

Rock Gardening in Oklahoma

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Introduction

Nature creates many occurrences where plants and rocks are grouped together, creating sublime imagery. This placement is appealing because of the contrast between the strong and solid texture of rock, and the soft delicate foliage of plants. This same effect can be created in Oklahoma with the construction of a rock garden.

Rock gardens are uncommon in Oklahoma because they are typically composed of alpine plants indigenous to high altitude, mountainous regions usually above the tree line. The climate in the mountains is very different than that of Oklahoma, where the growing season is short, temperatures are much cooler, especially at night, and the humidity is considerably lower.

The soils of mountainous areas are quite different than most of those in Oklahoma. Mountainous soils, comprised of mostly disintegrated rock, are very porous. Thus, very few, if any, true alpine plants will perform well in the state. However, by using a nontraditional approach to rock gardening, Oklahomans can create and enjoy beautiful rock gardens modified to fit our climatic challenges.

Any setting with a combination of plants and a few strategically placed rocks may be loosely considered a rock garden. Even in warm, dry areas of the world, small cacti and succulents can be used to create rock gardens. Although true alpine plants are found naturally only in mountains, many other plants have a similar dwarfed rock garden-type appearance and growth habits. Many of these plants also require well-drained porous soils.

Many natural rock outcroppings and formations occur throughout Oklahoma. By using these formations as an example, along with rock garden-type plants and a special soil mix, a successful rock garden can be created for Oklahoma. For our purposes a rock garden is defined as a juxtaposition of small plants arranged with rock that appears to be of natural origin and associated with quickly draining soil. This type of garden will open up a whole new group of plants for gardeners in Oklahoma and parts of surrounding states. It will also provide a more favorable growing environment for some plants already being used. A garden of this type exists in Stillwater at the studio gardens of *Oklahoma Gardening*, a very popular public television program.

A Brief History of Rock Gardening

The history of rock gardening began in England in the eighteenth century. The Romantic Movement brought about changes in the style of garden design. The naturalistic or landscape style was replacing the formal garden style. People were turning away from the rigid, formal look

of clipped hedges, straight lines, and parterres in favor of a more natural look.

The naturalistic style was a direct observation of nature. The English would see features they liked in the countryside and attempt to recreate them in their own gardens. Trickling brooks, wildflower meadows, or small groups of trees were all copied. The more adventurous gardeners, whose travels had taken them through mountaintops with beautiful rocky vistas, attempted to recreate bits of this rugged, craggy scenery in their home gardens. These small simulated mountaintop gardens were the first rock gardens.

Site Selection and Preparation

Whether used to enhance an existing embankment or created to host a unique collection of plants, rock gardens can serve functional purposes in addition to being beautiful works of art. To provide proper drainage and to allow better display of structural detail, a slope is needed for a rock garden. Existing slopes can be utilized, or one can be created. An optimal site has abundant sunlight and good air circulation.

Gardens that slant towards the east are ideal in that small microhabitats can be created to help plants combat the extreme summer heat. For example, a plant positioned directly against the east face of a large boulder will be shaded during the hottest part of the day after receiving the mild morning sun. This small change in temperature and aspect can make a significant difference in the survivability of some plants.

If no slope exists on the property, a mound can be created with a recommended soil mix and the planting area oriented towards the east. The back side of the mound can be mulched heavily, planted with a ground cover, or created by building a retaining wall and sloping the soil away from it (Figure 1). The retaining wall can be constructed out of

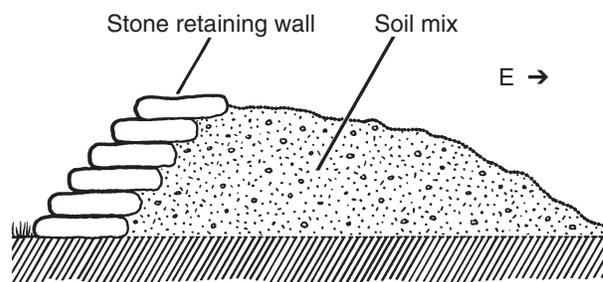


Figure 1. A retaining wall can be used to hold a mound of soil in place, providing a slope for the rock garden.

stone, landscape timbers, or old railroad ties. If the rock garden is to be viewed from several sides, a retaining wall isn't necessary and a gently sloping mound of soil can be used. It is important to note that plant material used on south- and west-facing slopes must be very heat tolerant.

To convert an existing grassy slope into a rock garden, use a garden hose to line out the boundary where the garden will be located. Spray the area with a non-selective herbicide to kill all existing vegetation. Two or three applications of herbicide may be needed to ensure that all perennial weeds and bermudagrass are completely killed. The undesirable vegetation needs to be actively growing to ensure that the herbicides will work their best. Spraying dormant sod in the winter will have no effect.

When the sod is completely dead, cut and remove it by shovel on small sites or by a mechanized sod cutter—which can be rented locally—on larger areas. The dead sod can be piled aside to compost. After removing the sod, the soil on the slope should be excavated 8 to 10 inches deep and piled to the side. At this time, installing some type of lawn edging around the perimeter would be ideal. “Shelves” can be cut into the subsoil to support large rocks. The garden is now ready for adding the new soil mix.

