

FIELD NOTES

FOR MEMBERS OF THE NATURE CONSERVANCY IN ARIZONA

SPRING/SUMMER
2023

INSIDE
*Ramsey Canyon's
beautiful insects*

Cool cities

The Nature
Conservancy 

Protecting nature. Preserving life.



FIELD NOTES

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From the Director

Dear Friends,

As my family and I celebrated Earth Day this year, I could not help but reflect on the depth and breadth of impact The Nature Conservancy and our Arizona teams are having right here in our own backyard. Earth Day not only reminds us to take stock of the environmental issues facing our communities but to celebrate the strides we have made and remind us that when working together, humans are capable of extraordinary things.

Extraordinary things that are evident as we, and partners, tackle complex challenges like climate and siting infrastructure to support a clean economy as showcased in our *Power of Place: West* study (pages 3-5); and empower local citizens, like Rosalyn, to improve health and welfare in our cities through our Healthy Cities Urban Heat Leadership Academy, in partnership with the Phoenix Revitalization Corporation (pages 8-11). Not only has the Academy become a national model but it was recently honored with two environmental excellence awards as well as the President's Award, the top honor of all project submissions, from Arizona Forward. I could not be more proud.



And, that recognition would not be possible without those who make this work possible. Our program teams, conservation teams, support teams and TNC writ large. It would also not be possible without your commitment and support. It is truly a pleasure to be a part of a group that is capable of extraordinary things to ensure a future where people and nature thrive.

Last, but certainly not least, a special thank you to Tana Kappel, who started this magazine and has led editorial. She retired this year but is likely not done sharing stories. Please do share your stories with us whether dropping us a line at arizona@tnc.org or visiting us on Facebook at The Nature Conservancy in Arizona.

Best,

Dan Stellar, State Director



POWER OF PLACE WEST



The Nature Conservancy recently published *Power of Place: West*, a study that takes a comprehensive look at 11 Western states and their ability to reach clean energy goals by 2050.

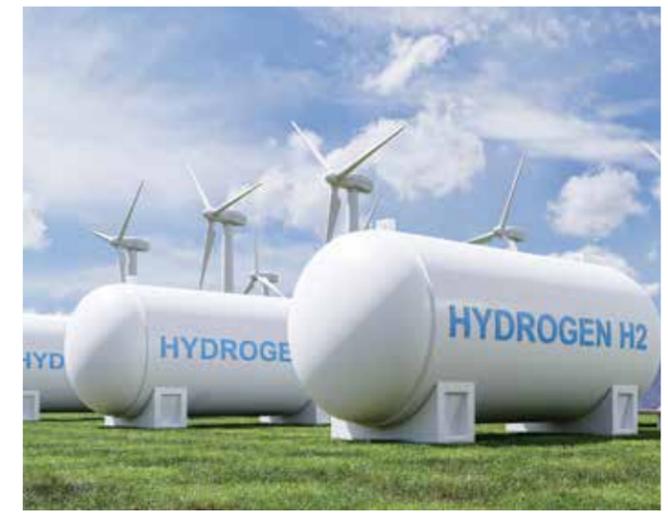
Climate change is an active threat to lives and livelihoods everywhere, and its effects are already being felt. Wildfires threaten our homes and communities, drought is prevalent throughout the West, and record-breaking storms and flooding are commonplace.

Power of Place: West details an immediate plan of action. It incorporates more than 200 layers of data, including information from the Department of Energy, best-in-class modeling scenarios developed by groups such as UC Santa Barbara and Montara Mountain Energy, and ecosystem and wildlife data from The Nature Conservancy.

Changing the way the West makes and uses energy will require a massive undertaking not unlike the construction of the national Interstate Highway System starting in 1956. It is predicted that 1.7 – 2.5 terawatts of clean energy sources will be needed by 2050 to meet the goal of net-zero emissions. Current energy planning to accomplish that objective is on track to cost billions, occupy 10 million acres of important wildlife habitats, and involves little to no coordination between states, counties, or even companies. If done poorly, the scale of this energy transformation could harm neighborhoods, increase fire hazards, damage ecosystems and wildlife, destroy or injure agricultural lands, and add to already strained water resources.

