

Restoring Connections



Newsletter of the Sky Island Alliance

Vol. 8 Issue 1

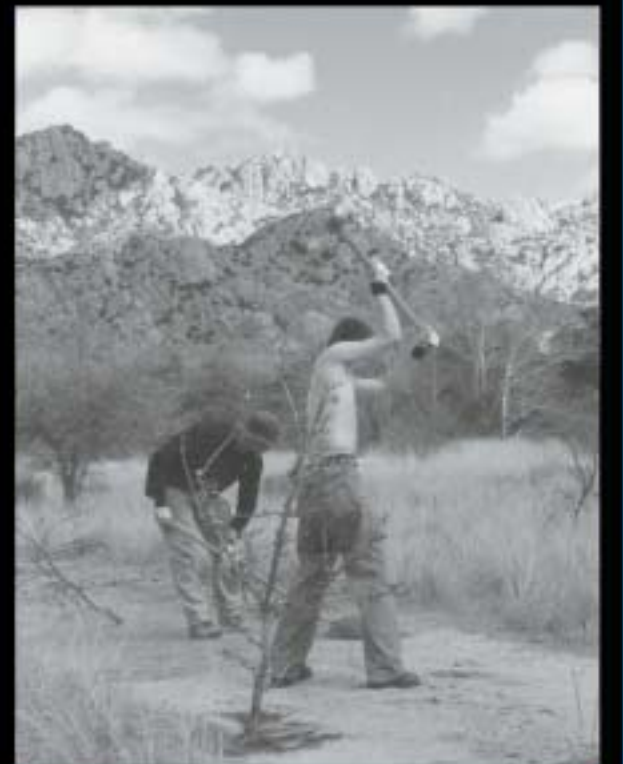
Spring-Summer 2005

Restoration: Is it gone forever, or can we get it back?



A road in the Dragoon Mts. listed as closed in the Forest Service inventory, 1999...

...and the same road—now a trail—after SIA decommissioned it, 2004



Sky Island Alliance volunteers hard at work, closing roads and restoring the land

❖ Ft. Bowie's grassland restoration ❖ **Holding your ground and getting your water back** ❖ Remember the Sierra de Álamo ❖ **Holy Galloping Gullies, Batman!** ❖ SIA bids farewell to two friends ❖ **Bob VanDeven exposed: centerfold** ❖ Buffelgrass outlawed, *almost* ❖ **Reconnecting habitat divided by highways** ❖ Harvesting rainwater for restoration ❖ **Packrats preserving the past** ❖ Alliance outings & other events



Sky Island Alliance

**Protecting
Our Mountain Islands
& Desert Seas**

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New Board Members

SIA welcomes two stellar advisors to our board of directors. **Angel Montoya** (Las Cruces, NM) obtained both his B.S. and M.S. degrees from New Mexico State University in Wildlife Science. He has worked as a refuge biologist with two National Wildlife Refuges. Angel is currently working for The Peregrine Fund on aplomado falcon restoration and monitoring efforts in the Southwestern US and Northern Mexico. Since 1996 he has conducted research on a population of falcons in Chihuahua, Mexico. He has a strong interest in bird and plant communities occurring in desert grasslands.

Chris Roll (Apache Junction, AZ) currently works as an attorney in the civil division of the Pinal County Attorney's Office, located in Florence, AZ. Chris previously served as the Cochise County Attorney from 1999 through 2004. Prior to law school at the University of Arizona, Chris obtained a Bachelor of Science degree in botany and plant pathology at that same university. An Arizona native, he was raised on a ranch in Southeastern Arizona. Botany and evolutionary biology continue to be his avocation. He enjoys hiking and the outdoors, and hopes to use his knowledge and experience to assist the Sky Island Alliance in pursuing its goals and staying out of trouble.

Many Thanks to Our Contributors!

Campaign for America's Wilderness communication guru Rachel Bocchino, who has the enviable job of letting people know how terrific they (and their neighbors) are; Watershed restoration entrepreneur Jarred Buono; Frog fan, volunteer, and writing teacher Jefferson Carter; Corredor Colibri's lively restoration master Jennie Duberstein; Tucson Audubon Society's Ann Phillips, Manager of Restoration Projects; Randy Seraglio, the volunteer who always looks guilty no matter how innocent he really is; epicurean Tumacacori friends Nick and Birdie Stabel; Silver City, New Mexico's gully-fix-it master Van Clothier; long-time volunteer and stargazer Tim VanDevender, who grew up with a pack rat in his locker; native plant booster and long time SIA board member Nancy Zierenberg; and, of course, the SIA staff. Special thanks go to Bob VanDeven and Vince Walkosak, who contributed more to our lives than they could have imagined.

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Seeking SIA newsletter submissions:

Send us your poetry, your words of wisdom, your art!

We want to keep this newsletter filled with inspirational, informative material, and we'd like your help! Do you write poetry? Draw, sketch, paint, or photograph? Like to address regional conservation issues? Review books or websites? Anything that relates to the Sky Islands region is fair game! You can respond to items in our recent newsletter, comment on your experiences as a volunteer or conference-goer, etc. Also, let us know if you'd like to be a regular contributor, e.g. with a column each issue. The deadline for our next newsletter is August 1, 2005. Material submitted after that date may be saved for subsequent issues. Please email submissions to newsletter@skyislandalliance.org, or mail them to Sky Island Alliance attn: Gita, P.O. Box 41165, Tucson, AZ 85717. Resolution of digital images should be at least 300 dpi if possible. **Give your favorite small-town restaurant a boost by writing a review and letting us promote it!**

ch- ch- ch- changes: Staff plays musical chairs

Please welcome **Cory Jones** as our new Public Land Planning Coordinator. Your generous response to our Special Giving Campaign helped fund this position, and volunteers' fieldwork will help us show what the land actually needs. Thank you! Previously, as a part-time work-study grunt, Cory made SIA's stellar maps between classes at the University of Arizona. When he graduated, we snapped up this talented fellow and expanded his responsibilities with this new job (plus, it would be dangerous to have such mapping knowledge fall into the wrong hands). The Coronado National Forest and BLM are both revising the management plans that will guide the use of public lands for the

next 20 years. Cory will be our point person working with other organizations, agencies, and individuals to make sure these plans consider the biological and historical uniqueness of our region and are based on the best available science.

Sergio Avila, a native of Zacatecas, Mexico, has a bachelor's degree in biology from Universidad de Aguascalientes and masters in arid lands management from Universidad de Baja California. Sergio comes to SIA fresh from tracking jaguars in the Sierra Madre with the Northern Jaguar Project. This bilingual punster has taken time from his tent-in-the-field lifestyle to help promote Wilderness with the Friends of the Tumacacori Highlands in the Nogales

area. He'll also be scouting new jaguar research opportunities across the imaginary line dividing our Sky Islands into two nations. Keep an ear out for his patented roar-in-a-bucket jaguar call.

Just below Map Guru and Jaguar Whisperer in the staff hierarchy come various "directors." Former Program Director **Matt Skroch** is now on the hot seat as Executive Director. Outgoing ED **David Hodges** is pleased to return to more program work as Policy Director. Expect to see David in the field more, and send Matt your condolences for being stuck in the office or out hobnobbing with other bigwigs! Read about this change in their own words below.

Moving over

by David Hodges, Policy Director

Friends: I am stepping down as Executive Director, but will continue my work in a newly created position within the organization, Policy Director. I will focus my attention on public lands management planning, several legislative initiatives, and some larger conservation issues with national impact.

My tenure as ED was unexpected, but life is funny that way. One day, I was just doing my job, minding my business, and BOOM, out of the blue, I was ED. Boy, did my life get interesting! Within the first months we lost funding from three foundations: One began to only fund projects in South America, one moved from funding the Southwest, and another ran out of money as the economy tanked and the stock market crashed. I could only wonder, "What have I gotten myself into?" Despite these challenges, we prospered and grew during a time when many non-profits were cutting budgets and staff. During this shaky economic period we have more than doubled our staff and funding while increasing membership fivefold. SIA has thrived in tough times because we produced results. This is a testament to a special group of people: our staff, our volunteers, and our collaborators.

During my time with SIA, our volunteers have contributed more than 50,000 hours to our programs and projects. They have helped us map roads and roadless areas on BLM and National Forest lands. Better yet, we all went back and closed many of the roads that encroached on these sensitive areas. More than 100 volunteers have completed our five-day training workshop on wildlife tracking and have adopted monitoring transects. Working with partners, we've put on two major conferences, halted telescope construction in the Santa Ritas,

fought a powerline in the Tumacacoris, fought a mine in the Dragoons, and worked to create effective fire policy and forest restoration. I mention all this because it gets to the crux of why we not only survived trying times but thrived when many struggled—our hard-working volunteers, our dedicated partners, and our talented and innovative staff.

No organization is about one person, and no ED is successful unless surrounded by quality people. We owe our success to them. Thanks again to all the wonderful folks who have made my life here much easier: our amazing volunteers, who keep us on our toes; our wonderful staff, who I respect tremendously; and the many partners I've worked with over the years, including other conservation groups, private landowners, and employees of wildlife and land management agencies.

Thanks, too, for making my experience here a lot richer.

Matt Skroch will move from Program Director into the hot seat. Many of you know and have worked with Matt; he has been on the staff of Sky Island Alliance since June of 2000. Prior to that, he worked with SIA as both an intern and a volunteer. He has helped build and overseen some of our most successful programs. We have great confidence that our work will continue smoothly and that we will continue to grow and expand our positive influence on the landscapes of the Sky Islands. We are in good hands.

Moving forward

by Matt Skroch, Executive Director

To begin, I want to convey my deepest appreciation and respect for David Hodges, who as our Executive Director for the last three years steadily guided Sky Island Alliance to the forefront of regional conservation organizations throughout the country. David's vision and strategic mind is unsurpassed, and combined with his deep commitment to conservation and the Sky Islands, we are delighted that he remains with Sky Island Alliance as our Policy Director.

Seven years ago David and I worked and volunteered together for a young organization that was based out of living rooms and makeshift offices. Then, as today, there was a strong vision and energy focused around emerging concepts of applied conservation biology and landscape-level planning we found refreshing, proactive, and wholly appropriate for our Sky Island region. Together with many others, we also recognized the power of our fellow citizenry. Combining these two main elements—science and citizens—we found a conservation strategy that continues to power Sky Island Alliance to new levels of success every year. This foundation will continue to grow at SIA.

Our future holds many challenges for those dedicated to keeping our landscape whole, protecting our quality of life, and ensuring our native biota's continued sustenance. As one of the fastest growing regions in the country, we've added more than 70,000 new residents just in the last five years. We can't blame 'em—we live in a wonderful place—but with more and more people, homes, roads, and other resource needs comes an added responsibility to care for the land and ensure its health. Otherwise we shall spoil what we love.

We will succeed. Together with you, our members, volunteers, and supporters, we shall continue to restore ripar-

ian areas and floodplains, continue to identify and protect wildlife corridors, continue to close and rehabilitate illegal roads, continue to work with our elected officials to pass conservation initiatives, and continue to build a greater appreciation and respect for the incredible region we call home: the Sky Islands.

Our approach to conservation is relatively simple—we do what it takes. We don't make assumptions about anyone. That philosophy will continue to flourish at Sky Island Alliance as we move forward in our conservation work. We hope that in addition to our on-the-ground success, we can increase our effectiveness at educating and involving *you* in the conservation issues we all face. Sky Island Alliance will ask for your help in this regard. Your contributions, in the many forms they come, will continue to increase in importance as we begin to build the long-term stability of SIA. As our conservation strategy surely does, our organization must also respect the importance of long-term commitments.

As our newest Executive Director, I'm humbled and honored with the opportunity to serve our cause in new ways. Sky Island Alliance has already blessed me with many fond memories and experiences. I look forward to many more in my new capacity here and hope that we'll have the chance to meet around the campfire soon!

Restoration and restitution

By Trevor Hare and Matt Skroch

Restoration

Function: noun

1: an act of restoring or the condition of being restored: as a: a bringing back to a former position or condition.

Restitution

Function: noun

1: an act of restoring or a condition of being restored: as a: a restoration of something to its rightful owner b: a making good of or giving an equivalent for some injury.

We owe her; we owe her big time. Two hundred years of unnatural natural resource management has left us with degraded rangelands, spider-webs of wildland roads, erosion, dry rivers, impounded streams, de-watered springs, invasive species, and loss of large predators and aquatic organisms. The judge (our conscience) says pay restitution for taking without giving back; Mother Nature is patiently waiting for it. So are we ready to make good on our debts? Yes, Sky Island Alliance is, and we are going out there and paying with blood, sweat, and tears (ok, mostly sweat).

Restoration is defined as “bringing back to a former position or condition.” This automatically invokes the question of restoration ecologists “What is natural?” or “What is the former condition?” Paleoscientists spend lifetimes dedicated to reconstructing fire regimes, picking through packrat middens (see article, page 18), and carbon dating artifacts from hundreds or thousands of years ago to identify vegetation types, climate, and other factors that once prevailed across the Sky Island landscape. Some general observations can be confidently made regarding the last 200 years:

- Fire was frequent, widespread, and often of low intensity across many vegetation zones in the Sky Island Region. Exceptions may be in high-elevation mixed conifer or spruce-fir forests where fire continues to be infrequent but high in intensity, and Sonoran Desert that naturally does not burn.

