

Water for Wild Birds: Tools for Arid Landscapes

**Trans-Pecos Bird Conservation
Tierra Grande Master Naturalists
Borderlands Research Institute**

Birds are in danger, their numbers are declining. This booklet will educate you on easy ways that you can help by providing water for wild birds. These simple efforts make an enormous difference and you will benefit along the way too.

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Educate Yourself

Sul Ross and the Borderlands Research Institute offer diverse adult education opportunities both on and off campus, likewise the Tierra Grande Master Naturalists' Chapter (as well as Chapters throughout the region) offers an extensive natural history course.



Educate Others

Opportunities abound to help local educators share the outdoors and birds with our youth. Pictured here are elementary school students learning the ins and outs of Hummingbird banding – A fall course offered by the volunteers at Trans-Pecos Bird Conservation.



Help With Research

It takes a village to conduct field research on secretive grassland birds! Each winter hundreds of grassland species descend upon our region and Borderlands Research Institute students, partners, and volunteers work to collect data on their distribution. Volunteers are vital to this work - join us!

I. Our Birds are Declining! What can we do?

An analysis of North American bird populations published in September 2019 in the journal SCIENCE shows that the number of birds in the United States and Canada has fallen by 29 percent since 1970. There are 2.9 billion fewer birds taking wing now than 50 years ago. These declines have shocked researchers and conservation organizations.

Experts have long known that some bird species have become vulnerable to extinction. But the new study, based on a broad survey of more than 500 species, reveals steep losses even among such traditionally abundant birds as robins and sparrows. These common bird species are vital to ecosystems, as they control pests, pollinate flowers, spread seeds, and regenerate landscapes. When these birds disappear, their former habitats often are changed as their beneficial place in the ecological process is lost.

While some species populations grew, the researchers found the majority declined, often by huge numbers. Among the worst-hit groups were warblers and blackbirds. Grassland species have suffered the greatest declines by far, having lost 717 million birds. These species have been hurt by the conversion of their natural habitat with unsustainable uses and poorly planned land development, overgrazing, and brush encroachment. Also declining are the insect eaters such as swallows and flycatchers, whose decline may be a result of falling insect populations related to pesticide use.

Additional interference related to human environments kill billions of birds a year: artificial night lighting interferes with birds' natural eating and sleeping patterns, their mating and hunting habits and their typical flight paths; collisions with power lines, buildings, and vehicles account for about 900 million bird deaths annually; domesticated and feral cats kill another 2.6 billion—or about a quarter of the songbird population.



Eastern Meadowlark – The melodious sounds of a Meadowlark calling from its grassland perch is one of the finest birdsongs in nature. These ground nesting birds are low flyers; their notable yellow underbody displays a striking black chevron across the chest. It is one of nature's most beautiful grassland species.



Burrowing Owl – A remarkable long-legged ground dwelling owl, historically found in prairie dog colonies on large expanses of open grasslands; it feeds on big insects such as grasshoppers, also mice, rats and ground squirrels. It is amazing to watch this small owl walk around its colony and dart into its hole when threatened.



Long-billed Curlew – This large, long-billed bird's preferred breeding habitat is cooler grassy wetlands in large open expanses. Good stewardship of native grasslands for grazing cattle could help in this bird's overall survival. It feeds on crayfish, frogs and snails. One female curlew's sickle-shaped bill was measured at 8.7 inches long.

Grassland bird populations collectively have declined by more than 50%, or more than 700 million birds. Habitat loss is likely to be the driving factor in these declines, particularly agricultural intensification and development.



Baird's Sparrow – Very little study has been done on this sparrow's wintering grounds in Texas and much of the west. Once considered among the most common of prairie birds, Baird's Sparrow is now rare throughout its range and only locally abundant depending on the condition of grasslands. This bird does well on winter grasslands that have not been overgrazed.



Prairie Falcon – The highly-efficient Prairie Falcon makes its living in areas of periodic droughts. It is a mammal-eating specialist feeding mostly on ground squirrels. Unlike the closely related bird-eating Peregrine Falcon, it survived losses from pesticide use in 1940's-50's. Horned Larks and Western Meadowlarks are among its prey in winter. A ferocious hunter, Prairie Falcons catch birds in mid-air, also large flying insects.

