Restoring Connections

Newsletter of the Sky Island Alliance  Vol. 9 Issue 2  Summer 2006

Borders and Boundaries

The border near Naco, Arizona. Photo courtesy Kat Rodriguez, Derechos Humanos.
From the Director’s Desk:

The fence looked like any other. It was your typical three-strand barbed variety they sell down at the hardware store. It’s used for just about anything that needs to be fenced in or fenced out, in addition to serving as the ubiquitous means of delineating one’s property boundary. The barbed wire came across on this particular day served all of those needs, plus an additional purpose that was cause for a moment of pause. It served as the dividing line between the United States and Mexico. Since the Gadsden Purchase in 1853 when the United States bought southern Arizona and New Mexico’s bootheel from Mexico (for $12/acre in today’s dollars!), the main cause for concern along the international line has been making sure the wandering cattle stay on their respective sides. The fence I came across seemed to be doing a pretty good job at that. Unfortunately, cattle management seems to be the least of our concerns along that fence line today.

Later on, after thinking about the significance of that little barbed wire fence and the large political barrier it represents, I found myself watching the United States Senate debate border and immigration issues before passing a reform bill on May 25th. During the debate, a particular Senator came to the floor and proclaimed “Good fences make good neighbors” as he called for authorization to build double- and triple-layer 15-foot high walls along the U.S.-Mexico border. That’s a far cry from the barbed variety that currently exists along most of the boundary. I couldn’t help but dwell on the effects that 15-foot high triple-layered walls would have on local, regional, and continental wildlife movement patterns. The Sky Island region is a premier example of the interconnectedness of ecosystems — it spans the temperate and sub-tropical, the Sonoran and Chihuahuan. What would a wall mean for the jaguar, for the ocelot, the black-tailed prairie dog, or hundreds of other species (including various species of low-flying birds) that rely upon the ability to travel between our two countries for their daily, seasonal, or annual life-cycle needs?

The impacts of our current border and immigration policy are obvious — the environmental damage and loss of human life currently occurring is not acceptable. A solution exists, although it’s more complicated than building big fences between neighbors. The solution doesn’t lie at the point of conflict in this case, but rather it lies within a comprehensive perspective that must acknowledge the multi-faced realities of our situation. For one, we must acknowledge the ecological reality that our border environment is not divided, but rather very much connected. That connection, to every extent possible, must remain intact. Otherwise, we risk tarnishing the basic principles that sustain the work that so many share — namely landscape-level conservation planning that strives to reconcile and mend the often differing realities of ecology and policy.

Thanks to a bad map and James Gadsden’s aspirations of a southern transcontinental railway 153 years ago, the Sky Islands now span the political divisions of two countries. This somewhat unique cause for our current international land ownership patterns poke at a larger issue and concept of borders and boundaries. In early May, Sky Island Alliance and its partners hosted the 6th conference on Research and Resource Management in the Southwestern Deserts. The theme of this year’s conference was “Borders, Boundaries, and Timescales” and we appreciated the thoughtful discussion that emanated from the many different contexts that these three concepts can be viewed from. This issue of Restoring Connections strives to bring you a comprehensive perspective of borders and boundaries. While one particular border is in the spotlight today, we hope to broaden the perspective that these topics can take, and provide a thoughtful look into just what a border is.

Matt Skroch
Executive Director

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 related 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. Or give your favorite small-town restaurant a boost by writing a review and let us promote it! Also, let us know if you are interested in being a regular contributor, e.g. with a column each issue.

Restoring Connections is published three times a year and the deadline for our next newsletter is August 15, 2006. 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, PO Box 41165, Tucson, AZ 85717. Resolution of digital images should be at least 300 dpi if possible.
A Shifting Line Across Time

by Julie St. John, Editor

Our Sky Island bioregion was politically bisected over 150 years ago to fulfill one man’s vision of making the West commercially dependent upon the South instead of the North. There was gold in the new state of California, a fervor to open the rest of the United States to trade with the Far East, and a direct and winter-free route across the lowest section of the Continental Divide which was perfect... except for the fact that it was south of the US border.

His name was James Gadsden and he was president of the South Carolina Railroad Company. His friend and fellow empire dreamer, Jefferson Davis, then U.S. Secretary of War, got him appointed as US Minister to Mexico with the instructions to buy from Mexico enough territory for a railroad to the Gulf of California.

Some background... At the end of the Mexican American War in 1848, Mexico abandoned its claim on Texas and in the Treaty of Guadalupe Hidalgo ceded two-fifths of her territory to the United States — all of California, Nevada and Utah, part of Colorado, and most of Arizona and New Mexico — for a mere $15 million. The treaty map, however, had some major inaccuracies (misplacing El Paso and the Rio Grande being the two most egregious), which led to four years of polite wrangling and/or posturing among various US and Mexican boundary commissioners, surveyors and politicians. The real estate in question, about the size of Pennsylvania, became known as the Mesilla Strip. Depending on one’s perspective, it was either a no man’s land plagued by frequent Indian raids, or a prime swath of real estate including the Santa Rita del Cobre copper mines and the lush Mesilla Valley. Perspectives aside, in the end, it came down to money.

Mexican President Antonio López de Santa Anna was heading a financially bankrupt government. He and Gadsden negotiated and renegotiated boundaries and prices many times, with the press, politicians, and public in the wings, taking sides. The Mexican people saw Santa Anna’s actions as yet another betrayal of their country, and in the U.S., northern and southern politicians were already priming themselves for a fight as to whether the new western territories would be pro- or anti-slavery. Finally, on December 30, 1853, Gadsden and Santa Anna, in the Treaty of Mesilla, more popularly known as the Gadsden Purchase, agreed to exchange the land (shaded in grey in the map above) for $10 million. The treaty went into effect in 1854, interestingly also including a provision, never exercised, allowing the U.S. the option of building a transoceanic canal across the Isthmus of Tehuantepec.

The deal was so unpopular in Mexico that Santa Anna was unseated as dictator and banished. And although Gadsden was successful in his purchase — acquiring not only his route, but also valuable natural resources and the towns of Yuma, Tucson, Nogales, Wilcox, Douglas, Lordsburg, Deming and Mesilla — he did not live to see the completion of the Southern Pacific Railroad. The purchased lands were initially appended to the existing New Mexico Territory, and the North and South continued to play tug-of-war over them. In 1861, the Confederacy claimed the southern portion of the Territory and formed the Confederate Territory of Arizona, mostly comprised of the lands acquired by the Gadsden Purchase. In 1863, using a north-south dividing line, the Union created its own Arizona Territory out of the western half of the New Mexico Territory, which also included most of the newly acquired lands. The Union’s boundaries held after the Civil War, and both Arizona and New Mexico became states in 1912. At last, the boundaries were fixed.

From a number of fine articles in this issue you will find that the only fixed aspect of natural borders is that they are constantly in flux — whether from climate change, human impact, opportunistic migration, invasive species, you name it. The elements of the natural world — so intimately interconnected — must be able to evolve together... or perish.

Over 150 years ago, a line was drawn in the sand. It divided not only a functioning, highly diverse bioregion, but families, cultures, and ways of life. Now the US Congress is considering building an impermeable, towering structure on that line. As Arizona Governor Janet Napolitano says, “Build a 50-foot wall, and they’ll build a 51-foot ladder.” But she’s not talking about the jaguars, wolves, lions quails, bees, and so many other species that make our Sky Island bioregion so special. What will become of them? And in the end, what will become of us?

Sky Island Alliance supports comprehensive immigration legislation that will reduce environmental impacts on private and public lands along the United States-Mexico border by facilitating legal immigration through established ports of entry. Sky Island Alliance will also provide input to border agencies to help reduce negative impacts on wildlife and sensitive habitats that might be caused by border security technology and infrastructure. We are particularly concerned with the proposed construction of walls, fences and other barriers in wildlands along the border that would interfere with the movement of wildlife that utilize habitats on both sides of the border.

— Sky Island Alliance Board of Directors, June 2006
Crossing Boundaries
by Mike Quigley,
Wilderness Campaign Coordinator

Thinking about boundaries and borders, I’m reminded of a Peter Gabriel song, “Not One of Us”. The song is about how groups of people make themselves into smaller groups of people to feel strong by excluding others.

Social boundaries are as real as fences or lines on a map. Perhaps that’s a vestige of our distant past — where tribal membership and rapidly classifying the real world into threats and nonthreats was necessary for survival. Perhaps that’s an extension of the boundary between self and other. Perhaps that easily reinforces a comfortable sense of belonging, or avoids the effort and risk of thoughtful reconsideration, or provides an easy means to dismiss others.

There’s comfort in knowns, to be sure. Social boundaries can be useful, defining a set of expectations and patterns for us. But by defining, they divide — us and them, with me or against me, friend or foe, right and wrong.

I’m dismayed that so much of the public and political discussion in America today reinforces the boundaries that separate us rather than the underlying values that unite us. Most of us are a Venn diagram of beliefs and attitudes — overlapping circles describing our current positions on various issues. Imagine layering someone else’s diagram on your own — look for the similarities. It’s been the rare time when I’ve found absolutely no overlap. Or when I’ve found complete overlap. Most of us belong to several communities and groups and we move between them, move through the group boundaries. For most of us, the boundaries are both dynamic and permeable. And underneath we share some common values — even if we express or show them differently.

We have more in common than we have differences. For example, poll after poll shows preserving and protecting the environment ranks high among people’s priorities — regardless of their political affiliation, socioeconomic class, or positions on other issues. Environmental stewardship is a core value most Americans share, it’s where most of our values’ Venn diagrams overlap — whether we’re conservationists, office workers, hunters, ranchers, students, construction workers, or whatever.

Then why is it that environmental protection is not a public policy priority? Why is the environment under increasing attack — from owls or affordable housing locally to the seemingly-weekly efforts to sneak drilling in the Arctic National Wildlife Refuge into the next “must pass” bill to hit the Senate? Why, when we share the common ground of wanting a healthy environment, is that not reflected in our government policies, corporate actions, and even personal choices? And why, if so many of us share the value of preserving our wild heritage, is there so much distrust, bickering, and name-calling around environmental issues and so little collaboration on a truly broad level?

We’re being divided to be conquered. We’re being presented false dilemmas as givens — it’s owls or jobs; it’s drilling in the Arctic or gas at $5 bucks a gallon; it’s pollution-belching factories or trashing the economy. And we’re being placed in little circles and told everyone else is out to get us. Hunters can’t talk to environmentalists because the enviros will take away their guns. Conservationists can’t talk to ranchers because ranchers just want to abuse the land for profit. Our boundaries become barriers. Our barriers become more stationary and impermeable.

Doors close, windows are boarded up. We entrench. And we lose.

We lose because preserving the natural world is a big challenge. With little business profit potential, it’s one that requires a lot of helping hands and minds, one that requires conversation and cooperation, and likely some measure of unselfishness. In short, it requires a lot of people—diverse people—working together for the common good. When boundaries become barriers, conversation becomes debate, cooperation becomes selling out, unselfishness becomes weakness, and improving the world becomes a quaint notion rather than an achievable goal.

So what’s to be done? I submit that examining one’s own biases and beliefs is a good place to start — an open mind is required, caring is required, and we have to be comfortable with ourselves if we’re to be comfortable with others. Then, let’s talk — to others. Reach out beyond the obvious boundaries; engage in a discussion with someone we might not routinely talk with. And I mean real discussion — not debate. Go to boundaries and look around. Challenge some stereotypes. We’ll likely be beaten back or turned away at times. It’s not about being Pollyanna-can’t-we-just-all-get-along; it’s about getting things done. We need to stay true to our principles; but maybe when we go to the boundaries we’ll see others looking around and reaching out, maybe we’ll learn some things. Regardless, it seems a necessary effort to me — it’s at boundaries where the action is, where change occurs, where growth happens.

