DIY LANDSCAPE CONVERSION PACKET

Beyond Lawn Program

EAGLE COUNTY CONSERVATION DISTRICT

COLORADO STATE UNIVERSITY EXTENSION

EAGLE RIVER COALITION

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Introduction

Thank you for your participation and interest in converting your lawn to low water!

The Beyond Lawn Program is a partnership between Eagle River Coalition and Eagle County Conservation District. This program was developed to provide education and monetary support to Eagle County residents to support domestic water efficiency changes. Visit BeyondLawn.org for additional resources.

Acknowledgments

We would like to thank and recognize the **Colorado River District** and the **Colorado Water Conservation Board** for awarding and funding the Beyond Lawn Program. Additionally, we would like to acknowledge **CSU Extension & CO Master Gardeners** for their support and in-kind match & technical assistance. Most of the information on this sheet is found in various CSU resources. With each section, we will attach a link to the associated CSU Extension resource.

Economic Benefits

Transforming your lawn is not an easy task and will take time. However, with the right tools and resources it can be **a long-term investment** with many ecological and economic benefits. When watered and maintained effectively, replacing turf with sustainable irrigation systems & landscaping can potentially reduce your outdoor water use by 50-60%, and less water will result in less money spent!

Sustainability: Water-wise and Native

Kentucky bluegrass (the most commonly used turf grass) needs about 58 inches of water every growing season. In the mountain west, we get around 14 inches of rain during the growing season. This means we have to irrigate around 44 inches of water every growing season. There are a lot more sustainable plants and grasses that will take minimal irrigation, and planting native plants has additional benefits:

- Native plants are adapted to our soils, meaning they will require fewer soil amendments and changes to naturally occurring soils
- They are adapted to our dry climate
- They do not need fertilizer to grow
- They restore habitat. Many natural plants provide food, shelter and other important resources for insects, birds and mammals

Where to Begin

First, it is important to understand your current property, boundaries & hydrozones. This includes your irrigation and landscape. We recommend that you receive a landscape assessment and irrigation audit before you start any type of transformation, to ensure the best return of investment. Your irrigation system likely has inefficiencies, and you cannot begin to develop a water-wise landscape without addressing those water outputs.

Below you will find a list of irrigation and landscaping companies:

***Companies with** * only perform irrigation audits and fix system inefficiencies*
***Companies with** ** perform landscape audits, fix system inefficiencies AND can help you with your conversion process.*

Irrigation & Landscape Companies

ET Irrigation | https://etirrigation.com/ *
Rocky Mountain Custom Landscapes | https://rmcl-usa.com/ **
Ethos landscaping | https://mtorganiclandscaping.com/ **
Ceres Landcare |https://cereslandcare.com/**
Mountain properties and landscaping | https://mountain-properties-landscapes.business.site/
SHC | https://shclandscape.com/irrigation.html
Oasis Irrigation Company | https://www.oasisirrigationvail.com/services/waterauditing.html
Tendered Earth Landscaping | https://tendedearthlandscaping.com/
QWEL Contractors | https://www.qwel.net/pub/htdocs/hiremap.html#hiremap

Understanding your Irrigation System & Zones

Getting your irrigation system updated is one of the most important parts of the lawn conversion process. An improved irrigation system with smart controllers and flow meters can save you money and conserve water, regardless of conversion. With today's newest technologies, you can measure exactly *how much* water you *need* per day and set your system in sync with those requirements. Visit your local CoAgMet (weather) Station, which measures evapotranspiration rates to provide daily watering recommendations.

Some common irrigation inefficiencies:

- Over & underwatering areas
- Broken sprinkler heads & leaks
- Long watering cycles causing runoff
- Watering after rain
- Water cycles don't match individual hydrozones

Planning Your New Landscape

This is perhaps the most fun part of the process! Please allow a considerable amount of time to plan and execute your conversion. Remember, it is a long-term investment with the objective of replacing a *non-functional space* with a *functional* one. Give yourself plenty of time to accomplish this goal and make sure that you are set up for success!

