

Carapace

NEWSLETTER FOR THE

Upper Gila Watershed Alliance

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The Middle Fork putting a dent
in the drought.

Photo by Autumn Stinar

Upper Gila Watershed Alliance

Office

PO Box 1536 • Silver City, NM 88062

575-590-5698 • admin@ugwa.org

www.ugwa.org



Mission Statement

The Upper Gila Watershed Alliance is a non-profit watershed protection and conservation organization working to promote the long-term health of the Upper Gila Watershed and its communities of life. Through advocacy, education, research and restoration projects, we are striving to build communities of stewards in more locally based economies.

UGWA Staff

Donna Stevens
Executive Director

Carol Ann Fugagli
Education Director

Charmeine Wait
Administrative Assistant

Board of Directors

Nora Fiedler

Jim Furnish

Sarah Johnson

Tom Krohley (Treasurer)

Ron Parry

Sharman Apt Russell (Chair)

Dennis Weller

Board Member Interns

Heather Hillyer

Molly Pendleton

Graphic Design

Autumn Stinar

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**Give Grandly!
Give Local!**

Sponsored By Grant County Community Foundation

Saturday, May 6

9 am - 2 pm

Main Street Plaza, Silver City

The Upper Gila Watershed Alliance is one of 50+ local nonprofits working to make southwest New Mexico a better place to live.

Please join the community for Give Grandly: fun, food, music, and a celebration of charitable giving.

Stop by the UGWA table and say hi! And don't forget to spin our Bug Wheel of Fortune for an edible adventure!



Angel Potts and Joseph Gottschalk marvel at the heat emanating from the bioreactor chimney.

Photo by Carol Ann Fugagli



Planting Trees Should Be a Priority

By Chris Lemme

The endless stream of bad news about the environment can feel overwhelming. The multiple effects of climate change are depressing, from floods to droughts, from forest fires to increasingly severe storms. Throw in habitat destruction and other human activity that is causing the extinction of thousands of species of birds, mammals, plants, and insects around the globe, and a common response is to ignore the problems because they all seem too big. You might ask, "What can I do about it anyway?"

Fortunately, there is a relatively simple solution that every person in Grant County can pursue that will have a huge impact on combating all of these problems – planting trees.

The recently released United Nations Intergovernmental Panel on Climate Change (IPCC) AR6 Synthesis Report of 2023 makes two disturbing conclusions, among several:

- Projected CO2 emissions from existing fossil fuel infrastructure will exceed the remaining carbon budget (to stop global warming at) 1.5°C (above 1850 averages).
- Climate change (above 1.5°C) is a threat to human well-being and planetary health. There is a rapidly closing window of opportunity to secure a livable and sustainable future for all.

We should all be alarmed by these conclusions, which essentially tell us that not only is our current level of fossil fuel burning making the earth unlivable, but every passing year that we do little or nothing makes the outcome much worse.

So, how can planting trees help? First, we have to understand that a tree is more than just a tree – it is part of a complex symbiotic ecosystem that provides habitat and nourishment for everything from the microorganisms in the soil around its roots to the birds in its branches to the humans who eat its nuts and fruits. Not only that, according to the National Wildlife Foundation, planting trees helps:

- Improve air quality by filtering pollutants from the air
- Improve water quality and reduce flooding and erosion
- Temper local climate by lowering air temperatures through transpiration of water through their leaves
- Regulate earth's hydrologic cycle, resulting in more frequent, less intense rains
- Reduce home energy costs by providing shade in the summer and windbreaks in the winter
- Restore lost habitat for endangered species
- Sequester more than a ton of atmospheric carbon per tree, not including the carbon sequestered by a tree's symbiotic organisms (which can be ten times more!)