Soil

Creating a well-drained soil mix is the most important factor in enabling the Oklahoma gardener to grow the greatest variety of unique rock garden-type plants. Typically, Oklahoma soils tend to be high in clay, with small pore space resulting in poor aeration and drainage. A good rock garden soil mix should contain equal parts of soil, grit, and compost. Due to the higher level of precipitation in eastern Oklahoma, a soil with high sand content is recommended, whereas a soil with lower sand content should be used in the west. The grit portion can be a very coarse sand or small pea gravel. Particles approximately 1/8 inch in diameter are ideal. The compost can be any lawn or garden waste material as long as it is uniform and near soil-like in its consistency. Thoroughly composted herbivorous animal manure will work as well. Herbivores are plant eating animals such as cattle, sheep, and horses. Organic matter (compost) provides a vital source of plant nutrients, and it plays a key role in providing good drainage.

Good drainage and aeration are achieved when the soil, grit, and compost are mixed together; the organic matter coats the grit and soil particles, binding them together to form crumbs or aggregates. A significant amount of large pore space is created when the mixture becomes aggregated, providing the best soil environment for the roots of rock garden-type plants. Ingredients can be mixed thoroughly by hand for small gardens or with a mixer for larger areas. When the mix is placed in the excavated slope area, the final depth should be about 12 inches to 18 inches. This will make the height greater than the original soil level (above grade) and further aid in providing drainage.

For gardens where the mound is created, till the subsoil before adding the mix. The size of the mound can be as tall and wide as desired, but extremely steep slopes should be avoided to prevent erosion. Wet the area down several times to promote settling.

Construction of Rock Detail

Arrangement of the rock is the most artistic part of building the garden. Although possible, it is often difficult to draw out an exact plan for the garden. Some planners think it is easier to design while building and allow for flexibility throughout the process. If a pathway is desired, its location should be decided and marked from the beginning.

Prior to construction, study the rock formations around the state. Take pictures and jot down notes. Oklahoma has an abundance of beautiful rocky sites from which to gain inspiration. Areas of jagged cliffs and bluffs, as well as outcrops partially protruding from the surrounding soil, provide the best examples for the construction of a rock garden. Partially exposed outcrops are easiest to mimic, and they provide good spaces around the rocks for planting.

One of the most noticeable features of natural sedimentary rock formations are their layers of strata (Figure 2). The appearance of lines in the rock occurs as the result of years of continuous deposition. These lines continue in the same direction from rock to rock unless portions have crumbled away due to weathering. The strata lines generally run horizontally, but may be vertically oriented on occasion.



Figure 2. Many exposed sedimentary rock formations are characterized by their visible layers or strata lines.



Figure 3. A natural effect can be achieved by arranging the rocks to imitate a series of tilted layers of strata.



Figure 4. Creating the appearance of a disintegrated layer of strata begins with the placement of several large rocks in a row with their lines running in the same direction. Gaps between rocks simulate sections that have broken free and tumbled downhill.

To emulate nature, begin by placing a few strong lines of rock in rows at different heights. Be certain their strata lines all continue in the same direction. Use the largest rocks for these first layers. Tilting lines of strata as in Figure 3, seem to give a more natural look than do level lines.

Figure 4 shows a row of rock with gaps providing the illusion of a layer having had sections break off and tumble away. Place some rocks among the strata layers to imitate rocks that have broken free uphill and tumbled into place. The tumbled rocks do not have their lines running in the same direction as those in the layers of strata. The basic principle is to create a series of slanted terraces with each layer staggered back from the next.

Place tumbled sections randomly throughout the layers (Figure 5). Begin at the bottom of the slope if a large quantity of rock is to be used and the terraces overlap one another. A less dense grouping of the strata layers provides a more weathered prairie out-crop appearance, and will allow more space for plants. Increasing the distance between layers may not necessitate beginning at the bottom of the slope.



Figure 5. Each layer resembles a crumbled terrace made up of either large or small rocks.

When positioning the individual rocks, bury them by at least one third and securely tamp or pack the soil underneath. This gives the rock a fixed natural look, as if the soil has washed away exposing it over time instead of appearing to be simply plopped on the ground. Tucking the soil underneath will help keep small animals from taking up residence and provide a cool root-run for plants. In fact, the soil underneath the rocks will be much cooler than the surrounding soil and will assist in the survival of some of the heat-sensitive plants.

Rocks that have relatively flat tops should be placed slightly sloping backwards into the hill. This will ensure that rain and irrigation water runs backwards, seeping into the soil rather than spilling over the top, gaining speed, and causing erosion (Figure 6). You should be able to stand on the rocks without movement once in place. The best face of each rock should be utilized, and portions discolored from previously being buried should be buried again. Placing any flat rocks vertically can give the look of a tombstone and should be avoided.

In nature, large boulders sometimes have cracks or crevices that provide ideal growing conditions for some plants. This feature can be re-created by positioning two similar rocks with flat faces next to each other, leaving a



Figure 6. Rocks with flat tops should be positioned so that rain and irrigation water flows backwards into the slope.



Figure 7. The imitation of a split rock, created by positioning two similar stones inches apart, provides an ideal planting spot.



Figure 8. Highly desirable mosses and lichens add character and color to the surfaces of the rocks they occupy.

small gap. The crevice can then be filled with soil and planted (Figure 7).