It’s easy to see boundaries, and easy to take them as more than they are. It’s easy to see the differences between us. It can be hard to look for the common ground, to see the core values we share with others. It can be hard to reach out across boundaries. We can divide ourselves into smaller groups to feel strong by excluding others. Or, we can include others and be strong.
Beautiful Borders

Reflections of Sky Island Margins and Fringes

by Peter Marshall, SIA Board Member & Maniacal Naturalist At Large

Borders are beautiful. Some faded, ragged, or sharp, contrasting colors or shadows and light, outlining patches of Earth, appearing or disappearing with time. Especially now, when borders can be seen from satellites or through microscopes, their boundaries delineate so many thoughts and important images — where the fence separates grazed from over-grazed, riparian from hillslope, lichen into fungal filaments and algal blobs. Of course, as a local maniacal naturalist, I have a special affection for borders of the southwest, especially those of the Madrean Sky Island archipelago.

The hugest borders enclose the air masses that travel over the sky islands — the Arctic air mass, the Pacific maritime air mass, and the Caribbean maritime air mass. In summer, a highly unstable, dry, hot but clearly defined tropical continental air mass hovers over the sky island region, only to disappear each fall. (You can go to gacc.nifc.gov/wwc/ and click on “weather” and then “GOES Satellite Imagery” to see the boundaries of these air masses that impact the sky islands in the visible, infrared, and water vapor.) These borders are quite distinct if somewhat seasonal and ephemeral. They scud the lower atmosphere bringing the equinoctial of winter and the lightning-storm monsoons of summer. Sometimes, the edge of the Pacific maritime air mass creeps northeast into the sky islands and brings fall tropical storms. These borders teach a lesson: you can be coherent (an air mass has predictable moisture and temperature content) and yet moveable. The maritime air masses are well-circumscribed moveable feasts of water. In nature, a border does not mean “nailed to the landscape.”

Some sky island borders change slowly. The borders between the Neotropical/Holarctic flora and the Neartic/Neotropical fauna are a good example. These borders became more clearly defined when the land bridge between North and South America allowed the movement and mixing of very different cohorts of species. The border organism itself over millions of years and through dozens of climate changes and animal/plant movements. The border is, in some sense, a belt of points — the unique limit of one species meeting another species also at its unique limits. Maples can grow with organ pipe cactus; oaks with palms. Fourteen plant families reach their northernmosts in the sky island region (including the northern Sierra Madre). Seven bird families reach their southern limit and four their northern limit. Until recently, thick-billed parrots and trogons mixed with nuthatches. About 30 bird, over 35 reptile, and 145 mammal species reach their limits. The edges of their distributions form the border. The border is not a thin line but an exceptional strip of the planet — a kind of beaded border of creatures at their geographical fringe.

Since the “border” is a matrix, many details remain mysterious to humans. Why the yellow-eyed junco, a perfectly capable flyer, draws a psychological (or some other) line between two sky islands, we do not know! Similarly, another capable migrant, the Mexican chickadee refuse to fly north and cross a line paralleling I-10; while its counterpart, the Mountain chickadee, rarely crosses the same border going south. Sometimes, we can guess at what a border means to a bird. The Mexican duck should have probably been named the Cienaga duck. In the past, it gave up long-distance migration and only flew short distances between wetlands. With the coming of cattle tanks, wetland pockets increased and some long-distant migrant mallard ducks stopped migrating and settled in cattle tanks or sewage ponds. Today, they breed confidently with the Mexican (sic: Cienaga) duck. The Mexican duck is now losing its identity (it’s been downgraded from species to race) as its homeland security disappears.

The most famous borders of the sky islands are part of their definition. Sky islands are isolated mountain ranges with a stack of biotic communities, layered one on top of another. One layer must be an oak-pine forest to be part of the Madrean archipelago. Each layer has a top and bottom border. Nature now try to understand these borders — they slant downward on the south and west side of a mountain more than on the north and east; they vary with canyons and self-shadowing from adjacent peaks, and they vary with soil types. The pine-oak appears as a slither on the Pinalenos; fattens out on the Huachuca; and blossoms on the Sierra Opoura.

Crossing the vertical borders on a sky island can be beneficial. Black bears, for instance, ignore the vertical borders of their homeland sky islands, eating cactus fruit at the bottom, then wandering past the encinal, the pine-oak, the mixed conifers, and into the high mountain cienagas for a few roots. They do their border crossing in a few hours, leaving telltale signs of cactus fruit in conifer forest scat. Many migratory birds nest at elevations that take the skirt of snowfields into account. If the border of the snowfield is thick and distinct in June, they will nest downhill. Like the air masses, it is important to keep in mind that borders can be vertical, not just a line on the ground.

Over time, the montane borders of each layer move up and down. The sky island borders have moved fifteen to twenty times over the last two million years of glaciations. About 11,000 years ago, the glaciers were at a maximum with small glacial bodies on the Pinalenos. The Pinzon-Juniper woodland border was about 2,900 feet ASL but now is at 4,800 to 7,700 and climbing. During these fluxes, the valleys were, at times, not borders between the mountains, but bridges. The yarrow spiny lizard, for instance, marched north as the glaciers retreated, crossing valleys that may have had oak riparian or oak woodland valleys.

Right now, with climate change and human disturbance for instance, the upper edge of the Engelmann spruce/cothatch fir border is moving up and off the top of the Pinalenos. Fire has literally sacrificed the forest edge to the atmosphere. Spruce, stressed by climate, has also been attacked by five species of insect pests and thousands have died. The clear border between the high elevation spruce/fir and the lower elevation mixed conifer (which includes much more Doug fir) has fragmented. Until there is a new glacial advance, the border may never return.

In short, all borders are temporary. We look at them within “time frames” that are of interest. We can trap ourselves into believing that a border is somehow “solid” or immovable. This mindset is common in both human and natural history. But, borders sing a wistful improvised frame-of-reference blues.

Perhaps the most sacrilegious attitude toward borders occurs among invasive plants and animals. They have not experienced the bio-geo-history that defined their niche or place in the community. Exotics ignore natural borders. Starlings move into saguaros displacing the desert form of the purple martin. Buffel grass does not stay within the grassland where it was planted. A major goal of ecological restoration is to keep the natural borders — prevent the southwest from becoming a homogenous landscape of exotics and human-adapted cultivars. At times, as with various sky island lilies, the protection of the species requires an actual perimeter fence around the cluster of plants.

We are now in an era where humans are interposing barriers, inserting dividing lines that have little relationship to Nature’s borders. These intrusions have the greatest impact on the large carnivores and migrating hoofed animals like pronghorn, who need large tracts and many habitats for survival. The jaguar has become emblematic of “borderless wildlife” in search of homeland security. It reminds us how arbitrary lines on maps are not in any way comparable to the rich and textured margins of the sky island stack of biotic communities, or the north-south mix of tropical and temperate creatures.
How long can the elusive mountain lion pass through our manmade borders?

by Kerry L. Nicholson, Graduate Research Assistant, University of Arizona.

Corresponding map on back cover.

One of the challenges for the 21st century will be to determine how wildlife can co-exist with an expanding human population. This will be especially important as humans expand into the habitats of large mammals (i.e., large predators and ungulates) inhabiting large landscapes. Mountain lions (Puma concolor) are cryptic, crepuscular, and exist in relatively low densities. They are one of the most difficult terrestrial mammals to study in the world. However, mountain lions are ideal animals to examine how a large predator is influenced by urbanization because mountain lions can adapt to a variety of environments that overlap with humans. The International Union for Conservation of Nature Cat Specialist Group (IUCN) has called for increased research of wild cats in urban settings, because urbanization is one of the greatest threats to wild cat species worldwide. Within the past decade, researchers have initiated several studies of mountain lions in urbanized settings throughout the western United States. When humans and mountain lions share the same landscape, conflicts arise including mortalities from vehicles, poisoning from rodenticides, shooting, and concerns for human safety.

Research addressing how and when mountain lions and humans can co-exist is relatively new. Studies that specifically examine mountain lion movements and interactions with an increasingly urbanized landscape are limited and most thus far are based on sighting locations or locations obtained on an irregular basis.

Due to its rate of development, Tucson, Arizona, provides an ideal location to study mountain lion movements and interactions with an increasingly urbanized landscape. To address many of these urban-mountain lion issues, an intensive joint mountain lion study was initiated in 2005 by Arizona Game and Fish Department and the University of Arizona using GPS technology. This study will answer some crucial questions and issues about mountain lions’ responses to urban situations. Some of the questions to be examined include: Are mountain lions using urban areas? What are the movement rates through various landscapes types? How are they moving between mountain ranges? and How do they interact with each other?

Expanding human development and fragmentation is inevitable. In Arizona, Interstates 10, 8, and 40 (I-10, I-8, I-40) bisect the state. The Central Arizona Project is a canal system running from the Colorado River through Phoenix and south of Tucson. There are also proposals to erect a barrier between Arizona and Mexico to prevent the illegal immigration of humans (Arizona Daily Star, 12 March 2006). These man-made structures are potential barriers to all wildlife. They fragment the landscape and eventually diminish the connectivity necessary for wildlife persistence. If the public wants mountain lions populations to persist in Tucson, changes will need to be made in landscape decision-making and management. Managers may need conservation strategies that go beyond traditional land acquisition by government and include economic programs to preserve critical landscapes on private land. The ploths of the Bighorn sheep on the Catalina Mountains’ Pusch Ridge and the Florida, which is making its last stand in south Florida, are prime examples of situations that could have been prevented through forethought, commitment, and follow-through. Arizona has the ability to learn from these mistakes and begin planning now.

In Florida, urban development has effectively fenced in the Florida panther (Puma concolor coryi), leaving its genetic viability — and species survival — in question. The panther population is so isolated and restricted by development that if attempts are made to disperse, the amount of pavement necessary to cross to reach more suitable habitat increases the likelihood of collision. If the panthers choose not to disperse, they compete with each other for the limited resources available which often results in death. The fate of the Florida panther has likely reached the point where manipulation by humans, such as translocations, is likely the only way for the population to survive. Is this the future of all mountain lions adjacent to urban centers?

Bighorn sheep (Ovis canadensis) provides an example of what can happen when conservation efforts do not consider animal movement or land needs. One goal in establishing the Pusch Ridge Wilderness in the Catalina Mountains was to provide protected habitat for desert bighorn sheep. The public wanted bighorn sheep, and wanted to be able to have the experience of viewing bighorn sheep. However, during development of management plans, little or no thought was given to corridors providing links to other sheep populations. Due to continued development, a building and housing barrier was soon established around Pusch Ridge Wilderness, which effectively fenced the sheep and limited available habitat. The bighorn sheep conservation goal failed. There is no viable sheep population in the Pusch Ridge area and none have officially been documented in the Catalina Mountains for the last ten years. Now that desert bighorn sheep have declined, we must question the management strategies for the area — if the mountains surrounding Tucson had been managed by conserving numerous habitat patches and allowing for potential dispersal, would there be a viable population of bighorn sheep in the Santa Catalina Mountains?

The current mountain lion study in Tucson has successfully collared nine lions from the surrounding mountain ranges. This study began in 2005 with the first lion captured in May. One lion was collared, released and subsequently killed by another lion within a week of release.

In August 2005, a second lion was captured in the backyard of a private landowner bordering the Catalina Mountains and fitted with a spread spectrum satellite collar (Telonics, Inc., Mesa, Arizona). The 989 locations obtained from the male lion’s collar indicate this mountain lion used the Coronado National Forest in the Santa Catalina Mountains, the Tortolita Mountains, Picacho Peak Mountains, the Nineteen-Six Hills and the Black Mountains, surrounding and within, 60 km of Tucson, Arizona (see map on back cover). We collected data from August 2005 until April 2006. The home range (159,000 ha) incorporated several large parcels of land that are slated for development, including parcels near the Biosphere and land between the Tortolita and Black Mountains, which has been approved for development within the next five years. The land will have approximately 5,000 new homes and businesses associated with new community development. The mountain lion’s habitat already incorporates some developed areas and active living communities. Movements between the Santa Catalina Mountains and the Tortolita Mountains cross Oracle Road on numerous occasions and are on the edge of the currently developing communities.

