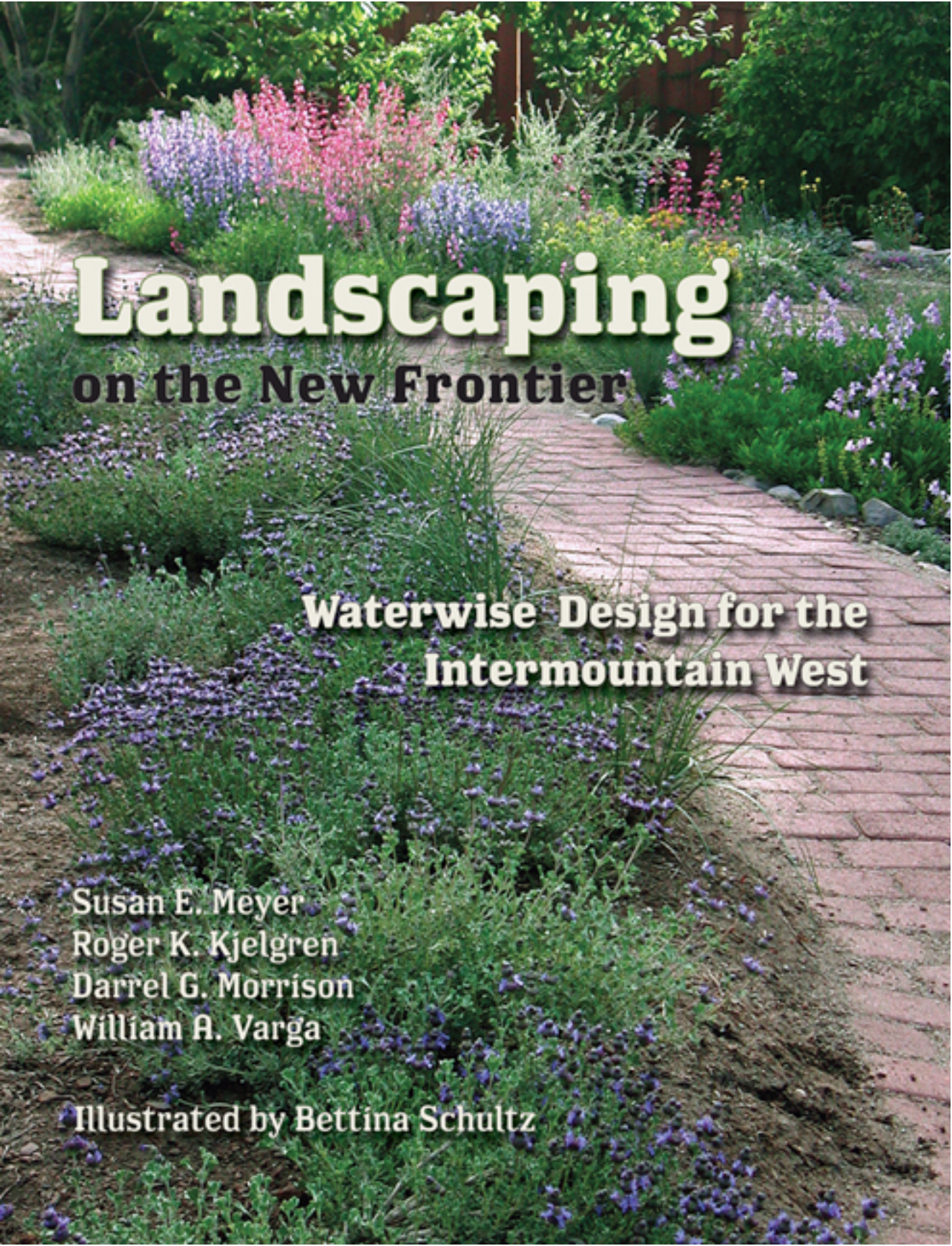




Landscaping

on the New Frontier

**Waterwise Design for the
Intermountain West**

Susan E. Meyer
Roger K. Kjelgren
Darrel G. Morrison
William A. Varga

Illustrated by Bettina Schultz

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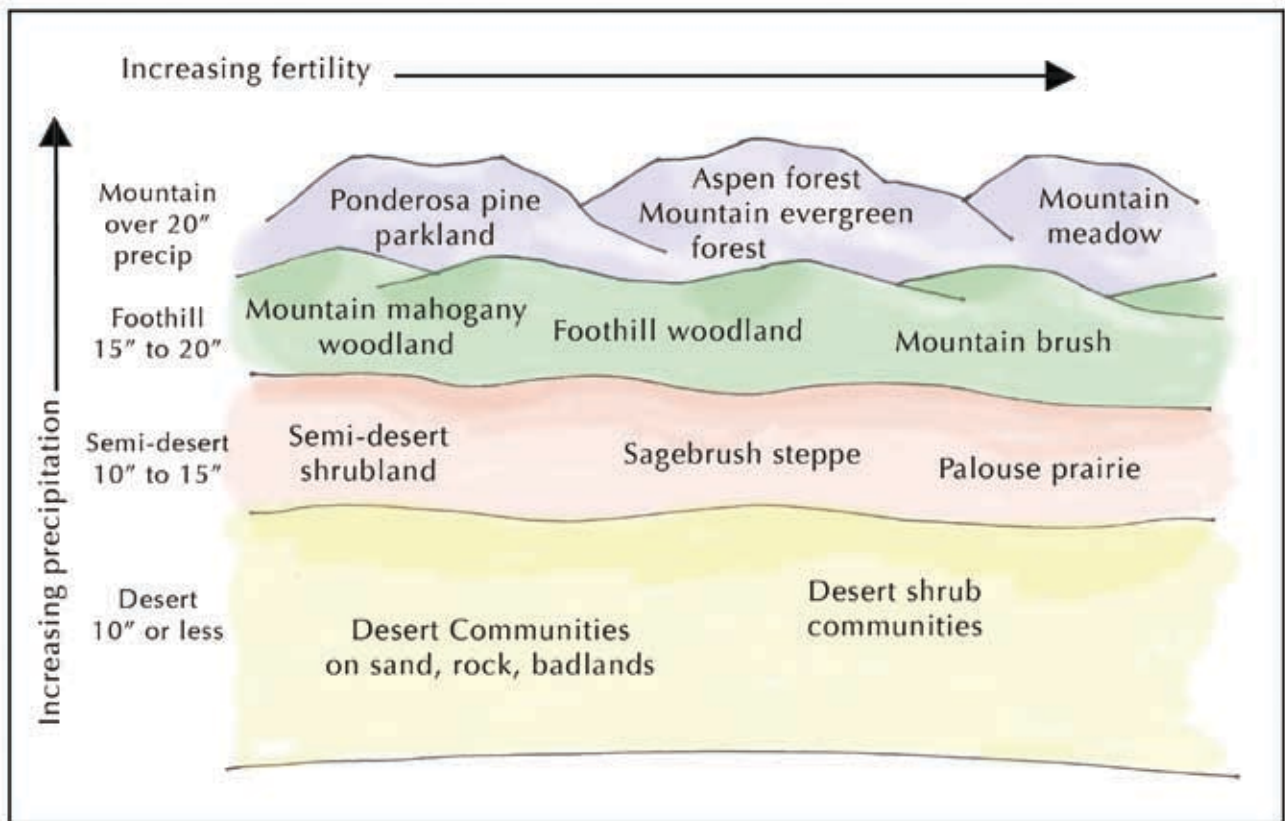


Native Landscapes of the Intermountain West

Chapter One

To design beautiful and functional native landscapes, the first step is to learn to look at landscapes in nature and to begin to understand why they look the way they do. Even intuitively obvious truths about intermountain landscapes need to be given some thought. For example, all westerners know that, to escape the heat of summer, a picnic in the mountains is generally a good approach. In the winter, we know that we can head for the desert to escape from the snow. Plants respond to these climate differences at least as much as people do. The native plant communities in high mountain valleys are completely different from the plant communities in the desert country, where people often go to seek winter sunshine.

As you drive up into the mountains from towns nestled in the valleys at their feet, first the low sagebrush steppe vegetation gives way to foothill communities characterized by small trees like gambel oak and bigtooth maple, or to a pygmy evergreen forest made up of juniper and pinyon pine. Further up, patches of quaking aspen and white fir or lodgepole pine start to appear, interspersed with meadow communities of grasses, low shrubs, and an abundance of wildflowers. If you are driving up a canyon with a year-round stream, you will see the difference right away between the streamside vegetation, which is very green and lush, and the hillsides above, which support shrubs and grasses found in much drier environments. Often, arriving in the aspen/white-fir or lodgepole pine zone is enough to relieve the heat of summer, but if the road continues to wind upward, it will pass through evergreen forests of sub-alpine species of spruce and fir, until at last it reaches timberline and breaks out into alpine tundra, the dwarf community that lives on the high, windswept ridges that are too harsh to support trees.



Schematic diagram showing how plant communities in the Intermountain West are distributed relative to the gradient of increasing precipitation associated with increase in elevation, shown on the vertical axis, and relative to the fertility gradient associated with soils, shown on the horizontal axis. Precipitation ranges for the four water zones are shown on the left.

Each of these plant communities represents a response to a set of environmental conditions that define the habitat for the species that occur in that community. By understanding how plants interact with environmental conditions in nature, you will begin to see how you might create designed landscapes that capture the essence of these natural landscapes. You can use suites of species with complementary needs as well as complementary aesthetic features, and group them into patterns that reflect the natural patterns you have observed.

A hallmark of the Intermountain West is its great variability in terms of climate, topography, and geology. The basic theme is that of a generally semi-arid region with cold winters and dry summers, but there are a multitude of variations upon this theme. Majestic mountain ranges rise up like islands out of the Great Basin desert lowlands, while mighty rivers dissect immense canyons into the giant staircase of high mesas on the Colorado Plateau, and the massive spine of the Sierra-Cascade axis creates rain shadow effects far to the east. All this topographic diversity creates an incredible array of growing conditions for plants, and a corresponding diversity in plant communities.

As mentioned above, the most basic climatic trend in the region is related to elevation. Dry environments with hot summers in the desert valleys give way to successively cooler and moister conditions as you travel up into the mountains. Superimposed on this basic pattern are microclimate variations created by differences in slope and exposure. A close look at a west-facing range like the Wasatch Mountains will reveal the great importance of exposure in our region. At higher elevations, the north-facing exposure can be cloaked in white fir and aspen, while the south-facing exposure supports a mountain brush community usually found on warmer, drier sites.

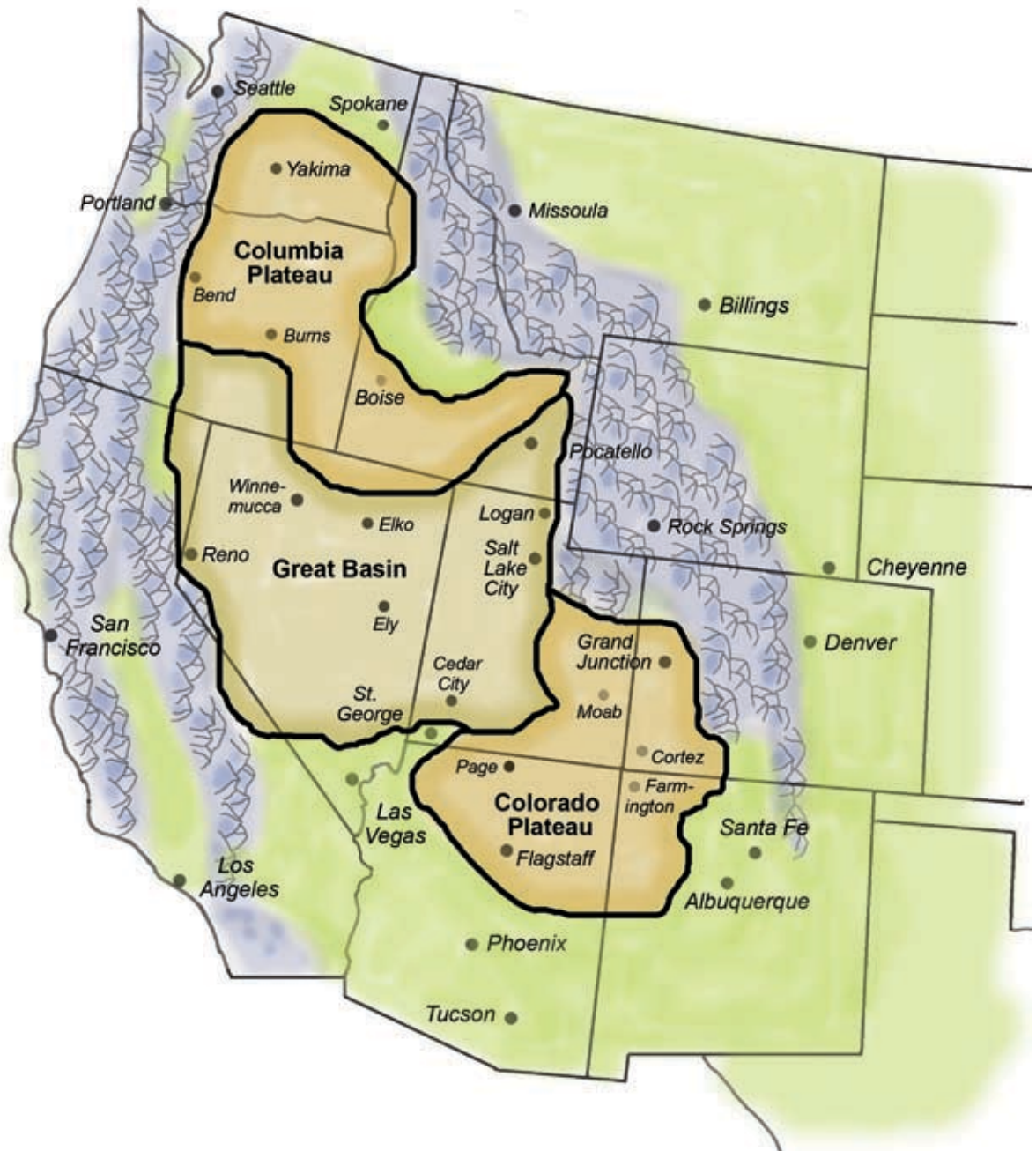
Look lower down on the mountain, and you will see that the mountain brush community occupies the north-facing slopes, while the south-facing slopes support the characteristic low shrubs and bunchgrasses of the sagebrush steppe community. Each plant community occurs under a characteristic climatic regime, but that regime is the result of the interplay of a number of factors, such as latitude, elevation, exposure, and slope.

