

ARIZONA WILDLIFE

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ARIZONA WILDLIFE NEWS

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AWF MISSION STATEMENT

AWF is a non-profit organization dedicated to educating, inspiring and assisting individuals to value, conserve, enhance, manage and protect wildlife and wildlife habitat.

Our cover photo was submitted by the Arizona Game and Fish Department and was taken with a remote camera set up at a wildlife watering station. Given the high temperatures and low rainfall this past summer, wildlife waters such as these were essential to the health of Arizona's wildlife.

The back cover photos were taken by Ryan Kreuzer at the September Becoming an Outdoors Woman event held at Friendly Pines Camp in Prescott.

Special thanks to Ryan Kreuzer for the cover design & layout.

If you have a photo you would like to submit for our cover, please contact Kimberlee at awf@azwildlife.org

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Message from the President

By Brad Powell

As summer comes to a close, activity in our nation's capitol continues on a hectic and erratic path. The Arizona Wildlife Federation just completed a successful trip where we held meetings with our Congressional delegation, Secretary of

Interior, Undersecretary of Department of Agriculture, the Council on Environmental Quality (CEQ) and the Commerce Department. Our meetings were focused on keeping the mineral withdrawal moratorium around the Grand Canyon and permanently reauthorizing the Land and Water Conservation fund. We made progress on both fronts.

The Department of Interior indicated that they did not intend to weaken the mineral withdrawal moratorium and that they would work closely with the Department of Commerce in its upcoming reports on the production of critical minerals (uranium) and the determination of the need for quotas. We were encouraged in the discussions but remain vigilant until final decisions are reached.

The Land and Water Conservation Fund (LWCF), America's most successful conservation program, had been hanging by a thread with literally days left before its expiration on September 30. While AWF's team was in Washington, due to the outstanding work of Congressman Grijalva, a lifeline began to develop for this essential program. Congressman Grijalva announced an agreement with the chairman of the House Natural Resources Committee to permanently reauthorize this important program. In addition, the agreement paved the way for a new Parks Maintenance Bill to move forward.

In Arizona, the LWCF has provided over \$235 million for outdoor recreation over the last 50 years. The benefits of the LWCF program can be found in virtually every community in our State. Access and recreation opportunities have been enhanced at the Grand Canyon National Park, Saguaro National Park, Lake Mead Recreation area, Coconino National Forest, Buenos Aires National Wildlife Refuge and the San Pedro Riparian National Conservation area. Hundreds of additional recreation projects have occurred in our State and community parks.

The news that the reauthorization of LWCF was proceeding was certainly encouraging, but much work remained to be done. The agreement reached by Congressman Grijalva successfully navigated the legislation out of the House Natural Resources Committee, but the Bill then needed to pass the House of Representatives and the Senate. In addition, it was anticipated many "poison pill" bad amendments (5 were defeated in the Committee) might be attached to this bill as it proceeds through the process. Unfortunately, time ran out before the bill was reauthorized.

For more than 50 years, the LWCF has delivered on-the-ground conservation achievements to communities across our State. In particular, benefits to rural America and the small

communities that depend upon the hunting, fishing and outdoor recreation economy for economic development depend on this key program. In addition, urban opportunities to get our youth outdoors will suffer significant losses without the reauthorization of the program. Outdoor recreation supports 210,000 jobs, generates \$5.7 billion in wages and salaries and produces \$1.4 billion in State and local tax revenues. Over 1.5 million people participate in hunting, fishing and wildlife watching in Arizona, and they contribute over \$2.1 billion to the States economy.

LWCF is not funded by taxpayer dollars but from fees collected from offshore oil and gas extraction. Let's not break the 50-year-old promise to the American people to invest a small portion of the royalties generated from offshore oil and gas drilling to enhance our National Parks, State parks, community recreation programs, hunting and fishing access, trails and open spaces. AWF, along with other conservation groups across the country, are still working to get LWCF bills approved by the House and the Senate and ultimately signed by the President. Please thank Congressman Grijalva for his leadership on this key issue and contact your Congressional representatives to ask for their support of the permanent reauthorization of the Land And Water Conservation fund.

In addition to the uranium moratorium and LWCF, AWF has also been working on several other campaigns, including Climate Action for Wildlife. Working with National Wildlife Federation, the campaign aims to raise awareness and address impacts of climate change on wildlife. Toward this effort, the theme of this edition of Arizona Wildlife News (AWN) is wildlife and our changing climate. You will find contributions from several of our Board members on wildlife, habitat, precipitation, and wildfire. This is the first of many thematic issues of AWN. Look for future editions of AWN to focus on themes including water, hunting, and collaborative conservation.

Letters to the Editor

Keep your communications short and to the point. All must be signed. If you send us questions, we will seek answers and print them here. There may be times mail volume may prevent us from publishing every letter we receive, but we will do our best to print as many as possible.

Send your 'snail mail' to:
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Regional Roundup

Highlights from AWF's Regional Directors



Arizona Wildlife Federation divides the state into regions in the same manner as the Arizona Game and Fish Department. This map depicts each of those regions and the members of our Board of Directors who serve as directors for each area. Our Regional Directors are busy! In this column, we present a few of last season's activity highlights from selected regions. For their full and complete reports, visit our website at www.azwildlife.org

REGION 1

Bob Vahle, Regional Director

Apache-Sitgreaves National Forest (ASNF) Projects Update

On behalf of AWF, Region 1 Director, Bob Vahle, continues to track proposed land management projects that are planned for implementation on the ASNF. During this reporting period he has been reviewing the 3rd Quarter Fiscal Year 2018 - ASNF 5 Year National Environmental Policy Act (NEPA) schedule to identify proposed Forest-level projects that are of key interest to AWF in

respect to their potential effects on wildlife, wildlife habitats, and public recreation that may be implemented in the next two years. Key projects that AWF will be tracking include:

1) Phase 2 of the Rim Country Forest Restoration project as part of the Four Forests Restoration Initiative (4FRI) that would treat extensive acreage of Ponderosa pine through the use of mechanical thinning and prescribed fire on the Black Mesa and Lakeside Ranger Districts to improve forest health and reduce

wildfire potential.

2) Completion of the Travel Management plan for the ASNF, which will address desired open road density for public use on the ASNF and Off-Highway Vehicle (OHV) use and regulations.

3) Black River Forest Restoration Project, which would treat extensive acreage of Ponderosa pine, mixed conifer, and spruce-fir habitats within the Black River watershed on the Alpine and Springerville Ranger Districts through mechanical thinning and prescribed fire to restore forest health and reduce wildfire potential.

4) Completion of a management plan for the Heber Wild Horse Territory on the Black Mesa Ranger District.

5) Revision of the livestock management plans for the Wildbunch and Stateline Range Grazing Allotments on the Clifton Ranger District to improve ecological conditions of the vegetation, soils, and watershed.

6) Bear Wallow Creek Fish Barrier Removal and Bear Wallow Pesticide Application projects as they relate to the Arizona (Apache) Trout Recovery Program.

Mexican Wolf Recovery Program - Update

As reported by the Arizona Game and Fish Department as part of the Mexican Wolf Recovery Program - Interagency Field Team (IFT), the year-end minimum population count for 2017 was 114 wolves in the wild in Arizona and New Mexico. Annual surveys are conducted in the winter when the population experiences the least amount of natural fluctuation (i.e. in the spring the population increases dramatically with the birth of new pups and declines throughout the summer and fall as mortality is particularly high on young pups). The IFT summarizes the total number of wolves in the winter at a fairly static or consistent time of year. Counting the population at the end of each year allows for comparable year-to-

year trends at a time of year that accounts for most mortality and survival of young pups. At the end of July, there were 71 wolves with functioning radio collars that the IFT was actively monitoring.

Other Region 1 Highlights

Regional Director Bob Vahle attended the AGFD - Show Low HPC meeting to identify and evaluate potential wildlife habitat projects to be submitted to the AGFD for funding consideration by the State Wide HPC Committee later this year. Bob also represents AWF on the Heber Wild Horse Working Group and participated in several work group meetings and conference calls during this reporting period to help identify and recommend potential management strategies for consideration by ASNF staff in their development of a management plan for the Heber Wild Horse Territory.



A Mexican wolf in its enclosure acclimatizing to the site before release.

REGION 2

Tom Mackin, Regional Director

Continued Drought in the Region

At the start of this reporting period, Region 2 was in the throes of an 8-10 month severe drought with fire dangers off the charts. Fortunately, the monsoons arrived pretty much on schedule by early July and they've been steady ever since and we're now at or slightly above average precipitation on a year-to-date basis. There have been numerous lightning strike fires but fortunately none of them caused too much damage and several provided beneficial land management objectives, totaling over 24,000 acres since October 1st.

Many wildlife/habitat NGOs have been hauling water for wildlife since last fall and the monsoons have provided much needed precipitation so these dedicated groups can turn their efforts to other worthwhile projects, fence work, water development repairs, wetland and riparian area protection and numerous other tasks. One of these groups, Friends of Northern Arizona Forests (FoNAF), recently rebuilt an important water development, NW of Flagstaff near Saddle Mountain in GMU 7E.