II. Priority Birds of the Chihuahuan Desert Bird Conservation Region

Riparian Forest & Woody Wetlands

Gambel's Quail

Bell's Vireo

Black-capped Vireo

Crissal Thrasher

Varied Bunting

Painted Bunting

Common Black-hawk

Gray Hawk

Elf Owl

Summer Tanager

Hooded Oriole

Lucy's Warbler

Southwestern Willow Flycatcher



Yellow-billed Cuckoo

Shrublands & Savanna

Scaled Quail

Gray Vireo

Curve-billed Thrasher

Cassin's Sparrow

Brewer's Sparrow

Sagebrush Sparrow

Lark Sparrow

Scott's Oriole

Woodhouse's Scrub-Jay



Lucifer Hummingbird

Basin Wetlands

Mexican Mallard
Northern Pintail
Snowy Plover
Long-billed Curlew
Common Yellowthroat
Least Tern



Black-necked Stilt

Upland Grasslands & Herbaceous Pastures

Northern Harrier
Swainson's Hawk
Golden Eagle
Applomado Falcon
Prairie Falcon
Long-billed Curlew
Burrowing Owl
Sprague's Pipit
Loggerhead Shrike
Common Nighthawk
Cactus Wren
Baird's Sparrow

Grasshopper Sparrow
Lark Bunting
McCown's Longspur
Eastern Meadowlark
Western Meadowlark



Ferruginous Hawk

Pinyon-Juniper & Pine-Oak Forest

Montezuma Quail
Zone-tailed Hawk
Cassin's Kingbird
Hutton's Vireo
Band-tailed Pigeon
Northern Flicker
Flammulated Owl
Spotted Owl
Western Bluebird



Grace's Warbler

III. Conservation Needs

Our Birds are Declining! How can I help?

The science is in—whether we are at home in town or in rural landscapes, we must do our part to help birds not only survive, but thrive.

Significant ways to help include: 



Keep rainfall on your land for birds and aquifer recharge.



Year-round water for wild birds is one of the most important resources for the landscape, especially in the Trans-Pecos Region of Texas.



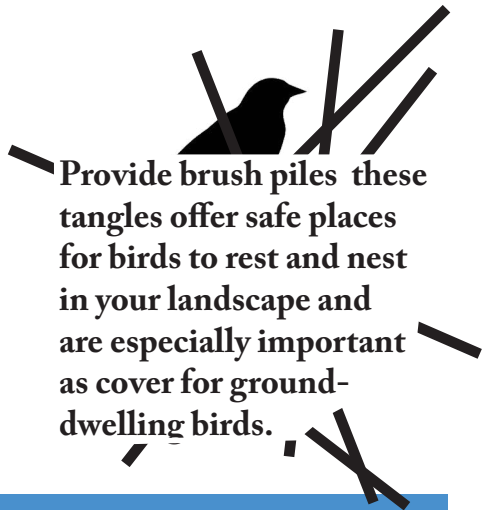
Use more or all native plants in managed landscapes, i.e., yards, gardens, community common areas, and parks.



Use fewer or no pesticides, these directly and indirectly kill wildlife and their food supplies.



Reforest stream sides, plant local native trees and let some dead trees remain.



Provide brush piles these tangles offer safe places for birds to rest and nest in your landscape and are especially important as cover for ground-dwelling birds.

Historical accounts of perennial or intermittent streams within the Big Bend Region indicate many were lined with large stands of cottonwood and willow. Mining and agricultural activities during the late 19th and early 20th centuries required the harvest of many riparian forests for fuel and structural material.

In 1933 Terlingua Creek (near Big Bend National Park, TX) was described as a “bold running stream, studded with cottonwood timber and was alive with beaver.”

The old riparian forest provided the nursery conditions necessary for cottonwood and willow recruitment by reducing hydrologic forces during high flows. Once the forest was gone, normal annual flows were sufficient to scour young plants. Scientists hypothesize that the removal of vegetation encouraged downstream excavation of gravel and reduced the extent of the riparian aquifer. They propose that reforestation and structures such as beaver dams within stream beds will not only increase riparian habitat for species such as the yellow-billed cuckoo and the gray hawk, but will also increase resilience to climate change by altering hydrologic conditions such that the channel aggrades, increasing the depth and extent of the riparian aquifer.



Photo of Limpia Creek, Fort Davis, TX. Courtesy of Destiny Locke, Borderlands Research Institute.

IV. Size Up Your Landscape

Whether it is your backyard or an open field, consider where you have the ability to access or collect rain water. Proximity to your daily activities is important too, it enables you to more easily monitor a project not to mention more opportunities to view wild birds. The more you maintain and improve your water systems the more you and birds will benefit!

Different bird groups require different types of water sources. What types of birds do you want to manage for?

Songbirds need shallow water sources

Water drips or misters over rocks or live tree branches, shallow bird baths or water pans in yards; rocky seeps, ponds with shallow vegetated edges, creeks, ciénagas, bird-safe guzzlers on the landscape.

