

BIG SKY WATER WISE LANDSCAPE GUIDE



Every drop counts.

This guide is organized according to the seven principles for creating a [Water Wise](#) or xeriscape landscape, first developed in Denver in 1996. These principles optimize water use while maintaining flexibility in the design of healthy, attractive, cost-effective, and Water Wise landscapes.

- 1. Comprehensive Planning
- 2. Improve Soils
- 3. Appropriate Plant Selection
- 4. Practical Lawn Areas
- 5. Efficient Irrigation
- 6. Use Mulch
- 7. Appropriate Maintenance

Water Wise Basics

In short, use water practically and efficiently. Effective planning with deliberate planting is key to being Water Wise. For Big Sky, residential and commercial landscapes may incorporate Water Wise strategies such as planting low water, drought-tolerant, and native plants, along with an efficient watering schedule. Water Wise landscapes are also trout-friendly: they save water to protect Gallatin River’s world-class fishery!

Use this guide to be Water Wise throughout landscape design, installation, and maintenance—whether you are starting from scratch or looking to update an existing site. Share it with neighbors and friends to make a bigger impact to conserve water in our community.

WATER IN BIG SKY

Water Conservation: For Now & Later

BEFORE YOU PLANT

Plan & Design

Improve Soils.....

WHEN YOU PLANT

Appropriate Plant Selection

Practical Lawn Areas

Efficient Irrigation

AFTER YOU PLANT

Use Mulch

Appropriate Maintenance.....

PLANT LISTS

GLOSSARY

Find key terms in [purple](#)

GET INVOLVED

Water in Big Sky

Big Sky's water supply is sensitive to changes in climate and is impacted by our use.

Snowmelt drives water supply in Big Sky.

Snow melts off the landscape to recharge groundwater, feeds the Gallatin River, and provides cold, clean water for public water supply, recreation, businesses, and downstream agriculture.



We have long, snowy winters broken up by short, dry summers. Annual rain and snow vary with the most precipitation accumulating at the highest elevations. Spring rains augment supplies driven by snowmelt and runoff.



Water supplies are sensitive to drought conditions in Big Sky. Droughts are caused by both natural climate factors and human water use. As Big Sky continues to grow rapidly and our community's available water supply changes, efficient and conservation-minded water use is imperative.



Warming temperatures and shifting precipitation patterns impact how much water is available for us to use. Historical snowpack observations coupled with recent projections show a shift towards reduced snowpack, earlier snowmelt, lower later-season streamflows, and more frequent droughts. This trend is predicted to increase as temperatures continue to rise.

Big Sky runs on groundwater.

Clean water stored underground provides the water we use every day in the house, at work, and at school. Groundwater is also connected to surface water supplies; snowmelt and runoff help replenish groundwater supplies annually. Warmer temperatures combined with low precipitation rates and drought conditions in critical times like summer increase the vulnerability of Big Sky's water quality and quantity to adequately meet our needs.



Each yard and landscape is part of the Gallatin River Watershed. All activities on the land affect both surface water and groundwater.

How we use water matters.

Water that is used in our homes is cycled back into the system, recharging groundwater resources. On the other hand, 65% of landscape-applied water may evaporate and is lost from the watershed.* Plus, traces of fertilizers, pesticides, and herbicides that we apply to landscapes are collected and carried to nearby waterways and eventually, to the Gallatin River. When we are Water Wise, more water is conserved, and less pollutants make their way into the river.

**Water Wise landscape strategies like efficient irrigation can reduce evaporative losses and increase water conservation. See pg 23-28.*

"Protecting our natural resources is paramount to protecting our livelihood and future."

Kevin Germain - Vice President, Moonlight Basin

Water Conservation: For Now & Later

Water conservation is the most eco-friendly, economical, and easiest way to extend existing and future water supply in Big Sky.

Did you know water use skyrockets each summer?

According to data from the Big Sky County Water Sewer District from 2011 to 2020, summer water use is 160% higher compared to other times of the year. Data also shows that the demand for water has been steadily increasing over the last ten years, consistent with population growth.

Knowing this, it is clear that the most efficient way to cut down on Big Sky's water use is through water-wise landscapes. **If all landscapes switched to water-wise practices, Big Sky could save over 40 million gallons of water a year!.**

Case Study: The Task Force and Big Sky County Water and Sewer District found 85% of total annual water use in 2017 was applied to landscapes for 57 homes in the Meadow Village.

It's especially important to pay attention to your water use during the summer. Water conservation can relieve the stress of high temperatures, low precipitation rates, and reduced streamflows and help ensure water supply when the watershed needs it the most.

The biggest opportunity to put water conservation into practice starts at home.

How Much Water Do You Use Outdoors?

The best way to keep track of your water use is to use a water meter. Anyone connected to the Big Sky County Water and Sewer District already has a meter. Consult your annual water bill and estimate outdoor water use in these steps below.

Outdoor Water Use = Total Annual Water Use - Indoor Water Use

Indoor water use tends to stay the same throughout the year and water use increases in the summer for landscape irrigation. So, let's place our winter water use as a stand-in for indoor use to help us figure out our outdoor water use.

Step 1: Estimate Average Monthly Winter Use

Add up the total gallons used from October to March. Divide that sum by 6 to yield a winter monthly average.

Average Monthly Winter Use = (Water Use from October - March) / 6

Step 2: Estimate Average Annual Indoor Use

Take your answer from Step 1 and multiply by 12.

This product will give you an idea of your annual indoor water use.

Average Annual Indoor Use = Average Monthly Winter Use X 12

Step 3: Estimate Outdoor Water Use

Subtract your answer from Step 2 from total annual water use, as seen on your bill or meter.

