

Plants of El Rojo Grande Ranch

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TREES

-TRUMPET-CREEPER FAMILY (BIGNONIACEAE)-

Desert Willow (*Chilopsis linearis*) is a native deciduous tree reaching 10 m upon maturation, found in dry riparian areas and foothills throughout the Southwest. Flowers are large (2.5 cm long), purplish, showy and fragrant, appearing in clusters from April-August. The fruits are long slender capsules (10.2-20.3 cm long, 6mm diameter). Hummingbirds and bees are attracted to the showy flowers and feed on the nectar, which is a good energy source. Mule deer eat small quantities of the leaves and fruit, and various species of birds eat the seeds. The tree also provides nesting sites for desert songbirds and cover for other wildlife species. Desert willow is used to stabilize soil and is cultivated as an ornamental because of its attractive flowers. It has been used for roadside beautification, border rows, screenings, and mass plantings. Native Americans use desert willow in basketry, cradleboards, and bows, and also as an anti-fungal and general antimicrobial. **(PLATE 1)**

-BITTERSWEET FAMILY (CELASTRACEAE)-

Crucifixion Thorn (*Canotia holacantha*) is a native, dioecious (male and female flowers borne on different plants), large shrub or small tree reaching 3 m at maturity. Found on dry slopes and mesas in central and western Arizona, crucifixion thorn has spiny, rigid branches that resemble a crown of thorns, hence the name. The green stems also photosynthesize, a task performed by the leaves in most plant species. Its flowers are reddish brown, five petaled, and less than 1.3 cm wide, blooming in clusters from May-August. Fruits are reddish-brown, egg-shaped capsules (19-25 mm long) called “bucknuts” by hunters. The fruits are eaten by deer and are also used as food by the Apache. **(PLATE 2)**

-CYPRESS FAMILY (CUPRESSACEAE)-

Arizona Cypress (*Cupressus arizonica*) is a native gymnosperm reaching 12-15 m in height. It is the only true cypress native to Arizona and the most widespread cypress throughout the Southwest, distinguishable from similar juniper species by its large (3 cm) spherical cones that remain on the tree for several years. The flowers are small, yellow in color, and wind pollinated. Arizona cypress is found naturally on dry, sterile, rocky mountain slopes and canyon walls, but does very well when planted on better soils or when irrigated. Arizona cypress generally requires little maintenance once established, though deep watering at least every other week is necessary for desert planting during the growing season. Often used as a wind break, it requires full sunlight for best development, but is subject to sunscald when grown as an ornamental. Though rodents eat the seeds, it is not likely to attract herbivores except under drought conditions. Native Americans use Arizona cypress in breads and cakes, and also as a treatment for rheumatism or a cold remedy. **(PLATE 3)**

One-Seed Juniper (*Juniperus monosperma*) is a native gymnosperm reaching 7 m in height. It is found along dry hills, plains and plateaus, often mixed with ponderosa and piñon pines as well, as other juniper species. The flowers are small, inconspicuous and orange in color. Berries/cones are spherical, conspicuous (5-7 mm), bluish in color with a waxy coating, and usually contain just one seed. The seeds are used by some mammals and birds year round, while wild hoofed mammals eat them in winter. One-seed juniper is an important food source for wild turkeys, Townsend's solitaire, western and mountain bluebirds, as well as American robins. Birds serve as the chief seed-dispersal mechanism. The berries have been eaten raw or ground and baked into bread by indigenous peoples. Dried berries have also been used to make jewelry. Leaves are used medicinally by many tribes including the White Mountain Apache, Navajo, Hopi, other Pueblo tribes and the Paiute. Branches are burned for purification, and leaf ash is added to food for minerals. Wood and bark are used for fuel. **(PLATE 4)**

Utah Juniper (*Juniperus osteosperma*) is a native gymnosperm reaching 6 m at maturity. Growing along dry hills, plains and plateaus, it can often be found mixed with ponderosa and piñon pines, as well as other juniper species. The flowers are inconspicuous and yellow in color. Berries/cones are spherical, conspicuous (6-14 mm), and reddish-brown or bluish, often with a whitish, waxy coating. Utah juniper can be distinguished from one-seed juniper by its harder, drier, mealier cone, and its more often single-stemmed growth habit. Jackrabbits, coyotes and birds eat the berries and use the foliage as cover. The wood of the Utah juniper has been used for hundreds of years as an aromatic cooking fuel throughout the Southwest. The Navajo use this plant as an emetic and a medicine to treat headaches, influenza, stomach aches, nausea, acne, spider bites, and postpartum pain. **(PLATE 5)**