Light is another factor that has a major impact on plant communities. In fact, the differences caused by exposure are largely due to differences in the duration and intensity of sunlight. Northern exposures are shaded for longer periods than southern exposures, especially during spring and fall, at least in the Northern Hemisphere. Topographic relief can have an even more dramatic effect on light in places where vertical cliffs and deep canyons are part of the landscape. In a canyon bottom, the ground surface may be shaded for most of the day, and the plants that grow there, while enjoying moderated temperatures and better moisture, must be able to tolerate low light intensity. Rock outcrops in the desert can have a similar effect. Lastly, the plants themselves can change the light environment for associated species. For example, the shade under the closed canopy of an evergreen mountain forest is so dense that only a few species are shade tolerant enough to grow there, whereas the dappled shade created by an aspen forest supports a very diverse suite of understory species.

Over a region as vast as the Intermountain West, latitude has a major impact on climate, particularly temperature. At a given elevation in the southern part of the region, temperatures will generally be much warmer than those at that same elevation in the northern part. For example, St. George, Utah, and Boise, Idaho, have similar elevations, but St. George is in the Mojave Desert, which has relatively warm winters and very hot summers, while Boise, five hundred



White fir forest cloaks the north slope in a side canyon at Zion National Park, while the south slope supports a drought-hardy mountain brush community.



The Intermountain West, showing major geological regions (Columbia Plateau, Great Basin, and Colorado Plateau) and population centers in and around the area.

miles farther north, has much colder winters and cooler summers. The elevation at timberline is also much lower at more northerly latitudes than it is in the south, so plant communities are shifted downward in elevation as one goes farther north. This makes it hard to predict climate in a particular place just from a knowledge of its elevation, but the trend for cooler, moister environments at higher elevations can be seen throughout the region.

Climate information for some cities around the Intermountain West. *Locations are color-coded according to their water zone: yellow-minimal water, peach-low water, green-medium water, lavender-high water.*

		Mean Annual Precipitation (inches)	Mean Summer Precip	% Precip in Summer (Jun Jul Aug)	Mean Jan Min Temp (F)	Mean July Max Temp (F)
Spokane	WA	16.1	2.4	15%	22	84
Yakima	WA	8.2	1.2	15%	21	88
Walla Walla	WA	16.6	2.1	13%	28	88
Bend	OR	11.6	1.9	16%	22	82
Burns	OR	10.8	1.5	14%	15	86
Boise	ID	11.7	1.4	12%	22	91
Pocatello	ID	11.5	2.2	19%	15	88
Elko	NV	9.6	1.6	17%	11	91
Ely	NV	9.6	2.1	22%	10	87
Reno	NV	7.3	0.9	12%	21	91
Winnemucca	NV	8.3	1.1	13%	17	92
Cedar City	UT	10.6	2.6	25%	17	90
Logan	UT	17.7	2.7	15%	16	87
Moab	UT	9.0	2.1	23%	18	98
Salt Lake City	UT	15.6	2.4	15%	20	93
Cortez	CO	13.0	3.2	25%	13	89
Grand Junction	CO	8.9	2.1	24%	18	93
Flagstaff	AZ	21.2	5.9	28%	16	82
Page	AZ	6.5	1.4	22%	26	97
Albuquerque	NM	8.8	3.5	40%	23	92
Farmington	NM	8.2	2.4	29%	17	92
Santa Fe	NM	13.8	5.4	39%	18	86



Silver buckwheat

How to Design Native Landscapes

Chapter Two

Now that you have completed your tour of native landscapes, imagine some possibilities for taking a new approach to designing landscapes in the Intermountain West. What might be some characteristics of these landscapes? First, they would be experientially rich. Their spatial character would incorporate a sense of mystery or intrigue, making us want to explore them further. The forms, colors and textures of the plants would be harmonious, just as the forms, colors, and textures of plants growing together in the natural landscapes of the Intermountain West exhibit harmony.

Second, these designed landscapes would be ecologically sound. Plants would be matched both to the regional environment and to the microhabitats in which they are placed. Because of this matching, the need for supplemental water would be reduced. And because there would be few, if any, areas of mowed turf, there would be little need to use fossil fuels to mow them. These landscapes would not include invasive introduced species that have the capacity to escape into the native landscape and reduce the natural diversity there.

Third, these landscapes would be “of the place”. The character of the designed landscapes would draw on the rich menu of regionally distinct landscapes. These designed landscapes may or may not be naturalistic in form. They may very well be artistic distillations of native plant communities of the Intermountain West. But because they draw on the plant species and patterns of the region, they would speak unmistakably of the place.

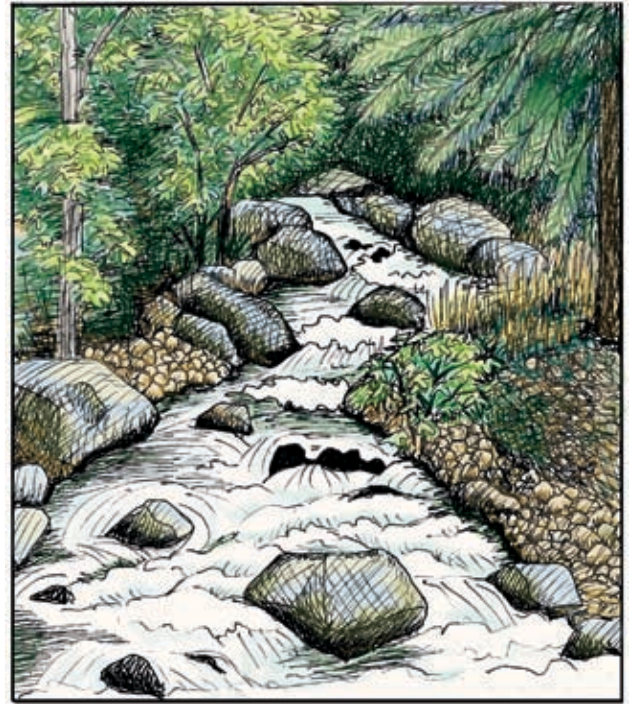
Finally, these landscapes would be dynamic, changing over time. They would exhibit the rich change in color through the seasons that we see in the natural landscapes of the Intermountain West. And there would be other, longer-range

changes as well, such as those resulting from the reproduction and spread of some species, or the phasing out of some species and the phasing in of others as the amount of shade increases under expanding tree canopies. Hence, there would be new things to discover in the landscape over the years. A whole new concept of landscape management would apply: one that is not oriented toward “freezing” the landscape in time, but instead guides the direction and rate of change.

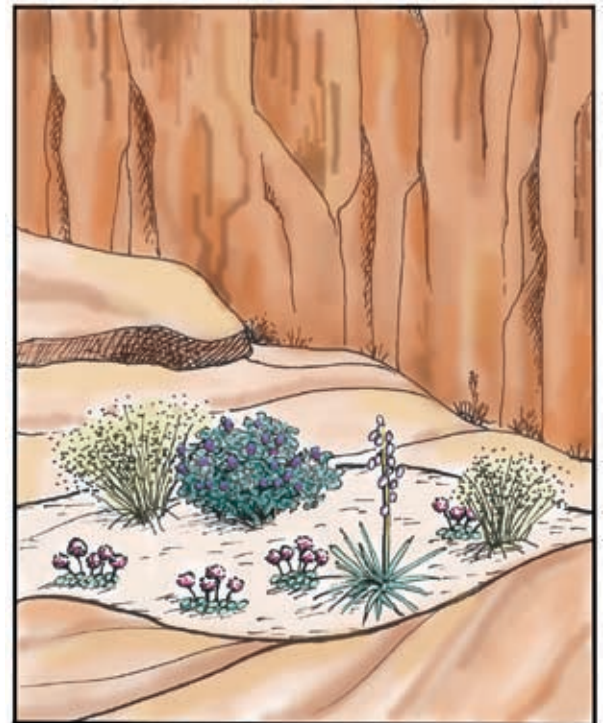
Getting Started on Design

How do you go about designing landscapes that would have these characteristics? What do you need to know? What are the logical steps you might go through? One starting point, certainly, would be to familiarize yourself with the distinctive aesthetic characteristics of the natural landscapes in a variety of habitats in the Intermountain West. In the end, you will not necessarily be copying them in design, but trying to capture their essence. Two environmental psychologists in the School of Natural Resources at the University of Michigan, Drs. Steve and Rachel Kaplan, have identified four characteristics that occur frequently in natural landscapes, ones to which people seem to have a positive response. These are: *mystery*, *complexity*, *coherence*, and *legibility*. We will discuss how these features are exhibited in western landscapes, and we will also characterize the prevalent lines, forms, colors, textures, and patterns in representative intermountain habitats. These could provide a vocabulary for designing landscapes on sites with particular sets of environmental characteristics.

Mystery is the quality of having part of the landscape concealed, thus leaving more to be discovered. A meandering stream typically provides the element of mystery as it bends out of sight beyond peninsulas of rocks or vegetation. Similarly, open, riverlike spaces—some broad and some narrow—can occur on dry land, where clumps of trees or shrubs partially block the view. Mystery is also



Mystery: What’s around the bend?



Complexity: The varied shapes and textures of the plants in this desert sand garden are set off by the bare rock around them.



Coherence: In nature, individuals of each plant species cluster in the areas best suited for them.



Legibility: You can see how to get into the meadow by going through the "doorway" between the trees.

found in layers of one mountain range behind another, then behind another, luring your eyes forward until they faded into the distance.

Complexity implies the qualities of diversity and intricacy in line, form, color and texture. In the natural landscape, this property is manifested by a diversity of plant species. It is not uncommon in nature to find at least six or eight plant species growing together within a square yard, and in the mountain meadows of high elevations, this number may be doubled or tripled. This leads to the possibility of always having more to discover as well, and a diversity of flowering at different times. Contrast this with the monocultures we have come to expect in designed-and-managed landscapes, as in lawns and single-species ground cover plantings.

Coherence is reflected in the fact that the complexity in natural landscapes is balanced by a logical order in the distribution of species diversity. There is patterning, with individuals of a particular species showing various degrees of aggregation, or gathering together, based both on the way plants reproduce and interact and on minor differences in soils, moisture, or light. Pattern is perhaps most obvious in open landscapes such as marshes and salt flats, where vegetation is clearly grouped according to minor differences in water depth or salinity.

Legibility refers to our being able to read how we can move through the landscape, and thus is related to its spatial configuration. Again, rivers or river-like spaces, which are visual pathways through the landscape, provide legibility. The most basic form of legibility is space, and in the Intermountain West, there is space in abundance, both on a landscape scale and on the scale of individual plants.

As mentioned earlier, a central source of inspiration for designing landscapes that have a distinctive Intermountain West aesthetic is the natural landscape of the region, and the plant communities that occupy different portions of the landscape. These may be sharply separated or, more often, grade or feather gradually from one to another. In observing such communities, we will be looking for the ecological and aesthetic characteristics that can be translated into designs for landscapes that capture their essential qualities.

Utah ladyfinger milkvetch



Native Landscape Pioneers Tell Their Stories

Return of the Natives

Phil and Judy Allen, Orem, Utah—*Semi-desert Zone*

Personally, my choice to “go native” was as much about reconnecting with favorite childhood plants and memories as it was about art or philosophical ponderings related to environmental stewardship. Still, ripping out what remained of our front lawn in 2004 felt strangely awkward. (Every other front yard on our street had copious quantities of Kentucky bluegrass, and my PhD in horticulture focused on high-maintenance turfgrasses). That said, the journey from a solid carpet of lawn to the creation of a Wasatch Front canyon landscape has been worth it in every way.

We purchased our brick rambler in 1992. At that time, the completely flat landscape was dominated by lawn that reached from the house to all property lines. The trees included exactly one of each of the following, growing as “lollipops” in the grass: Norway maple, sycamore maple, quaking aspen, flowering plum, cherry, apple, and Douglas fir. The only shrubs in the yard included four dwarf Alberta spruces (located in the front yard at the corners of the house and sides of the porch), a single lilac, and a row of pfitzer junipers along the fence in the back yard. We immediately removed the flowering plum, which was located in the center of the back lawn and conflicted with soccer.

It took just over one year to complete the initial design for our yard. The idea was to use a combination of favorite Utah and Minnesota plants—Utah where

Chapter 6



we were raised and Minnesota where I had attended graduate school. The design included large beds for trees, shrubs, and perennials. This, we felt, would allow plenty of room for the plants to grow without seriously competing with the lawn. In the front yard, planting beds were located both near the house and as a curvy island in the center of the yard. The entire perimeter of the back yard was converted to curvilinear beds, while the center of the yard was kept open for recreational lawn use.