Outdoor Water Use = Total Annual Water Use - Annual Indoor Use

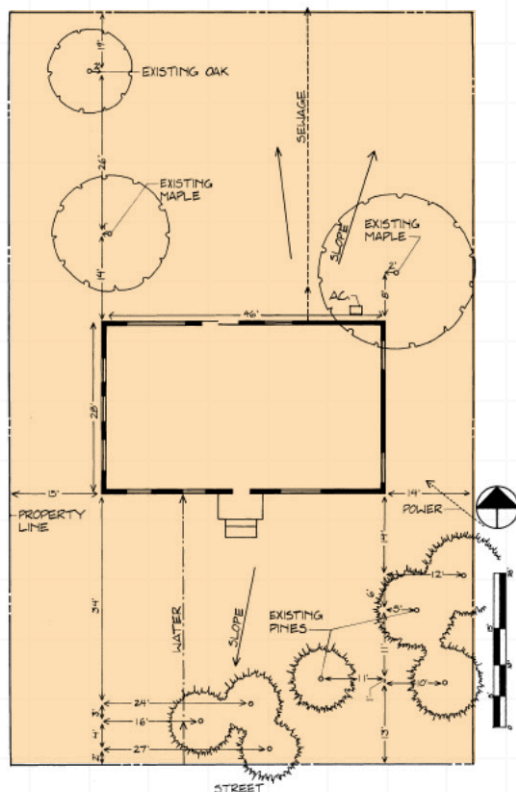
If your average outdoor water use is more than double your indoor water use, read on to learn how to make Water Wise landscaping choices.



BEFORE YOU PLANT



START WITH A PLAN



Simple site analysis showing sunny, shady, and windy areas, and existing vegetation.

Graphic adapted from Xeriscape Guide, The University of Georgia College of Agriculture and Environmental Sciences, Cooperative Extension, 2007

Planning is essential to achieve an efficient use of water.

Step 1: Sketch Out Your Site*

Draw the major elements of your landscape to scale including the house, driveway, sidewalk, patio, existing trees, and anything else you can easily spot. Walk around the site and note especially sunny, shady, sloped, and narrow areas on your sketch.

**Your builder or developer may already have a site plan, also called a "plat map." Ask for a copy and skip this step!*

Step 2: Consider Your Goals

How do you plan to use each area of the landscape? Curb appeal? Room for the kids and pets to play? Keep these goals in mind to help match the function of each area to its use.

Step 3: Evaluate What's There

- Do your best to keep healthy native vegetation already present on the site
- Pay attention to site soils. Preserve **topsoils** if you plan to grade the site. (pg 11-14).
- Check for invasive plants and **noxious weeds**. Contact Gallatin Invasive Species Alliance for assistance.

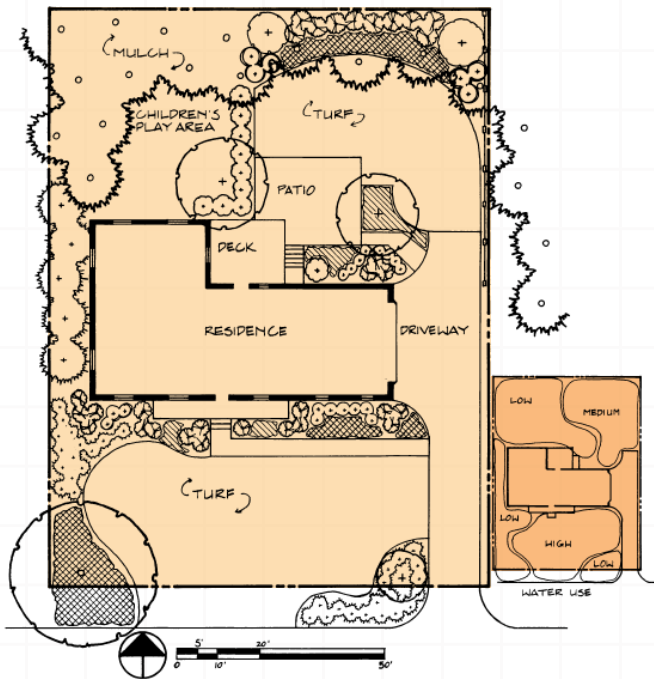
Step 4: Finalize Your Landscape Plan

- Choose plants that are suitable for Big Sky. Prioritize native, drought-tolerant, and cold-hardy species. Check out **Plant Lists** for recommendations. (pg 35-40).
- Group plants with similar needs for water and sunlight to encourage **efficient irrigation** (pg 23-28).
- Be practical with lawn size, and consider using grass species that are consistent with the local environment (pg 21-22).

A good plan saves money, water, and time.

DESIGN LIKE A PRO

Once you've made your site plan, finish off the design for your Water Wise landscape.



Landscape plan design featuring important Water Wise landscape principles like practical lawn areas, mulch, and plants grouped by watering needs.

Graphic adapted from Xeriscape Guide, The University of Georgia College of Agriculture and Environmental Sciences, Cooperative Extension, 2007.

Six Design Tips for a Water Wise Landscape

1. Keep lawns in flat areas for **efficient irrigation**.
2. Use native and **drought-tolerant** plants or add **hardscape** elements like patios and boulders for areas not needed as lawn space.
3. Be **fire-wise** by creating a defensible space around buildings and structures using rock, pebbles, and gravel.
4. Break up slopes by incorporating a rock terrace garden.
5. Try shrub borders for hard-to-irrigate or narrow areas.
6. Add mulch to provide a protective cover that moderates soil temperature and holds in moisture.

SOILS ARE THE SECRET

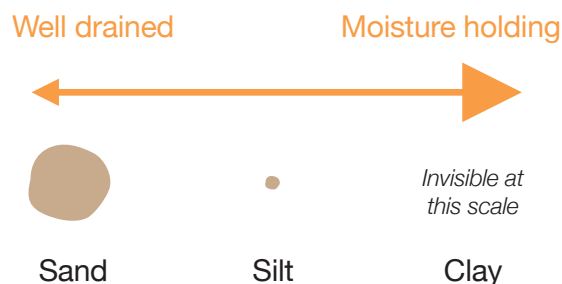
A healthy soil base is a key to a Water Wise landscape.

