

A close-up photograph of a green hummingbird perched on a rock. The bird has a long, dark beak and iridescent green feathers. The background is a blurred stream with yellow and blue reflections. The text is overlaid on the left side of the image.

Photo by the Verde River Institute 2018

# BRINGING BIRDS HOME

A GUIDE TO ENHANCING  
RIVERS, STREAMS, AND DESERT  
WASHES FOR BIRDS & OTHER  
WILDLIFE IN THE GRAND VALLEY

Produced by RiversEdge West, Bird Conservancy of the  
Rockies, and Grand Valley Audubon Society

## WHAT IS A RIPARIAN AREA?

"Riparian" refers to the areas along our rivers, washes, ponds, and other bodies of water. In the arid West, riparian areas are a green ribbon of relatively lush vegetation in an expanse of more rugged terrain.

Although riparian habitat makes up less than 5% of land area in the southwest US, it supports over 40% of the region's bird species.



Photo by the Verde River Institute, 2018

## YOUR RIPARIAN HABITAT— WHY DO WE NEED IT?

Native riparian plants stabilize banks, control or attenuate floods, trap pollutants and undesired nutrients, and provide shade and other habitat structures for aquatic life, including endangered fish species.

Managing the riparian areas on your property with care will increase the productivity and bolster the overall health and stability of your land—all while providing valuable food and shelter for many wildlife species.

Colorado Parks and Wildlife estimates that around 75% of our state's wildlife species are dependent on riparian habitat during a portion of their life cycle. For birds, the vegetation found in riparian areas provides cover, nest sites, cooler temperatures, as well as food such as seeds, fruit, and insects.



## RIPARIAN AREAS ARE UNDER STRESS

Despite their tremendous value, riparian habitats are some of the most altered by humans. We have significantly altered the natural cycles and movements of rivers via dams and diversion of water for irrigation.

The Colorado River, which flows through the Grand Valley, is heavily impacted by human use. The river as a whole provides drinking water for over 36 million people and irrigates 5.5 million acres of agricultural land.



Photo by Alik Griffin

## ALTERED FLOWS, ALTERED HABITAT



Historically, the riparian areas along the Gunnison and Colorado rivers in the Grand Valley were dominated by cottonwood trees, willows, shrubs, and other native vegetation. These species depend on high groundwater levels, flooding, and a shifting river channel for their propagation.

Reduced flows and lack of major seasonal floods changed the riparian habitat along the river. Invasive plants, such as tamarisk (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia* spp.) have taken over in some places because they are better adapted to the altered conditions.



## NATIVE PLANTS ARE STILL BEST

While non-native plant species do provide habitat for birds and other wildlife, research shows that it is not equivalent to quality of habitat that native riparian plants provide.



Photo by Cara Kukuraitis

First, native cottonwood-willow habitats have a more multilayered physical structure than does tamarisk-Russian olive dominated habitat. Cottonwoods can grow to 70 feet in height with a mid-story of other native shrubs, whereas tamarisk and Russian olive dominated areas tend to be a lower, uniform height with little understory vegetation.

Second, while non-native riparian habitats may support similar quantities of insect prey for birds, the insects in non-native vegetation appear to be less diverse. Some

species of birds may be happy to feed on any available insect species. But others, such as the Western Yellow-billed Cuckoo, may preference insect prey, like caterpillars, that are less abundant in non-native vegetation.

## BE REALISTIC WHEN RESTORING RIPARIAN HABITAT

In recent decades, there has been a great deal of effort to control these invasive plants in the Grand Valley, and elsewhere in the West, in order to improve wildlife habitat and the health of rivers. But these riparian restoration efforts have been a learning process and along the way we have realized that some efforts may have been detrimental to birds and wildlife- at least in the short term.

Riparian restoration efforts will only benefit wildlife if it successfully replaces invasive plants with native vegetation.

But even successful restoration to native riparian habitat takes considerable time. During the period between removal of non-native vegetation and maturation of native plants, restoration may temporarily decrease the habitat value of riparian areas.



Photo by RiversEdge West

## RECOMMENDED PRACTICES

This guide is intended to help both land managers and residents who live along riparian areas to conserve, enhance, and restore habitat to benefit birds and other wildlife. The information provided will aid large and small riparian restoration projects; from large tracts along a river to small backyard washes.