Four Forests Restoration Initiative (4FRI) efforts in the first EIS area continue at a very slow pace, especially early in this period when the forests were under cutting restrictions or in some cases completely closed so clean-up operations could not even be completed. Additional timber offerings have been made and the Flagstaff Watershed Protection Project, FWPP, has been able to gear back up, making steady progress with this unique publicly funded program.



Members of the Friends of Northern Arizona Forests gather for a well-deserved photo op after completing their latest project, rebuilding a wildlife water catchment apron north of Flagstaff at Saddle Mountain.



Stock tanks throughout the region filled once the summer monsoons brought much needed rain

REGION 3

Loyd Barnett, Regional Director

Wet Monsoon Followed a Dry Winter

As reported in some of the other Regions, it has also been a generally wet monsoon in Region 3. The monsoon followed one of the driest winters on record -- Prescott reported only 2.07 inches for the October through April winter period, second only to 1905 at 2 inches, in records going back to 1876. As of September 7, Prescott had received more than 12 inches this summer. As usual the monsoons were not uniformly distributed, but most areas received storms and many were intense, causing localized flooding and some road damage. Several stock tanks in the Verde Valley, which had rarely seen water, were noted to be overflowing after a couple of the major storms. The climate change models forecast more intense monsoon storms, and the Region's average temperatures have been increasing for the last 25 years. Whether that is part of the cause, or it is just part of the natural variability, it is a reminder to be prepared for more of the same.

Other Regional Highlights

The Verde Watershed Restoration Coalition has been focused

on removing invasive plants along the Verde River and major tributaries and has made a great deal of accomplishment over the last several years. They are broadening their focus on restoration beyond the riparian areas and have task forces developing plans and coordinating requirements. They have developed a native plant seed nursery and are working with Camp Verde parks.

Regional Director, Loyd Barnett, along with Region 2, Director Tom Mackin, attended a meeting with the Coconino National Forest Supervisor and key staff regarding their recently approved Forest Plan. Loyd and Tom expressed some concerns regarding the travel management plan (which was previously developed and was not part of the Forest Plan). However, they supported much of the plan as it applied to habitat management. The big unknown is funding to accomplish the Plan's objectives.

Loyd also continues to monitor the proposed Big Chino pump-back hydroelectric generation project as it goes through the early stages of public involvement and environmental reviews.

Drought Conditions Keep Volunteers Busy in Region 4

Members / volunteers from AWF Affiliate, Yuma Valley Rod & Gun Club (YVRGC), have been busy working with the Arizona Game and Fish Department in Region 4 building new water catchments and hauling water for wildlife. Trying to keep ahead of the continued drought conditions we are suffering throughout the state is not an easy task. So far this year the YVRGC has assisted in the building of two complete new systems and expanded two existing ones. These four catchments combined are now capable of containing 44,000 gallons of much needed water.

Perhaps even more important, many groups throughout the state have been busy hauling water for wildlife, and YVRGC is no exception. Since May, the Club and its volunteers have helped haul over 392,000 gallons of water in Region 4 alone. When they are not busy doing all the above, volunteers are checking water levels on hundreds of catchments and performing maintenance work on older ones that have not yet been replaced with the newer, more efficient systems. Chris Mitchell, Region 4 Director, states, "My hat goes off to the volunteers, not just in Region 4 but around the entire state, that take the time out of their busy lives to make sure our Wildlife and Wild Places continue to thrive in Arizona."

REGION 4

Chris Mitchell, Regional Director



REGION 5

Glen Dickens, Regional Director

Region 5 Director Represents

On June 16th, Regional Director, Glen Dickens, attended and helped MC the annual Arizona Antelope Foundation (AAF) and Hunter Recognition Banquet in Tempe, Arizona. This is the annual event where successful Arizona Wildlife Trophies Book Annual Awards are presented and there were 27 deserving recipients. See the Trophy Book section of this newsletter for more information about the event.

On July 9th and 27th Glen, along with AWF Board member, Chris Mitchell, attended and co-chaired an AWF sub-committee to develop education funding options for the Arizona Game and Fish Commission. They developed three options and those have been

submitted to the Arizona Game and Fish Department for consideration.

Also in July, Glen attended an A G F D - A A F sponsored pronghorn survey at Allen Flat northwest of Wilcox. He also represented AWF and AAF at the annual Arizona Game and Fish Habitat



Partnership summer meeting held in conjunction with the AZ Cattle Growers. It was very successful meeting with over 100 attendees.

Welcome to Our Public Lands Organizers! Meagan Fitzgerald and Espen Yates



I graduated from the University of Central Missouri with a Bachelor of Science Degree in Community Health in December 2017. My time there showed me the importance of being a part of the community and raising my voice about issues that I am passionate about. Thanks to my involvement in leadership roles such as an organizer of Earth Week, I found my passion in activism for the environment and landed an internship in Denver, Colorado. There I worked with an environmental group to stand up for access to public lands. It was an eye-opening experience that showed me just how many people love the ability to enjoy the outdoors of their own free will.

Here at AWF, I am a public lands organizer, working to keep public lands in public hands. Although I have only been with AWF for a few months, I have learned how to focus on the issues most everyone wants addressed and how different organizations are working together to achieve these victories. I can portray these learned lessons in every aspect of my life and am excited to continue to grasp new strategies for victories in the conservation world!



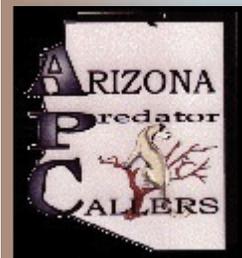
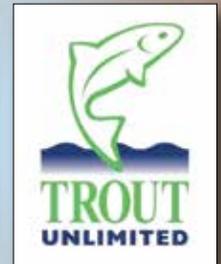
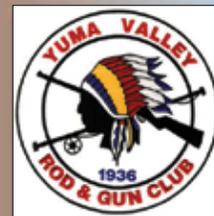
My name is Espen Yates and I am one of the new Public Lands Organizers with the Arizona Wildlife Federation. My passion for the environment started early in college at Northern Arizona University. Being surrounded by the pines and the San Francisco Peaks in Flagstaff Arizona, I grew a love of the outdoors. During my first year of college I was studying art and I wanted to become an artist.

Then, seemingly all at once, I changed my focus to Environmental Studies. The presence of nature around me made me want to better understand the connections between people and places. I wanted to learn how to communicate environmental ideas in a personal way that people could relate to.

I am grateful to work with Arizona Wildlife Federation, because I now have the opportunity to collaborate with people and organizations who share my passion. AWF has also helped me reconnect my love of the environment with my love of art and design. I enjoy developing new visual content for campaign outreach to help people better understand why we do what we do, and how they can help. All my AWF colleagues are a joy to work with, and I look forward to continuing my work with AWF in the future.

Working together, the AWF and affiliated organizations are better able to address the various conservation concerns that we have in common. This close association allows our voices to be combined on issues and amplifies our messages, which reach local, national, and state levels.

AWF Affiliates



Conservation Corner:

Notes from the National Wildlife Federation

By Lew Carpenter



Lew Carpenter is National Wildlife Federation's Director of Conservation Partnerships in the Rocky Mountain region. Lew works directly with NWF affiliates in Colorado, New Mexico, Arizona and Nebraska.

the 30 Major League Baseball stadiums have roofs, so most teams are very vulnerable to weather-related issues. The remaining 23 MLB teams have 20 major cities that they call home (some cities have more than one team).

The Weather Channel's Climate Disruption Index looked at six factors to determine the top 25 U.S. cities most vulnerable to climate change: sea-level rise, extreme precipitation, extreme drought, urban heat islands, and changes in precipitation and temperature.

Of the 20 cities hosting roofless MLB teams, more than half of them were among the 25 cities the Climate Disruption Index lists as most at-risk from climate change. But these changes will not affect every part of the country in the same way. According to the third National Climate Assessment, incidences of very heavy precipitation are up 71 percent from Maryland to Maine, up 37 percent in the Midwest, and 27 percent across southern states from Louisiana to Florida and Virginia.

National Wildlife Federation's report, *Safeguarding Summer* (link below), chronicles the latest scientific findings on climate change issues as they relate to summertime. Baseball is but one of the activities effected. The report also presents recent developments in the fight against climate change and how we can engage on these issues to save our summers now and for future generations.

What's at Stake

- The nationwide economy supported by outdoor recreation— jobs that can't be outsourced
- \$887 billion annually and 7.6 million jobs
- In 2016, 103 million U.S. residents 16 and older participated in wildlife-related recreation
- Over 35.8 million fished, 11.5 million hunted, 86 million participated in at least one wildlife-watching activity

Recommendations & Solutions

- Safeguard wildlife and wildlife habitat from climate change by increasing the health and resiliency of ecosystems
- Significantly expand large-scale conservation funding investments for wildlife at the national level
- Invest in clean, wildlife-friendly energy and improve energy efficiency
- Reduce emissions from the transportation and power sectors

The new report on *Safeguarding Summer*, with additional information and recommendations posed by NWF, may be found at: https://www.nwf.org/-/media/Documents/PDFs/NWF-Reports/2018/Safeguarding-Summer_2018.ashx

Safeguarding Summer

With each passing summer, more of our summertime activities are affected by climate change. Some of these changes are direct connections like hotter summers contributing to droughts and wildfires or to an increase in hurricanes, flooding, and sea level rise. Other connections to climate change are less readily apparent but not less significant, such as increases in toxic algae outbreaks or parasites like ticks and mosquitoes that each can put local communities, pets, and wildlife at a greater risk. Even summer pastimes like baseball are being affected by climate change both on and off the field.

