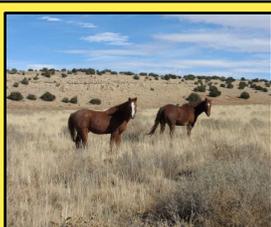


Ground Truth



A Publication of the Diablo Trust – A Northern Arizona Collaborative Grassroots Land Management Team



The Diablo Trust is a 501(c)(3) land management team created in 1993 to promote the social, biological, and economic sustainability of 426,000 acres of intermingled federal, state, and private lands southeast of Flagstaff, AZ, by engaging in a collaborative stewardship process that is in harmony with the natural environment and the broader community.

The phrase "Learning from the land and sharing our knowledge, so there will always be a West" captures our mission.

Ground Truth is the publication of the Diablo Trust, mailed free-of-charge to everyone on our mailing list. If you would like to be added to or removed from the mailing list, please contact us at:

Diablo Trust
PO Box 3058
Flagstaff, AZ 86003
info@diablotrust.org
(928) 523-0588

Contributors are solely responsible for the content of their articles, and the opinions expressed in the articles, linked materials, and comments are not necessarily those of the Diablo Trust.

Cows, Carbon, and the Classroom

NAU looks at the relationship between grazing and changes in soil properties

by Jeremy D. Krones



L-R: Dr. Nancy Johnson, Joe Sweet, Judy Prosser, Aradhana Roberts, and Zach Sumner

Scientific research has been a part of the Diablo Trust since its inception, building on partnerships between the ranches and the various federal and state agencies to produce ecologically-informed management practices that are attuned to current scientific knowledge. Even after 24 years of work, not including the generations' worth of experiential and anecdotal data gathered by the on-the-land managers, the work is not over. Every year there are new teams and students studying the ecology of the Bar T Bar and Flying M ranches.

Dr. Nancy Johnson, a professor in the School of Earth Sciences and Environmental Sustainability at Northern Arizona University (NAU), is following up on an experiment started over 18 years ago

Continued on page 5

Golden Eagle Research Is New And Strong

by Jeremy D. Krones

The Flying M and Bar T Bar ranches are home to a great number of animals, from the fish in the lakes to the bears on the mountain to the eagles in the sky. Both bald eagles and golden eagles live on the ranches, nesting, breeding, and hunting throughout 'Diablo Country.' At least one pair of breeding golden eagles live south of the Hopi 3 Canyon Ranches in Diablo Canyon, the boundary between the Flying M and Bar T Bar ranches.

Despite being relatively similar in size and scope to bald eagles, there is little historical data on golden eagles in the western United States, compared to the amount of data state and federal agencies have on the national bird. There have been concerted efforts over the last 15 years to survey

and assess the golden eagle population of Arizona by both the Arizona Game and Fish Department (AGFD) and the Hopi Tribe.

Kenneth "Tuk" Jacobson, the Raptor Management Coordinator for AGFD, explains that there were state surveys to find and document golden eagle populations in the late 1970s. The surveys ended shortly after and were not reinitiated until 2006, just prior to the removal of the bald eagle from the endangered species list. The 2007 Bald and Golden Eagle Protection Act maintained protection to eagles by prohibiting any activities that impact the survival and productivity of the birds.

The Hopi Tribe also conducts regular assess-

Continued on page 6

Cows, Carbon, Classroom 1	Message from the Flying M 4	Rust from the Range 12
Golden Eagle Research 1	Book Club 7	Plant Spotting 12
Ranch Map 2	Donors Appreciation 8	On The Ground Pictures 13
President's Message 3	Dispatch From Albuquerque 10	Sponsorships 14
Office Notes 3	Arizona Gives Day 11	Upcoming Events 16
Getting to Know 4	From the Calendar 12	

Diablo Trust



President
Norm Lowe

Vice President
Kit Metzger

Secretary
Bill Towler

Treasurer
Bob Prosser

Board Members at Large

Diana Kessler
Judy Prosser
Norm Wallen
Stephen Williams

Program Manager
Jeremy D. Krones

Accounting
Johanna Klomann, CPA
Gail Reynolds

Acknowledgments
Western Silhouettes by
Ace Reid, Jr., originally
published in "Rawhide
Bound," by Ed Bateman,
Sr., Moss Publishing Co.,
San Angelo, TX, 1950.