### INVASIVE PLANT REMOVAL

There are several invasive plant species that are common in the riparian areas of the Grand Valley. Tamarisk, which is also known as "saltcedar", and Russian olive are most familiar. However Siberian elm (*Ulmus pumila*) is also common, as is Russian knapweed (*Acroptilon repens*) which can form dense monocultures. Tree of heaven (*Ailanthus altissima*) is not yet common in the Grand Valley, but it is a major invasive plant elsewhere.

### SHOULD ALL INVASIVE RIPARIAN PLANTS BE REMOVED?

Land managers should carefully consider their goals before removing non-native vegetation. Some species of invasive plants may be a higher priority for removal than others. For instance, many birds eat Russian olive fruits and these small trees or shrubs provide good cover. Therefore, this species may be a lower priority for removal than tamarisk. Please note that the Colorado Department of Agriculture added Russian olive to the Noxious Weed List B in December 2017. This means that the state will implement a weed management plan to stop the continued spread of this species.

Russian knapweed, on the other hand, provides relatively little habitat value aside from some seeds. This perennial can quickly out-compete native plants and form a monoculture because it releases chemical compounds into the soil that prohibit the growth of other plant species.

In many places, tamarisk has moved into areas that, due to altered river hydrology, can no longer support cottonwoods and other native riparian species. In these cases, it may only be possible to replace tamarisk with native upland species such as rabbitbrush or greasewood.

#### COMMON INVASIVE PLANTS



Invasive plants growing in the floodplain should be prioritized for removal over those growing in higher, drier areas because they can more easily be replaced with cottonwood-willow habitat. Furthermore, as tamarisk and Russian olive are more prone to fire than native riparian vegetation, prioritization of their removal in the floodplain can help to reduce wildfires that may jeopardize existing habitat.



Photo by Jacob Frank

## REMOVAL TECHNIQUE

Invasive riparian shrubs can be difficult to remove and each requires different control treatments in terms of types of herbicide, method of application, etc. Please see the resources section at the end of this guide to find links to best recommended control practices on the internet.

## HOW MUCH TO REMOVE?

Land managers should also consider how much non-native vegetation to remove. Often, it is most cost effective to remove larger areas of non-native vegetation at one time rather than removing smaller patches incrementally. But this approach effectively renders a larger area of habitat temporarily "out of commission" for birds and other wildlife. In addition, removing large amounts of invasives means that large areas need to be replanted and land owners/managers may find their revegetation funds spread too thin.



Photo by Jacob Frank



Photo by RiversEdge West

## REMOVAL METHOD

The selected removal method will impact speed of revegetation and hence impacts to wildlife. Hydro axe mulching can be cost effective, but it shreds invasive woody plants into a large amount of mulch which is typically left on site. In some climates this mulch will break down fairly quickly, but land managers in the Grand Valley report that in our dry climate, mulch can take several years to biodegrade. Some managers report that

persistent mulch impedes recolonization by native plants, while others say it may help prevent colonization by secondary invasive weeds, like Russian knapweed, that often invade disturbed areas. Cutting by hand and treating woody stumps with herbicide often costs more, but can be more selective. This avoids collateral damage of any native plants present and leaves the site in a better condition for revegetation.

## TIMING

When timing invasive plant removal it is important to consider birds and other wildlife. Spring and early summer are breeding seasons when birds are nesting and feeding nestlings. Scheduling invasive plant removal for the end of summer or fall will minimize disturbance to nests and young fledgling birds.

## DEAD TREES ARE VALUABLE TOO

Dead cottonwoods and even invasive tree species provide critical nesting sites for birds in the Grand Valley. Unless a dead tree could fall on a structure, road, or pedestrian trail, consider leaving it standing. Bird species in the Grand Valley that depend on dead trees or dead limbs for nest sites include Western Screech-owls, Wood Ducks, Northern Flickers, American Kestrels. Larger birds like Great Blue Herons, Bald Eagles and Osprey also commonly place their nests in large dead trees.



Western Screech-owl, photo by Baker County Tourism

## COVER YOUR PIPES!

Many cavity nesting birds are attracted to man-made holes including small pipe openings. They will enter them when scouting for nest sites and then become trapped when they cannot get traction on smooth inner walls to climb out. This is the carcass of an owl that entered a pipe used to mark a mining claim and was unable to get out. Bird deaths in pipes of all sizes are surprisingly common and totally preventable. Cover your pipe openings with a bit of inexpensive screen, or a plastic or cement cap.