Soil Properties & Water

Two important factors that influence how soils store water are **soil texture** and **organic matter**. Pay attention to these factors to understand how water naturally moves through your soil and learn how to improve them for successful plant health and growth.

Soil texture relates to the relationship of sand, silt, and clay-sized particles that make up the mineral part of soil. Loam soils are a combination of sand, silt, and clay. Soil composition informs physical properties like particle size and also relates to how soils store water and exchange nutrients.

As particle size increases, soil's ability to retain water decreases.



Particle size and water holding-capacity in soils.

Graphic adapted from Dr. Clain Jones of MSU Extension Soil Fertility.
<http://landresources.montana.edu/soilfertility/index.html>

Sandy soils have a greater number of larger spaces between particles. These soils are well-drained, but water may move through so quickly that plant roots are unable to absorb it.

Clay soils have a greater number of smaller spaces between particles. These soils hold moisture longer, but clays absorb water very slowly and can only take brief periods of watering before **runoff** and ponding.

Loamy soils are considered the best for plant root growth because they readily absorb and store water.

TIP: Adding mulch to sandy soil will keep it from drying out as quickly, whereas adding mulch to clay soil will improve drainage.

Organic matter is a mix of living and dead materials usually found in the top 10" of soil, called topsoil. Organic matter helps provide nutrients, improves moisture storage, and insulates soils against cooling and heating. Adding compost or peat moss are simple ways to increase organic matter in your soil.

TIP: Add organic matter to increase water storage in sandy soils or increase infiltration in clay soils.



Locally made compost is available in Big Sky at the Water and Sewer District.

Meadow and Mid-Mountain

(Elevation Range: 6000-7500 ft.)

Soils vary from clays to loams to sandy/rocky soils.

Upper Mountain

(Elevation Range: 8000+ ft.)

Well-drained, sandy/rocky soils are most prevalent.

In Big Sky, soils vary. Different soil types and their respective health conditions may be present within the same site, especially if any grading or backfilling activities were done to construct the property.

Building and construction activities can compact soils and increase erosion, which degrades soil health and landscape production. Plant roots are hard to establish in compacted soils because water can't easily get into the soil, which limits the success of your Water Wise landscape.

Remember to preserve healthy **topsoils** during these activities by stockpiling them and returning them to the site after final grading. Turn and loosen compacted soils. **Ask an expert** if other amendments should be made to the soil. A popular amendment in Big Sky is using organic products that contain **mycorrhiza** to increase the exchange of nutrients and moisture between plant roots and beneficial fungi in the soil.

What's On My Site?

Here are a few simple ways to analyze soils:

Method 1: Add water drop by drop to a handful of soil until you reach a pudding-like consistency.

- Clays will feel sticky
- Sands will feel gritty like sugar
- Loams will feel smooth

Method 2: Mason Jar Texture Test

1. Collect about a cup of soil from your site, remove any leaves, crush lumps, and place in a jar.
2. Add water to jar, leaving about an inch of air at the top. Shake well.
3. Let sit for 24 hours to allow soil particles to settle. Sands will settle at the bottom, silts in the middle, and clays at the top.
4. Using a ruler, measure soil depth in inches, discarding any floating materials from your measurement. Measure each soil layer in inches and divide by total soil depth.
5. Finally, estimate the percent of sand, silt, and clay by multiplying each by 100%.

(Soil Layer (in.) / Total Soil Depth (in.)) X 100% = Sand, silt, or clay %
For example, if the total soil depth was 4 in. and $\frac{3}{4}$ in. of sand sits at the bottom, divide $\frac{3}{4}$ in. (0.75 in.) by 4, which yields 0.1875 in. Multiply 0.1875 in. by 100, which gives you 18.75%. Your soil contains 19% sand.

Sample soils in early spring or late fall to allow time for testing results and recommendations.

Contact the Gallatin County Extension Agent at Montana State University and experts at local Big Sky nurseries for more information on soil health, testing, and advice for your specific site.



Note on Fertilizers: Fertilizers may help improve soil health and plant production by adding key nutrients to the soil. However, over-application of fertilizers may have detrimental, long-term effects on water quality and fish health. To keep excess nutrients from entering our waterways, always opt for organic fertilizers.



WHEN YOU PLANT



Catmint and Yarrow, Gail Frederick



Fleabane, Patrick Standish

Choose plants that are cold hardy and tolerant of dry weather to match Big Sky's climate patterns. Specify plants that will meet your site's particular soil and light needs. Shop local for plants, and look for labels like "drought-tolerant," "native," and "fire-wise."

USDA Plant Hardiness Zones Suitable for Big Sky

Trees & Shrubs: Zone 2 & 3

Hardy from -45 to -35°F

Perennials & Grasses: Zones 2-5

Hardy from -45 to -10°F



Shopping Tip: Big Sky's nurseries arrange their plants according to light requirements. Need full sun perennials, trees, and grasses? Check outside tables and other sunny areas. Look inside the greenhouses for plants more tolerant of shade. Always ask someone if you are unsure.

Trees Spotlight: Incorporating trees on the landscape can provide extra shade areas, reduce runoff from stormwater, stabilize soils, and protect against winds. Aspen trees are a local favorite, but they prefer plenty of water. Make trees a Water Wise choice by placing them in sunny, lush areas where water naturally drains. Allow soils to dry out slightly before watering again.