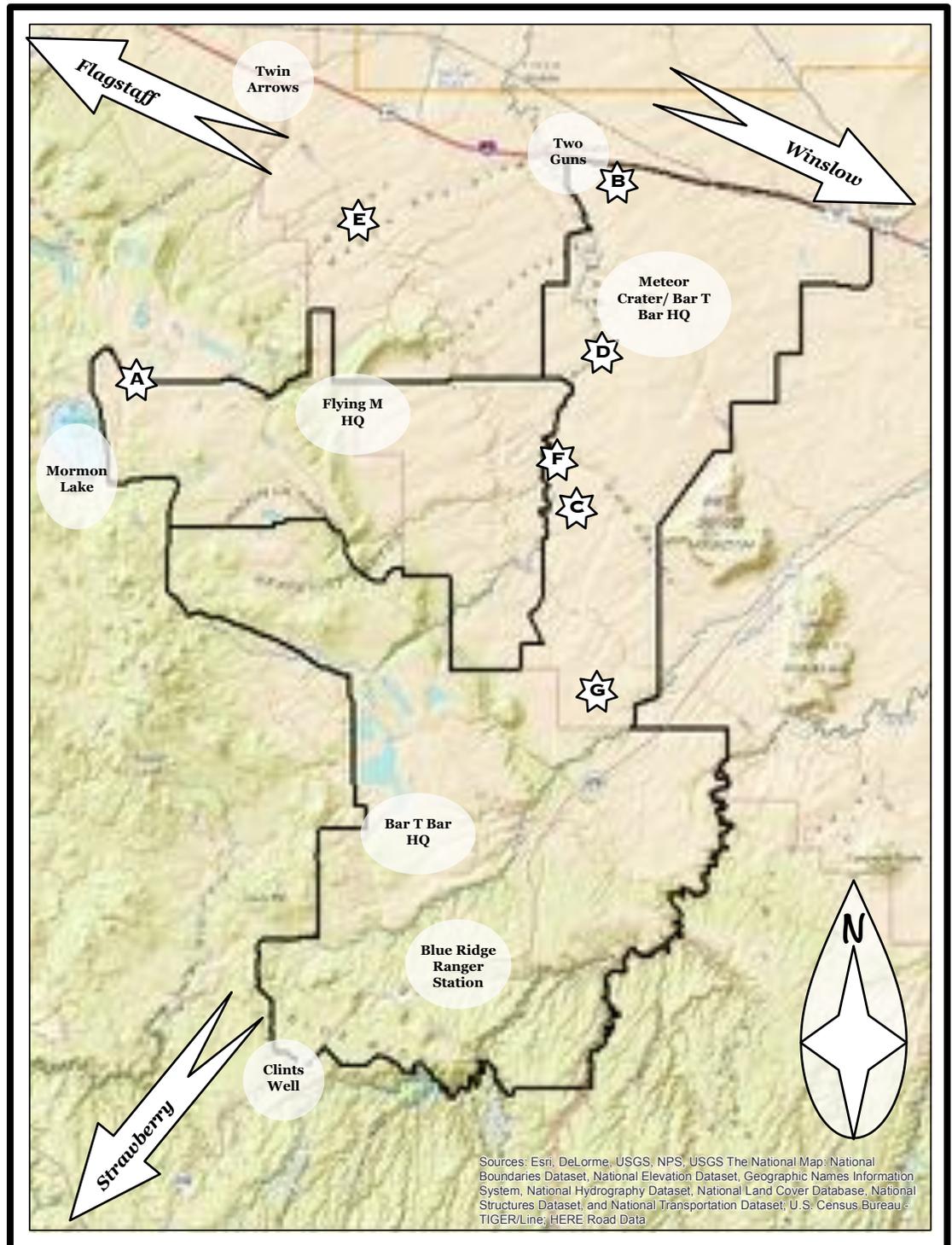
Copy Editor
Denise Hudson

All photographs and
texts, unless otherwise
credited, are property of
the Diablo Trust
archives.



Where We Are

A map of the Diablo Trust land area: Flying M and Bar T Bar ranches



Locations In This Newsletter:

- A** – Reed Lake Plots (Cattle, Carbon, Classroom, p1)
- B, C** – Research Enclosures (Cattle, Carbon, Classroom)
- D** – Diablo Canyon (Golden Eagle Research, p1)
- E** – Hopi 3 Canyon Ranches (Golden Eagle Research)
- F** – 2016 Campout location (Office Notes, p3)
- G** – Pipeline location (Monthly Meeting, p12)

President's Message

by Norm Lowe

This newsletter's pages show how ecologically-attuned management maintains wide open spaces for aesthetics, production and the essential dynamics of fire and wildlife movement to sustain those values.

What is sustainability? It is a subject I have studied a lot. In terms of carbon, the life element, sustainability means balancing for the ability of biological systems to remain diverse and productive indefinitely. Thus, sustainability reflects the fourth dimension of time, where empirically-monitored sites maintain carbon-balanced living health, even in the face of the regional desertification trend we see playing out across the Southwest.

In this issue's lead article, *Cows, Carbon, and the Classroom*, Dr. Johnson mentions how Holistic Resource Management (HRM) has been applied in increasing the carbon in the Reed Lake demonstration plots. As a range conservationist, over the past 31 years I have applied the HRM decision model in many ways. The model is not very good if used prescriptively, but is great as a real-time responsive action tool – because it sets balanced goals, uses a full spectrum of tools, does empirical monitoring, and uses the data immediately to alter management to pace with dynamically moving natural processes. Collaboration between all stakeholders on a land area is a fundamental requirement of the HRM model, and this is why the Diablo Trust continues with our many meetings and field days involving ranchers, agency representatives, special interest groups, and the general public.

Like our Program Manager Jeremy, I also attended the Quivira Coalition's annual conference in Albuquerque (titled "Lights, Soil, Action!") that honors "outstanding leadership in the radical center" in the areas of ranching, conservation, civil service and research. Keynote speaker Dr. Wes Jackson (40-year leader/ researcher with The Land Institute) said they now have international recognition for perennial grain and seed crop polycultures that out-produce normal agricultural crops, but without the usual soil erosion, nutrient depletion and fossil fuels dependency. He says sustainability involves emergence of "perennialism" for harvesting food and fiber crops from lands that maintain soils with constant stable cover.

Two water pipelines, totaling about 10 miles in length, to benefit livestock and wildlife in the east-central area of the Diablo Trust have recently been completed (photos on page 13). The ranches wish to thank the Arizona Game and Fish's Landowner Compact Program for funding the larger of these



Office Notes

by Jeremy D. Krones

As so many have said before me, 2016 was a pretty wild year. Politically, socially, economically – in the cattle industry, the market took some turns for the worse (although it does look like it's bouncing back). And yet, Diablo Trust has had a great year.

We started with our Annual Meeting at the Museum of Northern Arizona, and then had four Days on the Land on the Flying M and –T– ranches, two film viewings, an Annual Campout on the rim of Diablo Canyon, and a very joyful Christmas party. Diablo Trust is built on the principles of collaboration, education, and conservation, and we strive for our events to promote and enhance these values. At the start of my third year with the Trust, I think I'm really getting the hang of it!

For all of our activities, which will only improve in 2017, the number of which I am most proud is the amount of donations we received throughout the year. Both ranches contribute on a regular basis and provide most of the funding for Diablo Trust, but in 2016 we had over 80 unique donors, totaling nearly \$50,000 in donations. It is that kind of money that keeps us going – it is difficult to quantify successes for Diablo Trust, because it really comes down to the growth and continued progress of the Flying M and Bar T Bar ranches, which are private businesses, but when you truly care about a mission like ours, you can learn to see the successes where they happen. We can show support for sustainable public land management and forward-thinking ranchers by purchasing their products, using the land in conservation-minded ways, and engaging in discussions pertaining to the best ways to conserve our shared lands, animals, and resources.

The plan for 2017 is still in the works at the time of this writing, but we do have some events planned for the first part of the year; the upcoming Annual Meeting is looking to be another great success. A field trip is planned in March to the Vermilion Cliffs to tour the condor center, and we have over a dozen other trips and events on the calendar, not to mention monitoring sessions, films, and book club meetings. Stay up-to-date by following us on Facebook, Twitter, or LinkedIn, or checking www.diablotrust.org/calendar.

2017 promises to be a year of growth, progress, and taking even bigger steps to make this world one on which we enjoy living. I hope to see so many more of you at our events throughout the year, and please don't hesitate to drop me a call or email. We are a community, and communication is the best way for a community to grow.