-PEA FAMILY (FABACEAE)-

The Arizona state tree, **Paloverde** (*Parkinsonia microphylla*) is a native tree or large shrub reaching 6 m at maturity. Paloverde produces large numbers of five-petaled flowers each year (the largest petal is white and the other four are yellow), is pollinated by bees, and blooms from April-May. The seeds are edible to humans as well as many other species. Often the seeds "lucky enough" to germinate are those that were gathered, buried, and forgotten by rodents before they could be infested by bruchid beetles. Paloverde provides cover for lizards and small mammals such as rabbits. While it is mostly used only as a starvation or famine food, Native Americans occasionally roast the seeds and grind them into flour. One of the most unique characteristics of the paloverde is its ability to photosynthesize through the chlorophyll in its bark, thereby conserving water. **(PLATE 6)**

Velvet Mesquite (*Prosopis velutina*) is a native tree or shrub reaching 15 m in height, found below 1700 m in desert washes and plains. The inflorescence is a white or pale yellow catkin, 6.5 cm long, that hangs downward and blooms in early summer. Mesquite is an important tree to wildlife. The seeds are eaten by

jackrabbits, Gambel quail, songbirds, various small mammals, and domestic livestock. Western chipmunks, ground squirrels, pocket mice, and various species of kangaroo and wood rats consume the foliage. Numerous birds also nest in the canopy. The pods of this mesquite provide an important food source to the Maricopa, Pima, Hualapai, and other tribes of the Southwest. The pods or the seeds alone are ground into a nutritious meal or flour in a mortar. The black gum from the mesquite is an important medicine to the Pima; it is boiled with a little water and applied to sore lips and gums or chapped fingers, and taken internally to cleanse the system. **(PLATE 7)**

-SILKTASSEL FAMILY (GARRYACEAE)-

A native, evergreen shrub to 2 m tall, **Wright's Silktassel** (*Garrya wrightii*) is typically found in chaparral, oak woodland, and pine-oak forest. Flowers are inconspicuous and white in color, forming a catkin inflorescence blooming from March-August. Wright's silktassel provides cover for small mammals and birds. Garryin, an alkaloid found in several *Garrya* species, has some medicinal uses. **(PLATE 8)**

-OLIVE FAMILY (OLEACEAE)-

A native tree reaching 8-9 m in height, **Velvet Ash** (*Fraxinus velutina*) grows in moist soils along streams and riparian areas, often interspersed with hardwoods, cypress, pines and firs. Velvet ash blooms from March-May, with inconspicuous yellow flowers covered with dense hairs. Fruits have a broad, flat, paddle shaped wing (2 cm in length and 0.75 cm wide); the paddle end may be notched. Velvet ash has a low palatability for livestock, although deer will browse it when other preferred species are not available. It provides habitat for wild ungulates and small rodents, and also provides nesting sites for songbirds and other bird species. Velvet ash is a host plant for the two-tailed swallowtail butterfly. The Hualapai use velvet ash wood to make bows and a sharp tool for gathering mesquite agave. **(PLATE 9)**

-PINE FAMILY (PINACEAE)-

Piñon Pine (*Pinus edulis*) is a native tree reaching 12 m at maturity. It grows on dry mountain slopes, mesas, and plateaus, and can be found mixed with juniper species or in pure stands. Cones are yellowish-brown and egg-shaped (3-5 cm long), with thick, resinous scales and wingless brown seeds (9-14 mm long). Piñon pine provides food and shelter for a variety of bird and mammal species as well as winter shelter for large hoofed mammals. It is also a host plant for the pine white butterfly. The nuts are highly desirable for both humans and wildlife. They are high in fat and protein, and form an important food source for the native peoples of the Great Basin, as well as Clark's nutcrackers, scrub jays and piñon jays, all of which also act as dispersal agents. Nuts are gathered and sold commercially by many Navajo people. The pitch is used internally and externally

for medicine, and is also used in pottery and dyes or burned for purification. The needles are a good source of vitamin C. **(PLATE 10)**

