Planting to Reduce Water Demand

The layout and plant composition of our gardens and landscapes can make an enormous difference on how much water they require. Through careful planning and mindful design you can dramatically reduce watering and maintenance needs. Take some time to evaluate your property, determine your vision and goals, and come up with a plan before engaging in your next major landscaping project. The following are strategies for designing a “water smart” landscape.

**Evaluate the site**

The first step to coming up with a plan is to analyze the space:

- How much sun exposure is there?
- How much rainfall?
- Is the area exposed to high winds?
- Are there any structures or large trees nearby?
- Are there steep slopes?
- What are soil conditions like?
- Does the area tend to stay moist or dry?
- What plants seem to be thriving/failing?

These are all important questions to answer in order to better understand the site conditions. By knowing the environmental and growing conditions of your site you will be able to make informed decisions on how to design your garden.

**Size and scale**

As you go about your design work, think about how big you want your yard to be. Do you really need a large lawn that you have to mow, water and fertilize frequently? Do you want to have large filled out planting beds if you find gardening to be a laborious chore? Think about how you will be maintaining your outdoor space. Will you be doing it yourself or hiring a professional? What is your budget? Knowing the answers to these questions will help you to determine what percentage of your property you should be devoting to lawn or landscaped space. Perhaps it makes sense to restore a portion of your property to native vegetation and let it revert back to wild. Maybe there are portions of your lawn that are unnecessary and could become a meadow or a grouping of native shrubs and perennials. By reducing the size of our lawns and formal landscape plantings we can drastically cut down on water use and maintenance efforts.

**Develop a planting palette**

Once you have evaluated your site, you can determine what plants you would like to use. A planting palette is a list of the different plants that are suitable for the site conditions and also have the desired aesthetic qualities that will help you achieve your vision. In order to conserve water and reduce plant loss, you should look for species that are hearty, drought tolerant, and are well adapted to your conditions. Try to incorporate native species whenever possible. Natives are well adapted to the range of climate conditions of our region and are easier to care for. A well-
crafted plant palette will reduce the need for supplemental watering and horticultural maintenance. Consider working with a local landscape designer, horticulturist, or nursery/garden center to help you determine which plants should be on your list.

**Plant placement and layout**

After you have your plant list defined you can begin to sort out where your plants will be located and how you want them arranged. As the design comes together make sure that you are putting the “right plant in the right place.” For example, keep shade tolerant plants out of direct sun and keep plants that prefer well-drained soils away from clayey or boggy areas. Plants should also be placed in groupings according to their water requirements; this way you can be more targeted when watering and reduce water waste. For example, keep drought tolerant species separate from water demanding ones so you aren’t watering them unnecessarily. This will also save you time by making watering more efficient.

**Green mulch**

As part of your planting arrangement consider putting in a groundcover plants. Groundcovers are low growing, spreading plants that help fill in the empty space in the soil around other plants. Groundcovers reduce maintenance by keeping out weeds, minimizing areas that must be mulched, and also give your arrangement a more lush, filled in look. A thick groundcover layer also serves as “green mulch” helping to moderate soil temperature and slow down evaporation from the soil.

**Healthy soils**

As part of your landscaping plan you should also plan to improve your soils to provide more suitable growing conditions for some of your plants. When setting up new planting beds or turf soil add organic matter by topdressing or lightly tilling into your soil. Organic matter will help improve the water retention capacity of the soil. Compost is a great soil amendment for this purpose and it is also a source of nutrients for your plants.
**Design goal: “Xeriscaping”**

Xeriscaping is a term that became popular amongst landscape designers and municipalities in the western US during the droughts of the 1980’s. The term comes from the latin words xero, meaning dry, and scape, meaning landscape or view. The principle behind xeriscaping is to create a landscape that does not require any irrigation or supplemental watering. The seven principles of xeriscaping are:

- Thoughtful landscape planning and design.
- Reduction of lawn to appropriate, functional areas.
- Use of plants with low water needs.
- Avoiding irrigation use and using only high efficiency systems.
- Amending soils for optimal water retention and health.
- Use of mulch to help retain water and reduce evaporative loss.
- Efficient and appropriate landscape maintenance.

Although xeriscape design has been popularized in more arid regions out west, the principles are highly applicable to our New England landscapes and can easily be implemented. Consider using xeriscaping principles on your next project, with the design goal of creating a totally water neutral garden.