Future studies need to examine lion use of urban areas, inter-mountain movements, human interactions and response practices. Mountain lions can move easily between several mountain ranges or across borders, and therefore unimpeded land must be set aside for persistence of this species. Studies that document how lions interact with urbanization are important, but unless action is taken to implement the findings, mountain lions adjacent to urbanization will not have a future.
Overlapping Boundaries
by Janice Przybyl, Sky Island Alliance Wildlife Monitoring Program

During the five-day training workshop, Wildlife Monitoring volunteers learn about the behavior patterns, natural history, and habitat requirements of our six focus species. Four of these species — puma (mountain lion), bobcat, jaguar, and black bear — are solitary and elusive. If you are ever so lucky to see any of these critters in the wild, then most likely you’ll encounter only one individual. If you see two or more bears together or two pumas together, then you’ve stumbled upon a mother with young, siblings, or a mating pair. At all other times, puma avoids puma, bear avoids bear, bobcat avoids bobcat, and jaguar avoids jaguar.

These animals are territorial and mark using a variety of visual and olfactory modes to communicate their presence on the landscape. Tracking volunteers learn where to locate, and how to recognize and photo-document “wildlife message boards.” For example, black bears declare their presence and intentions by scratching and biting tree trunks, telephone poles, fence posts, signposts, and other similar structures. Next time you’recinching on a backpack before your hike, stop and examine the trailhead sign for telltale scratches in the wood (see photo, lower left).

Male felines create “scrapes” — both a visual and olfactory cue — by swiping their hind feet backward to create two parallel furrows. Then they spray the mound of organic litter at the end of the furrows with urine (see photo, upper right). Females occasionally create scrapes. Bobcat scrapes are similar in construction to a puma’s, but are notably smaller.

Whatever the characteristic sign, the message could be “KEEP OUT!” Interactions between adult males are anything but sociable. Physical encounters can result in a fierce skirmish that is fatal to one of the animals, so avoidance is key. But then again, for the purposes of mate seeking, close encounters between members of the opposite sex are desirable and the message may be “Female in estrus seeking local male with healthy genes.”

Male puma — and most likely jaguar — territories are extensive and do not overlap, therefore delineating boundaries of home range is essential for survival. Female ranges are smaller and do overlap with other female and male territories. In fact, an individual male territory often encompasses neighboring female territories. Bobcat and black bears follow suit, but there is less segregation between male territories. Bobcat and black bears follow suit, but there is less segregation between male territories. Bobcat and black bears follow suit, but there is less segregation between male territories.

Multiple species can share the same spot of earth. The mosaic of jaguar territories overlay puma territories, which overlay bobcat territories, which are contained within bear territories or the home ranges of wolf packs. So how do similar carnivores share the landscape? Again, avoidance is key. Encounters are deadly to the smaller species. Puma outweigh bobcat and jaguar trumps puma. The scratching, scraping and spraying described earlier can telegraph the whereabouts of one species to another species.

Avoidance can operate by partitioning the landscape both spatially and temporally. For example, bobcats prefer smaller prey than would pumas or jaguars. However, in southern Arizona and northern Sonora, jaguars and pumas compete for the same large prey. Recent information from studies along the Arizona-Mexico border indicates that “nervous” pumas are accommodating the larger feline and are restricting hunting to times when jaguars are not moving.

Even with overlapping territories and home ranges, wildlife move fairly freely over the landscape to fulfill dietary and mating needs. However, one set of boundaries can overtly obstruct wildlife movement — the overlay of human political boundaries.

Often political or jurisdictional changes are delineated only on a map. A signpost or a barbed wire fence — wildlife friendly, we hope — may be the only indication on the ground that one crossed from Arizona to New Mexico, from private property to National Forest, from the United States to Mexico. However, our claim on the landscape increasingly degrades and fragments wildlife habitat, threatening species survival. Recent legislative proposals and public impetus in the United States are pushing to construct sizeable walls along the international borders with Mexico.

The Sky Island bioregion spans the international border and subsequently so do the ranges of many species that inhabit the sky islands. A wall that is impenetrable to humans will affect the home ranges, movement patterns, and migratory routes of bobcats, badgers, bears, birds, bees, and more. What will be the fate of the one or two male jaguars stranded on the north side of the wall? Discussions of immigration policy and border security issues should incorporate awareness of how our human boundaries overlap wildlife territorial requirements and movement patterns.

Our region is international and the species continental.
Blurred Lines, Borderless Wings

By Ken Lamberton kjlamb@ mindspring.com

Trees tower over us, screening the air of sunlight and sound but not the cottonwood fluff, which drifts across the road like down plucked from the breast of a songbird. We park at a gate leading to the fourth residence on today's agenda, a ranch house on the north bank of Tanque Verde Creek, and immediately I hear a sharp kek, kek, kek. "There it is again," I say to Bill. "Every time we stop, it's like they're welcoming you."

"Or taunting me," he says, slipping on his straw fedora and denim jacket.

At just after sunrise, I'd met Dr. William Mannan, professor of Wildlife and Fisheries Science, outside his office at the University of Arizona, "Bio East" building, and together we drove through the morning commuter rush to Tucson's east side. Negotiating city traffic is what Bill Mannan does well, even keeping an eye on every tree we pass as he scans for the subjects of his study: urban Cooper's hawks.

The study is in its tenth year, and Bill Mannan is continuing the research that wildlife biologists Jim Dawson and Clint Boal began in the mid-1990s. Then, these scientists were calling it a "phenomenon." It still is: Cooper's hawks, and other raptors as well—red-tailed and Harris' hawks, great horned owls—nesting in Tucson, in residential areas, in city parks and cemeteries, in the trees above Golf N' Stuff.

In 1994, Jim Dawson, then a University of Arizona professor, submitted a report to the Arizona Game and Fish Department saying he was convinced that Harris' hawks began nesting in developed areas in Tucson in the mid-1980s, "and in the short time since have established a significant urban-nesting segment of the population in Arizona." The behavior was unknown in the 60s and 70s.

What interests me—it's part of the reason why I asked Bill Mannan if I could join him during some of his field work—is the behavioral shift the raptors must make to live in an urban environment. And why they are making the shift in the first place. Normally, Harris' hawks inhabit the Sonoran Desert outside Tucson, feeding on ground squirrels and cottontails among the paloverde and prickly pear and nesting in giant saguaro cacti. In the city, the chocolate-brown or black, rufous-shouldered hawks prey on animals drawn to bird feeders and desert landscaping and nest in tall eucalyptus and pine trees. Researchers counted 72 nests over a broad swath of north Tucson in 1994; today, there are twice the number in twice the area. The incursion continues. As I write from my home on the west side of Tucson, a pair of the birds are nesting in a tree along the street for the first time in our forty years here. Only yesterday, I heard a screech from the top of our utility pole and looked to see the smaller male standing on—and screaming from—the back of his mate. The two have been hoisting deadwood into a pine tree across the street, and are feeding on the rabbits and doves in my yard. And, two weeks ago, I watched a Harris' hawk fly across a six-lane street near the busy intersection of Grant and Oracle roads and land on a billboard. You can't get any more urban than that.

In 1995, when I first heard about and became fascinated with the phenomenon, I met with Clint Boal, a Falconer and U of A graduate student who was finishing his Ph.D. dissertation on urban Cooper's hawks. He had learned that the hawks had been nesting in Tucson for the previous five years and believed they had only recently arrived here. I wanted to know why.

Cooper's hawks, crow-sized birds of prey in the accipiter clan, which includes the larger goshawk, seem the most unlikely city dwellers. The hawks commonly inhabit undeveloped forests and woodlands, their short rounded wings and long narrow tails adapted for quietly twirling and darting among tree branches and shrubs to chase down other birds, their primary prey. In this environment, the hawks are shy and secretive. In the city, however, Cooper's hawks hunt, court, and reproduce in a place where the human population exceeds half a million citizens. Researchers have counted as many as 80 active nests in one season, some of them densely packed—another urban behavioral shift—into neighborhoods and parks. In Tucson, families picnicking on fried chicken under cottonwoods that spill feathers as hawks feast on doves.

Of all the raptors invading our city, we know the most about Cooper's hawks. We know that there are at least three likely reasons why the hawks nest in Tucson.

The first is trees. Large trees. Not the twisted resident mesquite or green-skinned paloverde but the huge, water-loving alights like eucalyptus and Aleppo pine and our native cottonwood. "I found that Cooper's hawks in Tucson generally selected small, grove-like aggregations of exotic, large, well-canopied trees as nest sites," Clint Boal writes in his Ph.D. dissertation, adding that the level of human activity did not seem to disturb them. City hawks, in contrast to those more rural, have adjusted to people—even crowds of three-foot-high little leaguers—in order to nest in urban trees.

The second reason is water. Cooper's hawks normally nest close to water, and the birds may be favoring the city's plethora of fountains, pools, bird baths, and irrigation systems. But water in the desert also draws other birds, and this, with the popularity of bird feeders, may account for the third reason urban living agrees with Cooper's hawks: food.

Doves, both mourning and inca, are the hawks primary prey in Tucson and also some of Tucson's most common birds. This abundance of food may actually permit the hawks to shrink their territories, another city adaptation (not unlike the one humans make), allowing them to nest much closer to each other.

It would seem that city life appeals to Cooper's hawks, that the urban habitat, with its plentiful resources, provides the birds with what ecologists call a population "reservoir." But there are drawbacks—the risk of electrocution from power lines, impacts with cars and reflective windows, disease. Disease is a particular problem for young hawks. From 1994 to 1997, Clint Boal studied Cooper's hawks in metropolitan Tucson and compared them with non-urban Cooper's hawks inhabiting ruparian and woodland areas outside Tucson. Although urban hawks nest earlier and lay more eggs per clutch, probably another benefit of abundant prey, it turns out that nesting and fledging deaths are greater than non-urban hawks, ten times greater. The culprit is Trichomoniasis, a disfiguring disease caused by a protozoan and spread by the hawks' favorite food—doves.

Clint Boal suggests that, because more than half of juvenile Cooper's hawks in the city don't reach adulthood, and because Tucson continues to draw adult birds from outside, the urban environment may be functioning not as a reservoir but as a population sink, an ecological deathtrap. A La Brea tar pit for Cooper's hawks.

Urbanization certainly means a loss of wildlife; roads and concrete don't mix well with prairie dogs and pinyon owls. But the real tragedy is what we don't immediately see—that urbanization depletes not only species from inside the city limits but from outside them, that there really are no borders between what's urban and what's wilderness, between what's developed and what's not yet felt the grader's blade. And the insidious part is the deception. For the appearance of abundance might be the Piper's assembly call. La Brea is one of this continent's richest gatherings of species too, fossil species.

We draw lines on maps, erect fences, we lay down pavement for six lane highways, but wilderness pays little attention to our proclivity for boundaries. Species always push the limits; they are trespassers by nature. Birds violate our airspace. Weeds encroach upon our sidewalks and streets. Insects invade our homes. Like it or not, the lines are blurred. We are part of the equation, part of the nature of things. The poet Alison Deming writes that "the human soul is an aspect of being that comprehends no boundary, no edge." Why don't we, of all creatures, understand this?

Wilderness is not only a place "over there," something delineated and set aside on a map for preservation from human impact. Wilderness is the cottonwoods and thistles and dung-hunting beetles in our own backyards.

This morning at our fourth stop, a blond woman wearing a blue knit pullover greets us at the gate. She knows Bill Mannan from his many previous visits.

"Did you see the hummingbird nest?" She asks, pointing into some low branches we've just walked under. We pause to look. "I haven't seen your birds lately," she adds, "but their nest is still there."

"She's here," Bill says. "We heard her as we drove up."

She is the second owner we've found at home today. Bill has introduced himself to all the residents.
of his study sites, and in all cases except for one, people have allowed him access to their property. Generally, residents want to make sure he’s not going to harm the birds. “Most people love them, thinking they’re just terrific,” he told me when I asked about how people like having hawks raise clouds of terrified songbirds in their yards. And, residents have become extremely helpful with Mannan’s research, calling him with reports and new sightings.

Earlier, however, at our first stop in a residential community of mesquite lined streets, neat sidewalks and trimmed lawns, we were searching for a missing pair of Cooper’s hawks. “The Donner nest,” Bill called the site, named for the street where the hawks had nested last year. The nest was gone, unfortunately, cut down. But when I pointed toward the edge of her property several gigantic cottonwoods.

Bill was unconcerned, knowing that the pair would relocate somewhere nearby, but I couldn’t help feeling some loss as I stared at several table-sized tree stumps among the piles of sawdust and twisted sections of branches. Loss for the trees and the hawks. The owner, a thin, dark-haired woman in her thirties, knew Bill, and she knew about the hawks. But all she could say to us as an explanation was, “Thank God. Now I can see my house.”