Power of Place: West presents a safe, economical, job-growth accelerating path to hitting net-zero emissions while preserving sensitive ecosystems and working land. This scenario, referred to as “High Electrification” within the study, combines a diversity of technologies to reach the 2050 goal. They include solar power, onshore and offshore wind power, biomass energy from sources like wood, agricultural residue, and animal and human manure, geothermal power, hydrogen power, and battery storage for excess energy created by renewable sources like solar and wind. It also utilizes some existing power sources such as nuclear and hydroelectric to limit costs, take up less land, require less transmission, and to help accelerate

the rate of transformation needed by 2050. Newer technology will also need to be used in tandem to limit the Earth’s atmospheric temperature increase to under two degrees. Carbon has been accumulating in the atmosphere over the past century and this legacy pollution needs to be addressed. The Nature Conservancy has been supporting the development and production of direct air capture, which, once it has been scaled up, will allow us to remove carbon already in the atmosphere, while we simultaneously work toward eliminating further carbon emissions. The blueprint proposed in this study is guided by six basic principles.



ECONOMY-WIDE ENERGY MODELING

	CURRENT PRACTICES	HIGH ELECTRIFICATION	RENEWABLES ONLY
Energy Mix	<ul style="list-style-type: none"> Solar Wind Geothermal Biomass Existing Nuclear Hydrogen Hydro Electric Electric Vehicle Gas with Carbon Capture Direct Air Capture Battery Storage 	<ul style="list-style-type: none"> Solar Wind Geothermal Biomass Existing Nuclear Hydrogen Hydro Electric Electric Vehicle Gas with Carbon Capture Direct Air Capture Battery Storage 	<ul style="list-style-type: none"> Solar Wind Geothermal BioFuel Biomass Hydro Electric Electric Vehicle Direct Air Capture Battery Storage
Protection for Important Natural Areas and Working Lands?	<ul style="list-style-type: none"> Deer Farmhouse 	<ul style="list-style-type: none"> Deer Farmhouse 	<ul style="list-style-type: none"> Deer Farmhouse
Area Occupied by Energy Infrastructure	39 million acres	21 million acres	26 million acres
Pace of Construction Needed	4x+	4x	8x
Cost of 2050 Energy System	\$260 billion	\$268 billion	\$284 billion

All three scenarios result in net-zero emissions by 2050. **High Electrification— the “Goldilocks” Solution.**

- Future energy planning needs to be:
- Better for nature
 - Reliable for the public
 - Clean
 - Affordable for consumers
 - Equitable
 - Resilient

