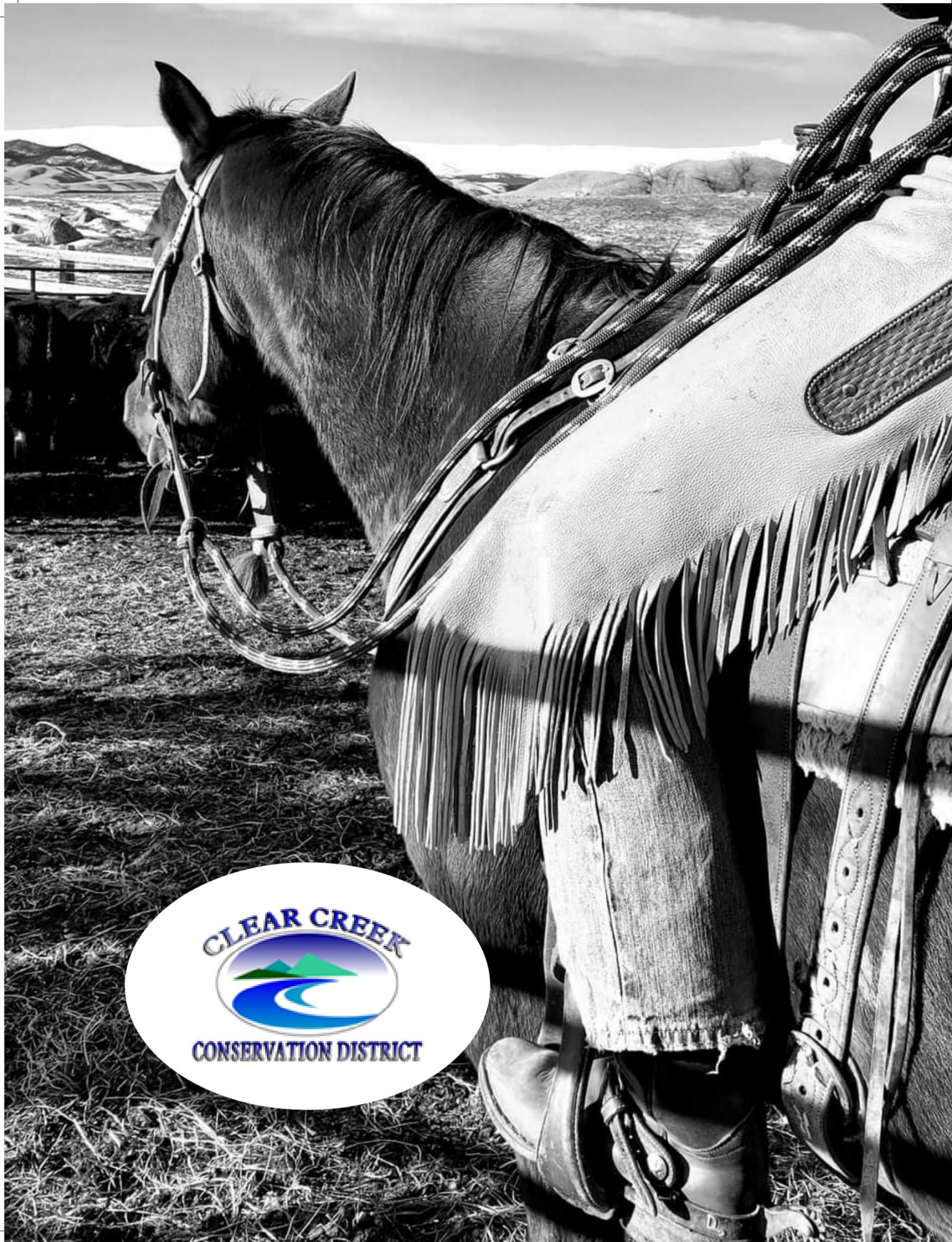




CLEAR CREEK
Northern Johnson County
Rural Living Resources
CONSERVATION DISTRICT



Welcome!

Rural living in Wyoming has its challenges and its rewards. Whether you have been living on rural acreage for a long time or you're new to Wyoming and Johnson County, we hope you find this guide interesting and of practical use.

This guide is brought to you by Clear Creek Conservation District where we are interested in promoting good stewardship of natural resources. We understand the appeal of rural living but there is also a responsibility that comes with the rural living lifestyle. We want to provide you with the tools and information needed to enjoy your rural living experience while maintaining the value and aesthetics of the land that attracted you in the first place.

Our mission is to provide user-friendly information on several topics pertinent to rural living, whether you have a few acres or many. This guide is not meant to contain highly detailed information on each topic but instead to offer sufficient information to guide and stimulate considerations for the rural landowner on how to conserve our natural resources and to be good stewards of the land.

Each topic includes contact information for more in-depth assistance as well as a resource Directory located at the back of this publication. The Resource Directory provides a quick reference to contact information for numerous agencies and organizations that may be able provide more in-depth information.

Successful rural living involves learning and patience. We hope this guide will provide a practical education resource to help you live better on your land.

Clear Creek Conservation District



Table of Contents

EDITORS

Zach Byram
Amanda Hulet

CONTRIBUTING WRITERS

Zach Byram
Amanda Hulet

GRAPHIC DESIGN

JHL Creative

PHOTO CREDITS

Lisa Killian Photography

*Written and Published by Clear
Creek Conservation District 2022*

For more information or to obtain
more copies, please contact the
district office

Clear Creek Conservation District
500 W Lot Street, Unit B
Buffalo, WY 82834
(307) 620-3021
www.clearcreekcd.org

About Clear Creek Conservation District.....	2
About Northeast Wyoming	8
Property Management Plan.....	9
Small Acreage Grazing	10
Manure Management	16
Living with Wildlife.....	17
Water	20
Soils.....	26
Weeds	28
Forestry.....	34
Landscaping.....	36
Urban Agriculture.....	38
Recycling	39
Appendix.....	40

TOPIC	AGENCY	ADDRESS	PHONE	WEBSITE
Solid Waste Disposal	Johnson County Solid Waste	284 TW Rd, Buffalo	(307) 684-2541	www.johnsoncountywyoming.org
Soils	USDA NRCS	500 W Lott St, Unit A, Buffalo	(307) 684-2526	www.nrcs.usda.gov
Recreation	Bureau of Land Management, Buffalo	1425 Fort St, Buffalo	(307) 684-1100	www.blm.gov/office/buffalo-field-office
	Bighorn National Forest Buffalo Chamber of Commerce	1415 Fort St, Buffalo 55 N Main St, Buffalo	(307) 684-7806 (307) 684-5544	www.fs.usda.gov/bighorn www.buffalowyo.com
Recycling Disposal	Johnson County Solid Waste	284 TW Rd, Buffalo	(307) 684-2541	www.johnsoncountywyoming.org
	Buffalo Recycle Center	550 Butte St, Buffalo	(307) 217-0320	
Rural Security	Johnson County Sheriff's Office	639 Fort St, Buffalo	(307) 684-5581	www.johnsoncountywyoming.org
Stream & Riparian Management	Wyoming Game & Fish Department	629 N DeSmet, Buffalo	(307) 684-2801	www.wgfd.wyo.gov
	USDA NRCS	500 W Lott St, Unit A	(307) 684-2526	www.nrcs.usda.gov
Tree Care	Wyoming State Forestry Division	600 Veteran's Lane Buffalo	(307) 684-2752	www.wsfed.wyo.gov/contact-us/district-5
Water Quality	Wyoming Department of Environment Quality	510 Meadowview Dr, Lander, WY 82520	(307) 332-3144	www.deq.state.wy.us/index.asp
Wildfire/ Controlled Burning	Johnson County Fire Control District #1	970 Volunteer Lane, Buffalo		www.johnsoncountywyoming.org
Wildlife Habitat	Wyoming Game & Fish Department	629 N DeSmet, Buffalo	(307) 684-2801	www.wgfd.wyo.gov
Wyoming Water Law	Wyoming State Engineers Office	2100 W Fifth St, Sheridan	(307) 674-7012	www.seo.state.wy.us

Appendix

TOPIC	AGENCY	ADDRESS	PHONE	WEBSITE
Backyard Wildlife	Wyoming Game & Fish Department	629 N DeSmet, Buffalo	(307) 684-2801	www.wgfd.wyo.gov
Composting Tree Care	Clear Creek Conservation District	500 W Lott St, Unit B, Buffalo	(307) 620-3021	www.clearcreekcd.org
Landscaping Xeriscaping	Clear Creek Conservation District	500 W Lott St, Unit B, Buffalo	(307) 620-3021	www.clearcreekcd.org
Construction Permits	City of Buffalo Johnson County Planning and Zoning	46 N Main St, Buffalo 76 N Main St, Buffalo	(307) 684-5566 (307) 684-1907	www.cityofbuffalo.com www.johnsoncountywyoming.org
Drinking Water Wells	US Environmental Protection Agency (EPA) Wyoming State Engineers Office Johnson County Planning and Zoning	999 18th St., Suite 200 Denver CO 80202 2100 W Fifth St, Sheridan WY 82801 76 N Main St, Buffalo	(800) 227-8917 (307) 674-7012 (307) 684-1907	www.epa.gov/Region8 www.seo.state.wy.us www.johnsoncountywyoming.org
Emergency Services	Johnson County Emergency Management National Weather Service	26 N DeSmet, Buffalo 12744 W US Hwy 26 Riverton WY 82501	(307) 684-2761 (307) 857-3898	www.johnsoncountywyoming.org www.crh.noaa.gov/riw
Fisheries	Wyoming Game & Fish Department	629 N DeSmet, Buffalo	(307) 684-2801	www.wgfd.wyo.gov
Grazing & Raising Livestock	UW Johnson County Extension Office	30 Fairgrounds Rd, Buffalo	(307) 684-7522	www.wyoextension.org/johnsoncounty/
Hunting & Fishing	Wyoming Game & Fish Department	629 N DeSmet, Buffalo	(307) 684-2801	www.wgfd.wyo.gov
Irrigation	USDA NRCS	500 W Lott St, Unit A, Buffalo	(307) 684-2526	www.nrcs.usda.gov
Livestock Health	Wyoming State Veterinarian	2020 Carey Ave Cheyenne, WY 82002	(307) 777-6443	www.wlsb.state.wy.us
Livestock Transport	Wyoming Livestock Board	2020 Carey Ave Cheyenne, WY 82002	(307) 777-6443	www.wlsb.state.wy.us
Noxious Weeds	Johnson County Weed and Pest	123 Flatiron Dr, Buffalo	(307) 684-5715	www.jcweedandpest.com
Septic Systems	Johnson County Planning and Zoning	76 N Main St, Buffalo	(307) 684-1907	www.johnsoncountywyoming.org

Introduction

CLEAR CREEK CONSERVATION DISTRICT MISSION STATEMENT

“The Clear Creek Conservation District is dedicated to the development and implementation of programs to provide leadership and technical assistance for the conservation of Johnson County’s natural resources, agricultural heritage and resource base, to promote the control of soil erosion, to promote and protect the quality and quantity of Wyoming’s waters and all other natural resources, to preserve and enhance wildlife habitat, to protect the tax base and to promote the health, safety, and general welfare of the residents of this County through responsible conservation planning.”

ABOUT CLEAR CREEK CONSERVATION DISTRICT

History of CCCD

The Conservation District concept began in the Dust Bowl era of the 1930’s in response to severe drought and drastic soil loss. The federal government created the USDA Soil Conservation Service, now called Natural Resource Conservation Service (NRCS), under the Soil Conservation Act of 1935. This agency was charged with administration of programs and practices to address soil erosion concerns.