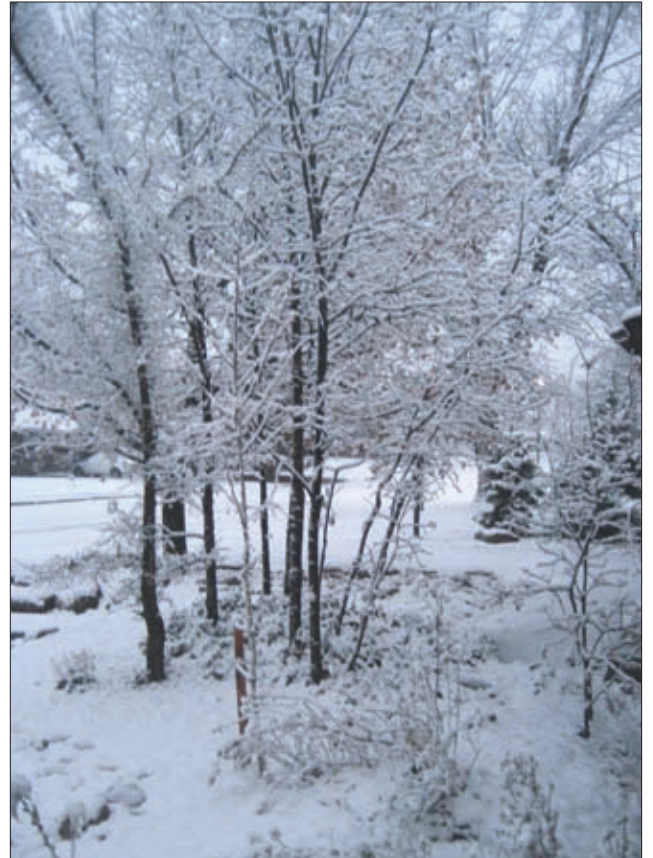
I then designed and installed a sprinkler system to keep the grass happy. It was actually quite impressive to watch my well-designed system at work, efficiently watering the lawn while virtually eliminating runoff onto the sidewalk and driveway. And the new back-yard sprinklers no longer watered the cedar fencing. Over time, the arcs of hard water deposits gradually faded from the fence slats.

Functional design considerations for our yard called for a number of deciduous trees to shade the house during the summer, while allowing sunshine to warm the bricks and siding during the winter months. We accomplished this by choosing relatively small trees to use near the house (bigtooth maple, Gambel oak, staghorn sumac, and water birch) and large trees for farther away (bur oak and a *temporary* Norway maple). We achieved aesthetic appeal in three ways. First, we repeated native plant clusters in multiple locations. Second, we added white fir to the clusters in order to create strong winter interest and provide balance and contrast to the deciduous trees. Shrubs and perennials, generally planted in groups of three or five, were added to fill in the gaps while the trees grew, as well as for additional variety. The ground cover we used beneath tree clusters was creeping Oregon grape, which has attractive yellow flowers in the spring and reddish leaves in the winter.

Unfortunately, the two native trees (Douglas fir and quaking aspen) had been planted directly beneath overhead utility lines, so they were cut down within a few years. But the Douglas fir made a fine Christmas tree (at least the top six feet!), as did each of the dwarf Alberta spruces. Today, only three of the original trees remain. The two fruit trees located in the corner of the back yard were kept as much for the shade to my kids' play area as for the fruit. Also, the Norway maple has been granted a temporary stay of execution because we need the shade until our new forest can replace this vital function.

As previously mentioned, the original design included several intermountain natives. Gambel oak and bigtooth maple were obtained from a friend as six-inch seedlings. Later, additional oaks were added as acorns. White fir and Douglas fir were purchased as tubelings, and western water birch and netleaf hackberry were purchased in one-gallon containers. Big sagebrush, fernbush, oakleaf sumac, curleaf mountain mahogany, green Mormon tea, Rocky Mountain maple, basin wildrye, and western mountain ash were either purchased as seedlings or donated by friends from the Utah Native Plant Society. The Oregon grape starts were dug up on nearby Forest Service property, under a special removal permit obtained during a road-widening project.

We generally plant trees in early spring or autumn. Our soil is nearly filled with rocks, ranging from the size of your fist to that of a football. But my trees obviously love it! In contrast with numerous written and verbal claims that native



intermountain trees are inherently slow growing, my experience has been that they grow as quickly as many nearby non-native plants installed at around the same time. For example, oak seedlings planted in 1995 are approaching fifteen feet in height just twelve years later. The water birch and bigtooth maple are even taller, and one limb of the hackberry shot up to twenty feet before I pruned it. My personal view is that our native trees perform best when they have a large root system, especially at an early age. I once dug up a Gambel oak seedling to discover that, at the four-leaf stage (less than three inches in height) the taproot was already more than a foot deep! Nursery production practices are just beginning to incorporate an awareness that native plants from semi-arid habitats benefit from much larger root volumes than traditional containers allow. Because all our trees were planted at a small size, the problem of trying to transplant a tree with insufficient root volume was avoided.

In the front yard, the trees and lawn tolerated each other fairly well, at least for a few years. Eventually, tree roots reached the edges of the driveway and sidewalk, turning to run parallel to the concrete. It became increasingly difficult to apply enough water to keep the grass green next to the concrete, and I began to tire of the need to overwater most of the lawn in order to keep the one foot next to the concrete happy. But what was the alternative?

On my 40th birthday, my wife and I climbed a large talus slope in nearby Rock Canyon. I noticed that where the forest and talus met, rocks dominated the soil surface beneath the trees for several feet. Additional forays into the steeply sloped, tree-covered canyon faces confirmed that the forest floor on many sloped areas is indeed covered with rocks. So the idea for an alternative to lawn was born. Additional benefits were that weeds would virtually be eliminated, and in this context, at least, the rocks were aesthetically appealing. We obtained a permit from the Bureau of Land Management to harvest two tons of rock from a talus slope located twenty-five miles from our home. The last mile to the rock pile was on a marginal dirt road that might have deterred us, were it not for the fact that we had already severed the lawn sprinkler pipes in a few locations. We eventually purchased a total of three permits and hauled eight pickup and trailer loads of rock back to the yard. To contrast with the ground cover of rocks, we purchased yellowish river stones for the dry stream bed that now meanders through the forest. And the walking path that connects our front sidewalk to the porch was built by recycling sandstone from our living room fireplace, which was removed during a remodeling project.

As with other journeys into the unknown, we have learned a great deal from our landscaping experience. If we were starting over today, we would have passed on the bur oak. Gambel oaks are just as lovely and can be coaxed to grow quite tall through close spacing—you then thin some trunks as they mature. We

planted a few clusters of ginkgo around the front yard as a substitute for quaking aspen, and in retrospect I wonder if aspen wouldn't have worked just as well. A healthy forest often includes trees of various ages, and we regularly remove trees that are growing too tall for the scale of our home. Each year we cut down a fir tree for Christmas. We spread a few new acorns and bigtooth maple seeds around the yard each year, and we plant new fir seedlings every few years as well, so there is a continual supply of new seedlings for the future forest. We could easily renew the quaking aspen by eliminating trunks as they become diseased or outgrow the yard.



After killing the lawn, we should have removed all the dead sod wherever we were going to plant native perennials. The high organic matter that was left over led to fertility levels that are too high for penstemons and gilia, and even the sagebrush appears too lush and needs pruning to keep it from lodging (flopping down).

While we purchased components for a drip irrigation system and have much of it plumbed already, we have never felt the need to actually finish and operate it. French drains originate wherever downspouts come down from the roof and lead to key tree clusters. While shoveling snow in the winter, I toss it onto areas where more water might be needed. In the summer, we water plants by dragging a hose a couple of times each year. We have learned, however, that watering the wildflowers occasionally (every few weeks when in flower) can significantly extend the blooming season. Some years we do, others we don't. However, we specifically selected plants for our yard that could survive for two or three months without being watered.

We initially worried that our unconventional landscape would offend the neighbors. But the same views we enjoy from every window of our house are enjoyed by the neighbors in reverse. And children who walk or ride their bicycles down the sidewalk feel compelled to enter the yard, to walk across the bridge that crosses the stream bed, to feel the rocks. As a boy, I loved to picnic with my family in wild places. In the canyons I climbed trees, threw pine cones, and gathered acorns and painted them with faces. In the deserts I chased rabbits through sagebrush and green Mormon tea, and even today the fragrance of these wonderful plants takes me to a place where I feel free and playful. On those days when I don't have time to actually go to a wild place, my yard works just fine.

Sharing a Patch of Sagebrush

Jan Nachlinger, South of Reno, Nevada—*Desert Zone*

Native plant landscaping at the western edge of the Great Basin is neither very difficult nor worthy of praise when much of our yard had not been significantly altered from the natural shrubland landscape. In 1990, I was thrilled when we stumbled on the mostly intact 1.25 acres in a rural area south of Reno—the house was nearing completion, and the local independent home builder had only disturbed the building and driveway footprint. The presence of an intact native plant community was among the chief reasons that we decided to buy the house, as I knew I was well on my way to having the kind of yard I wanted.

The property is at 5,500 feet in elevation, on a northeast-sloping alluvial fan adjacent to eastside foothills of the Sierra Nevada. The local shrubland is dominated by Wyoming big sagebrush and antelope bitterbrush, with desert peach, spineless horsebrush, and woolly mules-ears. In summer, spurred lupine, Anderson milkvetch, Bruneau mariposa lily, foothill deathcamas, tall woolly buckwheat, and dwarf purple monkeyflower adorn the shrubland. Yes, there is cheatgrass. It is a persistent problem requiring attentive weeding—especially in wetter years—but, at least it seems to have lessened its stronghold in the shrub interspaces, due to competition from perennial grasses (squirreltail and needlegrass) that I broadcast-seeded from a locally collected seed bank.

Planting trees was our initial priority, because we wanted shade and a vertical dimension added to the three- to five-foot-tall shrubland. I knew that the native trees I wanted would be slow growing, so I scoured a number of local nurseries for relatively large trees and had great fun on a rented bobcat digging holes for their planting. The soil is fertile though very rocky. I designed the tree layout to coincide, for the most part, with the larger ecological context of their natural distributions. That is, I planted eastside Sierran trees (Jeffrey pine, ponderosa pine, incense cedar, western white pine, and curlleaf mountain mahogany) on the west side of the property and Great Basin trees (singleleaf pinyon, Great Basin bristlecone pine, Rocky Mountain juniper, Rocky Mountain lodgepole pine, Engelmann spruce, and Rocky Mountain ponderosa pine) on the east side. For color among the Sierran trees I planted western mountain ash, western columbine, Sierra spirea, and firechalice as associates. Planted associates for the Great Basin trees and sagebrush included oakleaf sumac, creeping Oregon grape, Nevada buckwheat, Lewis flax, showy penstemon, and firecracker penstemon. In an effort to salute the Mojave Desert of southern Nevada, I planted Apache plume, Gambel oak, fernbush, and Bridges penstemon at the southwest corner near a Rocky Mountain ponderosa pine—a



virtual Spring Mountains landscape in miniature. We installed drip irrigation lines throughout to water the trees, as the site averages only eight or nine inches of precipitation annually.

We chose to plant an aspen “grove” in lieu of lawn and located it centrally in the south part, where there was a natural opening in the shrubs. It is in our view through the front south-facing windows. The grove is modeled after eastside Sierran stands, and in addition to several quaking aspens, it includes mountain alder, two Sierran lodgepole pines, and a volunteer arroyo willow which came in just a year or two after we started drip-watering the grove. Because willow seed is short lived, I imagine it drifted in from one of the nearby streams, where it is abundant. I purposely kept the middle of the grove open so that we could have a small shady respite on hot summer days, and it is one of the yard’s delights to lie or read among the aspen gently trembling in the breeze.

Most of the aspen are healthy and suckering; however, one died about five years ago, and two more have been losing vigor for several years. I may not be watering some of them adequately to reduce their summertime transpiration stress, but since I obtained them from several sources, some appear to be genetically better adapted to their artificial home in the sagebrush. As with most of the other native plants that I have added to the yard, if they don’t survive with my minimal caregiving, I move on to less finicky options. Lately, the grove has had a

Cooper's hawk occasionally perched in it, which makes me feel like it's a pretty successful imitation of a natural stand.

Early on I brought in many cubic yards of decomposed granite. It took quite a while to shovel it along the several pathways winding through the property to different interest points. But the effect is a nice and easy natural path, and it doesn't take very much time to pluck out the sagebrush and bitterbrush seedlings that inevitably germinate each year. What takes more time is the annual removal of dead woody material in the spring, especially in years of higher snow loads. We keep it picked up to reduce the fire hazard and to open microsites for shrub regeneration. Initially, we removed several prize bitterbrush that were located within the defensible open space surrounding the house. Now, however, a neighboring housing development, which completely scraped off the shrubland, is likely our most effective fire deterrent.

I made a winding dry creek bed connecting the aspen grove to a dry meadow located much closer to the house. At the aspen end of the dry creek bed I planted coyote willow, Woods rose, and western thimbleberry. The dry meadow is a drip-irrigated construct giving us a sense of verdant herbaceous space that transitions to the gray-green shrubs. To create the dry meadow, I collected seeds of favorite plants from nearby meadows. In addition, I also received many seeds from the Nevada Native Plant Society (then known as Northern Nevada Native Plant Society), which at that time organized seed collectors and seed cleaners and mailed out seed to members upon request, all for the price of postage. I simply broadcast-seeded and initially protected the area with chicken wire to keep out the cottontails and jackrabbits during establishment. Plants that have successfully established in the meadow include mountain goldenrod, meadow penstemon, sticky cinquefoil, nettleleaf horsemint, spiked sidalcea, Lewis monkeyflower, and Hooker evening primrose. I transplanted plugs of Douglas sedge from a trail along a nearby stream, and it has filled in the bottom part of the dry creek bed. But the most prolific meadow plant is the rhizomatous Nuttall sunflower—it is the glory of the yard in August, with its seven-foot-tall wands, and is the object of desire of sparrows and finches in the fall when in seed. I originally dug up several clumps of it from the garden of Margaret Williams (a founder of NNPS), and she told me to plant it where I wouldn't mind it taking over. Well, it has taken over the meadow, but its summer bouquets are worth it, and I manage it by digging it up at the margins to supply my friends' gardens.