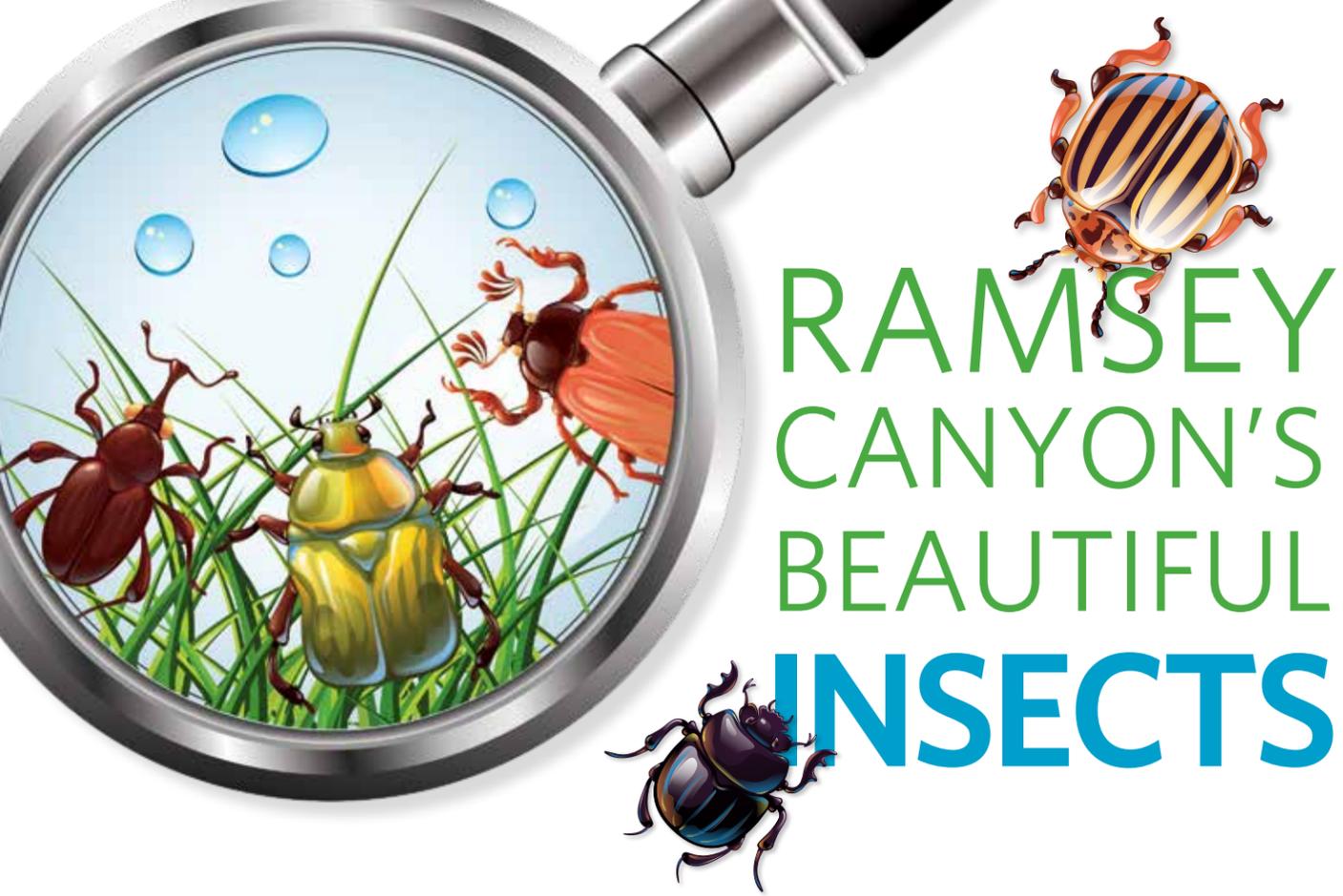
The study also recommends that any decision regarding clean energy production should be analyzed through the decision hierarchy of avoiding, minimizing, and mitigating harmful impacts to the communities on the front lines of development.

Responsibility will fall on consumers as well to help limit energy use. The Nature Conservancy encourages the expanded use of financial incentives for reducing energy consumption and adopting more “demand response” programs in which consumers can opt in to reducing their energy use during peak hours for a lower rate on their bill.

Power of Place began in California and now encompasses the American West. Next, The Nature Conservancy’s study looks to tackle clean energy on a national scale.

The hope is that *Power of Place: West* will become the guide for all 11 Western states as we adapt to our new energy reality. Anyone interested in learning how to successfully transition to clean energy is encouraged to read the study and get it in front of policy makers at the local, state, and federal levels as well as energy companies – developers, buyers, and utilities. The best path to a healthy future is to coordinate now on an economical, environmentally friendly path to clean energy.

CLOCKWISE A pair of Burrowing Owls © Mark Koster/TNC Photo Contest 2022; Caption © iStock; Turbines and fields of solar panels supply electricity for the city Tucson, Arizona. © iStock; Electric vehicle © iStock



RAMSEY CANYON'S BEAUTIFUL INSECTS

Southeastern Arizona is widely known as being one of the most biodiverse areas in North America. And if you're an insect enthusiast, you probably know all about the Chiricahua Mountains and their long history as an oasis for collectors far and wide.



Entomologist Gary Alpert is working to document a lesser-known habitat that is as diverse, if not more so, than the famous Chiricahuas: the Huachuca Mountains.