In February of 1937 the President urged all states to pass legislation authorizing locally led soil conservation programs. This need initiated the formation of conservation districts across the United States with the first passage of the Soil Conservation District Law in Arkansas in March, 1937. The Wyoming State Legislature followed suit by passing the enabling legislation for the formation of local conservation districts in March of 1941.

The Clear Creek Conservation District was organized on November 18, 1942. Through the years the District’s boundaries have expanded to encompass 1,450,840 acres.

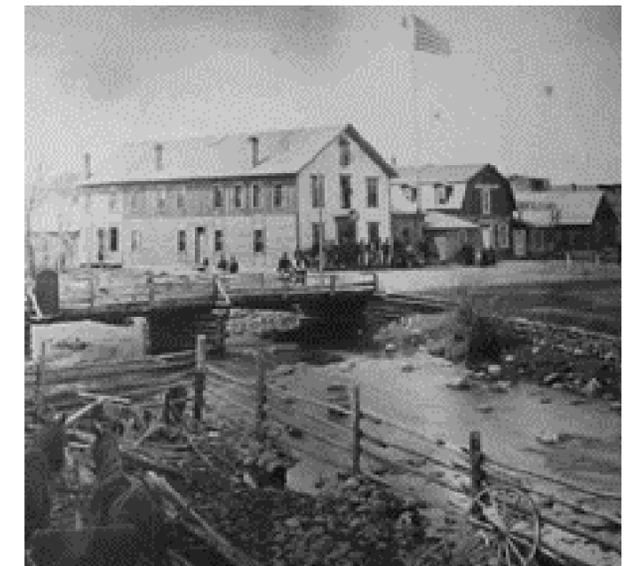
Authority

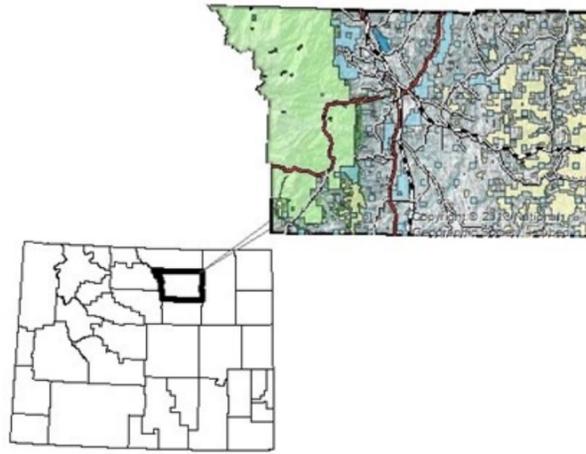
CCCD is a local subdivision of the state as defined and established by the Wyoming State Statutes at Title 11, Chapter 16, et seq., entitled “Wyoming Conservation District Law.” Clear Creek Conservation District, pursuant to W.S. 11-16-122(iv) and

(xvi) of the Wyoming Conservation Districts Law, is authorized to develop plans for the Clear Creek Conservation District and to file said plans in the office of the Johnson County Clerk.

The people residing within the CCCD boundaries elect the five-member Board of Supervisors of the Clear Creek Conservation District by popular vote during the general election. The elected members represent both the rural and urban populations within the District. The Board of Supervisors is the only locally elected board charged with the responsibility of representing local people on natural resource issues. A conservation district supervisor serves the community voluntarily

The CCCD’s programs and administration is supported by a one mill levy and grants.





Location

The Clear Creek Conservation District is one of two conservation districts within Johnson County and is located in the northern portion. The Powder River Conservation District is the second conservation district in Johnson County and lies in the southern half of Johnson County. CCCD is also bordered by both Washakie County Conservation District and South Bighorn Conservation to west, Sheridan County Conservation to the north, and Campbell County Conservation District to the east.

Watersheds

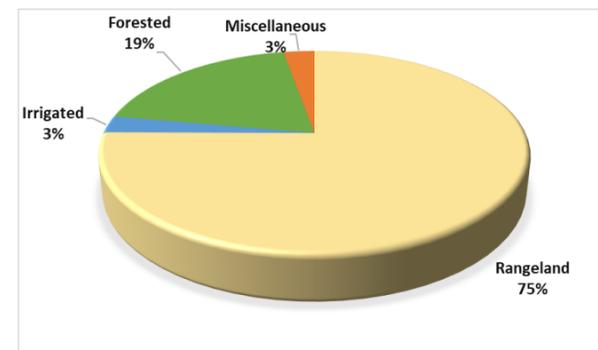
The Clear Creek Conservation District encompasses six hydrologic units, or drainage basins, within its borders. These are Clear Creek, Crazy Woman, Upper Powder River, Middle Fork, Nowood, and Upper Tongue. Major rivers and streams within these watersheds include Powder River, Clear Creek, and Crazy Woman Creek. Primary tributaries to Powder River are Salt Creek, South Fork Powder River, North Fork Powder River, red Fork Powder River, Beaver Creek, Middle Fork Powder River, and Buffalo Creek. Within the Clear Creek drainage, the primary tributaries are Piney Creek, Little Piney Creek, North Piney Creek, South Piney Creek, Shell Creek, Johnson Creek, Rock Creek, and French Creek. Primary tributaries of Crazy Woman drainage are Middle Fork Crazy Woman, Billy Creek, Muddy Creek, North Fork Crazy Woman Creek, Little Fork Crazy Woman Creek, and Kelly Creek.

Climate

Climate within the Clear Creek Conservation District can vary widely depending on elevation. Generally, the Bighorn Mountains and associated foothills receive more snow during the winter months and more rainfall in the summer. The Bighorn mountain range obscures moisture arriving from the west creating a semi-arid climate regime and leaving the majority of Clear Creek Conservation District in a rain shadow resulting in a dry climate. On average, the district receives 10-14 inches of annual precipitation. Sub-zero temperatures are not uncommon during winter and are often associated with high winds. The average summer temperature is 82.5 degrees Fahrenheit with temperatures occasionally reaching into the 100's. The average growing season is 136 days, although freezing temperatures have been recorded in July and August.

Land Use

Approximately 75 percent of the district is rangeland which is used for a variety of production activities, including agriculture. Many of these agricultural operations supplement range forage with irrigated hay and pasture. Approximately 39,000 acres within the District are irrigated hay or pasture lands. Cattle, sheep, and horses graze both the range and irrigated pastures. The area also supports both mule and whitetail deer, elk, pronghorn antelope, and moose.



A variety of industries operate within the District boundaries as well. Natural gas and oil production constitute the majority of the commercial non-renewable resources in CCCD. Sand, gravel, and scoria are other economic resources with in CCCD. Timber harvest on national forest land accounts for a limited amount of land use.

Recycling

Reduce, Reuse and RECYCLE! Johnson County has a number of opportunities to incorporate these efforts into your every day life.

The Buffalo-Johnson County Recycling Center is located at 550 Butte Street. This is the go-to for 1 & 2 plastics, aluminum and steel cans, glass, cardboard, paper, books, Styrofoam and fabric & clothing. There are some specifics on care of the items you bring in. Those stipulations are posted on the Johnson County website under Recycle Information. But generally, you can take all of this to the center.

Household Hazardous Waste Day is a one day per year event sponsored by the Clear Creek Conservation District to drop off those items like pesticides,

oil, old gas and paint. All you have to do is load up your treasures on the first Saturday in June and bring them to the event to be disposed of properly. Advertising is on the radio, in the Buffalo Bulletin and also on the district's website.

Our local landfill has a composting program where you can bring in grass clippings and small tree branches. They take it at no charge and turn it into compost that you can come back to get once it has completed the composting process.

The Clear Creek Conservation District also offers a cost share on composters, rain barrels and weed barrier for your property. You can contact them for more information.



Urban Agriculture

We live in a great rural community. The city of Buffalo offers small town living at it's best. And with that comes questions from newcomers to the area. Here are a few things you need to know.

Gardens are totally allowed! Be sure to know the covenants of your subdivision (which should have been given to you when you purchased the property) so that if you build a fence or do some landscaping, that it falls within those limits. Some subdivisions of the city are much more strict than others.

Be sure to call 411 and do a line locate before digging into the ground. There are a number of different lines running through the city lots and it's good to know where they are.

Animals. We are super lucky that the city of Buffalo does allow some animals. Of course, this comes with rules and those specific rules can be found on the City of Buffalo's website, under Ordinances.

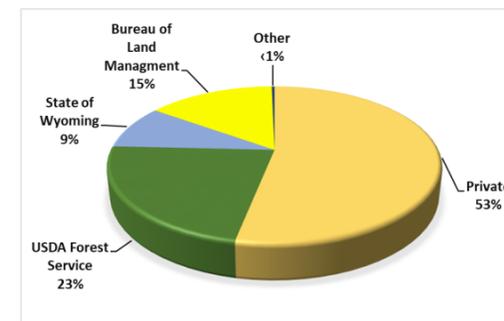
Here is the quick rundown of what you should know. There are no hogs or pigs allowed; no roosters, either. With the animals you do have, make sure to take good care of them. Be sure they have food, water and shelter. Keep them fenced in, other wise they will be considered a nuisance and can be found at large. This means you will get fined. Be sure that you aren't hoarding a crazy number of animals and that you are keeping their facilities clean. Ultimately, play nice so your neighbors don't get grumpy and turn you in.

Urban Agriculture is a growing topic among Americans today. Often called "homesteading" or "urban homesteading", most of these folks have small acreage or live in town and they are learning how to grow their own produce and most are loving having chickens for fresh eggs. This can be you, too. Just be sure to know the rules before you start.



Land Ownership

Land ownership in the CCCD is categorized as Federal, State, Private, and Other. The portion of CCCD under Federal jurisdiction includes USDI Bureau of Land Management and USDA Forest Service and accounts for approximately thirty eight percent of the total area. State lands encompass nine percent of the land area within CCCD boundaries including Wyoming Game and Fish properties, public schools, state parks, cultural resources, historic sites, and State Forestry. Private land ownership accounts for fifty three percent of the total lands, while Other, including water bodies, County lands, City lands, and unclassified land account for less than one percent.

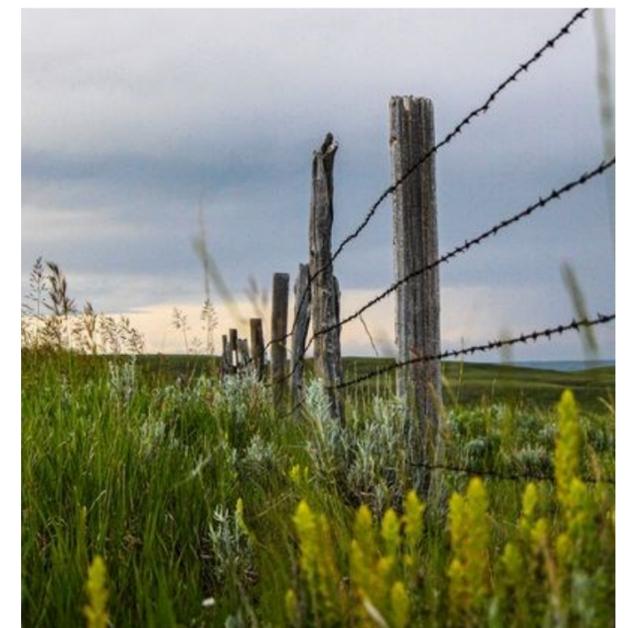


Being a Good Neighbor

Getting along with your neighbor can often be challenging. These challenges are often different in the country than in town because rules and perception can be different. These differences can cause conflict to arise between new and existing rural landowners so it is a good idea to get to know your neighbors. Your neighbors can be a valuable resource for information on what it takes to successfully live on rural acreage and the neighboring rancher will appreciate you learning about their operation. Newly arriving individuals are often unaware of private boundaries when they first move to rural acreage. In Northern Johnson County pub-

lic lands are often bordered by Federal, State, and private lands and this can cause unintentional trespass. It is always the responsibility of the individual to know whose land they are on regardless of whether it is fenced or not. Remember, Wyoming is a fence out state for cattle, meaning that landowners who prefer not to have livestock on their property are responsible for fencing them out.