-PLANETREE FAMILY (PLATANACEAE)-

Arizona Sycamore (*Platanus wrightii*) is a native tree reaching 25 m at maturity and found growing along streams and in canyons. Arizona sycamore blooms in the spring and has green, ball-like flower heads in clusters of 2 to 4. The fruits are round, somewhat fuzzy tan balls (2.5-4 cm in diameter), each composed of numerous tiny, tufted seeds; the balls disintegrate over winter, dispersing the seeds with the wind. Arizona sycamore is an important tree for many bird species. The wood is difficult to work with and resists splitting, but was once used to make buttons. **(PLATE 11)**

-WILLOW FAMILY (SALICACEAE)-

Fremont Cottonwood (*Populus fremontii*) is a native deciduous tree with an open crown, reaching 30 m in height. It is found along rivers and streams in all counties of Arizona. Flowers are both male and female and form hanging, yellow-green catkins (4-5 cm long), appearing in early spring before the leaves. The fruits are light brown, egg-shaped capsules that split to disperse numerous, small cottony seeds. Fremont cottonwood is good nesting habitat for birds, especially cavity nesters. Beavers, elk, deer, horses and squirrels feed on various parts of the tree. It is a host plant for the red-spotted admiral and viceroy butterflies. The Hopi frequently use the wood of this species for Katsina dolls, while the Navajo make many household game pieces from cottonwood. **(PLATE 12)**

-SOAPBERRY FAMILY (SAPINDACEAE)-

Wingleaf Soapberry (*Sapindus saponaria*) is a native perennial tree reaching 12 m high with a rounded crown, typically growing along rivers or in desert washes, arroyos, and dry watercourses. It sometimes also grows singly or in thickets in foothills and uplands. The leaves are alternate and pinnately compound, with 7 to 19 lanceolate leaflets. The small, 5-petaled, intensely fragrant flowers are borne in large, branched clusters at the branch tips, and usually bloom from May-June. The large, round, poisonous fruits are translucent golden orange in color, and ripen in November. Wingleaf soapberry provides hiding, resting or nesting cover for a variety of mammals and birds, including doves and many songbirds. As an ornamental the uniqueness of the fruit and bark sell themselves; the plant is virtually pest free, and provides a superb canopy as a patio or backyard shade tree. The fruits were crushed to make cleaners and soaps by Native American peoples and early settlers; however, wingleaf soapberry can cause contact dermatitis in susceptible people. Although the berries are somewhat poisonous, preparations made from them have been used to treat fevers, rheumatism, and kidney problems. The Kiowa make a poultice of the sap

and apply it to wounds, and the Comanche and Papago use the wood to make arrow shafts. **(PLATE 13)**

-TAMARISK FAMILY (TAMARICACEAE)-

Five Stamen Tamarisk (*Tamarix chinensis*) is a non-native shrub or tree reaching 4-8 m in height with numerous large basal branches, common and widespread along riparian areas of the southwestern United States. Tamarisk has a deep, extensive root system that reaches to the water table, and is also capable of extracting water from unsaturated soil layers. Mature tamarisk plants reproduce vegetatively by adventitious roots, or by seed. The seeds have small hairs on the apex of the seed coat and are readily dispersed by wind and water. Native Americans have used tamarisk for building material and winter fuel. **(PLATE 14)**

-ELM FAMILY (ULMACEAE)-

Netleaf Hackberry (*Celtis laevigata* var. *reticulata*) is a native tree reaching 10 m at maturity, often found growing in riparian areas, rocky canyons and ponds. The broad, toothed leaves are rough and sandpapery to the touch. Flowers are inconspicuous, green, and bloom in the spring. Fruits are inconspicuous and white, and are eaten by a wide variety of mammals and birds. Deer and pronghorn browse the leaves in the spring, and beaver feed on the wood year round. It provides good cover for a variety of big game species, and supplies nesting sites for numerous desert birds. Netleaf hackberry is well suited for use in landscaping as a shade tree; it is tolerant of dry sites and can be planted in yards or patios, and along streets in urban areas. The shade value of netleaf hackberry was also recognized by early Native American peoples, including the Basketmakers of the Southwest. Because of its tendency to grow near flowing water, this tree provided the focus for habitations such as Hovenweep and Montezuma Castle. The sweet, edible fruit was traditionally an important food source for many Native American peoples. **(PLATE 15)**