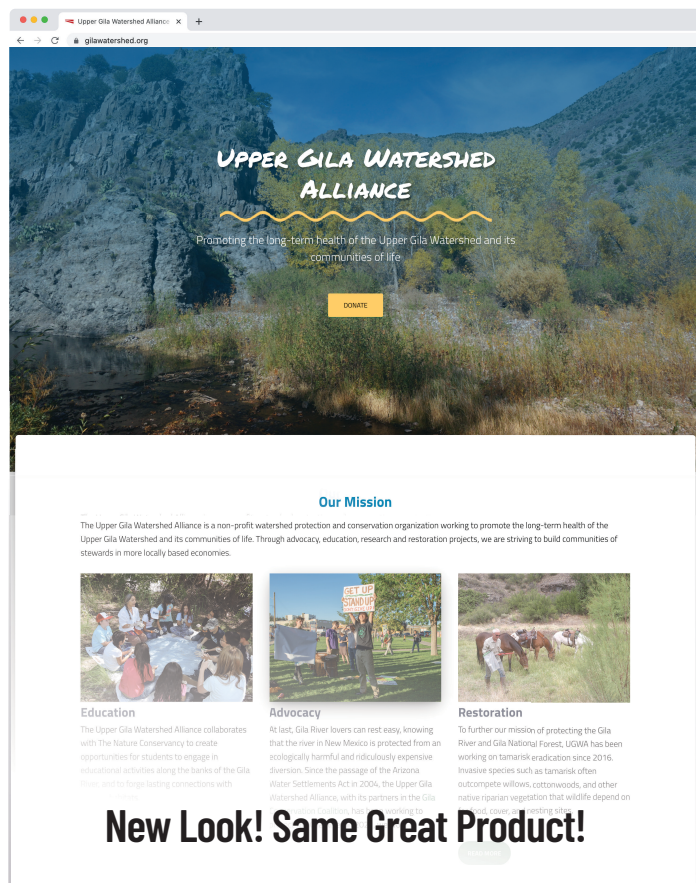
The piñon pine/juniper/scrub oak forest we are all familiar with here in Grant County is nothing like the old-growth forest that grew here through the first half of the 19th century. Like other old-growth forests which are healthy ecosystems, the one we lost to clear-cutting 150+ years ago supported hundreds of species of trees, shrubs, and grasses. In addition, a diverse array of animals that lived in that forest have also since disappeared.

The tree-covered hills and mountains outside of Silver City are not diverse, healthy forests. They are pale shadows of what used to grow here. It might take centuries for such an ecosystem to regrow without human intervention, but we can accelerate the process by planting a rich biodiversity of (mostly native) trees.

Unfortunately, as anyone who has tried planting anything anywhere in Grant County knows, the current land, soils, and ecosystems are so degraded that most seedlings will simply die if planted and left on their own. However, we now understand enough about what needs to be done to increase tree survivability rates so that organized efforts can be successful. Tried and true reforestation systems integrate our ecology, botany, and soil biology knowledge into reliable, simple practices. We can emulate successful reforestation projects from around the world as guides.

As of the 2020 census, the population of Grant County was approximately twenty-eight thousand. Imagine if everyone in the county pledged to plant one tree a year. This informal plan shows how a small capital expense of a few dollars per tree is an achievable goal when the cost is spread over the whole population.

A conceptual plan to reforest our landscape will include fruit and nut trees, native trees for habitat restoration, trees for erosion control and biodiversity expansion, and trees for the beautification of public spaces. While such an effort has minimal costs, the benefits to the local ecosystem and the larger environment are enormous. So if you are feeling overwhelmed by all the bad news out there (and there is quite a lot of it), plant a tree.



New Look! Same Great Product!

by Donna Stevens

As the advertising industry says, “New Look! Same Great Product!” The Upper Gila Watershed Alliance’s website has a new look. Our work – “product” in the corporate world – remains the same: protecting the Gila River and Gila National Forest, educating students about ecology and climate change, and developing a major composting/carbon sequestration/soil regeneration project.

The UGWA staff and board of directors are a modest bunch. When we’re busy – most of the time, in other words – we tend to keep our heads down and concentrate on the work. Last on our lengthy to-do list is updating our website.

But we also recognize that it’s important to let the world know who we are and what we’re doing, even at the risk of being boastful. After all, we don’t want “to purify ourselves right out of existence,” as a board member recently cautioned.

So – drumroll, please! – check us out at ugwa.org!

Many thanks to Marion MacDonald at Desert Lavender Design for creating our new website and endlessly accommodating our persnickety preferences.



Happy 4th graders from Jose Barrios in front of the Johnson-Su bioreactors on a field trip to the New Earth Project work site at Gila WoodNet. Photo by Carol Ann Fugagli

The New Earth Project Keeps Growing!

By Nan Franzblau

While vulnerable communities continue to cope with impacts of the climate crisis, UGWA’s New Earth Project is implementing climate solutions. As a recipient of an Environmental Justice for Climate grant from the Commission for Environmental Cooperation, the New Earth Project focuses on issues of food security, soil health, and carbon sequestration through a large-scale community composting program.