- Sky Island valleys had much higher components of grassland over the past several thousand years. The San Simon Valley is recognized worldwide as an archetype in desertification, speaking volumes to the changes that Europeans, and perhaps changing climate, have brought to the

region’s once lush grasslands.

- Large carnivores were more prevalent and diverse. No longer do we host the Mexican grizzly bear or Mexican gray wolf. While the wolf holds promise for recolonization, our own Southwestern grizz may be gone forever.

- Rivers and streams held more water and supported diverse *cieneegas*, old-growth mesquite *bosques*, and huge cottonwood-willow gallery forests. With functioning floodplains, most rivers and streams were not “downcut” or eroded into the narrow, deep channels we see today.

- Connections between Sky Islands were fragmented only by their own topography. All wide-ranging species moved relatively freely from place to place based on environmental fluctuations, fire, dispersal, or other factors. Species that did not naturally cross long distances remained isolated in resident populations, each evolving with local conditions.

Some former grasslands will never regain their topsoil to again resemble their historic conditions. With a little help, however, many riparian areas can recover within a matter of a few years. And in other cases, years of intensive restoration may be needed to bring back a particular area to a functioning status.

In general, we agree that shrub-encroached grasslands need to burn; bullfrogs and non-native fish and plants must be eliminated; streams must be healed; springs must be protected; erosion must be halted and repaired; and extirpated critters must be repatriated. To state the obvious, we’ve got a lot of work to do! And before we even start our work, what is it we’re trying to do, and when do we know we’ve succeeded? These aren’t easy questions to answer.

Sky Island Alliance’s Landscape Restoration Program is designed to tackle these hard questions with our coalitions of volunteers, scientists, land managers, historians, natives, and cowboys. Once a well-coordinated plan is put into place, our job is then

to do what we do best: on-the-ground conservation action.

The Landscape Restoration Program has worked for several years on decommissioning and rehabilitating illegal or redundant roads on public lands throughout the region. From the Coronado National Forest to Las Cienegas National Conservation Area to the Big Burros of the Gila National Forest, our volunteers and expertise have, to use a terrible pun, paved the way for the removal of roads and

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“defragmentation” of our Sky Island landscape. As a foundation of this program, our road-removal work is only a part of the activities it engages in.

We’re ramping up a volunteer riparian monitoring and restoration project that aims to identify potentially viable sites for native frog reintroduction throughout the region. Before moving forward with direct restoration though, we’re monitoring non-native bullfrog populations in surrounding areas to understand these nasty critter’s dispersal capabilities. Too often, conservation action occurs with little monitoring or follow-up, thus failing due to factors, such as bullfrogs, that could’ve been considered and accounted for up front.

With foresight and planning, projects such as these have great promise. They involve collaborative planning in the beginning, volunteer action and involvement throughout, and monitoring to gage our success on the back end. We look to our Landscape Restoration Program to succeed and grow in other areas as well. And remember, there are always great ways to get involved! Pop us an email at Trevor@skyislandalliance.org to find out more!

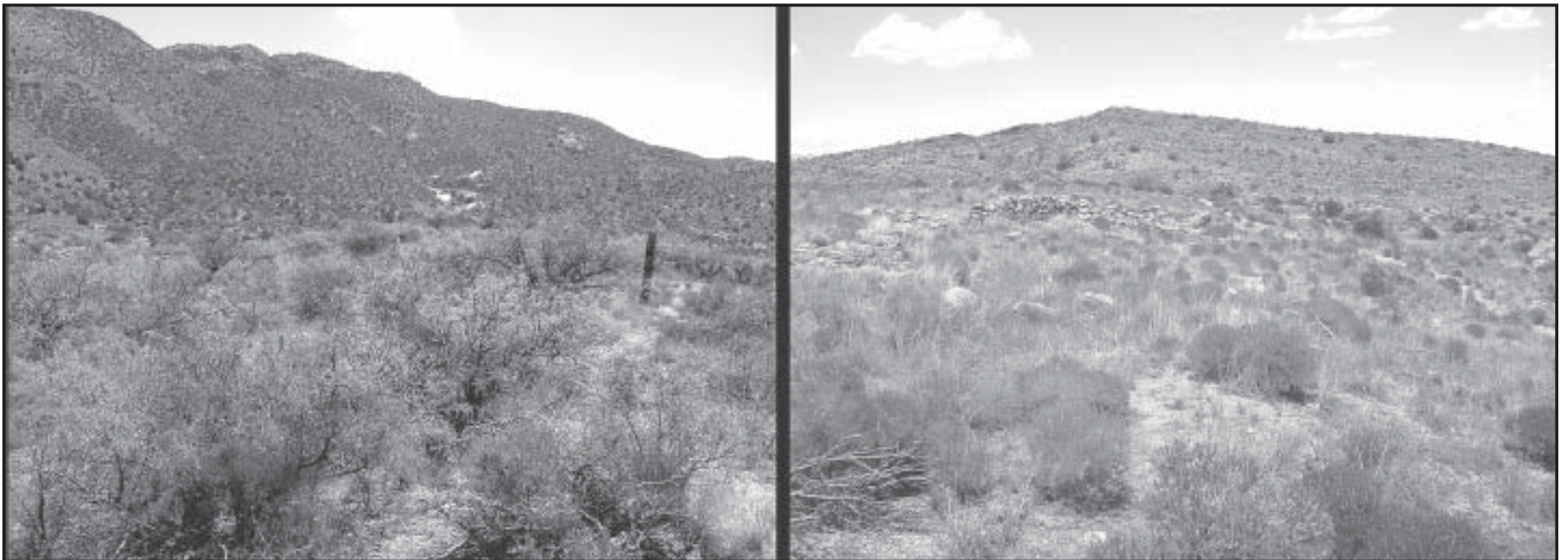


cartoon courtesy www.politicalcartoons.com



Historical accuracy at Ft. Bowie: grassland restoration by any other name

by Gita Bodner, Restoring Connections general editor



Fort Bowie National Historic Site, Arizona. Photographs taken from the same point, looking south (left) at an area left untreated, and looking north (right) at an area treated to remove mesquite. The ruins visible at right are from the first set of fort buildings constructed in 1862.

The year is 1861. On a limestone ridge, crouched behind a low-growing sandpaper oak, a man scans the grassy valley below. Four days before, army agents had taken three of his family hostage for the return of a boy kidnapped, as it turned out, by someone else. The man himself escaped capture only by slicing through the army tent with a knife. Since then, his own people had caught three workers on a freight wagon and offered them in trade. It had been easy to find such vulnerable travelers; Apache Pass held the only reliable water for miles around. Both sides waited, each watching the other's every move. Several days passed in a standoff; signs of Indian presence gradually vanished. Lulled by clear views across this open valley, soldiers gathered and warily prepared to approach the canyon spring—an excellent place for ambush, shaded by the only dense trees around. Ensuing violence would throw all of southern Arizona and New Mexico into a bloody cycle of mutual retaliation for years to come.

Now imagine it's 130 years later, and you're standing on the same limestone ridge. The sandpaper oak is still there (or maybe one of its offspring). But when you look across the valley, all you see is brush. How could the Apaches have so keenly ambushed individual soldiers and travelers? Through such tangled vegetation, how could they have tracked the precise movements of each man, and how could the soldiers have taken the routes that history recorded? "These historians," you think, "must just be making things up."

Across the West, shrubby mesquite, creosote, and junipers have spent the last century growing up through grasslands like these. Southeastern Arizona's Fort Bowie, site for the scene above, is no exception. To be sure, shrubs have tried this tack for millennia, but were long held back by competition with thirsty grasses, and flamed out of meadows

by frequent lightning fires. Now fires come seldom, if ever, and hungry grazers crop down competing grasses. Changes in climate—more cool-season rain seeping below where winter-dormant grasses can reach it—pushed this change, too. So did sloughing off of topsoil that grasses depend on but shrubs hardly need. The result: grasslands have become ever more scarce, taking with them many grassland-dependent animal species. And our own sense of connection with the past becomes distorted. We read about hay-cutting camps outside of Tombstone; today's miles of creosote flats imply that historians must have made a mistake here, too.

Enter Larry Ludwig, site manager at Fort Bowie. Ludwig's post as head of a national historic site charges him with protecting natural and cultural resources, and with helping visitors experience the historical events that justify protection

of this site. One of his first projects when he arrived in 1991 was to remove mesquite from the fort's parade grounds. He and the bare-bones staff spent many a day out with chainsaws; after stumps resprouted, they returned with herbicide to deal each one a final blow. Next they tackled the site of the fort's first buildings. Then came the "triangle valley" and the area around the Post Cemetery, where at one time some 100 people laid in rest, including such historic figures as medal of honor recipient Orizoba O. Spence; Geronimo's son, Little Robe; and many simply marked "Unknown. Killed by Indians."

Today, many of the areas treated are lush with grass (others still mostly weedy annuals). In the triangle valley, Ludwig and Park Service staff piled cut brush into eroded gullies. These gullies have now accumulated up to two feet of newly deposited soil, and the work has clearly improved the valley's ability to hold its water as well as its topsoil. Staff again see deer in the valley. Perhaps best of all, from Ludwig's perspective, visitors can again see across from the cemetery to the Butterfield stage line, and up to the hills beyond, can imagine themselves back in 1861 amidst the clash of Manifest Destiny ideology versus the passions of a people who would stop at nothing to defend their homeland.

This transformation has not been easy. Nearly everything has come out of the site's limited general operating budget. The park staff has done much of the work themselves, along with a smattering of sweaty volunteers. Some mesquite stumps sprout back a year or more after they were thought to be dead, and new mesquites germinate in the midst of fort

ruins. It's a never-ending process. "You have to keep on top of it," says Ludwig, "or you turn around and find out that all your work has been for nothing, it's all grown back." Sometimes he and his handful of staff feel overwhelmed by the size of their task. "You have to start small," he says, "so you can see the results of your efforts, first in one patch, then in another."

Just as the grasslands of the 1860s owed their existence to millennia of wildfires, managers today feel they need a return of fire to maintain these results. The Park Service and the adjacent BLM managers have completed a prescribed fire plan. Now they wait for the political will and the resources—staff time, trained fire crews, money, and weather—to make the plan a reality.

This work is typical of other grassland restoration efforts in some ways, but bears some striking differences. Perhaps the biggest difference lies in the most fundamental questions that restoration planners must ask: What is "natural" for this area? If we're restoring it to some previous state, what time period do we choose for our baseline? How do we know what it really looked like? At the fort these answers are easy: We want it to look like it did in the 1860s to 1880s, and we have photographs to guide us.

Conveniently, the 1860s were good times for wildlife in the Southwest. Grizzly bears still roamed these hills. Massive overgrazing and erosion were still a decade or two away. Surely today's meadowlarks and scaled quail don't care why we've brought their grasslands back. But they would have been here in 1861, and their songs add another level to the Fort's historical accuracy.

Holding ground: slope and stream restoration at the El Coronado and beyond

by Gita Bodner, Restoring Connections general editor

I first met Jho and Valer Austin by proxy, in the form of the grassy, overhanging banks of West Turkey Creek. I'd driven through miles of shrubby flats and bare arroyos to get here. The map showed a creek up this canyon. But maps don't measure health when they name features, so I hadn't known what I'd really find—a blind date. After nodding hesitant hellos to miles of degraded soils, there it was—a burbling, clear, fish-filled vein of utopia!

What turn of fortune had blessed this creek and left so many others eroded and dry? Look around. The creek bed winds its narrow way through roots of pines and alders, pours over rocks, and slides under overhanging clumps of deergrass. Endangered Yaqui chub swish their tails in the shadowed pools. Grass covers the upland slopes; a closer look reveals that many of these tufts sprout from soil patches held by small piles of rocks.

grass; on degraded lands, we may have to hold soil manually to give grass a chance to start growing back and doing the rest of the work for us. Our soils and other near-surface ground layers can hold a lot of water, which they then release slowly to vegetation and to surface features like cienegas and streams. But if water flows too fast (or too deep in downcut channels), it doesn't get a chance to soak in, and most ends up in the Gulf of California, along

methods often work best. Where cattle are causing erosion and soil compaction problems, taking them off does more good—for less money—than any other technique. In fact, Jho and Valer routinely pull cattle off new project areas for a few years, and then monitor carefully when they return. If the cattle impede recovery, they come off again.

Next in low-cost effectiveness come loose rock structures, from a few rocks to a few hundred in each wedge or arc-shaped gully stack. Water runoff and soil erosion start at the top of a watershed. If you can hold the soil and slow the water there, the creek at the bottom should be able to handle most any storm. The West Turkey Creek watershed has over 20,000 upland rock piles, most now holding small patches of soil filled with native bunchgrass. These were tested after the 1999 Rattlesnake Fire charred forests above the El Coronado. Post-fire soil erosion often causes more damage than a fire itself, washing away hillsides and silting up streams. Slopes with these rock check dams held far more soil, lost less grass, sent less silt downstream, and recovered dramatically faster than nearby slopes without such work.