Jeremy D. Krones, Program Manager
Office: 210 Peterson Hall, Northern Arizona University
Contact: (928) 523-0588 or info@diablotrust.org

Getting to Know . . . Jackie Thomas (Holm)

Range Resource Area Manager
AZ State Land Department

Jackie's introduction to the West was when she moved to Fort Collins, CO to study Natural Resource Management at CSU. She worked on several ranches and with the US Forest Service as wilderness ranger in the Wind River Range in Wyoming, before receiving her teaching credentials at the University of Wyoming in Biology and Earth Sciences in order to



teach on the Wind River Indian Reservation. In the interim, Jackie lived in Lander, WY, and worked on Red Canyon Ranch with The Nature Conservancy. At the time, she thought she would live in Lander for the rest of her life. However, she and her family moved to Redwood National Park in Arcata, CA, for eight years, then to Crater Lake National Park for another four years, and then to the South Rim of the Grand Canyon for one year. About three years ago, Jackie moved into Flagstaff to get her master's degree in Environmental Science & Policy at NAU. She started with the AZ State Land Department in August 2016, and she says that she'll be here forever! Jackie has two daughters, whom she treasures, a new dog, an old cat, and six chickens.

Born in: Boston, MA

Childhood Hero: Leo Conroy (my horse trainer)

Current Hero/Muse: Melody Beattie

Contribution to the Flagstaff Community: I want to work with AGFD to put flashing lights on the bottom of Cedar Hill by Buffalo Park that would be triggered by mule deer so people are more aware of the deer crossing the road

Favorite Hobbies: Walking, cooking, skiing, sports

Fondest Outdoor Memory: Trapping grizzly bears in Wyoming

Favorite Western: Shane, by Jack Schaefer

Favorite Western-wear item: Belt

Favorite Ranch Recipe: Carrot cake

Currently Unrealized Life Dream: Hiking Mont Blanc

Possible (or Actual) Ranch Nickname: Scout

Favorite College Class: Watershed management

Favorite Quotation: "This is the most beautiful place on earth. There are many such places . . . a greasy alley near the Hoboken waterfront . . ."

- Edward Abbey in *Desert Solitaire*

Message from the

by Kit Metzger



The other day while shoveling a break in one of our ditches where the rain and snow water had run too high and washed it out, I got to thinking. We have talked about our ditch systems and the other waters on the place but maybe never really shared how dependable they are and how we use them. So here is the long and short of how they function and why they are so important to this open space.

Northern Arizona is a pretty dry place (no news to anyone) and when it comes to water, the Flying M lands are no exception. Even though we are "on top of the hill," so to speak, we don't have very many "natural" permanent waters. This ranch has only two such waters; both are springs and are down in very steep rocky canyons. All of the other "natural" waters, blow out lakes, small water holes in the big canyons, and pot holes in the draws, only hold water for a short time. They are totally dependent on how much moisture we receive, and the timing of the precipitation. Our predecessors in the livestock business on this land started working on bettering the waters as soon as they got here.

Let's start with springs. Anderson Spring is the largest and is owned and maintained by Flying M. It is the water that supplies the ranch headquarters and a few tubs through pipelines. Anderson Spring was developed in 1911 when a pipeline was put in from the spring to the then-headquarters of the Harlow Yeager Sheep Company. This spring collection system has been rebuilt at least four times, and soon the six miles of pipeline will need to be replaced again. The spring runs anywhere between 40 to 80 gallons per minute, depending primarily on the weather cycle and winter precipitation. Before it was collected in the spring, water used to just dribble down into the floor of Anderson Canyon and disappear in the rocks.

The other spring that seems to seep year-round, and only in the rocks, is Kinnikinick Spring, located in Kinnikinick Canyon. During wet times it may run or seep up to one-eighth of a mile in the canyon, but most of the time it is in a small pool holding maybe 500 gallons in a boulder pile in the bottom of a steep canyon. If it had been a larger and more dependable spring it probably would have been developed at about the same time so I am guessing it never was much more than it is now.

The major canyons on the ranch are Anderson, Grapevine, and Diablo Canyons. They run water in the spring with snowmelt off of Anderson Mesa, depending on the temperature and amount of snow. They also occasionally run in the summer rains, fast and not for more than a day.

Anderson Canyon is a steep, boulder-covered canyon about 3 miles long, from the top of the rim. It will leak out most of the water running in it in that distance most years, and I think it is a major contributor to the aquifer. Diablo and Grapevine Canyons, east of Anderson, are not as steep the farther east you go, and have pools in the rocks or at the bends in the deep parts that will hold water for a month or so after the running water quits. These pools are not very

Cows, Carbon, Classroom (continued from page 1)

by NAU professor Dr. Tom Sisk. Along with undergraduate and graduate students, Dr. Johnson is examining the influence of grazing management practices on the amount of carbon and other elements in the soil.

The Reed Lake experiment, located on the Flying M Ranch, compares three different grazing treatments repeated three times, for a total of nine one-hectare plots. Three plots are left unfenced to be the control group, or without any management that is different than the rest of the ranch. Three other plots are fenced to completely exclude livestock, and the remaining three are fenced to impose high-density, short-duration grazing. The third treatment is also called mob grazing; near the end of each summer, approximately 160 head of cattle intensively graze the plots for just 24 hours. Cattle are not allowed to graze those plots for the rest of the year.

Dr. Johnson was inspired to start this project after watching a TED Talk by Allan Savory, a well-respected but controversial wildlife ecologist from Rhodesia (now Zimbabwe). Savory is the founder of The Savory Institute and the developer of Holistic Resource Management (HRM). HRM is a unique approach to resource management, using an understanding of how the ecological, social, and economic components of a ranch and its community interact to create a more sustainable and productive ranching operation. A primary goal of HRM is to reverse desertification through carefully managed mob grazing, designed to mimic



Allan Savory's TED Talk, "How to fight desertification and reverse climate change," February 2013.

[Photo from www.ted.com]

the grazing patterns of herds of native, hoofed grazing animals.

When Dr. Johnson saw Savory's TED Talk, she said she was put off by what she saw as a lack of scientific backing to his claims, mainly about the ability of mob grazing to increase carbon stored in soil and reverse climate change.

"It just kind of sent me into this fact-finding mission, because I didn't think he was saying things that made a lot of sense, based on what I know," she said in reaction to the talk. "I felt that a lot of people who were saying this had absolutely no data to support it."

In 2015, Dr. Johnson and Aradhana Roberts, one of her graduate students, found that the ranches around Flagstaff were ideally situated for them to study below-ground responses to above-ground management. Since the Flying M Ranch practices parts of the Savory Method, and Dr. Sisk's plots had had continual treatments for over 18 years, Reed Lake was an appropriate place to start the research.

Ms. Roberts explained, "Another important intrigue in this project is the spectrum of responses that the literature is showing on grazing treatment and soil carbon. There are some that are showing increase, some showing decrease, and some showing no response. So, for sure there is a regional effect, but at the same time there is something greater happening with what grazing can offer to soil carbon."