We divert organic material from the landfill from two local waste streams: cafeteria food “surplus” from three elementary schools in Silver City, and woody biomass from forest thinning projects undertaken by the Gila National Forest to maintain forest and watershed health. The trees are shredded in preparation for composting. In addition, trees and pecan shells are pyrolyzed, or decomposed at high temperatures without releasing CO₂ into the atmosphere, to make biochar. Biochar returns carbon to the soil, and its structure includes pockets that provide habitat for microbes. We are experimenting with adding biochar to some of our compost systems.

Every week, the New Earth crew builds and fills at least one Johnson-Su bioreactor with this waste. The Johnson-Su composting method, created by molecular biologist David Johnson and his wife and collaborator Hui-Chun Su Johnson, is a static, aerobic process that creates a diverse, fungal-dominant microbial inoculant that works with plants to sequester carbon in the soil, fix nitrogen, and increase

biomass and crop yields. Each reactor is filled in one day with about 600 pounds of food and 1,200 pounds of woody biomass, and will ultimately yield about 700 pounds of finished compost after one year (there is weight loss due to evaporation).

But New Earth is far more than just a composting project! Last October, we hosted climathons for 4th graders from Jose Barrios, Harrison Schmitt, and San Lorenzo, and 4th and 5th graders from Cliff Elementary School.

Students built worm boxes for vermicomposting in their classrooms and made videos and posters about the importance and benefits of composting. Since the climathons, New Earth staff has conducted monthly activities with the 4th-grade students (and 5th graders at Cliff). We have analyzed soil structure and water retention in different soil types, further studied the decomposition process and different methods of composting, and plan to delve into the growing and processing of native plants later this spring.

We recently hosted field trips for participating schools at our work site at Gila WoodNet in Santa Clara. Students observed how the leftover food is ground into a slurry, mixed with the woody biomass in an industrial mixer, and then drained on a large grate to achieve 70% moisture content. The kids also added their classroom worms to bioreactors, calling the worms by name as they bade them farewell!

For this field day, we partnered with the Vietnam

Veterans at the Bataan Veterans Memorial Park adjacent to Gila WoodNet. The veterans invited the kids to eat lunch in their meeting room, play on their playground, and tour their memorial, complete with a real helicopter, tank, and lookout tower. Throughout the tour, the veterans engaged the students in heartfelt reflection of the devastation and loss of war.

As well as educating kids, we feel it is vital that their voices are heard, so we created a monthly radio show called New Earth Kids. Each month, we host a roundtable discussion with kids of all ages – as well as teachers, group leaders, or government officials – where they can talk about their connections to nature, their environmental concerns, and the actions they are taking to address these issues. In the five episodes we have recorded to date, we have interviewed 4th graders about the climathon, eco-monitors from Aldo Leopold High School (ALHS), 9th grade Environmental Science students, 5th graders from Cliff who created giant murals about composting, and several current and former 4th graders from Stout Elementary, which has a successful garden-to-table program. New Earth Kids airs the third Monday of each month at 10 am and is rebroadcast the following Sunday at 4 pm. All shows are archived at gmcr.org.

In addition to the aforementioned collaborations, the New Earth Project has forged many other valuable community relationships. We have worked with Cruces Creatives' Seeding Regenerative Agriculture program to conduct two community workshops. Last fall, 30 participants built and filled a bioreactor, and this spring, we worked with Future Forge to host a similar event with a half-size reactor that is suitable for backyard use. We worked with The Commons in January to provide a Christmas tree chipping service. In February, we presented to the WNMU Horticulture Club and recruited students interested in our project. In April, we organized three soil science workshops at Future Forge.

We have also connected with ranchers, large and small-scale farmers, and backyard gardeners, for whom we can supply finished inoculant. Meetings with Supporting People in Need (SPIN) and the Grant County Seed Library have also generated interest in our final product.

As we embark on the second year of our two-year grant, we are optimistic that community composting, soil regeneration, carbon sequestration, and hands-on education about all these topics are vital, valued, and



Dena and Heather Hillyer diligently grinding cafeteria food leftovers in a garbage disposal to produce homogenous size particles that will be combined with shredded wood and put into a bioreactor. Photo by Carol Ann Fugagli



Zoe Pitts, Colin Casler, Molly Pendleton, and Rachel Gulick, filling a bioreactor with combined food slurry and shredded woody biomass. Each bioreactor contains approximately 1,800 pounds of feedstock. Photo by Carol Ann Fugagli

feasible. The New Earth crew has grown to about 20 people, including four interns from ALHS, several recent high school graduates, and people from the community. We have enthusiastic support from Lt. Governor Howie Morales, State Senator Siah Correa Hemphill, Silver City Mayor Ken Ladner, and Grant County Commissioner Alicia Edwards, among others.