When **designing your new landscape,** there are many things to take into consideration:

- Desired hardscapes
- Site conditions (sun, soil, slope, wind, water, zone)
- Stormwater retention
- Defensible Space (Fire Free Five)
- Size of mature plant
- Number of plants
- Season
- Color
- Texture
- Grouping & variety
- Unity, balance & harmony

If you intend to contract assistance through a landscape or irrigation company, make sure to contact them early during the beginning of your planning stages. They are typically very busy with limited availability

All of these considerations may seem daunting, but we can simplify everything with these easy steps:

1. **Know Your Site**
2. **Know Your Needs**
3. **Make it Yours**
4. **Make it a Reality!**

Step One: Know Your Site

1. Grab some graph paper, determine your **scale*** & draw out your **property boundaries**. You can accomplish this by:
    a. Physically measuring your property,
    b. Google maps -> search your address -> select “Measure Distance” -> click “Add Points” around property line, or
    c. Search your **exact** property boundaries through Eagle County Property Records
2. Measure and draw out your **house and existing structures** through the same methods above: House, garage, shed, driveway, foot paths, water & power lines.
3. Measure and draw **existing vegetation** (that is there to stay). Make sure to number & identify your plant species.

4. Determine and mark your **site conditions**: Sun, soil, slope, wind, water, hydrozones.

Consider making multiple copies. When you begin to explore your new landscape ideas, we encourage you to try multiple designs!

**NOTE ON SCALING: The drawing of the landscape should be scaled to accurately depict the landscape and allow measurements to be taken from the drawing. A scaled drawing means that measurements taken outside will be drawn in a much smaller dimension on the paper, depending on the size of scale used. Most landscape plans are drawn to a scale of 1:10, which means that 10 feet on the ground equals 1 inch on paper. Using a 1:4 scale, 100 feet would be 25 inches on paper. Scales of 1:4, 1:8 or 1:16 match the common increments used on a conventional ruler, but scales of 1:10 and 1:20 are used by engineers and landscape architects.*

Step Two: Know Your Needs

When considering your new landscape design, think about what you might need in order to create a functional space. Things to consider:

- Pets/Children
- Shade
- Tool shed & Snow Storage
- Low Maintenance
- Stormwater Retention Features
- Defensible Space- “Fire Free Five”

Stormwater Retention Features

Stormwater retention features are a helpful tool for sustainable landscaping. They help us harvest rainwater to percolate into our soils. Think: **Slow, Sink, Spread!** Here are a couple ways we can capture rainwater:

- ***Rain Gardens***: a garden that lies below the level of its surroundings, designed to absorb rainwater that runs off of a surface such as a patio or roof
- ***Rock Gardens***: Using roughly 2” pebbles or gravel as mulch to increase water retention by up to 80%, preventing loss of water and evaporation
- ***Rain Barrels***: Collecting rainwater from your roof into rain barrels with a combined storage of 110 gallons or less to irrigate your garden.

NOTE: For more facts and information on how to install rain gardens and rain barrels, see the “Other Consideration” section.

Defensible Space & "Fire Free Five"

REALFire® is a wildfire risk reduction program that provides homeowners in Eagle County with free property assessments to educate residents on how their home and landscaping may be susceptible to wildfire, and specific ways to reduce wildfire threat.

"Fire Free Five"

One of the most vulnerable elements of any structure to wildfire is the first five feet of landscaping that surrounds the building. This area acts as a natural trap for embers, accumulating them in dangerously close proximity to the building. If this area contains flammable vegetation, these embers may cause the ignition of the structure. In areas of high density, this one burning structure may rapidly spread to others.

Within this area recommended landscaping includes:

- Hardscaping such as on-grade patios, walkways, driveways, etc.
- Non-combustible mulch such as pea gravel, cobble and stone
- Well maintained and irrigated lawn
- Perennial flower beds
- Perennial ground cover

Within the five-foot zone from your house, AVOID:

- Trees and shrubs.
- Trees planted outside the five-foot zone that hang over into the zone should be limbed up to a height of six feet or one-third the total height whichever is less and should be trimmed to leave at least a two-foot gap between the nearest branch and the building.
- Combustible materials such as firewood, construction materials or other combustibles. (Combustibles may be stored here if enclosed in a fire-safe manner)

Reimbursements for your "Fire Free Five" action:

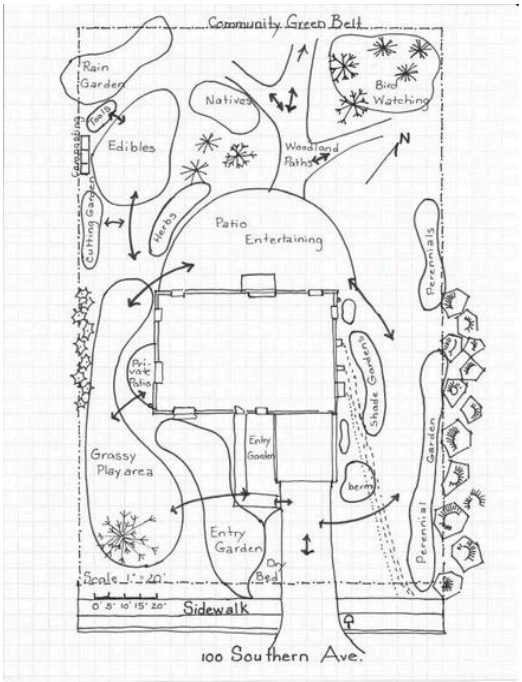
- This program will reimburse the property owner **75%** of the actual costs of materials and labor. The property owner must provide a minimum **25%** match
- Creation of Fire Free Five around outbuildings is an eligible expense but is not eligible for a separate reimbursement
- Reimbursement limits are as follows:
    - Single Family Dwelling: $2,000
    - Duplex: $3,000
    - See link for multi-family and commercial structure limits

Resources:

Sign up for your FREE property assessment
REALFire Homeowner's Guide
Fire Resistant Landscaping

Step Three: Make it Yours

In this section, you will have the opportunity to explore a variety of options for your landscape, using your graphed out property boundaries. We encourage you to start simple, with envisioning general spaces of what might work where. Start broad and work your way to specifics. You'll begin to critique your designs & improve them each time to create that functional space! Remember: **try, assess, critique, repeat.**



Example of a broad design with nonlinear rooms (NC State Extension)

Envisioning Your Landscape

First, let's explore your wants & consider what each outdoor space could provide. Do you like to host guests and throw dinner parties? Or are you looking for a quieter, more private space? Maybe you'd like to grow your own food, or grow a pollinator garden for native habitat.

Types of Gardens to explore:

- Pollinator garden
- Native or habitat garden
- Natural Meadow or prairie field
- Colorful desert garden
- Rock or succulent garden
- Terrace garden

**Take a visit to Betty Ford Alpine Gardens in Vail, Colorado and explore a variety of water-wise garden designs and themes!*

To read more about design principles, click here: Principles of Landscape Design

Design Steps

Once you have designed a space that is suitable to your wants and needs, you can begin the plant selection process and narrow down on the specifics. In order, sketch out your:

1. Desired hardscapes: Patios, terraces, walkways, benches, etc
2. Stormwater retention & "Fire Free Five"
3. Plants: **Biggest to smallest** (provide numbers for identification)
    a. Trees, shrubs, ornamental grasses, flowers, native or drought-tolerant grasses & ground covers

Considerations: Right Plant, Right Place!

- Site conditions: Sun, soil, slope, wind, water, hydrozones
- Size of mature plant
- Number of species
- Grouping
- Season & seasonal blooms
- Color
- Texture

Plant Selection - Finding Plants for Your Landscape

Remember to consider each plant and how it might serve a purpose in your garden.

Mountains 7500' and above

Western Slope - Below 7000'

Resources & Garden Design Ideas

Perennial and Annual Waterwise Plant Species
Water Wise Garden Designs: CA
Plant Select Waterwise Designs
Waterwise Inspiration
CSU Extension Low Water Native Plants (7,500' and Above)
CSU Extension- Low Water Native Plants (7,000' and Below)
CSU Extension- Low-Water Native Plants (Front Range & Foothills)

Seeding Native & Drought Tolerant Grasses

Cool Season Grasses

- Seed from March through September. Along the Front Range and Western Slope, the optimal time is mid-August to mid-September

Warm Season Grasses

- Seed from April through July. Seeding after July is not recommended
- At high elevations (greater than 7,000 feet) do not use warm-season grasses
- Cool-season grasses can be seeded in the spring, as soon as temperatures rise

Why use native grasses?

- Bunchgrasses can be used ornamentally as specimens or in groups
- Sod-forming grasses can make great low-maintenance turf and offer savings in mowing, fertilizing and irrigation
- Grasses provide excellent forage and cover for birds and beneficial insects
- Consider a meadowscape with a native wildflower mix!