In addition, domestic pets can be a threat to livestock and wildlife and it is unlawful to allow dogs and cats to harass wildlife or livestock. Although a landowner might believe that a free-range domestic cat killing rodents is beneficial these cats are the number one killer of songbirds in the United States accounting for up to 2.4 billion song-bird deaths a year. Domestic pets harassing livestock and wildlife will certainly cause conflict and may result in unwanted and traumatic circumstances for the pet and pet owner. Also, unvaccinated pets can transmit rabies and may spread parvo virus, feline leukemia virus, canine and feline distemper as well as several other viruses and parasites.





Location, Location, Location Your Rural Land

A little bit about Northeast Wyoming and some points to ponder

Northern Johnson County, like much of the rest of Wyoming, has a broad array of elevations, soil types and other factors that affect what you will be able to do with your property. With a short growing season and low precipitation Mother Nature often moves slower than what we would like here. Consider setting realistic expectations so you won't waste your money and other resources trying to speed along these processes. For example, if you are reseeded a pasture with the intention of pasturing a horse or two it may take up to four years for your seeding to completely establish. You may fight annual weeds and an unkept look for the first couple of years while the seeding takes hold. Keep this in mind when making changes to your property as disturbance by some changes may take a long time to be restored. In the example above the need to reseed a pasture could have been avoided if the landowner had recognized the signs of overgrazing by livestock before it was too late for the existing plant life to recover.

Rural living in Northern Johnson County may be more difficult and challenging than where you moved from or where you're planning on moving from. If you are considering buying land there are some things you will want to know about it. For example, is there adequate quality water available or will you have to haul it, what are the water rights the property may have, whether or not you will be responsible for the maintenance of your roads (winters in our area can be severe and roads often have to be plowed frequently), how much wind is there going to be, how the local wildlife will impact you, and many other factors. Keep these



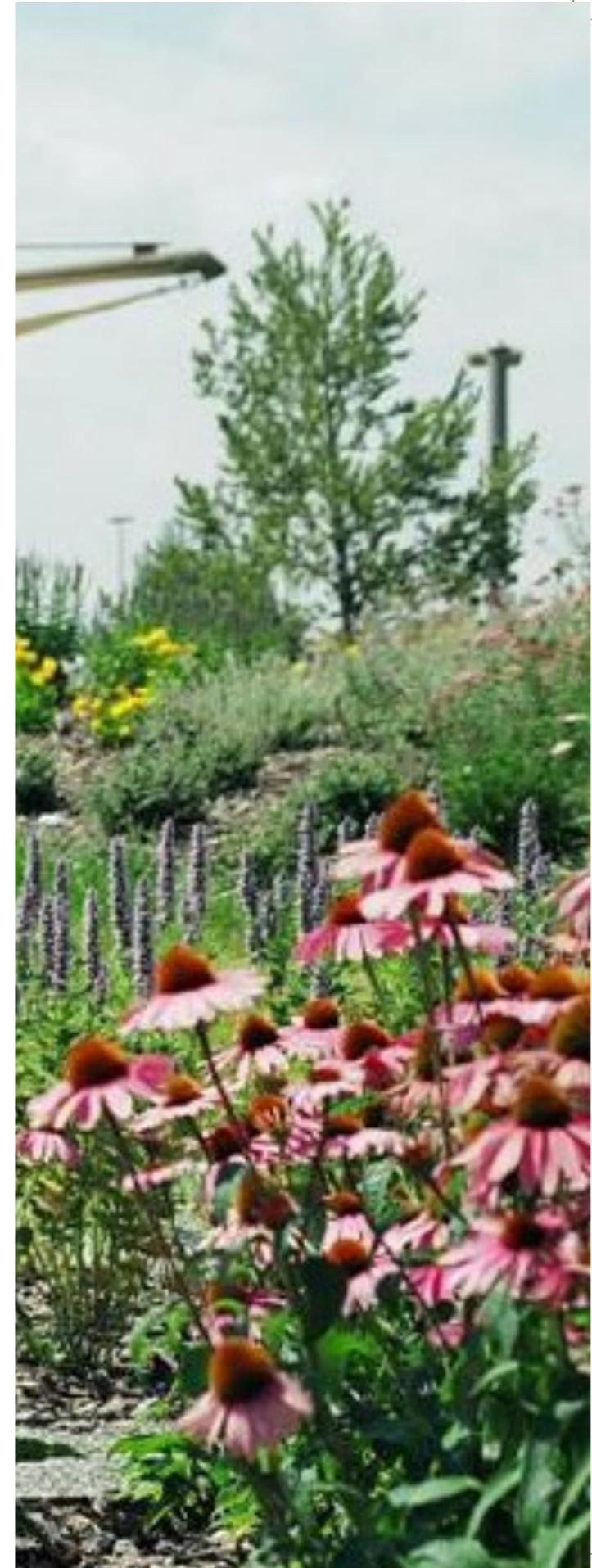
and many other factors in mind before you purchase property or make changes to your investment.

Chances are you will be happier and more successful at rural living if you plan ahead and are prepared to deal with whatever factors you encounter. There are resources in our community that can help to determine your properties potential for a variety of activities. Resource professionals at the Natural Resource Conservation Service, UW Extension, Johnson County Weed and Pest, and Clear Creek Conservation District can help you get started depending on your area of interest and need.

Trees and Shrubs

Site selection is key in growing trees and shrubs in northern Johnson County. Things to consider when selecting a site is how windy it is, how close it is to any type of structure, consider power lines both above and below ground, other trees in the area, how much sunshine it has, WATER, soil pH and human neighbors. These are all factors that will mean the difference in your tree growing well or not growing at all. But now that you have the perfect spot, what tree do you get? Again, find a tree that has a hardiness zone level of 4. 5 and up will not grow well at all here. They come in all different ways and all different ages. Bareroot trees are small and young and come as just a root with a "whip" as a tree. They can come in containers and balled and burlapped. Then once you've figured out which tree and how it's coming to you, prepare the site for planting. Make sure the hole is deep enough and wide enough and when you go to plant it, DO NOT plant it deeper than it comes in a container or ball and burlapped. You are essentially snuffing out the tree if too much dirt goes up the trunk. Then make sure you have it protected from wildlife, feed it, water it and you're good to grow. Some species that seem to thrive here are Colorado Blue Spruce, Concolor Fir, Rocky Mountain Juniper, Eastern Red Cedar, most Maple species, our favorite being Autumn Blaze Maple, Alders, Birch, Crabapples and more!

Making sure that the plants do receive enough water is key to survival here. Even though you are planting natives and water wise plants, they still need water to survive, especially the first year being planted. That and a little bit of fertilizer and you're set in the nutrients department. We strongly recommend fencing around your trees, shrubs and plants until they are mature. Our wildlife has a taste for young plants of all types and can destroy a landscaping project in just minutes. Wire cages can be built easily for trees. Small flowering plants can be surround with the same cages. Leaving those cages in place for the winter will also help as it will keep the wildlife from digging at your garden and chewing on the bark of the trees.





Property Management Plan

Landscaping

According to Webster's dictionary, landscape is a transitive verb meaning to modify or ornament (a natural landscape) by altering the plant cover. I like Google's definition better. It is a noun meaning the process of making a yard or other piece of land more attractive by altering the existing design, adding ornamental features, and planting trees and shrubs. Whether you have 5 acres or 500, chances are that there are areas that will be needing your landscaping attention. Here are just a few ideas to get those ideas going!

Xeriscaping or Water Wise Landscaping

This is simply creating a landscape that fits our climate! With an annual precipitation average of 12.68 inches, we look to the plants that are surviving in near drought conditions. Also, consider things like wind, wildlife, intense sunlight, and weather events that are super unpredictable (think

hail storms). Your soil may also not be as adequate as you might like. Even with all of this chaos, there are certainly a number of plants, shrubs, and trees that will survive!

Perennials and Annuals

There are a number of flowers that won't only grow here but are also native as well. Here in northern Johnson County, we are at a hardiness zone of 4. No matter what you decide, plants that you want to come back (annuals) will not survive if they are zone 5 or higher. Flowers that get tall (i.e. gladiolus, hollyhocks, etc) need to have sturdy support to help keep them straight and tall because of the wind. Some great flowers we recommend because they are hardy, water wise and native to the west include: Purple Poppy Mallow (Winecups), Sulfur-flower Buckwheat, Scarlet Gilia, Tufted Evening Primrose, and Dotted Gayfeather.



In the last section it was mentioned that you will be faced with many variables and factors that will affect what you will be able to accomplish with your property. Whatever expectations you may initially have for your property, you will be best served to develop a property management plan. Once you have purchased your property a property management plan can be a useful tool for guiding a landowner's effort in trying to reach desired benefits. A good approach to developing a plan is to look at what is important to you, things you want to avoid, and what you want your land to do for you. In developing goals for your property, it will be helpful to answer a number of important questions such as:

- 1) Why did you buy rural property?
- 2) Why did you decide to buy your particular parcel?
- 3) What do you want your property to look like?
- 4) How do you want to use the land?

Once you have answered these questions and included a timeline for your individual goals it is time to take the next step...take an inventory of what you have. A good way to do this is to draw a map of your property and include the items listed above.

It is also a good idea to consider any local (city/county), state regu-

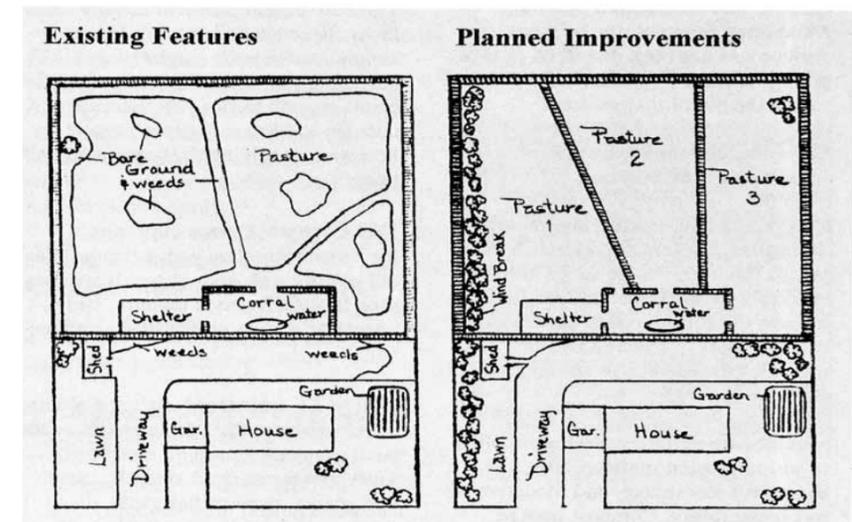
Property Management Plan: Items to Include in your Sketch:

- property boundaries
- fences and corrals
- buildings
- domestic and livestock wells
- septic system
- streams, wetlands, ponds
- roads, driveways
- bare ground
- weeds
- lawn, garden, pastures, crop land
- trees/shrubs
- soil type
- depth to groundwater
- neighboring land uses
- topography

lations, codes, covenants, and restrictions when doing a property management plan. Also keep in mind the importance of being a good neighbor and consider how your planned activities could affect your neighbors.

After your inventory and map have been completed some goals may need to be adjusted given the opportunities and constraints on your property. Remember, even if you like things just the way they

are, you will need to maintain your property to keep it this way. Several local contacts are available to help you with your goal setting and property management plan. These include the University of Wyoming Cooperative Extension Service, Natural Resource Conservation Service (NRCS), and Clear Creek Conservation District. Contact information for these can be found in the Resource Directory.