The abundance of rocks onsite provided source material for low dry rock walls and a scattering of focal boulders. Now there are a number of showy natives growing near the rocks that were either planted from nursery stock or seeded. Early bloomers among these natives include yellow currant, wax currant, and little-leaf mountain mahogany, all of which attract many pollinators, especially native



solitary bees. I initially wanted some large rocks in the decomposed granite that were unadorned with flowers and rather zenlike; however, I reneged on my intentions after western columbine and cardinal monkeyflower self-established from their original placement and now attract hummingbirds for much of summer.

I planted several Jeffrey and ponderosa pines as individuals or in threesomes in the southeast, southwest, and northwest areas, for interest among the shrubs. Two Fremont cottonwoods and a black cottonwood grow on the north side of the property to provide shade and screening (from neighborhood houses) in summer and color in autumn. Two garden-grown western virgin's bowers are planted at the edge of the master bedroom deck. They annually create a 150-square-foot privacy screen—and that's with pruning. These plants were grown by Margaret Williams, and I am honored to have her plants on our property as a tribute to the best-known native plant garden enthusiast in the Reno–Sparks area in her time.

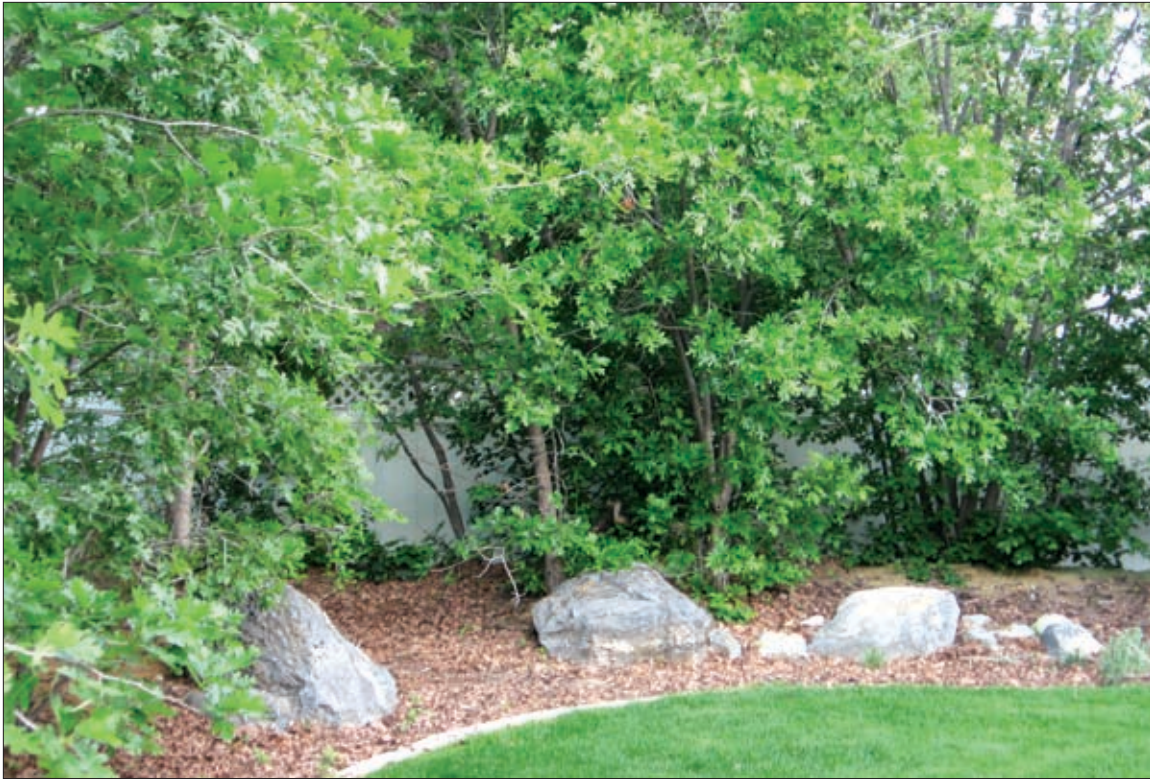
Accidental Journey into Native Plant Landscaping

Randall Nish, Provo, Utah—*Foothill Zone*

My accidental journey into native plant landscaping began as a boy. I spent countless hours wandering the rolling prairies of southern Alberta, Canada, and the then-vacant foothills east of Provo, Utah. My parents, Dale and Norene Nish, introduced me to landscaping as we attempted to tame a difficult plot of ground around our new home in the Indian Hills subdivision of Provo. We used red sandstone gathered (with permission) from private land east of Heber City, Utah, to create a sculpted rock garden around the yard. As a child, I found the subject of western animals and birds to be approachable and familiar. However, the subject of native plants was cloaked in a confusing array of common names and unintelligible Latin.

Deer hunting in Hobbie Creek Canyon, Utah, is an experience in close-quarters combat with plants. The steep terrain is covered with brush that tears at your clothing and scratches your skin. It was during one of these hunting trips in the early 1980s that it occurred to me that I could identify every mammal and bird in the area but could not name more than a couple of plants. I decided then that I could not claim to be an educated outdoorsman until I learned more about our native plants. I started a casual search for books about western plants in the gift shops of national park visitor centers and the local Utah State Extension Service. The books in the university and city libraries were useless to me because of their dense, technical language and the hated Latin words. The most helpful books were Ronald M. Lanner's *Trees of the Great Basin* and Hugh N. Mozingo's *Shrubs of the Great Basin*, along with a smattering of Utah State Extension Service booklets, including Sue Nordstrom's *Creating Landscapes for Wildlife*.

Two things happened that changed my casual interest in native plants to one of heightened urgency. First, our oldest daughter was born with cerebral palsy and would have only limited access to the natural world. Second, in 1989 we bought an empty lot in the Edgemont area of Provo, Utah, and decided to build a home. The idea was to bring the outdoors to our back yard, so our handicapped daughter could learn about her western heritage. The biggest obstacle was a lack of knowledge about the use of Utah native plants in residential landscapes. The resistance of our neighbors and my long-suffering bride to the then-unfamiliar topic of native plant landscaping was another problem. A compromise was reached where I could use native plants in the back and side yards while planting conventional Kentucky bluegrass and ornamental plants in the front yard. Our back yard became a decades-long living laboratory that continues to educate and fascinate.



Our home is located on the Provo Bench in northeast Provo, at an elevation of 4,770 feet. The property is 0.37 acres (1,497 m²) and was originally the site of a fruit orchard and, later, a cow pasture. The topsoil consists of four to six inches of Bingham loam. The subsoil reaches ten to twenty inches deep, followed by a deposit of coarse sand, gravel, and river rock presumably hundreds of feet thick. Soil drainage is such that one can pour a five-gallon bucket of water onto the soil and it will disappear in less than a minute.

The first step in the back and side yards was to reduce the amount of lawn by creating large planters around the perimeter of the lot. Once the borders were established, we decided to plant trees for privacy and native fruit crops that would attract birds but could also be eaten by humans in an emergency. We also wanted different watering zones for three distinct plant communities. We relied on publications from the Colorado and Utah State Extension Services and occasional field trips to the local canyons and foothills to plan our landscape.

A breakthrough came when I heard a lecture at the newly created Utah County chapter of the Utah Native Plant Society, where the researcher taught that western landscapes are dominated by groves of small trees rather than large, single specimens. After this, we began to plant a large grove of Gambel oaks, sprouted from acorns gathered from a single surviving grove located next to Centennial Middle School. It is important to harvest the acorns from groves



at the same elevation where you intend to plant. It took us two years to work out a method for sprouting Gambel oak. The acorns were gathered in August and kept in a plastic jar filled with moist potting soil. The container was left in the refrigerator until the following February. Each sprouting acorn was transferred to a small pot and kept next to a south-facing window until it could be safely planted in the yard the following spring. We tried planting a few bigtooth maple and netleaf hackberry seedlings among the small oaks to simulate native Gambel oak groves in the area. The hackberries thrived, but the bigtooth maples had a 50 percent mortality rate. Creeping Oregon grape was used as an understory plant, due to its symbiotic relationship with Gambel oak. Examples of this plant community can be seen along the Provo River trail in Provo Canyon.

The southwest corner of the house was reserved for heat-loving trees, such as curlleaf mountain mahogany and Utah juniper. Attempts to grow singleleaf pinyon pine have been a complete failure. The trees were bought from a local nursery. Shrubs included green Mormon tea, winterfat, and sand, black, and big sagebrush. Perennials we used included Greek yarrow, scarlet globemallow, pineleaf penstemon, scarlet bugler penstemon, Palmer penstemon and scarlet hedgenettle. Scarlet globemallow was sown directly into the ground, using seed taken from an area east of US Highway 89 and south of Springville, Utah. The land was going to be bulldozed, so we also dug as many sego lily bulbs as we could use.

Over the next two years the sego lilies all died out, but the globemallow began to grow and continues to thrive almost twenty years later. The penstemons and scarlet hedgenettle are incredible hummingbird attractors, but the hedgenettle must be planted in areas where it will get water at least once a week.

The southeast corner of the home was planned as a bigtooth maple grove. This area is shaded in the morning by a large honey locust tree in the neighbor's yard. Unfortunately, the bigtooth maples have failed to thrive. The planter is slowly being turned into another Gambel oak grove by the scrub jays, who stash acorns in the bark mulch. When the scrub jays plant an oak in a good spot, we let it grow. Unwanted seedlings are removed with a shovel.

The remainder of the yard is devoted to edible shrubs, such as currants, gooseberry, elderberry, chokecherry, and Saskatoon serviceberry. The currants and gooseberries are generally unkempt looking and are of little interest to the birds. We planted elderberries and chokecherries in spite of being discouraged from doing so by local gardening experts. The elderberries are beautiful and are moderately useful to the birds. They require heavy pruning and thinning each year to keep them attractive. The chokecherry and serviceberry bushes are the star performers in our landscape. They reliably produce heavy crops of berries and are hugely popular with the native birds; they seem especially important for fledgling robins. The shrubs have deep green foliage all summer, with good spring and fall color. The chokecherries tend to sucker, and they will grow over twenty-five feet tall if given good soil and some summer water.

The biggest surprise about our yard has been how much we have enjoyed the experience of the last eighteen years. We have been amazed by how our yard has become a magnet for native birds. The Gambel oak grove is now twenty feet tall and is the preferred habitat for hummingbirds, robins, California quail, scrub jays, and blackheaded grosbeaks. Curiously, the non-native birds, such as starlings, avoid our yard. Another important lesson has been that all of our gardening problems are related to water. In the native plant areas, we find that we have few weeds and no pests. Weeding takes about an hour a month of light work. It is the water-intensive parts of the yard such as the bluegrass lawn and vegetable garden that require the most money and time.

If we were doing it over again, we would start out with even less lawn, both because of its high water requirements and because today's children spend little time outside. We would also hire a landscape architect experienced in Utah native plant landscapes. This would have saved us time and money. But it would also have deprived us of the wonderful experience of trial and error. Prepare the best you can. Take your first, best shot at a natural landscape. Don't worry about making a mistake, because nature will teach you how to sort things out if you are willing to learn.

Tabula Rasa

Carl Dede and Angie Evenden, Boulder, Utah—*Semi-desert Zone*

In the mid-1990s, we bought twenty acres just outside of Boulder, Utah, with the vision of living there someday. The parcel, located at the edge of a valley at 6,300 feet elevation, supports a mosaic of Navajo sandstone slickrock and sand dunes, with native pinyon pine and juniper woodland. Most of the land was undisturbed and in good condition—however, four acres of deep sand along one edge of the property had been scraped clear of pinyon, juniper, and sagebrush a number of years before, presumably in preparation for a hay field that was never planted. This disturbed area, which included our eventual house site, was covered with annual weeds dominated by tumble mustard, tansy mustard, and Russian thistle, with only an occasional clump of native sand dropseed or Indian ricegrass. No sagebrush, pinyon, juniper, or other woody species remained on this portion of the property, although some beautiful old-growth trees grew along the edge. Being plant lovers, we saw the possibility of landscaping and restoring the disturbed area with native plants. Our vision was to broadly mimic the species and patterns of the naturally occurring native sagebrush and bunchgrass communities and to augment these with other suitable and attractive natives. We wanted to create a landscape that would be beautiful as well as drought resistant. In anticipation of our project, we began collecting seed of local native grasses, wildflowers, and shrubs and identifying other sources of plants for our project.

We built our house in the late 1990s, and that is when our restoration project began. After construction was completed in the fall, the house sat in the middle of three-quarters of an acre of completely empty sand, contoured and bare. Our first act of landscaping was to hand-drill in small caches of Indian ricegrass seeds, two inches deep, every eighteen inches or so, covering the entire bare area. That effort took four days on our hands and knees, sometimes in the rain. The damp conditions that fall and winter were perfect for producing the moist pre-chill needed for germination. The supply of our hand-collected grass seed was insufficient for a project of this size, so we augmented it by purchasing several pounds of Indian ricegrass seed from a local seed supplier. We were able to find seed collected within a hundred-mile radius of our property. However, it took three years before an abundant stand of ricegrass was established. We learned that as the delicate young blades emerged, they were promptly eaten by a hungry population of cottontail rabbits. Eventually we countered this by installing plastic vexar tubes (typically used to protect tree seedlings) over each small ricegrass clump and leaving them there until the plants gained sufficient

volume to outpace the rabbit consumption. Now, several years later, we have a self-perpetuating stand of ricegrass that does not need protection. That first winter, we also broadcast-seeded a variety of native grasses, wildflowers, and shrubs that we collected in the vicinity of our property. These seeds also took their time in germinating, and it would be a surprise each year to see what came up.