Species & Resources

EC Conservation District- Native & Drought Tolerant Grass & Wildflower Seed (For Sale)
CSU Extension- Renovating a Lawn
CSU Extension- Native Grasses

Step 4: Make it a Reality

How to Remove your Current Turf Grass

Now that you understand your irrigation systems & zone, you've had a landscape assessment, and you made a general plan for what you want your landscape to look like, it's time to get rid of your turf grass! Here are some important factors to consider:

- Maintaining soil structure and soil microbiology
- Protecting above-ground insects & wildlife
- Ease of use
- Expense
- Length of time

There are quite a few ways to remove your landscape, however, none of the options are able to meet all of the considerations listed above. Also consider how much of your lawn you want to remove. This process can be time-consuming and difficult, and does not all need to happen at once. Be patient, and understand that this is a long-term project and can often take longer than one season.

Spray with a non-selective herbicide, e.g. Glyphosate

This method is a relatively fast, cheap and easy way to kill your lawn. It maintains the soil's structure and microbiology and leaves the organic content (dead grass and roots) in place to decompose. Because you are not disturbing the soil, weed seeds are not brought to the surface to germinate. You may need to apply the herbicide 2-3 times, 2-3 weeks apart. Click here to to decide if you are comfortable with the possible health and ecological risks. Read and follow the label instructions for safe application.

Solarize

Water thoroughly and cover the area you want to kill with clear plastic, making sure that the edges are sealed. Leave it there for 4-8 weeks. This method is most effective in the hottest months (June - August). It is not aesthetically pleasing, but it is a low-effort option. Leave the dead grass or rake it up. Avoid disturbing the weed seed bank by not tilling it. Research has shown that there is only a temporary reduction in soil microbial activity.

Mow close and cover

Withhold water from the area to stress the grass. Mow it as close as possible, then cover the area with compost and an 8-12" layer of wood chips. Water well to encourage decomposition. Many gardening sites recommend using layers of newspaper or overlapping pieces of cardboard. This will slow down an already lengthy process, and it temporarily reduces soil microbial activity which is important for soil and plant health. Be aware that this will take a season or more and still may not kill all of the bluegrass.

Dig it up

Water the area thoroughly to soften the soil. Dig up the grass, thatch and roots. Then cover with soil and mulch. This method is a quick solution, depending on the size of the area, and it allows you to plant immediately. However, it is difficult work, and you are removing beneficial organic material. It also disturbs the soil's structure and brings weed seeds to the surface where the warmth and moisture will germinate them.

Till it under

Till 24 hours after rain when the soil is warm and damp. Start with a shallow setting to slice the sod, using increasing depths to break up the clods of grass, soil, and roots. It is best to till in the fall when the grass can return nitrogen to the soil. In the spring, grass and weeds may regrow as the weather gets warmer. A tiller can be heavy, noisy, and smelly, but you can plant immediately. This method does destroy soil structure and can propagate weeds like bindweed and Canada thistle.

Use a sod cutter

First, mow and water your lawn. Cut overlapping strips of sod and roll them up. Cut strips short enough to be moved easily. This method is quick, but requires heavy equipment and leaves you with rolls of sod. You can figure out how to get rid of them, or you can flip the sod over to decompose in place, keeping the organic matter in your yard or garden. You then treat it like the 'mow and cover' method. Cover with compost and mulch and water to promote decomposition. To look into renting a sod cutter click here.

Nurseries

- Pawnee Butte (seed) | https://pawneebuttesseed.com/
- Eagle Gardens (Wholesale) | https://www.eaglegardens.com/
- Stephen's Nursery | https://stephensnursery.com/
- Little Valley Wholesale Nursery | https://www.lvwn.com/
- Chelsea Gardens | https://chelseanursery.com/
- High Country Gardens | https://www.highcountrygardens.com/
- Bluebird Nursery | https://www.bluebirdnursery.com/
- Prairie Moon Nursery | https://www.prairiemoon.com/

Planting your Landscape

How to plant a tree
Selecting & planting a tree
The Science of Planting a Tree
How to care for plants

Maintenance and Care

Plant Establishment

All waterwise and native plants take a significant amount of water to get started. This can take anywhere between one to two years. However, once your plants are established, they will require little to no water. Click here to learn more about native plant establishment: Native Lawn Establishment in Colorado

Grasses

During dry summers, all native lawns will become dormant – especially if they are mowed. Unmowed native grasses will have better drought resistance and will often retain some green color during the longest dry periods. If a greener lawn is desired, applying 1-2 inches of water every 4-5 weeks (all at once, using soak cycles to prevent runoff) can keep a native lawn green during a dry summer. If mowing is a must, mow at the highest setting possible. Fertilize buffalo grass/blue grama once yearly in July or August; fertilize wheatgrass and June grass in September.