SHRUBS

-SUMAC FAMILY (ANACARDIACEAE)-

Sugar Sumac (*Rhus ovata*) is a native shrub reaching 4.5 m, found in chaparral on slopes and mesas, in central Arizona and southern and Baja California. Flowers are small and inconspicuous, forming white catkins (5 cm long) that bloom from March-April. Fruits are conspicuous and red; thus it is commonly used as an ornamental in southern California. It is also used for erosion control. Sumac propagates both by seeds, which are spread by birds and other animals, and by new sprouts from the roots, forming large colonies. The Yavapai use raw berries for food, or make them into tea or juice, or use them as a sweetener. It is also an effective but gentle astringent. **(PLATE 16)**

Skunk Bush Sumac (*Rhus trilobata*) is a deciduous, dioecious flowering native shrub. It grows from 0.6-3.6 m tall, and is found on dry, rocky hillsides and sandhills, as well as along streams, canyon bottoms, and wetlands. Flowers are yellowish to whitish and found in small, dense clusters on short lateral shoots, opening before the leaves. Fruits are 5-7 mm in diameter, red at maturity and sparsely hairy, each containing a single nutlet. Skunkbush sumac is browsed by many mammals, including elk, bighorn sheep, pronghorn, mule deer, rabbits and porcupines, and occasionally by cattle and domestic sheep and goats. The fruit is an important winter food source for birds, including songbirds, Merriam turkeys, grouse and quail, and is also eaten by black bears. Southwestern Native Americans eat the fruits of skunkbush sumac, either fresh or after being ground to form a meal. The berries have a distinct lemony flavor and can be mixed with various foods for seasoning, dried and made into jam, or mixed with water to make a beverage. The leaves of skunkbush sumac are dried and mixed with tobacco for smoking, and also used for medicinal purposes (stomach ache, diuretic, toothache pain, bleeding, head colds, poison ivy rashes). Native Americans burn skunkbush sumac to stimulate production of long, straight sprouts which can be used for making baskets and handcrafted items. **(PLATE 17)**

-ASTER FAMILY (ASTERACEAE)-

Shortleaf Baccharis (*Baccharis brachyphylla*) is a native shrub, generally less than 1 m tall and commonly found in canyon bottoms and dry washes. The 2 cm linear leaves are alternate and simple with smooth edges. Blooming from May-October, the 2-4 mm white flowers are found in heads at the ends of stalks. The stems of this plant produce tiny globules of a sticky or oily substance, often giving the plant a dusty appearance. **(PLATE 18)**

Mule Fat (*Baccharis salicifolia*) is a native perennial shrub reaching 3 m at maturity, mostly found along stream banks and in dry stream beds. The leaves, which resemble those of the willow (*salicifolia* means "willow leaved"), are 5-15 cm in length and arranged alternately on the woody stem, which can often be sticky. The white flowers are arranged in clusters at the end of the branches, and bloom from April-October. Mule fat is a browse source for deer and elk, and is considered an important butterfly plant. The name "mule fat" comes from the days of the gold rush when miners would tie their mules to the bush and allow them to browse throughout the day. The Cahuillas utilize the plant medicinally as an eyewash or baldness preventative, and as a material to make paintbrushes or storehouses. **(PLATE 110)**

Spearleaf Brickellbush (*Brickellia atractyloides*) is a native perennial shrub with succulent stems, growing to 30 cm tall, and often found growing on rocky slopes and in cracks of boulders. The 1.5 - 3 cm alternate leaves are generally lance-shaped to oval, leathery, clearly toothed, rough to the touch, and usually

sticky with tiny hairs. Flowers are cream-colored and clustered in tight heads about the size of a thimble, blooming from March-May. **(PLATE 19)**

A native shrub reaching 25-100 cm tall, **California Brickellbush** (*Brickellia californica*) is commonly found on dry, rocky slopes and washes. The small, numerous flower heads are discoid (meaning they have disk flowers only), green to purple, and bloom from July-October. Leaves are used to aid in treatment of diabetes. The Diegueno make tea from the leaves for fevers and the Navajo make a cold tea for coughs and fever. **(PLATE 20)**