## ADD NEST BOXES

Adding nest boxes to your riparian habitat can attract cavity nesting bird species like Wood Ducks, American Kestrel, Western Screech-owls, or Violet-green Swallows. Different species require different sized boxes with different sized holes. See the Resource section for more information.



Photo by Larry Meade

## LOOK AT THE LAYERS

Healthy riparian habitat has multiple layers, which are used by birds in different ways. Here are some habitat improvement tips for each layer.

**UNDERSTORY** consists of grasses, wildflowers, and small shrubs. This level stabilizes banks and prevents erosion. Postpone mowing until after nesting season to avoid disturbing ground nesting birds. When flowers have gone to seed, give birds a chance to feed before removing seed heads. "Weedy" looking native plants like sunflowers are an important food source for goldfinches and other birds.



**MID-STORY** consists of tall shrubs and young trees. This layer provides nest sites and food (fruit, insects) for many birds species. Avoid pruning during the nesting season. Consider installing nest boxes, especially if your property doesn't have many natural tree cavities.

**CANOPY** consists of the crowns of tall trees like cottonwoods. Avoid removing native trees when possible, and if felling/pruning, do so outside of breeding season. If young trees are not present, plant some to create large trees in the future.



## REVEGETATION: PLAN AND BUDGET

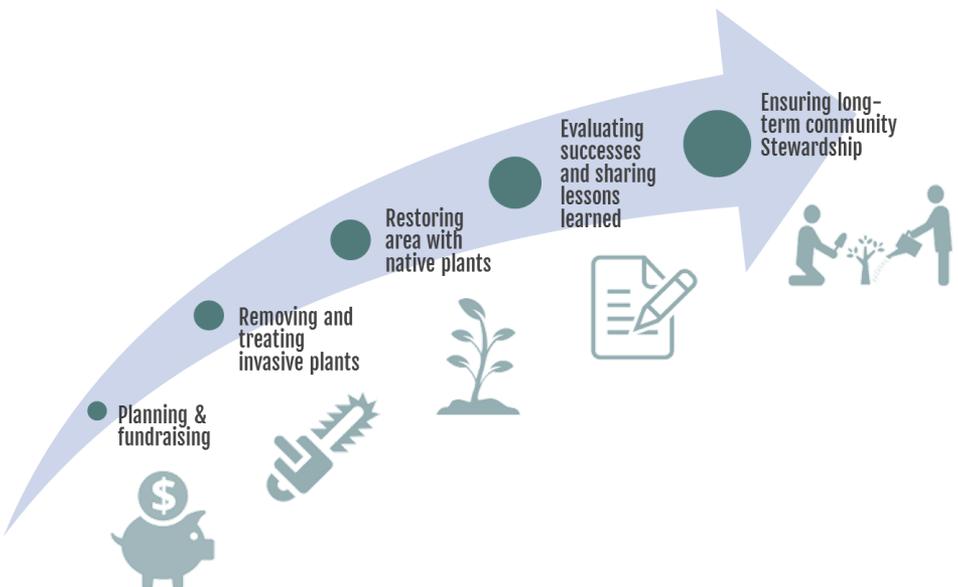
Before removing tamarisk and Russian olive, make sure you have a plan and funds for revegetation with native plants.

Unless you are removing an isolated shrub or tree, you cannot expect that areas where invasive plants have been removed will be naturally reseeded or recolonized by native riparian vegetation. Often, the area will simply be recolonized by tamarisk and Russian olive, or by another invasive plant such as Russian knapweed.

In many cases, invasive plant removal is the easier, less expensive part of the riparian restoration process.

In the Grand Valley's climate and conditions, revegetation with native plants can be challenging, and it takes time. If an area of mature tamarisk or Russian olive is removed and replanted with native trees and shrubs, it may take several years before the native plants grow large enough to recreate the structure provided by the removed invasive plants. Thus, there is a time lag between removal of an adequate, but not ideal, invasive plant habitat and its replacement by high quality native plant habitat.

### LIFE SPAN OF RESTORATION



In order to facilitate and speed the transition between non-native riparian vegetation and native riparian vegetation, we recommend the following:

### Consider reducing the size of treatment area

An incremental approach, removing invasive plants and replanting with native plants in smaller patches of a riparian area and staggering the process over multiple years reduces the time and area of riparian habitat that is "out of commission" for wildlife.