Increasing weather extremes from climate change affect... yes, baseball!

Rain. Baseball's mortal enemy. Thanks to climate change, extreme weather conditions are becoming the new normal. This season, the Weather Channel reported that rain and other extremes like ice/snow/cold had postponed 28 games by the end of April— breaking the MLB record for most "weather-related postponements" since they started keeping track in 1986. (The Associated Press reported that the previous record was 26 games). These climate trends and shifting rainfall patterns are going to continue to affect baseball around the country. Only 7 of

Legislative Update

Reflections from Washington D.C.

By Scott Garlid

An optimistic look at 2 critical priorities

The Arizona Wildlife Federation took a message of common sense and valuing public lands to Arizona Representatives and Federal Agency leaders in the nation's capitol this past month. Our message on the importance of keeping uranium mining away from the Grand Canyon (it just doesn't make sense) and full funding of the Land and Water Conservation Fund (it makes total sense) was based on what AWF prides ourselves on—sound science, common sense, and a love of the outdoors.

Some of these meetings were uplifting and cautiously celebratory, like talking to Arizona Congressman Raul Grijalva about the Land and Water Conservation Fund immediately after the bill passed in the Natural Resources Committee. Others were more like logical discussions between concerned people on important topics, like the meeting with the Department of Commerce where we discussed the impact of uranium mining and outdoor recreation on the economy of northern Arizona. Still others were flat out difficult, like meeting with a couple individuals who clearly weren't happy to hear that we believe they are on the wrong side of an issue, and perhaps even less happy to know that our members are paying attention and will speak up for public lands.

On the issue of the uranium mining moratorium around the Grand Canyon (see Arizona Wildlife News—Summer 2018 edition), the meeting with the Department of the Interior was difficult, and Deputy Secretary Bernhardt stopped short of a formal acknowledgement of support for the existing moratorium. But it was clear that we have the Department's attention on the issue, including a quick chat with Secretary Zinke himself, and it was encouraging to know that the different departments we spoke to (National Forest Service, Department of Commerce, Council of Environmental Quality), are talking with each other

and including in their discussion the Arizona Wildlife Federation's concerns and consideration for wildlife, habitat, and outdoor recreation.

The business of getting the Land and Water Conservation Fund (LWCF) permanently authorized and fully funded was particularly exciting. AWF's perspective is that it would be terribly irresponsible of the current congress not to reauthorize and fully fund the program. The LWCF has broad bi-partisan support and has been a great conservation program for over 50 years. It gets communities outdoors and supports everything from local soccer fields, to hunting and fishing access on public lands, to State and even National Parks. But for a variety of reasons, the bill to reauthorize LWCF was stuck in the Natural Resources Committee and headed toward expiration at the end of September. It was exciting to watch the wheels of Washington in action as deals were being cut, amendments proposed, votes cast the bill finally passed the Committee, all while we were there. Somewhat surprisingly, LWCF is not well understood by some legislators, so it was particularly timely for us to meet and educate some of the Arizona Congressmen on LWCF prior to it coming to the House of Representatives for a vote.

At this point, we are cautiously optimistic on both the LWCF reauthorization and the uranium mining moratorium, but we need to remain vigilant with both issues and we still need your help. There are still opponents of the LWCF who will now set their sights on trying to cut it back or stop it in the House, and there are still uranium mining companies who will continue to push to open the Grand Canyon to more uranium mining. Please go to our new website at www.azwildlife.org to learn more about these two critical issues and to add your voice to stand up for public lands and outdoor recreation.



AWF 2018 Annual Meeting

LIVING WITH A CHANGING CLIMATE

By Loyd Barnett, Region 3 Director

"If you don't like the weather in Arizona just wait 15 minutes and it will change." We have often heard that cliché. And, it is true — Arizona does have a long history of a changing climate.

Climate History

To evaluate climate change, it is important to look at climate conditions over time. Although geological studies describe conditions extending back hundreds of million years, a time period that may be easier to grasp is the Holocene, which makes up approximately the last ten to twelve thousand years. The Holocene followed the end of the Pleistocene, which included the most recent episode of the Ice Age and southward advances of glaciers in North America.

Scientific studies have described the differences in southwestern vegetation between the end of the Pleistocene (beginning of the Holocene) and the current situation. Back then, spruce-fir, mixed conifer or sub-alpine forests covered much of the area occupied today by pinyon-juniper woodlands. Ponderosa pine was virtually absent and packrat midden records indicate it came into the southwest only in the last few thousand years. Additionally, scientists point out that migration of plant communities (e.g., movement of plant groups such as pinyon-juniper northward and up-elevation) initiated early in the Holocene, is still ongoing, but in some areas, at an accelerated rate.

Tree ring scientists described 20th century climatic trends in the southwest as including wet winters in the early part of the century (1905-1930), a mid-century dry period (1942-1964) and the last quarter of the century beginning in 1976 characterized by warm, wet winters and erratic summers. They found that tree ring width for a variety of conifers in the last quarter of the 20th century was unprecedented in the last one thousand years, believed to be due to the combination of precipitation and warmer temperatures. These types of environ-

mental responses are due more to long-term climate change rather than seasonal climate variability.

A Variable and Changing Climate

Climate variability is the variation in climate from year to year and decade to decade about a general average. Climate change is a long-term change in average or range. The two overlap and are often difficult to distinguish. The Southwest has long been known for climate variability, especially in terms of precipitation. To illustrate, precipitation in Prescott has been analyzed for more than 140 years, beginning with measurements taken by the U.S. Army at Fort Whipple in the 1870's. Figure 1 illustrates Prescott precipitation from 1876 through water-year 2018, with both winter and summer precipitation shown together by water-year. The figure shows that there has been, and continues to be, a great deal of variability in both winter and summer precipitation, with the variability being somewhat greater for winter than summer. There were periods of drought near the turn of the 20th century, just as there

has been leading into and continuing in the 21st century.

Geologists and tree ring scientists have found evidence of a series of droughts in the last several thousand years, including some lasting for several decades. Droughts and wet periods affect episodes of recruitment and mortality in plant communities, such as described above. In addition to droughts, the Southwest has also seen its share of floods. Paleo-hydrology studies reported evidence of a number of floods in the last 1000 plus years with the greatest frequency in the last 600 years. A 2002 report pointed out that 7 of the 10 largest flood peaks since stream gage records and flood calculations began in the late 1880's had occurred since 1978, a period also with documented El Niño episodes.

A History of Drought and Floods in Central Arizona

Early settlers in central Arizona found a variable climate as well. Joseph Pratt Allyn reported on experiences in Arizona between 1863 and 1866. He was a judge appointed by President Lincoln to accompany the first territorial governor following establishment of Arizona as a territory. In March 1864, he accompanied an exploratory party traveling from near Prescott to the Verde River and then down the Verde. (At this time there had not yet been any European settlement in the Verde Valley.) As they crossed the lower end of the Verde Valley (where the most recent floods had most likely been two years prior, in January 1862), he observed,

"The terrible floods of two or three years ago have furrowed this valley with channels, paved it with smooth round stones, and strewn it with drift wood. The volume of water must

Photo by Chris Schnepf, University of Idaho



The growth rings on trees such as this long-lived ponderosa pine provide us with a snapshot of the tree's life history including the age of the tree, the local weather during the tree's lifetime, and fire history of the area.

have been immense, the stream there perhaps a mile wide. There is an abundance of cottonwood trees and mesquite bushes."

In January 1874, another major storm occurred and caused flooding in Granite Creek near Prescott where the Fort Whipple rain gauge measured 3½ to 4 inches in a five-day period. Flow in the Verde River near Camp Verde was described as being very destructive,

"...sweeping away a dam and seriously injuring a ditch, built by the troops to supply the post with water."

As has been the case in some of the recent flood years (e.g., 1993), the January 1874 flood was followed by another very large storm and flood in February. The Prescott newspaper reported that,

"...the oldest settlers declare this storm exceeds in severity and duration any previous one in northern Arizona."

Just five years later, in June 1879, Charles Douglas Willard and his brothers drove a herd of cattle into the Verde Valley from the northwest, reaching the river near present day Clarkdale. Seventy years later in writing of the early days he said,

"At that time there was no such a thing as erosion anywhere. The river channel was just wide and deep enough to carry the water in the summertime. And so far as evidence went, there had never been a flood in the river."