Small Acreage Grazing

How to feed your livestock while maintaining the health and value of your land

Many folks move to rural acreage to enjoy the open space, to potentially own livestock for hobby or pleasure, or to provide space for their children/grandchildren to raise animals. Improperly managed animals grazing on rural acreage can create a large number of resource problems that people may not be aware of. These problems include a shortage of grass covering resulting in soil erosion, reduced soil and water quality, reduced livestock health, and an increased number of weeds. Proper grazing can invigorate plants and make use of a renewable natural resource. This section is designed to provide information that will help you avoid negative results while optimizing the forage resources your land offers.

Among the questions to answer include:

- How much do my animals need to eat to be healthy?
- How much forage can my land provide while remaining healthy?
- What are some specific grazing strategies that will allow me to best take advantage of the available forage while keeping forage plants healthy and producing to their full potential?

How much our livestock need to eat

How much forage do our animals need to stay healthy? Depending on the type and stage of growth of our animals, they have varying nutritional requirements. Below are some considerations outlining such differences.

How much does your livestock eat each day?

Forage required by an animal is commonly measured in “animal units” or an AU (one AU equiva-

lent is 25 pounds of feed per day). It is a way to compare different animals and their feed requirements (Table 1).

- One mature 1,200-pound pleasure horse will eat approximately 32 pounds of grass or hay per day (1.25 AU)
- A 1,000-pound cow not lactating will require approximately 25 pounds of grass or hay per day (1.00 AU).
- A mature ewe or doe goat will eat 4 to 5 pounds of grass or hay per day (0.2 AU).

It is important to remember that during winter months the quality of forage decreases and supplemental feeding is generally required.

This may be in the form of a complete feed, a grain, and/or a protein supplement. Replacement feed in the form of hay may also be required if there is insufficient forage available due to previous harvesting or snow cover.

As forage amount is discussed, you may hear the term “animal unit month” or AUM, being used. This is simply the forage required for one animal weighing 1,000 lbs for one month. For example, one 1,000 lb cow will consume 1 AUM which equals about 800 lbs of forage for one month. A 1,200 lb saddle horse will consume 1.2 AUMs (960 lbs) in one month.

Once we determine how much forage your animals need to eat we can start to think about the amount of forage our land or pastures can provide. This is the second part of the equation in determining how many animals can use the property for how long while maintaining healthy pastures.

avoid damaging the forest.

Wildlife habitat recommendations - Recommendations will be made to improve habitat for a wide range of wildlife species. Recommendations might include aspen enhancement, riparian improvements, pond establishment, and invasive plant management plans.

Forest health/diversity recommendations - Recommendations will be given to increase forest health and increase tree species and tree age diversity. Projects might include forest thinning, prescribed burns, and invasive plant removal.

Production of forest products- Recommendations will be made to maximize the production of forest products.

Once the goals and objectives of a forest stewardship plan have been developed and written a schedule implementing each activity will



be included in the plan which typically covers a 10-year period. This time-period will be based on the goals and priorities of the landowner and recommends specific timeframes to complete each of the activities. In addition to having clear goals, objectives, and timelines having a forest stewardship plan can help landowners qualify for cost-share assistance through different agencies and organizations. Your Wyoming

State Forestry forester can assist in determining which cost-share programs could best apply to your property.



Can You See The Forest Through The Trees?

Managing Your Forest Property

Forests have recently started to be viewed as more than just trees. They are viewed as a diverse community of plants, animals, water, and soils that are constantly changing. Understanding how to work with all of these variables to improve your forested land can be a difficult task. This already difficult task of sustaining a diverse ecosystem can become even more challenging when you start thinking about noxious weeds, insects, disease, fragmentation, and wildfires and how these can degrade a forest. Whether your forested land is small or large CCCD recommends contacting a professional forester with Wyoming State Forestry to help educate you and help you sustain and improve your forest (please see Resource Directory). A forester can provide you with an evaluation of your property which would include what tree species you have as well as what is the age and health of your forest. They can also help to identify any insect and disease issues that may be contributing to poor forest

health. The professional forester can use this information and conduct an in-depth inventory of other natural resources such as rangeland, wildlife, and riparian areas. This information can then be used to help you develop a forest stewardship plan.

Forest Stewardship Plan

A forest stewardship plan is a written plan, made up of multiple sections, that is tailored to the goals of the landowner. Everyone has different goals for their property however many landowners have the same goals which could include improving forest health, reducing tree mortality from disease and insects, mitigating wildfire danger, improving rangeland, improving riparian areas/increasing streamflow, and generating forest products.

Although the plan will have some requirements and standards each property is unique so each plan will include unique items. The following are common items included in a forest stewardship plan:

Accurate and up-to-date maps -

These maps will include acreages, distances, elevations, detailed property boundaries, forest stands, riparian areas, roads, water bodies, rangeland areas, buildings, etc.

Forest stand recommendations -

Forest stands will be delineated by similar characteristics such as tree species, age, density, and/or condition. Recommendations will be made for each stand to address forest health and other landowner goals.

Firewise recommendations -

These recommendations are given in order to reduce fuel load on the property that can help reduce the potential for a catastrophic fire. Recommendations to increase the properties defensible space will also be given.

Domestic livestock grazing recommendations -

Long-term negative effects can occur if domestic livestock is mismanaged on forested lands. Recommendations are made to assist the landowner in developing a grazing plan to

The Natural Resources Conservation Service has developed ecological site descriptions (ESDs) for Wyoming that can help guide you in estimating various ecological aspects of your land, including estimating forage production for your area. Local NRCS contact information is located in the Resource Directory.

	Fertile Soils		Poor Soils	
	Hay Tons/Acre	Forage AUMs (lbs/Acre)	Hay Tons/Acre	Forage AUMs (lbs/Acre)
Irrigated hay pasture	2-4 tons	3 - 4 (2,400-3,600)	<2	1 - 2 (800-1,600)
Non-irrigated hay pasture	1-2 tons	1 - 2 (800-1,600)	0 - 0.5	0.5 (400)
Rangeland/Woodland	0-1 tons	0 - 0.5 (400)	0 - 0.5	0.25 (200)

Table 1. Average annual pasture and hay production values (values may vary depending on area and management)

So, how productive are our landscapes (forage supply)

Now that we know how much feed our animals require, the next question is: can the forage from our property keep them full and healthy? What can we realistically expect from our pasture(s)? General guidelines regarding estimates of annual pasture and hay production are in Table 2 (figuring approximately 800 lbs = 1 AUM).

Also understand that pastures are unique and your conditions may vary significantly from the figures listed.

To get a more accurate estimate of the amount of forage on your property, follow a few steps to calculate pounds of forage per acre.

1) Using PVC pipe construct a square with inner dimensions of 25x25 centimeters. This is a

quarter meter square and will help with calculations.

- 2) Randomly place the square on the ground in several representative areas of the pasture.
- 3) Clip all of the grasses and forbs (not shrubs) inside the square to a height of 1 inch and place the clippings in a brown paper lunch bag.
- 4) Let the contents dry in the bag for 2 days.
- 5) Zero a scale with the weight of an empty bag (to subtract the weight of the bag from the final weight you will record).
- 6) Weigh each bag with the clippings in them and record the weights in grams.
- 7) After weighing the bags calculate the average weight for a bag, then convert it to pounds per acre by multiplying by 35.7.

Animal	Weight (lbs)	AU Equivalent	# Animals per AU	Pounds of forage per day
Cow	1,000	1	1	25
Cow	1,500	1.5	0.66	37.5
Yearling Cow	700	0.85	1.25	21.25
Mature Bull	1,700	1.5	0.67	37.5
Milking Cow		1.5	0.67	37.5
Working Horse		2	0.5	50
Saddle Horse		1.25	0.8	31.25
Colt < 2 yrs.		0.5	2	12.5
Sheep	120	0.2	5	5
Goat		0.17	5.9	4.25
Elk	600	0.66	1.5	16.5
Mule Deer	125	0.22	4.5	5.5
Pronghorn	90	0.17	5.9	4.25

Table 1. Animal Unit Equivalent based on weights and pounds of forage consumed on average each day.

Calculate your stocking rate

Once you know your animal's requirements and your land's production, it is easy to estimate how much forage you have available for your livestock.

You will need the following numbers:

Pasture Size: _____acres

Pasture Production: _____pounds/acres

Animal Requirements: _____pounds/acres

Example

Assumptions:

- 30 acres native range
- 10-14 inch precipitation zone
- Sandy soil range site
- Needle and Thread/Rhizomatous Wheatgrass
- Plant Community

Predicted plant production:

- Favorable precip year = 1,500 lbs/acre
- Average precip year = 1,200 lbs/acre
- Poor precip year = 700 lbs/acre

1,200 lb horse will eat around 32 lbs of dry matter per day

In an average year this pasture will produce 36,000 lbs of forage (1,200 lbs/acre x 30 acres).

Half of this must be left in place to keep the plants healthy, and 15 percent will be lost to other grazers (deer, antelope, etc.). So only 35 percent of this is available to domestic animals.

This pasture has **12,600 lbs of available forage** (36,000 lbs x 0.35) and can support **one 1,200 lb horse for 394 days** (12,600 lbs / 32 lbs per day) or **three 1,200 lb horses for 131 days** (12,600 lbs / 96 lbs per day) .

Now that we know how much our animals need to eat and the productivity (in pounds/acre or AUMs/acre) of our pastures we can calculate our stocking rate (see sidebar). Our stocking rate calculation will tell us how many animals we can put on our property without causing damage to the resources.

Healthy grasses make happy horses

The more knowledge a landowner has regarding how grass grows the better they will be able to keep grasses healthy and productive. Healthy grasses are not only more nutritionally valuable but they often produce more forage.

Is grazing necessary?

Many of Wyoming's landscapes, including north-eastern Wyoming, have evolved with grazing beginning with bison when they roamed the plains. This has allowed our native grass species to adapt and flourish with grazing. There is a catch- now that there are fences it is the landowner's responsibility to control the grazing since the animals don't roam freely. As much we need to control grazing so as to not overgraze plants, it can also be detrimental to have no grazing. This is because of the lack of stimulation on the grasses. In the absence of grazing, plants often become less healthy and productive. A heavy layer of litter (dead layer of plant material) can block or prevent new emerging vegetation from getting needed sunlight and the nutrients to grow.

Unhappy grasses keep everyone unsatisfied

You may find yourself in a situation where your animals need more than your pasture can supply, this is often the case in northern Johnson County because of our semiarid conditions. Continually grazing plants during the growing season numerous years in a row (when supply doesn't meet demand) can damage the plants, not allowing them to recuperate once they have been grazed. This keeps the plants from producing enough food from sunlight to keep themselves healthy. As a result, they will be reduced in size and often die. This type of mismanagement will create a reduction of your forage supply in future years. On the next page are two pictures illustrating sustainable grazing management and the unfortunate outcome of mismanagement.



Houndstongue



Canada Thistle



Scotch Thistle



Russian Olive



Spotted Knapweed

There are many other weed species found throughout our area.

Please contact the Johnson County Weed and Pest for help in identifying weed species on your property.

Common weeds in northern Johnson County



Bulbous Bluegrass



Cheatgrass



Ventanata



Leafy Spurge



Medusahead



1. Continuous grazing allows weeds to grow where healthy desirable plants grew before but have been weakened and outcompeted.



2. Good grazing management promotes more forage, fewer weeds, and less bare ground.

Fortunately, as you can see in picture 2, mismanagement can be avoided, leaving your pastures healthy and productive. As landowners it is your responsibility to avoid a situation like picture 1.