The Huachucas are often ignored by collectors in favor of their more famous neighbors to the east. Alpert believes those collectors are missing something important by doing so. "There's something called collector's bias and it only looks like the Huachucas aren't as diverse as the Chiricahuas. But that's because it's been under-collected and not documented as much," he said.

He and fellow entomologist, research technician Zane Holditch, have begun the meticulous task of proving this theory by collecting specimens at The Nature Conservancy's Ramsey Canyon Preserve. "Most people are familiar with Ramsey Canyon as a beautiful nature preserve and people travel there to see birds that are coming up from Mexico and tropical regions," Holditch says. "We are there to look for the insects, so we're looking down instead of up."

Holditch describes the region: "[It's] at this kind of unique junction where you have moisture that's coming up from the tropical regions, you have the sky island systems like the Huachuca Mountains that isolate populations from each other, and so you get to see insects there you're not going to see anywhere else."

An initial exploratory trip into the area demonstrated to Alpert that, "Ramsey is probably one of the most diverse canyons in the Huachucas and the Huachucas are one of the most diverse sky islands." As he puts it, "the diversity is so high there, based on extrapolation... it will take about



10 years just in Ramsey Canyon for the species accumulation curve to start to flatten out." That means he predicts that the volume of new insect specimens discovered on each one of their research trips will only start to decline after a decade of collecting. "There's probably going to be over 10,000 insects just in Ramsey alone."

But they aren't merely accumulating samples to take back to a private collection. "[We're] bringing a set of cameras and [we'll] photograph everything we collect so it can be immediately available for public outreach," Alpert says.



Holditch adds, "We have a chance, for the first time ever, to provide a real comprehensive picture of what is going on in Ramsey Canyon and be able to show the public the diversity."

There's a second reason they are embarking on this project. "[We're] trying to protect the data for future generations," Alpert says. Amateur entomologists familiar with the area have noted to the duo that collecting in the canyon is becoming more difficult. Insects need moisture and, like all of Arizona, Ramsey Canyon is feeling the effects of drought. "The diversity, the abundance of insects is going to change over time," Holditch says. "It's a good idea to document what's there because decades from now, people will be looking at our data to see are these particular species still there? Are they



somewhere else? Or are they reduced in abundance relative to what they used to be? We're definitely providing some potentially useful data points for future researchers."

And fortunately, these data points are already accumulating. The duo took their first official trip down from their lab at Northern Arizona University in Flagstaff in July of 2022, and over the course of ten days, they found and photographed around 300 different species. "Out of those 300," Alpert explains, "I would say over 100 of them are extremely rare. It's not only biodiverse, but there's also a lot of endemism there," meaning a lot of these species are found only in the

Huachucas, and some may be specific to Ramsey Canyon or Fort Huachuca, the canyon just north of Ramsey.

Of course, at the end of the day, collecting is fun as well. Holditch, who has an especially keen eye for



finding rare specimens, particularly enjoys using a black light to gather specimens at night. "You get to see a part of the world that you're usually missing most of the time...It's hard to go to bed some nights because there's always something new that's coming in or something that's freshly hatching. I gotta say, the black lights are drawing me in as much as the moths."

For now, the entomologists are busy identifying and documenting the large number of specimens they collected in July. But they are already looking forward to their next trip to Ramsey Canyon Preserve. As Holditch says, "it has a little bit of an addicting quality to it. You don't know what's going to happen when you pull the lever, sometimes you hit the jackpot."





Rosalyn, a Phoenix native.

"My reason for joining the Urban Heat Leadership Academy was because I walk a lot and I have noticed the difference in the heat and how some areas have gotten hotter over time. Being out in the community, I saw more firemen at bus stops or people just on the side of the road that were having to have heat issues addressed and ending up in hospitalizations. So, it just tugged at my heart, and I wanted to learn more, learn what was going on and see the solutions and the Urban Heat Leadership Academy allowed me to do that."