A few winters ago, a bald eagle visited Tucson for the first time in anyone’s memory, grazing the city’s northwest side for several months. I began looking for it with my three daughters when people started reporting its location and talking about how “beautiful and majestic” the bird was, posing on power poles and feeding on ground squirrels. The girls and I did it around the same time, and every time we saw a bald eagle from our apartment, a college-friend’s house, or the Arizona-Sonora Desert Museum, we would point it out. And then one day, we saw it. A bald eagle, perched on a utility pole, overlooking the neighborhood.

Shortly afterward, I ran into Scott Richardson, urban wildlife specialist with the Arizona Game and Fish Department. He told me that the eagle’s death “probably couldn’t have been prevented.” Although, since the mid-nineties, Tucson Electric Power has been retrofitting problem utility poles to protect urban Harris’ hawks (78 of the hawks were injured or died from electrocution in 1991 and 1992), the bald eagle’s five-foot wingspan was more than the new design allowed for, and its wings eventually made connection with two of the wrong wires. “And the eagle was all over the place,” Scott said, “moving around from one area to the next, pole to pole.”

Maybe we couldn’t have done anything to save Tucson’s first bald eagle, and we should dismiss the tragedy as a fluke. I can’t, however, dismiss the irony. It was our need for power, coal- and gas-produced power—the same power that operates the computer I’m sitting at now—that caused the death of our country’s national symbol. Maybe this is more than irony.

Why do I care about one bald eagle? Or a few hawks that wander into the city and get electrocuted or succumb to disease? Cooper’s hawks aren’t even endangered. So what if Tucson is a sink for them? The hawks as a species won’t suffer too much. There are plenty of other birds and wildlife in habitats and forests and riparian drainages, where the birds can quietly fulfill the roles nature intended for them.

But why should Tucson be a sink for anything? We still don’t know about the status of urban Harris’ hawks. Should we allow Tucson, or any city for that matter, to be a sink for even grackles and starlings? Or a once-in-a-lifetime bald eagle? The issue here could be purely ecological: the importance of population reservoirs and wildlife diversity. Or the issue could be as simple as affection. Affection, too, should have standing. Doesn’t it make sense to work toward the health of urban species just because we like them, because we value their place in our lives?

Wendell Berry says that we do not live alone. “Living is a communal act, whether or not its communality is acknowledged.” We have a responsibility to each other, to all life that shares space with us on the planet, whether we inhabit cities or homestead roadless regions. The neighborhood is global.

Living is a communal act. And living connects us to wilderness in one way or another. There are things I can do. I can be aware of my connection to nature’s community—and aware of my impact, good or bad, upon it, in general. Specifically, I can make adjustments. Since I know that window strikes account for the deaths of an estimated 100 million to a billion birds every year, I won’t use reflective window coatings or station bird feeders near windows. This will aid my resident Cooper’s hawks, since collisions with windows is a major cause of death for adult birds. For the juveniles, I can help reduce the spread of disease by using less seed and spacing out the feedings to avoid attracting large congregations of birds to one place.

It’s not much. Just a start.

At site number eight, we’re looking for “possible nest-building,” and this time another bird alerts us to the presence of a Cooper’s hawk. “Hear that hummingbird chirping?” Bill says, quickly braking the car. “That’s a good sign. They do that a lot when there’s a hawk around.” We’re on a residential street near Willmont and Broadway, and I can hear the traffic noise only a few hundred yards away. Bill has his scope out and scans a curtain of large pines directly behind a row of houses, and suddenly a hawk jumps up out of a fountain in one of the front yards. “She was down in the water!” he says, pointing his scope to the place where she perches in the trees. “Got her!” PU Black. He notes the band designation in his field book (Bill inscribes bands with letter pairs that he can see from a distance; a black band means “female”) and offers the scope to me. As I’m concentrating on the hawk’s image, her mate begins keeking from another tree. “And there’s the male,” Bill says.

Bill’s excited. He’s been tracking this particular female Cooper’s hawk since he banded her as a nestling less than a mile away from here, and he’s just now beginning to get her whole life history. This will be the female’s third year as a breeder at this site. Bill’s current research deals with what he calls, “natal dispersal.” “We think the pattern is they bounce all over huge distances, females farther than males, in the first six to nine months after fledging. After these exploratory distances they’ll settle down in home ranges and usually breed in their second year.” Bill mentions that when this female was a fledgling he spotted her in Oro Valley, about 20 miles away.

Bill Mannan’s radio telemetry work with Cooper’s hawks over the last few years has convinced him that Clint Boal’s conclusions were wrong. Bill doesn’t think Tucson is an ecological deadbeat for Cooper’s hawks. “There’s still some unanswered questions because the hawks are dispersing farther than we can track. But adult survivorship in the city is eighty percent.” And ten percent of these hawks show up somewhere in town as breeders, he explains. “Others leave the area or just float.” Tucson, in fact, rather than being a sink for Cooper’s hawks, may be more like a reservoir, a source of young birds connected and contributing to the surrounding wild populations.

Disease, however, continues to be a problem for juvenile urban Cooper’s hawks, and I like to think that community interest in curbing the infection by keeping streets and feeders clean and reducing congested feeding during the summer months when the protozoon is most active, has made some difference. But it’s just as likely that the hawks—as with Seattle’s skyscraper peregrine falcons—are adjusting to living in the city regardless of whether or not we are adjusting to living with them. Anne Matthews, author of Wild Nights: Nature Returns to the City, says, “In cities, people want other people. The real trick will be learning to share the changing urban scene with our newest and most determined immigrants, the ones with wings.”

Two weeks later I join Bill Mannan again, this time with his two graduate students, an east-side community park where I had hoped my daughters would see their first bald eagle. He carries a falconer’s halter trap, a noose-covered, wire-mesh box, baited inside with two energetic house sparrows. A Cooper’s hawk pair has recently adopted the park and begun nesting, and Bill wants to catch and band the male to include it in his study. “The hawks are filling in places never used before,” he explains. Kennedy Park is one of them. He places the trap close to the pine tree where the female incubates her eggs, walks a short distance away, and waits. Immediately, the male plunges in and drops onto the trap, snaring its feet among the nylon nooses.

An assistant holds the bird while Bill collects his tackle box containing a string of aluminum U.S. Fish and Wildlife Service bands, his own color-coded, plastic bands, pliers and measuring tools, and leather falconer’s hoods. We gather around. The bird’s crown and raised hackles are slate-gray, almost blue, its breast feathers barred with red. But it’s the copper eyes that draw me. They seem more than just fearsome—as though the hawk is looking through us, past this rude circle of students, past the awe on our faces. Those eyes miss nothing. I imagine that we must appear like little more than a blurred line, a porous fringe, that those fiery eyes look through us as they see right through the human boundary between what’s urban and what’s wild.

This article was previously published in Sonora Review, the oldest student-run literary journal in the country. From start to finish, each issue is put together solely by graduate students in the Creative Writing Department at the University of Arizona.
A vast Sonoran grassland, the sweeping landscape of the Buenos Aires National Wildlife Refuge lies within Altar Valley, a quiet and picturesque valley dotted with historic ranches and surrounded by rugged Sky Island mountains. The refuge sits in the shadow of the landmark Baboquivari peak, a mountain sacred to the Tohono O’Odham people, whose nation borders the refuge to the west. Created in 1985 to benefit the endangered Masked bob-white quail, the 118,000-acre refuge is important for many endangered species, including the Chiricahua leopard frog, southwestern willow flycatcher, lesser long-nosed bat, and the elusive jaguar, spotted in the Baboquivari Mountains as recently as 1996.

This refuge is especially important to me personally because it is where I started my career in conservation almost 10 years ago, as the volunteer coordinator for a habitat restoration group. We spent almost every weekend on Buenos Aires, building gabions in eroded washes, planting native grasses, and camping under the stars. It was an eye-opening experience, one that helped me realize my passion for conservation work.

I recently went back to the Buenos Aires Refuge, and many things have changed in the last 10 years. Adjacent to the Mexico border, these and other federally-protected lands are now caught in the crossfire of the battle over illegal immigration, and the damage being inflicted on these lands is staggering. From the helicopters buzzing overhead, to the piles of trash and illegal foot trails, to the constant, overwhelming presence of Border Patrol both on- and off-road, it was a far cry from the experiences I used to have here. This place does not feel like a wildlife refuge; it feels like a war zone, and it is getting ripped to shreds under our current border policy.

Known for its quiet and rugged isolation, Arizona’s border region is largely comprised of protected federal lands like the Buenos Aires Refuge. In fact, more than 85% of the land along the border and 62% of the land area within 100 miles of the border is federally owned or is held in trust for several tribal nations, including the Tohono O’Odham, Pascua Yaqui, Cocopahs and others. The borderlands include national monuments, wildlife refuges, national forests, and designated wilderness areas, and they represent some of the most pristine and valuable wildlife habitats in the nation. These areas offer almost limitless recreation opportunities for residents and visitors alike, and provide stunning examples of the incredible biodiversity and natural beauty found in the borderlands region.

Things began to change for the Arizona borderlands in the late 1990s, in direct response to the implementation of Border Patrol’s Southwest Border Strategy earlier that decade. This strategy, which includes Operation Gatekeeper in San Diego, Operation Hold the Line in El Paso, and Operation Safeguard: Arizona in Nogales, increases enforcement efforts in urban border areas and shifts undocumented migration into more remote areas. It was a deliberate, strategic decision to funnel migrants into the rugged borderland deserts, the underlying assumption being that the hostile terrain would act as its own barrier and discourage crossers, and the few who did risk the trip would be easily apprehended in these open areas.

However, this assumption was wrong. Experts say that the total number of migrants illegally crossing the border has changed very little over time; if anything, it appears right now to be on the rise. However, what has changed is where the majority of migrants are crossing — over half now cross through Arizona’s deserts, mountains and rivers. According to the Department of Interior, the number of undocumented migrants apprehended on its lands has increased exponentially — between 1997 and 2000, apprehensions numbers went from 512 to more than 113,000. It is estimated that in 2005, approximately 400,000 migrants crossed through the Buenos Aires National Wildlife Refuge alone.

Considering that there has been little change in overall levels of undocumented migration, it is no surprise that this policy has taken a heavy toll throughout the Arizona borderlands. In fact, the scope and extent of environmental damage occurring throughout the region, especially on protected public lands, is unprecedented. And worsening.

To visit the Buenos Aires National Wildlife Refuge and other borderland parks is to see first-hand the consequences of this policy. Illegal foot and vehicle traffic has ripped up fragile deserts, created miles of illegal roads, left behind abandoned vehicles and huge amounts of trash, and damaged rare desert springs and wetlands. The degradation caused by illegal migrant traffic has been compounded by Border Patrol enforcement actions, including authorized and unauthorized road and wall construction, lighting projects, and patrols by off-road vehicles and low-level helicopters. Short- and long-term damage being done to these lands includes massive habitat fragmentation, interruptions in cross-border migration, spread of invasive species, and the introduction of air and water contaminants.

Making matters much worse, Border Patrol often fails to consider or mitigate its impacts to the environment. Like all agencies of the federal government, Border Patrol is responsible for conducting its operations in a lawful and transparent fashion, yet its compliance with environmental laws has been insufficient, and sometimes completely absent. Among the laws that govern Border Patrol operations are those intended to keep citizens informed of plans and actions that affect the environment, and give them an opportunity to voice their opinions. These laws include the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Wilderness Act, and the National Wildlife Refuge Administration Act, among others. Border Patrol’s compliance with these laws is critical because the agency has shifted major operations onto some of our nation’s most spectacular and fragile lands, lands inhabited by rare and endangered wildlife. Regrettably, adequate compliance is not the norm but the exception, and the agency’s commitment to upholding environmental laws has been overwhelmingly lacking.

For example, under the ESA, federal agencies are required to “consult” with the US Fish and Wildlife Service (FWS) when they undertake, approve or fund any action that may affect a listed species or its habitat. However, since the inception of the Southwest Border Strategy in 1994, the Border Patrol’s Tucson Sector has never completed a consultation with FWS analyzing the overall effects of its actions. This, despite the fact that the sector covers two-thirds of the state’s border, and includes habitat...
Welcome to the Border  continued

for the endangered jaguar, cactus ferrugineus pygmy-owl, and Sonoran Pronghorn, among many other imperiled species.