Soil Amendments & Mulch

A soil amendment is a product that you add to your plants or lawn to improve soil quality. It can improve water retention, permeability, water infiltration, drainage, aeration and structure. The goal of soil amendments is to better support soil health, root growth and establishment.

Soil amendment MUST be mixed in with the current soil to work properly. Simply laying it on top or burying it, will not yield the same results as mixing it in the soil.

Mulch is a layer of material applied to the surface of soil. Reasons for applying mulch include the conservation of soil moisture, improving fertility and health of the soil, reducing weed growth, guiding and conserving water, and enhancing aesthetics.

Organic

Organic amendments come from something that was alive. These include sphagnum, peat, wood chips, grass clippings, straw, compost, manure, biosolids, sawdust and wood ash. Before choosing any of the organic amendments, you need to understand what your soil is missing. Wood ash, for example, will increase pH and salt. In Colorado, we tend to already have soil with a high pH and salt.

Inorganic

Various types of materials do not decompose and therefore do not need to be replenished very often, if ever. These inorganic options include rock, stone, lava rock, crusher dust, decomposed granite, landscape fabrics, and other man-made materials. Inorganic materials are ideal for decorative use, controlling weeds, and guiding and conserving water. Because rocks and stones absorb and reflect heat, they have the advantage of warming the soil for early spring planting of fruits and vegetables but may be detrimental to some plants during periods of hot, dry weather.

Different types of amendments

Compost

Compost refers to decomposed organic matter. In Colorado, a wide variety of compost products are available in bagged and bulk products. These may be a combination of plant-based compost, manure-based composts, biosolids, and other agriculture by-products. With the large livestock industry in Colorado, manure-based composts are the most common. These are often high in salts. Use with caution.

Compost made solely from plant-based products (such as wood chips and yard wastes) are low in salts. These are preferred over manure-based composts which are often higher in salts. However, they are generally more expensive.

We highly recommend compost. It will work with most soil types. Check out the resource below to learn more about other options for soil amendments. We do not recommend mulching with wood chips as it adds too much nitrogen to our already nitrogen full soil.

As a point of clarification, composts and manures are not regulated. Many commercially available products are labeled as "composted." However, this does not mean that it has been through the active decomposition process.

Considerations when Choosing an Amendment

There are five factors to consider when selecting a soil amendment:

1. How long the amendment will last in the soil
2. Soil Texture
3. Soil salinity and plant sensitivities to salts
4. Salt content and pH of amendment
5. Defensible space

Read more about soil amendments and considerations here: Considerations when choosing a soil amendment

Natural Ways to Care For Your Yard

- Click here to learn more about Natural Herbicides
- Click here to read more about Bare Root Planting

Other Considerations

When is the best time to start your conversion?

The timing for lawn renovation varies according to grass type and elevation of the site. For the most success, follow the guidelines below.

- Seed cool-season grasses (bluegrass, ryegrass, fescues) anytime from March through September. Along the Front Range and Western Slope the optimal time is mid-August to mid-September.
- Seed warm-season grasses (buffalograss, blue grama) April through July. Seeding after July is not recommended.
- At high elevations (> 7,000 ft) do not use warm-season grasses. Cool-season grasses can be seeded in the spring, as soon as temperatures begin to warm.
- Seeding after the first fall frost is not recommended, as young seedlings may be winter killed. It is better to wait until the following spring to practice lawn renovation.

Read more here: CSU Ext. Renovating the Home Lawn

Challenges for Planting in Colorado

Colorado is unique, with its unpredictable snow storms and sudden drops in temperatures and periods of drought. In the high country, we have unique challenges that make it difficult to know how, when, where and what to plant. Below are tips and tricks to make sure your plants are set up for success!