The New Earth Project is not just growing, but flourishing!

For more information about the New Earth Project, please contact Carol Ann Fugagli at education@ugwa.org.

*When the Forest is naked, unprotected,
Mofokari, the solar entity, burns the streams and the rivers.
He dries them with his tongue of fire
and swallows his fish.
And when your feet approach the forest floor,
it hardens and burns them.
Nothing else can sprout in it.
No more roots and seeds in the soil moisture.
The waters run far away.
Then the wind that followed them and refreshed us like a fan hides also.
Desiccating gales replace it.
Sizzling heat hangs everywhere.
The leaves and flowers that are still on the floor dry and shrink.
All earthworms die.
The scent of the forest burns and disappears.
Nothing else grows.
The fertility of the forest goes to other lands.*

((ancestral indigenous wisdom about the forest and the climate by Davi Kopenawa, from Urihi A: A Terra-Floresta Yanomami, translated from Portuguese. Davi Kopenawa is the winner of the 2019 Right Livelihood Award))

Syntropic Agriculture: A New Old Story

by Coaki (Wildcat)

The story I want to tell you today begins 800,000 years ago. There does not appear to be a break in the lineages of humans and our ancestors Neanderthal and Homo Heidelbergensis using fire and hand tools to create forest clearings to select for and plant special species of trees, shrubs and herbs which have been important foods, medicines, and materials to countless groups of people. These forest gardening practices are our collective heritage and a defining feature of our identity as a species. These practices span more than half a dozen entire cycles of ice age. We call our ancestors and many of our living relatives "Indigenous" to distinguish them from those of us who have recently lost these practices.

We see these practices dwindling around the world as we continue the deforestation of the planet, a practice which has gone hand-in-hand with the genocides of our Indigenous ancestors and which continues part and parcel with the genocides of our Indigenous relatives in parts

far and wide. When we began losing our ancestral forest gardening heritage we originally replaced it with biodiverse polycultures which emphasized grains and legumes such as the maslins (or "mashlum" in Scots). We now monocrop immense swaths of land with these grasses and forbs. Our small gardens are where we preserve the remaining faint reflections of our once-advanced ancestral forest gardening techniques. Many of us have forgotten to include the trees and shrubs in our gardening and farming systems and ecosystems around the world are suffering because of this.

However, our ancestral forest gardening practices are not lost. They are still practiced in many surviving traditions such as the *dehesas* of Spain and other Mediterranean forest gardening and silvopasture practices, in the ancient form of *milpa* still practiced in Guatemala and Chiapas, Mexico (likely the most advanced system of regenerative agriculture in the world), in the *ahupuas* of Hawaii, in the terraced polycultures of Haiti, which include trees and shrubs, and

in the Indigenous agroforestry of the Amazon and Atlantic forests of Brazil. It is from these ancient agroforestry practices that modern syntropic agroforestry was born.

Syntropic agriculture is the restoration and preservation of our ancient ancestral heritage, the resuscitation of our local ecosystems and economies, the realization of food sovereignty and nutrient density, the cultivation of communal self-sufficiency, and the healing of our minds and hearts through ceasing to fight Nature and returning to nurturing roles in ecosystems. It is returning to our natural roles as a steward species. It is for these reasons that I feel humbled and fulfilled to teach this practice to the many human clans in parts of the world where we've lost much of our ancestral connection.

Syntropic agroforestry is a modern form of forest gardening, a powerful form of regenerative agriculture which combines modern ecology and botany knowledge with ancestral agroforestry wisdom to build and maintain fertile, resilient ecosystems. From this practice we receive our food, medicine, fibers, dyes, wood, and everything else we need from our living environment. It is a biodiverse polyculture system incorporating trees, shrubs, grasses, forbs, and nitrogen-fixing plants. We focus on accumulating organic matter in the system quickly to accelerate the rates of increase of biomass and nutrient cycling; the productivity and fertility of the system. This is accomplished through filling all canopy levels from forest floor to the tallest trees and by planting in waves of succession, so no space is without photosynthesis and unique foods. A large fraction of the plant matter created is left right there to contribute to the system so the system builds more and more plant matter and complexity. Pruning mimics regenerative grazing and other disturbances, stimulating an increase in the amount of organic matter plant roots release into the soil food web, building soil faster. Our constant awareness of the metaorganism allows us to maximize our benefit to the system. The Indigenous peoples of Brazil never forgot what Suzanne Simard (editor's note: Simard is the author of *Finding the Mother Tree*) just reminded us about the communication and resource sharing which happens between all organisms in the forest through the complex mutualisms occurring inside the living soil.