Ms. Roberts reported that they were able to get more data in just one year of studying the Reed Lake plots than many other studies, because of the longevity of the treatment and of how the project's pastures are arranged. Ms. Roberts' study of the Reed Lake plots showed that, as Savory predicted, mob grazing increased the amount of carbon in the top seven inches of the soil. The next step in the project is to determine the depth of this increased carbon, and calculate the capacity for this increased carbon storage to offset warming caused by the greenhouse effect.

Megan Deane McKenna, a master's student with Dr. Johnson, will continue these studies at the Bar T Bar, where the soil has different properties. In addition to measuring soil carbon in grazed and un-grazed

pastures she plans to examine ways to apply these findings to the carbon market. The carbon market is a market-based tool designed to limit greenhouse gas emissions from various industries through regulations and industry trading.

"Right now," Ms. Deane McKenna said, "protocols are so complicated . . . they're not being implemented." The goal of her master's thesis is to design better protocols so that those who work in the carbon market can more easily validate if there is carbon being stored, and what they can do about it.



Zach and Joe at an enclosure on the Bar T Bar Ranch by Interstate 40 in August 2016.

Two undergraduate students involved in this project are Zach Sumner and Joe Sweet, both in Environmental Studies. Mr. Sweet believes that since agriculture is such an important part of society and has impacts across the natural world, making it more sustainable will make it better for the natural ecology.

Mr. Sumner is also interested in sustainable agriculture, specifically in arid environments. He explained that for our region, "you couldn't just set up a potato or corn farm and expect there to be enough water and get the same nutritional benefit you'd get from cattle."

This project has been a long time coming, and with each step the potential effects grow in the soil science, resource management, and agricultural worlds. Through research, collaboration between academic institutions and ranches, and an understanding of common goals, a more sustainable future for our ranches and shared resources is within our reach. ▀

Golden Eagle Research (continued from page 1)

ments of golden eagles, led by Darren Talayumptewa, the Director of the Wildlife and Ecosystems Management Program under the Department of Natural Resources for the Hopi Tribe. The eagle assessment surveys are performed on Tribal lands, the Hopi 3 Canyon Ranches, and in breeding areas on neighboring ranches to the Hopi 3 Canyon, which include the Flying M and Bar T Bar.

The Hopi-led surveys began in 1998 but their design was not finalized until 2006, with the help of Dan Driscoll, bald and golden eagle biologist with the American Eagle Research Institute. The Tribe's surveys were started because of a concern that the ceremonial use of the eagles was contributing to their decline. The Hopi Tribe uses golden eagle feathers for both ceremonial regalia and as offerings at key times throughout the year, such as the winter solstice. Through their surveys, both the Hopi Tribe and AGFD have found Arizona's golden eagle population to be much larger than previously documented.

When the AGFD golden eagle surveys began in 2006, Tuk admits that AGFD did not know nearly as much as they should have, 40 years after the first surveys were performed. Over the last ten years much has been done in Arizona to increase and enhance AGFD's general understanding of golden eagles. For example, the Southwest Golden Eagle Management Committee was formed in June 2010 to further the efforts of learning more about the birds and their lives in Arizona, and by January 2011, the committee had acquired enough funding to start a state-wide helicopter-based golden eagle nest inventory. Occupancy assessments began in 2013, to measure what nests were being used, and by whom, and productivity assessments began in 2015.

Surveying on neighboring ranches by the Hopi Tribe began in 2012, when Darren's researchers noticed some of the Hopi 3 Canyon birds flying on the Bar T Bar and Flying M ranches. Darren received permission from the ranches to perform visual surveys of the birds, and then to perform aerial surveys with helicopters. The Hopi Tribe and AGFD collaborate on eagle projects and monitoring, and share data.

It is documented that there are 250 oc-

cupied golden eagle breeding territories in the state, not including those on tribal lands (which make up nearly a quarter of Arizona). There are likely more to be discovered. In comparison, there are only about 65 bald eagle breeding territories.

Golden eagles are active hunters and apex predators, which means they are at the top of the food chain. In ecology, that also means the health of their population is tied to the health of the environment around them, such as the populations of small and medium-sized animals and the vitality of the plant matter those creatures eat. In contrast, bald eagles are primarily passive hunters, or scavengers.

Also, golden eagles are not as tied to waterways as bald eagles, which contributes to their relatively large population in Arizona – despite golden eagles being more than four times as populous in Arizona as bald eagles, the national bird is more numerous nationwide.

Much like other predators, golden eagles tend to mate for life, and pairs will build a nest and use it for several years. Sometimes they will build another nest nearby and use it in alternating years. That practice continues over time, so one breeding pair might have a dozen different nests in one area. Based on the size and number of nests, the pair in Diablo Canyon is estimated to have been there for 30 years!

Golden eagles can be very territorial birds, and can even be more sensitive to intrusions than bald eagles. While aircraft doesn't bother them much, hikers and climbers will. Their actions also change based on the season: during breeding season, the eagles prefer not to get off their eggs unless absolutely necessary, which Tuk defines as a disturbance within a couple hundred yards from the nest. Later in the breeding season, however, the birds will be more apt to leave the nest due to a disturbance because the nestlings do not need round-the-clock care anymore.

The Diablo Canyon eagles nest near a pasture that Bar T Bar has used for calving large numbers of cows for over 30 years. That means that from March 1st through April 15th every spring, there is a regular flow of four-wheeler and horseback activity. These activities do not bother the Diablo

Canyon eagles because those activities usually take place at least a half-mile from the canyon edge.

Since the canyon walls block the line-of-sight from the nest to what happens on top, the birds do not get concerned. The eagles are also estimated to have moved to the area after the neighboring pastures were already established, so the eagles are used to the activity. Also, calving provides a ready supply of food for the birds, such as afterbirth and the occasional (and unfortunate) dead calf, at a time when it is especially important for the birds to have a good food supply.

On the Hopi Reservation there is a one-mile 'no construction' zone around all breeding locations, and a one to two-mile no disturbance zone around sites. After the breeding and reproduction season is over (in late May to early June), some development activity can start again, but the goal is to minimize the amount of activity in the area year-round. Acknowledging that some of the Hopi ranches and lands are open to recreational activities, Darren explains, "We strive to be good neighbors, and good stewards of the land."