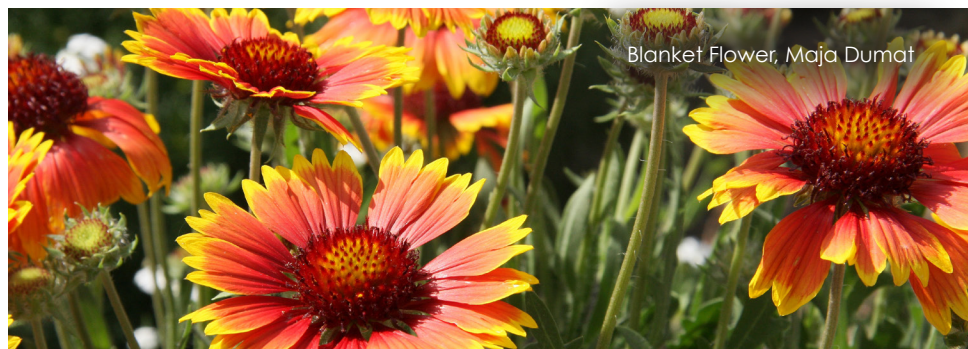
Tips for New Plantings

For recommendations of appropriate perennials, trees, shrubs, and grasses, flip to **Plant Lists**.

The best times to plant are spring and fall. For new sites, complete any site grading and soil preparation work in the spring and begin planting in the fall.

Keep in mind new plantings will often require supplemental watering to get established, which often takes between 1 to 3 growing seasons.

Planting a vegetable garden? Look for hardy and quick-to-mature vegetables including spinach, kale, peas, onion, lettuce, radish, and chard. Check your local nursery for specific varieties.



Blanket Flower, Maja Dumat



Common Juniper, Andrey Zharkikh

GO NATIVE!

Native plants grow in balance with nature in their endemic regions. In Big Sky, characteristics of native plants often include drought tolerance, fire resistance, quick maturity, cold hardiness, and the ability to grow in dry, rocky, and sandy soils.

In this guide, any plant that has grown in the US before European settlement is characterized as native.

Native plants provide many benefits that enhance the world around us — environmentally, aesthetically, and economically. We let them do the things they naturally do!

Here's a few benefits that native plants provide:

- Improve water and soil conservation
- Improve air quality and carbon sequestration
- Preserve natural heritage
- Enhance biodiversity
- Increase real estate values
- Reduce maintenance needs and associated costs
- Create habitat for [pollinators](#) and other wildlife
- Reduce or omit use of fertilizers and pesticides
- Reduce associated pollution in nearby streams, rivers, and groundwater resources

When we promote plants that naturally adapted to our environment, we don't need to manage and maintain them as much, or at all, to promote successful growth. Find great resources on native plants, their benefits, and other gardening tips at gallatinisa.org/growwild.

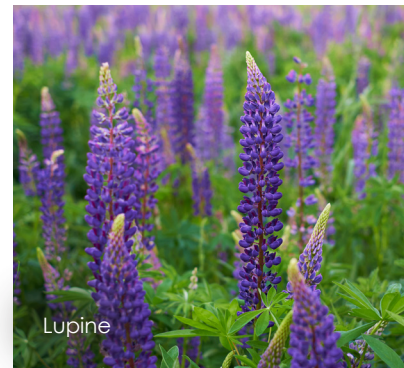


Growing Wildflowers?

Montana's native wildflowers are highly sought after to mimic in our landscapes. Fortunately, Big Sky's local and regional nurseries provide many plant species that are cultivated from ones in the wild to be grown in the garden. Shop for wildflowers such as Jacob's Cline Bee Balm in 1-gallon pots to get the best chance of success.



Sticky Geranium, Jen Mohler



Lupine

Planting Tip: Never transplant from the wild to establish native landscapes. This practice is often unsuccessful and can promote the spread of weeds.



Musk Thistle

Note on Noxious Weeds: [Noxious weeds](#)

are troublesome when established, causing harm to local plant and wildlife communities and even public health. It is unlawful to allow any noxious weeds to propagate or go to seed on your property. Beware of mixed seed packets, they can contain noxious weeds. Check out Montana's Noxious Weed Field Guide or contact Gallatin Invasive Species Alliance (gallatinisa.org) for help.

In Big Sky, lawns are the biggest culprit for high water use.

Therefore, it's the easiest part of your landscape to adopt Water Wise strategies that save money, water, and time. It all starts by being practical.

Lawns are a central element of a typical landscape, but the fact is not many places in the US have the climate to sustain them. Montana is one of them.

Where water is scarce, highly irrigated and maintained lawns don't make sense.

Just like any of the other plants we install into our landscapes, do your best to match your lawn area with the conditions of the site. If you can, choose native, low maintenance, and [drought-tolerant](#) grass species instead of the traditional Kentucky Bluegrass, which often needs a substantial amount of water in our area.*



**Many homeowners associations in Big Sky currently have specific lawn requirements that may be an obstacle for you to implement these Water Wise practices. Contact the Gallatin River Task Force if you are interested in advocating to amend your neighborhood covenant to conserve water.*

Limit lawn size whenever possible.

Keep the size of the lawn in mind with how you plan to use it. Opt for native or [drought-tolerant](#) plants, patios, rock gardens, and terraces to beautify your landscape and save water.

Reducing lawn areas that still receive supplemental watering may save anywhere from 15-50% more water than traditional bluegrass lawns.

Amy Vickers's Handbook of Water Use and Conservation.

Learning to Lawn

Carefully consider site preparation before you install lawns. Whether you are seeding or laying sod, remember to complete grading work and initial soil improvements before you start. Flip back to the [Soils section](#) or remove any guesswork and contact a County Extension Agent at Montana State University for soil testing and analysis.

Take care to seed in thickly so native or [drought-tolerant](#) grasses develop a thick stand. Soils should be rolled so that only shoe prints can be seen on the top. The best time to seed is around Labor Day so the grass can begin establishing before next summer's heat and weeds get in the way.

Place lawns in the easiest areas to take care of on your site: flat, large, and regular shapes are best. Skip the hard-to-grow and hard-to-mow area for lawns. Try to stay away from slopes and narrow or irregular areas.

On steeper areas, choose low maintenance ground covers. For borders, try [drought-tolerant](#) shrubs.

Grasses can also be used ornamentally as accent pieces on the landscape. Blue Oat Grass and Sheep Fescue are great options for this use.