After completing the Academy, she joined a small team of graduates to partner with a church in South Phoenix (an area in the Phoenix Metro Area that has been historically disinvested in and is disproportionately impacted by urban heat), to open a cooling center. They also led an advocacy and educational campaign with the local community. It is just one example from the graduates who are making a difference with nature-based solutions in our community.

Cool Cities

URBAN HEAT LEADERSHIP ACADEMY



Phoenicians are no strangers to sweltering heat. However, the climate has grown unmistakably hotter over the years. Phoenix reached temperatures over 100 degrees Fahrenheit 145 times in 2021, tying 2020 for the most days above that threshold on record.

When it comes to escaping this growing heat, the neighborhoods least equipped to help residents are often the areas disproportionately affected. Some areas of Phoenix are 13 degrees hotter than another two miles away simply due to a disparity in vegetation.

The Urban Heat Leadership Academy just wrapped up its 2nd year of instructing Phoenicians how to help cool the city down. So far, 80 graduates have received training, resources, and connections to make a difference in their communities.

Members from the first cohort in 2021 took their knowledge and quickly secured grants to improve their neighborhoods. They have implemented community greenings at three private residences, Grant Park Community Garden, and Capitol Elementary School; neighborhood plant giveaways; and the opening of a cooling center in Phoenix to combat the effects of Urban Heat.

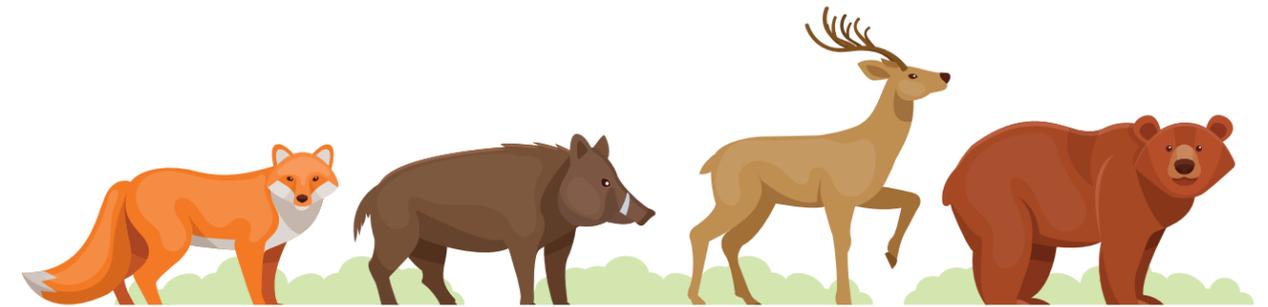
The small grants program provided teams with mentorship from Trees Matter and Arizona Sustainability Alliance and with support from Watershed Management Group to incorporate rainwater harvesting to support new plantings.

The Nature Conservancy partnered with Phoenix Revitalization Corporation, a community-based organization with a history of working in communities most impacted by heat and convened learning partners to develop the five-month long program. It is free of charge and available in Spanish and English to residents of the Phoenix Metro Area.



Phoenix reached temperatures over 100 degrees Fahrenheit 145 times in 2021, tying 2020 for the most days above that threshold on record.

TOP TO BOTTOM An increase of shade at bus stops as well as the safety elements of accessible water and a blue light system can ensure that public transit users have a more comfortable experience. © Ivan Martinez



Room to Roam

Wildlife Connectivity in a Changing World

Habitat connectivity is the ability for species to safely move between environments to obtain resources they need such as food, water, shelter, and to find mates for breeding. Birds can fly themselves where they need to be to survive, but flightless wildlife species rely on the ability to pass through the land itself when needed - be it daily, seasonally, or annually.