The materials of choice for a rock garden are sandstone or limestone. Granite will most likely be harder to obtain, and is less porous. Both sandstone and limestone are porous materials that can have attractive character, and also support the surface growth of highly desirable mosses and lichens (Figure 8). Extreme care should be taken not to scrape the mosses and lichens when handling or transporting the rock. Also, every effort should be exercised to avoid breaking or chipping the rock, which will reduce its weathered appearance.

Rock can be purchased at nurseries, stone-yards, or collected from private property. If collecting native rock, do not remove all of the rock from an area, as this could disrupt the natural ecosystem. The rock in the garden should be of only one type and consistency for a more natural appearance. Use rocks with nice character and of all different sizes.

If possible, include some really large rocks, as these give a strong, permanent, and natural look. Heavy equipment will be needed to move and place these large rocks, but the investment is well worth the results. Large rocks or boulders make an impressive display, and they will also facilitate the use of a wider range of plant material in that larger species can be used without covering the rock as they mature. Furthermore, large rocks will also have more visible surface area after they are buried by one third. Once all rock is placed, additional soil mix may be needed to finish the garden.

Safety

Good judgment and extreme caution must be used when working with rocks. Rocks are often heavier than they look, and aren't easy to handle. Machinery should be used, whenever possible, to lift and move the rock. Smaller rocks can be lifted and moved by hand by bending at the knees and lifting with the legs, not your back. Instead of lifting, rocks can be rolled or flipped over repeatedly to position them. A soil ramp can be formed to roll smaller rocks uphill into place.



Figure 9. A natural looking pathway, winding through the rock garden, provides many small planting areas and offers close-up viewing of several plants.



Figure 10. Rupturewort (*Herniaria glabra*), makes a nice carpet of green between rock garden stepping stones.

Proper clothing and footwear should be worn when constructing a rock garden. Leather gloves, long pants, and steel-toed boots are necessities during construction.

When collecting from native rock sites, you should be aware of unwanted reptiles or insects. For example, snakes, scorpions, or spiders may be encountered. You should familiarize yourself with the appearance of Oklahoma's poisonous snakes and the black widow spider before collecting rock.

Planting

Adding plant material to the rock garden is one of the most enjoyable aspects of its construction. As a general rule, you should try to use plant material that matures at 12 inches tall or less. A few taller, vertical elements or columnar plants may work, but you should avoid having too many tall plants. As alluded to earlier, larger plant material can be used if the garden is comprised of large rocks.

A sequential order to follow in relation to the type of plant material used is provided. The first group is the dwarf conifers, which provide year-round interest due to their evergreen nature (Table 1). Randomly scatter the conifers throughout the garden. Many shapes, forms, textures, and

Table 1. Dwarf coniferous evergreens.

<i>Common name</i>	<i>Botanical name</i>	<i>Height by width, feet</i>	<i>Flowering time</i>	<i>Comments</i>
Dwarf Jingles Hinoki Falsecypress	<i>Chamaecyparis obtusa</i> 'Nana Wells Hinoki Jingles'	3-4 x 2	NA	Dark green color; performs best with afternoon shade.
Golden Threadleaf Japanese Falsecypress	<i>Chamaecyparis pisifera</i> 'Mops Golden Threadleaf'	3 x 3-4	NA	Gold thread-like foliage; prune to maintain desirable size.
Blue Star Juniper	<i>Juniperus squamata</i> 'Blue Star'	1-2 x 3	NA	Slow growing; bluish coloring; poor heat tolerance.
Dwarf Globe Blue Spruce	<i>Picea pungens</i> 'Globosa'	3 x 3	NA	Outstanding powder blue color; deer resistant.
Dwarf Swiss Mountain Pine	<i>Pinus mugo</i> var. <i>pumilio</i>	2-4 x 4-8	NA	Plants are seed propagated; select plants with the most compact growth.
Sunkist Arborvitae	<i>Thuja occidentalis</i> 'Sunkist'	3-4 x 3	NA	Golden foliage; will grow larger than some gardens may allow; prune if desired.

Table 2. Deciduous shrubs, grasses, broad-leaved evergreens.

<i>Common name</i>	<i>Botanical name</i>	<i>Height by width, inches</i>	<i>Flowering time</i>	<i>Comments</i>
Blue-Gray Sedge	<i>Carex glauca</i>	10 x 24	NA	Bluish color; a sedge not a grass; likes moisture.
Variegated Sedge	<i>Carex morrowii</i> 'Aureus-variegatus'	18 x 18	Feb.-March	A lot of white blades; more of a clumper than a spreader.
Gregg's Dalea	<i>Dalea greggii</i>	4 x 30	May-June	Very low growing deciduous shrub with silver foliage and small purple spring blooms; marginally winter hardy; give a southern exposure.
Red Yucca	<i>Hesperaloe parviflora</i>	24 x 48	June-Aug.	Tall dark pink inflorescences to 3 ft.; provides a nice vertical element; yellow flowering forms are available.
Dwarf Candytuft	<i>Iberis sayana</i>	2 x 12 Oct.	Mar.-April	Smaller leaves; more compact growth habit than next species; occasionally reblooms in the fall.
Candytuft	<i>Iberis sempervirens</i>	12 x 36	Mar.-April	Broadleaf evergreen; completely covered by white flowers in spring; a classic rock garden plant.
Japanese Blood Grass	<i>Imperata cylindrica</i> 'Red baron'	16 x 24	NA	Red-tipped blades, more intense in fall; remove green portions to keep plant truly red.
Gray Santolina	<i>Santolina chamaecyparissus</i>	20 x 36	May-June	Silver evergreen sub-shrub; yellow daisy-type flowers; cut back hard in early spring to keep compact.
Magic Carpet Spirea	<i>Spiraea</i> 'Magic Carpet'	20 x 20	April-May	Pink flowers; chartreuse foliage is wine-colored when new.

colors are available. Coniferous shrubs typically supply the structure or backbone to a garden; their colors include hues of green, blue, and gold.