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In nature, plants grow naturally in areas that suit their moisture, light, and nutritional requirements—with rainfall being the only source of water. On the other hand, the plants in our landscaped yards and gardens often require additional water to remain healthy and green. Nationally, the EPA estimates that roughly one-third of residential water use goes towards watering our lawns and gardens. Fortunately, there are many strategies we can employ to reduce demand and conserve water in our landscapes.

**Garden design and layout**

A wisely designed garden can help to conserve water by reducing water needs and simplifying watering.

- **Plant selection:** All plants have different water requirements. Try to choose species that require less water, are adaptable, and are tolerant of dry and drought conditions.
- **Know your plants:** Put the “right plant in the right place” according to its water, light, and soil requirements. A plant that prefers consistent soil moisture and afternoon shade is going to require more supplemental watering to stay alive if placed in a dry, sunny location.
- **Use native species:** Natives are well adapted to the range of climate conditions and rainfall of our region. By nature, natives are easier to care for, requiring less supplemental watering and reduced horticultural care. In addition they provide many ecological benefits.
- **Plant in groupings:** Place plants in groupings according to their water requirements. This way you can be more targeted when watering and reduce water waste. For example, keep drought tolerant species separate from “water hogs” so you aren’t watering them unnecessarily. This will also save you time by making watering more efficient.
- **As a general rule of thumb,** the north side of a property will be cooler and moister, whereas the south side will be hotter and drier. Areas under trees can have varied characteristics. Pay attention to the different conditions around your property and place plants accordingly.
- **Take advantage of slope:** Water flows downhill, so slopes are generally drier at the top and wetter at the bottom. Put water-needy plants towards the lower end of a slope and drought-tolerant species at the top.
**Horticultural practices**

There are a range of horticultural and landscape maintenance practices that can help to reduce the amount of watering you need to do.

- **Use mulch:** Mulch decreases evaporation of soil moisture by insulating the soil to hold in moisture and reduce soil temperatures. Use approximately 2” of shredded bark, hardwood, leaf mulch, or wood chips. Keep mulch away from the stems of trees and shrubs and do not mulch over the tops of perennials as this encourages rot and disease.

- **Amend soils:** Add organic matter by topdressing or lightly tilling into your garden and lawn soils. Organic matter can help improve water retention capacity of the soil. Compost is a great soil amendment for this purpose and it is also a source of nutrients for your plants.

- **The “establishment phase”** (1st season after planting) is the most critical time for watering your plants. During this period plants are growing their roots and trying to adjust to their new environment. Until a robust root system is established plants should be kept from drying out. After the first year, established plants often only need supplemental watering in times of drought. Talk to your local nursery or garden center to get advice on how much a particular plant should be getting watered after planting.

- **“One inch rule”**: Established plants and lawns generally need at most 1” rain per week (some plants more, some much less). If 1” rain, no supplemental watering needed. Evaluate water needs by periodically using a rain gauge or container to measure how much water a particular area has received in a given week.

- **Avoid planting or seeding during the middle of summer** when soils tend to be dry and the sun is strong—you will have to do a lot of watering! Spring and fall are the best times for planting.
Summertime
Watering Tips

Watering practices
How we water can make a big impact on the quantity of water we use. There are various ways that we can adjust our watering practices in order to conserve.

- **Water deeply:** Water plants slowly at the base where water will go into the soil and be accessible to the roots. Deep, infrequent watering helps encourage a strong and robust root system. On the other hand, frequent, shallow watering results in weaker surface roots.
- **Don’t spray:** Spraying the foliage results in high evaporative loss and can encourage plant disease. Sprinklers should only be used for establishing new lawns.
- **Choose your time wisely:** Water during the early morning hours or later in the afternoon/evening when more water will be absorbed and held by the soil. A high percentage of water will be lost to evaporation if you water during the middle of the day when it is hot and sunny.
- **Ditch the hose:** If feasible, look for alternatives to watering with a hose. Most water sprayed with a hose or a sprinkler does not get to the intended plants and a high percentage evaporates before getting into the soil/root zone.
  - For small areas or few plants consider using a watering can.
  - For larger areas, consider drip irrigation or soaker hose systems.
  - A soaker hose is a semi-permeable material that leaks water slowly along entire length. They are good for short-term use like watering a new planting until plants are established. A downside is that you cannot control the amount of water emitted and the hose material has a short life span.
  - A drip irrigation system has emitters spaced at regular intervals that deliver a specific amount of water over time (e.g., 1 gallon per hour). Drip systems are good for areas with continual supplemental water needs, such as a vegetable garden. A downside to drip systems is that they are more complex and expensive to install.