While this approach is likely not as cost-effective, it should minimize negative effects on birds and other wildlife. Also consider your project impacts within the larger context by taking into account removal and revegetation actions that may be occurring in the vicinity.

### Consider investing in high-quality, mature revegetation materials

One way to speed the maturation of new native riparian vegetation is to plant larger, more mature plants. Land managers in our area report that plants grown in tall pots, or deeply rooted native plants, are more successful than plants grown in the standard 1 or 5 gallon pots that are sold at most nurseries.

Unfortunately, these deeply rooted plants can be hard to find. If possible, start working with a nursery a couple of years in advance of expected planting so that you have quality native plants available when you need them.



## CHOOSING NATIVE PLANTS WISELY

When deciding what native species to plant it is important to consider the site. Some of the areas where tamarisk and Russian olive are growing in the Grand Valley are currently more upland habitat than riparian habitat. The other species of plants present can give you a clue as to whether or not native riparian plants will be successful. If rabbitbrush, greasewood, or four-winged saltbush are present, the area likely has more upland characteristics.

Different plant species prefer, or require, different soil and microclimate characteristics to be successful. A good rule of thumb to determine which native species might thrive in the area you are revegetating is to look at which species are already present and plant more of the same. Even patches that are dominated by invasive species may have an isolated native plant or two. These can tell you what will thrive there when you revegetate. For instance, if there are a few three-leaf sumac shrubs struggling to survive amid the tamarisk, preserve them and plant more once the tamarisk is removed.



Silverleaf Buffaloberry  
Longstem in Tallpot



Inland saltgrass  
growing in saline soil

Some areas in the Grand Valley have naturally salty soils- a white crust on the soil surface often indicates high salinity. Some native plants, such as greasewood and several grass species, can tolerate high salinity. Please see the Resource section at the end of this guide for more information on planting in salty soils as well as information on soil testing.

Consider the attributes of each native species from a bird or wildlife perspective:

*What kind of structure does this plant provide for nesting or hiding from predators?*

*Does it provide food like seeds or fruit?*

*More importantly, does this plant host a lot of insects?*

Most birds that breed in our area feed their babies insects, even species that specialize in other food types like hummingbirds. While homeowners may choose "pest-resistant" varieties of plants for their backyard, these may not be a good choice for riparian restoration projects. A cottonwood tree full of tent caterpillars may be unattractive to human eyes, but it's a beautiful buffet in the eyes of a Western Yellow-Billed Cuckoo.

## WHEN TO PLANT NATIVES

When planting native plants for revegetation, timing can influence success. Avoid exposing revegetation plants to herbicide. If herbicide was used in the removal of invasive species, it is important to check the herbicide information sheet to determine how long the chemical may remain active in the soil.

Also make sure treatment of invasive plants is complete. Some species, like Russian knapweed, may require multiple treatments with herbicide over multiple years before it is killed. Don't plant valuable native plants prematurely.

Plant experts in the Grand Valley often recommend planting native shrubs in the early fall. Many plants cannot handle the high summer temperatures in our area before they are established- especially if they are not watered as regularly as they might be in a residential setting.



Photo by RiversEdge West

## WATER IS CRUCIAL FOR SUCCESSFUL REVEGETATION

The most important factor for revegetation success is water. Even plants that tolerate very dry conditions need water to get established- the process of being transplanted from a nursery pot into the ground is not the same as germinating naturally from seed. It is crucial to have a plan in place to water revegetation plantings, otherwise their success rate will be very low.



Clay olla pot

By Thamizhparathi Maari

Unfortunately, many of the areas where riparian restoration projects occur in the Grand Valley, and other parts of the Southwest, do not have access to irrigation. There are number of techniques developed for watering revegetation plants, even in the backcountry. These include water tanks with gravity fed systems and even a traditional agricultural technique that involves burying porous clay pots, or "ollas", that are filled with water. Where to find information on some of these techniques is available in the Resource section at the end of this guide.

**Be realistic.** Riparian areas are not coddled gardens and even the most successful revegetation projects will lose some native plants to the stress of transplantation. So plan for losses and do not be alarmed.