Rather than maximizing extraction, we share with the living system and increase productivity dramatically. We end up receiving more for ourselves than we would

otherwise, and more nutrient-dense foods and medicines at that. We also begin healing our relationships with the living world around us. Rare birds and mushrooms return. Snakes and turtles and toads, wildcats, native pollinators, and every color of beetle grace these forest gardens and honor us with their presence, their dances, their ceremonies, their songs. Long absent native plant species begin returning on their own because our actions have invited them back. They come to support syntropic systems around the edges and to take leadership roles within, and ecosystems benefit when we allow them to return to their natural roles.

When we're ready to return to our ancestral forest gardening heritage, we have only to begin. We enjoy developing more relationships in the living communities we're a part of. The forests we cultivate welcome us home and we're nourished in this family, growing and co-creating with many beings, a part of the forest.

Intrigued? Join Coakí (Wildcat) for the last class of his series on soil health. Sunday, April 30, 1-3 pm (with an optional hour at 3 pm for questions), at the Future Forge, 307 E. College Ave., Silver City. This class, Connecting Regenerative Practices to Soil Ecology, links the effects of modern regenerative land practices with their physical, chemical, and biological impacts on soil life in greater detail, providing us with more agency to live in healthy relation to our ecosystem. FREE. No registration required. Space is limited, so please arrive early.

Coakí (Wildcat) was born in the Oklahoma Seminole Nation and has a long history of organic gardening and farming. A student of soil microbiologist Dr. Elaine Ingham, he integrates Western schools of thought in biology, ecology, botany, and soil science with modern regenerative ecology practices and Indigenous land management wisdom.



UGWA's Statement of Philosophy

The members of the UGWA recognize a vital and necessary connection between our individual and collective rights and responsibilities as landowners and community members and the long-term stewardship of the Upper Gila River Valley and Watershed.

The members of the UGWA share a love and concern for our community which is an integral part of our lives and, therefore, seek to harmonize our presence and activities within the watershed for the health and integrity of the entire "community," which includes the soil, the air, the water, the people, the plants, and animals.

The members of the UGWA share the conviction

that men and women work best together in a spirit of cooperation, conflict resolution, and consensual agreement that builds upon a common ground that benefits from the views and concerns of each individual acting as uncoerced free agents.

To realize our vision for the common benefit of the entire community served by the Upper Gila Watershed, and for the sake of future generations, the UGWA seeks ways and means to bring people and organizations together in constructive dialogue and activities aimed at clear communication, education, land restoration, research, and local economic health.

EARTH MATTERS

with
Allyson Siwik & Donna Stevens
Tuesdays & Sundays @ 10 am
KURU 89.1 FM Silver City



The Gila Resources Information Project and Upper Gila Watershed Alliance host Earth Matters, a weekly radio program and podcast that highlights conservation issues, helps you understand how New Mexicans are rising to the climate challenge, and how you can, too.

Each hour-long episode will bring to you conversations with people working on the ground to address climate change in the Southwest and provide you with information on how you can make a difference and help bring collective action to this global crisis.

Climate change is here and
New Mexico is feeling
its effects.

What can we do to draw down our
climate-changing carbon emissions, protect and
restore our land and water, and adapt to
harsher, more challenging conditions?

Allyson Siwik and Donna Stevens are
your hosts for *Earth Matters*, airing
every Tuesday and Sunday at 10 am
on Gila/Mimbres Community Radio,
KURU at 89.1 FM.

UGWA Membership Application

Your membership and additional financial support sustain UGWA and are critical to the organization’s ongoing health. Share in the protection and conservation of our watershed and become an UGWA member today.

Name(s)

Address

City

State

Zip

Telephone

E-Mail

Membership Categories—Annual Dues:

Chiricahua Leopard Frog	\$ 20
Gila Trout	30
Mexican Gray Wolf	50
Beaver	100
River Otter	250
Other Amount	



Make your check payable to
UGWA
and send to
PO Box 1536, Silver City NM 88062

☐ I don’t wish to join at this time, but please notify me of upcoming events:

Name

E-Mail



But WAIT, There’s More!

by Donna Stevens

Last November, UGWA hired Charmaine Wait as our administrative assistant. Carol Ann Fugagli had admirably handled administrative duties since 2013, but was eager to devote more time to environmental education, her true interest.