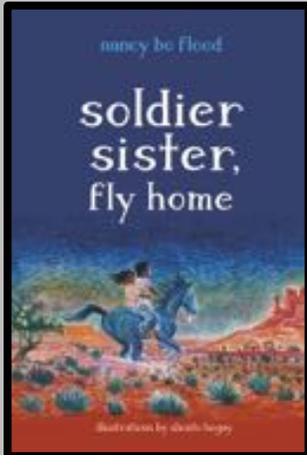
Likewise, it is important for the public to pay attention to the eagles. Tuk laments, "The public generally loves eagles, but oftentimes they love them to death." If anyone happens to come across an eagle nesting area and the eagle can be seen, either in the nest or flying around and vocalizing, the best action is to leave the area and report the eagle to both the landowner and the AGFD, and the Hopi Tribe if the eagles are seen on their lands. "Leaving them alone really helps them out," says Tuk, and reporting their presence helps further our understanding of these beautiful, powerful birds. ▫



Good Reads for the Western Life Book Club

Next Meeting:

Tuesday, February 28 @ 5:30PM



Flagstaff Public Library

**Jan Romero Stevens
Community Room**

300 W. Aspen Ave.
Flagstaff, AZ 86001

Meet the author!

**Buy your book at Barefoot Cowgirl Books
on N. San Francisco and get 10% off!**

December Book Review by Jeremy D. Krones

This House of Sky
by Ivan Doig

Every bookshelf in the western United States ought to include a book by Ivan Doig, and *This House of Sky* is probably the best choice of all his books. Ivan Doig, much like Wallace Stegner and A.B. Guthrie, wrote from his own experiences – *This House of Sky* is a memoir that delves into the vast landscape of his youth, from his personal interactions with his conflicted yet loving father to the beautiful range on which he rode from such a young age.

The book club discussed the conflicts of Doig's life, and how such a verbose and eloquent writer could have come out of such a rough 'n tumble atmosphere, of cowboys, bars, and wild animals. As poetic as his writing was, however, it did go too far for some readers. For all its expressiveness, the core meaning was sometimes lost in the language. Ultimately, though, Doig painted unbelievable portraits of his childhood in *This House of Sky*, and communicated his messages of family, strength, and a love of nature to every reader.

The book club loved reading *This House of Sky*, and it was unanimously agreed to read another Doig book soon. This book comes highly recommended.

October Book Review by Alexandra Voorstaan

Wildlife Wars: The Life and Times of a Fish and Game Warden
by Terry Grosz

Terry Grosz has written about his personal experiences as a Fish and Game warden and it reads like a cops and robbers adventure. I'm not a guy and this was not my kind of book, but what I liked about *Wildlife Wars* was that it showed a culture that I was not familiar with. Many of these stories allowed me to understand, if not agree with, the point of view of generations of families that hunted and fished without permission from the government and wanted to continue to do so.

The thing I like least about the book was the repetitiveness of the introductions to each story. The book needed some serious editing in the openings of the twenty chapters. But, the book generated a great discussion in the club meeting! Not highly recommended, but an interesting read.

November Book Review by Patti Van Tuyl

Coyote America: A Natural and Supernatural History
by Dan Flores

The coyote has gotten a bum rap.

So argues western environmental historian Dan Flores in his book *Coyote America: A Natural and Supernatural History*. He notes that, first, the coyote is unique to the Americas, one of the oldest large mammal species that originated and continues to thrive there. Second, no animal in America is more like humans in its survival strategies, problem-solving intelligence, and ability to endure change. *Coyote America* recounts a history of humans' understanding of, and interaction with, the coyote, starting with the Trickster character so prevalent in Western Native American religious stories, and continuing through the 20th century, when the U.S. government prosecuted a "war on wild things," now judged by ecologists to have helped throw nature out of balance. Declared in the 1930s to be "the archpredator of our time," the coyote was the focus of an all-out effort to eliminate him by bullets and by poison. The war can never be won, Flores argues, because coyotes can live anywhere, eat anything, and adapt to any threat they encounter.

Coyote America is a fascinating book, with its scientific and historical content embellished by literary and spiritual perspectives on the place of the coyote in the human as well as the natural world. We highly recommend it.

For more book reviews and Book Club updates, please visit our website, www.diablotrust.org/book-club, contact the office: info@diablotrust.org or (928) 523-0588, or sign up for the club listserv at bit.ly/dtbookclub.

Thank You to Our 2016-2017 Donors!

Diablo Trust is a donation-funded organization, and much of what we do couldn't be accomplished without contributions from our caring community. This newsletter is mailed to nearly 800 public-land stakeholders all over the country, and to nearly 700 email users.

Please turn to pages 14 and 15 for our newsletter sponsors

AmazonSmile Foundation°	Dorrance Fund°	Bill & Mary Keebler	Ann Pollock
Michael Anderson	Susanne Durling	Johanna Klomann	Virginia Riedel
Anonymous (4)	Joel & Diane Eide	Marie LaMar	S.B. Foundation
Bar T Bar Ranch ⁺	Ana Flores	Melanie Lawrence	Scott Harger & Pats Shriver
The Barringer Crater Co. ^x	Flying M Ranch ⁺	Vicki Lewis	Carl Smith
Robert W. Barris	Fry's Food Stores°	Terri & Bill Livingston	Sybil I. Smith
Susan Billingsley	Virginia & John Giovale	Mike Loven	Deborah Sparrow
Eldon 'Buck' Buckner	Mark Habgood	Baerbel & Ivo Lucchitta	Peg Swift
Grant & Susan Cooper	Don & Monika Hancock	Stephanie McCarthy	Phyllis Thompson
Steve Calish & Julie Creed	Connie Hatfield	Sam & Marjorie McClanahan	John Trimble
James Darrow	Loren & Jessica Haury	Bill & Mary McDonald	Norm & Lina Wallen ⁺
William Darrow	John & Mary Hendricks	Diane Meuser	Nat & Jean White
Roberta Dawson	Clarice Holder	Mother Road Brewing Co. ^x	Stephen M. Williams ⁺
Sheila DeHaven	Hope Construction ^x	Eugene & Molly Munger	Stephen & Paula Yeary
Diablo Burger ^x	Betty Hoyt	Mimi Murov	Steven Zeldes
Craig Dible	Peter Friederici & Michele James	Don & Jeanne Neff	
Herb Dishlip	Michele Janette	John & Cheryl Ossenfort	
John & Sharon Dobrinski	Edgar & Lucia Jaycocks	PayPal Partners°	

° Consumer choice donation ^x Conservation Exchange member ⁺ Board member/Ranch

Money matters & your support makes a difference



www.diablotrust.org/donate



Day on the Land: Condor Conservation

Sat, March 25 • all day • bring a camera!
Carpool to the Vermilion Cliffs

Stay informed: www.diablotrust.org/calendar

Message from the (continued from page 4)

accessible from the surrounding area, with steep trails into the canyons that can be a mile or so up or down stream.