To add insult to injury, in 2005 President Bush signed into law the Real ID Act, which allows the Department of Homeland Security (DHS) to exempt itself from all laws, environmental or otherwise, when building infrastructure along both US borders. This far-reaching exemption has already been used once, to complete a three-mile stretch of triple-fencing in San Diego that experts say will irreparably harm a protected estuary. At the time he signed the exemption, DHS Secretary Michael Chertoff also reserved the “authority to make further waivers from time to time,” under the authority of the Real ID Act.

Despite more than a decade of intensified efforts, the current strategy of building walls and shifting migrants into remote and dangerous areas has not stopped — or even slowed — illegal immigration into the United States. Undocumented migration levels across the southern US border have only risen, with decreased levels in localized urban areas being more than offset by increased levels in more remote parts of the border. This failed policy has caused massive environmental damage to be sure, but it has also resulted in another, far more tragic consequence: record numbers of migrants dying in the borderland deserts every year. Close to 4,000 men, women and children have died attempting to cross the border since the current policy was implemented — possibly many more, because it is likely that many bodies are never found. A record 282 migrants died last year in Arizona’s deserts, and this year that record is expected to be broken.

Illegal immigration is not a problem that can be solved at the border, because the issue is so much larger than what is happening here. However, immediate measures must be taken to prevent further environmental damage to our borderlands, including federal legislation to increase funding for environmental protection, better environmental training for Border Patrol agents, and a greater commitment to existing environmental laws.

In the long term however, a comprehensive solution must be developed that is anchored in the realities causing illegal immigration, one that eliminates the current underground immigrant economy and the flow of undocumented migrants across the US-Mexico border, and establishes an orderly and legal framework for immigration. Only then will this issue be meaningfully addressed, and our cherished desert wildlands like Buenos Aires National Wildlife Refuge be truly protected.

Einstein once said that the definition of insanity is doing the same thing over and over, and expecting a different result. Despite its tragic consequences, the Southwest Border Strategy continues to get implemented. Recently, both the US House of Representatives and the US Senate passed bills calling for more of the same, with little acknowledgement of the policy’s profound consequences and overwhelming history of failure. Those who advocate perpetuating this policy routinely say that it has something to do with national security, and that we need walls to protect ourselves. But at some point we are going to have to ask ourselves what kind of security we are really getting out of this policy, and what it is costing us.

For more information on the ecological impacts of illegal immigration and border security efforts, please see Defenders report, “On the Line: The Impacts of Immigration Policy on Wildlife and Habitat in the Arizona Borderlands.” You can find the report and other border-related information online at www.defenders.org/border
Historic Ranches & The Persistence of Biodiversity

by Diana Hadley, Office of Ethnohistorical Research, Arizona State Museum, Tucson AZ

The US/Mexico Borderlands have been home to imported European livestock for more than three centuries. Dotted with sky island mountain ranges that give way to oak woodlands, semi-arid desert grasslands, and green ribbons of riparian vegetation, the border landscape includes a tantalizing abundance of stacked ecological zones, each with a distinct response to grazing. Two historic ranches, the San Bernardino and the complex of ranches assembled by William C. Greene on the San Pedro River, provide a remarkable history of the ways in which the land tenure systems, grazing regulations, and traditional agricultural customs of Spain (1680s-1821), Mexico (1821-1854), and the United States influenced livestock management and ecological conditions along this delicate portion of the border. Despite three centuries of grazing, portions of the historic ranches are now recognized for their exceptional ecological values and are protected by U.S. government agencies and private owners.

Cattle first appeared on this portion of New Spain’s northern frontier in the late 17th century. Although the Jesuit missionary/explorer Father Eusebio Kino is widely credited as the earliest Borderland rancher, it is likely that local Native Americans (O’odham and Apaches) brought livestock with them on return trips from settled Spanish areas in central Sonora. Useful for food and travel, cattle and horses quickly became part of native economies. Some groups – like the Apaches – incorporated them so effectively they altered the balance power to their favor.

The Spanish government used livestock as an instrument of conquest and frontier settlement, issuing land grants to prominent citizens who had the financial capacity to develop and stock them. The goal was to make vacant lands productive and secure the frontier. Grants for ganado mayor (cattle, horses or mules) were for four sitios, or square leagues, equivalent to about 17,000 acres. Land grant applications went to the King in Spain, taking years to complete, but the applicants did not wait for the King’s signature to stock their estancias. On the unfenced ranges, herds expanded so rapidly that by the mid-18th century, cattle glutted the Sonoran market and prices devalued. Some grants in central Sonora had as many as 20,000 to 40,000 head of cattle and up to 100,000 sheep. Spanish land grant applicants always selected the most fertile, well-watered land for their grants, land that consequently had significant biological values.

Mexico, independent after 1821 but financially strapped, followed the Spanish system for issuing land grants, but funding for frontier military protection disappeared. By the 1830s Apache raiding made life on the grants so dangerous that owners and vaqueros fled to safer locations, visiting occasionally to brand and gather cattle under armed guard. Abandoned livestock increased to such a degree that by the late 1840s American visitors described vast herds of wild cattle and horses, some still bearing brands. During the Mexican War (1846-48), when members of the Mormon Battalion attempted to shoot the thick-hided wild cattle for food, wounded bulls retaliated, upending wagons and injuring soldiers. Forty-nine of them on their way to California’s Gold Rush on the Southern Overland Trail described (and likely exaggerated) the largest cattle herds near the San Bernardino cienega and along the San Pedro River. Bands of wild horses were more frequently sighted at higher elevations in the Canelo Hills and on the slopes of the Huachuca Mountains.

In 1854, when the United States officially acquired Mexican territory between the Gila River and the present border, the Gadsden Purchase created an arbitrary boundary line, unrelated to regional geography, but convenient for the construction of a southern trans-continental railroad. The illogical boundary severed both the San Bernardino and the San Pedro land grants. The Gadsden Purchase agreement provided for recognition of Spanish/Mexican land grants north of the border, if claimants could prove titles had been recorded. The complicated process for authenticating grants was first managed by the territorial survey general, who made recommendations to the secretary of interior, for final validation by Congress. But in 1891, Congress created the Court of Private Land Claims, with a district office in Tucson, to streamline the adjudication of Arizona’s 17 land grant claims.

Land grants at the San Bernardino and along the San Pedro River were approved. Over time, the ranches in these areas suffered from drought and overgrazing. Severe droughts, described in Spanish documents and registered in tree ring data, took place during the 1670s, the late 1730s, late 1740s, and the mid-1770s. Although drought during the Mexican period is less documented, it undoubtedly occurred. Under United States control, droughts devastated border rangelands in 1885, 1892-94, 1902-04, 1933-34, with the most protracted drought occurring from the late 1940s through 1956, and the most severe from the mid-1990s to the present. On the Arizona side of the border, overgrazing reached its extreme during the 1890s, while in Sonora the 1950s were the years of heaviest widespread stocking. Yet portions of both ranches retained species richness and many ecological values.

**San Bernardino (Slaughter Ranch)**

Valued as a significant water source, Spanish documents and 19th century American visitors described the San Bernardino cienega as a series of small lakes, surrounded by extensive acatón flats. The waters bubbled up from below the ground, supporting a variety of fish, flocks of migratory waterfowl, and herds of deer and javelina. An occasional gray wolf visited the adobe ruins, and a jaguar was sighted in nearby Guadalupe Canyon.

The San Bernardino appears on 18th century Spanish maps as a rancho, although no record of its owner has been found. From 1773 to 1780, while the site was a presidio (military garrison), soldiers constructed an extensive fortified adobe complex just south of the present boundary. The location proved indefensible and the army retreated to a safer location. In 1820, Lieutenant Ignacio Pérez, commander of the compañía volante (flying company) of Nueva Vizcaya applied for a land grant in the “unpopulated place” of San Bernardino. Twenty soldiers were needed to protect the surveyors from hostile Chiricahua Apaches. By the time the survey was completed and the application submitted, Mexico had become an independent nation. Pérez, whose family owned the mines at Cananea, stocked his new ranch with 4,000 head of cattle purchased from the missionary at Tumacacori. When he failed to pay for the livestock, relatives of his wife in the prominent Elias family made good on the debt.

Following the Gadsden Purchase, Sheriff John Slaughter of Cochise County purchased the US portion of the grant and leased the Mexican land. Slaughter ran up to 20,000 head of cattle on both sides of the unfenced boundary, often crossing cattle without the formality of inspection. In the 1890s, Slaughter used the Texas tick fever quarantine as an excuse to construct “drift” fences, actually intending to prevent his neighbors’ cattle from “drifting” onto rangeland he claimed. After much controversy, the courts determined Slaughter’s fences were illegally placed on the public domain and he was required to remove them. Slaughter drilled the first artesian wells in the San Bernardino Valley, developing extensive forage and truck farms to supply the new towns of Bisbee and Douglas. Following Slaughter’s death,
Historic Ranches & the Persistence of Biodiversity continued

several owners continued to ranch and farm the US portion of the ranch, stocking it with fewer cattle.

The Sonoran portion of the ranch returned to members of the Elias family who purchased additional properties, eventually creating a single ranch that extended 30 miles south from the border. The size of the ranch violated Mexican agrarian reform laws, established after the Mexican Revolution to prevent the reestablishment of latifundia (vast private land monopolies). During the 1970s, the Mexican government nationalized portions of the San Bernardino, selecting arable tracts along creeks to create ejidos, communal farms. The government distributed house lots, small parcels of farmland, and communal grazing rights to ejidalarios (members of the ejido) in some proportion of whom were brought from Sinaloa and other more southerly Mexican states to instruct the Sonorans in superior farming techniques. This plan proved to be a social disaster, creating resentment against the newcomers and resulting in decreased productivity. Heavy stocking, neglect, mismanagement, and lack of finances for supplies and improvements (seed, farm implements, water tanks, wells) forced the ejidalarios to rely on the sale of firewood, cut from the ranch’s riparian areas.

On both sides of the border, alfalfa fields replaced the sacaton flats and periodic floods entrenched San Bernardino Creek, ripping cottonwoods and willows from the banks. Over-pumping diminished water and consequently wildlife. Yet, despite harsh treatment, the San Bernardino retained considerable biodiversity. The US Fish and Wildlife Service, which acquired the Arizona portion of the cienega during the 1980s for management as a wildlife reserve, has removed non-native fish and is restoring the cienega. On the Sonoran side of the border, despite flood devastation and down-cutting, beaver survived. In the 1990s, American conservation ranchers purchased the San Bernardino, reduced stocking rates, constructed check dams, reseeded native grasses, replanted and encouraged riparian vegetation, protected native fish, and initiated a gradual restoration of the land. The need for water for Agua Prieta’s burgeoning maquiladora industry is the major threat to the San Bernardino on both sides of the border.

The San Pedro Land Grants and the Greene Cattle Ranches

The San Pedro River rises on the plains of Cananea in Sonora and flows northward across the present international boundary to the Gila River. A dozen or more prominent Mexican families received land grants near Cananea, the richest of the border grasslands and the site of mines that produced (with Nombre de Dios) almost 40 percent of all Mexican coins. In the 1820s, members of the Elias Gonzalez family applied for three grants downstream on the river and one on Babocomari Creek. Most were issued during the 1830s, a time when Apaches raided central Sonora, using the trail along the east bank of the San Pedro that later became known as the “Great Stealing Road of the Apaches.” After only a decade the Apaches had consumed their ranches.

In the 1890s, William C. Greene, an ambitious Tombstone miner and rancher, began buying ranch properties. He started with a small farm on the San Pedro in Arizona Territory but soon acquired ranchland upstream near Cananea, where he enticed American “capitalists” into copper investments, created the legendary Cananea Copper Company and the largest ranch in Sonora. Using mining profits, Greene purchased most of the land grants surrounding Cananea, the San Pedro grant that straddled the border, the San Rafael del Valle grant north of the boundary, and the San Rafael de la Zanja grant in the San Rafael Valley in the Santa Cruz watershed. By the early 20th century, his Ranchos de Cananea holdings extended some 68 miles along the international boundary and approximately 48 miles southward, with two ranches north of the border. Considered a model ranch at the time, Greene stock and farmland, high-quality cattle, including management of the US and Mexican ranch divisions, importing his Mexican cattle through Naco or the international crossing, and holding them for shipment on the San Pedro del Valle grant, where he constructed a shipping station and pens at Hereford, with connections to the Southern Pacific Railroad. Despite droughts, he could store cattle in California with adequate forage for his prized stock.