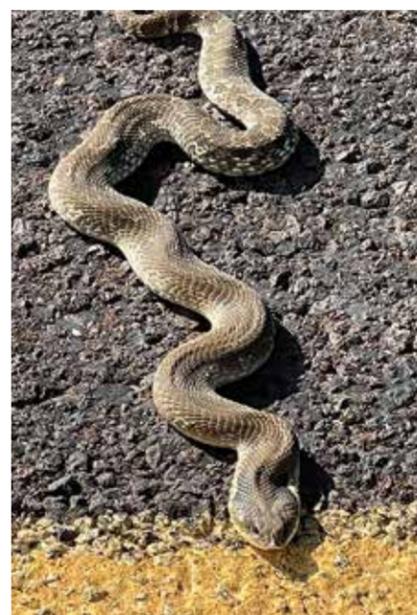
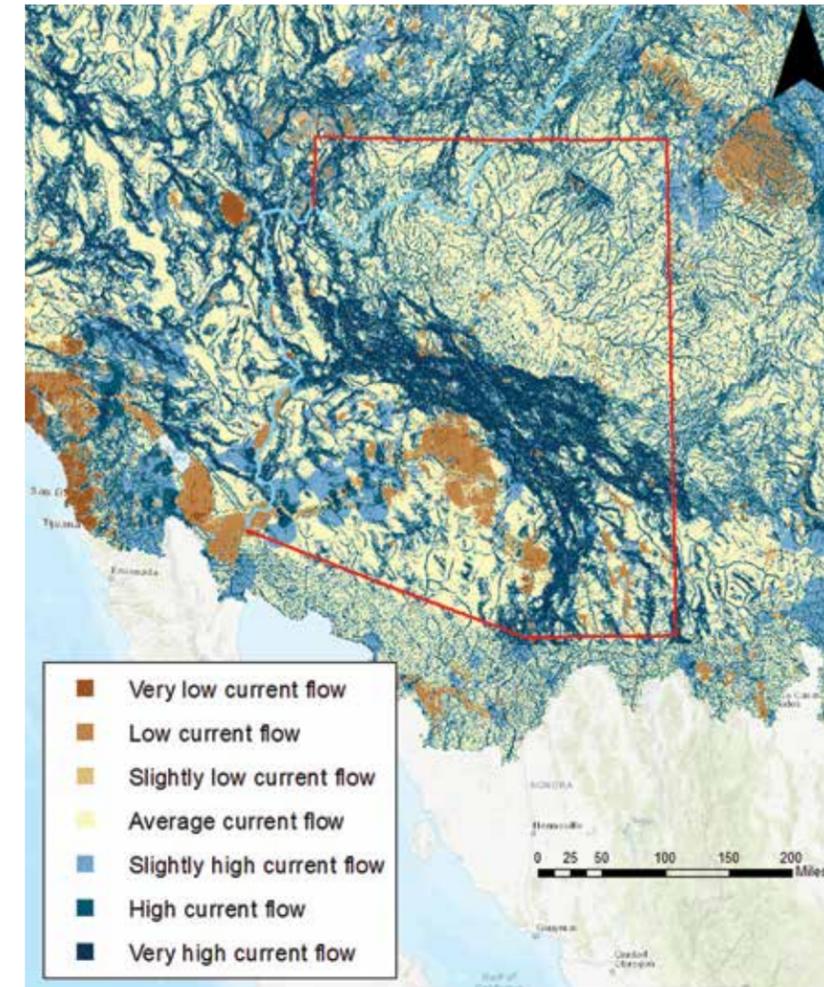
The problem at hand is the fragmentation of the environment. Barriers impede the natural migration of many species as they struggle to adapt to a warming climate. Core habitats have diminished, leaving sensitive species trapped in ecosystems that are no longer hospitable to their needs.

Primarily it has been humankind contributing to this impediment of land migration. Fences, farmland, roadways, development, mining, border walls - all of these man-made changes to the environment impact the species living there.



If they are trapped in one location, their survival is at risk. They may not have basic resources due to climate change. They may not have the ability to evade predators. Their offspring could lack the genetic diversity needed to ensure that some portion of the population will be able to adapt to a changing world.

The Nature Conservancy recently hosted a live event entitled, *Room to Roam: Wildlife Connectivity in a Changing World*, to address this issue. The panel convened to explain not only which barriers have been impeding migration, but also what can be done to help maintain and improve connectivity in the state.