Chihuahuan Brickellbush (*Brickellia floribunda*) is a native perennial shrub with sticky stems and leaves, growing to about 1.2 m tall in rocky canyons and washes. The 35 mm-long leaves are triangular, with a heart-shaped base and serrated margins. The yellowish to greenish-white flowers are clustered in heads of approximately 25-30 at the end of short stems, and bloom from September-October. **(PLATE 113)**

Littleleaf Brickellbush (*Brickellia microphylla*) is a native shrub reaching 30-60 cm tall and found growing on dry, rocky slopes. The green leaves are short-petioled with a 0.7–2 cm blade, which is ovate to round, entire to toothed or lobed, and glandular. Flowers are greenish-white and bloom from August-November. **(PLATE 21)**

Virgin River Brittlebush (*Encelia virginensis*) is a native shrub, 50-150 cm tall and 120 cm wide, typically found growing on desert flats, rocky slopes and roadsides. The alternate, silvery-gray to whitish colored leaves are triangular, 5 cm long and 1.3-2.5 cm broad, with smooth edges and a hairy underside. Blooming from January to July, the flowers are daisy-like, yellow and 5 cm in diameter, on long brittle stalks held above the leaves. Virgin River brittlebush is hardy and easy to grow by transplanting or by seeding, making it useful for rehabilitating disturbed areas and for use in low maintenance landscapes. It is browsed by mule deer and desert bighorn sheep, but it has little value for domestic livestock. Kangaroo rats also eat the seeds. Native Americans use a decoction of the leaves and flowers to treat rheumatism, and as a wash for horses with cuts and bruises. **(PLATE 22)**

Turpentine Bush (*Ericameria laricifolia*) is a native shrub growing to approximately 1 m and commonly found on rocky slopes from 3500' to 6500'. The 1.9 cm-long linear leaves densely cover the branches, and smell of turpentine when crushed. The 10 mm-wide brilliant yellow flower heads are in terminal clusters with variable numbers of disk and ray flowers, and bloom from August to November. **(PLATE 23)**

Alkali Goldenbush (*Isocoma acradenia*) is a native perennial shrub reaching 1 m tall, found growing along roadsides, valleys and washes, typically in sandy or clay soils. The leaves are alternate and simple with some being lobed and others not. The flower heads are arranged in loose to tight clusters of 4–5, with narrowly

cylindrical yellow flowers that bloom from June-October. The Cahuilla use this plant as a dermatological aid by applying boiled leaves to sores, or the leaves can be soaked in a pan of boiling water and the steam inhaled for sore throats. This plant is also used to build fences as a protection from cold winds. **(PLATE 126)**

Mariola (*Parthenium incanum*) is a deciduous shrub which is very similar to sagebrush in size, shape, and color, and in its habit of living in sunny, hot and dry areas. The plant has lobed leaves that are grayish-white and aromatic, many small white flowers at the tips of the branches, and can grow up to 1 m tall. Mariola has been used commercially for the latex found in its sap, and the Apache boil fresh leaves to make a beverage somewhat like coffee. **(PLATE 133)**

-BARBERRY FAMILY (BERBERIDACEAE)-

Red Barberry (*Berberis haematocarpa*), a native shrub reaching 1.8 to 2.4 m, is found on slopes and flats in desert shrubland, desert grassland, and dry oak woodland. Abundant yellow flowers in spring are followed by edible, deep pink to red, juicy berries 5-8 mm across. Red Barberry provides good cover and shelter for small mammals and birds, attracting thrashers, robins, towhees and other berry lovers. It is used by Native Americans as food, as well as medicinally for sore throats, fever and ulcerated gums. **(PLATE 24)**

-GOOSEFOOT FAMILY (CHENOPODIACEAE)-

Four-Wing Saltbush (*Atriplex canescens*) is one of the most widely distributed native, woody species in North America. It is an evergreen, much branched, gray shrub from 0.75 to 3 m tall, and is found in desert flats, gravelly washes, mesas, ridges, slopes, and even on sand dunes. Male and female flowers are located on separate plants - male flowers in spikes forming large panicles and female flowers in spikes forming large, densely leafy panicles. Fruiting bracts have 4 flat, entire or fringed wings from which the plant gets its name. Deer relish this plant, especially during the winter, while quail use the species for shady cover, roosting, and food. It is also known to be used by porcupines, ground squirrels, and jackrabbits. Native Americans boil fresh roots with a little salt and drink for stomach pain and as a laxative. Roots are also ground and applied as a toothache remedy. The soapy lather from leaves is used for itching and rashes caused by chickenpox or measles. Fresh leaves or a poultice of fresh or dried flowers is applied to ant bites, and leaves are also used as a snuff for nasal problems. Smoke from burning leaves has also been used to revive someone who was injured, weak, or feeling faint. **(PLATE 25)**