Rainwater harvesting
Another way to conserve water in our landscapes is to use rainwater harvesting techniques to capture water during rain events to store for future use or allow it to infiltrate into the soil.

- **Consider a rain barrel:** A rain barrel is a medium or large plastic drum connected to a gutter downspout allowing it to collect and store water from rainfall. The barrel usually has a hose attached at the bottom so the stored water can be used for filling watering cans or watering gardens directly. In larger applications rainwater can be collected in underground cisterns and stored for later use.
- **Directed downspouts:** In addition to filling rain barrels, gutter downspouts can be useful for directing water to specific areas. Consider locating plants with high water needs in areas adjacent to where downspouts drain out or use grading and drainage to direct rainwater to more water intensive areas.
• **Swales and berms:** Swales are linear shallow depressions and berms earthen mounds. Both can be effective features in the landscape to capture and direct rainwater that flows over the land surface. Planting water-loving species at the bottom of a swale or use a berm to capture and infiltrate water that would otherwise flow off your property.

• **Build a rain garden:** Rain gardens are planting beds constructed in shallow depressions that capture and infiltrate rain water. Rain gardens can be a very interesting design element in the landscape and are great at helping with stormwater management. Plants in a rain garden should be adaptable and must be capable of dealing with inundation with water and prolonged drought.

Above all else, observe and study the characteristics of your property and educate yourself about plants. Monitor your garden and develop an understanding of the soil moisture levels in particular areas and the water necessity of different plants. Evaluate your landscape water usage and come up with a plan for how you can conserve.
For many people, an expansive green lawn is the quintessential component of their yard and landscape. Unfortunately, lush, green lawns need a lot of maintenance—fertilizing, mowing, aerating, dethatching, reseeding, and watering. One way we can reduce our environmental impact, including conserve large amounts water, is to change our philosophy around lawn and how we design and maintain our yards.

- **Reduce lawn area:** A smaller lawn area will use less water. Often, only a small portion of lawn area is used for practical purposes, the rest is just a way to fill space in our yards. Consider eliminating portions of lawn that are not frequently used. **Replace lawn area:** You can use space formerly reserved for lawn to create ecologically rich and visually appealing landscape features such as meadows, perennial gardens, and shrub thickets.

- **Mow less often:** Don’t worry if the grass gets a little long or untidy. Longer grass helps to keep out weeds and keeps soil from drying out too fast. Longer grass also has a deeper, more robust root system, which is better at accessing water in the soil. Keeping the lawn short with frequent mowing means you will be watering more to keep it green.

- **“Brown is the new green”:** Be ok with a brown lawn. By nature, the cool season grasses we use in the Northeast tend to turn brown and go dormant during the hot summer months. When there is more rainfall and temperatures cool down, the grass will green up again.

**Grass selection**

Lawns are usually made up of several different species and like plants, there is a wide variety of species to choose from and each has their own requirements and preferred growing conditions. When seeding a new lawn or reseeding an existing lawn, choose a seed mix that consists of hearty, drought-tolerant grass species that are adapted to the conditions of your region. Grasses that are better adapted to our weather patterns and soil types will require less water to stay healthy.

**Lawn care practices**

How we maintain our lawns can also have an impact on the health of the turf grass and how much water it will need.

- **Don’t bag it:** Mulch your clippings back into the lawn while you mow rather than bagging them and taking them away. Mulching the clippings helps to build lawn soils and improve water retention. There are special mulching mower blades available that help to cut the clippings into smaller pieces for this purpose.

- **Don’t scalp it:** Keep mower height at a minimum of 2.5 inches, but 3-4 inches is better if you can tolerate the longer appearance. Shorter grass dries out faster and has a tendency to “brown up.” By mowing taller, grasses develop stronger root systems and the roots and soil are shaded, drying out less quickly. Longer lawns stay greener longer and require less water.

- **Keep it sharp:** Dull mower blades have a tendency to tear at grass rather than cutting cleanly. Damaged grasses are more susceptible to disease and they can appear ragged and brown. Healthier grass requires less water and stays greener. Sharpen your mower blades frequently and replace them when they are worn down beyond repair.
Water Smart
Lawns

Watering practices
Obviously, one of the biggest ways we can be “water smart” about our lawns is to be mindful of our watering practices and make adjustments in order to conserve.