Arizona is home to many species found nowhere else in the world, and its strategic location connecting deserts and mountain ranges on the US-Mexico international border make it a critical thoroughfare for wildlife connectivity across the North American continent. Using field methods such as GPS tracking, radio collars, and roadkill surveys, coupled with comprehensive landscape studies, such as the TNC-led Resilient and Connected Landscapes project that comprehensively maps resilient lands and significant climate corridors across North America, The Nature Conservancy and its partners have been able to determine Arizona's role in maintaining a gateway to and from the United States for thousands of species. It's a migration superhighway.

That's why entities throughout the state have joined forces to mitigate the damage done to these migration corridors and are working to restore them as much as possible. The Nature Conservancy is collaborating with federal and state agencies such as the U.S. Forest Service and Arizona Game and Fish, as well as local environmental groups and private landowners to change the narrative for the thousands of animals relying on safe, unhindered passageway.

As Damian Rawoot, Arizona's land and water protection manager for The Nature Conservancy said during the panel, "We all have different priorities, different purviews, so we have to balance those, but there's enough common ground for us to work together and achieve really good outcomes on the landscape as a result of that."

These collaborations have already generated numerous projects and strategies. Miles of barbed-wire fences have been replaced with wildlife-friendly fences that allow animals to pass underneath them without injury. Other fences along roadways have been designed to "funnel" wildlife to safe crossing points. Overpasses and underpasses, landscaped to resemble the natural environment, are in development to provide safe zones for wildlife attempting to cross highways. Similarly, there is work underway to retrofit existing culverts to make them friendlier for migrating wildlife as well.

Prescriptive fire is being utilized to thin the forests and help restore connectivity between habitats.

According to the panel, the most effective and economical tool available is to preserve acres of land from being used for further man-made development. One method is to collaborate with farmers and ranchers to establish conservation easements that will permanently maintain these areas as open, working lands and avoid any future fragmentation and habitat loss. The simplest method of land preservation is to purchase the property outright, as The Nature Conservancy has done in many areas of Arizona.

With coordinated programs, cooperation from local, state, and federal agencies, and a growing understanding within the private landowner community, there are high hopes that Arizona will remain a major migration corridor for native species as well as wildlife across North America.

WOOD — FOR — GROWTH HEAT LIFE

When the Navajo Generating Station and Black Mesa Peabody coal mine were shut down, it was a major environmental win for the Diné (Navajo) and Hopi people of Northern Arizona. The coal industry's energy production had been damaging land on both nations while simultaneously polluting the air and the water the Diné and Hopi people relied on.

But the closures also impacted the tribes in other ways. People in both nations relied on coal for energy to cook their food, boil their water and heat their off-the-grid homes. With the end of localized coal production, the community needed to replace that fuel-source, and the question was how to get new resources to everyone, especially the elders. The Coronavirus pandemic hit a few months later, curfews and stay-at-home orders kept people inside, making the problem even harder to solve. There was an urgent need for a solution.



Meanwhile, in Coconino National Forest, officials were trying to figure out how to handle their own crisis. They had recently deemed wildfire and the potential for post-wildfire flooding to be a critical threat to the health and safety of the residents within their county. They needed to restore Northern Arizona's forests by thinning the trees and removing the cut trunks and other biomass, reducing the hazardous fuel present on the forest floor. But the monetary value of the small-diameter

felled trees was so low commercially, and on occasion, the steepness of the mountain slopes so great, that it was a challenge to find any lumber companies to take the wood away from the restoration sites. Which meant it was left on the forest floor, simply adding to the wildfire risk.

In an innovative alliance, the Hopi and Navajo Nations joined together with the National Forest Foundation, the U.S. Forest Service, The Nature Conservancy and many additional partners to create the Wood for Life (WFL) initiative. Now in its third year, the program oversees collection of Coconino County's downed wood, the transportation of the lumber to the Hopi and Navajo Nations, and the coordination of volunteers who chop the wood into usable pieces and deliver bundles to the communities.

The program has been so successful in creating an example of partnership providing much needed fuel to communities while also increasing forest health that it is now operating in New Mexico, Colorado, and Idaho, based on the work that initiated in Northern Arizona.