## MONITORING AND REPORTING

Riparian restoration requires monitoring to determine if invasive plants have truly been controlled and if revegetation has been successful. Checking a project area twice yearly (for instance in the spring and fall) for multiple years can help catch problems (like recolonization by invasive plants) before they get out of control. Watering needs for revegetation plants can be re-evaluated and plants that did not survive can be replaced.



Photo by RiversEdge West

## SHARE WHAT YOU LEARNED

Riparian restoration is a challenging, albeit rewarding, process. Please share what worked for you so to help inform local land managers in the future. It is also important to share failures!

If a technique or material failed, help others avoid the same mistake. Ecological restoration is a relatively new and developing field. Riparian restoration is very site specific and local knowledge is important for success.

Organizations like RiversEdge West, which is based in Grand Junction, provide opportunities to share experiences as well as many resources for riparian restoration projects.

## CHARACTERISTIC SPECIES OF HEALTHY RIPARIAN AREAS:

### Western Yellow-billed Cuckoo

(*Coccyzus americanus*) The Western Yellow-billed Cuckoo, also known as the rain crow, is a secretive species that breeds in large patches of multilayered native riparian forest- most frequently cottonwood-willow forests. They may also nest in dense early to mid-successional riparian forests. During the breeding season cuckoos eat caterpillars, including tent caterpillars, as well as other insects. In the fall and winter, they also eat seeds and fruits.



### Yellow-breasted Chat (*Icteria virens*)

Yellow-breasted chats are the largest North American warbler and they are found in the dense vegetation of the riparian area in the Grand Valley. Because they usually stay in thick cover they are often hard to spot, but during the breeding season male chats are known for their improvisational jazz-like songs that include a diversity of sounds from whistles to grunts, rattles, and gurgles. Chats pick insects off foliage, eating ants, beetles, caterpillars and others. They also eat fruits and berries.

### Blue Grosbeak (*Passerina caerulea*)

Males are brilliantly blue with a chunky silver beak, while females are cinnamon colored. Nests in riparian areas and nearby agricultural areas. Will nest in both native riparian shrub species (willow, three-leaf sumac) as well as non-native species like tamarisk.



## CHARACTERISTIC SPECIES OF HEALTHY RIPARIAN AREAS:

**Lazuli Bunting** (*Passerina amoena*) Spectacular sparrow sized bird. Males are bright light blue above with orange on the breast, females are grayish brown and cinnamon. Lazuli Buntings nest in riparian shrubs and frequently sing from cottonwood trees to better broadcast their jumbled "squeaky" song.



### **Wood Duck** (*Aix sponsa*)

These exotic looking ducks nest in tree cavities near water. In the Grand Valley these are typically in dead cottonwoods or where a branch has broken off and wood has rotted away to create a cavity. May also use nest boxes placed in trees.

### **Yellow Warbler** (*Setophaga petechia*)

These tiny bright yellow birds were once common along the Colorado River but have declined along with native cottonwood-willow riparian habitat. These birds more commonly nest in multi-layered riparian habitat at higher elevations than the Grand Valley, but they do breed here and use the area during migration.



## NATIVE PLANTS TO CONSIDER FOR HEALTHY RIPARIAN AREAS:

**Rio Grande Cottonwood** (*Populus deltoides*) is the most important native tree in our area. It grows to over 100 ft. tall and its leaves turn a brilliant gold in the fall. These trees provide habitat structure critical to many of our riparian birds. Cottonwoods are nesting sites for species including Bald Eagles, Bullock's Orioles, Great Blue Herons and Great Horned Owls. When dead, they are used by cavity nesters like Wood Ducks and Western Screech Owls. Whenever possible leave dead cottonwoods standing.



**Coyote Willow** (*Salix exigua*) is a favorite food of beaver and deer- even some species of birds will eat willow buds. Dense stands of coyote willow foster a more humid microclimate and large insect populations that are an important food source for birds.

**Three-leaf Sumac** (*Rhus trilobata*) Also known as skunkbush for its pungent (although un-skunklike) smell, forms dense thickets that provide good cover for birds and other wildlife. It produces small fruits which are eaten by birds and persist on the bush through the winter. In the fall, three-leaf sumac's foliage turns an attractive red color.



## NATIVE PLANTS TO CONSIDER FOR HEALTHY RIPARIAN AREAS:

### Woods' Rose (*Rosa woodsii*)

A wild rose species with attractive pink flowers, it may form thorny thickets that provide good cover for small birds. The rose hips or fruits provide food for many species of birds as well as mammals like deer and bear.