Other unplanned fires surprised the Austins with their own benefits. Two wildfires burned mid-elevation swaths of their lands in Mexico. "It looked terrible at first," says Jho, "but the fires killed fields of shin daggers and shrub junipers. Now the grass is waist high."

Larger earthen berms and rock-and-wire gabions show mixed results. These structures have been placed in larger channels where erosive forces are much stronger, and stakes are higher. Some have washed out, and some have diverted channels in unintended directions. Others have held nicely and have created spectacular improvements, raising wash bottoms by several feet in a few years and/or recreating historic perennial marshes as if by miracle.

Despite all the scientific planning that has gone into their work, the Austins' own image of their goal comes across less like following strict scientific methods and more like raising children. I ask how they decide what an area "should" look like, or what state they are trying to restore it to. Valer responds, "I think we try to give an area as much potential as possible. If it has potential for water, we try to help it hold that water, because that supports so much wildlife." "Yes," adds Jho, "we try to head it in a direction where the land

can heal itself. We don't have to decide exactly what it should look like because we're just a small cog in the final result anyway." Overall, the Austins feel they've gotten better at working with Nature instead of fighting it, encouraging natural recovery and waiting patiently for results.

What else has changed? Somewhat ironically, after decades of this work the Austins are increasingly inclined to spend their resources protecting lands up front instead of starting new elaborate restoration projects. Nursing degraded places back to health is satisfying, but what if lands around are destroyed while you're at it? The region's landscape-level connections are real to them; they've seen firsthand animals moving from the Sierra Madre up through the Sierra San Luis, Peloncillos and Chiricahuas. But threats are real, too, so they founded *Fundación Cuenca Los Ojos* to expand efforts to keep these connections open.

Jho and Valer still refuse to give up on degraded lands but are more strategic about which they'll put their energy into. One new purchase is land that "nobody in their right mind would want," but they'll test the limits of restoration because it was once such a valuable section of the San Bernardino Valley's major waterways and connects other lands they've had great success with.

The Austins have hosted countless restoration workshops and tours, sharing their work with thousands of visitors from around the world. While they're especially committed to working with the local ranchers with whom they share stewardship of the same watersheds, they can't help feeling proud of how far afield their land's recovery has spread. Says Jho, "It's nice to talk to someone in Somalia who's putting in loose rock structures because of what she heard about at the El Coronado."



photo by Dan Roe

The Austins' loose rock structures gently slow a stream, keeping water from scouring off vegetation and soil. This stream flows near ground level. High water will spread across the floodplain and soak into surface alluvium, which will feed water back into the stream once flooding subsides.

The tender hands that set these rocks in place belong to Josiah and Valer Austin. The pair bought the El Coronado Ranch some 20 years ago. The El Coronado had suffered the same degrading forces as most Sky Island slopes and streams—overgrazing, fire suppression, timber cutting, road building, water diversion, introduction of non-native species, the works. But the Austins saw its remaining beauty and its potential, as well as its scars. So for two decades now, they've been putting their shoulders to the wheel to put this—and subsequent land purchases—on the road to recovery.

The main principle behind their work is simple: Our lands are lean on both soil and water, so the more of each you can keep in the watershed, the more productive the land will be. Vegetation—especially grass—holds soil and slows water. But you need soil to grow

with the extra sediment that fast water carries off. If we help slow it enough that it can drop its rich sediment load (i.e., soil) and soak in, our vegetation has more soil and water to grow on, and streams run longer.

To design their restoration methods, the Austins have studied effects of hundreds of other projects and tried many techniques that have worked in similar terrains elsewhere. They sought advice from experts, especially for their work repairing habitat and reintroducing native fishes. While others with National Forest grazing leases were quibbling over consulting with the U.S. Fish and Wildlife Service over impacts to endangered species, they went straight to the late great Dr. Wendell Minckley, who knew more and did more for southwestern fishes than anyone before or since.

The Austins learned a lot by trial and error as well. The conclusion: simple



Photo by Gita Bodner

Small rock stacks gather soil and grow native bunchgrasses, which gather more soil.

Reining in those galloping gullies by harnessing the power of water

by Van Clothier, Stream Dynamics Watershed Restoration, Silver City, New Mexico

Gullies, ditches, arroyos—whatever you choose to call them—are places where the natural geologic process of erosion has become concentrated. These watercourses are now cutting deeply into historic meadows, gobbling up acres of good pasture and farmland, drying up the landscape, and causing a vegetation-type conversion from grassland to shrubs. Shrubs, with their deeper roots, proliferate in this degraded landscape, their increasing numbers and thirst for water taxing the system further. The grass cover is diminishing over the years. The next gully washer causes down-cutting when the flood rushes straight down deep channels. Where there is a little extra drop-off, gravity accelerates water as it plunges. When it hits the bottom of the plunge it generates turbulence, scouring material from the bed. This is called a headcut. The headcut moves up valley during runoff events, extending the gully as it goes.

Although the Desert Southwest has always been prone to flash floods, the present degraded condition of our watercourses is a serious ecological problem with anthropogenic causes. Past and present overgrazing, and poorly designed roads and trails are at the top of the list. Livestock removing all the vegetation from fragile soil types and then making rutted trails has started many a gully. By speeding runoff down valley, groundwater recharge galleries are denied sufficient time to fill. This is one reason we have dropping groundwater levels—insufficient replacement. The arroyo lowers the whole stream system, leaving porous valley alluvium isolated above all but the most violent floodwaters. And speaking of violent floods, imagine two drainage networks: one gullied, one not. Which system is more prone to flash flooding?

These galloping gullies are difficult to fix. Many innovative solutions have been tried. I've seen tires and other debris, as well as old refrigerators, Fords, and Chevies pressed into use for erosion control. Eventually the water finds its way around the repair, and the gully is galloping up the valley again.

Fortunately keen minds have been working overtime on new methods to heal some of these landforms. One of the most intriguing is called Induced Meandering in Incised Channels. It was developed by Bill Zeedyk in the mid 1990s. Some well-intentioned person at Hubbell Trading Post in Ganado, Arizona, had straightened the creek for 1,000 feet with a backhoe in an effort to protect an important Indian ruin. This straightening speeded up stream flow, which sliced through and carried off huge amounts of gravel and soil sediment. The creek cut down five to 10 feet and lowered the

water table for a half mile or more. Bill reasoned a meandering creek would be able to drop some of its sediment load in the slower places on the inside of the bends. Streamside vegetation would have a better chance to reestablish there, and the healing could begin. He started moving rocks around to reshape the creek bottom and direct water flow. A large flood soon tested his design, moving some of his rocks. But he collected the rocks and tried again. And again. Each time he saw how water reacted to (and changed) his structures, and tried new ways to use the power of water instead of fighting against it.

Within three to five years this creek stabilized with a natural-looking pattern of meander bends that have made the new channel about 25 percent longer and two to three times wider than the straight channel he started with. Sediment continues to deposit on point bars, the low lying areas next to the stream channel on the inside of a bend where the water naturally slows down. Riparian vegetation has colonized these areas rapidly. The creek now looks beautiful, the channel bed has aggraded (built back up) about three feet, and the stable meander pattern now directs the flow away from the bank that the Indian ruin is sitting on!

By observing results after each flood and comparing these to similar but more stable creeks, Bill refined his design to a basic formula now being used in stream restoration projects all over New Mexico and Eastern Arizona. A wildlife biologist and former high-level Forest Service policy maker, Bill also conducts many hands-on stream restoration workshops and lectures at watershed conferences. His approach—harnessing the power of floodwaters to do the work of forming a healthy and natu-



Stream recovery aided by "induced meander" method, Mimbres, NM

ral stream channel—has appealed to private landowners, government agents, tree huggers, and cow huggers alike.

I attended my first of many Bill Zeedyk workshops five years ago. Having done restoration work myself since 1994 as a cooperator in the U.S. Fish and Wildlife Partners for Wildlife program, I was fascinated by Bill's insight into how creeks behave. I became one of his students and eventually started my own watershed restoration consulting business, Stream Dynamics.

One of my first "Zeedyk-method" restoration jobs was doing the rock work for a client of Bill's on Ancheta Creek, a tributary of the Mimbres River. This steep mountain stream in the bottom of a narrow V-bottom canyon had been overgrazed for about 100 years, and had lost over 99 percent of its riparian vegetation in the process. A recent large flood scoured the creek bottom to bedrock. The Fords and Chevies were unable to stop its galloping erosion.

Bill's client had recently bought the ranch, excluded livestock from all the streams, and hired him to fix the creek. The problem was that the channel bottom was pure bedrock in places, and there was nothing to slow the water down. No place for it to soak into the ground. Nowhere for anything to take root and grow. In lots of other places the channel alluvium was scored from floods and the vegetation was meager. Several places had remnants of grass that were making their last stand against the drying effect of headcuts. Bill marked 100 places where I should build one-rock dams—so named because they are only one rock tall, although they take many rocks to build. A one-rock dam goes all the way across the channel bottom, and should be many rows long in

the direction of the anticipated flood. It must also be built well so that it will still be there when you go looking for it.

By the time the monsoons finally started later in the summer, I had built quite a few of these low rock dams and baffles. The canyon flooded several times, and I had an opportunity to witness the dynamic process of stream flow and sediment transport first hand. Fortunately most of my work survived the test, although a few structures blew out and had to be replaced. Building hundreds of these low rock structures, along miles of a creek and all the little erosional rills, has a cumulative effect. Water, when it comes, now slows down and has a chance to soak into the cracks in the bedrock, recharging the dessicated aquifer. The ecology of Ancheta Creek got a jumpstart as grass and weed seeds, deposited in muddy sediment, started to sprout in the cracks in the rocks. This emergent vegetation helped thicken the layer of sediment deposition in lots of places. By the middle of monsoon season, there was a steady trickle of water in the creek for up to a week after each storm. Not perennial yet, but certainly better than it was.

Since then I have worked with dozens of Sky Island and Gila-area streams and arroyos, each with its own unique needs and teachings. But I still go back to Ancheta Creek to read new lessons in its shifting sediments and to feel the reward of having made a difference. I find great joy walking the creek during or after a flash flood to witness the power of moving water, healing myself as I assist in the healing of the natural system. I look forward to visiting this place, getting a little better each year.

photo by Van Clothier

Protecting and restoring Mexico's Sierra de Álamos and Río Cuchujaqui

by Tim Van Devender

The Río Cuchujaqui flows southwest from the foothills of the Sierra Madre Occidental passing just southeast of the historic town of Álamos, Sonora, and its adjacent Sky Island, the Sierra de Álamos. This area 100 kilometers southeast of Ciudad Obregón was recognized by the federal government of Mexico as an Area of Natural Protection for Flora and Fauna in 1996. The natural ecology along the Río Cuchujaqui is an excellent northern example of tropical deciduous forest, which is the evolutionary home to half the species in the Sonoran Desert. Efforts to study and conserve this unique habitat have been ongoing for nearly 50 years by biologists from the U.S. and Mexico, conservation activists, and most recently local communities.

The 1996 designation as an Area of Natural Protection is an important step in recognizing the importance of this area. Unfortunately the program is not capable of directly managing the 100,000-hectare reserve which consists of extensive private land holdings. Conservationists and local Álamos residents have begun an international effort to protect retired ranches and bring the protected status of the area to maturity. This concept is to work with local ranching communities to identify properties where cattle grazing is no longer economically feasible and begin management under a single conservation effort. The long-term goal is to protect in perpetuity habitat inside the area designated in 1996 while enabling ranchers to continue living and working on the land they have been connected with their entire lives.

One of the Area of Natural Protection's main features is the Sierra de Álamos, a small Sky Island rising from the tropical deciduous forest at 1,300 feet to pine-oak woodlands at 6,700 feet. The Sierra is estimated to have 1,200 species of plants. A very long day's hike can take you from town up the rugged canyons to the summit and back. The other primary feature is the Río Cuchujaqui, which flows through Sonora from the Chihuahua border west toward Álamos, then south to the Sinoloa border. The Area of Natural Protection also extends north along the Chihuahua border into 7,500-foot pine-oak forests.

The Río Cuchujaqui is a bedrock canyon with perennial pools and streams lined with Mexican bald cypress and strangler fig trees. Along 21 kilometers of the river, 740 species of plants have been cataloged. Almost 400 species of birds frequent these spots including elegant trogons, macaws, and Mexican parrotlets. The slopes above the river and throughout the area are prime tropical

The long-term goal is to protect in perpetuity habitat inside the area designated in 1996 while enabling ranchers to continue living and working on the land they have been connected with their entire lives.

deciduous forest habitat. The 10-meter canopy of trees has dozens of tree species including amapa, kapok, mauto, tree morning glory, and bursura, with organ pipe and hecho cacti underneath. A general rule of thumb in distinguishing tropical deciduous forest from the lower Sonoran desert is that the tree canopy is higher than the columnar cacti. Continuing up the Sierra or into the higher-elevation reaches of the Protection area brings us into pine-oak forests similar to areas in Arizona such as the Huachuca Mountains.