The Mexican ranches remained in the Greene family until the late 1950s, when the government nationalized them, converting the seven ranch divisions into seven large ejidos, the Ejes de Cananes. Although the new ejidos suffered from lack of experienced management, as long as the Banco Ejidal, the economic arm of the Agrarian Reform, continued to manage and invest in them, they provided some profit for the members. Ranching remained the main economic activity on the seven ejidos, while dairy farming, fruit horticulture, and cattle industries were added. Not only strictly enforced, stocking rates in the large communally managed pastures were regulated and the grasslands retained some fertility.

In 1992, management of the ejidos changed radically. The Mexican Congress abrogated Article 27 of the constitution, ending the protection under the Agrarian Reform and allowing the dissolution of ejidos and the sale of individual ejido properties or grazing rights. Many members of the Ejes de Cananea chose to sell their derechos, often finding buyers among the wealthier members of the ejidos. After 1992, sales of ejidal land broke up the large communal pastures, creating a multitude of excessively small and heavily stocked fenced lots that prevent wildlife movement. Without economic resources to develop water sources or allow pastures to rest, the new owners allowed cattle to decimate the famous Cananes grasslands. The subdividing and sale of ejido pastures continues today. A significant advantage resulting from the dissolution of the Agrarian Reform is that formerly restricted ejido property and land adjacent to the US border can now be purchased by international conservation buyers. Unfortunately, few conservation buyers have stepped up. To date the major conservation acquisition on the border is the purchase of Ranchos Los Fresnos, a private ranch, by The Nature Conservancy and Naturalia.

On the US side of the border, two of Greene’s San Pedro land grant ranches were a part of the Boquillas Land and Cattle Company, a corporate ranch company that owned the San Juan de las Boquillas y Nogales grant north of Greene’s ranches. The company was a subsidiary of California’s Kern County Land and Cattle Company, created by three of America’s wealthiest 19th century “capitalists” – Lloyd Tevis, founder of Wells Fargo, James Ben Ali Haggin, California’s second largest landowner and developer of the Central Valley’s irrigation districts, and George Hearst, developer of the Butte and Silver City copper mines. All three were California residents and Gold Rush successes. Initially management was progressive on the vast ranch that extended nearly 45 miles along the San Pedro River from the border to south of Saint David. During the 1960s, after Teteno purchased the property, carrying capacity and productivity decreased, and portions of the grasslands near Sierra Vista were sold for subdivision. In 1988, Congress acquired the land along the river, establishing the San Pedro Riparian National Conservation Area (SPRANCA) to protect the last free-flowing river in the Southwest, and with it, habitat for 389 bird species, 84 mammal species, and 47 species of reptiles and amphibians. Like the San Bernardino, SPRANCA is currently threatened by water withdrawals, in this case for Sierra Vista’s sprawling growth.

Ironically, in part we owe the remaining border biodiversity to the very undemocratic Spanish land grant system which rewarded New World settlers with large contiguous grants of fertile land, unlike the democratic American homestead system that favored the smallholder with parcels only slightly larger than the Jeffersonian ideal of the 40-acre farm, units that proved to be uneconomic and essentially unusable in the arid Southwest. Thus, the first border ranches to be stocked with cattle and the ranches that have been grazed the longest (and in some cases the hardest) were the Spanish land grants. In the cases where the grants remained in tact, the possibility exists to secure the properties for ecological restoration. Where they have been broken up — either into 40-acre Sierra Vista ranchettes subject to even further wildcat subdivision, or into tiny privatized former ejido parcels, preservation is no longer an option. Hopefully, some energetic conservation buyers will be willing to go through the legalistic bureaucratic quagmire required to purchase ejido property in Mexico and will be able to restore the legendary grasslands of Cananea - once so beautiful that the first Spaniards to see them named them for Canaan, the promised land.
State Natural Areas on the Border

By Joanne M. Roberts, Resource Ecologist, Natural Areas Program Advisory Committee Coordinator

In 2003, Arizona State Park Board provided staff with a shift emphasis to science-informed decision management vision. State Parks Board stressed the need to expand staff and consultants ecological knowledge base. In 2004, Director Travis announced the new vision and direction to staff: “to be recognized locally and nationally as an outstanding resource management organization”

One opportunity for State Parks to move towards this vision is through the Arizona State Parks State Natural Areas Program. State Parks administers Heritage Fund monies for the acquisition and management of State Natural Areas. The Fund provides the State Parks Board with $10 million each year and of that amount seventeen percent is for the acquisition of natural areas and four percent for maintenance, operation and management of natural areas (A.R.S. § 41-503). The primary purpose of establishing State Natural Areas: “…is the protection and/or preservation of a site’s natural resources”

There are currently three stated Natural Areas, two of which are found in southern Arizona. The Sonora Creek and San Rafael State Natural Areas are located in Santa Cruz County while the Verde River Greenway State Natural Area is located in central Arizona in Yavapai County. Through multi-resource management and interpretive education programs, the primary goals to conserve, protect and enhance the natural and cultural resources of State Natural Areas are realized while providing recreational opportunities to the public that are compatible with the conservation goals. Sonora Creek and San Rafael State Natural Areas are currently closed to the public with limited access through guided tours and for research and baseline data collection. The Verde River Greenway Natural Area can be accessed through Dead Horse Ranch State Park.

The Verde River is nearly 180-mile long Verde River is one of the Arizona desert’s last free-flowing river, sustaining a large regional wildlife population and a lush riparian community. The most significant natural resource in the park, besides the year-round flowing river, is the dense forest of riparian trees and shrubs along its riverbank. This Fremont Cottonwood/Gooding Willow riparian gallery forest is one of five remaining stands in Arizona and one of twenty such stands in the world.

A six-mile reach of the river, purchased in 1988, known as the Verde River Greenway State Natural Area, supports nearly twenty threatened, endangered, and sensitive species including river otter, southwestern bald eagle, southwestern willow flycatcher, and lowland leopard frog. Bird species such as great blue heron, osprey, black hawk, yellow-billed cuckoo, Gambel’s quail as well as numerous migratory bird species are known for this area. Mammals include beaver, raccoon, ringtail, mule deer, javelina, bobcat and coyote. In 2004, Audubon Society announced State Parks as one of three land managers for the Tarzioo-Tavaci Marsh Verde River Greenway Important Bird Area. Established in 1994, the Sonora Creek State Natural Area is a riparian and upland area of 7,912 acres (as of 2005, including the 2,628-acre Coal Mine Spring addition purchased by Arizona Game and Fish Department), managed by the Arizona State Parks for the protection of natural resource values. Noted as the first major State Natural Area in Arizona, Sonora Creek State Natural Area includes approximately seven miles of Sonora Creek and its associated riparian vegetation below Patagonia Lake State Park. With over one-hundred pre-pre-historic and mid summer avian species recorded, the Natural Area is an important migratory route for many neotropical migrants including the federally listed candidate species yellow-billed cuckoo as well as being home to the endangered native Gila topminnow fish.

In 1999, the San Rafael Shortgrass Prairie Preserve was purchased from The Nature Conservancy. The San Rafael Shortgrass Prairie Preserve is located in the San Rafael Valley, along the U.S.-Mexico border in Santa Cruz County. The San Rafael Valley ecosystem is noted for its uniqueness and high plant species richness. The 172 square mile San Rafael Valley lies between the Patagonia and Huachuca Mountains and is bisected by the headwaters of the Santa Cruz River that flows south into Mexico and then loops north and re-enters the U.S. near Nogales. The preserve is composed of the San Rafael State Natural Area and the adjoining conservation easement, privately owned property. Arizona State Parks manages and monitors the San Rafael State Natural Area for the protection and enhancement of ecosystem resources, processes and functions, including riparian and grassland communities, wildlife, open space and cultural values while allowing for compatible levels of use. The property has long been identified as a significant natural area. Protected species such as the Huachuca water umbel, Sonora tiger salamander, and Gila topminnow occur within the Preserve.

Assisting State Parks and our cooperators, in this charge, is a Technical Advisory Committee that is composed of seven voting citizen members and one non-voting ex-officio member. Members represent scientific expertise in the fields of botany, ecology, geology, hydrology, zoology, wildlife biology, preserve management and are actively involved in the conservation, scientific, or preservation fields. The Committee assists State Parks staff by holding public meetings and workshops, identifying potential State Natural Areas, reviewing site-specific management plans, and providing recommendations to the Arizona State Parks Board. If you are interested in participating in this committee please visit the Arizona State Parks website for more information www.pr.state.az.us.

The 33rd annual Natural Areas conference, “Stewards of the Old and New West,” will be on the mountain campus of Northern Arizona University in beautiful Flagstaff, Arizona, September 20 through September 23. For more information see www.cpesu.nau.edu/NAC2006 and www.cpesu.nau.edu/NAC2006 to register.
By Trevor Hare, Field Coordinator

I have crossed this border many times, some times illegally, most of the time legally. The physical act of crossing is simple, lift your leg, swing it forward and step down; step on the gas; sleep through it up in the air. Individual, social and ecological crossings have varying effects and impacts on the people and critters, the communities and institutions, and the ecologies of the Sky Island region. Individual and ecological crossings have limited impacts but great effects, sometimes negative but mostly positive. Social crossings — human and drug smuggling, security infrastructure, industrial, have had large, long-lasting impacts with some positive but mostly negative effects. My crossing history is long and varied but most have concluded with positive effects.

1975 My dad hadn’t let on at all about what he knew or what he was about to do. He must have been giddy though, the way he turned on us. We were approaching the border crossing and we were very much aware of the firecrackers and fireworks that existed hidden, but we were only 10 and 11. When we stopped and the customs agent asked if we had anything to declare, my father turned around looked rattled at us and replied loudly “no but I think my boys do.” We were shocked, appalled and crestfallen. We couldn’t believe that our father would turn on us like that; we really couldn’t believe that he knew about our stash. We thought we were going to jail, to do hard time, but when we handed the goods over we got a kindly lecture, a stern look and we were out of there.

1990 Man I was pissed, she was flaunting her authority, making us, with a little kid, wait like that. We had waited in the border crossing line for over two hours, idling in a cloud of exhaust and cheap crap, then as we waited at the white line, next to be asked that stupid question “your nationality?” she had the temerity to leisurely take her time to call us up and I gunned it and screeched to a stop and glared. Didn’t do me any good. We were soon under the big lights with a year’s worth of living in Mexico spread out around our little Subaru. I didn’t know what they were looking for but it was apparently meat, as one of the officers kept asking the two-year-old Cassidy “tiene carne?” “tiene carne?”

1992 Again I was pissed, did he think we were stupid? Does he ask every group of biologists heading north? “Do you have any pott?” I said it, I couldn’t help myself, “do we look stupid?” It didn’t help.

1996 Is this the border? Map and compass out, yes it is. No going back, north held way too much sand and not enough purchase. South it was, but first the shovel and the sand. And the fence. As we dug our way across the border we really didn’t think too much about how far on Highway 2 we had to travel to get to a border crossing or the real possibility that we would be seen traveling south from the border fence. A lizard biologist always carries a kill box. Inside there are kill lizards and other soon-to-be specimens. Mexican law frowns upon the possession of such items. It was a slow realization but we all knew we would be going to jail in Mexico. As the town of San Luis approached we began to feel better and as we crossed the border and approached customs we were almost giddy. I don’t know what the customs officer thought of this giddiness, the rank smell from our ten days in the desert, the UA Chevy suburban with sand lodged everywhere, but his question was the funniest we had ever heard: “Do you have more than 10,000 dollars in cash?”