In the first spring after construction, we began the second phase of our landscaping project—starting with the installation of a drip irrigation system. During this phase we planted a number of shrubs and trees, mostly acquired in one-gallon containers from local Colorado Plateau native plant nurseries. Our approach for reestablishing sagebrush, however, was to transplant small plants from elsewhere on our property. For the next five years, each spring, and sometimes in the fall, we would plant dozens of shrubs and trees each season and hook them up to the drip irrigation system. We selected a combination of local natives that we knew would have occurred on the site, as well as other natives that would be well-adapted and attractive in our new landscape. Some of the shrubs that we planted are cliffrose, littleleaf and alderleaf mountain mahogany, oakleaf sumac, Apache plume, big sagebrush, sand sagebrush, sand penstemon, fourwing saltbush, rubber rabbitbrush, fernbush, roundleaf buffaloberry, Utah serviceberry, and green Mormon tea. The variable foliage color and texture of these species provide a lot of visual interest. We were also able to purchase larger pinyon pine, Utah juniper, and ponderosa pine (four to six feet tall) from a local nursery for fall planting, giving us a head start on tree structure on the site. Because we have access to irrigation water from nearby Boulder Mountain, we also opted to plant a few fast-growing Fremont cottonwoods. For spots of color, we planted the brilliant magenta flowered desert four o'clock; datura, with its large, night-blooming,





tubular white flowers; yucca; and a variety of penstemons. In a shady corner by the deck, we fenced rabbits out of a small area for a blue grama lawn, presided over by alcove columbine, echinacea, Hooker evening primrose, coral bells, and blanketflower.

Due to the proximity of an alfalfa field, large numbers of mule deer browse their way across our property at night. In addition, there were occasional visits from stray cows, llamas, and even elk. It quickly became evident that most new shrubs and trees required protection (at least at first, when they were small). We made four- and five-foot-high cages from welded wire obtained from the farm supply store, or field fence reclaimed from the local dump, to protect plants and trees from browsing, trampling, and rubbing damage. Each cage was anchored to the sand by eight-inch-long, U-shaped wire stakes. As the plants prospered and outgrew them, the cages could be moved to smaller plants. Some species, gaining

sufficient size, no longer needed protection from deer; these included sagebrush, rabbitbrush, roundleaf buffaloberry, sumac, and Apache plume.

With the deep, loose sand on our site, small plants needed frequent watering to become established. The drip system provided this crucial early moisture, and battery-operated timers made it automatic. Some area sprinkling was done to help establish the bunchgrass at first—although this practice also encouraged the weeds. As some plants grew up, their emitters could be removed. As the plants around the house took off, they reproduced prolifically (especially sagebrush), resulting in numerous seedlings available for outplanting. In this way, we quickly had our own nursery and were able to transplant these seedlings in other areas, as well as sharing plants and seeds with others in the community.

Dealing with weeds has been an integral part of our project. We quickly learned that the “bare” sand was not entirely barren, but was well stocked with a seed bank of undesirable weeds as well as desirable natives. From the start of our project, we aggressively weeded the restoration area around the house. Fortunately, the weeding task has diminished each year as the native perennials became established and spread. We were very pleased that several native wildflowers and grasses volunteered, adding significant color and beauty to our landscaping project. These species included sand dropseed, pale evening primrose, purple aster, sunflower, and hairy golden aster. The latter species is a favorite fall food of the lesser goldfinch.

We succeeded beyond our wildest dreams and were amazed at how quickly we were able to establish a flourishing and beautiful native landscape. The combination of sand substrate and ample water resulted in ideal growing conditions and unbelievably rapid growth for the native shrubs. Littleleaf mountain mahogany planted at ten inches tall, with a few stems, grew within five years to a size five feet in height and four feet in circumference. Fourwing saltbush achieved heights and diameters of six feet in each direction within the same timeframe. Similarly, almost all of the shrub species we planted shared these dramatic gains in size.

Our project continues to evolve as the years go by. We now find ourselves removing plants from the landscape area around the house to maintain more openness. Since this area now needs little attention, we have shifted our efforts to restoring the remaining disturbed acres by planting grasses and sagebrush. Creating our native landscape has been an extremely gratifying undertaking, and we enjoy its beauty each day. Our project has attracted the interest of many local community members who are interested in establishing similar native landscapes, and our site is regularly visited by people for ideas and inspiration.

Starting Small, Becoming Emboldened

Ann DeBolt and Roger Rosentreter, Boise, Idaho—*Semi-desert Zone*

In 1990, as relatively new homeowners who also happened to be agency botanists, we decided to embark on establishing a small native garden in a non-landscaped portion of our yard. When we purchased this first home in 1988, it became apparent that this portion of the property had been used for parking cars and had received little attention, in spite of the fact that it served as the entry area into the back yard and to the back door of the house. Consequently, the silty clay loam soil was compacted and occupied by weedy, non-native species such as prostrate knotweed (*Polygonum aviculare*), bur buttercup (*Ranunculus testiculatus*), spurge (*Euphorbia glyptosperma*), common mallow (*Malva neglecta*), and prostrate pigweed (*Amaranthus blitoides*). Because the area would continue to serve as an access corridor to the back portion of the house and yard, it was necessary to create pathways through it. And rather than rototill or churn up the entire 30 × 30 foot area and encourage additional weed seed germination, we decided to hand-pull the undesirable species in the spring, when the ground was moist, and plant around the edges of the area, leaving much of the middle open for walking. We used pea gravel as mulch for the unplanted areas and as our walking surface, because it was readily available, affordable, and would provide good drainage for our compacted site and the type of plants we wanted to grow.

Our project area was on the east side of the house and adjacent to the street. Unlike the rest of the yard, it had no automatic irrigation system. There was a silver maple to the north that did cast a small amount of shade onto a portion of the area for several hours of the day, but the site was generally open, hot, and sunny. It was the perfect place to start small with our native landscape, as this particular portion of the yard could only be improved.

At around this same time, Ann began coordinating a native plant sale for the Idaho Native Plant Society, and through the process of acquiring plants for the sale from native plant nurseries and the yards of fellow plant enthusiasts, we had access to a variety of species. While we wanted to emphasize native species in this garden, water conservation was also an objective, so we broadened our palette to include plants native to other regions of the country, in addition to several drought-tolerant cultivars.

Idaho natives:

Achillea millefolium (western yarrow)

Erigeron pumilus (shaggy fleabane)

Eriophyllum lanatum (Oregon sunshine, woolly sunflower)

Lewisia rediviva (bitterroot)



Linum lewisii (Lewis flax)

Opuntia polyacantha (Starvation prickly-pear cactus)

Penstemon deustus (hotrock penstemon)

Phlox hoodii (Hood phlox)

Salvia dorrii (desert sage)

Native to the United States but not to Idaho, or as otherwise indicated:

Echinacea purpurea (purple coneflower)

Festuca ovina 'Glaucua' (blue fescue; ornamental cultivar)

Penstemon eatonii (firecracker penstemon)

Phlox subulata (low-growing phlox; ornamental)

The area was planted in stages, as species were acquired over a year-long period. We did not amend the planting holes (as is often recommended), but assumed that the pea gravel mulch throughout the open areas would work its way into the soil to improve drainage as time passed. Once planted, maintenance of this site required little effort. We irrigated those plants that seemed to need it, or would flower longer if they received water, once a week by hand. This included purple coneflower, Lewis flax, and the ornamental phlox. Others were watered approximately every other week, though we tried to withhold water from the pricklypear cactus and from the bitterroot once it became dormant in the summer. Other regular but infrequent maintenance included the following:

1. hand-weeding undesirable species that germinated in the gravel mulch
2. cutting back the Lewis flax after it flowered in the spring, thus reducing the seed production and spread of this species and promoting reflowering
3. removal of leaf litter that blew or fell into the area, as leaf litter promotes rotting during the winter if left on top of plants

4. cutting back the purple coneflower and firecracker penstemon flower stalks in late winter/early spring

We used local rocks to protect and highlight our plantings, and the area flourished and provided color and texture for us and passing motorists and pedestrians throughout most of the year.

Emboldened by our first success at incorporating native plants into our landscape, we decided to take on other sections of the yard. Modifying our landscape in sections worked perfectly for us, as we were on a corner and had built-in breaks in the existing landscape, such as a driveway, a sidewalk, and a concrete walkway. Our side yard was the next phase, with a portion of the front yard as phase three.

Both the side and front yard had a Kentucky bluegrass lawn, with shrubs and trees restricted to the edges, and an existing irrigation system. While there were several options for removing the lawn—rent a sod cutter, suffocate the grass with cardboard or newspaper followed by mulch to allow it to die in place, apply glyphosate (Round-Up) herbicide—we chose to use Round-Up herbicide in early summer and to withhold irrigation, so that by fall the lawn would be dead and ready for planting. This approach worked well for us and eliminated all risk of damaging the irrigation system, which we wanted to leave in place and functional for us as well as future homeowners.

The side yard (phase two) measured approximately twenty feet wide by seventy-five feet long. Here is a list of some of the species planted directly into the dead sod.

Idaho natives:

Artemisia cana (silver sage)
Eriogonum heracleoides (Hercules buckwheat)
Eriogonum umbellatum (sulfurflower buckwheat)
Purshia tridentata (bitterbrush)
Townsendia florifer (dwarf aster)

Western United States natives:

Cercocarpus montanus (alderleaf mountain mahogany)
Datura sp. (sacred datura)
Penstemon palmeri (Palmer penstemon)
Penstemon pinifolius (pineleaf penstemon)

The plants came from a variety of sources, including native plant nurseries and as seedlings, from the yards of various other botanists. The area was mulched with large pine bark chips, which, once weathered, gave an appearance of rock mulch without the weightiness and permanence of rock. This area was irrigated by hand on an as-needed basis, which meant once every second or third week.



All the plants thrived except for pineleaf penstemon, which survived but would have flowered much more prolifically with weekly irrigation. Silver sage, which can spread by root sprouts, requires annual late-winter pruning to keep it from becoming too large and woody. Should it receive too much water, root sprouts can become a problem.

We chose to keep phase three—the 25 x 25 foot, north-facing front yard—simple, planting it to a ground cover of kinnikinnick (*Arctostaphylos uva-ursi*), with an intermittent scattering of non-native bulbs (crocus, hyacinth, miniature daffodils) for spring color. Kinnikinnick plants were placed at random with approximately two feet between them, knowing they would spread up to three feet wide, but that they would do so slowly. In the hot, dry, alkaline Treasure Valley where Boise is located, kinnikinnick grows best if it is given a moderated environment with partial shade or a north-facing aspect. It also requires twice-weekly irrigation in the heat of the summer, at least until the second year, when it is well established. This area was also mulched with pine bark, but mulch was kept away from the base of the plants to prevent rotting. This is generally required for most native plant species, particularly those with a herbaceous growth form.

We have since moved to a much larger property (1.8 acres) where we have planted a combination of traditional and native gardens. We continue to use many of the same species as listed above, but have become fond of a number of others for their ability to thrive and to beautify Treasure Valley landscapes: curleaf mountain mahogany (*Cercocarpus ledifolius*), prairie smoke (*Geum triflorum*), sticky geranium (*Geranium viscosissimum*), Indian ricegrass (*Achnatherum hymenoides*), fernbush (*Chamaebatiaria millefolium*), shrubby penstemon (*Penstemon fruticosus*), maple mallow (*Iliamna rivularis*), and Munro globe-mallow (*Sphaeralcea munroana*). All are commercially available and are lovely examples of what our native habitats have to offer to those who wish to have a little bit of nature in their own back yard.

Learning by Trial and Error, or Life Is Change

Roger Kjelgren, Logan, Utah—*Foothill Zone*

I actually started with native plants in Illinois, where intermountain plants would be exotic, and hardwood forests native. I found Illinois natives much more interesting than your standard, run-of-the-mill landscape plants. Moving to Utah sixteen years ago, I was a bit taken aback with the apparently limited selection of plants to choose from. Very few trees, lots of strange shrubs, and all these funny perennial species, including so many NYC's (damn yellow composites) that looked like mutant dandelions.

However, over time and with lots of hikes around the state, where I got up close and personal with the plants around the Intermountain West, my attitude changed. I began to appreciate how tough some of these plants are, growing out of rock with no water and no visible sources of fertility, how attractive so many are, and, particularly for low, slow-growing shrubs, how low-maintenance they are. The other, and more subtle, revelation was the sense of space that allowed me to see each plant as unique, something that is hard to do in the wetter parts of the country, where the native vegetation is usually a wall of green.

I also began to appreciate the diversity of color in the intermountain native perennials and the nice small size of many of the perennials and shrubs. Small size and tight growth meant less maintenance, which I really liked, because I'm not into recreational pruning. Finally, I began to realize that I really liked low-water-use landscaping, after dragging hoses to irrigate turf on our sloped front yard and watching the water run off onto the sidewalk. So, since life is change, it was time for a change to native plants.

I started with ripping out all bluegrass turf in my front yard, putting in rocks to maintain grade where the ground had sloped down next to the sidewalk. I then made two small patches of turf, in this case a warm-season, shortgrass prairie mixture of blue grama, sideoats grama, little bluestem, and buffalograss. The grass was surrounded by beds containing a mixture of non-native and native perennials and shrubs. I really learned what drought-intolerant indicator plants looked like, as I planted a lot of coneflowers that would wilt after several days without water, while all the other plants were fine. Right next to the coneflowers I planted cliffrose, which taught me about native plants that are intolerant of water, as it got the same frequent watering as the coneflowers, and died over a period of two years.