Other consumers

Although we often do not see more than our livestock grazing our pastures on a regular basis, we cannot assume that livestock are the only ones consuming forage. There are numerous other consumers taking advantage of the growing plants in our pastures. Large wildlife like deer, antelope, and elk and much smaller creatures like gophers, rabbits, and grasshoppers all consume forage. Research has shown that, on a majority of pastures, 15 to 25 percent of forage is eaten by these types of consumers. In most season-long grazing situations, harvest by

domestic livestock is only about 25 to 35 percent. Therefore, when we are developing our grazing management plan, losses by other animals need to be accounted for to maintain plant health and vigor. So, grazing livestock and wildlife can benefit grasses by stimulating growth of individual stems, but too much grazing can remove important plant tissue for further growth. So, how can we reach a happy medium?

A happy medium...

There is a happy medium that can be found between the complete absence of grazing and overgrazing. Here are some guidelines to help you reach that balance and responsibly manage your pasture for years to come.

Options for rehabilitating degraded pastures

Preventing mismanagement of your property is always the best and often easiest plan to follow, but what if you purchase a property that has already been overused and the plants have been mismanaged?

How do you know if your property is degraded?

Does your property have large patches of bare ground?	YES	NO
Do the plants consist of mostly weedy or annual species?	YES	NO
Is there browsing damage to trees, shrubs, fences, barns?	YES	NO

If you answered yes to any of these questions, your pasture may be a candidate for rehabilitation. Depending on your goals and the status of your native seedbank (native grass seeds lying dormant in the soil) you have several options. If there are adequate desirable species still living, you may be able to rest the pasture and allow the existing grass species to recolonize the bare ground by their production of seed and the increase in plant width. However, if the plants are mostly weedy or annual and there is a lot of bare ground, you may have to consider more drastic measures like seeding. Seeding can be expensive and requires proper planning, and the landowner must be patient and allow at least two years of rest following the seeding. When seeding dryland sites (no irrigation), success is highly dependent on the amount of precipitation the site receives.

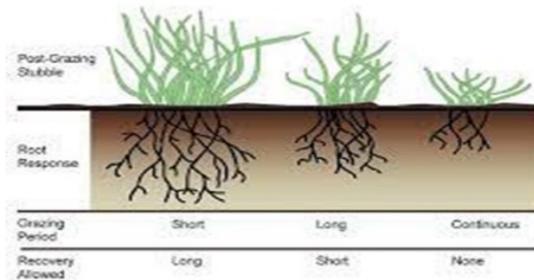
Some essentials or successful seeding include: 1) designing the proper seed mix; 2) preparing a firm seedbed; 3) properly timing the seeding so there is adequate moisture

A seeding plan can be made with the help of Clear Creek Conservation District, NRCS, or University of Wyoming Extension office.

Prevent Overgrazing... Leave a Stubble

- Leaving 2-6 inches (dry vs irrigated) protects both soil and plant health
- Plant leaves must remain for rapid regrowth to occur
- Exposed soil allows wind and water erosion along with the high chance of weed invasion
- Allow plants to recover (re-grow without animals grazing) before grazing again

Stubble/Pasture Health



- Don't allow livestock time to remove too much of the plant at one time
- Allow the plants time to regrow their leaves and store some food before grazing again
- Don't allow year-round continuous grazing of small pastures
- If using rotational grazing, don't let the livestock graze the same pasture at the same time each year

Take half, leave half

Plants produce food through the process known as photosynthesis to supply themselves with needed nutrients. Plants require a certain amount of carbohydrates, fats, proteins, and minerals just the same as animals do. Healthy growing plants produce a surplus of nutrients, which can be safely harvested by plant-eating animals. However, to maintain the health of our plants, their needs must

be adequately supplied. So allow your plants to feed themselves. Research suggests that, in a normal year, plants need to keep about 50 percent of their tissue (mainly leaves) to stay healthy and conduct photosynthesis. It is true that with moisture in the soil and adequate time to rest and recover from grazing, grasses can recover from more serious defoliation; however, the generalization holds for most pasture situations especially in northern Johnson County- take half for the animal (which may also mean wildlife as outlined in the above stocking rate calculation) and leave half for the plant. If the plant is continually grazed with no time to grow or regrow during the growing season, too much leaf material is removed and the root system is depleted. This makes the grass less competitive for limited soil moisture and less able to regrow leaves or tolerate drought. When plants are overgrazed, they



also become more susceptible to being outcompeted by less desirable plants (weeds) and the chance of erosion increases. Leaving about 4 inches of stubble is a good rule of thumb to maintain healthy grasses.

Grazing at the right time - (time and timing) of grazing

Grazing intensity (the amount of plant material removed) and frequency (the number of times a plant is grazed) are influenced by the number of animals and length of time they graze and area.

Generally, plants withstand grazing best when plants are grazed lightly or at a moderate intensity and are then allowed to regrow. Herbivores rarely take all of the leaf tissue the first time they graze a plant; they often take one or two bites then go to the next plant. Therefore, moving animals quickly through a pasture prevents repeated grazing of regrowth and is less stressful to actively growing plants.

Seasonality, or the time of year when grazing occurs, also affects how well plants withstand grazing. In arid areas such as northern Johnson county grazing early in the growing season is relatively harmless if there is ample soil moisture for plants to regrow.

Develop Your Weed Management Plan

1. Define your goals and be realistic. It may take several years to control the weeds if the property you purchased was already infested. Include how much time/money you want to spend.
 - A. Short-term: If noxious or poisonous weeds are present these should be your priority.
 - B. Long-term: Determine what you think is acceptable for weeds on your property but remember some noxious weeds have regulatory statute regarding control. Do you want to increase forage production, do you want only "native" species? Whatever your property goals are complete a weed survey on your property. This can help you take a systematic approach to weed control.
2. Survey your property: Take an inventory of the weeds and the desirable species you want to keep.
 - A. Make a map. It doesn't need to be fancy. This map can help you to determine if your plan is working and meeting your goals.
 - B. Take lots of pictures! Pictures can help you assess and monitor the effectiveness of your chosen treatment.
3. Develop your plan by determining what strategies will be used. Do you have obnoxious or noxious weeds or both? Will you mow, pull, or use herbicides? Will you do the treatment in the spring, summer, fall? Don't forget that plant species, densities, and severity of the problem help determine the best method. Use local agencies to help you determine the best method.
4. While planning remember that re-vegetation/re-seeding of severe infestation areas may be necessary once the infestation is under control.
5. Implement your plan! Whatever your method of control spend the season implementing your plan but be patient. You may see results in one season for annual weeds but perennial weeds may take longer to control.
6. Monitor. Continually survey your property and compare it to your first map. Additionally, revisit your original pictures to assess effectiveness of your plan and implementation.. Components of your original plan such as timing of control, herbicide type, may need to be altered. Continued monitoring is vital to the success of your weed management plan.





Your Weed Management Toolbox

Choosing the correct weed control method can save time and money. The following “integrated” approach uses all of your tools available for weed control.

Prevention: This is the easiest form of control!

- Maintain healthy, desirable perennial grass species. Proper watering, fertilization if appropriate, and managed grazing will make a big difference.
- Use weed free products (mulch, manure, top soil or other topdressings, trees, shrubs, and hay/straw).
- Limit disturbance and ground disturbing activities.
- Make sure any equipment brought onto your property has been washed to remove weed seeds.
- Have a GRAZING MANAGEMENT PLAN! Your local University of Wyoming Extension, NRCS, or Conservation District can help develop one for you.
- Don’t purchase or plant invasive plant species! In most instances invasive weeds grow better in our tough climate but that doesn’t mean you should plant it! A good example is Russian olive. This tree grows well in our area but is on the state’s designated weed list and you could face ramifications for planting it.

Cultural: Knowing what previous uses of your property were may impact your control efforts.

These practices could include burning, grazing, pasture rotation, crop rotation, etc.

Mechanical: These practices involve manual labor...mowing, hoeing, hand pulling, etc. This can also include using mulch and other weed suppressing plastics and fabrics.

Chemical: This is the use of herbicides to control weeds. There are many types of herbicides.

- *Selective* – damage or kill only broad-leaved plants or grass...not both.
- *Non-selective* – can kill or damage ALL plants they contact.
- *Pre-emergent* – applied before weeds appear.
- *Post-emergent* – applied after weeds begin to grow.
- *General Use* – may be purchased by an adult.
- *Restricted Use* – must have a license to apply.

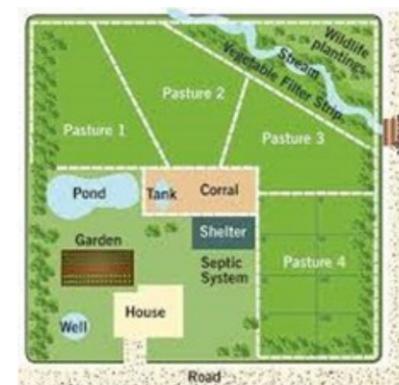
Biological Control: This is the use of a biological control such as an insect, disease, pathogen, or even goats to suppress or control weed spread. The method will not eradicate the weed and are used mostly in hard to reach areas

Strategies you can use to keep grasses happy while keeping forage production high

However, when plants are in the early reproductive stage of growth, grazing removes growing points which are responsible for the continuation of plant growth. In our area where moisture and nutrients are limited, plants may be safely grazed for short periods early in the growing season, when moisture levels are highest, or after plants have matured fully and are less vulnerable to grazing.

There are a few tools that can help maintain healthy pastures; one strategy is by altering a season-long grazing system.

Pasture Design / Grazing Strategy



Example: Rotational grazing system

Rotational Grazing- this strategy makes use of numerous paddocks where animals are rotated from paddock to paddock, so each area undergoes a short grazing period followed by a long rest period. Deciding on the number and size of paddocks to be grazed are important aspects of this strategy. Paddock layout will vary from acreage to acreage due to topography, watering areas, animal traffic, and

other logistical management concerns.

Upside-Down Grazing- this strategy flips the “normal” system in which livestock (horses especially) are allowed to graze in the spring/early summer and then are fed hay the rest of the year. Upside down grazing involves feeding hay in the spring/early summer and grazing during the dormant season. By grazing in the fall and winter desirable plants are given the chance to complete their full reproductive cycle every spring. This allows plants to grow as much forage as possible, set seed, and compete against invasive and undesirable species. This can be especially advantageous in our part of Wyoming where low annual precipitation, limited irrigation, and soil types may not be ideal for growing quality forage the pasture is allowed to reach its greatest potential before being grazed.

Animal nutrition and body composition should be monitored during the fall grazing season. Forage species, animal age and type, and weather all dictate how long animals can graze dormant forages and remain healthy

Healthy, full grown horses, especially those that aren’t being used hard every day, can do very well on dormant forages. You may need to resume feeding hay during the dormant season depending

on the amount of forage available in the pasture(s).

Each property is different and this should be taken into account. Examples:

- High-production pastures with adequate irrigation can often utilize high intensity grazing.
- Larger properties with one or two horses may allow grazing throughout the dormant season without supplemental feeding.
- If snow depth does not allow horses to reach the grass supplemental feeding will be necessary.
- Electric fence might be used to even out grazing in the pasture.
- Feeding year round may be necessary for many northern Johnson county landowners to maintain grass cover throughout their property.
- Stock water: In most cases, animals like to be near water. With that in mind, if there is only one source of water for the property the property may get overgrazed. Placing of a water source can encourage more uniform grazing.

Mismanagement of grazing can lead to pastures with problems, but properly managed grazing can benefit the entire ecosystem. To achieve this, landowners must have an idea of the amount of forage animals will consume as well as how productive their pastures can be before developing a grazing plan. Determining a grazing strategy that works best for your situation and maintains vegetative cover will ensure healthy plants and happy animals.