Kinnikinick and Anderson Canyons have ditch systems that take water out of the canyons up high near the rim of the mesa. The Kinnikinick ditch system transports that water to various dirt stock ponds off to the east, in our winter country, and the Anderson system takes water north and south. The ditch on the south side of Anderson Point flows through Flying M filling stock ponds on us then continuing on to the Raymond Wildlife Area (AZ Game & Fish Department).

Kinnikinick Canyon has the first dam and ditch clear up west of Kinnikinick Lake that takes water out of a natural drainage to Kinnikinick Lake, that spills into Morton Lake, which then spills out into a draw, Morton Canyon, which flows into Kinnikinick Canyon.

Are you confused yet?

In the bottom of Kinnikinick Canyon there is a small dam that takes water out at the confluence of Morton and Kinnikinick Canyons and the Morton ditch starts there. The Morton ditch runs out of Kinnikinick Canyon along the foot of Anderson Mesa to the north. With several head gates along it, water can be diverted into three different draws. Down these draws and side ditches we can put water into 15 different stock ponds across our winter country. The farthest stock pond is 23 miles from the first diversion where it was taken out of the draw.

In the spring snowmelt runoff, we juggle the water from draw to draw to get as many stock ponds full as possible. In most years we can fill all but the furthest away, and in a great year like this one, we will be able to fill all of them twice if not more. We usually spend February and March moving water around. With the water storage in the lakes on the mesa we can also let water out of those lakes and run water to the stock ponds in a dry year. It is not a fail-safe system, but keeps this ranch from solely depending on wells.

We have six wells on Flying M. The deepest is 1100 feet, and the shallowest is



575 feet. All have great water but because of their depth they require submersible pumps. To get the volume of water needed our generators pump 22 to 25 gallons per minute, and that cannot be done with windmills or solar pumps.

We don't have very many miles of buried pipeline at this time. In most places we would like to run pipelines it's difficult to rip one in or to find enough dirt to cover the pipe – we would be scraping off a whole lot of country to find the dirt! We do have some aboveground lines that we can run to storage tanks most of the year. Only if we are going to get below 15 degrees do we drain the lines. The pipe is thick-walled and can stand a lot of cold, but we have to have all the valves and vents well-insulated.

We are intending to put in another three miles in the next year to help with water distribution on the State and private lands out east of the mesa. We are looking into a well on private ground at Ashurst Run, but the cost is a little daunting. If we had a well there, we could possibly add a pipeline on the Forest land, which would be a great help in the dry years. The water really gets short on the mesa, or is nonexistent during the dry years, and the road systems are not really good enough to haul everywhere.

On Anderson Mesa we have stock ponds; some are in the blow out lakes and some are in draw bottoms, places that will hold water. Some of the Dry Lakes, formed

mostly by wind blowing dirt out, will hold water from snow melt for a period of time, depending on what type of winter we have. They rarely will catch water in summer rains. If we get one of those windy springs like last year you can literally watch the water disappear in those open lakes. Most of the larger “lakes” on Flying M's portion of the mesa that hold water have a manmade dam out the outlet, i.e. Yeager Lake and Corner Lake. Mud Lake was created when the road was built to Kinnikinick.

Most of the waters on this ranch were enhanced, developed, and ditched to in the last 100 years to form the Anderson Mesa water system that our livestock and wildlife depend on today. Flying M has 104 stock ponds, on private, Forest, and State lands. A location was picked because it was the best place to catch water in a draw or it was the lowest place in a dry lakebed. Sometimes it was even just, “I wonder if we can get that little flat to hold water if we build a dam across it.”

If you were a homesteader or an early rancher/sheepman, getting water in many places was your goal. The “high-tech” equipment at the time was a “tumble bug,” basically a big, horse-drawn shovel. Using a team, a couple guys could scrape dirt out of a low place and take it a little ways away and dump it. This contraption could not dig a very deep hole, so most of the little “puddles” created dried up fast and had to be re-dug often.

Not too sustainable.

It wasn't until after World War II that big equipment, like gas and diesel caterpillars, really made dependable “big” dirt tanks or lake dams that would hold water for most if not all of the year.

So there is a sort of quick-n-muddy run-down on the water system. When we think of water in the Southwest we need to remember that most of the waters we are familiar with today have been developed and maintained by someone, and the landscape would look different and have different critters on it if it were still “natural.”

*Kit Metzger, Flying M Ranch
Contact: flyingmrch@gmail.com or Facebook*

Dispatch from Albuquerque

Reflections on the 2016 Quivira Coalition Conference • Nov 9-11 • Albuquerque, NM

by *Jeremy D. Krones*

If you ever have the chance to attend the Quivira Coalition Conference, usually held in Albuquerque, NM, in early November, I highly recommend you take the opportunity.

Quivira is not only a powerfully educational and uplifting organization, but its conferences draw members of our community – the ‘New Ranching’ community, to borrow a term from Quivira founder and progressive ranch advocate Courtney White – from all over the country, and even from places as far away as Kenya, as we witnessed this year with a wonderful presentation by Lucy Waruingi, the executive director of the African Conservation Centre (ACC) in Nairobi. Like many organizations akin to ours, the need and drive for a more holistically sustainable future is not fenced in by national or cultural borders: it is a global effort.

This year’s conference began the morning of Wednesday, November 9, but most of the audience didn’t arrive until Wednesday evening. The keynote speaker that first evening drew a crowd that crossed disciplines and interests: Dr. Temple Grandin, now of Colorado State University. Dr. Grandin is a leader in her fields of animal husbandry, livestock behavior, animal welfare, and livestock facility design, not to mention her position as an autistic advocate, having autism herself.

Dr. Grandin started her presentation by discussing her work with animal welfare and facility design, but her talk quickly shifted to how she got to where she is today. She fought through not only the physical limitations of autism, but also the socio-cultural limitations that having such a condition puts upon her and many others through society.

Dr. Grandin benefitted from her parents encouraging her growth despite ‘professional’ opinions about the capabilities of autistic children; she found great promise when she first visited her family’s ranch as a young woman. When Dr. Grandin discovered her love and deep connection with the natural world and the agricultural life, she says her life opened up and she was able to make a path for herself. Hearing her



Dr. Temple Grandin, keynote speaker on November 09 at the Quivira Coalition Conference in Albuquerque, NM.

speech was very inspirational and she received multiple standing ovations from the crowd.

We had a packed schedule of seven speakers on Thursday and five more on Friday, ranging from Wes Jackson, co-founder and past president of The Land Institute, a pioneering research-based organization focusing on perennial crops, to Judith D. Schwartz, a journalist and author of *Cows Save the Planet* and *Water in Plain Sight*. The wide range of speakers alone would tell a newcomer how groups like the Quivira Coalition (and Diablo Trust) thrive in their diversity and tolerance.