OPPOSITE PAGE Fuelwood for heating and cooking © iStock TOP TO BOTTOM Logs cut near Mormon Lake in the Coconino National Forest. © Susan Sirkus/TNC; Crewman cutting small diameter timber from forest watershed. © iStock

Tracy Hare

Legacy Club member of Tucson, Arizona



Tracy Hare has been all around the world.

He was born into a military family that received a new station assignment every four years, so Tracy grew up both overseas and around the United States. He relocated throughout his childhood until his father's last assignment took their family to Tucson, Arizona. It was here that Tracy graduated from high school and attended the University of Arizona.

After college, Tracy enrolled in the U.S. Air Force, where he spent 11 out of 20 years living abroad. His wife, Teresa, was familiar with military life as well (and was even born while her parents were stationed in Paris, France). So it is safe to say that Tracy and Teresa are experienced world travelers, especially now that retirement has given them the freedom to explore the globe once again. But of all the places they have lived in or traveled to, the place they chose to anchor themselves in Arizona.

"I have seen many beautiful places and a broad variety of environments. Yet it was Arizona that called me home. I returned to its wide landscapes, free of telephone poles or other reminders of civilization," Tracy says. "There are red sunsets the likes of which I have not seen elsewhere."

Tracy has a true appreciation of the Arizona land and its history, having spent many recreational days hiking the state at Fort Bowie or Sabino Canyon or the Grand Canyon. He loves how unique the state is in its beauty and its openness. "It's incredible when the only people you can see or hear are those who hiked in with you. No farms, no streetlights, no cars honking. Just you, the wind, and nature."

With wildfires increasing in frequency and devastation, the Hares are passionate about supporting programs like the Legacy Club that help protect Arizona's natural landscape. "My wife and I have designated a large portion of our investments to go to The Nature Conservancy upon our passing. We want as a beneficiary, professionals with large hearts who will defend and grow natural spaces. Beauty exists and can be preserved. Being Legacy Club members ensures that desire."

© Courtesy of Tracy Hare

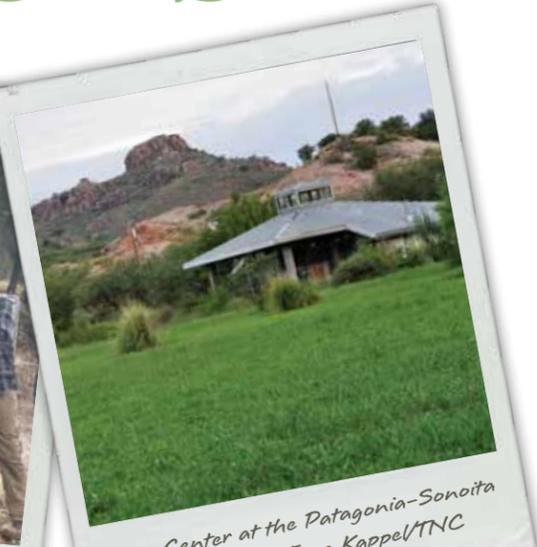
SNAPSHOTS



Hart Prairie Preserve. © Bob Hoffa



Ramsey Canyon sign installation © Peter Leiterman



Visitor Center at the Patagonia-Sonoita Creek Preserve © Tana Kappel/TNC

WAYS OF GIVING

While you may assume that an outright gift of cash or other assets is the only way to support The Nature Conservancy, there are many possibilities, each with different features and benefits. Determine the best choice for you at nature.org/researchmygift.

Find out more about the places we protect and where to visit: nature.org/arizona.



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TANA KAPPEL

Thank you to Tana Kappel who led editorial for *Field Notes* and retired last year.

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CLOCKWISE Cathedral in the Desert © Jay Huang/TNC Photo Contest 2021; Harris's Antelope Squirrel © Sean Stubben/TNC Photo Contest 2018; Macro sunflower © Russell Wynter/TNC Photo Contest 2022; Anna's Hummingbird © Teri Dashfield/TNC Photo Contest 2022

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