All water source types should have nearby dense vegetation to provide shelter from predators.



Shorebirds need shallow, muddy water sources

Open, seasonally non-vegetated shallow wetlands with muddy bottoms, grassland depressions in monsoon season, overflows at stock tanks, ciénagas, and seeps. Greatest use in spring (March–May) and fall (July–September), the prime migration months for these birds.



Western Sandpiper

Diving Ducks need deep, open water

Open-water lakes and deep-water reservoirs where ducks dive for fish and freshwater invertebrates.



Ring-necked Duck

Dabbling Ducks need vegetated water sources

Stock ponds with vegetated edges, creeks with deeper depressions, spring-fed marshes, ciénagas, constructed wetlands.



Northern Pintail

V. Water Features for Wild Birds

There are many ways to provide water on arid land for wild birds. Some are small and very simple additions to a yard or garden; others are larger additions on a ranch or farm, such as constructed wetlands or improvements to existing ponds to provide moist soils and shallow wetland edges. Natural or constructed wetlands are very productive and provide food for a wider variety of resident and migrating bird species, such as shorebirds, wading birds, waterfowl, warblers, and other birds using riparian areas.



The size and type of project can be as easy as providing a watering spot in your yard with a water dripper in a shallow bath, a mister in a tree, or simply a drip from a plastic jug into a garbage can lid and nearby brush or vegetation to serve as a shelter.



A larger project might be a newly constructed wetland with varying levels of water, from moist soils and mud for smaller shorebirds to deeper water for larger shorebirds, waders, and waterfowl species. Where shrubs and vegetation grow at the water's edge, wetlands also support other birdlife. These wetlands can be designed with diversion structures to control or release water as needed for maintenance.

Above: Recirculating Water Feature

Below: Painted Bunting drinks from hose

A. Rainwater Collection at Home

Capturing rainwater in a cistern or containers has been popular for generations. The old and new ideas for conserving water shown in this booklet are being used in western lands, and examples of all can be found in our region. An artificial wetland or water feature is a great way to attract different species of migrating birds, amphibians, and mammals. Differing depths of shallow water are ideal when creating a water feature. The water source can come from a rainwater-collection system that harvests rainwater off the roof of a home or building. Water running off the roof flows into a gutter that directs it toward a rainwater cistern or storage barrel. Water from the cistern can then be pumped or gravity fed to the water feature through a hose and drip irrigation emitter. Things to consider before installation are surface area of roof, volume of cistern or barrel, natural drainage or catchment areas, and the size, location, and shape of your wetland or water feature.



B. Opportunities for Constructed Wetlands and Moist Habitats

Recently in the Trans-Pecos, private habitat and community wetlands have been constructed using harvested water, treated wastewater effluent or irrigation effluent, as a water source. These habitats are extremely valuable for all life including birds and people. An example of what you or your community might do can be seen at the sites below.



Photos: Sandia Wetlands

The **Sandia Wetlands Project** is a 40-acre wetland habitat area created from the water coming off The Nature Conservancy's Sandia Springs Preserve. It is located on a Texas Department of Agriculture Family Land Heritage Ranch owned by Don and Ellen Weinacht. Ellen was inspired to utilize the spring's downstream effluent to create a wetland area for migratory wetland birds. Sandia is now a critical stop-over for migratory birds and a water source for Chihuahua Desert flora and fauna. The mission of the Sandia Wetlands Project is to restore private lands to their natural wetland state for desert flora, fauna and migrating waterfowl.



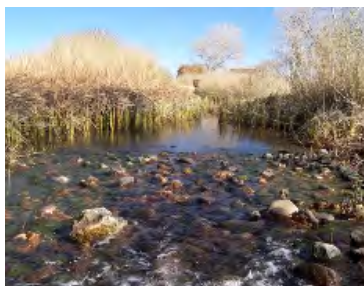
The **B. J. Bishop Wetlands** and Bird Sanctuary is located 0.5 miles east of Fort Leaton State Historic Site on Ranch Road 170, only a few miles east of Presidio, TX and west of Big Bend Ranch State Park. Fed by water from the City of Presidio wastewater treatment plant, the wetlands have become a sanctuary for thousands of migrating birds that pass through the Presidio Valley annually. The wetlands consist of 12 acres of contained and controlled water with a consistent feed to maintain healthy levels and a vast growth of aquatic vegetation.



B.J. Bishop Constructed Wetland in Presidio, TX by Becky Tharp.