The overarching theme of all the talks was simple: what we do is difficult, sometimes leaning towards impossible, but it’s necessary and vital for the future of our soils, our foods, and our planet.

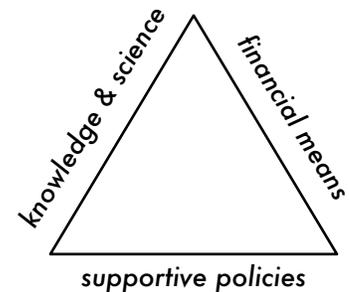
That’s not to discount the importance of what we do, through field trips and educational presentations, for a more collaborative community, too. Looking around the room, I saw young high school students from downtown Albuquerque and old wrinkled cowboys from the pastures of Wyoming – and as different as we all might have been as individuals, we were under the ‘big tent’ of collaborative resource management, progressive agriculture, and visions of a sustainable future.

Leslie Allison of the Western

Landowner’s Alliance spoke last on Friday. She emphasized the importance of the ‘Radical Center,’ and that we all ultimately strive for “a society to match its scenery.”

As much as I’m lauding the commonalities of the community brought together by Quivira this week, I do know that what we do in Coconino County would not necessarily work the same way in Powell County, MT (where the Blackfoot Challenge is located), or in Nairobi, Kenya, home of the aforementioned ACC. What is important is that we are striving to match our community, our own societies, to our local natural environments.

Leslie called what ranchers like the Metzgers and the Prossers are doing through groups like Diablo Trust, “sustainable prosperity,” where we are all succeeding in our goals, for the far foreseeable future. We need a strong land ethic, of course, but to do that we need to achieve the three sides of the triangle:



In order to achieve those goals, she listed four actions that we all must take, not only those of us ‘in the field,’ but also all of our community members and friends, including even those who are distantly connected to what we do:

- Invest in the West
- Build on Success
- Get Out In Front
- Work Together

The 2016 Quivira Coalition Conference was an edifying experience for me, and would be to anyone interested in learning more about the background of Diablo Trust and organizations like us around the world. I look forward to next year’s conference, and hope that a few more Diablo Trusters come along! ✪



We are taking part in Arizona Gives Day again this year, but this time, to further our impact and spread the wealth of knowledge that comes from the land and the people who work with it, we have an expressed goal of raising money to send teachers to the Summer Agricultural Institute, run by the University of Arizona's College of Agriculture and Life Sciences – Cooperative Extension. This five-day program is an intensive course for teachers in how to more effectively bring agricultural literacy into the classroom. Diablo Trust has participated in the program as a guest presenter for a number of years, and this year we decided to give even more to benefit this amazing program and the inspirational teachers who participate!

While the program is already subsidized for the 30 participating grade school teachers, we believe that such an education should not cost anything for these valued educators. Participation costs \$84, and while sending one or two would be great, our goal is to send all 30 teachers, for free.

To sponsor all 30 teachers, we'll need to raise \$2,520.

Please log into www.azgivesday.org/diablotrust on or before April 4 to donate to the campaign.

Thank you!



President's Message (cont'd from p3)

pipeline projects. Also, 5,021 acres of juniper brush treatment in the mid elevations of the Bar T Bar ranch is scheduled this year to open up grasslands to benefit wildlife and livestock. This work is from a combination of funding from the Natural Resources Conservation Service (EQIP) and Arizona Department of Environmental Quality for 3,659 acres on State lands, and from EQIP and the US Fish and Wildlife Partners for 759 acres on private lands.

On the weather front: Though this fall was forecast to be a dry La Niña period, it has turned out to be a normal one, having received good rainfall in each of the past three months. The earthen water tanks have been filling up.

I look forward to seeing you at our annual meeting on February 17th!

Norm Lowe

Norm Lowe, President
Contact: president@diablotrust.org

Annual Meeting:
Conservation in Cattle Country

Friday, February 17 at 8:00AM

Thornager's
2640 W. Kiltie Lane, Flagstaff

www.diablotrust.org/calendar/am17

©2000 Zachary Johnson

From the Calendar: *Winter 2016 Events*

Monthly Meeting on the Land: November 19th

Our final Day on the Land was held in November on the Bar T Bar Ranch, to look at a new project being completed to bring water to areas of the ranch on which there was none before. The pipeline connects a well on the Flying M to Bar T Bar pastures in a wonderful display of neighborly agreement and collaboration.

The day started with the dozen participants, ranging from old friends to new community members with an interest in the goings-on of the ranch, meeting at the Bar T Bar Ranch Headquarters, by Meteor Crater, to learn why we were there, where we were going, and what we would see throughout the day. Presenting maps were Jackie Holm, the new AZ State Land Department Flagstaff Range Resource Area Manager, Steve Cassady from the AZ Game & Fish Department, and Bob Prosser of the Bar T Bar Ranch. The maps were

descriptive of the ranch's topography, and some had details of projects from previous years, including infrastructure improvements and grassland treatments (*picture A on page 13*).

We then took a drive out to the newest drinking trough (or 'drinker') being installed along the pipeline, just under an hour's drive from headquarters. Duane Coleman, the foreman of the pipeline project, explained his work to the group and elaborated on the importance of the drinkers to both the cattle and the wildlife; while there is water on the ranch, part of the science behind ranching is distributing the livestock to ensure the grasses are grazed as equally as possible, to maintain a healthy landscape. Often, when there is water in only part of the pasture, the grasses on the other side won't be grazed as much, not by the cattle nor the wildlife. Installing such

waters in 'remote' corners of the pastures helps guarantee that the cattle, elk, antelope, and other creatures will be encouraged to graze the entire pasture (*pictures B, C*).

After meeting and having lunch with Duane, the group headed down to The Crack, a long but very narrow canyon cutting through a portion of the ranch (*picture D*). They explored and talked there for a little while, and then headed to a cell center. A cell center, in this case, is a set of corrals situated in the middle of a circle of intensively grazed pastures, shaped like pie pieces. Using this cell center is a necessity for gathering, processing, doctoring, sorting, and shipping livestock, although there are problems with the design, which we discussed.

For a late-season Day on the Land, this was a lot of fun and it was wonderful to see so many new faces join us! ▫

Rust from the Range



We found this at an old sheepcamp on the Bar T Bar by Diablo Canyon. Can you guess what it is? It has about a two-inch diameter, is perfectly circular, and even with the rust the middle piece is loose enough to move around.

Check back in the next issue of Ground Truth to find out what this rusty thing is!