The next group of plants to place in the rock garden is the dwarf deciduous shrubs and grasses (Table 2). These are permanent elements that will accentuate the seasons in the rock garden. They are valuable for their fresh new

leaves in spring, flowers (in some plants), and fall color (in other plants). The grasses give interesting foliage texture and work well to hold the soil in place on the steeper areas.

Probably the largest group of plants to include is the herbaceous perennials (Table 3). These plants survive for several years regrowing from underground structures. Select plants that flower in succession throughout the year.

Table 3. Hardy perennials.

<i>Common name</i>	<i>Botanical name</i>	<i>Height by width, inches</i>	<i>Flowering time</i>	<i>Comments</i>
Prickly Dianthus	<i>Acantholimon hohenackeri</i>	6 x 18	May-June	Not a Dianthus, but a tight mound of prickly blue-green foliage with nice pink spring blooms followed by showy white seed heads.
Allium	<i>Allium ostrowskianum</i>	12 x 4	May-June	Pink-purple drumsticks in early summer; bulbous.
Drumstick Allium	<i>Allium sphaerocephalon</i> 'Drumstick Purple'	18 x 4	May-June	Purple drumsticks with onion-like leaves; bulbous.
Mat Daisy	<i>Anacyclus depressus</i>	4 x 15	April-June	Low growing, feathery foliage; flower heads have yellow centers with ray florets, white above and red below; let this one reseed.
Columbine	<i>Aquilegia</i> spp.	24 x 12	April-May	Tall when flowering; shorter mounds of foliage; best in shade of deciduous trees; many different colors.
Thrift	<i>Armeria maritima</i>	8 x 12	May-June	Linear-leaved rosettes with balls of pink or white flower heads rising above foliage; dislikes wet feet.
Silver Brocade Wormwood	<i>Artemisia stelleriana</i> 'Silver Brocade'	6 x 24	May-June	Silver foliage; flowers not showy; the plant looks tidier if flowers are removed soon after bloom; use in a dry sunny spot.
Basket of Gold	<i>Aurinia saxatilis</i>	12 x 12	March-May	A traditional rock garden plant; yellow spring flowers; only lives two or three years, but is easy to grow from seed.
Bellevalia	<i>Bellevalia pycnantha</i>	8 x 6	March-May	Spring flowering bulb; very similar to grape hyacinth but raceme more pointed.
Wine Cup	<i>Callirhoe involucrata</i>	6 x 36	May-Sept.	Native hibiscus relative with magenta flowers in summer; tap-rooted; tough; good for southern or western exposures.
Calylophus	<i>Calylophus drummondii</i> var. <i>berlandieri</i>	12 x 24	May-Sept.	Texas native with yellow primrose-type flowers through the summer; give it full sun and dry conditions.
Blue Clips Campanula	<i>Campanula carpatica</i> 'Blue Clips'	6 x 24	April-May	Purplish-blue flowers; best with afternoon shade.
White Campanula	<i>Campanula cochleariifolia</i> 'Bavaria White'	3 x 12	April-May	Low growing, almost mat-forming; best with afternoon shade.
Mouse Ear Coreopsis	<i>Coreopsis auriculata</i> 'Nana'	6 x 18	May-June	Yellow daisies on dwarf plants; let this one reseed.
Hardy Cactus	<i>Coryphantha</i> sp.	6 x 12	May-June	Southwestern U.S. species with yellowish-green flowers; spiny.
Dutch Crocus	<i>Crocus</i> spp.	4 x 3	Feb.-March	Early flowering spring bulb in colors of white, purple, pink, yellow, and similar shades; some species are fall blooming.
Hardy Ice Plant	<i>Delosperma cooperi</i>	5 x 18	May-Aug.	Succulent plant; good for hot dry spots; may melt out with high humidity in summer; reseeds; nice pink flowers.
Bath's Pink Dianthus	<i>Dianthus gratianopolitanus</i> 'Bath's Pink'	8 x 24	April-June	Beautiful bluish-gray foliage covered with pink flowers in spring; a good dianthus for the South.

Table 3. Hardy perennials (cont'd).