Tropical deciduous forest relies on heavy monsoon rains from July to October. The forest changes from deciduous bareness to a bright green canopy within a week after the first rains in July. After leafing out in the wet summer months, the forest canopy completely hides the giant cacti from view. A secondary winter rainy season brings the yearly average of precipitation to 16 inches. During the dry season the trees drop their leaves and the underlying columnar cacti are revealed. Often it is difficult to identify which trees are present on a hillside until they begin to flower in the dry season. Many of the trees flowering times are keyed to the length of the days and with each species triggering in succession. This stunning progression of color lasts



The Sierra de Álamos watches over the historic town of Álamos, Sonora.

photo by Tim Van Devender

through much of the spring.

The city of Álamos was founded in 1681 after one of the largest silver deposits in North America was discovered in the Sierra above town. Álamos became one of the wealthiest towns in colonial Mexico with a population of more than 30,000 people. Heavy mining activities continued until the deposit was exhausted in the early 1900s. Following the Mexican Revolution in 1910 the area was mostly used for agriculture and cattle ranching. In the late 1950s, biologists from the United States realized that remarkably diverse biotic communities surrounded Álamos. For the past decade the giant farms in the coastal valleys of Sonora and Sinoloa have been making it increasingly difficult for small ranches to survive. Today's population of 8,000 people is learning to adjust to an economy based on tourism and immigration of wealth from the United States and larger cities in Mexico. Surprisingly little has changed in the town itself though as residents take care to preserve the historic nature of the town and restore its mansions to their former glory.

One important change to note is the reforestation of mining areas that once covered the base of the Sierra de Álamos. The natural tropical deciduous forest of the region has an amazing ability to regenerate; abandoned areas quickly progress into secondary growth tropical deciduous forest. Regrowth even forces out the highly invasive introductions of buffelgrass (see article, page 12). The very rapidly growing boat-thorn acacia establishes almost immediately in the Álamos climate. As long as there are no fires (tropical deciduous forest does not naturally burn), this acacia forms within 10 years a stand that shades out buffelgrass. Next the amapa, kapok, tree morning glory and other deciduous trees with organ pipe and hecho cactus rise up through the acacia canopy to form

secondary tropical deciduous forest. The intense rainy season of the region allows native herbaceous plants to quickly penetrate. In 30 years the secondary tropical deciduous forest is established, and within 100 years the full diversity may be recovered simply by leaving the land to its natural cycles. This is the key to restoration of heavily used areas in tropical deciduous forest zones.

Ranchers traditionally clearcut an area by hand with a machete and then burn it to provide open space for crops or grazing. Buffelgrass was introduced about 50 years ago and is the predominate grass used for grazing. In the open, buffel readily overtakes an area in a very short time. A biologic survey is beginning to identify the various biotic communities in geographic detail. Disturbed areas in the tropical deciduous forest will become primary areas of focus to begin management and allow a natural recovery to occur. Diverse riparian communities deep within canyons are also of interest for conservation, though they typically are too steep for heavy use.

Local schools are also teaching children a restoration technique using handmade clay seed balls. Native seeds are collected and then rolled into small pellets of clay and compost. The seed balls may then be distributed by simply tossing them out in an area. During the next rainy season the seeds germinate and restoration has begun.



The dry season's leafless trees reveal columnar cacti. Having tree canopies over such cacti is a defining feature of tropical deciduous forest.

photo by Tim Van Devender

Bob VanDeven June 11, 1967–April 5, 2005

On April 5th, our close friend and long-time volunteer Bob VanDeven passed away after he was struck by a vehicle while riding his bike in downtown Tucson. His unexpected departure leaves a void in our hearts and souls; he was a large part of Sky Island Alliance and a stellar example of the humor, commitment, persistence, patience, and talent we all aspire to.

Many of you knew Bob from SIA field events—the tireless hiker always carrying his tripod, telling off-color jokes around the campfire. Others remember the superb lecture series he organized a few years ago. Every reader of *Restoring Connections* knows Bob; each issue from the last two years featured Bob's stories and photographs (see back issues at www.skyislandalliance.org).

Bob was multi talented—a standup comedian with the driest sense of humor imaginable, a talented professional landscape photographer, a poet and writer, an avid hiker, professional guide, and backpacker.

Bob's fascination with the minutiae of life was wholly inspiring for all that knew him. He could

spend an entire day in one place waiting for the perfect light before snapping a photo, or hike 15 miles over his esteemed Galiuros to get to his favorite camp for the night. Versatility was second nature to Bob. If a situation ever turned sour, Bob was the one who kept it together—the one whom others found refuge in.

Bob held himself to the highest of standards. He never produced *anything* that was substandard. All the same, Bob wasn't a person who scoffed at others attempts—his kindness and acceptance were never surpassed.



Bob VanDeven, 1968, age one and a half, awaiting *The Simpsons'* debut and practicing the laid-back grin he would use on all of us.

Benefit Auction June 10

Bob's family and friends set up the Bob VanDeven Wilderness Fund in his honor. The fund invites you to a silent auction in memory of Bob, on Friday, June 10, 4-8 p.m. at Heart V (61 E. Congress St., Tucson, AZ). The auction will feature prints of Bob's photographs (see www.vandevenphoto.com), and other items. Proceeds will benefit the unique ecology of Southern Arizona through this fund. The event coincides with Heart V's happy hour and includes entertainment by local bluegrass great Greg Morton and NEW ARTiculations Dance Theatre.

Among so many admirable traits, Bob's unselfishness was perhaps his greatest. He had an unbending dedication to critters, landscapes, and people who needed his voice to speak out for them. He had so many interests and time commitments that even as good friends, we couldn't keep track of the many wonderful things Bob did.

Bob was clearly at peace with himself. Despite our loss we can be confident that Bob, in some weird way, appreciates his new voyage (hopefully he gets to ask lots of questions). —Matt Skroch

Two short months ago, an SIA board member phones to say he's never seen so many flowers in the Peloncillo Mountains and will pay for a professional photographer to catch their fleeting glory. Of course I call Bob. "I know you're swamped with student teaching, but can I tempt you out just for a couple days? Please? My treat; I'll drive, I'll cook, I'll even get up early." Turns out Bob has liberated himself from teaching the day before. Out we go, Bob the artist and I the chauffer, friends on an adventure.

As we scout for sunset, scout for night, scout for sunrise, Bob reveals bits of his craft: The eye loves a sense of distance, he says. Having some-

thing distinctive in the foreground helps "anchor" the image, creates movement and depth as the eye settles first here then travels through the image. Aha! I recognize this same technique in his writing, anchoring a story with something close-by—a word, an image, an idea, a personal moment—and expanding from there to principles that guide the world.

Our two days are packed with poppies, mallows, bladderpods, and boulders. With so many colors and shapes, Bob can't get enough. I must return to town, but Bob heads back out. A few days later he calls. "I've got the first set of slides." We ooh and ahhh, laugh about how we froze our butts off for the night shot, and head off to pick up the rest.

Hunched over the light table, landscapes come to life in each two-inch luminous square. "Maybe my best ever," he says. Sure enough, the vistas that were overwhelming in person Bob has framed, lit, and cropped until their true glory is accessible to the rest of us. Here lies the beauty of the living world, and of Bob's love for it.

Bob, you are now an anchor in our lives, so close to our hearts that you are here whenever we frame a view. Our eyes find you in the foreground, and the world spreads out beyond. You're that dash of color, that solid form, that guides our sights to the fullness of our own lives in the world you always cherished. —Gita Bodner

Vincent Joseph "Vince" Walkosak June 20, 1970–April 15, 2005

April was a doubly sad month for Sky Island Alliance when yet another friend was taken suddenly from our midst. Sergio Avila reflects on the goodness Vince shared and still shares with us.

It is never easy to talk about somebody who has passed away, especially because we want to express how good he or she was and how great our times together were. But sometimes we must.

I knew Vince for a little over a year, yet even in that short time it was easy to see what a committed and interested-in-wildlife person he was. Mostly it was peace and happiness that I got from Vince's company.

Some days ago, I had the pleasure of reading a letter he wrote when he was around six years old, describing what he would be when he grew up: "...a scientist, somebody who would look for and work with animals and protect them." I was impressed with Vince's conviction, motivation, and accomplishment of his goals. He did it!

Vince volunteered at the Arizona-

Sonora Desert Museum in Tucson for a long time, until they found a way to hire him, and then he worked more.

Vince volunteered for the Jaguar Detection Project, and that's when I spent most of the time with him. He had great luck and found jaguar scat, a mountain lion skull, and tracks. He was always looking for "bugs" (spiders, scorpions, reptiles, etc), especially his favorite: the Mexican vine snake (*Oxybelis aeneus*). Just like this secretive snake, Vince was a quiet, smart, carnivorous guy, and I am happy to remember him as an always-smiling, good friend and loving husband and

father. An intelligent, enthusiastic, and active Nature lover, Vince had a very special connection with the natural world: He worked for wildlife, its study, and preservation.

There is a term in some eastern religions, *Karma*, which means "deed" or "act" and more broadly names the universal principle of cause and effect that governs all life. Some *karma* accumulates and returns unexpectedly in this or other incarnations. *Kriyamana karma*, is the karma that humans are currently creating and will bear fruit in the future. Meritorious acts may create rebirth into a higher station, such as a superior human being or a godlike being. I think Vince had lived before and reincarnated in the higher human being he was, to share and to show some of us the path

and connection to Nature.

And I think Vince will be back, and maybe this time he will be a majestic bald eagle soaring above us, a mythical jaguar, or a silent vine snake.

What I know is that Vince's soul (spirit, energy) roams not only in the deserts of Arizona, it runs inside every person he met and shared with; and it definitely lives in his daughter Sidney's smile, whose lively eyes make Vince's presence so strong. And he lives in his wife Shiloh's love, strength, determination and commitment to work, to achieve both their goals and to keep working for all those "bugs", small and big, that share the world with (and despite of) us.

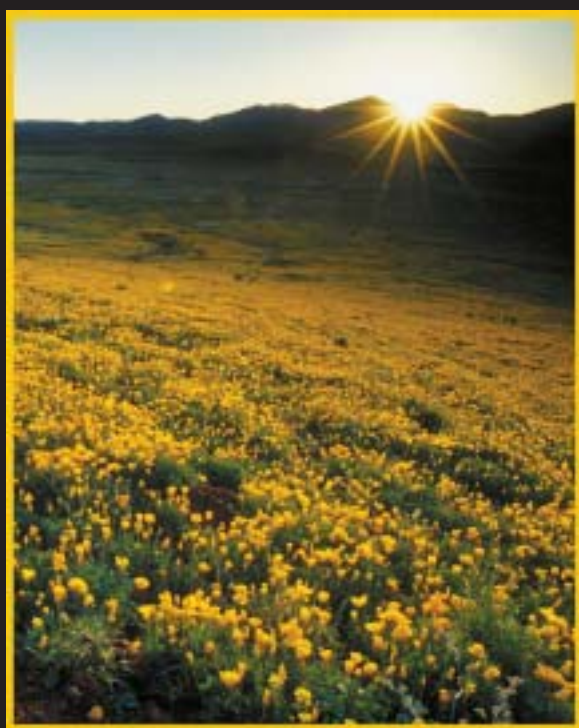
Thank you Vince for touching us all... We miss you.



Peloncillo Mts AZ,, March 2005



Dragoon Mts, AZ, 2004



San Bernardino Valley, AZ, March 2005

What we value we can save. It will take time, much capital, intelligent decisions, and the participation of those who live and play in the woods, as well as those who manage them.
—Bob

VanDeven



Recently I drove out to Cochise Stronghold in the Dragoon Mountains—last refuge of the legendary chief and today accessible by a single trail—to try some moonlight photography. My left rear tire blew out on the highway and I didn't arrive until 7 p.m. The June sun had raised temperatures to well over 100 degrees and even at dusk the terrain fairly glowed with heat. After



San Bernardino Valley, AZ, March 2005

three sweaty miles on the trail and an hour of bush-whacking I found a good location, a tiny perch amid towering granite pillars and monstrous boulders, a landscape full of potential and the ghosts of Apaches. In between long exposures I managed to grab an hour of sleep. It was a Monday evening and the rock climbers had coiled their ropes and gone home; Cassiopeia and

the Big Dipper swung around the North Star and I had the whole enchilada to myself. As I write this I haven't gotten the film back yet. Even if every slide turns out black, it was worth it.

Bob VanDine

Now we all agree: This weed is *obnoxious*

by Nancy Zierenberg, Arizona Native Plant Society

Most of us have heard about the problems that non-native animals cause to ecosystems: rabbits devouring Australia, rats killing off huge island bird colonies, or European starlings forcing our own Gila woodpeckers out of their saguaro-hole nests. Plant introductions can wreak just as much havoc on native systems.

We can guess why many trees (African sumac), shrubs (lantana), or wildflowers (African daisies) have been introduced: They provide good shade, grow fast, have edible fruits, are drought tolerant, or the flowers are pretty. Most introduced grasses have been brought in intentionally either for livestock fodder or for erosion control—replanting after floods, fire, or road building.

Bermuda grass was one of the first non-natives brought into Arizona (1902) to control erosion along Cienega Creek. Lehmann lovegrass (from Africa) was brought in 1932 by the Soil Conservation Service to “rehabilitate” overgrazed grasslands.