All the canyons and arroyos on both sides of the river were filled with live and dead grass. Whenever it rained, the water was held in these canyons and arroyos and was never allowed to reach the river. There was indeed no evidence that any rain falling in Arizona ever got out of the territory."

The natural cycles of drought and floods in the late 1800's had superimposed upon them the most widespread human impacts in recent history, with livestock using (and overusing) virtually all of the available rangeland. Settlers who had moved to the Southwest from more humid environments were generally not prepared for the intensity of the "boom and bust" cycles of precipitation and plant growth. Initially, the area seemed to be a "paradise"

for settlement. Willard, in describing his arrival in 1879, said that they,

"turned the stock loose in the finest pasture to be found anywhere. The grass was knee high and as thick as it could stand."

In describing what subsequently occurred, Willard states,

"However, almost every settler who came into the country brought cattle and horses, and soon the range was well stocked. These animals would stay in the shade of the trees and graze on the vines. In the evening, they would meander out on to the mesa to graze, returning to the river to drink and enjoy the shade. Generally they traveled single file, and naturally they soon had a trail in the yielding earth."

Besides eating up the grass that had grown for centuries, and tramping into the ground what they did not devour under their feet, the soil became packed so that when the rains came the ground would shed water like rain off a roof. About 1880, the river began cutting on the banks. From that time to the present, it has never quit."

After the cattle herds had built up to peak numbers, the effects of dry years began to take their toll. Large numbers of cattle died of starvation.

In 1890, and again in 1891, major floods struck central Arizona. In February 1890, a one hundred feet high dam on the Hassayampa River failed due to an inadequate spillway and 80 people, mostly in a downstream mining camp, were lost. In February 1891, the lower Verde River experienced peak flows estimated to be among the highest in the last 1,000 years.



The Verde River is roughly 170 miles long and is one of the largest perennial streams in Arizona. It is a major tributary of the Salt River.

Our Climate is Changing

Regardless of anyone's belief in the cause, or causes, the climate is changing, as reflected in weather records and physical and biological responses. Predictive models, which have been tested on past and recent weather and climate, suggest that the recent changes will continue and likely accelerate over the coming decades. Predicted effects, which have already started, include:

Warming temperatures

These warming temperatures include generally warmer winters, which means reduced snowpack and earlier snow melt. Shorter winters and earlier snowmelt affects the timing of natural cycles such as plant blooming and peak river flows. The earlier snow melt increases the drying period for fuels on the forest floor and contributes to an earlier, longer, and frequently more intense, fire season. Heat waves during the summer are expected to be longer with more days of extreme heat. Since the mid-1970's temperatures have been rising. The Forest Service's 2010 report stated that since 1976, average annual temperatures in Arizona had increased by 2.8 degrees Fahrenheit. Warmer temperatures create greater stress on vegetation, even with the same amount of precipitation. A major die-off of pinyon pines in 2002 and 2003 was due to an extreme drought, coupled with very warm temperatures, resulting in a vulnerability to bark beetles. Examples of this were common in the area near Prescott. A slightly drier drought in the 1950's occurred; however, with cooler temperatures the same mortality did not occur.

Changed precipitation

The accuracy of forecasting precipitation is much less than for temperature. However, extremes of both droughts and floods are expected. Tree ring records point to "megadroughts" lasting for decades. The current drought period may become the new "normal" for the upcoming decades.

Drought projections indicate about a 5 percent reduction in total precipitation, and possibly 10 percent in southern Arizona. Increased warming may result in increasing monsoon intensity or duration, with resultant flash flooding. Hurricanes and other tropical cyclones are projected to become more frequent and intense. Although Arizona has no vulnerable coastal areas, some of our largest floods have occurred when a

remnant tropical storm encountered a frontal storm from the north or northwest (e.g., the 1970 Labor Day storm which killed more than 20 people, with the greatest number along Tonto Creek).

A greater percent of winter precipitation being rain, rather than snow, will result in reduced ground water recharge impacting local springs with shallow aquifers dependent on frequent recharge.

Changes in vegetation

We know that vegetation has changed over the last several thousand years. However, the magnitude of changes that occurred over thousands of years in the past may now occur in only one or two centuries. We are already seeing much of this effect. Areas with high intensity fires in lower elevation ponderosa pine are frequently coming back with alligator juniper and/or brush species such as Manzanita as the dominant plants. As the temperature warms and evapotranspiration stress increases, many vegetation species tend to move upslope and (at a regional scale) north. Droughts, earlier snowmelts with longer drying periods, and warm temperatures have all contributed to the recent increase in megafires, and the risk will continue or intensify.

Stressors which impact the existing vegetation often open the door to invasive species, which then tend to perpetuate. For example, buffelgrass has invaded areas of the Sonoran desert. It can often outcompete native vegetation for soil moisture and nutrients and has altered the fire regime in the desert. It sprouts back rapidly after a fire while the native desert vegetation does not, leading to a replacement of many native plants. A desert area covered with buffelgrass burns hotter than it would with native species, causing fire damage to long lived vegetation such as saguaros. As it replaces native desert vegetation, buffelgrass is prone to repeated fires, increasing the damage to remaining native cacti, etc. Further north at mid-elevations cheat grass often invades disturbed areas and then can outcompete native grasses as it germinates earlier in the spring and becomes established to take advantage of late winter and early spring moisture.

Habitats most at risk include the alpine forest, which has very limited extent in Arizona. The sky islands in southeastern Arizona are separated by desert, and temperatures pushing ecosystems to higher elevations may squeeze out some local unique species of both animals and plants. Many riparian and wetland ecosys-

tems will be impacted by the combination of extended droughts, reduced water replenishment, and higher temperatures.

Wildlife effects

Biologists have observed that the natural reaction of species to climate change is to redistribute, or migrate, to more favorable habitats. Some species (e.g., elk) have shown an adaptability to change while others have not. As with vegetation, some species with currently very limited habitat may be squeezed into a much smaller area (e.g., the very top of a mountain range) and have difficulty retaining viable populations. Fragmentation of habitat (e.g., large desert areas between mountain ranges or major transportation corridors across traditional migration routes) limits the ability of some species to move to more suitable habitat.

With reduced snowpack and more of the winter precipitation running off to streams earlier, the amount of local groundwater recharge available to provide base flow, or flow during the dry season, will continue to be reduced. This will reduce streamflow during its low period, resulting in higher water temperatures, which impacts the normal reproductive cycle of fish and other aquatic fauna. Water and springs and seeps will often be reduced in quantity and some may become unreliable in dryer periods. Reduced available water locations may lead to more crowding near the remaining waters and greater competition for available suitable habitat.

What Can Be Done?

While we are already witnessing many of these climate effects, the degree to which predicted changes are expected to occur depends largely on the levels of heat-retaining gases in Earth's atmosphere. Developing systems that are more resistant to extreme events or resilient to both extreme events and general changes in precipitation and temperature may slow down, or sometimes mitigate, the adverse effects of the changing climate.

Planning for extreme events such as storm flows is important. Previous design criteria for storm flows may need to be altered in road and bridge design. Reevaluation of flood plains to anticipate more frequent, and possibly larger, extreme events is important.

Because of the more irregular precipitation pattern with droughts becoming more common plus some very intense rainstorms, water storage increases in importance. Water developments that

collect rainwater can benefit from larger storage capacity to take advantage of the infrequent very large storms or monsoon events and provide for longer periods with no significant precipitation.

Southwestern ecosystems evolved and adjusted with a highly variable and changing climate. Maintaining healthy ecosystems is important to respond to the extremes and disturbances likely to occur. Examples could include managing ponderosa pine at densities nearer to historical levels to maximize health and vigor. Management practices to achieve this include mechanical thinning and prescribed fires, such as is planned and approved in the Four Forest Restoration Initiative (4FRI). In grassland ecosystems, maintaining the health and vigor of the native vegetation, including a diversity of species is important. Healthy and robust root systems are quite important for storing both moisture and nutrients and for holding the soil. On the soil surface, a well distributed cover of plants, litter (dead and decaying plant material), and protective pebbles and rocks minimizes the amount of bare soil exposed to erosion from rain drops striking the surface and water forming into rivulets moving toward channels.

Managing to maintain connectivity of habitats becomes quite important for many species of wildlife. With increased human population growth and related traffic, safe and appropriately located crossings of major transportation corridors become even more important. Riparian areas are traditional travel corridors for many species, but are also very popular for recreation. In some locations limiting vehicular access to designated stream crossings, rather than parallel to the stream course, will be necessary.

The National Forests in Arizona recognize and acknowledge the existing climate variability and anticipate accelerated change as described above. In their most recently completed (or in progress) Forest Plans, all of Arizona's Forest Service Districts have incorporated directions to address climate change. ***The Forest Service's primary directive provided is to increase resiliency of major ecosystems using specific practices to improve health and vigor.*** Forest Management must include monitoring changes and effects, adaptive management practices, and continuing the iterative practice of monitoring and adapting.