<i>Common name</i>	<i>Botanical name</i>	<i>Height by width, inches</i>	<i>Flowering time</i>	<i>Comments</i>
Firewitch Dianthus	<i>Dianthus gratianopolitanus</i> 'Feuerhexe'	8 x 18	April-Sept.	Wonderful hot pink flowers that continue through the heat of summer; bluish foliage.
Cheddar Pink	<i>Dianthus gratianopolitanus</i> 'Sternkissen'	3 x 18	April-June	Pale pink flowers with very tight mat-like mid-green foliage.
Tiny Rubies Dianthus	<i>Dianthus gratianopolitanus</i> 'Tiny Rubies'	3 x 12	April-May	Dark pink flowers on small grayish leafed plants.
Twin Spur	<i>Diascia rigescens</i> 'Ruby Field'	10 x 30	April-May, Oct.	Rose-pink blooms in cool weather; only marginally hardy in northern Oklahoma.
Profusion Fleabane Daisy	<i>Erigeron karvinskianus</i> 'Profusion'	8 x 20	May-June	Flower heads on this daisy are yellow centered with white or pale pink ray florets.
Chameleon Spurge	<i>Euphorbia dulcis</i> 'Chameleon'	12 x 12	March-April	Grown more for the dark bronze foliage than for the flowers; do not keep roots wet.
Myrtle Euphorbia	<i>Euphorbia myrsinites</i>	10 x 30	Feb.-April	Early flowering; chartreuse flowers and bracts; remove spent stems as new ones sprout, which will bear next years flowers; full sun, dry conditions.
Blue Fescue	<i>Festuca glauca</i>	8 x 8	June-Aug.	Short bunch-grass with blue leaves; mulch with rock chips.
Fritillary	<i>Fritillaria assyrica</i>	6 x 4	March-April	Spring flowering bulb with drooping dark brownish-purple bell-shaped flowers.
Goblin Gaillardia	<i>Gaillardia x grandiflora</i> 'Kobold'	12 x 18	June-Oct.	Dwarf blanket flower with yellow and reddish daisies; good for summer color.
Rock Rose	<i>Helianthemum</i> 'Henfield Brilliant'	8 x 18	April-May	Excellent orange flower color; grayish leaves; protect crown from moisture with a stone chip mulch.
Rupturewort	<i>Herniaria glabra</i>	1 x 18	rarely flower	Low-mat-forming plant of dark green color and minute leaves; good between pathway stones.
Purple Coral Bells	<i>Heuchera micrantha</i> var. <i>diversifolia</i> 'Palace Purple'	14 x 18	inconspicuous	Grown for its dark purple foliage; flowers are not showy; needs shade and moisture.
Devil's Paintbrush	<i>Hieracium auranticum</i>	4 x 18	June-Aug.	Low green foliage producing 1-foot tall flower scapes with clusters of orange-yellow daisies.
Perky Sue	<i>Hymenoxys scaposa</i>	6 x 8	April-Nov.	This yellow daisy is a must for the Oklahoma rock garden; native; evergreen and long blooming.
Spring Star Flower	<i>Ipheion uniflorum</i> 'Wisley Blue'	5 x 6	March-May	Wonderful bulb for the Oklahoma rock garden; pale blue flowers in spring.
Dwarf Iris	<i>Iris histroides</i> 'George'	6 x 4	Feb.-March	Early flowering bulbous iris with purple flowers marked with yellow.
Siberian Iris	<i>Iris sibirica</i>	18 x 12	April-June	Purple-violet flowers amid slender grass-like leaves; foliage resembles an ornamental grass when not in bloom.
Snowflakes	<i>Leucojum aestivum</i>	16 x 6	April-May	Bulbous; spring flowering perennial with small nodding bell-shaped flowers tipped with green.

Table 3. Hardy perennials (cont'd).

<i>Common name</i>	<i>Botanical name</i>	<i>Height by width, inches</i>	<i>Flowering time</i>	<i>Comments</i>
Lewisia	<i>Lewisia cotyledon</i>	12 x 10	April-May	A true alpine plant; candidate for an eastern exposure, keep dry in winter; very attractive pinkish-orange flowers.
Blue Flax	<i>Linum perenne</i> 'Blue Sapphire'	18 x 18	May-July	An evergreen perennial; drought-tolerant plant with pale blue spring flowers.
Golden Moneywort	<i>Lysimachia nummularia</i> 'Aurea'	4 x 30	April-May	Bright golden foliage in sun, turns green in shade; creeper that roots at the nodes; needs moisture.
Dwarf Daffodil	<i>Narcissus</i> 'Jack Snipe'	8 x 4	March-April	Small daffodil with white perianth and yellow trumpet.
Miniature Daffodil	<i>Narcissus</i> 'Tete-a-tete'	6 x 4	March-April	Minute spring-flowering yellow daffodil.
Dwarf Mondo Grass	<i>Ophiopogon japonicus</i> 'Compactus'	3 x 12	occasionally	Grass-like leaves; evergreen; good between pathway stones; remove last year's growth in February.
Black Mondo Grass	<i>Ophiopogon planiscapus</i> 'Nigrescens'	8 x 12	May-July	One of the only true black-colored plants; best with light shade, moisture.
Purple Shamrock	<i>Oxalis regenellii</i> 'Triangularis'	12 x 12	May-Sept.	Purple foliage; white flowers occasionally.
Cambridge Penstemon	<i>Penstemon barbatus</i> 'Cambridge'	18 x 12	April-June	A series with colors of pinks, reds, and blues, and nice large spring flowers.
Pineleaf Penstemon	<i>Penstemon pinifolius</i>	12 x 24	May-June	Drought tolerant plant from Arizona and New Mexico; red-orange flowers with small leaves; a yellow variety exists.
Woodland Phlox	<i>Phlox divaricata</i> 'Louisiana Blue'	8 x 12	April-May	Light blue spring flowers; needs shade and moisture.
Candy Stripe Phlox	<i>Phlox subulata</i> 'Candy Stripe'	6 x 36	March-April	Low growing, somewhat prickly evergreen foliage; bicolored pink and white flowers.
Dwarf Ruellia	<i>Ruellia brittoniana</i> 'Katie'	12 x 12	April-Oct.	Rosettes of peach-like leaves produce purplish-blue flowers all season; needs moisture; will freeze out in cold winters.
Plume Sage	<i>Salvia nemerosa</i> 'Plumosa'	18 x 24	April-July	Dark purplish-maroon flower heads on crispy green leaves; cut back in mid-summer to tidy up.
Snowhill Salvia	<i>Salvia sylvestris</i> 'Schneehugel'	20 x 24	April-June	Multitudes of white flowers on dark green foliage; cut back to keep small.
Soapwort	<i>Saponaria ocymoides</i>	6 x 18	April-May	Plants are covered with pink flowers in spring; a must for the Oklahoma rock garden.
Butterfly-Blue Pincushion Flower	<i>Scabiosa caucasiaca</i> 'Butterfly Blue'	18 x 18	Feb.-Dec.	Blooms most of the year if dead-headed; favorite of butterflies.
Pink Mist Pincushion Flower	<i>Scabiosa columbaria</i> 'Pink Mist'	18 x 18	March-Nov.	Very similar to Butterfly Blue but with pale pink flower heads.
Prairie Skullcap	<i>Scutellaria resinosa</i>	10 x 10	May-Oct.	An Oklahoma native with tight growth and purple flowers; long bloom season.