Site Choice

To determine where to plant your garden, first evaluate your site. The best place to grow flowers is in a site that already supports some grass, wildflowers, or even weeds. This will usually be in a fairly sunny, open area. If the area has weeds, control them before planting something new. If the soil is very rocky, shaded, or there is little to no existing vegetation, increase the organic content of the soil to make these areas plantable.

Soils

There are two major types of soil found in the mountains - granite soils and clay soils. Both soils are generally high in nutrients, but clay soils have poor drainage while granite soils dry out quickly. Soil preparation is often the key to growing healthy plants in the mountains, particularly for non-native plants. Native plants are often adapted to leaner soils (lower in organic matter), and may 'flop' or have a shorter life span in well-amended soils.

Read more about soils here: Soils in Colorado
Read about how to determine your soil composition here: DIY Soil Test
Read more about a lab soil test here: Lab Soil Test

Raised Beds

Raised beds can solve many problems for mountain gardeners. Raised beds can be created with good, weed-free soil, and are especially beneficial if soils are poorly drained or are very rocky and hard to dig. They also warm faster in the springtime and can help protect the plants from burrowing rodents if a 1/4" wire mesh (hardware cloth) is tacked onto the bottom before the soil is added.

Microclimates

The successful mountain gardener learns to exploit or create microclimates. For example, southern exposures have more sun and a longer, warmer growing season than other exposures. These warmer microclimates are the places to experiment with plants that need more heat during the growing season to come into flower before frost. If the site is protected in the winter, this is also a place to experiment with less hardy plants. Another good site for more tender plants is in front of rock formations or walls (natural or created) where the thermal mass can raise winter temperatures.

Read more about microclimates here: Microclimates

Plant Choice

Even though many mountain gardeners live in wooded areas, 'woodland plants' are seldom good choices – this term in catalogs usually refers to Eastern woodland conditions (moist, organic-rich, acid soils, and humid air). We have few to none of those conditions in our mountain areas.

Plants with smaller leaves will often require less water, and will also experience less damage from hail. Be cautious with late-blooming plants or plants that are heat-lovers, as they probably won't bloom before frost. Native plants are some of the best plants for the mountains because they are already adapted to the harsh and highly fluctuating conditions.

Planting

In mountain areas, the best time to plant flowers is either immediately after the last frost or during the rainy season. Planting in late summer or fall decreases the chance of survival, especially for less hardy plants. Gradually harden off (acclimate) nursery or greenhouse-grown containerized plants, especially if they were purchased at lower elevations, or choose plants that have been grown outside at local nurseries. About two weeks before the anticipated planting time, reduce the amount of water the plants receive and expose the plants to increasingly longer periods of outdoor conditions. Start by placing the plants in a protected location, and gradually increase the exposure to sun and wind. Be prepared to provide temporary cover (frost caps, floating row covers, or even bed sheets) if the temperatures threaten to dip below freezing at night.

Watering

Determine the source of water for the garden and the associated water rights. If it is a well with a household-only use permit, water inputs can be minimized or eliminated by 'planting with the precipitation.' Plant drought-tolerant plants when the rainy season begins in your area which is often in early to mid-July. Plants should be watered on the day they are planted and then mulched to retain moisture. Trial gardens indicate a very high survival rate when planted this way. Wildflowers and native grasses sown in the fall also have little to no watering needs (see fact sheet 7.233, Wildflowers for Colorado).

Wildlife in the Garden

Exclusion of animals such as deer, rabbits, voles, and ground squirrels from the garden is the most effective long-term solution. While nothing is foolproof, most wildlife will generally avoid plants that are very aromatic, have prickles or spines, tough or leathery leaves, milky sap, or are toxic. See fact sheet 6.520 - Preventing Deer Damage, for plant suggestions.

Rainwater Retention Features (In Detail)

Rain Gardens

When it rains, the water that comes off rooftops, lawns, and driveways drains into the stormwater system and eventually ends up in a nearby river, lake or stream. Along the way, runoff can pick up pesticides, fertilizers, pet waste and other pollutants which end up harming local water bodies. Rain gardens are great for reducing runoff, as well as for using rainwater to irrigate your plants.

How it works:

Rain gardens help prevent this pollution from reaching water bodies by temporarily storing runoff and allowing the water to infiltrate into the ground (usually within 24 hours). During this time, pollutants are filtered out naturally by the compost, soil and plant roots.