In less than 10 years, it began showing up in areas where it had not been planted. Because cattle prefer native grasses to Lehmann lovegrass, the natives are under more pressure, and the advantage goes to the lovegrass, which eventually out-competes native bunchgrasses.

The introduced exotic grass that may prove to be the most devastating to the Southwest is buffelgrass (*Pennisetum ciliare*). Originally imported to Arizona by the Soil Conservation Service for livestock forage sometime in the 1930s, this African grass did not really spread widely here until the last 20 years. Now the spread is exponential, mostly along roadsides, streams, disturbed lots, and throughout our urban areas. A recent effort to map the invasion in Arizona showed dense stands along major highways and roadways, spread by vehicles and fed by the extra heat and water runoff from asphalt. But stands also thrive in undisturbed areas, in parks as well as in many Tucson and Phoenix neighborhoods. Worse, millions of acres have been purposefully bladed and planted with buffelgrass in northern Mexico, subsidized by the Mexican government as short-term cattle feed. This blading continues—the state of Sonora is slated for the eventual conversion of 15 million acres, providing Arizona with a giant seed source.

Buffelgrass out-competes some of our native shrubs and trees by stealing water and nutrients or by shading out young plants with its dense growth. Even more damaging is the plant’s ability to carry hot fires in Sonoran desert ecosystems that are not fire-adapted. This invader fills in spaces between saguaros, ironwoods, and palo verdes. When fires start,

The listing prevents the importation of plants and seeds from outside of Arizona... But because the Arizona Department of Agriculture chose to list it under the “prohibited and regulated weed rules,” buffelgrass grown in Arizona will still be allowed to be sold and transported within the state!

buffelgrass’ dense growth and layers of dry leaves fuel the flames into a frenzy, boiling saguaros alive and turning other desert plants into charcoal. In this indirect way, buffelgrass kills our desert plants and makes even more “disturbed” habitat for expanded buffelgrass populations.

This real and looming threat of ever-larger fires seems to have finally spurred some action on the part of officials here in Arizona. A coalition of scientists; landscape and transportation department employees from the city, county, and state; land management agencies; and representatives from nonprofit organizations (including Sky Island Alliance) teamed up to figure out just how to get a handle on buffelgrass, including how to get this most dangerous invader onto the state’s noxious weed list.

This time our lobbying effort finally bore fruit (even though this has been tried numerous times in the past), but only partially. The listing prevents the importation of plants and seeds from outside of Arizona (like from Texas A&M, which is working on developing a more cold-tolerant variety of buffelgrass!). But because the Arizona Department of Agriculture chose to list it under the “prohibited and regulated weed rules,” buffelgrass grown in Arizona will still be allowed to be sold

and transported within the state! It appears that there is still fear and trepidation of riling the ranching industry by totally banning buffelgrass in Arizona. If the department had listed it under a “restricted designation,” this would have required that all buffelgrass infestations be controlled to prevent further spread.

Our challenge now is to change the will of the Agriculture Department to really deal with this invasive species before it truly is too late. Private sector plans are being made to mount a massive public education campaign to involve all our neighborhoods in eradicating buffelgrass. This team has developed a good PowerPoint presentation

describing why we need to move full-steam ahead on the eradication effort now, and not 10 years from now. We’re developing materials to help people distinguish it from other grasses and know what to do about it.

Although buffelgrass is a prolific flowerer and is almost always found with seed heads, the seed appears to have a relatively short life span, only staying viable in the soil for about three years or so. Keeping mature plants out of an area for three to five years might be enough to eliminate it. Pulling by hand is the best way to maintain a buffelgrass-free zone, using a digging bar for large plants and dense stands. This method has succeeded in some places. The Sonoran Desert Weedwackers have yanked plants for five years in an effort to keep Tucson Mountain Park free of buffelgrass. It works, but because there are still seed sources coming in from other stands, it is a constant job. Imagine if everyone got inspired to pitch in: the city began removing it along roadsides, pulling buffelgrass clumps from road medians, the county and state doing the same, neighbors pulling it in their neighborhoods.

The herbicide Roundup is actually quite effective at killing buffelgrass, though concerns for neighboring native grasses, water pollution, and harm to wildlife are good reasons to stay away from chemicals if possible. A recently published study on effects of herbicides on non-target species (*Ecological Applications*, April 2005) has confirmed that Roundup does indeed affect water creatures like amphibians, causing a 70 per-



Buffelgrass (*Pennisetum ciliare*)

cent decline in amphibian diversity and completely wiping out the leopard frog population in the laboratory.

This is not a simple issue, but if we are to really stop this buffel beast, now is the best opportunity we have. The coalition effort to move forward with this is our best shot and we hope to see exponential growth in eradication efforts that out-compete this hardy invader.

Sources:

Special thanks to Travis Bean and Julio Betancourt at the Tumamoc Desert Laboratory for providing background material for this article. To schedule a presentation on buffelgrass to your neighborhood or organization, please contact Travis at: University of Arizona, School of Natural Resources, The Desert Laboratory, 1675 West Anklam Road, Tucson, AZ 85745; ph: 520/629-9455 x 104; bean@email.arizona.edu.

For information about the Sonoran Desert Weedwackers, please contact Wendy Burroughs with Pima County Natural Resources, Parks & Recreation at 520/877-6122 or wendy.burroughs@parks.pima.gov. *The Desert Grassland*, edited by Mitchel P. McClaran and Thomas R. Van Devender, U of A Press, 1995.



This organ pipe cactus was boiled alive by fire fueled by surrounding buffelgrass.

photo courtesy Arizona-Sonora Desert Museum

Preserving the past in packrat pee Can't find your car keys? Check the packrat midden in the yard. While you're there, you might as well find out what lived here over the past 40,000 years.

by Tim Van Devender

osing something strange to a packrat—keys, wrenches, a bike sprocket, necklace, pocketknife, whatever struck the rodent's fancy—is a rite of passage for residents of the Southwest. These collectors can be annoying pests if they damage something a human values (engine parts, false teeth...). But their incessant collecting may also help us to plan restoration of places where humans have caused far more damage.

There are 22 species in the genus *Neotoma*, commonly known as packrats or woodrats. The genus ranges across North and Central America, with four species in the Sky Islands. These cute rodents grow up to eight inches long with a furry tail that doubles their length. They all create dens using materials collected mostly within 100 meters of the nest. The den floor plan includes interior living chambers, a defensive barrier that insulates the nest and protects its residents from predators, and a trash heap. The defensive layer is often made of cholla or prickly

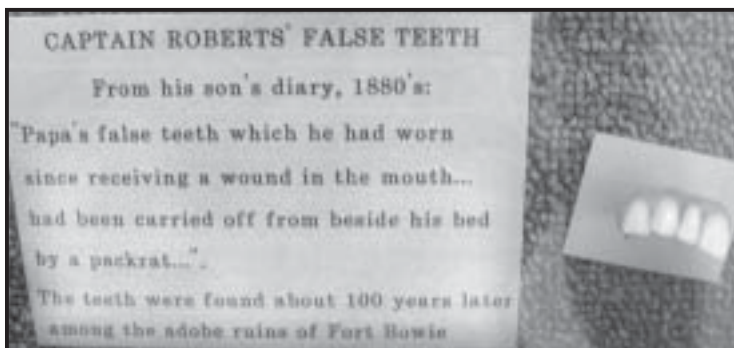
pear, but any other impenetrable material will do. Packrats generally eat seeds, berries, and small insects, then discard other collected goodies in the trash heap or "midden."

The packrat has another curious characteristic—its urine turns into a thick and penetrating liquid known as amberat. Amberat can soak in, solidify, and preserve the den's trash heap. Middens develop stratigraphic layers as successive residents deposit their own finds. As long as the petrified midden stays dry, material in it survives. Many caves and crevices on the rocky slopes of western North America contain midden deposits up to 45,000 years old. Packrat middens contain leaves, needles, twigs, pollen, exoskeletons, small bones, and left-over seeds. A researcher can reconstruct the living history of a site ranging over tens of thousands of years, just by identifying and radio-carbon dating the materials in midden strata. Modern layers may mix seeds from all over the world with Barbie doll heads, coins, and keys—a pretty accurate

view of our life and times.

A midden identifies many major species at a site, but does not provide a complete record of the flora or fauna. Packrats have preferred foods and construction supplies, and will readily drop any item in favor of a better one. Some items, like sport utility vehicles and ATVs, are simply too big for a packrat to carry. We can understand and compensate for these past collecting biases by comparing what modern *Neotoma* dens contain versus the flora and fauna living around them. One major limitation on our ability to reconstruct the past is the fact that middens preserve best on rocky slopes with dry crags, so these middens may not accurately reflect what was growing on alluvial valley floors.

Knowing the historical timeline of biologic migration is vital to understanding how humans have changed the landscape beneath them. Many written records mark the introduction and extermination of charismatic species in the United States, but few exist for the less noticeable species or for most of Mexico. A packrat midden may be the sole source of information pointing to what flora and fauna were abundant prior to modern human use. In this way a small rodent picking up whatever it finds and dumping it in its trash may provide valuable insight into what plants and animals are present in a healthy, natural environment.



False teeth from a packrat midden found at Ft. Bowie

photo by Gita Bodner

SIA volunteers, restoration in Mexico, and the discovery of an endangered plant: a recipe for success

by Jennie Duberstein

Take a small-scale, no-frills restoration project in northern Sonora; add in the enthusiasm, skills, and expertise of a small group of SIA volunteers; mix carefully; if you stir it just right, you just might end up with a previously unknown population of a highly endangered plant.

Ingredients:

1 riparian area in the Upper San Pedro
1 grassroots habitat restoration project
Assorted SIA volunteers

Instructions:

Invite Sky Island Alliance volunteers to join you for a weekend at Villa Verde in the Upper San Pedro watershed of Sonora, Mexico. Add in low-cost and low-technology restoration activities. Mix well (it is normal to hear laughter, music, and/or singing). Marinate for 24 hours. Serves approximately 20.

For the past four years, *Proyecto Corredor Colibri* (PCC) has worked with landowners in the Upper San Pedro Watershed of Sonora, Mexico, to protect and restore critical riparian habitat. One of PCC's project sites is Villa Verde, a main tributary to the Upper San Pedro river in Sonora. Villa Verde's large reservoir and 10 km of cottonwood-willow riparian habitat provide

important habitat for people and wildlife, including nearly 200 species of birds.

PCC has worked with landowners to develop and implement low-cost or no-cost, low-tech restoration projects. Using locally available materials, including ocotillo, mesquite, and bear grass, PCC staff, landowners, and volunteers have constructed vegetative gabions, dug contour lines, and planted and transplanted a variety of native species from seedlings and poles. In 2003, Matt Skroch of Sky Island Alliance and Juan Caicedo of PCC organized a work weekend in Mexico for SIA volunteers. The weekend was also a memorial for Mike Seidman, a beloved and tireless Sky Island conservation activist and long-time member of the SIA board (see *Restoring Connections* spring 2003). A crew of some 20 volunteers drove to Villa Verde to help PCC, enjoy the area, and celebrate Mike's life.

SIA volunteers spent the weekend dig-

ging contour lines, building gabions and planting cottonwood and willow poles. Resting from their hard work, volunteer Dale Turner and pals decided to explore a beautiful one-kilometer stretch of cottonwood-willow riparian habitat that had recently been fenced to exclude cattle from the restoration site. They hadn't gone far when Dale came across a small, nondescript plant near the creek's edge. Later examination confirmed Dale's suspicions: the plant was Huachuca water umbel (*Lilaeopsis shaffneriana* var. *recurva*), listed in 1997 as endangered by the U.S. Fish and Wildlife Service. It was a thrilling and very important discovery. This semi-aquatic plant is threatened throughout all of its range by habitat loss and erosion.

Dale's discovery prompted more comprehensive water umbel surveys. With funding from the Sonoran Joint Venture, PCC conducted baseline plant surveys at Villa Verde. cursory surveys in part of the fenced area showed a patch of water umbel approximately 75 meters long. More focused examination was needed to better understand this species not only at Villa

Verde, but in the Upper San Pedro watershed as a whole. T & E, Inc. (a Tucson-based small-grant supporter) enabled PCC to do just that in the fall of 2004. With their support, PCC implemented specific Huachuca water umbel surveys along the entire one-kilometer restoration site.

In-depth surveys showed three main patches of Huachuca water umbel along this stretch, ranging in length from 19 to 175 meters, totaling approximately 244 meters of creek, or 24 percent of the restoration site. Preliminary findings suggest that Villa Verde supports one of the largest known populations of Huachuca water umbel in Mexico.

PCC's restoration efforts here have continued since the SIA work weekend, working with area landowners to protect and better understand these important habitats. Collaboration and cooperation such as this will be key in the long-term protection of spots like Villa Verde. Only by taking into account the complex social, environmental, and economic pressures affecting the area can we hope to achieve sustainability for both the ecosystems and the people who depend on them.