Table 3. Hardy perennials (cont'd).

<i>Common name</i>	<i>Botanical name</i>	<i>Height by width, inches</i>	<i>Flowering time</i>	<i>Comments</i>
Tricolor Stonecrop	<i>Sedum spurium</i> 'Tricolor'	4 x 30	June-July	Showy easy-to-grow succulent; leaves are green, white, and pink and showier than the flowers.
Hens and Chicks	<i>Sempervivum</i> spp.	4 x 12	rarely flower	Tight rosette-forming succulents; green, gray, or reddish in color; sometimes hairy; forms colonies with off-shoots.
Flame Flower	<i>Talinum calycinum</i>	10 x 6	June-Sept.	Oklahoma native with succulent leaves and pink flowers that open in the afternoon; may go dormant before frost; let reseed.
Silver Tansy	<i>Tanacetum niveum</i>	18 x 30	April-June	An outstanding plant in full bloom; hundreds of white daisies with yellow centers, silver foliage; short lived but will reseed.
Peppermint Stick Tulip	<i>Tulipa clusiana</i>	10 x 4	March-April	Spring-flowering bulb with red and white alternating tepals; the longest lived; best performing perennial tulip trialed in Stillwater, OK.
Silver Speedwell	<i>Veronica incana</i>	10 x 15	April-June	Dark blue flowers with grayish leaves; as plants spread, they may die-out in the original planting spot.
Georgia Blue Veronica	<i>Veronica peduncularis</i> 'Georgia Blue'	6 x 24	March-April	A Ukrainian plant; not from 'the Peach State;' plants are blanketed with baby-blue flowers in spring; similar in appearance to <i>Phlox subulata</i> .
Golden Speedwell	<i>Veronica prostrata</i> 'Trehane'	6 x 16	April-May	Leaves are golden; flowers dark blue; prefers cooler temperatures.
Blue Bouquet Speedwell	<i>Veronica spicata</i> 'Blauteppich'	6 x 18	May-June	Medium blue flower spikes rise above dark green mat-like foliage.
Hummingbird Trumpet	<i>Zauschneria garretti</i> 'Orange Carpet'	6 x 15	July-Oct.	Low-growing plant with grayish leaves and bright orange flowers.
Plains Zinnia	<i>Zinnia grandiflora</i>	8 x 24	May-Oct.	Oklahoma native; yellow flowers most of the summer; full sun and dry conditions.

Avoid grouping all of the spring flowering perennials together in one area or all of the fall flowering plants in one area. Intermingle them so the entire garden creates interest year-round. Don't forget the foliage color of the plants, and remember to use contrasting texture and form when arranging the plant material. Heat-sensitive perennials will benefit from a fall planting, as this will allow time for the plant to build starch reserves and develop an extensive root system which may enhance heat tolerance the following summer.

Bulbous plants fall into this third group as well. The well-drained rock garden soil is a great place to grow many different perennial "bulbs" in Oklahoma. Most bulbous plants flower in the spring, but others will bloom in the summer such as shamrock (*Oxalis* spp.) and some alliums (*Allium* spp.). Others such as autumn crocus (*Crocus* spp.) and spider lily (*Lycoris* spp.) bloom in the fall. You should record the location of "bulbs" with a map so when their foliage dies and is removed, they won't be accidentally removed or injured when new plants are added.