A changing climate is already here. It is also expected to continue to change, although scientists predict it will be at a more rapid rate. There are numerous

sources of information available. The National Wildlife Federation has a number of short articles describing aspects of expected climate change as it relates to wildlife at:

www.nwf.org/Sportsmen/Climate-Change and the Arizona Wildlife Federation has Arizona-related climate information on its Climate Action for Wildlife webpage: <http://azwildlife.org/climate-change-info>

References

Numerous technical references were used in preparation of this article. The section on climate history was primarily excerpted from:

Barnett, Loyd O. and Richard H. Hawkins. 2002. Reconnaissance watershed analysis on the upper and middle Verde Watershed. School of Renewable Natural Resources, University of Arizona. 116 pp. Online at: http://www.verderiverinstitute.org/ReconnaissanceVerdeWS_Analysis.pdf

The Prescott precipitation graph was updated with data for the intervening period from Arizona Climate Summaries posted by the Western Regional Climate Center. <https://wrcc.dri.edu/>

There are many references on climate change. One that summarized much that is known, and which was referred to for this article is:

USDA, Forest Service. 2010. Southwestern Region Climate Change Trends and Forest Planning. 46 pp.

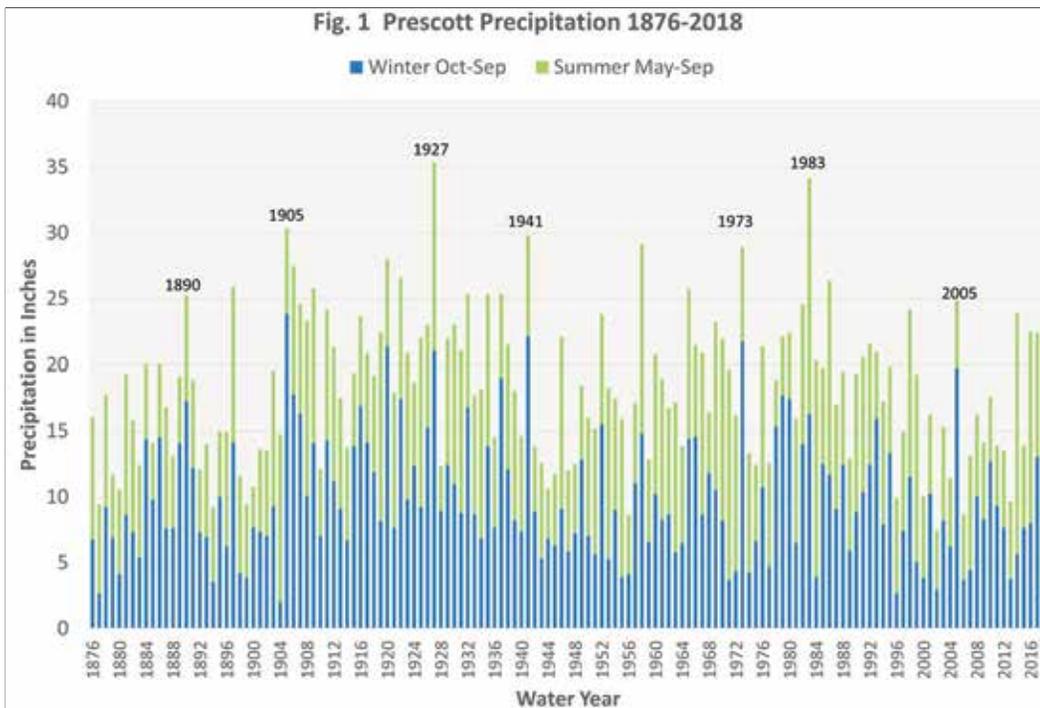


Figure 1 depicts the average annual precipitation (snow and rainfall) for Prescott, AZ from 1876-2018.

FIG. 2 VERDE RIVER STREAMFLOW 1889-2002

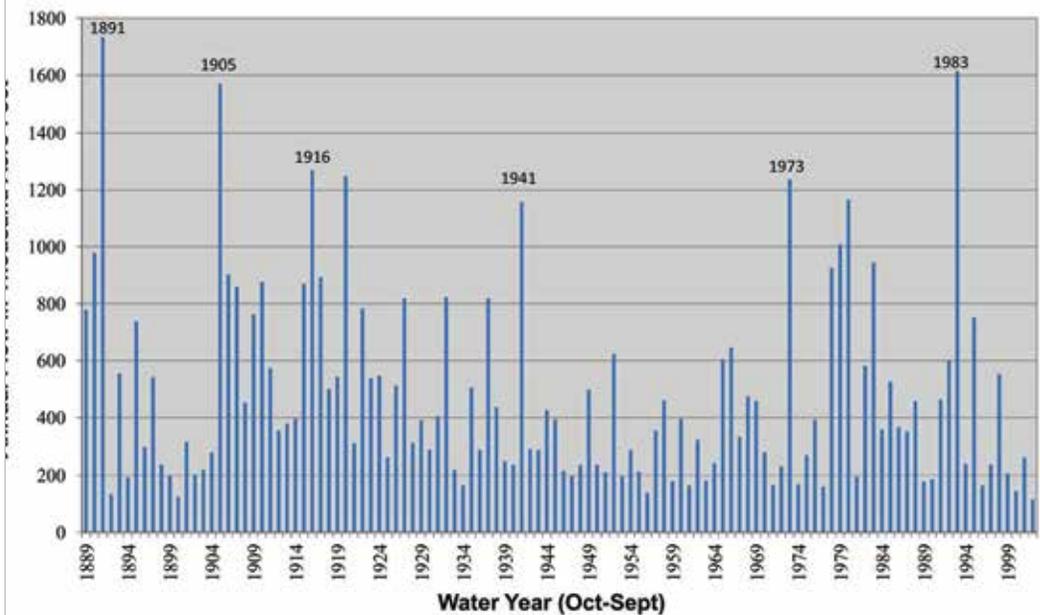


Figure 2 illustrates the variation of stream flow in the Verde River, though with a shorter period of analysis than the precipitation chart.

Precipitation and the "Water Year"

Precipitation is displayed and is analyzed on a water year rather than a calendar year basis. For hydrologic purposes this is more meaningful. The water year which begins October 1 and runs through September 30 of the following calendar year is numbered with the year in which it ends (water year 2018 runs from October 1, 2017 through September 30, 2018). Thus, it begins at essentially the end of the growing season when soil moisture reservoirs are more depleted. Succeeding precipitation begins to fill the soil moisture reservoir and surplus may flow below the root zone to recharge groundwater or flow overland into channels. The entire winter season is thus included, rather than being split between two calendar years. For the purposes of analysis and display, precipitation is divided into winter (October-April) and summer (May-September). Research in northern Arizona has shown that the majority of water yield occurs from winter precipitation, which is defined as October through April. Individual intense thunderstorms during the summer "monsoon" season may produce high peak flows but the volume of runoff is usually significantly less than that from the winter storms and snowmelt.

Wildlife and Wildfire

By Tom Mackin, Region 2 Director



Forest fires, such as the Shultz fire that burned near Flagstaff in 2010, can have varying effects on wildlife.

By early May of this year, tens of thousands of acres had already burned in our forests adjacent to Flagstaff in what appeared to be shaping up to be a very bad fire season. To say we'd been in a dry spell for the past several months would be a huge understatement, with May's precipitation at a near record of only 25-35% of average. Between the lack of winter moisture, somewhat normal high spring winds and temperatures that were more summer-like, the Forest Service and many municipalities enacted fairly significant fire restrictions and appropriately so in order to minimize or reduce human caused fires on the lands we love. Whether it was due to those fire restrictions or just luck, so far this year, we've escaped any catastrophic fires in Northern Arizona.

This brings up the question about the impacts of fire on wildlife and there are really very few surprises when you look into this question. For the most part, mammals, birds, and even reptiles and insects can usually leave the immediate area and seek shelter elsewhere. As expected unfortunately, those most often lost to fire include the very young, injured or in some other way hampered and unable to flee. If you look at the maps of the Rodeo-Chediski or Wallow fires, which consumed thousands of acres, the fires burned in a mosaic pattern depending upon vegetation, weather and geographic conditions and other factors so fleeing for many miles from the flames was not always necessary for much of our native wildlife. Like many of our other vegetation species, much of our wildlife has evolved in a fire regime and so they know what to do and how to avoid injury or death.

Because of these facts, the impacts to wildlife are often greater after the fires have passed. Depending upon the fire severity, important food sources may have been destroyed initially but personal observations indicate that for herbivores and omnivores like deer, elk, bears and turkeys, many acres are quick

to green-up and sprout luxurious new growth and with a newly opened canopy and reduced competition for water, nutrients and sunlight, these new plants may thrive for years. While many bird species need to find new feeding and nesting areas, for others (especially cavity dwelling woodpeckers), the recently killed trees can provide new homes often with an abundance of insects and beetles, a new feast is served.

Other impacts are not so beneficial, especially in riparian, wetlands or areas with many streams or springs. The runoff from sediment, ash and other debris as

well as more sunlight can significantly alter these formerly wet oases, no longer providing a suitable habitat for many species. Without adequate vegetation, many of these areas are prone to flooding and significant erosion further damaging these important environs. The same can be said when there is significant loss of timbered acreage that once provided hiding, bedding and thermal cover. For ground dwelling or foraging birdlife, loss of grasslands and forest understory also negatively impacts these species as well as those that depend on this cover for nesting sites.