The biggest lesson from my willy-nilly mixture of natives and non-natives was the importance of space, a trademark feature of native plant landscapes. My landscape looked like a jumbled mess; without space between the plants, it was



impossible to make sense of the landscape. I knew something was amiss but couldn't put my finger on it, until I asked my wife if she liked our native plant landscape, and she said flat out, "No, it's a jumbled mess"—the first clue. So I pulled out all the plants that were even a little bit intolerant of drought, including the small prairie planting, because it was too small to look like anything other than an overgrown lawn.

To make the landscape more legible, I broke up the entire front yard with paths so no one bed was larger than about ten feet. Lo and behold, it worked, as my wife gave it her seal of semi-approval (the plants still looked a bit ragged, in her opinion), and I liked it better. I got rid of the smaller perennials and put in lots of penstemons (mostly *Penstemon strictus*, or Rocky Mountain penstemon), buckwheat, and evening primrose. I replaced the prairie with a native ground cover I was intrigued with, trailing daisy (*Erigeron flagellaris*), to see if it could be made to look like a lawn. I also set up an extensive drip irrigation system, using lots of spaghetti tubing where every plant had an emitter.

This new setup worked much better, in the sense that things didn't need much water, I had lots of color in the spring, and I had two marvelous lawns of trailing daisy that turned snow white for several weeks in May. However, this setup also started to fray around the edges after a few years. Putting drip emitters at each perennial proved to be totally impractical, as many of them, particularly



the penstemons, are short-lived if they are overwatered—where they died I was irrigating empty ground. I also discovered that a large number of native perennials needed to be cut back (dead-headed) in order to look good, which was a lot of work, in my estimation. Finally, the trailing daisy was a bit more complicated than I realized. It was dense enough to be fairly competitive against many weeds—but those it couldn't out-compete included many volunteer grasses from the former prairie and or some broadleaf weeds. Because both trailing daisy and the weeds are broadleaf perennials, there are no herbicides to control only the weeds. The only broadleaf weed to actually be a problem was field bindweed. A spot application of glyphosate and 2,4-D took care of that. I transplanted a few trailing daisy plants and watered them, and their phenomenal growth rate filled in the blank spot in a hurry. Another thing I learned about trailing daisy was that the runners can become so dense at the end of a season that they can shade out the leaves, so the plant cover thins out and lets in weeds.

While there is a bit more to learn about maintaining a trailing daisy lawn, it does appear that if I mow the runners in late summer, the leaves come out stronger the following spring.

After a few more years of pondering this arrangement, my current state of mind is to simplify my native landscape by going with one or two long-lived perennials that need minimal cutting back—such as pink smoke buckwheat (*Eriogonum racemosum*) and lacy buckwheatbrush (*E. corymbosum*)—and keep shrubs such as manzanita (*Arctostaphylos* hybrids), littleleaf mountain mahogany (*Cercocarpus intricatus*), and Utah holly (*Mahonia fremontii*). These are very drought-tolerant and need little or no supplemental water, require no pruning, and generally look good. We'll see what happens next.

Designing on the Native Plant Frontier

Bettina Schultz, Elk Ridge, Utah—*Foothill Zone*

Prologue

I garden with Susan Meyer on a one-acre property in Elk Ridge, Utah, a few miles south of Provo. When we moved into the house in 1989, the front yard was a wasteland of ratty lawn, on a north-facing slope in the foothill zone. There were some irises and a few trees and shrubs next to the house, a small pine tree in the northwest corner, and lots of whitetop in the grass. The lawn area closest to the house was the most fertile and got the most shade. Then there was a fairly steep slope down to another flattish area at the bottom of the yard. Our soil was full of clay, but since there were plenty of rocks in it and we were on a hill, there was no problem with drainage.

Over the next twelve years, we reduced the lawn area by clearing out the edges and planting shrubs, trees, bulbs, and mountain wildflowers, and installing a drip system to cut down on the area that needed to be sprinkled. I was the principal lawn-mowing person, and I quickly tired of hauling the noisy gas mower up the steep part of the lawn. So we took the grass out of the steepest part first, replacing it with some big stepping stones. Then we cut a big circle out of the center of the steep area and planted it with flowers. I built an informal rock retaining wall above and below the circle. Eventually we cut away most of the rest of the steep part, extending the retaining wall and planting penstemons along the top and bottom. By this time we had removed about half the grass.

Taking the Plunge

In 2002, we decided to finally go all the way and kill the bluegrass. By this time I had some experience designing Utah Heritage public demonstration gardens, but I discovered that letting go of our very own lawn was a scary prospect. I mulled over the idea for a long time before we actually did the deed. In fact, there were several ideas that played into the eventual design.

I was stuck on the notion that we needed something low and flat to replace the lawn. Somehow, ground covers didn't feel like the answer. Then one day I saw a little photo on the Internet, a small area, full of shrubs of varying heights, colors, and textures, with a walkway next to the planting. A light bulb went on in my head. While I still needed some low, flat areas to set off taller vegetation, I could use hardscape—walkways. That idea opened the door for the rest of the design process. The thing about lawn, after all, is that you can get to wherever you need to go in the yard by walking across the grass. So I started looking at the



yard in terms of destinations—where did my pathways need to go?

I measured the area and made a simple map of the existing features I knew we wanted to keep: the trees and shrubs around the edges, the circular bed, and the retaining wall with its penstemons. I made lots of copies of the base map, so I could scribble on one with abandon and always have another copy to try again. Then, by thinking about where we typically wanted to go in the yard (and actually walking around in it), I was able to plan the path system. The path system turned out to have another advantage: it broke up the vast area of the front yard into smaller chunks, which were easier to think about. I made the main paths wide enough to accommodate our garden cart, knowing that as the plants grow up, the paths will become less noticeable.

I started to think about what the yard would look like from two main vantage points: from the driveway, as you approached the house, and from the living room windows that looked out on the front yard.

When I thought about shrubs, I remembered something I had seen years before. We were driving through central Utah, and I looked off across a wide valley to the low hills beyond. The floor of the valley was covered with blue-green sagebrush, and as the land rose up the hillside, there were bands of different colors of vegetation—olive green, gray-green, pale gold, and the dark blackish green of distant junipers. The bands were fairly distinct, but the range of colors was subtle, and it gave me a feeling of peace. I decided to use this idea in the yard by making bands of different-colored shrubs. Since we already had a band of lavender and another of day lilies across the east side of the yard next to the driveway, I just repeated the bands, using shadscale, winterfat, spiny hopsage, lacy buckwheatbrush, green Mormon tea, and black sagebrush. Desert sage and Indian ricegrass filled the area between the main path and the existing bulb bed along the front walk, with another section going to low rabbitbrush and more Indian ricegrass.

Then there was the circle bed. I decided to put a spiral path through the circle and fill the area around it with the lowest-growing flowers. It was Susan's idea to substitute sand for our clay soil in the spiral planting area. She hauled many loads of dirt away, and many loads of sand in, to make that happen. The flowers in the spiral were planted in a random mixed pattern, like a wildflower



meadow. They have been extremely happy with the drainage and low fertility.

I put some of the larger flowering plants in the areas adjacent to the spiral bed, keeping them grouped together as blocks of color. There were a few accent plants at focal points in the design: an alkali sacaton grass “fountain” at the tail end of the shrub area, an Apache plume in the flower area just east of the spiral, and some blue grama grass among the flowers around the outside of the spiral bed. Since the view from the driveway is toward the west, the grasses look great when backlit by the afternoon sun.

In the shadier, more fertile, drip-irrigated area closer to the house, I put plants that could take more water: a bank of firechalice, a row of little bluestem grasses, and a special spot for “foreign” penstemons—not native to Utah, but gifts from various friends. We also added some shrubs and another row of firechalice in the drip irrigation zone around the edges of the yard.

An Ongoing Process

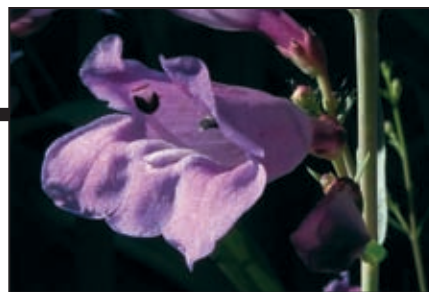
Our yard is an experiment in progress. Many of these plants had not been used before in a home landscape, in a foothill setting. Could the desert shrubs handle

the snow load? Which plants would be the winners and which the losers? What would the maintenance be like? We've been learning from the yard over the past several years since we planted it.

So far, the shrubs have not had any real trouble with the snow or the amount of precipitation in our zone. Spiny hopsage turned out to be a mistake. It loses its leaves by late summer, so we interplanted a stand of "pink smoke" buckwheat, which blooms when the hopsage goes dormant. We'll see how it works. The low rabbitbrush got too floppy in our soil, so we replaced it with a group of yellow-flowering lacy buckwheatbrush plants—that species has been very satisfying. Since we left the dead sod from the former lawn in place after killing it, some plants got surprisingly large because of the high fertility. We're hoping that this effect will diminish over time.

Some of the real winners have been little beebalm, silver buckwheat, showy sandwort, desert sage, fragrant evening primrose, and all the grasses. An unexpected bonus has been the fascinating array of pollinators that visit our flowers, from native bees to butterflies, moths, bee-flies, and hummingbirds. As for maintenance, it's been surprisingly easy. In the spring we get a carpet of seedlings around the shrubs. Weeding them out takes the two of us a few hours. We hand-water new plants through their first summer, and haven't watered at all since then, except for the little beebalm and the areas on drip. Watering with drip irrigation involves turning the faucet handle on about an eighth of an inch in the morning and closing it several hours later. As the shrubs grow up, they need a bit of pruning to keep them from getting gangly. In the spring, I whack the bunchgrasses back to a few inches high, to tidy them up and let the new growth show itself. I definitely don't miss the lawnmower.

The Plant Palette



Chapter Seven

This chapter contains the specific information you will need to choose the plants that will populate your native landscape. The species we have included in the Plant Palette were chosen from hundreds of native candidate species based on several criteria. First, the plant had to be attractive, if not astonishingly beautiful. This, of course, is somewhat a matter of opinion, and the list adopted here is the result of working and reworking by several knowledgeable people with different tastes. Second, the plant had to be relatively quick and easy to grow in container culture in a nursery setting. We avoided certain favorites, like sego lily, that have proven slow and difficult to produce. Work continues on many of these hard-to-grow plants, and the time may come when they will be commercially available. For now, we concentrated on plants that are either already available or could be brought on line quickly if warranted by demand. And lastly, the plant had to be at least somewhat tolerant of the abuses that are frequently encountered in residential landscapes. Too much water, too much mulch, too much fertility, and too much competition from other plants are some common forms of abuse. Not all of the plants we included are entirely foolproof in this regard, but, by using the information provided for each plant, you should be able to create favorable conditions in your landscape for even the more finicky species. We narrowed down the list of plants covered in the Plant Palette to one hundred species that we consider to be the core species for creating regionally distinctive landscapes in the Intermountain West. Many more species could have been included, and it is perfectly fine to use species not included in this book in your native plant landscapes. Just get the information you need to meet plant cultural requirements (water, soil, light, and cold hardiness) and make sure that the plants you select really are native to the intermountain area. “Native” is a somewhat slippery concept, in that plants can be native to a very restricted area, a state, a

region, a country, or a continent, and a few plants are naturally cosmopolitan (worldwide) in distribution. But just because a plant grows wild in a region does not mean that it is native to the region. Many species native to other places have been deliberately or accidentally introduced into the wild plant communities of our region. If you have any questions about whether a particular plant is native to the region, a good Internet resource is: plants.usda.gov.

Native plant species vary in the range of habitats that they can successfully occupy. There are many common plant species in the Intermountain West that occur over an amazing range. In some cases, the plant species may be made up of a series of races that are adapted to particular environments—these are called ecotypes. Ideally, it is the responsibility of the nurseries supplying native plants for horticultural use to make sure that the ecotypes being sold in a region are adapted to that region. This is particularly important with regard to cold hardiness. For example, desert sage plants from warm desert populations in the Mojave Desert have been found to be cold hardy only to Zone 7 (average winter minimum temperature from 0° to 10° F), while populations from cold Great Basin valleys are hardy to at least Zone 5 (average winter minimum temperature –10° to –20° F). These differences in cold hardiness clearly have a genetic basis. Similarly, it is quite possible that an ecotype of a widely distributed species that is from an area of higher rainfall will have a somewhat higher water requirement than an ecotype of the same species from a lower rainfall area.

There is another process involved in the apparently wide tolerance of many intermountain species. The plant may occur across a wide range of elevations, but in specific microhabitats, so that the microclimates are more similar across sites than the elevation range would imply. Firecracker penstemon is a case in point. This plant occurs from the fringes of the Mojave Desert up to rocky slopes at twelve thousand feet in elevation. At the low end of its range, it is usually found on shallow, sandy soils in sheltered canyons with partial shade. At the high end, it is again found on shallow, rocky soils, but in full sun as part of a low, perennial plant community. At middle elevations, firecracker penstemon is almost never found as a part of intact woodland or forest vegetation. Like many penstemons, it seems to be a road-cut specialist. It thrives on natural or manmade disturbances characterized by steep slopes, relatively high light intensity, and soils that are little more than rock debris. In these habitats it can escape competition and shade from other plants, as well as the pathogens found in richer soil under intact vegetation. The common elements in the cultural requirements for this plant include excellent drainage, soils very low in organic matter, steep slopes, and minimal competition. And even though its range includes wide variations in terms of precipitation, it tends to be found on the driest microsites available, especially at the upper end of its elevation range.