Christmas Mountains Oasis (CMO) is a desert oasis located on a private preserve and maintained with harvested rainwater collected in tanks. The 1,000-acre preserve is not a wetland but a true oasis with a small island of native trees and understory of fruiting plants and water features attracting many migratory birds (See cover photo). CMO is known to be the only place in Texas, or perhaps the U.S., where the unique Lucifer Hummingbird can reliably be found during breeding season. Carolyn Ohl-Johnson (and her late husband Sherwood Kolb) started the project in 1996 when they built diversion dams in an arroyo where flash floods occur once or twice a year. The diverted flood water fills up three surface tanks which is then used to irrigate the oasis. Because of leakage and problems keeping the tanks sealed over the years, in 2018 a large above ground tank was purchased to hold water in reserve for drought-ridden years. The Christmas Mountains Oasis is just outside Big Bend National Park near Terlingua, TX. See resources on page 22 to make an appointment for a visit.

Springs and associated wetlands or *ciénagas*, as they locally are known, have long existed in the desert, providing a rich stopover habitat with food, water, and resting areas for a great variety of migrating birds. Many historical wetlands no longer exist because they have been diverted or drained for other uses.



Larry D. Moore CC BY-SA 3.0 of the Balmorhea State Park *ciénaga* near Balmorhea, TX.

C. Guzzlers and Ranch Water

Small guzzlers are also a great way to provide water to attract birds. Guzzlers come in a variety of sizes and types constructed to use a rainwater-collection system as the source of water. The recommended water distribution for quail and most songbirds is one or more water sources per 80 acres.



Steel guzzler and storage tank with drinking basin by Mike Gray.



An example of a small mammal/bird guzzler designed to collect rainwater from a surface and direct it to a storage container to provide drip release of water to a small water feature.



A prefabricated fiberglass guzzler whose sides are intended to be buried in the ground up to the circular top and open side.

Photos: Texas A&M AgriLife Extension.

Protect quail from predators (at smaller water stations) by using a constructed rectangular cage as an enclosure with a shade cover.

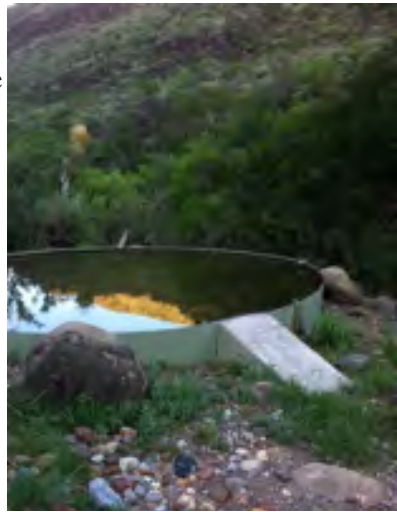
For example, this Quail Condo has two storage tanks on the back of the cage for rainwater run-off from the slanted roof into a PVC pipe fitted with chicken drinkers. This allows quail as well as songbirds and doves to have fresh water available at all times while protecting them from predators. During severe, dry conditions water can be hauled to the condos. These can also serve as feeding sites.





Photos: Bonnie McKinney, Biologist, El Carmen Land & Conservation Company.

Caution: Help prevent water tank drownings! Bigger ranch water tanks are built to serve livestock, deer and are sometimes deep. Birds needing water to drink and bathe are extremely attracted to these manmade water sources, and for many birds this might be their main source of water in a dry year. Sometimes birds, as well as frogs, lizards, and small mammals accidentally fall into water tanks, which is fine if they can swim to the edge and crawl out. However, many of these drown when the tank's side or edge is too slippery or high to make a safe escape.



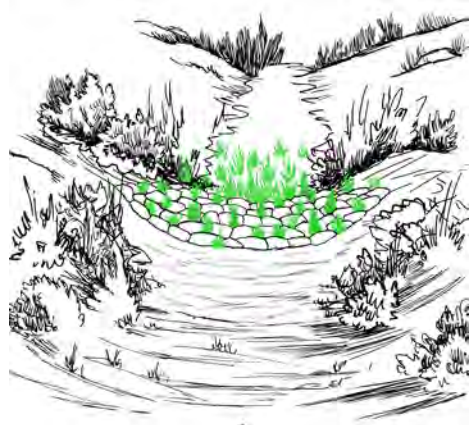
If you have such a water source, please help the birds and smaller wildlife by adding an escape ladder. Another option is to provide a drip from the tank to fill a small water feature on the ground next to the tank, safely accommodating birds and smaller animals.

Note: Backyard swimming pools can be notorious for drowning birds and other small animals. If you have a pool, please consider placing a water feature nearby, or a different safety option that might be provided by your pool supplier.