Keys to Successful Grazing

- Check your animals frequently to limit the amount of plant material being grazed.
- Avoid continuous season-long grazing; instead, develop flexible grazing strategies that allow plants to regrow after grazing.
- Grazing plans must be flexible; consider differences in growing conditions across years as a result of wet and drought cycles, grazing by wildlife or insects, and other changing environmental factors.
- Continue year-round rotation to distribute manure, food waste, and trampling across pastures, or hold animals in a corral.
- Have a water source available for each pasture.
- Horses and other livestock do not necessarily need 24-hour access to feed and forage. Corral animals and feed if needed to prevent overgrazing pastures.
- On limited acreage you may have only enough pasture to exercise your animals and will need to feed throughout the year.
- Grazing capacity varies from area to area. Make sure you are stocking pastures according to the amount of forage they can provide.
- Base your decision to move animals on how much grasses are used and the amount of green leaf material remaining, not a calendar date.

Rachel Meador was the University of Wyoming Extension range specialist.

Mae Smith was a University of Wyoming Extension educator.

Visit **Barnyards and Backyards'** "Forage/Pasture/Grazing" web page where you will find great articles, videos, and other resources on grazing.



Manure Management: What's the big stink?

If you plan on having livestock on your rural property part of your successful small acreage plan should involve proper livestock manure management. Proper management of your livestock's manure can result in the decreased amount of flies and parasites as well as protecting water quality whether it is surface water, ground water, or both.

Probably the most important step is to decide where to place your corrals, chicken coops, other animal pens, and the manure storage area. Watch how water moves across your property and do not locate any manure sources where the water runs or in low-lying areas. Make sure to keep all manure sources at least 100 feet from any water source and even farther away if the manure source is on a slope.

It is a good idea to keep a vegetated buffer strip around manure sources. This strip can help catch any manure or runoff from reaching a water source. Just remember...the steeper the slope the wider the buffer strip.

Take the time to learn where

your table is and what type of soil your property has. If your soils are very permeable (sandy or gravelly) and the water in your well is close to the surface, it can be easier for contaminants such as nitrogen or *E. coli* to reach your water source. If your soils contain more clay be more careful about controlling runoff from the soil reaching a surface water source.

To find additional information on manure management including composting livestock manure check out the following sources:

Managing small-acreage horse farms in central and eastern Oregon: <http://extension.oregon-state.edu/catalog/pdf/ec/ec1610.pdf>

Manure management for small hobby farms: http://www.nerc.org/documents/manure_management/mnure_management_handbook.pdf

The Scoop on Manure Management - Barnyards and Backyards, Summer 2017 – barnyardsandbackyards.com

Clear Creek Conservation District offers both soil testing and water quality testing. Call or stop by our office to learn more about these programs.

- Proper timing– Timing is critical to treatment. Most weed species reproduce by seed so treating before the plant sets seed is important.
- Learn about different control methods. Several options are available and some weeds may require several types of treatments. Cultural, mechanical, chemical, and biological control are the options you have to choose from.
- Evaluate . Once you have chosen a control method and implemented it evaluate it's effectiveness throughout the season. You may need to change methods if you are not happy with the results. Be patient however because you are dealing with a living system and change can take some time.
- Ask for help! If you have questions or need assistance contact Johnson County Weed and Pest. This organization can help you with all things weeds and may have cost-share opportunities for weed treatment depending on the weed species present on your property.





Noxious Weeds: A Growing Problem

Noxious or obnoxious?

Noxious weeds are a concern for every large and small acreage owner in Johnson County. Noxious weeds interfere with your management goals and affect the future goals of your property.

There are some weeds that are Obnoxious—Kochia, Russian thistle (we call it Tumbleweed in Wyoming!) and common lambsquarters are typical nuisance, or obnoxious weeds and are not listed on Wyoming's designated noxious weed list. Then there are weeds that are Noxious. These weeds can cause significant economical and environmental harm and are so aggressive they are regulated by state and federal agencies. Noxious weeds are often non-native invasive plants that require a greater effort to control, in Wyoming these are regulated by the Wyoming Weed and Pest Control Act. Weeds in our area in this category include Leafy spurge, Canada thistle, Yellow toadflax, Cheatgrass, Medusahead, and Ventenata. Both urban and rural landowners can help prevent the establishment of both

noxious and obnoxious weeds on their property. In most cases it takes a disturbance to the land and native vegetation for the weed seed to establish and germinate. Construction activities and overgrazing of livestock can leave bare ground which allows weeds to become established.

If you have land with grazing animals, a proper grazing management plan is a necessary weed control mechanism. Horses, for example, will selectively graze on native grasses. This constant selective grazing will create an opportunity for weed establishment since the horses won't eat the weeds as they grow and outcompete with the native grasses. A healthy stand of desirable plants has a greater chance of competing with weed species than an overgrazed pasture. Our area consists of a high desert which means that your property may not be able to support grazing animals for more than a few weeks a year. Please refer to the "Small Acreage Grazing" section of this magazine to learn about rotational grazing.

This method of grazing will allow for pastures to rest and regrow before being grazed again.

Grazing management alone won't correct serious weed problems. Different weed species require different methods to control them, and in some situations, may require several methods. The method you choose will depend on many variables such as time/money, management goals, future plans, and pasture availability for example. The following are general guidelines to consider when choosing a control method.

Group the weeds into one of two groups: non-grass or grass;

Identify the target species. If you don't know what the weed is contact Johnson County Weed and Pest to help id the plant;

Consider the life cycle of the plant—Is it an annual, perennial, or biennial. It is crucial to know the life cycle in order to choose the right treatment method;



Wildlife in the Wild West: Living with wildlife

Rural living comes with many wonderful qualities from wide open spaces to the freedom to do many things. One of the amenities of rural living is the opportunity to observe and live with wildlife including large and small mammals, birds, and reptiles. Learning to live with the wildlife on your property is an important part of being a good steward of the land and once you have figured out how to live with them wildlife can be very enjoyable. Just keep in mind that the wildlife were probably on your property before you were!

Wildlife are usually attracted to an area because of three (3) components. These components are food, water, and shelter. The combination of these elements creates wildlife habitat and are key to either encouraging or discouraging wildlife use on your property.

You will want to keep these components in mind when you are planning any type of improvements on your property and think about how your proposed change could either promote or discourage wildlife use.

Basic Considerations

Food: When done properly you can enhance food sources through a variety of means including planting native shrubs and grasses such as Silver Buffaloberry, Chokecherry, Native Plum,, Western Wheatgrass, Sandberg's bluegrass, and prairie Junegrass. In addition to planting native species removing non-natives such as Russian olive trees and a variety of invasive annual grasses, notably Cheatgrass, can assist in creating better wildlife habitat.

Water: All wildlife species need a good water source as part of

their survival. Creeks, ponds, and watering tanks can all provide a useful water source. When using a water tank be sure to install a wildlife escape ramp in your tank so wildlife can get out if they fall in while watering.

Cover: Most wildlife will travel to areas that they use for cover for bedding and escaping inclement weather. If your property does not have suitable cover establishing living snow fences provide not just a wind/snow break but they can also provide cover and a food source over time for a variety of wildlife species.

You can use this information about wildlife's needs to help avoid bad interactions. For example:

Keep pet food, trash, bird seed, and other food sources inside in covered containers;



Keep pet water bowls/pools, etc. inside fenced areas to discourage wildlife use;

Keep brush piles, leaf/litter, downed trees, and animal bedding (straw) in areas away from your residence or cleaned off your property.

Gardening & Landscaping:

If you are planning on having a garden or landscaping at your rural property there are several things you will need to do. For gardens, fences are the best way to keep wildlife out of your hard work. In order to keep out everything from gophers to deer it is advisable to construct a woven wire fence 6-7 feet high with 1ft of it buried in the ground. Fencing for trees on your property is also a requirement in order to protect the trees from being eaten or used to

rub antlers or horns on. Although it can be expensive and time consuming putting fence around your garden and trees it is less expensive than replacing dead trees and replanting gardens.



Also try placing netting on larger areas of landscaping to try to prevent wildlife use.

In addition to fencing, plant selection can help reduce wildlife problems. Deer, antelope, elk, and moose will often times select your trees, shrubs, and flowers to eat or rub their antlers/horns on rather than their more native species. Following is a list of trees and shrubs that will survive in our climate but wildlife usually won't eat unless they're very hungry.

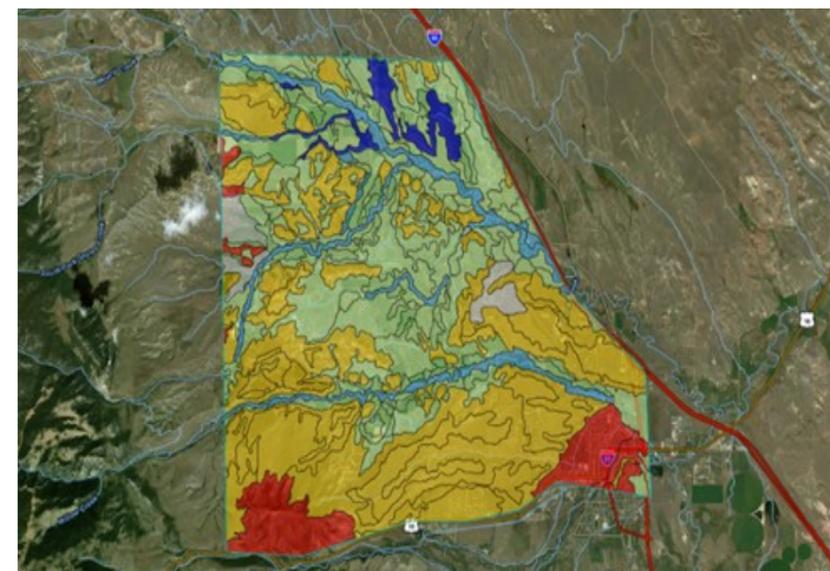
- **Trees:** spruce, boxelder, maple, pines (lodgepole, ponderosa, limber), honeysuckle, hawthorne.
- **Shrubs:** common juniper, cinquefoils (potentilla), raspberry, creeping mahonia, silverberry, buffaloberry, and white spirea.

A few simple searches for deer resistant annuals and perennials will turn-up plenty options. Just remember to try only a few to ensure that they can survive our climate before you spend a lot of money on something that won't survive.

Soil Tests

When to sample: If you are planning on testing your soil on an annual basis, such as for a crop rotation, it is best to collect the soil at the same time each year in order to more accurately compare the results. This is because residual nutrients in the soil can change over time while some other nutrients leach out, and still others can be released and made available from the organic matter. By establishing a consistent sampling time you can more accurately and efficiently track your soil tests and compare the results to production.

Where to sample: Identify the area you would like to sample. Although there are several different approaches to choosing the area to sample CCCD recommends dividing a large field into several smaller sampling areas based on different characteristics of the fields. These could be known differences based on soil

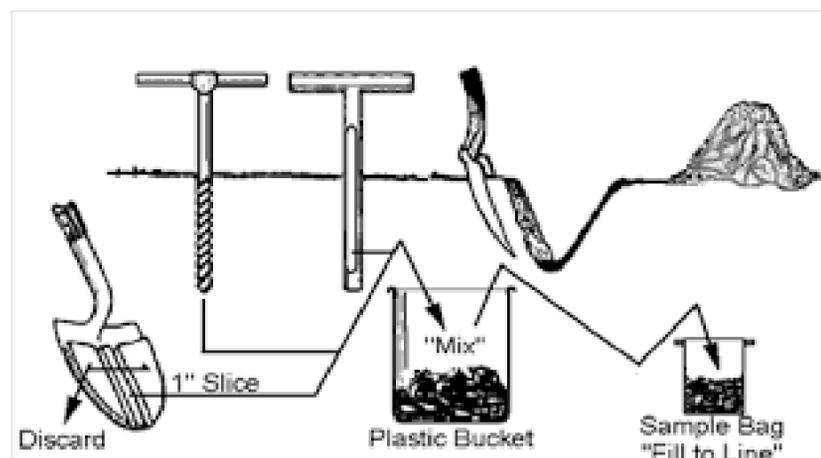


Web Soil Survey: Buffalo, WY to the northwest

maps, management differences, or areas of obvious differences in plant growth.