Restoring landscape connectivity where ecological and transportation corridors intersect—and sometimes collide

by Janice Przybyl, Wildlife Monitoring Program Coordinator

What would you think if you saw 139 adults emerging from three yellow school buses stopped by the side of a high-speed highway? This was the sight encountered by motorists on April 12 as they traveled Highway 260 outside of Payson, Arizona. Nope, we were not the roadside clean-up crew. Had we large plastic bags in hand you might have been right, but we were toting cameras and notebooks, listening intently to our group leaders and taking photographs of bridges and culverts. We were a diverse bunch of planners, engineers, and biologists from resource and transportation agencies, municipalities, counties, non-profits, and foundations based throughout the Western U.S. and Canada. We gathered for the Rockies Wildlife Crossing Field Course to share information about restoring landscape connectivity through wildlife crossings.

Event organizers included Southern Rockies Ecosystem Project (special thanks to Monique DiGiorgio), Arizona Game and Fish Department (AZGFD), Yellowstone to Yukon Conservation Initiative, Arizona Department of Transportation (ADOT), and USDA Forest Service. Our roadside field trip was sandwiched between two days of presentations on how to mitigate landscape fragmentation by tailoring structural design of culverts, land bridges, and other highway structures to meet the needs of wildlife.

Presenters ranged from Paul Beier, professor of Conservation Biology at Northern Arizona University, to Leonard Sielecki from the British Columbia Ministry of Transportation (BCMOT). Beier reported on the progress of two science-based efforts to develop wildlife networks linking suitable habitat blocks. The South Coast Missing Linkages Project in California uses a focal species approach, and the Arizona Wildlife Linkages Workgroup is developing a statewide map identifying wildlife movement corridors. Both programs are science-based and are collaborative efforts between public and private sectors. This theme was consistently emphasized throughout the other presentations: the need for multi-agency collaboration with input and effort from non-governmental organizations. Sielecki's presentation reflected another recurring topic: infusing science and monitoring into trans-

portation planning. He introduced attendees to BCMOT's systematic monitoring of highway-related wild-



Researchers speculate that this type of culvert inhibits elk from passing by providing a ledge upon which predators may hide.

photo by Janice Przybyl

life mortality and then integrating that data into the planning process.

During our "road trip" along Highway 260, we observed how these themes could be applied to highway construction in the context of the natural world. Since 2002, ADOT, AZGF, and the Tonto National Forest have been engaged in applying adaptive management principles to a phased construction project along Highway 260. The highway is being upgraded in stages, from Payson east to Heber, to accommodate increased travel patterns as more people from the Phoenix metropolitan area seek summer refuge in the Tonto National Forest. Even before the project was on the boards, elk-vehicle collisions were a major concern throughout this stretch of highway, not only because of property damage, but also because of the serious injury potential to both species—elk and human. In addition, convert-

ing the road to a separated four-lane highway would potentially inhibit elk herd movement between feeding grounds and disrupt seasonal migration patterns.

To reduce the incidence of wildlife-vehicle collisions and maintain landscape permeability for wildlife movement, ADOT incorporated 11 wildlife underpasses, six bridges, and ungulate-proof fencing. The unique aspect of this highway project is that as information about elk usage is gathered at completed bridges, adjustments are made to improve permeability at the next site down the road. Using video surveillance equipment both in the passageways and on the road above, Norris Dodd and Jeff Gagnon from AZFGD monitor

not only elk presence but also elk behavior in response to traffic volume and noise. A burst of noise and movement from a single vehicle can inhibit an elk from entering a structure more than steady vehicular activity does.

The primary species of concern is elk, but monitoring data from cameras and track sets record other species using the culverts and bridge passageways. Engineering considerations were also discussed. The mountainous landscape from Payson to the Mogollon Rim offers deep drainages that make it easier to design and construct wide, high bridges with natural cover through the passageways. As construction on HWY 260 moves eastward and over the Mogollon Rim, the terrain becomes flatter, hence more challenging to include

Our roadside field trip was sandwiched between two days of presentations on how to mitigate landscape fragmentation by tailoring structural design of culverts, land bridges, and other highway structures to meet the needs of wildlife.

wildlife friendly culverts. Maybe this is where a land-bridge over the highway will be appropriate?

Although the workshop concentrated on roads and highways, humans are a population on the move and we move more than vehicles over roads. We move power through power lines and pipelines. We move water through canals and irrigation ditches. We move goods over rail lines. We move words and information over telephone and fiber optic lines. We are covering the landscape with systems and infrastructures that contribute to habitat fragmentation and diminish landscape permeability for wildlife and ecological processes. It became apparent during the workshop, that scientific information on the use and effectiveness of wildlife crossing structures is becoming more readily available. The next step is to incorporate this knowledge into the culture of transportation and planning departments so that wildlife movement and ecological considerations become fundamental pieces of the entire planning process—from the blueprint and budget stage through continued monitoring of effectiveness after construction.



Road Rattlings

by Trevor Hare, SIA Conservation Biologist

I get asked a lot about how we use the data our volunteers collect in the field. The simple answer is to help in the fight against the darkside. The darkside in my short answer is easy to define—those ideas and actions that don't honor and conserve biological diversity and ecosystem complexity. The darkside in real life is harder to define—it resides in a discordant gradation from dark to light that is spatially and temporally askew. It is a slave to command-and-control, top-down institutions and a master to political power. It is insidious and cosmopolitan, strong-willed but weak-minded, and it is long-winded while being remarkably shortsighted. It is top-heavy, mostly appointed, has never walked it, and won't ever know it. Thank the gods that folks like us get it, walk it, and will speak up about it.

Take any land or wildlife management entity: At first glance the system seems like it works. It works for the folks who hunt, fish, and ATV. Or it mostly works. Yes there are complaints against them, but most people get what they want from them—clean campgrounds, abundant fisheries, hook-raised trout, some trees (usually scarred), and a semi-wild experience, not so much to upset grandma but enough to get the kids out torturing trees and giving the adults a chance to rip it up a bit with an ATV and a gun. Does it work for us, those of us who want to leave a functioning

ecosystem to our great grandchildren? No it does not work, and if we don't keep an eye out there they will overwhelm us.

So back to the original question—how do we use the data? We use the data to propose new Wilderness, protect existing Wilderness, advocate for protection of roadless areas, fight for truly healthy forests, plan and carry out riparian restoration and road closure projects, research and protect landscape linkages, and finally to influence policy. Policy is the lynch pin in all this, and, as we all know, it is the

sickle of the darkside. Healthy Forests, Clear Skies, No Child Left Behind, all a bunch of bad policy with no relationship to what the name says. Healthy Forests mean more profit for timber companies; Clear Skies means more pollution and less regulation; No Child Left Behind unless your child is poor, black, or brown. The truth is missing in the policies of the current administration and its cronies in big business and a bigger military, but we aim to bring it, and bring it hard.

Searching for truth over the last six months has taking us to some gorgeous spots and shown us both beautiful and ugly truths. In December we visited the Dos Cabezas Mountains to look at the Wilderness boundary on the east side and explore lands that will soon be traded to the BLM. The beautiful but ugly truth in the Dos Cabezas is that the lands to be traded to the BLM, while beautiful and a great addition to the public lands of the area, are being traded for lands above Safford so Phelps Dodge can open a giant open-pit mine smack dab between two of our favorite areas—the Gila Mountains and Turtle Mountain.

In January we started a new year of road closures on Las Cienegas National Conservation Area, and we all know the ugly truth out there!

In February we visited the Mesal Mountains. It was wet, wild,

and wonderful, and only beautiful truths emerged: Leopard frogs; floods; bald eagles mating at 1,000 feet with golden eagles looking on; a fresh lion kill (cow!); and unspoiled Wilderness (well, there is one ugly truth—the powerline running through it).

In March we finished our road inventories for our Aravaipa Ecosystem Management Plan recommendations, and I want to thank everybody who contributed to an excellent effort that will have lasting conservation benefits! Our recommendations are beautiful truths in a sea of ugly ATVs. Screech owls, big-horn sheep, black hawks, frogs, snakes, and lions all seemed to agree.

In April we visited with turkeys, black hawks,

The beautiful but ugly truth in the Dos Cabezas is that the lands to be traded to the BLM, while beautiful and a great addition to the public lands of the area, are being traded for lands above Safford so Phelps Dodge can open a giant open-pit mine smack dab between two of our favorite areas—the Gila Mountains and Turtle Mountain.

trogons, and lions in a beautiful little canyon on the west flank of the Huachuca Mountains. The ugly truth in this small paradise is that it is infested with the dreaded, nasty, introduced critter known as *Rana catesbeiana*, the American bullfrog. But we are planning restitution for the assault unleashed here, and we hope to eliminate the bullfrogs and let the native riparian-loving critters have a chance.

Also in April, as we will do almost every month for at least a year, we went out to Las Cienegas National Conservation Area to close more roads. And you all are invited to be a part of a beautiful truth this fall on Las Cienegas when we re-close the Narrows for the final time with a large-scale closure that will need lots of volunteers to pull off! (Stay Tuned!)

I encourage all of you Sky Island heads to come out with us and help us celebrate these beautiful truths, and discover the ugly ones and work to fix them. We will conduct invasive plant surveys along the beautiful Blue River in May and June; do road and riparian surveys in the Peloncillos in June and September; we will close and rehabilitate more roads on Las Cienegas in July, August, September, and October; we will revisit the Huachuca Mountains in August and November; and take a water break in a box canyon somewhere out there in July (see field schedule, page 19). And of course we will have our soon to be a legend, third annual Labor Day gathering in the Chiricahuas.

Riparian species inventory workshop

Dorsolateral fold, sexually dimorphic tympanum, vestigial oviducts.
I don't know the terminology yet.
I don't know if I'll ever know the terminology. I forgot how much these people, these biologists, like funky smells. Formaldehyde. Secretions. Decay.
I want to be useful, to be of use, but I don't know. I can't even kiss my wife goodbye until she brushes her teeth.
Our group leader knows the protocols. Between study sites, wash yourself down with five percent bleach solution. Do not urinate near ponds and streams. He doesn't personalize the subject, which is *Rana chiricahuensis*, the Chiricahua leopard frog, endangered by *Rana catesbeiana*, the bullfrog, invasive, omnivorous as a lawnmower. He knows we'll be hiking to the banks of the water body after dark, aiming our flashlights, giggling the bullfrogs, whose corpses we'll tag and sort, sort and tag until dawn.

—Jefferson Carter



Watershed Management Group helps landowners conserve soil and water

by Jared Buono, Watershed Management Group, Inc

The Watershed Management Group, Inc (WMG) is a non-profit 501(c)3 organization dedicated to helping people and communities in need through better management of our shared natural resources. Founded by graduate students at the University of Arizona's Watershed Management Program, the group focuses primarily on community-based approaches to soil and water conservation and environmental planning. WMG was started in 2003 when the founders discovered they all aspired to apply their skills to help those in need. Since then, the organization has grown steadily, inducting new members, developing programs and educational materials, and generally establishing a base of operations in Southern Arizona. To date, all the members are volunteers putting in hours on nights and weekends. However, this hasn't stopped them from getting to the business of community conservation. They are currently helping the San Pedro Natural Resources Conservation District to develop an area-wide conservation plan for the Middle San Pedro. They have also conducted several workshops on soil conservation practices in the San Pedro and Sulfur Springs Valleys.

By working within the framework of watersheds, WMG is able to work at the local, regional, and international scale. Members have spent time working and studying in the U.S.-Mexico border region to learn more about binational watershed management, such as in the Santa Cruz watershed. The group is realizing there is an urgent need for community-based watershed management both in developing nations and here at home. Since its inception, WMG has been overwhelmed by the amount of local inquiries regarding conservation practices. Most of the interest appears to be from the changing rural and exurban land-

scape where small land holders are in need of hands-on training to prevent erosion, harvest and conserve water, and generally manage their land. "It is the 'ranchette' community that has been our biggest client so far", says cofounder Catlow Shipek. Many ranchette owners seem to be clamoring for conservation assistance; however, their lands are often too small for assistance from the Natural Resource Conservation Service (NRCS). As our local watersheds continue to be subdivided, small landholder conservation practices will become increasingly necessary to maintain soil, water, and biological resources.



photo courtesy WMG

WMG's Jared Buono measures a headcut while helping a landowner solve her watershed erosion problems.

Over the next few years, WMG hopes to create resources that will satisfy the needs of our changing landscape. The group has already developed a program for landowners that includes the theory and hands-on application of watershed practices. Currently, they are publishing a set of educational materials aimed at backyard conservationists and active community groups. These materials cover basic watershed processes as well as examples and instructions for building erosion control structures and water conservation measures. The group is looking to expand its volunteer base and its board of directors. If you are interested in this or any other aspect of WMG's work please contact them at: Watershed Management Group, Inc., PO Box 65953, Tucson, AZ 85728; ph: 520/ 440-2316; email: info@watershedmg.org; www.watershedmg.org/.

Using water-harvesting microbasins in habitat restoration

by Ann Phillips, Manager of Restoration Projects, Tucson Audubon Society

The Tucson Audubon Society (TAS) Santa Cruz River Habitat Project North Simpson site, consists of river corridor and adjacent abandoned farmland in the floodplain of the lower Santa Cruz River. The site is located northwest of Tucson, Arizona, in the Sonoran Bioregion. The river flow is supported by releases of secondary effluent from regional wastewater treatment plants around 18 miles upstream. A burgeoning cottonwood/ willow habitat lines the channel, while sparse upland plants are present on the massive earthen flood control berms on either side of the channel. Off-road vehicle use, grazing, long-term farming, burning, dumping, and flooding have damaged the site. TAS conducts restoration work on this land through its 99-year right-of-entry agreement with the City of Tucson, which owns the land. Since on-the-ground work began in 2001, around 250 acres of this site has been seeded and planted.