In summary, while wildfires can be catastrophic and have devastating consequences, it's easy to see that there are often benefits in both the short term and future years and while some wildlife will perish, they're very resourceful and adapt to changing conditions.



Some animals, such as this Lewis's Woodpecker, benefit from wildfire.

Flagstaff Area Climate Trends, An Historic Comparison

By Tom Mackin, Region 2 Director

While the photo to the right, taken February 15, 2018 may look like all is well on the San Francisco Peaks, the reality is that we're once again in the midst of a significant precipitation shortfall. The Flagstaff area generally receives about 20-22 inches of precipitation each year. About 50% of that falls as snow during our colder months, September through March. Since 1900, when record keeping became more consistent and equipment for recording data more reliable and accurate, Flagstaff has averaged about 100-110 inches of snowfall in town at Pulliam Airfield each year. Since September 1st 2017, we have only received 18.8 inches versus an expected average to date of 68.5 inches, roughly a 70% shortfall. This snow pack is what insulates our forests, provides runoff water in the spring for our lakes, streams, and other natural and man-made water holes, and provides the drinking water for our municipal communities. Recent data collected for the Colorado River watershed in southern Utah and Colorado does not look much better with only about 18-30% of normal snow pack currently available. This does not bode well for Arizona and other nearby states that look to the Colorado for its primary water needs. It goes without saying that various land management agencies are also greatly concerned about our fire danger for the coming year.

Is this a catastrophe waiting to happen or the end of life in northern Arizona as we know it? Based on some research into what has happened in previous years, I think not. Looking at recent precipitation data, since 1960 we have experienced 23 years when precipitation has been above annual averages and 25 years when precipitation has been below average. While almost equal, a concern is that the variations have been more pronounced and with wider durations. And certainly these variations are making life more difficult. When it comes to temperature data similar information is also apparent. The period since 1950 has been the longest period of above average, warmer temperatures in the past 600 years. Specifically the decade between 2000 and 2010 has been the warmest ever by almost 2^oF. Additionally, each of the last three decades have shown consistent temperature increases, earmarked by fewer cold spells



and more extreme heat events.

With our primary interest in wildlife and wildlife habitat, the ramifications of these climate changes can be summarized below:

- Decreased available water, runoff, tanks, lakes, ditches
- Warmer spring, longer summer, increased water needs
- Greater fire danger and more extreme fire activity
- Drier soil conditions, less plant vigor, increased erosion
- More stress on livestock, wildlife, plant communities
- Reduced "carrying capacity"
- More manipulation required, increased labor, dependence on wells, hauling, etc.

In closing, I want to reiterate that we've been down this road before and we've been able to deal with these conditions but frequently the costs are great, the problems more expensive and difficult to control, and the impacts more far reaching and with higher consequences. We must continue to work for solutions including ongoing conservation measures, effective legislative actions, and open, transparent discussions concerning our future here in the Southwest.

Climate Action Heroes

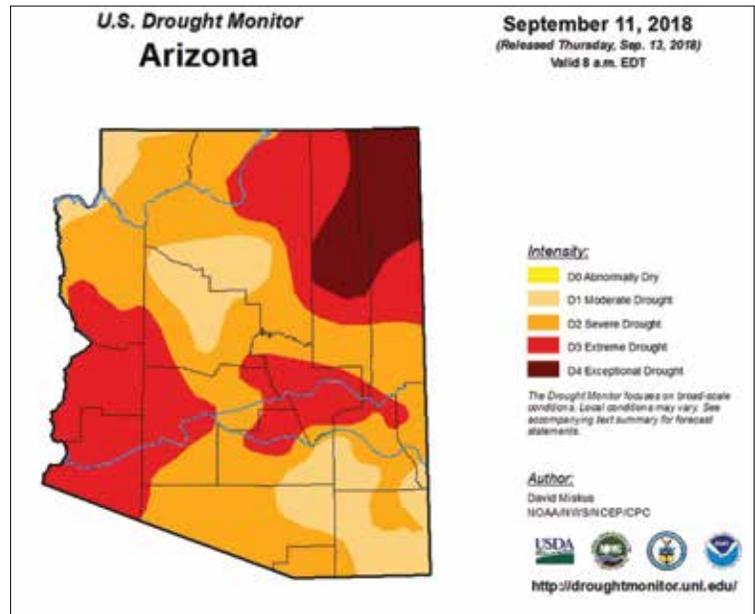
By Trica Oshant Hawkins

While over 83.98% of the state is currently classified as being in a severe drought, and while 2018 temperatures in Arizona are on track to be the 4th hottest on record (with only the three previous years being hotter), sportsmen across the state are taking action to safeguard wildlife during these environmentally challenging times.

Although the causes of climate change continue to be controversial, the current drought and increasing temperatures are scientifically documented facts. Most sportsmen agree that they are witnessing changes in wildlife habitat and in the movements and occurrence of wildlife. Rather than debate the whys of these notable environmental changes, the Arizona Wildlife Federation is lauding those that are taking action on behalf of our state's abundant wildlife. During these environmentally challenging times, there are many who are on the ground working hard to safeguard wildlife and improve wildlife habitat.

As environmental conditions change, one of the best things we can do is to safeguard wildlife and wildlife habitat from climate change. Healthy ecosystems are more resilient to the potential effects of climate change. By managing stressors such as water availability, access, water pollution, extreme flooding caused by rapid high-volume runoff from impervious surfaces and agricultural areas, invasive species, and habitat fragmentations, we have great potential to reduce the effects of a changing climate on wildlife. Here in Arizona, sportsmen and women, working in volunteer capacities, are taking on-the-ground action to safeguard wildlife and improve resiliency. At the Arizona Wildlife Federation, we are tracking and recognizing these heroic efforts with "Climate Action Hero" Awards. This past summer, two organizations across the state were recognized for their extraordinary efforts on behalf of wildlife. The Friends of Northern Arizona Forests (FoNAF), based out of Flagstaff, and the Southwest Wildlife Foundation (SWF), based out of Yuma, were both recognized for their heroic efforts to safeguard wildlife and wildlife habitat.

Volunteers with FoNAF have worked with the Forest Service



for eight years to help protect wildlife habitat in Northern Arizona forests. While they are actively involved in fencing, habitat improvement projects, and protecting riparian areas, FoNAF was presented the Climate Action Hero Award for their work on installing and re-building wildlife water catchments (trick tanks) north of the San Francisco Peaks, where drought has been severe. FoNAF volunteers have also delivered thousands of gallons of water to keep the trick tanks full for wildlife.

Yuma-based SWF volunteers have also been busy delivering water to heat-stressed wildlife. The group received the Climate Action Hero Award for delivering over 392,000 gallons of water to remote water catchments in the region. SWF is an all-volunteer arm of the Yuma Valley Rod & Gun Club, an affiliate group of the AWF. In addition to all they do for wildlife, they actively educate youth about conservation, hunting, and fishing.

The Arizona Wildlife Federation congratulates both organizations and thanks them for their heroic efforts. If you know of an individual or organization taking heroic measures to safeguard wildlife and wildlife habitat, nominate them for a Climate Action Hero Award. Contact trica@azwildlife.org for more information.



Tom Mackin accepts the Climate Action Hero Award for the Friends of Northern Arizona Forests



Chris Mitchell accepts the Climate Action Hero Award for the Southwest Wildlife Foundation

Trophy Book Corner

By Mike Golightly

I want to share with you some exciting news from the Trophy Book Committee's annual meeting held May 12th. Significant changes to the program were unanimously voted to include the following:

- The minimum entry scores for Typical and Non-Typical Coues Deer were lowered to reflect the paring space between Arizona Wildlife Federation and Boone and Crockett Club.
- Typical Coues Deer minimum is 100 B&C points
- Non-Typical Coues Deer minimum is 105 B&C points
- Velvet antlered animals will now be eligible for entry under a brand new category with no deduction for velvet. Minimum entry will be the same as non-velvet antlers. Each new category will also be eligible for the annual Awards Program with presentations given at the AWF annual banquet. Trophies will be awarded to the two highest scoring animals.
- Trophy Book entry fees are now \$30 for each entry. The fees for all other Special Awards program will remain the same.
- Turkey will now be included in the Arizona Trophy Hunter Award and the Arizona Big Game Award categories.

I recently measured a really large tom cougar taken by current AGFD Commissioner Jim Zieler on the White Mountain Apache Reservation. The Cougar scored 14 4/16. Also, I have updated the list of current official AWF measurers. Check out the Trophy Book Page on the AWF website (<http://azwildlife.org/trophy-book-awards>) for names and phone numbers.

Also, the annual Arizona Antelope Foundation and Hunter Recognition Banquet was held in Tempe, Arizona on June 16th. During this event, awards were given out as part of an annual competition that recognizes the unique, individual quality of big game animals in the state of Arizona. This year, 27 different Arizona Trophy Book Awards were presented for outstanding trophies in several categories selected at the discretion of the Arizona Wildlife Trophies committee. A number of honorable mentions were also awarded. For a list of recipients, visit AWF's Trophy Book Page at the link above.