Taking the sample: Once you have determined where you are going to sample it is important to know how to take a soil sample. Using clean tools remove the grass/debris from the soil surface, if using a shovel, dig a hole and

then shave a 1- to 2-inch wide slice off the side of the hole to a depth of 6-8 inches. Take 10-12 random samples from each smaller area and combine into a 5-gallon bucket, mix really well, remove any rocks, spread it on a non-metallic surface and allow the soil to dry in the shade. After the soil is dry mix it again and put 2 to 4 cups into a clean plastic bag. Once you have collected, dried, and bagged all of the samples you need it is time to submit your samples. As mentioned earlier, Clear Creek Conservation District performs soil tests annually and can interpret your test results to help you to understand what the results are telling you.





Soils, Figuring out what is below the surface

Unlike areas in the Midwest, Johnson County is not blessed with deep, fertile topsoil. Soils in Johnson County will be more challenging those found in Midwestern states and the characteristics of our soils dictate how successful we can be when using it for various reasons. It is important to gather information about your rural acreage and the soil that it sits on in order to know how best to utilize the soil and sustainably manage it. In general, Johnson County soils present several challenges. The soil pH is often high which changes the availability of nutrients that are available for plant life. Our soils are also generally low in the amount of organic matter that is available, this can lead to a decrease in the soils water holding capacity and decreases the potential for deriving some nutrients from the decaying organic matter.

Although some of these issues can be dealt with by selecting appropriate plant species to plant;

others can be mitigated for by proper management techniques.

Rural landowners use soil in a variety of ways. Soil provides the foundation for buildings, supports landscaping and crops as well as rangeland grasses that can be used to support livestock. One very



good resource to gather information about the soils on your property is the NRCS Web Soil Survey (link is in the Resource Directory). These surveys can provide you with maps of the dominant soil types in your area and will provide data about the soils physical and chemical properties. The surveys will also help you identify the soils in your area and provide information regard-

ing what the soil types are best suited for and what their limitations are. This information can help you begin to plan projects and make decisions about your property.

However, it is still important to conduct your own on-site evaluation and soil testing before moving forward with any major projects.

Soil Tests

Soil tests give you specific information about your soil that a broader soil survey can't. Soil tests can help you assess the suitability of the soil on your property whether you are planning on construction buildings, growing specific plant species, landscaping, or feeding livestock. Clear Creek Conservation District performs annual soil testing for residents within their district boundaries free of charge. Contact their office to find out more details concerning this service.



Living with wildlife

Property Fences

If your property has not yet been fenced please follow the link below to learn everything you need to know to build or modify an existing fence to a wildlife "friendly" standard and to find a type of fence that works for you and your property. This publication will also walk you through what it means to live in a "Fence Out" state.

For more information, visit <https://westernlandowners.org/publication/a-wyoming-landowners-handbook-to-fences-and-wildlife/>

For the Pet Owners

Wildlife and pets don't mix very well and it is your responsibility to keep bad interactions from occurring that could result in harm or death to your pet or wildlife.

Dogs:

- Don't let your dog(s) run free. Provide them with a dog run or kennel area. Domestic dogs chasing wildlife or livestock is unlawful and will result in a fine or your animal being put down. Also, our area has lots of territorial coyotes and a free ranging dog will be killed by coyotes so keep you dog(s) close to home.

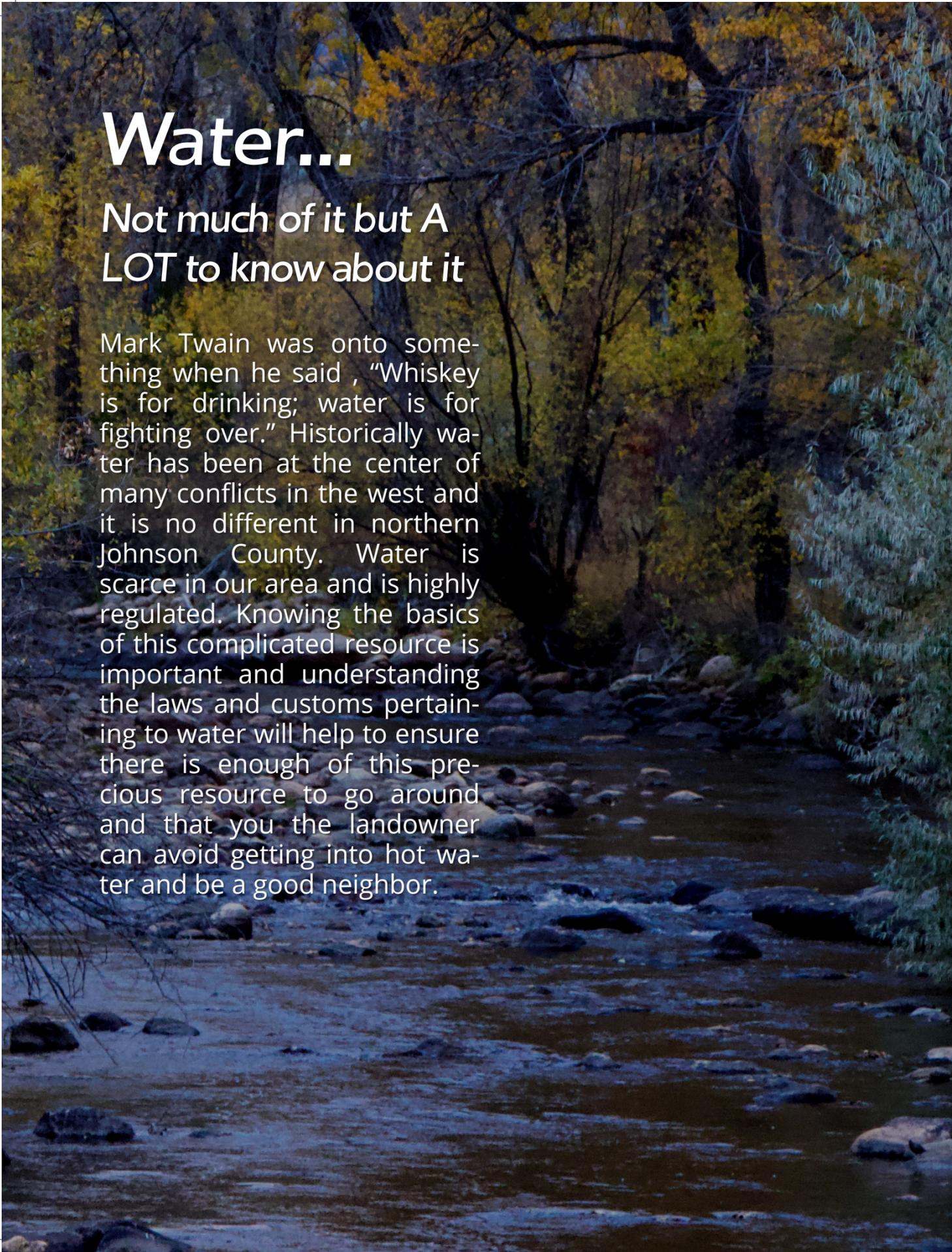
Additionally, some wild animals, especially skunks, carry diseases such as rabies that can be transmitted to your dog which will result in death of your pet.

Cats:

- Domestic free-ranging cats cause substantial wildlife mortality and are likely the single greatest source of bird and small mammals mortality in the US.

While dogs are generally kept close to home cats are often allowed to roam free where they follow their hunting instincts, killing birds, small mammals, reptiles, and amphibians. In Wyoming any cat not in care or possession of a human is considered a "stray cat" and is categorized as a predator such as a coyote, skunk, jackrabbit, porcupine, raccoon, and red fox and can be eradicated. If you must let your cat outside attach a bell to its collar to notify wildlife of its presence but better yet keep your cats inside.

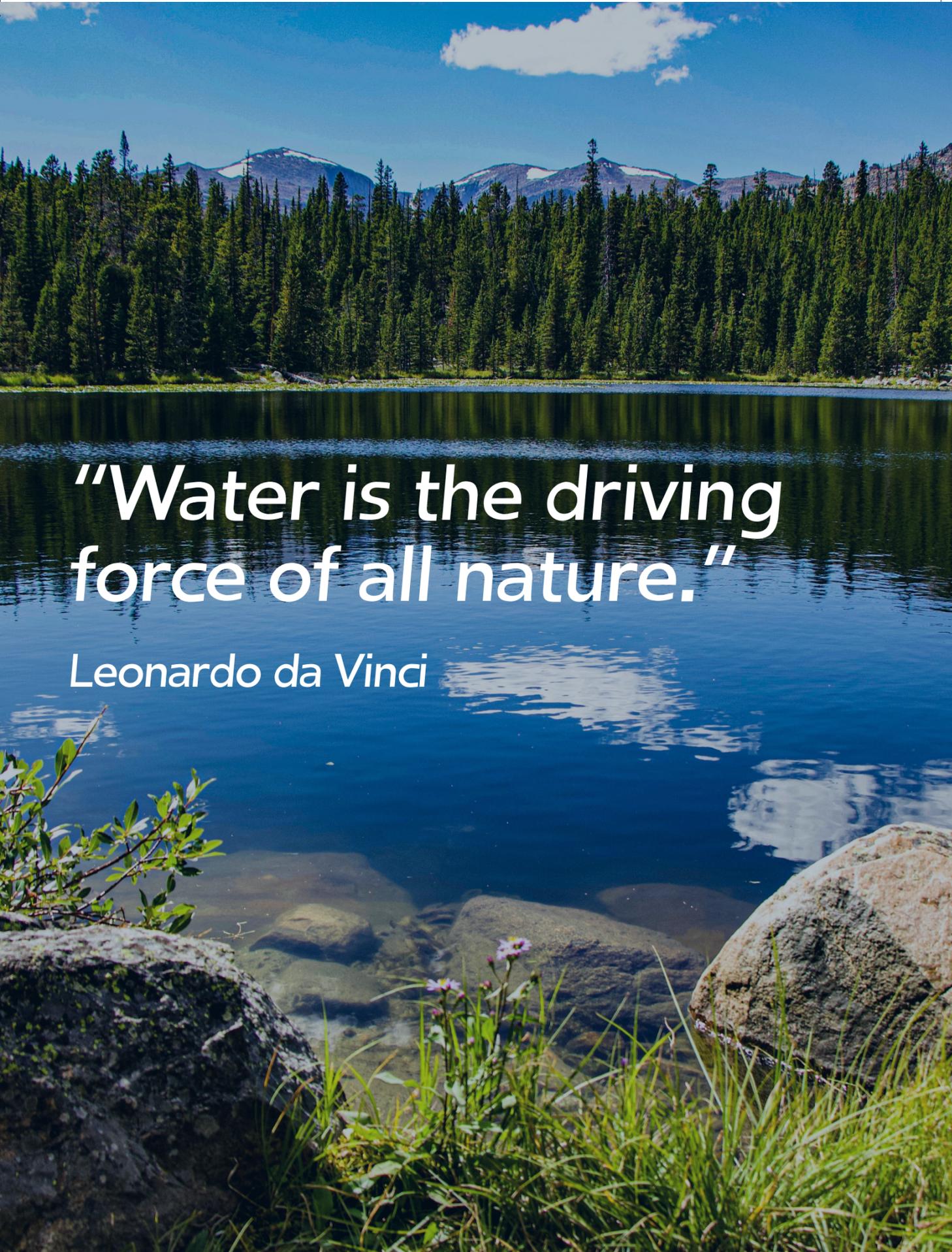
If one of the reasons you have decided to live on rural property is to enjoy the great wildlife viewing we have it is your responsibility to ensure your activities don't contribute to a decline of the wildlife you like to watch.