In her short tenure with UGWA, Charmaine has streamlined many administrative tasks and updated our accounting system so that, for the first time, we’re able to check finances online, a real advantage since we often work at home. This practice began three years ago as a pandemic precaution, and we’ve continued it as a way to decrease our fossil fuel consumption.

Charmaine Wait has twenty years of experience with nonprofits, including serving as an executive director for several years. She’s the co-founder and current president of the Southwest Women’s Fiber Arts Collective, a nonprofit supporting cottage fiber arts. This venture combines Charmaine’s creative adventures in weaving on inkle and four-harness floor looms with her interest in the nonprofit world.

Charmaine has a Bachelor of Science in Forestry from Northern Arizona University and moved to Grant County in 1990 to live near the Gila National Forest. She enjoys hiking and walks daily with her dog Ellie.

In her own words: “I’m excited about working with UGWA and supporting Donna and Carol Ann with all the great projects this organization is working on. I appreciate the opportunity and the ability to work part-time!”

Charmaine is the mastermind behind our monthly e-newsletters and will soon take over updating the UGWA website. She’s an administrative assistant worth WAITing for!

Thank You!
[October 12, 2022 - April 1, 2023]

New Members

Dave and Charmaine Wait • Candace Breen-Lee and Robert Lee

Returning Members

Victoria Reece • Tom Krohley & Esperanza Quintero • Ceil Murray & David Rose
Diane LaFrance • Sandra & Glenn Griffin • Elroy & Joan Limmer • Hara & Scott Davis
Meyoni Geougé • Damie Nelson • Betty & Ray Lawson • Lynda Aiman-Smith • Kathryn Haase & Jac Estes
Laurie Van Vliet • Louisa Wilcox & David Mattson • Mary Hotvedt & Bob Garrett • Chris Overlock
Teresa Tibbets & Tom Rangitsch • Linda Moore & Hong Lee • Robert Pittman & Kathleen Wigley
Mike Bertin & Carolyn Meinel • Marty Eberhardt & Phillip Hastings • Ellen Soles • Steven McGarity
Pamela Lichty • Mary Bechelli • Monica Rude & Kyle Johnson • Lee Bartlett
Sarah Johnson & Kevin Keith • Dylan Duverge • Susan Berry • Marilyn Fogleman
Ronald Parry • Marion & James Newton • Betsy Holdsworth • Susan Van Auken • David Gierke
A.T. & Cinda Cole • Patricia Taber • Frank Drysdale & Margaret Hadderman • Barrett Brewer
Joseph & Marilyn Gendron • Debra Preusch & Tom Barry • Jene Mosely • Susan Slade
Marc Nevas • William Maunders • Jackie & James Blurton • Deanna & John Mooney
John & Laurie Egbert • Catherine Bradley • Thomas Dwyer • Anonymous • Norm Gaume
Angela & Spike Flanders • HJ Epping • Jeff Goin • Robert Hunter • James Hickerson
Rick Lass • John & Laurie Egbert • Joyce Newman • Timothy Evans • Sandra & Paul Michaud

Funder Thank You!

Altman Foundation • Anonymous Major Donor • Commission for Environmental Cooperation
Conservation Lands Foundation • Lindee Lenox and Shelby Hallmark Charitable Foundation
Lineberry Foundation • Maki Foundation • National Forest Foundation • Native Plant Society of New Mexico
The Nature Conservancy • New Mexico Environment Dept. River Stewardship Program
New Mexico Outdoor Recreation Division Outdoor Equity Fund
Resources Legacy Fund • The Wilderness Society

Special Thanks

Pamela Bryant, Ron Groves, and Meyoni Geougé for donations of camping equipment

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JULY 19- 23, 2023 • AGES 13 - 18



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UNPLUG FROM TECHNOLOGY

CONNECT WITH NATURE

SWIM • MAKE NEW FRIENDS • LEARN ARCHERY

RELAX IN THE HOT SPRINGS

GO HIKING • LEARN ABOUT BIRDING

AND MUCH MORE!

Want to join the fun? Email Carol Ann for more info: education@ugwa.org

No experience necessary • Food and camping equipment provided • Sliding scale of \$25 - \$100 per camper
Scholarships are available.

Upper Gila Watershed Alliance
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