Pictured above are Glen Dickens with his Rocky Mountain sheep, Hunter Carmen Lopez with the 1st place Javelina award and David Hussey and Bill Keebler with David's Arizona Trophy Heads & Horns Award, Arizona Big Game Award and Arizona Trophy Hunter Award. Below are the 2017 Arizona Antelope Foundation Certificate recipients.



All Three Hunts

By Aspen Mathis



2015



2017



2016

I have been on three magnificent hunts, all so full of forever-memorable moments and trophies. I am so grateful for every tag and every person who helped with the amazing hunts I have been lucky enough to be a part of.

2014: The first year I was eligible to put in for a tag. Sadly, I did not get drawn but that was expected for my first year. I was crushed. All I wanted to do was go on a hunt with my dad and grandpa. That year I worked on my aim and consistency to be ready with a rifle for the next time to draw a tag.

2015: I put in for a tag and waited eagerly to be drawn. Yet, once again I was not. My dad then stood in a line and got me the last tag that Arizona had to offer for Coues deer. By this time, I

didn't really care about the tag, I was too excited for my hunt and the memories to come. We loaded up the truck and trailer and headed down south. Joining me on my hunt was of course my dad and my grandpa, but also a family friend, Cody Newby. I didn't have any expectations for this hunt because at the time I had only heard my parents' stories but had nothing for myself to compare them to. Little did I know my dad would have to walk miles and miles a day through this beautiful canyon. By the second day of the hunt I was a little sore but tried not to show it. We went to the same spot as the day before and spotted the buck. While it was bedded down, we hiked a very steep side of the canyon to realize we were still way too many yards away. Cody and my dad made a plan to get closer. Cody stayed on the top and kept an eye on the Coues deer making sure we didn't spook it while moving in. My dad and I were in for an adventure we were not expecting. From point A to point B was an extremely steep rockslide to the bottom. I was so scared, and to be honest so was my dad. This path was intense. It took more than an hour to get where we were aiming for, only to find we were still over five hundred yards from the buck. With only the canyon between us, we found a spot to go, not realizing it was a tree root sticking straight out from the incline of this mountain. We spotted the buck and then planted our feet into the bottom of this tree and leaned back into the mountain where we then waited for what felt like forever for the buck to stand. I took this time to practice finding the buck in the scope and call my mom to fill her in on the progress. I made sure not to mention we were hanging off this cliff on a tree being able to see straight down to the bottom of the canyon. The deer started to move and we got the gun in place on a branch of the tree. I found him in my scope, adrenaline was pumping through my body, all that I can remem-

ber is my dad telling me to take a breath and slowly squeeze the trigger. He was down. Tears uncontrollably rushed down my face — these were tears of joy and my grin was ear to ear. My dad gave me the world's biggest hug and I could hear Cody yelling from the hill behind us. I called my mom and told her the amazing news and she was cheering through the phone. We began our trek to the buck. Back down the cliff and up the other side. It was a tough climb just to reach the buck but my excitement pushed me through. Reaching my Coues deer, taking pictures, and field dressing him for the pack out was way more work than I expected. We got it done and headed back to camp. We reached camp and I got to tell my papa the amazing news and he said that he was so proud of me, and that means so much to me every time he says it. That night the four of us celebrated with my grandpa's chili and some mountain dew soda that Cody insisted I try because that is all he drank. We made our way home and measured the buck at 115 inches. I was honestly confused why everyone was so excited about the size. I was thinking this was extremely small comparing it to my dad's New Mexico recorded elk that sits in our house. After some explaining, I came to the realization that it was a great buck, and the whole experience was something to be proud of. I could not have of asked for a better first hunt.

2016: This was the first year I was actually drawn for a tag. Trust me when I say, just because the hunt is an hour from your house doesn't mean there will not be plenty of adventure. The hunt lasted two weeks and I had to go home for a part of it. I loved this hunt because I could really work on my glassing. We glassed and hiked everyday. Some days were full of snow and others were blistering hot. I saw so many amazing things while glassing, my favorite sight during this was watching a buck bedded in a bright white snow bank. I think everyone was happy to have a little snow. My adventure continued when the ranger broke down and left us stranded for hours waiting for a ride. My grandpa and I built a fire and we all cozied up by the heat. I went to grab another sweatshirt and got stung by a bee that had flown into my pack during the day. I now know that I am extremely allergic to bees. My arm started to swell up and I did not have any Benadryl or an EPI-pen on us. When our friend Heath came to get us I was so happy. He had some allergy medicine that helped my symptoms. I don't leave home without an EPI pen now. After a couple days, I was ready to go find a buck. That is exactly what we did, going back to the freezing cold and glassed for what felt like forever until we found my buck. I want to thank my dad, Dusty Mathis, Justin Syler, Heath Tompson, Toby Gladen, Mike Newby, and Cody Newby for all the help making this an awesome hunt.

2017: I was drawn for the strip. This tag was definitely something that I was not expecting. The timing however was not ideal. I knew I had club volleyball tryouts that I could not miss Saturday of opening weekend. We knew we could not do this on our own so

we hired Mule Deer Addiction. This was one of the best choices we could have made. Our guide, Brett, had been watching several bucks but had a buck named Flames that we were going to hunt first.

It was finally time to go. I drove up to the hunt with Dar and Parker Colborn. My dad went up the day before and set up camp. We got to camp really late so I went right to bed. We woke up extremely early and it was freezing, well at least it was to me. Knowing that I had to head back to Phoenix that night to make my tryouts, I was extremely nervous about finding Flames and making this happen. I knew he would not be there when I returned. When it was time to load up, Brett, Dar, Parker, my Dad, and I headed out. We drove for what seemed like an hour to the spot where we would be splitting up. I got in the Razor with my guide Brett, my dad, and Parker. Dar and Tyson (Brett's spotter) went in another direction. Bret had all angles covered — if Flames was here, we were going to find him. We dropped off my dad and Parker at their hills to glass and we went to another ridge to glass. It did not take long before Tyson found Flames. We jumped back into the Razor and raced over to the spot where we thought we would able the glass him. We had found Flames! I jumped out of the Razor, set up my rifle, and tried to control my shaking. I looked in the scope and was able to find him right away. This was the first time my dad wouldn't be right next to me when I took the shot. I just remembered him saying good luck and shoot straight that morning. I took a deep breath in, looked in my scope 500 yards away and shot straight. The excitement was overwhelming and I could hear my dad screaming from several hills over. Brett gave me a huge hug and congratulations. We then took hours' worth of pictures and headed back to camp. That night at camp, I could barely even celebrate because I had tryouts to get ready for. I ended up making the team and then driving back up the Utah to enjoy the hunt. Thank you to everyone who helped make this dream come true. Flames was entered into the Boone and Crocket record book with a net score of 224 5/8. I also received the first place award at the Arizona Wildlife Trophies record book dinner. Flames was also featured on the cover of the June issue of Huntin' Fool magazine. Flames will also be featured in the King's Muledeer Calendar in 2019. I can't wait to see what month he will be.

These past three years have been unbelievable. I have made so many memories and learned so many different things. I have experienced the outdoors like nothing ever before. All of this has given me a great passion for hunting and it is something I will continue doing for the rest of my life, not just for the trophies or for the records, but for the opportunities. I have seen so many amazing things and have learned so many new skills. I have grown closer to so many people who inspire me to hunt and I hope I can inspire you.

Social Media

Want to stay in touch with AWF between newsletters? On Facebook, you'll find regular postings about Arizona wildlife, AWF activities and events, and BOW happenings. **Find us on Facebook at:** Arizona Wildlife Federation and Arizona Becoming an Outdoors Woman. www.facebook.com/azwildlife www.facebook.com/Arizona-Becoming-an-Outdoors-Woman-295848287943/
Make sure to Like and Share our pages!

2019 BOW Dates

January 25-27

April 12-14

September 6-8

Be sure to join us for the fun!!

Becoming an Outdoors-Woman (BOW) Happenings



by Linda Dightmon

Spotlight on BOW Instructor Volunteer Extraordinaire: Bill Larson

"When I see the faces light up. When they feel that first fish and then they feel it coming in and ohhh the excitement!" Bill Larson

It was a noisy Saturday morning breakfast in the dining hall at Friendly Pines Camp this past September when I finally found a moment to talk to our fishing (and now also crawfishing) guru, Bill Larson and his wife Joyce. Friday had been very busy for both of us. The previous day, Bill and Joyce had shown 10 ladies how to trap a crawfish. The class has become super popular... and why not? We shuttle the participants to Goldwater Lake where the couple waits with traps and a boiling pot of water, and of course some melted butter. When the women get a taste of those little lobsters... well, it's game on! What the class doesn't devour lakeside is brought back for the Friday night game taste. This time the group trapped so many crayfish that they didn't have time to cook them all. Bill and Joyce had another 12 dozen (Yes 12 dozen) to take home.