Efficient irrigation means that water is optimally delivered to plants across the landscape with a minimum amount wasted.

Plan ahead to reap the many benefits that efficient irrigation will bring to your Water Wise landscape.

Plants don't save water, people do.

Remember to choose the plants best suited for your site and place them in areas where they can be easily maintained.

CAUTION:

Watch out for water that is running off the sidewalk, driveway, or other areas not targeted for irrigation. If you see this happening, try splitting up your watering times into shorter sessions over the week.



Cluster plants with similar watering needs to the same schedule. If you choose to use an automatic irrigation system, separate them by watering zones; these are called hydrozones. For example, high-water-need lawns should be placed in separate zones from low-water-need trees.



The Gallatin River Task Force offers rebates to community members who make water conservation a priority at home or work. Significant savings are realized with the installation of water-saving products. Visit gallatinrivertaskforce.org for more information.

Irrigation Options

There are a couple different irrigation options:

- 1. **Drip systems** are a form of low volume irrigation. They deliver water slowly and directly to the root zone, minimizing water loss. You might recognize them as the black tubing surrounding trees and shrubs. Emitters can be added to the tubing to get the water to go just where you need it. Drip Systems are great for smaller areas, mulched areas, trees, shrubs, and perennial beds.
- 2. **Spray systems** deliver water to the foliage of plants and take time to properly calibrate to reduce the chance of runoff or loss from evaporation. Two popular spray heads are rotors and pop-ups. Rotors rotate as they distribute water and pop-ups use a fan-like spray. Remember to install a check valve regardless of which head you choose to avoid backwash contamination. Spray systems are great for large flat areas and lawns.
- 3. **Hand watering** is the traditional hose or watering can method you might use to water your landscape. It's the simplest way to water and the easiest way to avoid overwatering. Hand watering is great if all you need to water are decorative pots and garden beds.

Typical Flow Rates

Type	Rate
Drip	0.5-4 gallons/hour
Hose	2-5 gallons/minute
Pop-Up Spray Head	1.5-2 inches/hour
Rotor Head	0.5 inches/hour

Drip systems will deliver water the slowest. Rates taken from Bozeman Water Smart Guide, 2018.

Save 25-75% of water when you switch from a conventional spray head to drip emitters on non-lawn planted areas.

Did you know poor irrigation scheduling is the primary source of wasted water on our landscapes? We water too much, too often. Let's change that.

Lawns: Estimate Your Flow

Use tuna or cat food cans to get a sense of how much water your system is delivering to your lawn.

- 1. Place 6-8 cans throughout the lawn area to get an even coverage.
- 2. Run your system for 15 minutes.
- 3. Grab a ruler. Measure the depth of water in each can, add all the measurements, and divide that number by the total amount of cans to get an average sprinkler output in 15 minutes.

Sprinkler Run Times

Depth of Water (Inches)	0.2	0.4	0.6	0.8	1.0
Watering Time (minutes)	75	37	25	19	15

Rates adapted from Bozeman Water Smart Guide, 2018.

- 4. Use this chart to determine how long you should run your sprinklers to apply about 1 inch of water to your lawn each week. For example, if your average was 1 inch from step 3, you would need to run your system for 15 minutes to apply 1 inch of water.
- 5. Finally, put your numbers to work. Run the system for the appropriate time calculated, wait an hour, and then check the soil moisture. Use a long screwdriver or spade to push into the grass. It will push in easily in wet soil and be hard to push in dry soil.

Note: If you notice any water running off your lawn, split watering into shorter sessions.

For instance, if you want to water an inch of water for the week and you know your system delivers about that much in 15 minutes, try watering only 7-8 minutes twice a week to get the amount you need to minimize water waste.

 Rule of Thumb: Lawns need about 1 to 1.5 inches of water per week on average.



Chokecherry, Matt Lavin

Trees, Shrubs, Perennials, and Other Plants:

Aim for the drip line in the area under the edge of the leaf canopy to effectively reach the root zone. Using a drip system is a great way to get water delivered directly to the roots. Install emitters on your drip system to add more points of water delivery to the plants.

Larger plants, like trees, will need more water to saturate their root zones, but can store water for longer.

Gallons Needed for Each Plant Size

Plant Canopy Diameter/ Drip Line	1'	2'	4'	5'	8'	10'	12'
Shrub (Gallons)	1	4	12	17			
Small Plant/ Ground Cover (Gallons)	0.5	2	5	9			
Tree (Gallons)	1.5	5	16	22	38	59	85

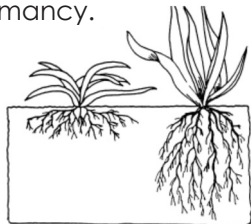
For example, a 10" diameter tree will need 59 gallons of water per week. Rates adapted from Water Use it Wisely, wateruseitwisely.com, 2018



Scheduling

- Best times to water: 4:00 AM - 8:00 AM.
 - » Early morning watering will reduce water loss from wind and heat, as well as fungal diseases.
- Adjust watering throughout the season and as the weather changes.
 - » Keeping the same schedule ignores plant growing cycles and local conditions.
 - » If it's raining, don't run your system.
- Practice deep and infrequent watering (2-3) times a week.
 - » Help establish roots that will hold water for longer.
- Pay attention to local watering restrictions.
 - » Big Sky Water and Sewer District enforces summer water restrictions usually starting on July 1, check signs around town or their website for information.
- After Labor Day, reduce watering.
 - » Prepare lawns for winter dormancy.

Aim for healthy, deep roots like the grass on the right by watering deep and infrequently.



Graphic adapted from Xeriscape Guide, University of Georgia Cooperative Extension, 2007.



Water-Saving Gadgets

- Install a water meter.
 - » Monitor your use and aim to use less each summer.
- Use a soil moisture sensor or a rain gauge.
 - » You can also use a long screwdriver to estimate soil moisture; screwdrivers will penetrate easily in wet soils.
- Set up an automatic system to respond to local weather conditions.
- Use an automatic controller to program watering zones and schedules.
 - » Smart controller use can save 5-10% of water.