### Silverleaf Buffaloberry

(*Shepherdia argentea*) This species looks very similar to non-native Russian Olive, but produces bright red fruit in fall that are eaten by birds and other wildlife. Also provides good cover and nest sites for many bird species.

### Golden Currant (*Ribes aureum*)

In the Grand Valley this shrub usually grows to about 3 ft. in height. It produces small yellow flowers in the spring that are attractive to pollinators and numerous small fruits that ripen to a dark purple and are excellent food for songbirds, turkey and quail.



**Other native riparian plants to consider:** New Mexico privet (*Forestiera neomexicana*), boxelder (*Acer negundo*), netleaf hackberry (*Celtis reticulata*), inland saltgrass (*Distichlis spicata*)

## CONCLUSION

Coloradans know that water is a precious resource for both people and wildlife. The areas around washes, creeks, streams, and rivers serve an important function in the larger landscape, and when healthy, protect our properties and provide vital resources for wildlife. Sometimes these areas are large and grand, but more often birds find refuge in small patches of healthy habitat that are being protected and cared for by someone like you.

We encourage you to check with your area Audubon chapter and RiversEdge West ([www.riversedgewest.org](http://www.riversedgewest.org)), and become involved in a local riparian project. Caring for your own wildlife habitat is a critical link in the conservation of riparian habitat statewide.

Birds and invasive plants know no boundaries; and, especially during migration, a reach of dense, riparian vegetation is a welcome resource for birds, many of which may be on a cross-continental trek. We hope this guide aids in making your oasis hospitable for birds while also providing healthy landscape for the benefit of your family and community.

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THANK YOU FOR BEING A FRIEND TO  
BIRDS, WILDLIFE, AND A GOOD STEWARD  
OF OUR PRECIOUS RIPARIAN HABITAT.

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*Migratory Milestones*  
Impact through the Decades

## ADDITIONAL RESOURCES FOR IMPROVING YOUR RIPARIAN PROPERTY

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**Birds and Water in the Arid West: a report from the National Audubon Society**

<http://www.audubon.org/conservation/western-water>

**Field Guide for Managing Saltcedar in the Southwest (USDA):** [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5410127.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5410127.pdf)

[https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5410127.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5410127.pdf)

**Field Guide for Managing Russian olive in the Southwest (USDA):** [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5410126.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5410126.pdf)

[https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5410126.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5410126.pdf)

**Field Guide for Managing Russian Knapweed in the Southwest (USDA):** [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5410125.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5410125.pdf)

[https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5410125.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5410125.pdf)

**Plants for Saline to Sodic Soil Conditions:** <https://www.riversedgewest.org/resource-center/documents/tech-note-9-plants-saline-sodic-soil-conditions>

<https://www.riversedgewest.org/resource-center/documents/tech-note-9-plants-saline-sodic-soil-conditions>

**Colorado State University Soil Testing Lab:** <http://www.soiltestinglab.colostate.edu/>

[www.soiltestinglab.colostate.edu/](http://www.soiltestinglab.colostate.edu/)

**Alternative Irrigation Systems for Arid Land Restoration by David Bainbridge**

[http://www.gaiacollege.ca/course\\_content/Maintenance2/alternative\\_irrigation.pdf](http://www.gaiacollege.ca/course_content/Maintenance2/alternative_irrigation.pdf)

[http://www.gaiacollege.ca/course\\_content/Maintenance2/alternative\\_irrigation.pdf](http://www.gaiacollege.ca/course_content/Maintenance2/alternative_irrigation.pdf)

**Information on nest boxes from the Cornell Lab of Ornithology:** <https://nestwatch.org/learn/all-about-birdhouses/>

[nestwatch.org/learn/all-about-birdhouses/](https://nestwatch.org/learn/all-about-birdhouses/)

**Information on preventing accidental bird deaths in pipes:**

<https://www.fws.gov/cno/conservation/MigratoryBirds/DeathByPipes-final.pdf>

**Information on preventing accidental bird deaths in vault toilets:**

<http://tetonraptorcenter.org/our-work/poo-poo-project/>

**Bird Conservancy of the Rockies**

<https://birdconservancy.org/>

**RiversEdge West**

<https://www.riversedgewest.org/>

**Grand Valley Audubon Society**

<https://www.audubongv.org/>



Photo by Cara Kukuraitis