Restoration work is conducted both along the river channel and on the hot bare slopes of the adjacent earthen flood control berms. A number of innovative techniques have been used to support restoration efforts at the site including placing plants in hundreds of water harvesting microbasins. Water harvesting is the process of slowing or completely intercepting rainwater runoff

In addition to collecting rainwater, water-harvesting basins also capture seeds and organic material blown by wind or carried by rainfall runoff.

from a surface, and putting it to beneficial use, typically to support plant growth. Rainwater harvesting reduces the frequency of irrigation that is necessary to help establish plants and increases the amount of soil water available for plants after supplemental irrigation has stopped.

Microbasins are small depressions dug in the ground and partially surrounded by a sturdy rounded berm constructed downhill from, and to the sides of, the depressions. Rainwater falling on the catchment area above the microbasin is intercepted by the depression and berm, and collects in the bottom of the basin, where it infiltrates into the ground around the plant's roots. Natural depressions can function as microbasins as well.

Microbasins are constructed by digging out a gently sloped depression ranging in size from several feet to several yards wide, depending upon localized conditions. Dirt removed from the basin is used to build up the berm on the downhill side of the depression. The berm is carefully shaped to wrap around either side of the basin to create a U-shaped container for the harvested water. After final shaping, the berm is

tightly compacted. The bottom of the basin is gently sloped and is not compacted, since this would retard infiltration of rainwater. Microbasins take 15 to 30 minutes to dig by hand in reasonably soft soil.

We placed one to three plants within a microbasin, typically arranged in a row along the bottom of the U-shaped portion of the basin where most of the water collects. To imitate the natural concentration of plants found around nurse trees in native habitat, a native tree was placed in the center of the microbasin (e.g. mesquite, blue palo verde), a heat-tolerant plant was placed on the west side of the tree (e.g. four-wing saltbush, creosote), and a plant that grows well as midstory or understory was placed on the east side of the tree (e.g. wolfberry, graythorn).

At the North Simpson site, we typically irrigate plants for two years, gradually reducing irrigation frequency and volume to harden the plants out to natural conditions. We found that the presence of a microbasin can substantially increase the depth of rainfall infiltration after a monsoon storm. For example, the first monsoon storm of the summer of

continued on next page

The guilty volunteer, or how I learned to stop worrying and love the drug blimp

by Randy Seraglio

Editor's Note: A version of this article originally appeared in the Tucson Weekly.

I just got back from a Sky Island Alliance volunteer weekend, and boy do I feel guilty. I spent the weekend helping survey a local canyon for wilderness potential. Whence comes the guilt? Let me count the ways.

It's not just because my girlfriend Louise is doing an internship there, collating data and helping to write comments on the Aravaipa Canyon management plan. And it's not just because I can claim volunteer hours for the sort of thing I would be doing in my spare time anyway—namely, exploring the forests and deserts of the Sky Island region.

No, this conflation of guilt and volunteerism goes back a ways for me, at least a couple years. That's when I showed up at David and Gita's house to watch a basketball game and got a parking ticket because... there was a basketball game! Luckily I convinced a very sensible judge that the University of Arizona athletic department's dictation of nearby neighborhood parking ordinances was not only idiotic but unjust, thus qualifying me for "community service" hours in the field with Sky Island Alliance in lieu of a big fat fine. Seemed appropriate.

Louise and I lit out on a Friday afternoon to the northeast flank of the Huachuca Mountains, armed with two days worth of food, beer and fine tequila, and Trevor's typically cryptic directions: "Take a left here, I think it's signed, go two to four miles on this dirt road..." Two, or maybe double that. Sigh.

But, as usual, we made it. The one disturbing thing was the looming presence of the ridiculous drug blimp that hovers over the north end of the Huachuca range, floating above the piney ridgeline like a vast, flying white elephant on a very long leash, accomplishing nothing. The closer we got to the site, the closer we got to that blimp. Kinda creepy.

On Saturday morning about 10 of us

received marching orders and necessary equipment—maps, GPS, radio, camera, wilderness inventory forms, everything we would need to thoroughly document our hike—and set out down a delicate little canyon with an intermittent spring trickle winding through it. Our task was

Luckily I convinced a very sensible judge that the University of Arizona athletic department's dictation of nearby neighborhood parking ordinances was not only idiotic but unjust, thus qualifying me for "community service" hours in the field with Sky Island Alliance in lieu of a big fat fine.

to seek water and corresponding riparian habitat, document the existence and condition of travel ways (paths, roads, jeep trails, etc.), and note any critters we encountered, especially those of the endangered and threatened persuasion. And keep a special eye out for snakes. Trevor loves snakes.

The point is to compile a database full of reasons to close roads and expand wilderness. We succeeded, though at times the map didn't make sense (there was no jeep trail where there should have been one, which I guess is a good thing). In one side canyon we found no water, but we did run into a group of 20 Mexican migrants cooling themselves in the shade. Startled, all I could think to say was "Buenas tardes!" (much to their amusement), and be on my way.

But I wasn't half as startled as Trevor when 30 more stumbled across him as he tried to take an environmentally correct dump the next morning. My border spies tell me that a greatly inflated legend of the wacko vigilan-

tes that are stalking the more popular migrant corridors near Douglas has spread like word-of-mouth wildfire in the staging areas of Sonora, pushing migrants even further into wild areas like the one we were in.

It's a shame. Will the clatter and trash chase away the common black-hawk we saw nesting along the watercourse? How about the elegant trogon we heard

croaking in the trees, which precipitated a sneaky surveillance that resulted in my long-awaited first glimpse of this majestic bird? (The guilt, the guilt!) Just about everything people in this country do to stop drug smuggling and illegal immigration does nothing to even slow them down, but does result in mounting damage to the environment.

We completed our assignment and returned to camp in time to do some more exploring. A few dozen yards from our tent a pair of buff-breasted flycatchers (whose only U.S. range is in the Huachucas!) worked a tiny marshy area. We walked farther and watched a tarantula hawk wasp excavating a spider-sized hole in anticipation of a successful hunt. Toward evening I had a fine gobbling conversation with a wild turkey. Although he was quite talkative, he never did let us see him.

On Saturday night some of us kept Trevor up late, eating chocolate and pie-iron treats and passing bottles around the fire. It was an odd collection of



Trevor and Mike "in-seine" a stock pond.

photo by Ellen Lark

folks. There were the usual scruffy desert rats, including a trio we'll call the Clanton Brothers, who were armed and dangerous (mostly to bullfrogs, and themselves, until Trevor engaged the administrative safety on their toys). But there was also a perfectly normal woman named Nancy, and another named Ellen, a 20-year-old Pima College student working on her class project, and the inevitable Guy Who Lives In His Truck.

The Pima student said things like "Dang, that was a great big spider!" and we concocted a fairly ingenious "Free the Blimp!" campaign, although you'll have to see me in person to get the details.

On Sunday the whole pack of us went to seine a nearby stock pond, although I'd say *in-seine* might be the better term. It was pretty goopy. A couple of us tried to warn Trevor that he'd be hauling up about four tons of sopping organic matter even if he did somehow miraculously drag that net all the way across the bottom of the pond. But he was determined to find out what was in there.

Well, to make a long spectacle short, much hilarity ensued. In the end we hauled up about a half dozen bullfrog tadpoles, many colorful water beetles, and some fearsome predatory larvae. And a whole lotta goop.

It was glorious, guilty fun. I highly recommend it, if you're in the mood for self-serving volunteerism, and you don't mind getting a little goopy in the process.

continued from previous page
2002 resulted in four inches of infiltration on sloped land next to a microbasin, and 20-plus inches of infiltration within the microbasin. Water harvesting is particularly effective on gently sloped land, but can also be used on flat land. In either case, it will concentrate rainwater, though the effective catchment area draining to a basin on a slope will be larger than the effective catchment area on flat land.

In addition to collecting rainwater, water-harvest-

ing basins also capture seeds and organic material blown by wind or carried by rainfall runoff. Native annuals and perennials have volunteered in the higher moisture conditions created within water harvesting basins at the North Simpson site. The berms act as low windbreaks, sheltering small seedlings from the hot dry southwesterly winds that prevail in late spring and early summer, and retain mulch added to reduce evaporation loss from bare soil. At the TAS restoration site, water harvesting microbasins have become

concentrated sources of native forage plants and seeds available to birds, insects, herpafauna, and other wildlife. They act as concentrated seed sources, increasing the density and diversity of seeds available for recruitment outside the basins. The 15- to 30-minute investment it takes to construct a water harvesting microbasin is well worth the effort!

Editor's note: For a personal account of using microbasins for water catchment, see *Restoring Connections*, volume 7, issue 2, page 8.

Tumacacori Highlands Wilderness Proposal update

by Mike Quigley, Wilderness Campaign Coordinator

There have been some exciting happenings on the Tumacacori Highlands Wilderness campaign! The most important news being the release of a poll of voters in Pima and Santa Cruz counties asking specifically about their views on Wilderness for the Tumacacori Highlands. Seventy-six percent support Wilderness, with 61 percent saying they “strongly support” the proposal! Support for Tumacacori Highlands Wilderness is high across political affiliation, geography, and ethnicity. After becoming informed of the proposal, 75 percent of self-identified conservative voters support Wilderness; Hispanic voters support Wilderness by an astounding 95 percent; and hunters and ORV riders support Wilderness by 71 and 74 percent, respectively. And, 75 percent of all voters said Arizona has too little Wilderness and we need more! Of course, we are thrilled with these results!! It’s always nice to know that there are so many people from all backgrounds and walks of life who agree that our wild areas need preserving.

Since our last update, we have greatly expanded outreach efforts in the City of Nogales. We’re working to secure Resolutions of Support from the Nogales City Council and the Nogales-Santa Cruz Chamber of Commerce. In late March, Congressman Grijalva attended a special business mixer sponsored by the Nogales-Santa Cruz Chamber of Commerce. The Tumacacori Highlands Wilderness proposal was featured with displays, educational materials, and supportive comments from the Congressman. Many Nogales business leaders attended and it was a great way to get the word out and have some substantive discussions about the proposal.

In a preview of things to come, we

hosted 15 artists for an Art in Wilderness weekend field event in early April. The weekend was a blast, and was the first step of our Art in Wilderness project, which aims to showcase the beauty and importance of the Tumacacori Highlands through poems, essays, paintings, songs, sketches, photographs, and other art forms. Inspired by the Art in Wilderness weekend, local Tucson singer/songwriter Kevin Pakulis performed his Tumacacori song “Jaguar Blues” at the Tucson Folk Festival on May 1 to an audience of more than 500 cheering fans. Look for a traveling exhibit to open next autumn!

A very exciting development has been that the Tubac Chamber of Commerce

voted unanimously in favor of a Resolution of Support, calling on Congress to designate the Tumacacori Highlands as Wilderness. The Chamber Directors see the value of Wilderness to the economic growth of the region and to the quality of life of residents. The vote was the capstone of a wildly successful outreach effort by our volunteers in the area, particularly Birdie Stabel. We enjoyed discussing Wilderness with the Chamber Directors and are very pleased to have their full support.

Currently, we’re working to expand our outreach and educational efforts, particularly in Green Valley and Nogales. We are also working to convince Senator McCain that Wilderness

for the Tumacacori Highlands is an issue that he should champion. Calls or letters to the Senator expressing your support for the proposal and asking for his sponsorship would be very helpful. Please address letters to The Honorable John McCain, 241 Russell Senate Office Building, Washington, D.C. 20510; ph: 202/ 224-2235; fax: 202/ 228-2862; local: 520/ 670-6334; John_McCain@McCain.senate.gov; www.mccain.senate.gov.

For more information, visit our website, www.TumacacoriWild.org.

We’re looking forward to an active and exciting summer and remainder of the year. As always, if you’d like to get more actively involved, please call us!



photo by Frog

Cantrell Maryott takes advantage of a moment of inspiration at SIA's Art in Wilderness weekend in the Tumacacoris.

Roulade with a view

by Nick and Birdie Stabel, Friends of the Tumacacori Highlands

Two of our long-time favorite restaurants in Tubac, both supporters of the Tumacacori Highlands Wilderness proposal, are Melio's Ristorante and Shelby's Bistro. Each is excellent, different, and we've never been disappointed by the food or the service.

While living in Italy, Melinda met Elio, and one of the results was Melio's, their trattoria transplanted from Rome. They're locally famous for wonderful appetizers, great salads, a fine selection of pasta dishes and finally, a variety of meat and fish. Our favorite is an *insalata mista* with one of the excellent pasta dishes and a carafe of Chianti followed by a cappuccino. The food is always good and reasonably priced. The ambience is pleasant with windows overlooking the Santa Rita Mountains; arrive in the early evening and watch the mountains glow in the sunset. Located on the east frontage road between Tubac and the country club, they're open for lunch and dinner from Wednesday through Sunday.