Bill is a native of Minnesota. He and Joyce have been married for 49 years. They have known each other since kindergarten and they grew up together. He really did marry his best friend. They have three children and seven grandchildren. The grandchildren range in age from 3 to 23. Not surprisingly, all of their children and grandchildren fish except for the 3 year old, and that is in the works.

Bill spent 22 years in the Air Force. He served from the Vietnam era to the Desert Storm operations. He talked of being the "Radar O'Reilly" to the base chaplain at Luke Air Force Base, helping out with wakes and weddings. Joyce would sometimes play organ music for the weddings. With a little help from the Air Force, Bill has fished all over the world. It was fun to watch his smile flash as he talked of fly fishing his way from Norway to New Zealand. Bill and Joyce were stationed all over the country but when it came time to retire from the Air Force (lucky for us) they chose Arizona.

He volunteered as a hunter education instructor with the Californian and Hawaiian agencies while still in the service. That volunteer spirit led him to the Arizona Game and Fish Department where he volunteered for fishing classes. Then from 2009 until 2015, Bill was contracted to teach fishing all over the state. I remember helping out on one of these events. We were at one of the urban lakes. There were at least 50 kids and we were trying to keep the lines in the water and take fish off of hooks and triage rods and reels. IT WAS CRAZY! And the entire time, Bill was his usual sweet patient soft spoken self. He would sometimes do three or four of these a week during season!

Looking back at my unique shorthand from our twenty minute conversation I see the word, or more accurately scribbles that only I can read, volunteer no less than 10 times. Besides the ones already mentioned Bill has volunteered or currently volunteers for the Cub Scouts, Disabled Vets—Project Healing Waters,



Camp Rainbow (at Friendly Pines) and Camp Not A Wheeze (also Friendly Pines). He is also a member of the Aquatic Recourses Education Association (AREA).

Bill was at some of the early BOW (1996 1997) workshops volunteering (of course). He helped with the first shotgun class. He remembers Bob Hirsch cooking up some game meat for the camp. But it was in 2009 when he became the regular fishing instructor. At the time I was working with him at Cabela's and was surprised and delighted that he was joining our team of instructors.

I asked him if he had a favorite memory and what he came up with echoes several other instructors.

"When I see the faces light up. When they feel that first fish and then they feel it coming in and ohhh the excitement! Young or old the expressions are precious. This happens so many times that I can't remember just one."

Well, I have a favorite memory of working with Bill Larson. It happened in 2011 and it was the year that Bill saved fishing at BOW. It goes something like this: Due to some scheduling conflicts at the camp, the August workshop was moved out two weeks. This meant that we would lose the wonderful services of the Arizona Flycasters. Now, this club does everything for us. They teach three different fly fishing classes and conduct an ongoing fly tying workshop both evenings. I was lamenting what to do when Bill Larson stepped up. He volunteered to teach the three fly fishing classes, his warm water fishing class AND the Saturday night catfishing event! We had a full camp of 100 participants and these classes were full. I will never forget Bill sitting in a camp canoe in the middle of the pond watching over the float tube class on Sunday morning. He was still smiling and waving.

I also asked him why he keeps coming back to BOW.

"There is a certain loyalty to people like you and I really like the camaraderie that happens within the staff and the other instructors. Its fun!"

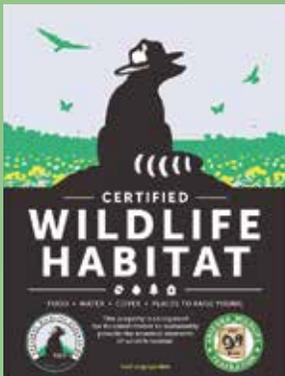
I saw that loyalty last night. I knew that he was tired and ready to call it a night. But when Bill saw 16 ladies wanting to go night fishing he immediately realized that the two instructors were hopelessly outnumbered and jumped in the truck to help.

Bill and Joyce are going to be doing some more traveling. They recently returned from a trip to Alaska and Maine and Hawaii is on the itinerary. They spent their 49th anniversary in the 49th state and the 50th will be in the 50th state.

It was time to wrap up our interview. The room was getting quiet so there were BOW fires to put out and they were heading home. But as I was getting up he gave me that Bill Larson grin and said, "I'll probably be back."



Gardening for Wildlife



The Arizona Wildlife Federation is teaming with National Wildlife Federation (NWF) to certify your garden as "Wildlife Habitat." With a small amount of planning and effort, you can create a wildlife habitat in your yard, on your balcony, at your school, or along roadsides! With NWF's Certified Wildlife Habitat program, folks are encouraged to plant native shrubs, flowers, and trees that produce berries, seeds, and sap, to create an eco-friendly environment for birds and wildlife.

For more information, visit us online at:
<http://azwildlife.org/habitat>

Welcome New Members

Catherine	Allison	Phoenix
Alexis	Bechman	Payson
Martha	Beltran	Lake Havasu
Louise	Bietendorf	Tucson
Nick	Biggs	Gilbert
Jami	Busch	Phoenix
Alyssa	Bute	Gilbert
Rebecca	Cauthen	Flagstaff
Katherine	Clawson	Payson
Alyson	Coffin	Scottsdale
Heidi	Cordova	Phoenix
Amber	Cordova Navarro	Phoenix
Dennis	Cummins	Green Valley
Jessica	Curtis	Chino Valley
Kerisue	Dasher	Lake Havasu
Maria	Duncza	Parks
Joyce	Evans	Tucson
Emily	Feldman	Phoenix
Jim	Feldt	Surprise
Marie	Ford	Sun City
Deborah	Foster	Parker
Lynn	Frazier	Tucson
Katharina	Gelfand	Chandler
Janet	Ginder-Berchick	Payson
Matt	Gold	Peoria
Nicole	Griffin	Scottsdale
Leana	Hamblin	Mesa
Terry	Harmon	Globe
Kate	Hopeman	Phoenix
Kathy	Jerde	Prescott
Kristen	Kauffman	Prescott
Nicole	Koenes	Phoenix
Karol	Koepf	Phoenix
Susan	Law	Scottsdale
Barbara	Lindenfelser	Apache Junction
Susan	Lloyd	Scottsdale
Anna	Lueck	Chandler
Myla	McGuire	Oro Valley
Melissa	Mike	Mesa
Chris	Mitchell	Yuma
Joy	Neumann	Mesa

Audrey	Ownby	Mesa
Debra	Poston	Bullhead City
Krystal	Poteet	Fort Mohave
Connie	Richards	Glendale
Jurhee	Schneider	Mesa
Tina	Schulte	Mesa
Denise	Sims	Buckeye
Leslie	Slone	Show Low
Stephanie	Spencer	Carefree
Laura	St George	Mesa
Julie	Stoddard	Tucson
Sharon	Stringer	Tucson
Michelle	Thompson	Mesa
Pat	White	Star Valley
Bev	Wilfong	Payson
Annell	Wilson	Phoenix
Cathy	Wilson	Lake Havasu
Lysa	Wright	Scottsdale
Beth	Wylie	Cottonwood

OUT OF STATE

Shane	Beebe	Zanesville, OH
Susan	Clarke	Palatine, IL
Eve	Clarke	Palatine, IL
Andrea	Emma	Bridgewater, NJ
Jean	Heuer	Brighton, CO
Mary	Merz	Encinitas, CA
Amanda	Murphy	Las Vegas, NV
Pedro	Santiago	Guttenberg, NJ
Diana S	chlott	Mariposa, CA
Kathryn	Schlott	Council Bluffs, IA
Carol	Shanks	Flowerly Branch, GA

BOW INSTRUCTOR YEARS OF SERVICE

20 years

Don Farmer (Founder)
Mark Hullinger (Founder)
Don Greene
Kathy Greene
Tice Supplee

Sarah Yeager
Donna Walkuski

5 years

Susan Baldwin
Stacy Boone
Clay Crowder
Kelly Dwyer
Jean Groen
Amy Horns
Triska Hoover
Coleen Lancaster
Bill Larson
Brian Marshal
Mike Matthews
Cliff Saylor
Danette Schepers
Stan Schepers
Connie Sullivan
Susan Zinn

15 years

Linda Dightmon
Russ Gunderson
Brian Mazoyer
Amanda Moors
Jeff Sorenson

10 years

Nicole Ansley
Steve Bilovesky
Roger Clark
Bill Deshaw
Holly Dickinson
Jan Dunkelberg
Elsie Ferguson
Wendell Gist
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Jarred Kaczmarek
Barbara Kennedy
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Please take a moment to review the list of Life Members and past Benefactors to make sure we have not missed anyone. If you want to add someone to the list or upgrade your own membership status, please use the membership form provided below.

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Signature _____

- \$ 15 Junior (17 & under)
- 30 Individual
- 75 Individual - 3 years
- 45 Family
- 110 Family - 3 years
- 100 Patron
- 500 Life Member
- 325 Distinguished Life Member (65+ or Disabled Veteran)
- 500 Benefactor
- 75 Small Business
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PO Box 51510
Mesa, AZ 85208

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