Many native plants were virtually unknown in the trade only a few years ago, and most designers, contractors, and homeowners have limited experience with them. In this guide to species for Intermountain regional landscapes, we try to give you enough information about each plant to incorporate it into an intelligent and workable design. This includes information on both aesthetic characteristics and cultural requirements. The Plant Palette entry for each plant is comprised of several kinds of information, including the common and scientific name of the plant, a habit illustration, a color photo, and a short description that highlights uses in the landscape and special features. Each Plant Palette entry also includes a series of icons that indicate plant characteristics, such as growth rate and flowering season, as well as cultural requirements. The Plant Palette is organized first into two groups, woody plants and perennials. Within each group, the plants are grouped by their water needs. Within each water-need group, the plants are listed in ascending order according to their average height at maturity. To facilitate design work, we also provide supplemental tables for woody plants and perennials. Plant features such as height and diameter at maturity are listed, along with cultural requirements and the page number for the Plant Palette entry for that plant.

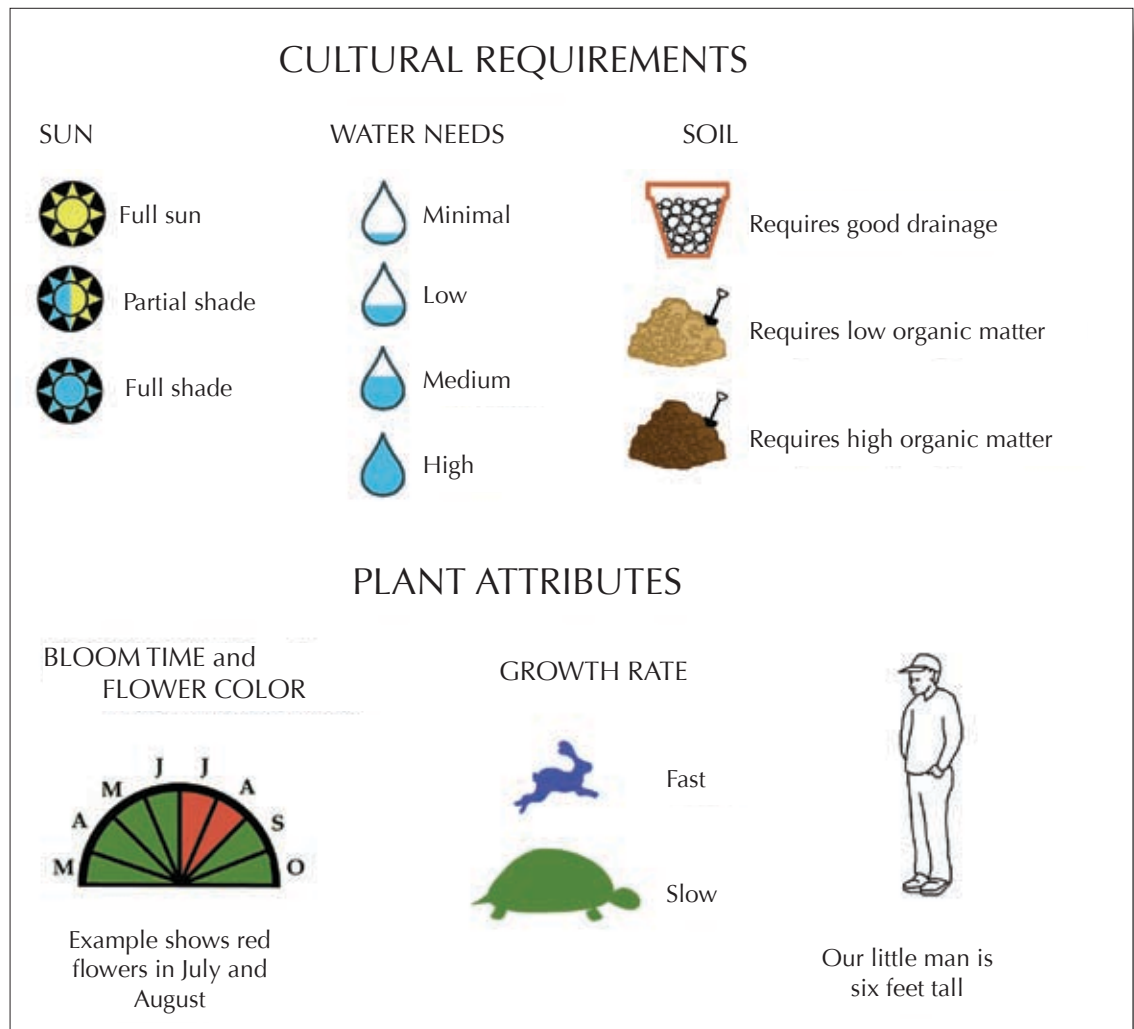
In order to use the Plant Palette to find specific plants, we provide a comprehensive index to both common and scientific names at the back of the book. This includes all the commonly encountered variants for the common and scientific names of the plant, as well as the names used in the Plant Palette itself. This should make it possible to quickly determine if a plant of interest is included in the Plant Palette, and, if it is, to find the page number of its entry.

Plant Characteristics

Habit Illustration

The habit illustration for each Plant Palette entry shows the size and form at maturity of a typical member of the species. A scale figure is included in each illustration—this person is six feet tall. For species two feet tall or less at maturity, we just show the knees and ankles of the figure, scaled to be two feet tall, in order to provide a more detailed representation of the plant habit.

Many factors interact to affect the mature size of a woody plant in the landscape. These include both genetic variation within the species and differences in growing conditions. We chose to represent average rather than maximum mature height, so be prepared for the possibility of a somewhat larger plant over the longer term.



Growth Rate

We include an icon to represent growth rate for woody plants that are either exceptionally fast growing (hare icon) or exceptionally slow growing (tortoise icon). Species that have no icon are considered to have medium growth rates. Growth rate, like maximum size, is variable, depending on growing conditions. Our estimates of growth rate are based on conditions specified in the accompanying cultural requirement icons. For example, if bigtooth maple is grown under the water regime for plants with a medium water requirement, it has a moderate growth rate (i.e., no growth rate icon). Under a high water regime, in an environment with little competition from other plants, it can grow more quickly. We do not include a growth rate icon for perennials because, in general, all of these plants have a fast growth rate in a landscape setting. Most can be expected to reach flowering size in two years, even from seed, and the increase in size from the first spring to the second can be phenomenal.

Flowering Time

We include flowering time icons for all species whose flowers are large and attractive enough to represent a desirable feature of the plant. This icon is a semicircle divided into eight pie wedges, each wedge representing a month of the growing season, from March through October. For those months when you will find this particular plant in flower, the wedges are filled in with the color of the blossoms, while the remaining wedges are colored green. This gives you a sense of the flowering season at a glance. We use flowering times as observed in gardens in the semi-desert precipitation zone for the icons, not flowering times in the wild. These can sometimes be quite different, for example, for high elevation penstemons, which can flower in mid-spring in the valleys, when their native sites would still be deep in snow.

Cultural Requirements

Water Needs

Water needs for each plant are represented in icon form by a water droplet filled to four different levels, from almost empty, representing plants with minimal water needs, to full, representing plants with high water needs. These levels correspond to the amount of naturally available water in each of the four climate zones described earlier, namely the desert, semi-desert, foothill, and mountain zones, and also correspond to the water zones already designated on your landscape plan during the design process.

The water needs icons given for plants in the Plant Palette are intended to be conservative, in that they are based on the driest environment where the species grows naturally without the benefit of favorable microsites. The plants will generally be just as happy in a water zone that is one step higher than the one shown. Thus minimal- and low-water-use plants can be grown together in a low water zone, low- and medium-water-use plants can be grown together in a medium water zone, and medium- and high-water-use plants can be grown together in a high water zone. Plants can also sometimes be grown successfully within a water zone that is one step lower than the one shown in the icon if they are placed in a favorable microhabitat, such as a microhabitat that receives harvested water.

Light Needs

Most of the plants in the Plant Palette fall into three groups in terms of light needs, those that require full sun, those that tolerate either full sun or partial shade, and those that prefer partial shade. By partial shade we mean either full

shade for several hours during the day or dappled shade. In addition, there are a few native intermountain species that can tolerate continuous full shade. We indicate the range of light conditions that a species can tolerate using combinations of three symbols, a full sun symbol, a partial shade symbol, and a full shade symbol.

Soil Needs

In general, all of the plants listed in the Plant Palette require at least adequate drainage, as described in the site analysis section. There are, however, many native plants, especially low- and minimal-water-use plants, that require exceptionally good drainage in order to thrive. These plants generally do better if the soil is sandy or gravelly, if the subsoil is cobbly, or if the site has enough slope to offer natural drainage away from the root system. We designate these plants with an icon that shows a flower pot full of coarse soil.

Species in the Plant Palette that have an aversion to soils with high organic matter are designated with an icon showing a light-colored pile of soil. Most of these are desert and semi-desert plants. Soils for these plants should never receive organic amendments or organic surface mulch. Gravel mulches, which drain water away from the plant crowns while still functioning to conserve subsurface water, will give far better results. Plants from the mountains that benefit from the higher fertility and water-holding capacity associated with organic matter are designated with an icon showing a dark-colored pile of soil. These plants may be grown in soil with organic amendments and organic surface mulches. Plants that have no soil organic matter icon are generally tolerant of the organic matter in ordinary topsoil but will not benefit from organic amendments except in truly heavy soils.

Cold Hardiness

We do not include specific information on cold hardiness for species in the Plant Palette because all listed species meet our minimum cold-hardiness requirement. A primary criterion for inclusion in the Plant Palette was that the species needed to be cold hardy to USDA Plant Hardiness Zone 5 (average winter minimum temperature from -10° to -20° F). Most of the urban areas of the Intermountain West are in Zone 6 (average winter minimum temperature from 0° to -10° F) or warmer, but a few cities and towns in mountain valleys, such as Logan, Utah, are in Zone 5. Many of the plants in the Plant Palette are known to occur in nature in places at least as cold as Zone 5. A few do not grow naturally in places as cold as Zone 5 or even Zone 6, but they are successful in cultivation at much colder sites. For example, Apache plume does not naturally occur in places colder than Zone 7 (average winter minimum temperature from 0° to 10°

F), but it can be successfully cultivated at sites as cold as Zone 3 (average winter minimum temperature from -40° to -30° F). Natural distributional ranges therefore give a conservative estimate of cold hardiness. Species in the Plant Palette that are not found in nature in places as cold as Zone 5 are included based on their proven ability to survive long term in Logan, Utah.

Interactions

Because of the interconnections between climate, topography, and soil, as well as the feedback from the plant community that develops under a particular set of conditions, there is generally a tight relationship between the water requirement for a plant and its light and soil requirements. For example, desert plant communities are generally characterized by high light intensity and low soil organic matter as well as low rainfall, so you are unlikely to encounter a minimal-water-use plant that thrives in shade or in very rich soils. Similarly, plants of mountain streamside communities generally grow in rich soils in partial shade, so high water use is often coupled with tolerance for shade and high organic matter. Thus the same combination of icons is often repeated for different plants in the Plant Palette. Plants with similar icon sets can be thought of as members of the same plant community, and can successfully be planted together.

Cushion Globemallow

(*Sphaeralcea caespitosa*)

In the wild, this pretty little plant is restricted to the dry deserts of west-central Utah. It combines quite large, fragrant orange flowers with a diminutive stature and thick, silver-green leaves with scalloped edges. It can be grown in a variety of soils, but it will live longer if the soil is rocky and lean and watering is kept to a minimum. It will volunteer from seed, however, so you will likely have a persistent planting, even if individuals only live two or three years. Cushion globemallow is an ideal plant for a rock garden or low perennial border. It combines well with other petite desert plants like sundancer daisy and silver buckwheat.

Special Features: Like all its globemallow relatives, cushion globemallow readily forms hybrids with related species, so if you want the volunteers to look like their parents, be sure to plant only this species.



Fragrant Evening Primrose

(*Oenothera caespitosa*)

Large, heavily perfumed flowers that open in late afternoon and bloom all night give this plant its name. Its rather large, deep green leaves and extravagant blossoms belie its tough, drought-hardy nature. Each flower blossoms only once, wilting and turning pink in late morning, but the profusion of new blooms lasts for weeks. The flowers feature abundant nectar that attracts hawk moths, and the anthers and cross-shaped stigma are held well forward from the petals, where the hawk moth cannot help but contact the sticky pollen. Be careful when sniffing the flowers, or a dust of cobwebby golden pollen will be left on your nose. This plant combines especially well with Utah ladyfinger milkvetch, and they are often found growing together along gravelly road shoulders.

Special Features: The sight of this plant flowering in the moonlight is unforgettable. Be sure to plant it where you will be able to enjoy the heady fragrance.



Perennials: Minimal Water Use
(Ranked Short to Tall)

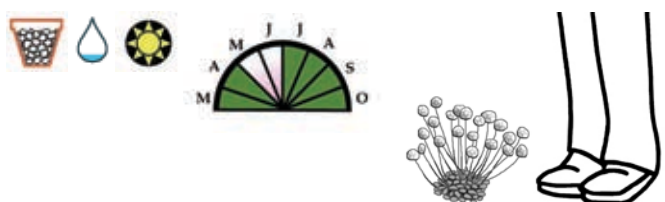


Indian Paintbrush

(*Castilleja angustifolia* var. *dubia*)

Indian paintbrush is probably the best-known wildflower of the Intermountain West, yet it is rarely seen in gardens. The main reason is that this plant is dependent on the roots of other plants to help it obtain food and water—it needs a buddy to prosper, whether in the wild or in a garden setting. When you buy an Indian paintbrush plant in the nursery, it should already be potted up with a companion, so the roots have a chance to connect before being planted in the ground. We like to use big sagebrush as a companion plant for Indian paintbrush—the color contrast is beautiful. There are many species of paintbrush. This is the common spring paintbrush of desert and shrub steppe plant communities; other species are found in mountain meadows.