2004 The guy about scared the devil out of me, sneaking around in the dark like that. It was raining like hell in August and mi amigo nuevo was lost, wet and cold. Deep in a border mountain range is no good place to be during a chuvas grande. Lightning was everywhere; the rain was thick and smelled like toads. He was an illegal immigrant from Phoenix, coming back from visiting his abuela in Sonora. We showed him the map, showed him where his pickup point was, offered him food and water and el fue.

This border is a strange place. Whenever I am near I am drawn to it, from Antelope Wells to the Summit Byway, I am always jumping across it, always have to pee across it (usually north), I gesture obscenely at invisible surveillance technologies and flaunt my disdain and derision at efforts to control it, I always have to struggle something little across it. I like the border because jaguars and vine snakes cross it heading north, I like the border because tequila also crosses north, I like the border because mi amigo Mariposa has crossed it twice yearly for decades.

But really I hate the border because it is not real, it’s a stupid bright line on a map, it has no relevance to my life or the life of the Sky Islands and the Sonoran Desert. For thousands of years, humans, bison, cats, snakes, tortoises and wolves have crossed the imaginary line daily, monthly, yearly. With the failings of politicians, corporate greed, and ignorance and bigotry, the stupid bright line has been transforming into an ugly scar. Current human infrastructure already impedes animal movement and alters behavior and genetic dynamics. A wall could keep jags out of the US, it could keep pronghorns and bison from crossing; but it won’t keep a human from crossing.

So what to do we? If you have read my rattling’s before you know the answer! Go out there and work! We work on protecting and restoring our border wildlands and we won’t stop. We will march out and work to heal wounds, educate ourselves and our communities, and advocate for wild critters and land! Recently we have visited many of our border wildlands on both side of the line. The Sierra El Pinto was en fuego when we visited, and we had a great time and were graciously hosted by the local landowner. The Burro Mountains across the New Mexico border was the site of a riparian restoration and fencing project that had a fantastic SIA turnout! And on the southern flank of the Huachuca Mountains we surveyed riparian areas from the pine-oak woodlands down into the grasslands and across the border into Mexico. All summer we will be in the oak savannas of the eastern Santa Rita Mountains restoring roadbeds and drainage patterns and in the Peloncillo Mountains surveying and restoring riparian areas.

Exploring El Pinito
by Robert Villa, herpsandviolin@aol.com

This is an excerpt of the account of my trip with Sky Island Alliance to explore and experience a part of El Pinito (“little pine”) mountain range, southeast of the Arizona/Sonora border town of Nogales (“walnut trees”). It’s on this trip that the same love and appreciation I have for herpetology expanded to the rest of the biological and anthropologic picture. Aside from feeding the appeal of mystique that I have for Mexican natural history and anthropology; it made me more proud of my Mexican heritage and gave me a new perspective on my mother’s side of the family — an oak-covered hillside took on new significance when I remembered my grandmother telling me of a time when she and her cousins were caught in a summer downpour and lightning storm while picking bellotas (“acorns”) on the outskirts of the small (at the time) mining town of Cananea.

I left pennies of live snakes (the initial goal of my attendance), but “richer in love, appreciation, and understanding of everything else wild, and my cultural heritage, pride, sense of being and understanding.

I. Awe and Discovery in El Pinito

After picking up food in Nogales, we drove east to the immediate sky islands known as El Pinito (“little pine”). As we drove along the Santa Cruz River we passed quaint little houses and gargantuan alamo trees (Arizona Cottonwood, Populus fremontii) with bright green canopies that shimmered in the sun. The Santa Cruz River flows south into Mexico where it looks like a backwards J back into Arizona. There was intermittent water in her and I felt honored to be amongst such old and giant living things that reminded us of a time when steam ferries floated down the river and otters, beaver and native fish teemed her waters.

We were late to meet Raul, the gracious rancher to host us for the weekend. However, he was in good spirit when I introduced the group and myself to him at our meeting spot. Cory, the brilliant Global Information System (GIS) whiz had already showed me on the map where he would like Raul to take us to camp — a beautiful mesa called Mesa de los Yaquis (Yaqui mesa). Unfortunately the ranch hand who lived in the stone house behind the gate that would grant us access to the mesa was away in Nogales. We then decided for the bottom of La Escondida (“hidden canyon”). After barely catching up with Raul and his beat up Chevy pick-up on the most rugged canyon road you can imagine, we arrived at the bottom of La Escondida. Arizona Walnut (Juglans major), Ash (Fraxinus velutina) and Arizona Sycamores (Platanus wrightii) marked the presence of trickling water. I was at home! The silence and smell of wet canyon bottom was making me giddy inside.

I had to keep my cool walking between the world of tough Mexican rancher and crazy gringos. We were clad in shorts and jeans; t-shirts and unbuttoned shirts; and sneakers, flip flops and sandals. Not to mention we also had a beautiful gringo amongst us all. Raul was a quiet but tough rancher. Clad in boots, jeans, and a Mexican cowboy hat, his complexion and stature was indicative of his Yaqui roots, hot sun and rugged lifestyle. Despite all this, I was slightly surprised by his genteel handshake and quiet disposition.

I asked him of tigre (jaguar, Panthera onca), and he mentioned that he had four of his livestock taken and a horse injured by tigre. Finally, the hard reality of the relationship between big cat and rancher hit home and I told him we were sorry to hear about his livestock. He then proceeded to invite us to better camp at his house about a mile and a half up the canyon and we obliged. It was twilight when we arrived. He asked us about our plans and we told him that we’d like to see Mesa de los Yaquis. It was Friday and he would have to go for his ranch hand in Nogales so we decided right then to stay in the canyon and surrounding areas. He told us of a nearby canyon called Los Agudos (“the drowned”); where his grandfather died fighting Mexican president Alfredo de la Huerta. Raul obviously inherited this ranch, and his house is but feet from an eroded corner of an adobe house; all that is left of his grandfather’s house.

We were sharing the area with a fire crew that was attempting to put out a fire a canyon away. They were exhausted, walking four hours over 16 miles to fight it! Raul told us that they had killed some rattlesnakes for food which led us to realize the difference between US and Mexican firefighters). Paul and I crossed the stream to greet them and they showed us two Northern black-tailed rattlesnakes (Crotalus molossus molossus) that were gutted, skinned and drying — with the tails and rattles left on, they were a quick ID. Another firefighter proceeded to tell us he had killed a small brown rattlesnake that was flushed from the fire. This really piqued my interest. The only small brown rattlesnake that could exist at this elevation would have to be the Ridge-nosed

Weeds Across Borders III Pulling Together Continues: The View from the South
by Cariann Funicelli, Arizona Native Plant Society (Southern Chapter) Conservation Chair

I often joke that we need to rename our organization to Arizona Anti-Non-Native Invasive Plant Society, as issues relating to invasive non-native plant species consume most of our efforts, in the Southern Arizona Chapter Conservation Committee.

What a treat it was to attend this tri-national (Mexico, the United States, and Canada) conference focusing on invasive plant species held in Hermosillo, Sonora, Mexico, over Memorial Day weekend. This ambitious meeting was organized largely by the Arizona-Sonora Desert Museum (ASDM), and the primary financial sponsors were the Federal Highway Administration (FHWA) and the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW).

Over seventy oral and poster presentations were made regarding the status of invasive plant species throughout North America, current research, education and outreach campaigns, prevention, best management practices, and control. Presentations and printed materials were bilingual and there was a true spirit of unity and cooperation amongst all involved. An all-day field excursion started at Carion La Pintada, the site of over 2,000 pictographs, some of which are 2,000 years old. At the ranch house, we had an in-depth discussion about buffelgrass (Pennisetum ciliare) ranching in Sonora. On the way to San Carlos, we witnessed roadside buffel-fires (both in flame and charred remains of fires past) and stopped to see an impressive roadside grove of aher tamurik (Tamarix aphylla) trees that has established from seed in the past 15 years. Those sightings prompted a great many of us to consume several margaritas on a sunset cruise in the Sea of Cortez off San Carlos.

I attended this conference on behalf of the Arizona Native Plant Society Southern Chapter Conservation Committee (along with Marilyn Hanson, Nancy Zierenberg, and Dana Backer). Marilyn Hanson was completely enthused to have a captive audience to bombard with the success of the Sonoran Desert Weedwackers in defending Tucson Mountain Park against buffelgrass (as we co-authored a poster on the topic.) We also really enjoyed getting a chance to connect with the Sonora Native Plant Society (Asociación para las Plantas Nativas de Sonora A.C., www.apnasa.org) — they had a really incredible native plant display at the Fiesta del Pític in downtown Hermosillo.

We extend our thanks to ASDM for providing our transportation to the meeting, and look forward to participating in the next Weeds Across Borders conference, scheduled for 2008 in Canada! If you would like to get involved with local non-native invasive species issues, please contact me at conservation@aznps.org.
rattlesnake (Crotalus willardi), however, this species isn’t known from anywhere west of the Santa Cruz River this far north in Sonora (yet). I have yet to fully investigate our finding, and I have yet to research known rattlesnakes and herps (amphibians and reptiles) from this range.

We ate dinner and then talked, strolled, away all night before we stumbled to our tents only to wake at 7:30 the next morning for a day of hiking. That night Cory informed me that recently, ranchers have been referring to mountain lions as tigers as well as jaguars.

II. Fuego en El Pinito

I awoke at 7:30pm, cold but forcing myself to put my jeans, shoes, tshirt and long sleeve shirt on, to start the coffee. The firemen had already been long gone to fight the flames. The night had created a massive rock face that now towered over camp. The coffee was good and we relished it with eggs, potatoes, flour tortillas and green chiles. While we ate breakfast, we noticed ravens (Corvus corax) roosting at the rock face. I read the historical accounts of cero grande (Mexican grizzly bear, Ursus arctos nelsoni) and other majestic, odd and unfortunately extinct or almost extinct Mexican mammals and birds from Aldo Starker Leopold’s (son of Aldo) The Wildlife of Mexico (University of California Press, 1959). Approaching the spring-fed creek by camp, I startled two tortugas del agua (Sonoran mud yurtes, Kinosternon sonoriense) and schools of charalotes alta ona (Longfin face, Agnus chrysogaster).

The night before, we were told not to go near the fire so we decided to go farther up La Escandola to see what we could see, not knowing this was the access to the fire. The day was begun nicely when a male Painted Redstart (Myioborus pictus) on migration curiously flew within a few feet of our heads. Cory was jokingly assuming that the birds he couldn’t identify were new species. Paul and I were on the lookout for snakes, and the trail passed slides of loose rock close to the canyon bottom — ideal habitat for Handled rock rattlesnakes (Crotalus lepidus klauberi), which also are not known this far west — however the weather was too dry and hot in the middle of the day to see any rattlesnakes. I did see the radiant crimson flowers of a desert cactus (Echinocereus triglochidiatus) on the edge of the talus. Farther up we came upon a Mexican fireman jacket hung in a juniper (Juniperus sp.) and we took this as a sign to stay back. Being crazy gringos, we decided to continue “for a little ways.” Then we came to a massive boulder to our left and we climbed it to eat lunch, nap in the sun, and view the fire with our binoculars. Much water, Gatorade, and snacks were consumed as we watched unidentified hawks and what were most likely Turkey vultures (Cathartes aura) scavenging the small creatures that were being flushed from the fire. We enjoyed our view of the fire since in the US we would be breaking the law getting so close to the flames (about 3/4 mile up a canyon intersecting ours). After going even a little farther up the canyon we decided to head back down. I collected some nice wood pieces, bones, rock and what appears to be some sort of Native American rock tool. Just before reaching camp, I lost what appeared to be a shiny blue-tailed skink (Eumeces sp.) in the leaf litter. After a while we encountered Raul and his grandson Omar, on horseback to take lunch to the firemen fighting the flames.

Near camp there was a brick pile and scattering of livestock bones that we decided to investigate. Instead of returning to the main path we left camp from, we decided to pass through what seemed like a simple corral to camp. However, the heat certainly changes one’s reasoning skills, and that coupled with the general mentality of the human male and general psyche of the male herpetologist, made us test the proximity in distance from man and massive bull that could be civily attained from each other in what then seemed like a maze of corral after we discovered the levitahon bovine (“Bullhood” and all). This made the refreshments all the better after we arrived at camp.