A fourth group of plants that can be added to the rock garden are annuals or non-hardy plants (Table 4). Annuals can provide instant color and are especially useful when the garden is new and other plants have yet to mature. The rock garden will benefit from the establishment of a few kinds of reseeding annuals that will be present year after year. A few species that work well for this application are the Dahlberg daisy (*Thymophylla tenuiloba* [syn. *Dyssodia t.*]), rose moss (*Portulaca grandiflora*), cup flower (*Nierembergia hippomanica*), and johnny-jump-up (*Viola tricolor*). Simply thinning them where they aren't wanted is all it takes to keep the planting under control. Some of the most natural effects in the rock garden will occur when a few plants are allowed to germinate and remain in that location.

Interest to the garden can further be achieved with the addition of a few well-placed tender plants not intended for reseeding. Sturt's desert pea (*Clianthus formosus*), ruby grass (*Rhynchelytrum nerviglume*), and angelonia (*Ange-*

Table 4. Annuals and other tender plants.

<i>Common name</i>	<i>Botanical name</i>	<i>Height by width, inches</i>	<i>Flowering time</i>	<i>Comments</i>
Angelonia	<i>Angelonia angustifolia</i>	12 x 12	all summer	Multitudes of blue, pink, or white snapdragon-like flowers on very heat-tolerant plants.
Trailing Periwinkle	<i>Catheranthus roseus</i>	6 x 24	all summer	Prostrate form of the popular bedding plant; very heat-tolerant; colors are whites, pinks, reds, and shades in between.
Cup Flower	<i>Nierembergia hippomanica</i>	10 x 12	all summer	Cultivars of white or purple flowers with yellow centers; will over-winter in mild winters; reseeds.
Rose Moss	<i>Portulaca grandiflora</i>	8 x 12	all summer	Succulent, reseeding annual with very bright flowers in many colors; 'Sun Dial Peppermint' is one of the best.
Ruby Grass	<i>Rhynchelytrum nerviglume</i> 'Pink Crystals'	20 x 16	all summer	A tender grass with outstanding pink inflorescences and silver foliage, may overwinter in mild years.
Sturt's Desert Pea	<i>Swainsona formosus</i> (syn. <i>Clianthus f.</i>)	18 x 30	June-frost	Brilliant, unique legume from Australia; silver foliage with amazing 4-inch red and black banana-shaped flowers.
Dahlberg Daisy	<i>Thymophylla tenuiloba</i> (syn. <i>Dyssodia t.</i>)	8 x 12	nearly year-round	Yellow-flowering reseeder with delicate fern-like foliage; native of Texas, Mexico.
Mexican Bush Zinnia	<i>Zinnia angustifolia</i>	10 x 12	all summer	Colors are white, yellow, orange, and dark red; will reseed sparingly.

lonia angustifolia) make excellent non-hardy accents when added to the rock garden each year.

Allow the plants to grow where they perform best. In particular, some perennial plants may creep onto the rocks nearby or around the sides into a different exposure and then die out in the original location. Some perennials may also reseed themselves with the new seedlings becoming better established than their planted parents. If possible, allow the newly established plants to become part of the design.

The plantings of a rock garden can be as simple or complex as desired. For example, the garden could be planted only with rose moss and be spectacular, or it could be used as an experimental garden where several types of plants are trialed to determine which ones will perform best. Unless a plant is quite showy, groups of three, five, seven, or more should be used rather than a single plant. Plantings arranged in irregular masses look more natural than blocks or straight lines. Invasive plants should be avoided as they may hide rock work and crowd out nearby plants.

A pathway of stepping stones through the rock garden helps provide small cracks and crevices for planting as well as areas between adjacent level stones for low carpeting plants such as rupturewort (*Herniaria glabra*) or ajuga (*Ajuga reptans*) (Figures 9 and 10). The garden can have different regions for plants, requiring similar requirements such as hostas (*Hosta* spp.), various ferns, and coral bells (*Heuchera* spp.) in shaded spots or groupings of xeric

(drought tolerant plants) in designated, non-irrigated, sunny areas. In fact, the rock garden lends itself well to being made up entirely of xeric plants, native plants, or a prairie plant theme.

Native plants and xeric plants will look natural nestled among native stone. These plants would also be the most appropriate for a low maintenance rock garden. The short grass prairie has numerous plants of small proportion to fit the scale of a rock garden. The addition of a water feature such as a stream or waterfall can further enhance the appearance and experience of the rock garden.

Care and Maintenance

As with most gardens, the rock garden will take a year or two to become established. Frequent watering may be required initially. Whether watering by hand, sprinkler, or automatic irrigation, the duration must be fairly short to prevent erosion. Some type of intermittent schedule will work best, such as 10 minutes of watering followed by 10 minutes rest repeated a few times.

Besides the irrigation method, the steepness of slope, coverage of plant material, and arrangement of rock will determine the degree of erosion. If a rock mulch can be obtained that is similar to the rock in the garden, it would be very beneficial applied to a 1- to 2-inch depth over the garden. Strategic placement of rock and the planting of fibrous rooted plants, such as grasses in the steeper areas of the rock garden, will aid in controlling erosion.

Besides watering, the rock garden will need weeding, dead-heading (removal of spent or fading flowers), and periodic removal of debris that will collect in small pockets. Reseeding annuals will need to be thinned, yellow bulb foliage removed, and some plants pruned occasionally to control their size. Some perennials will also need to be divided as they age. Springtime may be the most spectacular display, so prepare the garden early by cleaning up and removing the previous season's growth on the perennials. Remove plants that don't perform and replace them with better-adapted plants as needed.