Special Features: Once established, Indian paintbrush will come back in the same spot year after year, with the first cheerful, red flowers of early spring, as well as the first reliable nectar for migrating hummingbirds.



Silver Buckwheat

(*Eriogonum ovalifolium*)

This eye-catching little plant features tight mounds of fuzzy, silvery green leaves, topped with flowering stalks that look like lollipops. The blossom puffs vary in color from cream or white through dark rose or even butter yellow. These turn rusty red as the seeds ripen. Silver buckwheat is easy to grow and tolerant of a range of soil types, though it will live longer in a lean, well-drained soil. It is an excellent rock garden plant, and it also works well as a perennial border plant or even as a drought-hardy ground cover. The plant keeps its shape and color and looks good even when not in flower. It volunteers readily from seed. If this is not desirable, just deadhead once the puffs turn rusty.

Special Features: Silver buckwheat is a classic example of a cushion plant, which is essentially a little shrub that is condensed into a tight shape. Cushion plants can survive in tough environments, including alpine tundra as well as deserts.

Perennials: Minimal Water Use
(Ranked Short to Tall)

Sundancer Daisy

(*Tetaneuris acaulis*)

This elegant, golden daisy features slender stems with single flowering heads that seem to dance above the mounds of bright green, grass-like leaves. One of the better-behaved members of its family, sundancer daisy is not much given to volunteering from seed, making it a good choice for more formal plantings. It looks magnificent in mass plantings and also combines well with plants like silver daisy or purple crazypea for a pleasing, polychrome effect. It is not fussy in its requirements, making it a good plant for people just getting started with native plant gardening. It occurs over a wide range of plant communities in nature, from desert and foothill rock gardens to alpine tundra, but always in the bright sunlight of open spaces.

Special Features: This plant shows an astonishing variability in flowering stalk height. Nine-inch stalks are the norm, but some tundra and badland races are less than an inch tall.



Purple Crazypea

(*Oxytropis lambertii*)

This plant has a lot in common with Utah sweetvetch, including brilliant magenta pea blossoms, but it is a true desert plant that can succeed in minimal water landscapes. It can also tolerate medium water environments as long as the drainage is good. Its pale green leaves are held nearly upright, giving the plant a compact, tidy appearance. It puts on a show in late spring that is truly outstanding, and the straw-colored seed pods that follow are also subtly attractive. Purple crazypea rarely volunteers from seed. It is a well-behaved plant that looks good interplanted with Indian ricegrass, gooseberryleaf globe-mallow, and prince's plume.

Special Features: This plant is popular with big native bees when in bloom, though they often nearly weigh down the flowering stalks in their efforts to trip the entrance into the flower.



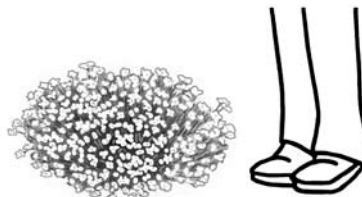


Utah Penstemon

(*Penstemon utahensis*)

The combination of neon pink flowers and waxy blue foliage makes this plant a showstopper when in bloom. It is one of the earliest-flowering penstemons, making it especially welcome in the spring garden. Found in the driest, rockiest places in the southeastern part of our region, it is not tolerant of coddling. In fact, it can prosper in pure sand, a planting medium some experts recommend for many desert penstemons. Make sure the soil has excellent drainage and minimal organic matter, and give the plants plenty of room. A mature plant can have up to thirty flowering stalks, a sight that is unforgettable. Dwarf golden-bush and silver buckwheat make good companion plants.

Special Features: This plant is one of the suite of native species that are badland specialists. Badlands have heavy clay soils, but are located in such dry places that the excess water-holding ability of the clay is not a problem.



Showy Sandwort

(*Arenaria macradenia*)

This handsome plant of rocky outcrops is a relative of domestic baby's breath, and the family resemblance can be seen in the white flowers. It has very fine, needlelike foliage that makes it rather inconspicuous when not in flower, though it does provide a sparse green backdrop for other plants. But the airy domes of flowers are the main attraction, lasting for several weeks in early to midsummer. This plant looks especially good flowering with sulfurflower buckwheat, and it can be used effectively in dry meadow plantings. It rarely volunteers from seed, so it can also be used in more formal settings. It is a long-lived, almost shrubby perennial that will bloom for many years with virtually no care.

Special Features: In nature, this plant occurs over a wide range of elevations, from low desert to alpine fell fields, but the common denominator is always rock. Fortunately, it is not nearly as picky as this preference for rock seems to imply.

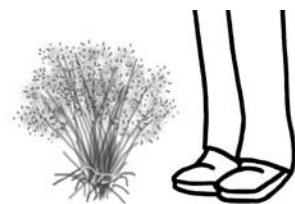
Perennials: Minimal Water Use
(Ranked Short to Tall)

Indian Ricegrass

(*Achnatherum hymenoides*)

This distinctive, cool-season bunchgrass is one that many people can recognize, with its open, airy flowering stalks, threadlike green leaves, and seeds that look like little black BBs. It can thrive in hot, dry places, but it is equally at home on infertile soils in the foothills, making it an attractive addition to many desert, semi-desert, and foothill plantings. It looks best when grown in a lean, fast-draining soil and when given plenty of room to express its fountainlike growth form. Indian ricegrass is usually relatively short lived, especially when life is too good, but it is a prolific seeder and volunteers readily. It is best used in larger-scale, informal plantings, where it can replace itself from seed.

Special Features: Indian ricegrass seeds are edible and even tasty, and were a staple crop for native people of the region. Out in the desert, they are also the favorite food of kangaroo rats, who collect them by the thousands for later consumption, and plant many of them as part of the bargain.

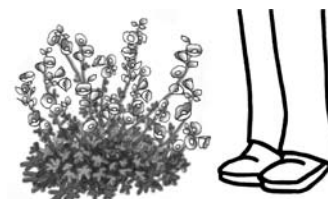


Gooseberryleaf Globemallow

(*Sphaeralcea grossulariifolia*)

Like many globemallows, this plant features orange flowers that resemble miniature hollyhocks, in this case borne along vertical stems above a mass of deeply lobed green leaves. It is broadly adapted but does best in lean, dry soils, where its flowering display can be quite showy. Where life is too cushy, it tends to grow mostly leaves. Globemallows produce abundant, long-lived seeds that generate a steady supply of volunteer seedlings. Clipping the stalks while the seeds are still green is a good way to prevent self-seeding, and it also can trigger another round of flowering if soil moisture is sufficient. Plant gooseberryleaf globemallow with other species of globemallow at your own risk—as mentioned before, globemallows hybridize freely.

Special Features: Many people never notice the delicate, sweet scent of globemallow flowers, which resembles a mix of orange blossom and cotton candy.



Palmer Penstemon

(*Penstemon palmeri*)

Perhaps the tallest of our native penstemons, and certainly one of the most magnificent, Palmer penstemon combines large, waxy green, clasping leaves with long spikes of chubby pink flowers. The flowers, which bear a family resemblance to snapdragon flowers, have a fuzzy golden beardtongue as well as a memorable, sweet fragrance. Palmer penstemon is a true desert penstemon that does best in dry, lean, well-drained soils. In the right spot, a plant can live for many years. This species is best used as a specimen plant or mass planted as a screen. To prevent self-seeding, just clip the stalks after flowering. The foliage stays green all winter, except in the snowiest places.

Special Features: Palmer penstemon is the perfect bumblebee flower, and watching these mighty bees climb in for a sip of nectar is one of the most amusing aspects of a Palmer penstemon planting. Be sure to site the planting close to a seating area to enjoy the fragrance.





Utah Ladyfinger Milkvetch

(*Astragalus utahensis*)

One of the earliest-blooming wildflowers throughout the Great Basin, this is just one of over a hundred milkvetches native to our region. It is a low, mat-forming plant that can be used as a drought-hardy groundcover or in a rock garden setting. In nature it is often found on road shoulders and in abandoned gravel quarries, habitats that indicate its preference for well-drained soils low in organic matter. It features woolly, mint green foliage with compound leaves typical of the pea family, and it is graced in spring with masses of large, pink to magenta blossoms. It does volunteer from seed, but usually not in great numbers. Cushion globemallow and fragrant evening primrose are good early-flowering companions for this plant.

Special Features: After flowering, the fuzzy seed pods look like a flock of little white chicks surrounding the mother plant. Be careful handling them—they have beaks that bite.



Dwarf Goldenbush

(*Stenotis acaulis*)

This tidy little plant is found throughout our region, from semi-desert communities on up into the mountains, usually on sunny sites with shallow, rocky soils. In flower it forms a tight dome of yellow daisies that is very attractive to both people and butterflies. In fruit it forms fuzzy balls of seeds that do not disperse far, and it does not volunteer much from seed. It is easy to grow and tolerant of a range of soil types, though it does like good drainage. Its compact growth form suggests use in a rock garden setting or as a perennial border with other low-growing plants, such as silver buckwheat and cushion globemallow.

Special Features: Dwarf goldenbush is a plant for all seasons. Its bright green clusters of sword-shaped basal leaves keep it looking good even when it is not in flower.

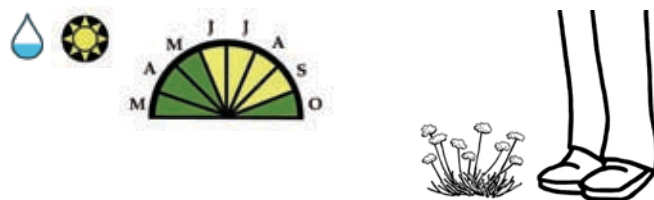
Perennials: Low Water Use
(Ranked Short to Tall)

Shortstem Buckwheat

(*Eriogonum brevicaulle*)

Shortstem buckwheat is one of the hidden treasures of the intermountain area. Its bright yellow flowers keep coming all summer, one of the longest bloom times of any native wildflower. Typically found in badlands communities in nature, it thrives in dry, exposed spots, and can tolerate salt and heavy clay soil. But it is a broadly adapted plant that performs equally well in richer, more moisture-retentive soils. The velvety, blue-gray foliage keeps it looking cool even on the hottest days. It is an excellent plant for rock gardens or for the front of a border. It combines well with other buckwheats and various low-growing perennials and carries the show started by these mostly early bloomers well into late summer.

Special Features: Shortstem buckwheat and other buckwheats are good flowers for dried arrangements—just clip and dry them when they are in full bloom. The bright color will last for years.

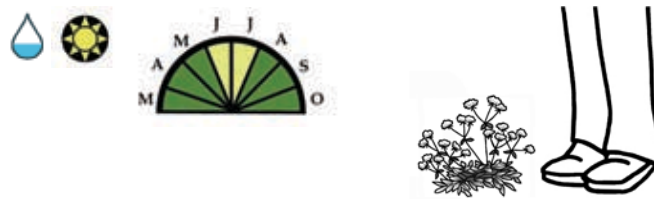


Sulfurflower Buckwheat

(*Eriogonum umbellatum*)

The low, mounding form of sulfurflower buckwheat, combined with its shiny, dark green leaves, makes it an ideal species for rock gardens and more formal plantings. It can also be used in a prairie planting, though it needs plenty of light and space. It is not particular about soils, growing equally well in coarse, well-drained soils and those that are rich and moist. In flower, the plant forms a loose dome of bright sulfur yellow blossoms, sometimes tinged with red. This red becomes more pronounced in fruit, as the flower clusters turn rusty. Sulfurflower buckwheat does not volunteer freely from seed, though occasional new plants may be seen.

Special Features: Sulfurflower buckwheat is an evergreen plant that looks good throughout the year. The leaves frequently turn bright red in winter, adding extra color and interest to an often bleak season.





Silver Daisy

(*Erigeron argentatus*)

Just one of many attractive daisy species, this characteristic southern Great Basin plant features lavender flowering heads, each on a slender stalk held above a basal tuft of silvery, strap-shaped leaves. It is easy to grow and not picky about soils, and it can be used in the medium water zone if the drainage is adequate. It is small enough for rock garden use, but can also be mixed to good effect with other wildflowers and grasses of the sagebrush steppe in an informal dry meadow setting. It looks especially attractive with sundancer daisy, which is about the same size but has contrasting bright green foliage and golden flowering heads.

Special Features: Silver daisy is a magnet for butterflies in the garden, so if you want to see a diversity of these attractive pollinators, try a silver daisy planting.



Blue Grama

(*Bouteloua gracilis*)

Blue grama is a summer-active grass that is a dominant species on the Great Plains. In the intermountain area, it is confined mainly to the south, where summer rains are more reliable. Blue grama is a versatile grass, occurring naturally from the desert shrubland up into the ponderosa pine parkland. It may be a bunchgrass or a weak sod-former, depending on its origins. The bunchgrass form makes a wonderful specimen plant—the attractive flowering spikes persist into late fall. Blue grama is also useful as a substitute for cool-season turf grasses. It requires about a quarter as much water as Kentucky bluegrass, and can tolerate mowing and moderate foot traffic. It may also be left unmowed, and performs well in prairie mixes with spring and summer wildflowers.

Special Features: Blue grama has intriguing one-sided flowering spikes that have given it common names like eyelash grass and navajita (little razor).

Perennials: Low Water Use
(Ranked Short to Tall)

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