKW Farms
Bureau of Land Management
Center for Biological Diversity
City of Tucson
Coalition for Sonoran Desert Protection
Conservation Lands Foundation
Discover Marana
Dove Mountain Hiking Club
Friends of Buenos Aires NWR
Friends of Saguaro National Park
Highlands at Dove Mountain Hiking Club
Historic Y
MET Foundation
Marana Heritage Conservancy
Marana Parks and Recreation
National Park Service, Saguaro NP
National Parks Conservation Association
Old Pueblo Archaeology Center
Pew Charitable Trust
Pima Association of Governments
Pima County
Sky Island Alliance
Sierra Club
Tohono O'odham Community College
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Town of Marana
Town of Marana Chamber of Commerce
Tucson Audubon Society
Tucson Cactus and Succulent Society
Tucson Clean and Beautiful
Tucson Herpetological Society
Tucson Soaring Club
University of Arizona
The Wilderness Society

The Ironwood Gallery

Send us your favorite photographs of IFNM

Monsoon Lightening by Ryan Olinger