Adapted from article by Cliff Shackelford, TX Parks & Wildlife Dept

D. Rainwater Harvesting for Wildlands and Beyond

Structures placed in arroyos can slow water and allow for recharge of aquifers and floodplains and increase riparian vegetation. One-rock high dam (trinchera) along a drainage feature or ephemeral or intermittent streambed allows runoff to slowly drain through the rocks (See figure). The slow filtering of the water through the rocks reduces erosion, traps sediment and nutrients, allowing vegetation to establish itself.



Another strategy is to install Beaver Dam Analogs, wooden stakes driven in the creek bed that capture woody debris and work like the loose rock structures. By slowing runoff water, riparian vegetation will increase providing shade, cooler soil temperatures with greater soil moisture. These tactics are a proven method to increase water storage and wildlife habitat in streams.

The team developing Water for Wild Birds drew inspiration from Rainwater Harvesting for Drylands and Beyond, Vol. 1 and 2. Brad Lancaster, the author, lives on an eighth of an acre in downtown Tucson, Arizona where rainfall is less than 12 inches (300 mm) per year. His volumes are impressively illustrated with easy to follow instructions for keeping rain water on the land. Using these volumes, home owners can learn to harvest water for wild birds, nurture home gardens, grow native plants, and control erosion on their property for aquifer and stream-flow recharge. **Recognizing the value in Lancaster's work, these books have been donated for public use to libraries in Alpine, Fort Davis, Marfa, Presidio and Fort Stockton, TX.** They are also available on-line.

Reproduced with permission from "Rainwater Harvesting for Drylands and Beyond, Volume 1, 3rd Edition" by Brad Lancaster, www.HarvestingRainwater.com

VI. Resources

Publications:

- Rainwater Harvesting for Drylands and Beyond, selected volumes by Brad Lancaster
Available at: www.harvestingrainwater.com and the Fort Davis, Alpine, Fort Stockton, Marfa, and Presidio Libraries.
- Let Water do the Work, by Bill Zeedyk, Van Clothier
- Beaver Dam Analogues
<https://fs.usda.gov/treearch/pubs/58234>
<https://fs.usda.gov/treearch/pubs/57456>

Rainwater Harvesting for Wildlife:

- <http://texnat.tamu.edu/files/2018/08/Water-rainwater-harvesting-for-wildlife-2006.pdf>
- <http://txmn.org/coastal/files/2010/03/Wildlife-water.pdf>

Public Places to View Water Projects and Features Developed for Wild Birds:

- B.J. Bishop Wetlands and Bird Sanctuary, Presidio
- Sandia Springs Wetland Project, Balmorhea
- La Calera Spring and Photo Blind, Big Bend Ranch State Park
- Davis Mountains State Park Bird Blinds, Fort Davis

Private Places to Visit by Appointment Only:

- Christmas Mountains Oasis, Terlingua. Contact Carolyn Ohl-Johnson
<https://cmoasis.blogspot.com> – carolynohl@aol.com
- El Carmen Land & Conservation Co. is a private conservation area owned by Cemex USA & J. Austin Ranches, located in the lower desert elevations of the Big Bend Region along the Rio Grande corridor.
<https://cemexnature.com>

For questions about birds, management for birds, or to get more involved with birding, contact any of the following organizations:

- Trans-Pecos Bird Conservation, Inc.
tbc@bigbend.net
- El Paso/Trans-Pecos Audubon Society
<https://trans-pecos-audubon.com>
- Davis Mountains Hummingbird Celebration
<https://davismountainshummingbirdcelebration.com>
- Borderlands Research Institute
<https://bri.sulross.edu>
- Rio Grande Joint Venture
<https://rgjv.org>

For Assistance in restoration of wetlands, streams and grasslands:

Rio Grande Joint Venture – <https://rgjv.org>
TPWD Wildlife Diversity Program – www.tpwd.texas.gov/huntwild/wild/wildlife_diversity

VII. Credits

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CONSERVING THE LAST FRONTIER



TEXAS MASTER NATURALISTS
Tierra Grande Chapter

* Bird Rewards

Helping Wild Birds Survive

Beautiful Birds On Your Land

Save Money with Exemptions

*If you plan to install a rainwater-harvesting system, check with your respective Texas county appraisal district for guidance on exemptions

*County property taxes per Texas Tax Code §11.32

*State sales tax per Texas Tax Code §151.355 for rainwater-harvesting equipment and supplies



Front: Christmas Mountain Oasis in Christmas Mountains near Terlingua, TX.