Conclusion

Part of the excitement of rock gardening is the opportunity to try new plants and determine which ones will perform well. The microhabitats or microclimates provided by the rocks, especially the positions on the eastern face, should bring surprising results regarding what plant material will survive and perform well in the hot, humid summers of Oklahoma.

The video, *Rock Gardening in Oklahoma* (VT873), may prove useful in providing visual concepts from which to draw ideas. Visits to the *Oklahoma Gardening* studio grounds in Stillwater to view the rock garden are also suggested and encouraged.

Plant Gallery



Ruby Grass – *Rhynchelytrum nerviglume* 'Pink Crystals' (back)
Angelonia – *Angelonia angustifolia* (front)



Basket of Gold – *Aurinia saxatilis*



Purple Coral Bells – *Heuchera micrantha*, var. *diversifolia* 'Palace Purple'



Dwarf Globe Blue Spruce – *Picea pungens* 'Globosa'



Rock rose – *Helianthemum* 'Henfield Brilliant'



Firewitch Dianthus – *Dianthus gratianopolitanus* 'Feuerhexe'

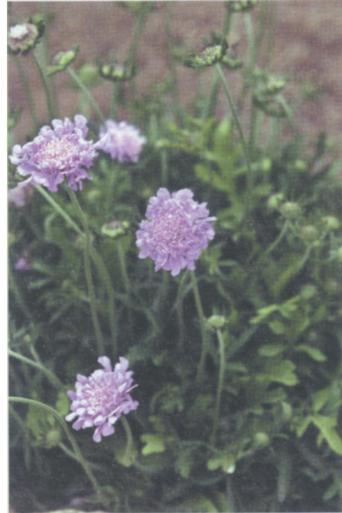


Tiny Rubies Dianthus – *Dianthus gratianopolitanus* 'Tiny Rubies'

Plant Gallery



Candy Stripe Phlox – *Phlox subulata* ‘Candy Stripe’



Pink Mist Pincushion Flower – *Scabiosa columaria* ‘Pink Mist’



Cheddar Pink – *Dianthus gratianopolitanus* ‘Sterkissen’



Magic Carpet Spirea – *Spiraea* ‘Magic Carpet’



Dahlberg Daisy – *Thymophylla tenuiloba* (syn. *Dyssodia t.*)



Perky Sue – *Hymenoxys scaposa*



Desert Pea – *Swainsona formosus* (syn. *Clianthus f.*)

Plant Gallery



Goblin Gaillardia – *Gaillardia x grandiflora*
'Kobold'



Chameleon Spurge – *Euphorbia dulcis*
'Chameleon'



Cambridge Penstemon – *Penstemon barbatus*
'Cambridge'



Golden Speedwell – *Veronica prostrata*
'Trehane'



Bath's Pink Dianthus – *Dianthus gratianopolitanus*
'Bath's Pink'



Silver Tansy – *Tanacetum niveum*



Thrift – *Armeria maritima*

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Societies

North American Rock Garden Society
PO Box 18604
Raleigh, NC 27619-8604
www.nargs.org

Alpine Garden Society
AGS Centre,
Avon bank
Pershore,
Worcestershire,
WR10 3JP
United Kingdom
www.alpinegardensociety.net

Scottish Rock Garden Club
Groom's Cottage, Kirklands
Ancrum, Jedburgh, Scotland TD8 6UJ
<http://www.srgc.net/site/>

American Penstemon Society
Ann Bartlett, Secretary
1569 South Holland Ct.
Lakewood, CO 80232
<http://www.apsdev.org/>

International Bulb Society
Dave Lehmilller, Membership
550 IH-10 South, Suite 201
Beaumont, TX 77707
www.bulbsociety.org

Plant and Seed Sources

W. Atlee Burpee Co.
300 Park Ave.
Warminster, PA 18974
<http://www.burpee.com/>

High Country Gardens
2902 Rufina Street
Santa Fe, NM 87505-2929
<http://www.highcountrygardens.com/>

Brent and Becky's Bulbs
7900 Daffodil Lane
Gloucester, VA 23061
<https://brentandbeckysbulbs.com/>

Park Seed Co.
One Parkton Avenue
Greenwood, SC 29647
<http://parkseed.com>

Siskiyou Rare Plant Nursery
2115 Talent Avenue
Talent, Oregon 97540
<http://siskiyourareplantnursery.com/>

Joy Creek Nursery
20300 Northwest Watson Rd.
Scappoose, OR 97056
<http://www.joycreek.com/>

Plant Delight's Nursery, Inc.
9241 Sauls Road
Raleigh, NC 27603
<http://www.plantdelights.com/>

Thompson & Morgan Seeds
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Jackson, NJ 08257-0308
<http://www.tmseeds.com/>

Meadowbrook Nursery/We-Du Natives
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Marion, NC 28752
<http://www.we-du.com/>

Arrowhead Alpines
P O Box 857
Fowlerville, MI 48836
<http://www.plantdelights.com/>

Bluestone Perennials
7211 Middle Ridge Road
Madison, OH 44057
<http://www.bluestoneperennials.com/>

Sunshine Farm and Nursery
22523 E 1020 Road
Clinton, OK 73601
<http://www.sunshinenursery.com/>

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