Water...

Not much of it but A
LOT to know about it

Mark Twain was onto something when he said, "Whiskey is for drinking; water is for fighting over." Historically water has been at the center of many conflicts in the west and it is no different in northern Johnson County. Water is scarce in our area and is highly regulated. Knowing the basics of this complicated resource is important and understanding the laws and customs pertaining to water will help to ensure there is enough of this precious resource to go around and that you the landowner can avoid getting into hot water and be a good neighbor.



**"Water is the driving
force of all nature."**

Leonardo da Vinci

In addition to rotational grazing make sure you provide a stock tank with fresh water in the pasture or in a location where it can be reached by all paddocks. Having a stock tank will reduce the amount of time animals spend in or near a stream. If you cannot provide a stock tank create a water gap where livestock can access a small portion of the water body instead of the entire stream. To make a water gap, fence off the stream to create one small, designated area for the livestock to access the water. Gravel or rock the area to reduce erosion once the water gap has been created.



Landscaping

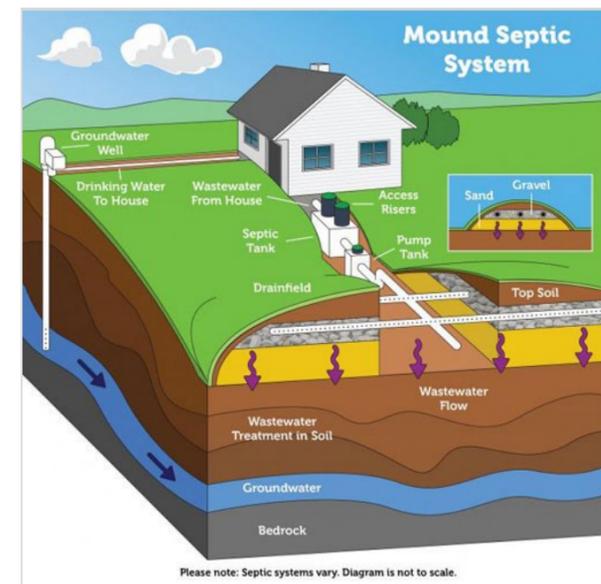
Maintaining ground cover is a good start to avoid having a negative effect on water quality. Ground cover can minimize the overground flow of water and which can reduce the amount of pollutants that can be picked up and transported to a water body. Even in areas where having ground cover is not possible such as driveways and heavy-use areas try to maintain a vegetative buffer around those areas. If you choose to use fertilizers and/or pesticides as



inputs to your lawn and landscaping be careful to monitor the amounts and the timing of application of these inputs. Poorly managed inputs on lawns and landscaping can cause more water quality issues acre-for-acre than large farms so make sure you follow the label directions when using inputs on your lawn, pasture, or large garden.

Septic System

Before you purchase your rural property make sure to investigate the septic system. On property that will be developed there are requirements that must be met for your septic system. Contact the Johnson County Planning Department to find out what requirements need to be followed when installing a septic system on your property including design, permits, and percolation test requirements (see Resource Directory). If properly designed your septic system can provide long-term, efficient household waste treatment. Because septic systems are designed to clean water before it ends up back in a stream or in the ground water, a poorly designed septic system or a septic system that has not been maintained can cause serious water quality issues. With good planning you can help avoid putting non-point source pollutants into northern Johnson County's waters and help protect our most valuable natural resource.



Wyoming Water Rights and Water Law- A brief introduction

The Wyoming Constitution states that water from all natural streams, springs, lakes, and other collections (such as aquifers) is the property of the state. People may only use that water if they put it to "beneficial use" and receive permission from the state. Beneficial use includes domestic household use, irrigation, stock water, and instream flow (water flowing in a creek, stream, or river). This applies to both surface water and groundwater resources within the state. A water right grants the holder a legal right to use a certain amount of water for a specific use at a specific place. The Wyoming State Engineer's Office (SEO) is the chief administrator of Wyoming water in streams, wells, irrigation ditches, ponds, and reservoirs. All lands in Northern Johnson County are located within Division II which maintains its Division headquarters in Sheridan, WY. Contact information for the State Engineer's Office can be found in the Resource Directory. Wyoming water law is based on the idea of prior appropriation. Under prior appropriation, the first to claim a right to water on a particular waterway has the senior right to use the water. Under this approach senior rights on a waterway are fully satisfied before a junior right holder receives any water. A right holder's seniority is determined by the date they file an application with the State Engineer's Office for a water permit. An application filed today would have a present day priority.

Can I Irrigate?

The first step in irrigating on your small acreage is to know if you have a water right. If you are buying land or own land with live surface water flowing across it (irrigation ditch, stream) or a small stock pond the water may not be yours- call the SEO to find out about the situation before you pump or divert any water. You can also contact the local water commissioner in Sheridan, or visit the county clerk's office to determine if water rights are associated with your property. Additionally, the county assessor's office should be able to tell you whether or not an irrigation district or ditch company administers your water rights. Many irrigation districts and ditch company's assess fees for opera-

tion, maintenance, and rehabilitation expenses from landowners whose properties have water rights.

So you have a water right- now what?

If you have done your homework and determined that you do have water rights what is your next step? Every landowner with a water right should contact a local official (ditch rider/water commissioner) to learn about laws and local bylaws to better understand how to access their water rights.

Below is a general checklist that can help you get started:

- Do I belong to an irrigation or ditch company?
- Does the district/company have bylaws or other written rules?
- Does the district/company meet- if so when do they meet?
- Is there a map that shows the irrigation ditch system and can I get a copy?
- Does the district/company have a fee? If so how much and what are the fees used for?
- How is water allocated among the landowners with water rights? Are the rights combined and rotated among other landowners?
- If so, who is responsible for rotating the water?
- What happens if I use up my allotment of water before the water is turned off for the year?
- Is the irrigation water automatically turned on each year or do I have to request water when I want to irrigate?
- When is the water usually turned on/off?
- Who do I contact to receive water?
- How long do I get to keep the water?



Discussing Water Rights, A Western Pastime

How Can I Irrigate?

There is a lot to know and understand as a small acreage irrigator including learning about common irrigation methods in Wyoming and northern Johnson County. Before you decide how you are going to irrigate there are a few things to keep in mind:

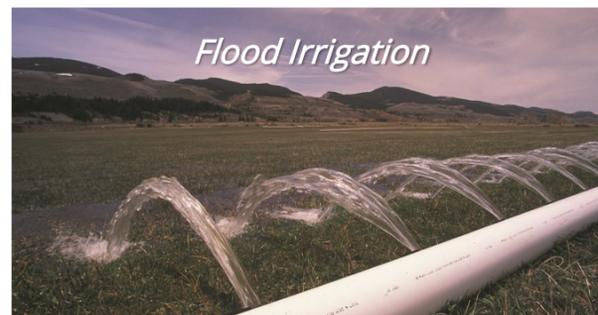
- Remember that in Wyoming landowners wanting to change their method of irrigation from what it was to a new method must work through several regulations because Wyoming waters are legally tied to the land they flow through or irrigate.
- When deciding how much irrigation water you'll need to raise a crop remember that pasture grasses and crops need different amounts of water at different growth stages.

Crop health will improve with appropriate watering and landowners will save money when they apply only what plants can use.

In flood irrigation fields are flooded by water that is delivered by gravity feed from high-elevation snowpack to low-elevation fields through a series of canals, pipes, and/or ditches to individual fields. With flood irrigation water flows down furrows in the field with row crops or spreads out across the field without furrows, such as pastures. Flood irrigation is better suited for relatively level ground or with moderately uniform slopes. Long or irregularly shaped fields will make uniform distribution of water more difficult. Flood irrigation strategies are also better suited for heavy clay or silt soils with high water holding capacity. Proper management is vital when flood irrigating. Soil is full of living organisms that require oxygen. When a field is flood irrigated for too long oxygen can be excluded from the soil killing the organisms and decreasing the quality and health of the soil. Additionally, if irrigated for too long, water will move downhill to a

neighbor's property that may not want it and create issues. Although very simple and inexpensive, flood irrigation is very inefficient for irrigation purposes but may have some unseen benefit in certain areas. Flood irrigation can help recharge aquifers that supply wells and keep salts from accumulating in the soil. In other areas, ephemeral wetlands can be created that support wildlife species during irrigation season.

Sprinkler irrigation can come in many forms, including hand lines, side rolls, dragline, mini gun, or solid set. Costs and labor vary with these different methods. Although more expensive, sprinkler irrigation can be more efficient when designed and managed properly. By utilizing a sprinkler set-up a landowner can be more precise over the timing and amount of water that is applied, which in turn can better match the water need of the crop. Additionally, sprinklers can distribute the water more uniformly than flood irrigation therefore are better for more coarse textured soils and shallow rooted crops. Because sprinkler irrigation puts the water into a mist or droplets the potential for losses in efficiency due to drift/evaporation from wind is higher than that of flood irrigation. Other disadvantages of sprinkler irrigation are the potential for accumulating salts in the soil from the groundwater source as well as an increased possibility of certain plant disease caused by the wetting of the crop canopy, this issue can easily be alleviated by altering the timing of the watering and decreasing the time the canopy is wet. For a small acreage landowner you may have plans to water your lawn using a sprinkler set-up. If you are buying a new property and have the ability to start your own lawn from scratch think about keeping the size to a minimum and use low-water, drought-resistant grass species, and avoid water loss by watering in the early mornings. Water-wise landscaping can be attractive and reduce your work.



Keeping Our Waters Clean



Surface drip irrigation systems are often used in vegetable gardens or small-scale production, it can also be used in landscaped areas, and for trees and shrubs. Drip irrigation is also the most efficient way to water windbreaks/living snow fences. See the "Windbreaks/Living Snow Fence" section for more information on creating drip irrigation systems for windbreaks and living snow fences. Drip irrigation has benefits that include efficient use of water as well as the potential to reduce plant disease because the plants leaves don't get wet. By applying small amounts of water in specific areas overall water use is reduced which reduces the cost for water and electricity. Potential disadvantages for a drip irrigation system include generally high initial cost of installation and filtration of the water being used will be required if the water is coming from a well or ditch.

Wyoming and northern Johnson County's water resources can be a very challenging topic to both understand and use. This "Water" section has only been a drop in the bucket when discussing the intricacies of water and water management. For more in-depth information regarding this important topic please navigate to the following link and view the many documents covering this subject.

Visit the link: <http://www.uwyo.edu/barnbackyard/resources/water.html>

Water Quality

Water quality is a term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose such as livestock watering or domestic use. Depending on the intended use poor water quality can be a health risk for humans and also can pose a risk to the ecosystem.

If you own or are thinking about purchasing property that has a stream or pond on it, you have a major influence on the quality of that water. Most water quality problems arise from non-point source pollutants, which means you usually don't see the pollutant going into the water. Examples of non-point source pollutants:

- Excess fertilizers, herbicides and insecticides from agricultural lands and residential areas
- Oil, grease and toxic chemicals from urban runoff and energy production
- Sediment from improperly managed construction sites, crop and forest lands, and eroding stream-banks
- Salt from irrigation practices
- Bacteria and nutrients from livestock, pet wastes and faulty septic systems

A common source of non-point source pollution comes from the mismanagement of livestock grazing near water bodies on small acreages properties. Because of this proper grazing management is an important solution, stick to the "take half, leave half" philosophy, this will help increase plant regrowth, reduce weed problems, decrease soil erosion, trap blowing snow, and the stubble left can act as a filter for manure particles and sediment that can run off the pasture during a rain event. To do this divide your pastures into several smaller paddocks and rotate your livestock accordingly.