Best practices for establishing a rain garden

- The rain garden SHOULD NOT be over any utilities. To find where your utility lines are you should call **811** to mark out your property
- Develop the rain garden at least 10 feet away from your home to make sure flooding does not occur in your basement or crawl space
- A rain garden does best in areas of full or partial sun
- For ease of construction, try to find a flat area to develop the rain garden

Sizing your rain garden:

When determining the design of your rain garden, two sizing numbers need to be calculated - the rain garden's depth, and the required surface area or footprint of the rain garden.

Determining depth:

Depth should be maximized to capture substantial runoff, but shallow enough to prevent standing water. A simple infiltration test can be performed to determine the rain garden depth. The procedure for performing the infiltration test is as follows:

1. Dig a hole the size and shape of a coffee can in the location of the rain garden
2. Fill the hole with water and measure the initial water depth with a ruler
3. After 4 hours, measure the new water depth and note the change
4. Divide the change in water level by 4 to account for lateral water movement. E.g. – Change in water level of 4 inches ÷ 4 = 1 inch
5. Use the table below to determine the rain garden depth based on the change in water level value.

Change in water level ÷ 4 (inches)	Rain Garden Depth (Inches)
½ - 1	3
1-1 ½	6
1 ½ -2	9
More than 2	12

Note: If the change in water level is less than 0.5 inches, the area is not suitable for a rain garden.

Determining Surface Area

Determining the proper surface area will ensure runoff will be captured from most storms. The size of your roof, garden depth, available space and how much runoff you want to control will determine the rain garden surface area. Within Colorado a rain garden should be able to capture 0.5 inches of runoff from the contributing area. Below is a step-by-step guide on how to calculate the required surface area. Please note that these steps assume that each downspout has the same contributing area.

Step	Directions	Value
1	Enter the building foundation length (feet)	
2	Enter the building foundation width (feet)	
3	Calculate the total roof area (Square Feet) **Step 1 value * Step 2 Value**	
4	Enter the total number of downspouts from building	
5	Enter the number of downspouts that will drain to the rain garden	
6	Calculate rooftop area collected (Square feet) **Step 3 value ÷ Step 4 value * Step 5 value**	
7	Enter rain garden depth (Inches)	
8	Calculate rain garden surface area (Square feet) **Step 6 value * 0.5 ÷ Step 7 value**	

If the calculated rain garden surface area is too large for the allotted space, a smaller garden can still be built. Some runoff capture and treatment is better than nothing!

Layout:

Your rain garden can be any shape as long as it has the required surface area! Just remember that the garden bed needs to be as level as possible.

http://www.cpe.rutgers.edu

Colorado Stormwater Center

Read more here: [Colorado Rain Garden Guide]

Rain Barrels

Up until 2016, rain barrels were illegal in Colorado due to Colorado's "Prior Appropriation" doctrine. Rain barrels were thought to take water away from water rights holders downstream, but a recent study by the Colorado Stormwater Center showed that rain barrels have no effect on downstream users. In response to this, **Colorado passed Hb 16-1005**. Now, most Colorado homeowners are allowed to use rain barrels to collect rainwater, which is a great tool for sustainable landscaping!

Rules and Regulations:

- You must live in a house or townhouse with fewer than 4 units
- A maximum of **two rain barrels with combined storage 110 gallons or less** are allowed at each household
- All water collected must be used OUTSIDE and on YOUR PROPERTY
- Untreated Rainwater Collected from roofs is not safe to drink.
- Remember to always check with your HOA

Mosquitoes:

- Although any container can be used to collect rainwater, Hb 16-1005 requires the container to be equipped with a sealable lid, to keep rain barrels from becoming mosquito breeding grounds
- The rain barrel should be completely emptied monthly (or less). If you plan to be away for more than a week, disconnect your rain barrel from the downspout

General water quality:

- In Colorado, rainwater quality is generally good, but it is still important to maintain water quality and purify your rainwater, due to various impurities absorbed from the atmosphere, including arsenic and mercury
- The best strategy is to filter and screen out contaminants before they enter the storage container, using **first flush diverters**
- Roof washing is not needed for water used solely for irrigation purposes

More Resources:

Blue Barrel Rainwater
CSU Extension- Rainwater Collection

Need More Information?

Did we miss something that you would like to know more about? Please email either sandell@erwc.org or laura.eaglecountycd@gmail.com and we will do our best to find you more resources!