Special Considerations

- Watch out for slopes.
 - » Water will typically begin to run off after 15 minutes of watering on a site with even a small gradient.
- During high temperatures, plan to put newly seeded or planted lawns on the heavier watering side.
- Let your plants show you when they are thirsty.
 - » Look for wilting and leaf discoloration for signs of water stress.
 - » If grass doesn't spring back up once you walk on it, it's time to water.
- Never water after you apply herbicides or pesticides.
 - » They can run off into nearby creeks and rivers.
 - » In high amounts, they are harmful to fish and impact water quality.

1 to 1.5 inches of Water – Rain Water =
How much you water your lawn per week

Pick up a free rain gauge from the Task Force to help you plan your water use.



Save 10 - 15% of water from improved irrigation programming and scheduling.



AFTER YOU PLANT



PLANTS BREATHE BETTER WITH MULCH



Use a 2 to 3 inch layer of mulch cover around trees, shrubs, and other planting beds to help hold water in the soil longer. On newly seeded lawns, apply a thin layer.

Mulch helps soils retain moisture, slows evaporation, and moderates temperatures. Mulch can also prevent weed growth.

How To Apply Mulch:

1. Remove any weeds from the mulching area.
2. Moisten soils.
3. Mix a thin layer into the soil and then add 2 to 3 inches of mulch.
4. Spread the mulch evenly to cover the drip line of the selected plants.

Types of Mulches

Organic mulches decompose over time, so they need to be replenished annually. Organic mulches may be made up of materials like shredded bark, compost, wood chips, and sawdust. Because they break down, organic mulches will improve soil structure over time, allowing for better soil exchange of water, air, and nutrients.



They do help release plant nutrients to soil, regulate soil temperatures, and may be less expensive than inorganic mulch.



They don't use harmful dyes/paint that may contain pesticides or other harmful chemicals.

Inorganic mulches are most often used to create a weed barrier. They are made of manufactured materials that do not break down naturally. Some materials commonly used for inorganic mulches are landscape fabric, rock, rubber, and plastic film. They may use environmentally harmful dyes or chemicals to achieve a certain appearance. Because they don't readily break down, these materials may stay in the environment and won't improve soil quality.

Both types can provide an aesthetically pleasing background to your landscape, but organic mulches may provide added benefits to help improve the success of your plants and achieve greater water efficiency.

Shop local for mulches, and choose organic products whenever possible.

All landscapes require ongoing care to keep them healthy and beautiful. Use this list to remember important maintenance tasks for your Water Wise landscape.

- ☐ Run each irrigation zone for 2-3 minutes at the start of the watering season. Use the “test” setting if you have an [automatic controller](#).
- ☐ Top dress lawns and planting beds with fertilizer early in the season.
- ☐ Only mow when grass is dry.
- ☐ Set mower blades to the highest setting and return nutrient-rich clippings to the lawn.
- ☐ If you notice sprinkler heads are watering sidewalks, driveways, and roads, adjust as needed.
- ☐ Remove weeds as soon as they spring up.
- ☐ Prune at the end of the season or early fall when plants are dormant

Important Note on Lawn Maintenance:

Maintenance practices that favor lush lawns may cause harmful effects to the environment and nearby water resources. Overwatering and fertilizer application are two practices that require special attention. Use slow release, organic fertilizers and only apply as much as recommended by soil test results. Overwatering may starve soils of oxygen, filling up pore spaces with too much water and too little air. Plus, too much water at once can pool and run off, carrying away whatever fertilizers or other chemicals you may have added to the site to nearby water resources. Practice the efficient irrigation strategies and watering tips on page 23-28 and look for signs of overwatering like leaf discoloration or pooling.

Improve Drought Tolerance

Gradually reduce the amount of water you apply to your Water Wise landscape once your plants establish. Your plants will adapt to the amount of water given as long as they can remain healthy. Try removing one or two minutes off each irrigation zone. If everything is still healthy, try removing another couple minutes.

Did you know leaks may be increasing your water use by 30%?

Regularly check for irrigation system leaks, and repair any as soon as possible.

Be a Leak Detective...Look for:

- A surprise increase in your water bill
- Overly green/soggy areas
- Hissing sounds near hoses or tubing
- Overgrown lawns
- Broken, clogged, or misaligned heads
- Cracks in hoses



Drought Tolerant Plants:

No supplemental water needed once plant is established, 2 -3 years after planting. During long, hot periods plants can be deep watered occasionally if showing stress.

Watersmart Plants:

Water less often than regular garden plants, usually every 7-10 days, deep soak.

Key:



MT Native



Deer
Resistant

DT

Drought
Tolerant



Pollinator
Friendly



Shade
Tolerant

WS

Watersmart



Shrubs:

Plant Name



Buffaloberry, Silver <i>Shepherdia argentea</i>	✓		✓	✓	✓	
Caragana, Pygmy <i>Caragana pygmaea</i>	✓			✓	✓	
Caragana, Siberian <i>Caragana arborescens</i>	✓			✓	✓	
Chokecherry ** <i>Prunus virginiana</i>	✓		✓		✓	
Cotoneaster Peking** <i>Cotoneaster apiculatus</i>	✓			✓		
Currant 'Greenmound' <i>Ribes alpinum</i>						
Golden Currant** <i>Ribes aureum</i>	✓		✓		✓	
Juniper Common** <i>Juniperus communis</i>	✓		✓		✓	
Junipers DR <i>Juniperus species</i>	✓		✓			
Kinnickinnick** <i>Arctostaphylos uva-ursi</i>	✓		✓	✓		
Lilacs** <i>Syringa species</i>				✓		
Oregon Grape** <i>Berberis repens</i>	✓		✓	✓	✓	✓

Shrubs (cont.):