Plant Spotting



<http://www.swbiodiversity.org/seinet>

Common Name:
Oneseed Juniper

Scientific Name:
Juniperus monosperma

Family:
Cupressaceae

On the Ground with Diablo Trust

Visit www.diablotrust.org or our Facebook page for more pictures. Articles about some events are on page 10.

FRSG Monitoring: October 17-28, 2016



Jackie Holm, the new AZ State Land Department Flagstaff Range Resource Area Manager



Steve Cassady (AGFD), Jackie Holm (ASLD), and Eric Burden and Joey Dahms (NRCS)



The tablet and cage for Unit 10 on the Bar T Bar Ranch

Day on the Land: November 19, 2016



Jackie Holm (ASLD) shows the group where the projects are located and where the field trip would take us. Deb Burney from the Flying M helped hold the map.



The newest tire drinking trough, completed and being filled



Listening to Duane Coleman, foreman of the pipeline project, as he explains his work



Our second-to-last stop was at The Crack, an amazing small canyon in the middle of the ranch! We had a lot of fun playing for a bit.



With Many Thanks to Our Sponsors:



As a member of 1% for the Planet, we grant 1% of sales to local environmental and conservation organizations including Diablo Trust.

Thanks to our customers, we've granted more than \$135,000 to the Flagstaff community.



FOR THE PLANET.

Downtown Flagstaff
24 N. San Francisco Street
(928) 226-2885
mountainsportsflagstaff.com

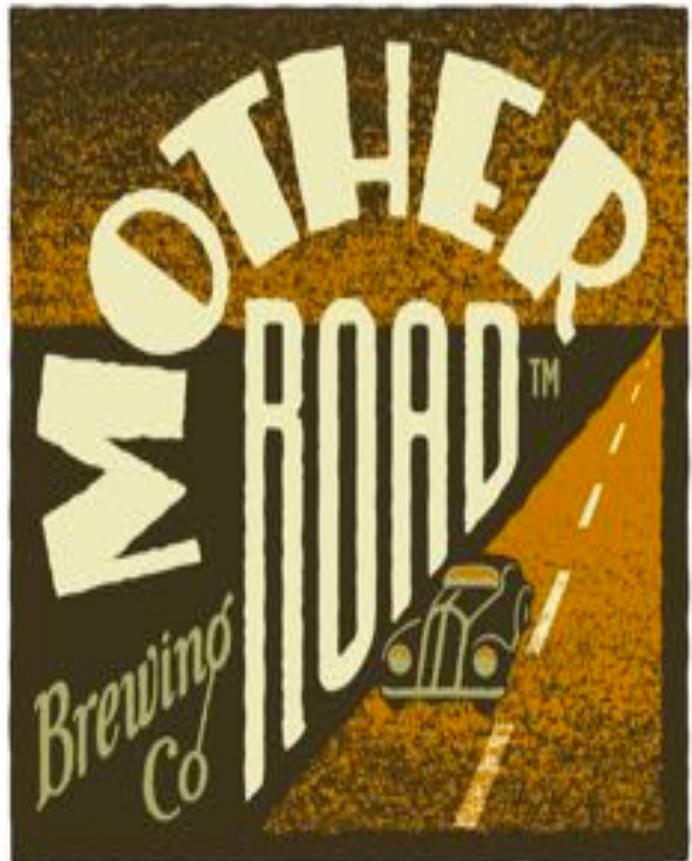
With Many Thanks to Our Sponsors:



*Improving
the Quality of Life
in Arizona and the West
SustainableArizona.org*



SedonaKind.org
*Be Kind Whenever Possible.
It Is Always Possible.*

HOPE

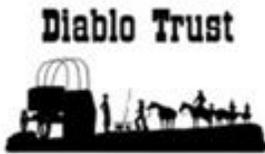
CONSTRUCTION

GENERAL CONTRACTING & CONSTRUCTION MANAGEMENT



*Canyon Diablo Spirits & Distillery
Artisan Crafted Spirits
Flagstaff, AZ
Available throughout Arizona*

**If you would like to sponsor
Ground Truth, please contact
info@diablotrust.org or go to
www.diablotrust.org/donate.**



Diablo Trust
PO Box 3058
Flagstaff, AZ
86003

NONPROFIT ORG
U.S. POSTAGE
PAID
FLAGSTAFF, AZ
PERMIT NO. 387

**Return Service
Requested**

***"Learning from the land and sharing our knowledge . . .
So there will always be a West"***

Upcoming Events

- Thurs-Sun, February 16-19: Flagstaff Mountain Film Festival • Orpheum Theater, 15 W. Aspen Ave, Flagstaff
- Friday, February 17: Annual Meeting: Conservation in Cattle Country • 8:30AM - 12:30PM • Thornager's on Kiltie Lane
- Tuesday, February 28: Book Club • 5:30PM - 6:30PM • Flagstaff Public Library, 300 W. Aspen Ave, Flagstaff
Soldier Sister, Fly Home, by Nancy Bo Flood
- Tuesday, February 28: Agriculture to Appetites: Strengthening Food Connections in a Changing Arizona •
6:30PM - 8:30PM • Yavapai College Verde Valley Campus Community Meeting Room (Clarkdale)
- Tuesday, March 28: Book Club • 5:30PM - 6:30PM • Barefoot Cowgirl Books, 18 N. San Francisco St, Flagstaff
The Rites of Autumn, by Dan O'Brien
- Saturday, March 25: Day on the Land: Condors and the Cliffs • 7:00AM - 5:00PM • carpool to Vermilion Cliffs
- Tuesday, March 28: Agriculture to Appetites: Strengthening Food Connections in a Changing Arizona •
6:30PM - 8:30PM • Venue TBA (Tuba City)
- Tuesday, April 4: AZ Gives Day • all day • www.azgivesday.org/diablotrust
- Tuesday, April 25: Book Club • 5:30PM - 6:30PM • Barefoot Cowgirl Books, 18 N. San Francisco St, Flagstaff
Beyond the Hundredth Meridian, by Wallace Stegner
- Tuesday, April 18: Agriculture to Appetites: Strengthening Food Connections in a Changing Arizona •
6:30PM - 8:30PM • Ashurst Auditorium (Flagstaff)
- Tuesday, May 23: Book Club • 5:30PM - 6:30PM • Barefoot Cowgirl Books, 18 N. San Francisco St, Flagstaff
Lonesome Dove, by Larry McMurtry

If you have suggestions for events, books, films, presentations, or field trips, please do not hesitate to contact us!

For further information on these and other events, please email info@diablotrust.org or call (928) 523-0588.
Please also visit our website, <http://www.diablotrust.org/calendar>, for more details on these and future events.