-ROCKFLOWER FAMILY (CROSSOSOMATAACEAE)-

Spiny Greasebush (*Glossopetalon spinescens*) is a small, intricately branched native shrub that grows to one meter tall. It is a desert shrub that can withstand high temperature, intense sun and little moisture. Its stiff, angled branches are green when young, aging to gray or brown with the bark exfoliating in thin strips,

and have weak spines at the tips. Spiny greasewood can be recognized most easily by its small leaves and white flowers as well as by its green twigs. A decoction of this native shrub can be taken for tuberculosis. **(PLATE 26)**

-MORMON TEA FAMILY (EPHEDRACEAE)-

Mormon Tea (*Ephedra viridis*) is a native shrub reaching 60 - 150 cm high and found growing on rocky or sandy slopes and plains. In the springtime, the male plant becomes a conspicuous mass of yellow pollen sacs, while the green ovules (later becoming brown seeds) are an obvious but less conspicuous feature of the female plant. The mountain quail eats the seeds of *Ephedra* species and the plant is browsed by deer, bison, and antelope. Green ephedra was traditionally used as a beverage and medicine, and Native Americans have made flour and a coffee-like beverage from the seeds. A number of tribes boil the slender twigs to produce teas used as a tonic, blood purifier, treatment for gonorrhea and syphilis, regulator for kidney or bladder disorders or for delayed or difficult menstruation, and for backaches. The Navajo gather the twigs and leaves and boil them with alum to produce a light tan dye **(PLATE 27)**

-HEATH FAMILY (ERICACEAE)-

Pointleaf Manzanita (*Arctostaphylos pungens*) is a native shrub reaching 4 m at maturity and frequently found on foothills, mountain slopes, and in canyons. The inflorescence is a raceme of perfect, urn-shaped, terminal flowers, each 6 mm long. The fruit is a round berry, 5-8 mm in diameter, containing 1 to several seeds. Pointleaf manzanita provides food and cover for wildlife and livestock. Many fruit eaters consume the berries, including blue grouse, Montezuma quail, wild turkeys, Gambel's quail, mule deer, black bears, coyotes, hooded skunks, and collared peccaries. Stands of pointleaf manzanita are managed by the Cahuilla for production of food, firewood, and construction materials. The fruits are mashed and used to make a beverage, eaten raw, or made into a cake. The Navajo smoke the leaves for good luck, while a decoction of the leaves has been used in Arizona and New Mexico as a remedy for stomach trouble. Leaves and fruit are used in Mexican household remedies for dropsy, bronchitis, venereal diseases, and other infections. **(PLATE 28)**

-PEA FAMILY (FABACEAE)-

Catclaw Acacia (*Acacia greggii*) is a native shrub or tree reaching 6 m in height and occupying dry gravelly mesas, canyons, arroyo banks, rocky hillsides, desert flats, washes, floodplains, and riparian areas in southwestern regions. Catclaw acacia blooms in early summer. Flowers are yellow, fragrant and found in small clusters approximately 5 cm long and 13 mm wide. The fruit is that of a typical legume, 5 - 13 cm long and 13 mm wide, flat, often twisted, and narrowed between seeds. Catclaw acacia provides food, shelter, nesting sites, and nesting material to a host of wildlife including black-chinned hummingbirds, ladder-backed woodpeckers and ash-throated flycatchers. It is browsed by deer,

livestock, and rabbits. Native Americans eat the pods fresh, or dry and grind them into flour for mush or cakes. The wood is used in construction, basketry and as a source of fuel, and the buds and blossoms are dried for use as a perfume. **(PLATE 29)**

A non-native shrub or tree introduced from Argentina, **Bird-of-Paradise Bush** (*Caesalpinia gilliesii*) reaches 1.5-3 m in height and is naturalized along roadsides and in washes, preferring sandy, rocky soils. Flowers are yellow, with ornamental and prominent red stamens. It blooms from July to August and is frequented by bees, butterflies and hummingbirds. **(PLATE 30)**