Plant Name	DT	WS	☐	☐	☐	☐
Pine, Mugo <i>Pinus mugho</i>		✓				
Potentillas <i>Potentilla fruticosa</i>	✓		✓	✓	✓	
Rose, Woods <i>Rosa woodsii</i>	✓		✓		✓	
Sagebrush <i>Artemisia tridentata</i>	✓		✓	✓		
Sagebrush, Silver <i>Artemisia cana</i>	✓		✓	✓		
Serviceberry, Western <i>Amelanchier alnifolia</i>		✓	✓		✓	
Spirea Birchleaf 'Tor' <i>Spiraea betulifolia</i>		✓	✓		✓	



Perennials:

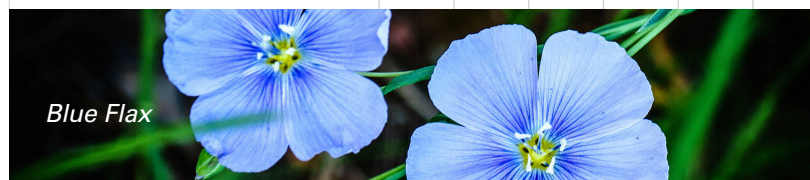
Plant Name	DT	WS	☐	☐	☐	☐
Alliums, Ornamental <i>Allium species</i>		✓			✓	
Alumroot, Roundleaf <i>Heuchera cylindrica and rotundifolia</i>	✓		✓	✓	✓	✓
Alyssum 'Basket of Gold' <i>Aurinia saxatilis</i>		✓			✓	
Blanketflower <i>Gaillardia aristata</i>	✓		✓		✓	
Blue Flax <i>Linum lewisii</i>	✓		✓	✓	✓	
Buckwheat Sulfur <i>Eriogonum umbellatum</i>	✓		✓	✓	✓	
Butterflyweed <i>Asclepias tuberosa</i>		✓			✓	
Catmints <i>Nepeta faassenii</i>		✓		✓	✓	
Columbines Assorted <i>Aquilegia species</i>	✓				✓	✓
Cut-Leaf Fleabane Daisy <i>Erigeron compositus</i>	✓		✓		✓	
Gayfeather, Dotted <i>Liatris punctata</i>	✓		✓	✓	✓	

Perennials (cont.):

Plant Name	DT	WS				
Geraniums, Big Leaf <i>Geranium macrorrhizum</i>		✓			✓	✓
Harebells <i>Campanula rotundifolia</i>		✓	✓	✓	✓	✓
Hen and Chicks <i>Sepervivum species</i>	✓				✓	
Lamium 'Hermans Pride' <i>Lamium galeobdolon</i>	✓					✓
Lamiums <i>Lamium maculatum</i>		✓		✓	✓	✓
Pale Purple Coneflower <i>Echinacea pallida</i>	✓		✓	✓	✓	
Pasqueflower <i>Anemone patens</i>		✓	✓		✓	✓
Pearly Everlasting <i>Anaphalis margaritacea</i>	✓		✓	✓	✓	
Penstemon Little Flower <i>Penstemon procerus</i>	✓		✓		✓	✓
Penstemon Rocky Mtn <i>Penstemon strictus</i>	✓				✓	
Penstemons <i>Penstemon species</i>	✓		✓	✓	✓	

Perennials (cont.):

Plant Name	DT	WS				
Prairie Smoke <i>Geum triflorum</i>	✓		✓	✓		
Purple Coneflowers <i>Echinacea purpurea</i>		✓			✓	
Pussytoes <i>Antennaria microphylla and rosea</i>	✓		✓	✓		
Purple Prairie Clover <i>Dalea pupurea</i>	✓		✓	✓	✓	
Sage, Meadow <i>Salvia nemerosa</i>	✓			✓	✓	
Sedums <i>Sedum species</i>	✓				✓	
Snow in Summer <i>Cerastium tomentosum</i>		✓		✓	✓	
Snow on the Mountain <i>Aegopodium podagraria</i>	✓			✓		
Thymes, Creeping <i>Thymus species</i>		✓		✓		
Yarrows <i>Achillea hybrid</i>	✓			✓		



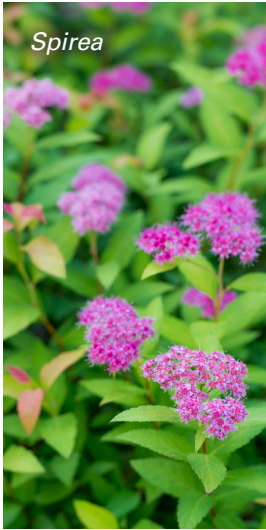
Ornamental Grasses:

Plant Name	DT	WS				
Blue Grama <i>Bouteloua gracilis</i>	✓		✓	✓		
Fescue Blue <i>Festuca glauca</i>	✓			✓		
Fescue 'Siskiyou Blue' <i>Festuca hybrid</i>	✓			✓		
Little Bluestem <i>Schizachyrum scoparium</i>	✓			✓		
Prairie Junegrass <i>Koeleria macrantha</i>	✓		✓	✓		
Side Oats Grama <i>Bouteloua curtipendula</i>	✓		✓	✓		
Blue Oatgrass <i>Helictotrichon sempervirens</i>		✓		✓		
Feather Reedgrass <i>Calamagrostis x acutiflora</i>		✓		✓		
Tufted Hairgrass <i>Deschampsia caespitosa</i>		✓	✓	✓		



Vines:

Plant Name	DT	WS				
Hops <i>Humulus lupulus</i>		✓			✓	
Virginia Creeper DR <i>Parthenocissus quinquefolia</i>		✓				



Glossary

•**Automatic irrigation system:** Refers to the use of clocks and sensors that operate irrigation and requires little to no manual components.

•**Automatic controller:** An irrigation system component which has an automatic timing device capable of operating irrigation stations that either have or connect to a sensor that detects evapotranspiration data, or a rain sensor and uses this data to suspend or alter irrigation operation.