After some relaxation, I explored the spring-fed stream next to camp, looking for snakes such as a Gartersnake (Thamnophis sp.) and Brown viksnakes (Oxybelis aeneus). Seepwillows (Baccharis salicifolia) grew in the dry portions of streambed, and along with bedrock, it was a good natural form of erosion control. Nacapule (Strangler figs, Ficus sp.) were in abundance and clinging to the trees. It was the first time I noticed this far north and Trevor told me a group of SIA volunteers had seen one or two in the Huachica Mountains in Arizona. I had no such luck with snakes…

I had brought a bag of reference books which we discussed in relation to our findings that day. We discussed the Ridge-nosed Rattlesnake specimen with a map and our knowledge of its known range, Cory talked about his work with orangutans in Borneo, and about everything else under the sun as it set. I noticed golodrinias ("swallows") overhead. The bats began their nocturnal rounds to feed on the pesky mosquitoes and other insects that would be attracted by our activity and campfire. That night as the burning Alligator juniper’s (Juniperus deppeana) lovely fragrance filled the canyon, amorous Screech-owls (Otus sp.) began their flirting and I read aloud this section of “The Green Lagoon,” a chapter in Aldo Leopold’s A Sand County Almanac (1949):

“…We saw neither hide nor hair of him, but his personality pervaded the wilderness; no living beast forgot his potential presence, for the price of his animal awareness was death. No deer rounded a bush, or stopped to nibble pods under a mesquite tree, without a premonitory sniff for él tigre. No campfire died without talk of him. No dog curled for the night, save at his master’s feet; he needed no telling that the king of cats still ruled the night; that those massive paws could fell an ox, those jaws sheer bone like a guillotine.”

I wish that Sergio had come along to sound a tiger call afterwards! After the last of libations, we “slept the sleep of the sleepy” as we dreamed of the biological wonders of Mexico. The firemen, slept with what they had in the field.

Afterward

After further researching, the presence of the Arizona Ridge-nosed rattlesnake in El Pinito is not so far-fetched. A dry portion of Santa Cruz River could make a corridor from the Patagonias across the way to El Pinito. They are also known from a few mountain ranges south that all connect to each other and El Pinito via the right habitat for these snakes (Madrean Evergreen Woodland; see Brown, 1994). I have yet to thoroughly look into museum amphibian and reptile specimens from El Pinito or any other names it may have, but I suspect that the specimens we encountered are of few known from the range. El Pinito is the northernmost range of the Tarahumara Salamander (Ambystoma rouseae) according to Dr. Cecil Schwalbe (pers. comm.).

The American West

He’s driving a dirty, old, white pickup truck
She sits right next to him on the bench seat
There’s a Coke can on the dashboard
And the cable from the CB whip antenna snakes into the cab through the open window.

He one-hands the wheel
His other hand’s on the face...

reassuring, protecting, hoping, expecting

her hair’s tied back, held by a ribbon.

His grey t-shirt, her denim jacket.

There’s dirt and hay in the bed, and bits of tie-down twine still around the bumper.

They’re young, in love.
He drives as we enter town.

Her shiny new black Jetta has LEDs for taillights and a vanity tag.

She sits alone in a contoured bucket seat. Her air is conditioned.

One hand on her cellphone, one hand between wheel and stick
Gold bangles tie her wrists.

Her hair’s wild, eyes lined, top sleeveless, skin tattooed.
There’s a dreamcatcher and a cross hanging from her reaview mirror.

She steps on it as we leave town.

I’m alone,
Steadily speeding.
I have a long way to go.

The windshield’s cracked and bug-splattered.
The CD volume high to get over the hum of the road and the wind.

Both hands on the wheel, I’m thinking of heroes, history, the road, the land.

Far from frontiers, and 20 miles north, the road is closed at the Border Patrol checkpoint.

A young man in a pressed uniform, not from here, stands in the road
One hand on his gun, the other motoring me to stop.

He looks in my back seat, makes a judgment, tells me to drive safely.

A mockingbird lands on a strand of barbed wire.
Black-and-white triangle tail balancing above a stand of white-green prickly poppy.

I go. Accelerating into the night on a long, straight stretch of road.
The sun sets in the West.
Mountains silhouetted on a pink-purple-indigo sky.

Clouds beyond.

We’re in a drought.

There’s a storm coming.

Sky Island Alliance
Now is the time to tell the Arizona Game & Fish Department that you want 100% of Arizona's roadless national forest lands fully protected. Your participation at public meetings and comment letters will assist Governor Janet Napolitano and the Arizona Game & Fish Department in developing Arizona's petition to the U.S. Department of Agriculture to protect all 1.2 million acres of inventoried roadless areas in six national forests in Arizona.

These lands are crucial to wildlife and their habitat, recreational opportunities like hunting, fishing, hiking, and camping, protecting our forest watersheds, and guarding against dangerous wildfires.

Visit www.arizonaroadless.org to learn more about roadless areas and how you can help! Tell your friends. Spread the word!

Written comments will be accepted until Aug. 31st.

Email comments to: roadless@azgfd.gov

Mail comments to: Arizona Game and Fish Department-WMHBR

Attn: Roadless Area Comment

2221 W. Greenway Rd., Phoenix, AZ 85023

Mark Your Calendars to Be at These Open Houses:

A series of open house meetings will be held around the state in July and August to provide the public with more information on roadless areas and the state's petition process.

Attending the open house meetings is perhaps the most important way you can support the Governor in this effort. We need lots of people to turn up and voice their support for protecting roadless lands and their value to you, your family, and your passion for the outdoors. Oral comments will not be taken at the meetings, so make sure you write your comments.

All open houses will be held from 6 to 9 pm:

Wednesday, July 5: Safford (Coronado/Apache-Stigaretas National Forests), Graham County General Service Bldg., 921 Thatcher Blvd., Safford.

Thursday, July 6: Tucson (Coronado National Forest), Arizona Game and Fish Department Tucson regional office, 555 N. Greasewood Road, Tucson.

Monday, July 10: Phoenix (all National Forests), Arizona State Fairgrounds Wildlife Building, 19th Ave. and McDowell Road, Phoenix.

Tuesday, July 11: Mesa (Tonto National Forest), Arizona Game and Fish Department Mesa regional office, 7200 East University Dr., Mesa.

Wednesday, July 12: Payson (Tonto/Apache-Stigaretas National Forests), Payson Inn Conference Room, 801 N. Beeline Highway, Payson.

Thursday, July 13: Globe (Tonto National Forest), Gila County Fairgrounds, 3 miles north of Globe on Highway 60, Globe.

Tuesday, July 18: Kingman (Prescott National Forest); Arizona Game and Fish Department Kingman regional office, 5325 N. Stockton Hill Road, Kingman.

Thursday, July 20: Prescott (Prescott National Forest); Yavapai County Board of Supervisors Office, 1015 Fair St., Prescott.

Thursday, July 25: Springerville-Eagar (Apache-Stigaretas National Forests), Eagar Town Council Chambers, 174 S. Main St., Eagar.

Wednesday, July 26: Pinetop (Apache-Stigitreaves National Forests), Arizona Game and Fish Department Pinetop regional office; 2878 E. White Mountain Blvd., Pinetop.

Tuesday, Aug. 8: Flagstaff (Coconino/Kaibab National Forests), Radisson Woodlands Hotel, 1175 West Route 66, Flagstaff.

Wednesday, Aug. 9: Fredonia (Kaibab National Forest), Fredonia Courthouse Building, 110 North Main St., Fredonia.

Visit www.arizonaroadless.org to learn more and TAKE ACTION!
WANTED: YOUR PHOTOS

Announcing: The SIA Photo Contest!

We invite you to submit your landscape photographs of the Sky Islands into our 2007 calendar photo contest. We are looking for photos of Sky Island landscapes representing the concept of Sky Islands, their beauty, uniqueness, natural resources, etc. No photographs of people or species, please. Landscapes, open spaces, mountain ranges, seasonality only. We will be selecting 12 photos to be printed in our 2007 calendar. Contest winners and Legacy Club members will receive a free copy of the calendar.

Submissions must be received by September 29, 2006. We will announce the winners at our Annual Volunteer Appreciation Party. Please send submissions to: Sky Island Alliance, Attn: Nicole, PO Box 41165, Tucson, AZ 85717 or email digital files to nicole@skysilandalliance.org. If the file size is bigger than 3 MB, please contact us before electronically sending your photograph. Please include name of photographer, contact information, and location of photograph. You may be asked to verify that you are the photographer of submitted photos. Unfortunately, we cannot return submitted photos.

Please contact Nicole at 520.624.7080 x209 or nicole@skysilandalliance.org with any questions.

What is the Legacy Club?

Comprised of our monthly and quarterly donors, this program is an easy way to donate to SIA and helps us tremendously!

By donating just $10 a month, you can turn your yearly $35 membership contribution into $120. Or, by donating $30 each quarter, your yearly contribution would total $120! There are many different donation options through this program.

If you are interested, please call Acasia at 520.624.7080 x207 or click on the Donate Now button at www.skysilandalliance.org.

Tumacacori T-Shirts!!

*The winning wilderness is yet a part of our western heritage. We wonder how have the winds during our lifetimes and we must ensure to the future grandchildren that we have not damaged the same experience during their lives." ~ Senator Fife Symington

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

- 100% organic cotton, pre-shrunk
- Fun and easy logo on the front!
- Unisex shirt (and women’s sizes) on the back!
- Men’s on a light blue shirt, women’s on a green t-shirt

See pictures on our website at: www.TumacacoriWild.org

How many? What sizes?

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Where would you like your order shipped?

Name ____________________________

Address ____________________________

City, State, ZIP ____________________________

Phone number ____________________________

Send this form with payment to: Sky Island Alliance, P.O. Box 41165, Tucson, AZ 85717

Field Schedule: Summer into Fall 2006

14-16 July. Huachuca Mountains Riparian Inventory, Join us in the beautiful Huachuca Mountains! Home of the Mountain Tree Frog! Trogons! Turkeys! Bears and Lions 2.0 hours from Tucson.

4-6 August. Peloncillo Mountains Riparian Inventory, Visit the beautiful and remote Peloncillos in a project to assess restoration potential of historic ciénegas and degraded streams. 3.5 hours from Tucson.

18-20 August. Sucker Gulch Road Restoration. Come out and get your hands dirty installing vertical mulch and erecting barricades, and play a direct role in improving the ecological health of your public lands! 1.5 hours from Tucson.

1-4 September. Labor Day in the Chiricahua Mountains. Join the Sky Island Alliance as we revisit a favorite haunt! We will be looking at the boundaries of the existing Chiricahua Wilderness. Trogons! Ridge-nose rattlers! Coatis! 2.5 hours from Tucson.

8-9 September. Los Posos Road Restoration. Come out and get your hands dirty installing vertical mulch and erecting barricades, and play a direct role in improving the ecological health of your public lands! 1.5 hours from Tucson.

29 September - 1 October. Ophir Gulch Road Restoration. Come out and get your hands dirty installing vertical mulch and erecting barricades, and play a direct role in improving the ecological health of your public lands! 1.5 hours from Tucson.

For more information contact Trevor at trevor@skysilandalliance.org or at 520.624.7080 x204

Wishlist:

A late model truck or SUV, good running and good on gas! Steel posts for road closures! Contact Trevor!

Join us!

Join or renew here OR through our website: www.skysilandalliance.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.

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

Name: ____________________________

Address: ____________________________

City, State & Zip: ____________________________

Phone & Email: ____________________________

$35  $50  $75  $100  Other $ ________ (any amount helps and is appreciated!)

My check is enclosed

Please bill $ ________ to my:  MasterCard  Visa  American Express

Card No.: ____________________________

Exp. Date: ____________________________

Security Code: ____________________________ (usually the last 3 digits on the back of the card by the signature panel)

Sky Island Alliance PO Box 41165, Tucson, AZ 85717

Sky Island Alliance 19
Mountain Lions: Oh the Places They’ll Go…

One mountain lion's journey from November 2005 to January 2006. Satellite collars collected GPS coordinates every four hours, which were uploaded by research staff in bi-weekly flights. To keep the connect-the-dots simple, this map represents a sub-sample from nine months of data, showing the lion's movements every 24 hours. GPS data provided by Kerry Nicholson, map created by Cary Jones. See article page 6.