- **Know when to water:** Look for signs that the lawn is dry and needs watering. Patchy sections, footprints remaining long after they were made, lightening or browning of color are all indicators that more water is needed. If you suspect soil dryness, dig down a few inches with a small trowel or your finger to confirm.
- **Keep track of time:** Time of day can play a major role in how much water is lost to evaporation. Watering during the middle of the day when temperatures are higher and the sun is strong will result in a high percent of evaporative loss. Wet grass can also be more easily burned by the hot sun and is more susceptible to disease. On the other hand, watering in the early morning, evening, or even at night means that more water will get to its intended destination—the soil and root zone of the lawn.
- **Water infrequently and deeply:** Frequent watering encourages shallow roots, which can weaken the lawn. Watering deeply, but less often, encourages deeper root development and healthier lawns. Water slowly so that water does not puddle or run off—the water should be absorbed by the soil. Do not water when it is very hot, windy, or raining as this is simply a waste of water.
- **Adjust irrigation properly:** Make sure your sprinklers or automatic irrigation systems are watering efficiently. Check the run times and make sure your controller is set to the optimal time of day and duration. Adjust spray nozzles so that they do not spray onto walkways, driveways, structures, etc. Install and rain sensor or a moisture sensor so that the system does not run if it is raining or if there is adequate soil moisture.

Turf soil health
Healthy soils make for healthy lawns. By taking steps to care for it, your grass will stay greener with less water.

- **Keep it loose:** Avoid compacting turf soils with heavy foot traffic, equipment, or automobiles. Compacted soil has less water infiltration and reduced retention capacity. Aerate your lawn every couple years to help break up compaction and increase the amount of water that can be absorbed by the soil. Aeration also allows air and water to more easily reach the root zone of turf grasses.
- **Go organic:** Periodically add organic matter to your soil by topdressing with compost or other suitable material. Adding organic matter helps to beef up soils and improve water retention capacity, plus it provides nutrients to the grass and helps keep it strong and healthy.
- **If fertilizer is necessary:** Use only phosphorus-free natural fertilizers and apply only in the spring and fall. What we put on our lawns gets into our environment and lawn chemicals are a major source of pollution. Healthy, well-designed landscapes should require little to no fertilizers or pesticides.

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Water Smart Landscaping Resources

**Government**

**Massachusetts Department of Agricultural Resources**
Water Use and Water Conservation webpage
https://www.mass.gov/service-details/water-use-and-water-conservation

**Massachusetts Department of Environmental Protection**
Lawns and Landscapes in Your Watershed
https://www.mass.gov/guides/lawns-and-landscapes-in-your-watershed

**Massachusetts Executive Office of Energy and Environmental Affairs**
More Than Just A Yard- Ecological Landscaping Tools for Massachusetts Homeowners

**Massachusetts Water Resource Authority**
Garden and Landscaping Water Conservation Tips
http://www.mwra.state.ma.us/04water/html/gardening.htm

**Massachusetts Water Resource Commission**
Guide to Lawn and Landscape Water Conservation

**US Environmental Protection Agency**
Water-Smart Landscapes

**US Environmental Protection Agency**
WaterSense program- Outdoors
https://www.epa.gov/watersense/outdoors

**Non-Profit**

**Greenscapes**
http://greenscapes.org/

**Native Plant Trust**
http://www.nativeplanttrust.org/

**Plant Something MA**
Water Smart Landscaping
https://www.plantsomethingma.org/articles/water-smart-landscaping/
Water Smart Landscaping Resources

Tower Hill Botanic Garden
https://www.towerhillbg.org/

University of Massachusetts Extension
Efficient Outdoor Watering
https://ag.umass.edu/landscape/fact-sheets/efficient-outdoor-watering

Industry/Professional

Ecological Landscape Alliance
https://www.ecolandscaping.org/
  Find an eco-pro
  https://www.ecolandscaping.org/member-directory/

Massachusetts Association of Landscape Professionals
https://mlp-mclp.org/
  Member directory
  https://mlp-mclp.org/directory.php

Massachusetts Nursery and Landscape Association
https://www.mnla.com/
  Member directory
  https://www.mnla.com/search/custom.asp?id=2339

Massachusetts Horticultural Society
https://masshort.org/
  Help line
  https://masshort.org/mass-hort-helpline/

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