•**Drip system:** An irrigation system installed above the soil surface or buried within it that allows water to slowly drip to plants.

•**Drought-tolerant:** Plants that are naturally adapted to dry conditions that don't generally need supplemental irrigation once established.

•**Efficient irrigation:** A practice where an irrigation system runs at maximum capacity with minimum wastes of water through system design, installation, and maintenance.

•**Hydrozone:** A portion of landscaped area having plants with similar water needs that are served by a valve or set of valves with the same schedule. Hydrozones may be irrigated or non-irrigated.

•**Indoor water use:** Water used for drinking and general household activities.

•**Landscape water use:** Water applied to outdoor landscapes, like lawns and gardens.

•**Low volume irrigation:** An irrigation method (drip), that can be installed above or below ground, that is designed to apply water to a uniform soil depth or limited area. For optimal efficiency, calibrate systems to hydraulic specifications and operating pressures.

•**Mycorrhiza:** A mutually beneficial relationship formed when a fungus grows in association with plant roots, sharing nutrients and helping each to thrive.

•**Native Plants:** Plants that naturally occur in a habitat, ecosystem, or region without human interference, forming sustainable relationships with native wildlife.

•**Noxious weeds:** The status of an exotic plant species given by Montana County Weed Control Act. These weeds can form dense infestations and may harm native plant communities and render land unfit for wildlife, forestry, livestock, or agriculture.

•**Pollinator:** Animals, such as bees, butterflies, hummingbirds, or moths that help plants fertilize and produce viable fruits and seeds by transferring pollen between flowers of the same plant species.

•**Rain sensor:** A component of an irrigation controller that automatically suspends an irrigation event when precipitation is detected through a sensor.

•**Runoff:** Water from rain or snowmelt that drains to streams and rivers.

•**Spray irrigation:** A common irrigation method usually installed underground that is designed to uniformly distribute water across a larger area (like lawns). For optimal efficiency, calibrate systems to hydraulic specifications and operating pressures.

•**Stormwater:** Water generated from rain or snowmelt that flows over land surfaces, parking lots, and pavement that can pick up pollutants before making it to local rivers and streams.

•**Topsoil:** The most upper, outermost layer of soil (usually top 10"), which contains the highest concentration of organic matter, microorganisms, and biological soil activity.

•**Total annual water use:** The sum of water used indoors and outdoors each year.

•**Water-Wise:** A landscape area that requires little to no irrigation and maintenance, used in arid regions.

Get Involved

Look for the WaterSense label on high-efficiency products and get money back!



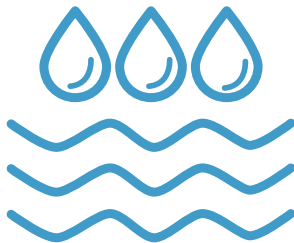
The Task Force is a proud nonprofit partner of the Environmental Protection Agency's WaterSense program, the national standard for high-efficiency indoor and outdoor appliances. We offer rebates to community members who purchase and install these products.

Learn more at epa.gov/watersense

Big Sky Outdoor Rebates:

Apply for rebates and get cash-back for making your landscape water-wise.

gallatinrivertaskforce.org/outdoor-rebates



Take the Trout-Friendly Pledge!

Show your commitment to protecting Big Sky's rivers and drinking water.

gallatinrivertaskforce.org/Trout-Friendly

Engage in the conversation with us.

Volunteer with the Task Force or become a member today.

gallatinrivertaskforce.org/volunteer/
gallatinrivertaskforce.org/dontate/



The Gallatin River Task Force leads the charge to protect water resources in the Upper Gallatin River Watershed.

Here are a few highlighted projects that aim to conserve water:

- **Drought Resilience Planning**

The Task Force participates in a locally-driven effort to build drought preparedness and long-term water supply resilience across the Upper Missouri Basin. We coordinate dedicated outreach and planning processes in order to better understand drought risks and mitigation opportunities in Big Sky, of which, water conservation programming plays a key role.

- **Stormwater Garden at Lone Peak High School**

Our first Water Wise landscape project features native plants. Native plants require little-to-no added irrigation water to thrive. This garden was installed to limit pollutants from entering nearby waterways by filtering runoff from the parking lot and road.



Visit Lone Peak High School to see the stormwater garden in person.

- **Big Sky Water Conservation Program**

This program aims to inspire a water conservation ethic across our community through outreach, incentive programs, and policy planning. We offer rebates for water-saving indoor and outdoor products, which is one of only two programs of its kind in Montana. As of 2021, participants are collectively saving an estimated 2.5 million gallons of water per year.

- **Crail Gardens**

Visit the Crail Gardens to see what plants will fit well in your landscape and learn about the benefits they have to our watershed. Managed by the Gallatin Invasive Species Alliance, native plants help us combat invasive species that are harmful to native flora and fauna. Located at the Historic Crail Ranch in Big Sky. Learn more at gallatinisa.org



Photo by : Jen Mohler, GISA



The Big Sky Water Wise Landscape Guide provides practical strategies for our community to save water outdoors. The guide integrates several conservation initiatives that work towards long-term sustainability and resilience for Big Sky's water resources while promoting healthy, attractive landscapes.

The Gallatin River Task Force produced this guide as a collaborative effort between local nurseries, landscapers, irrigators, and nonprofits to encourage water conservation.

Special thanks to Jen Mohler, San Goveia, Alan McLain, Scott Savage, Mike Richter, Nick Turner, Sarah Dubel, Rich Addicks, Big Sky Resort Tax District, and Outlaw Partners. This guide was written by Emily Casey, Water Conservation Program Coordinator of the Gallatin River Task Force in 2019.

The Gallatin River Task Force is a 501(c)(3) nonprofit based in Big Sky, MT. Our mission is to partner with our community to inspire stewardship of the Gallatin River Watershed.

Learn more about us
www.gallatinrivertaskforce.org