Shelby's is named after the owner's young daughter, and the bistro is owned and operated by a sister-brother team of Joan Buckelew and Anthony Tey. Anthony is the chef; Joan manages the restaurant, oversees the dining area and also does some cooking. You can dine indoors or out. We prefer the outside tables with views of the mountains to the east and west. We think the spectacular sunsets are ordered

Birdie Stabel chosen as wilderness hero

by Rachel Bocchino, Campaign for America's Wilderness

Birdie Stabel was honored as a Wilderness Hero in April for her dedication and determination to preserve and protect Arizona's Tumacacori Highlands. For Birdie's long-time involvement in protecting her beloved Tumacacoris, she was recognized by the Campaign for America's Wilderness, the Sierra Club, and The Wilderness Society.

Roberta "Birdie" Stabel is a true lover of nature and a dedicated champion of wilderness for the Tumacacori Highlands. An avid hiker and horseback rider, Stabel resides just three miles from the Tumacacori Highlands, and has lived in the region for 17 years. "It's my backyard, the first thing I see in the morning," she says. "It's an extremely important part of my life."

Stabel has been extremely influential in garnering business support for the wilderness proposal. So far, she has collected 60 signatures from Tubac-area business leaders on a resolution of support for protecting the Highlands. Those sig-

natures and Birdie's work to educate business owners about the value of protecting wilderness resulted in the Tubac Chamber of Commerce's casting a unanimous vote of support recently for the Tumacacori Highlands Wilderness proposal. Ten of the 13 Chamber Board members had already individually signed the resolution.

"Birdie 'gets it' about wilderness and the need for preserving Arizona's wild places," says Mike Quigley, the wilderness coordinator for Sky Island Alliance. "And because she's so passionate, honest and hardworking, she helps other people 'get it,' too. In fact, one of our organizers keeps saying, 'We need a Birdie in Nogales.' I think we need a Birdie in every community working to protect our wild lands."

The Wilderness Heroes program, part of a celebration of the 40th anniversary of the Wilderness Act, highlights the work of ordinary people making a difference in protecting the nation's public lands.

just for us. Specialties include salads, soups, gourmet pizza, seafood, pasta, beef, chicken, and pork. Our all-time favorite is the chicken roulade; it's hard to order another dish because we like the roulade so much. The lunch menu includes great salads, portabello

mushroom burgers, wraps, and pizza. Located in the Mercado de Baca at 19 Tubac Road, over the bridge behind the Tortuga Book Store, they are open for lunch and dinner Wednesday through Saturday.

We highly recommend both establishments!

Tumacacori T-Shirts!!



"The vanishing wilderness is yet a part of our western heritage. We westerners have known the wilds during our lifetimes and we must see to it that our grandchildren are not denied the same rich experience during theirs." - Senator Frank Church

Get your "Friends of the Tumacacori Highlands" t-shirts now!

- 100% organic cotton; **not** pre-shrunk.
- Pen-and-ink Jaguar logo on the front!
- Wilderness quotation (see above) on the back!
- Men's on a light-tan shirt, women's on a green-tea shirt.
- See pictures on our website at: www.TumacacoriWild.org

How many? What sizes?

Men's cut		Women's cut	
Quantity	Size	Quantity	Size
_____	XL	_____	XL
_____	L	_____	L
_____	M	_____	M
_____	S	_____	

Where would you like your shirt(s) shipped?

Name: _____
 Address: _____
 City, State, ZIP: _____
 Phone number (just in case): _____

Send this form with payment to: Sky Island Alliance
 (\$18.00 + \$3.00 shipping and P.O. Box 41165
 handling per shirt) Tucson, AZ 85717



Join Us!

Join or renew here
 or through our website:
www.skyislandalliance.org

If you received this newsletter and it's time to renew your membership, please send in your check! If you are reading a friend's newsletter, consider joining us! We rely on members for our basic operations.

Contributions are tax-deductible; we are a 501(c)3 organization.

Basic membership is only \$35, but if you add a little to that, here's a sampling of what your dollars can do:

- \$50 will help us survey 30 miles of roads.
- \$75 will sponsor volunteer training workshops.
- \$100 will close one mile of road.

Your Name _____

Address _____

City _____ State _____ Zip _____

Phone _____ E-Mail _____

\$35 \$50 \$100 Other \$_____ (any amount helps and is appreciated!)

My check is enclosed.

I'd like to pay by credit card. Master Card Visa American Express

Fill this out, or donate online. It's quick, easy, and safe!

Amount \$ _____ Card # _____ Exp. Date _____

Security Code _____ (usually the last 3-4 digits on the back of the card, in the signature panel)

Card billing zip code (if different) _____

Sky Island Alliance, P.O. 41165, Tucson, AZ 85717

Field Schedule Summer to Fall 2005

Defend Your Mother!

Get your hands dirty, your boots muddy, and your soul back!

Join Sky Island Alliance in the Field—50 Years of Conservation Since 1996 Please contact Sky Island Alliance at 520/ 624-7080 or trevor@skyislandalliance.org if you are interested in any of the following events.

May 27th–30th. Upper Blue River Tamarisk Survey Project. Join SIA and the Arizona Wilderness Coalition in a project to map locations of this nasty invasive weed that is sucking our precious rivers dry! This will be the first step in an eradication program along the beautiful Blue! Get wet and wild! 3.5 hours from Tucson.

June 10th–12th. Riparian Inventory Weekend. Peloncillo Mountains/ Animas Valley, 3.0 hours from Tucson.

June 24th–27th. Lower Blue River Tamarisk Survey Project (details above).

July 8th–10th. Las Cienegas National Conservation Area Road Closure. Come out, swing a pick, get your hands dirty, and play a direct role in improving the ecological health of your public lands! 1.5 hours from Tucson.

July 22nd–24th. Apache Box Exploratory Weekend. An amazing box canyon—hiking, climbing, bears, swimming. Limited space available. 3 hours from Tucson.

August 12th–14th. Las Cienegas National Conservation Area Road Closure (details above).

August 26th–28th. Huachuca Mountains Riparian Inventory. What better time to get wet looking for fish and frogs? 2.0 hours from Tucson.

September 2nd–5th. Labor Day Gathering at Onion Saddle! Time to hike and just hang out with this diverse and committed group of friends. Bring your own expertise and excitement to share with birders, botanists, butterflyers, and the rest of us nature nuts in one of the loveliest settings in the Southwest.

September 16th–18th. Las Cienegas National Conservation Area Road Closure. (details above)

September 30th–October 2nd. Peloncillo Mountains Roads Inventory. 3.0 hours from Tucson.

October 21st–23rd. Las Cienegas National Conservation Area Road Closure. (details above).

November 11th–14th. Riparian Restoration Project, Huachuca Mountains. 2.0 hours from Tucson.

\$ What Are the Sky Islands Worth to You?

\$10 a month? \$25 a month? How about \$40???

Set up monthly **AUTOMATICALLY DEDUCTED DONATIONS** and know that your dollars are working day in and day out to protect the places you love.

Equal to: *1 beer or latte per week **1 lunch out per week; ***one dinner out per month.

Don't delay! Visit www.skyislandalliance.org for online instructions, or contact Acasia at (520) 624-7080 ext. 207. Make sure your dollars count!

Become an SIA Program Fund Donor

Stories in recent newsletter issues have featured projects in our Rewilding Program: road inventory and restoration, wilderness work, wildlife monitoring, and ecosystem defense.

All the necessary road closures, tracking workshops, and wilderness advocacy gets done only with extra funding, so please consider a special donation to one of the following funds:

- Roads & Restoration,
- Wildlife Monitoring (Tracking),
- Missing Link,
- Wilderness, and

- Mexico—the Chihuahua Research Station in Janos and the Jaguar Program in Sonora.

Please make your check out to Sky Island Alliance, with a note in the memo line about which fund you'd like to support. We'll make sure your money goes to the programs that mean the most to you, and we'll send you reports!

Sky Island Alliance

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Sky Island grasslands in the 1850s. Painting of the San Lazaro land grant ranch in the upper Santa Cruz Valley, by Henry Cheever Pratt. This area still holds some of its grass today, but it, like so many across the West, is gradually losing soil and filling with shrubs. This area could be restored to its former grassy glory—if we change our management soon enough.

Sky Island Grasslands

“Our course today was nearly south, over a broad valley, from eight to 10 miles across, hemmed in on both sides by high ranges of mountains. So level was that valley, and so luxuriant the grass, that it resembled a vast meadow.” —John R. Bartlett, US-Mexico Boundary Commission, 1851, traveling across the Sky Island region.

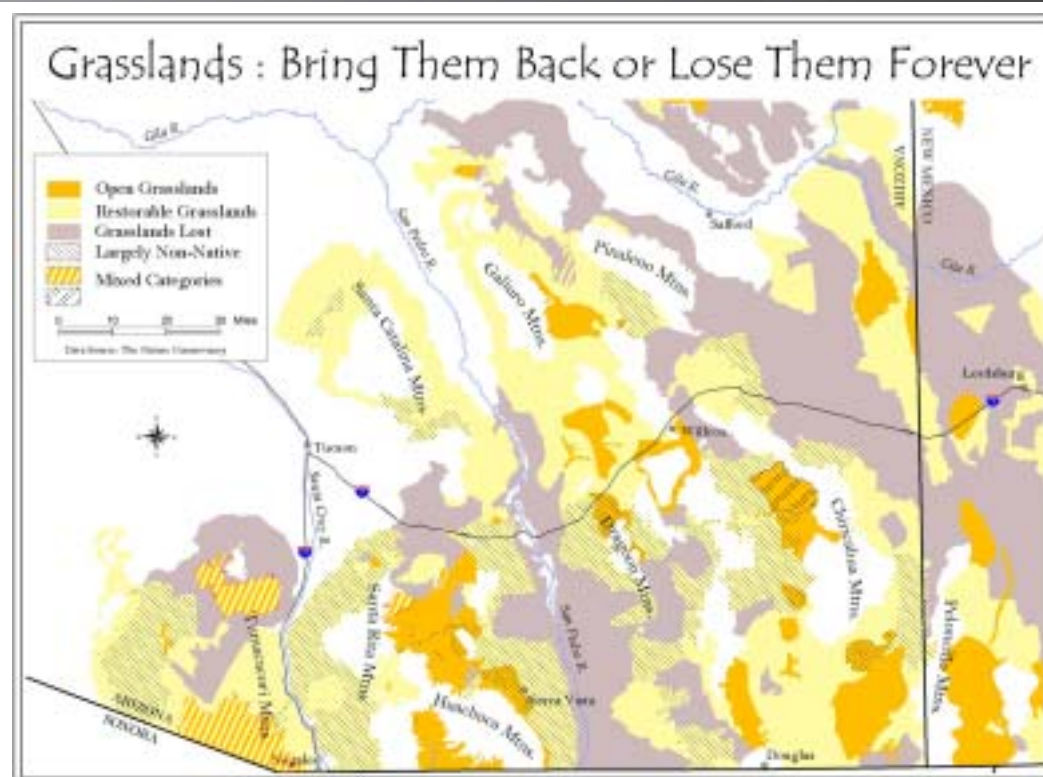
We Sky Island residents often talk about our “mountain islands surrounded by desert seas.” For most of the last 10,000 years, though, it was waves of grass that blew across vast reaches of these seas, not the shrub deserts that are so common today. We look out at creosote flats, and we wonder what insanity caused Texas cattle barons to bring hundreds of thousands of head here in the 1870s and 1880s. The vast grasslands that tempted these herders have been so diminished and degraded that we can barely imagine their former glory.

Our lowlands still show the scars cut by this onslaught of hooves and mouths. The great drought of the 1890s left cow carcasses strewn all across the region and stripped whole river systems of their spongy marshes. Bare riparian soils were easy fodder for “gully washer” storms that dug channels 10 feet down in a season or two.

Nature is a forgiving mistress, but even she has her limits. Many of these damaged grasslands rebounded from this crisis. Others lost too much soil to

grow grass again in our lifetimes. Lost soil, exclusion of natural fire, continued grazing pressure, and climate changes have conspired to convert large areas of grassland to shrubland.

Return of fire and rest from grazing can bring many of these degraded grasslands back to their former open structure. But because shrubs hold less water and less soil than grasses do, once shrubs reach a density threshold, grassland loss accelerates and becomes much



Status of current and former grasslands in the Sky Island region. Open grasslands are ones with less than 10% shrub cover. Restorable grasslands have 10% to 35% shrub cover. Lost grasslands have less than 3% perennial grass canopy; these are now so dominated by shrubs that they will not recover with fire or rest from grazing within the next 40 years or longer. Data is from Gori, D.F., and C.A.F. Enquist. 2003. An Assessment of the Spatial Extent and Condition of Grasslands in Central and Southern AZ, Southwestern NM, and Northern Mexico. Prepared by The Nature Conservancy, AZ Chapter. Our map combines some of the original categories. Data for Mexico is not shown here because so much less is known about grassland status south of the border.

more difficult to turn around. From a triage approach, these former grasslands are terminally ill; bringing them back would require heroic (and very

costly) intervention. Many landowners and managers are now working to nurse back to health the patients with more promise, labeled on this map as