Feather Dalea, Indigo-Bush (*Dalea formosa*) is a native shrub reaching 1 m in height and found in dry areas and on rocky slopes. Blooming from March to September, the flowers are deep violet with a yellow throat, surrounded by feathery plumes. The foliage is browsed by deer. Native Americans use a decoction of leaves as a cathartic and as an emetic before breakfast. **(PLATE 31)**

-BEECH FAMILY (FAGACEAE)-

Shrub Live Oak (*Quercus turbinella*) is a native evergreen shrub reaching 1-5 m in height, and grows well on dry hillsides and mesas on a wide range of soil types. It reproduces through both sexual and vegetative means. Fruits of shrub live oak are slender acorns 1.3-2.5 cm in length, dispersed by numerous birds and mammals which eat and/or cache them. Scrub jays are particularly important dispersal agents: these birds generally "plant" single acorns at depths of 4-5 cm, a few feet to a hundred feet from the parent plant, and then often forget one or two, which can germinate and grow into new plants. The foliage is utilized to at least some degree by a number of big game species, with new, succulent growth being the most palatable. Acorns of shrub live oak and related species constitute an important food source for many birds and mammals in the Southwest, including wild turkeys, geese, grouse, quail, scrub jays, and many other birds, collared peccary, Abert's squirrel, mule deer and cattle. Scrub live oak cambium is eaten by sapsuckers; porcupines eat the bark; and beavers consume the twigs. It provides effective cover for a wide range of birds and mammals, including the peccary, California brown bat, ringtail, whitetail deer, Cooper's hawk, screech owl, many songbirds, canyon tree frog, leopard frog, and Mexican garter snake. In central Arizona, mountain lion kills are sometimes hidden in shrub live oak thickets. Native Americans use shrub live oak acorns for food, and the wood is used to make handles for hoes and axes. **(PLATE 32)**

-OCOTILLO FAMILY (FOUQUIERIACEAE)-

Ocotillo (*Fouquieria splendens*) is a native shrub reaching 5 m at maturity and found growing on rocky slopes, mountainsides and in desert areas. The waxy, tubular, bright red flowers are produced in dense clusters at the end of the stems, and bloom in the early spring. The Ocotillo is attractive to hummingbirds, finches, orioles, bees, butterflies and other insects. The flowers are used by

Native Americans to make a summer drink. Nectar is pressed from the blossoms, allowed to harden, and chewed as a delicacy. Its thorny wood is used to make fences to protect cultivated crops from rodents, and also in the construction of houses and wind shelters. Thorns have been used to pierce the ears of both sexes. **(PLATE 33)**

-WATERLEAF FAMILY (HYDROPHYLLACEAE)-

Narrowleaf Yerba-Santa (*Eriodictyon angustifolium*) is a native shrub reaching 0.5 m and located in dry plains, slopes, and ridges. The leaves are usually coarsely toothed, alternate, leathery and 2.5-10 cm long, with a rolled under margin. The upper surface is shiny and sticky, and the lower surface is densely hairy. The white flowers are funnel shaped and look like little bells that grow to 1 cm long, blooming from May to August. Narrowleaf yerba-santa makes a nice addition to a bird or butterfly garden. Native Americans use a decoction of the leaves to treat indigestion and colds, as a laxative and anti-diarrheal, and as an expectorant. **(PLATE 34)**

-RATANY FAMILY (KRAMERIACEAE)-

Littleleaf Ratany (*Krameria erecta*) is a native shrub reaching 60 cm tall, commonly found growing on dry, rocky ridges and slopes. The small leaves are hairy, green, and linear. The flowers bloom from March-October, with 5 petal-like, magenta sepals and 5 tiny petals, followed by spiny fruits. Littleleaf ratany provides cover and forage for domesticated and wild herbivores, small mammals, and reptiles. The Pima make a poultice of dried roots and apply it to sores, while the Papago use the roots to make a red dye for buckskins. **(Plate 180)**

-OLIVE FAMILY (OLEACEAE)-

Desert-Olive (*Forestiera pubescens*) is a native shrub reaching 2 m in height and found in semi-deserts and washes, frequently growing with oaks. Flowers are small, clustered and yellow-green in color, appearing in early spring before the leaves. Fruits are elliptic purple or black drupes, 5-7 mm long and ripening in late spring or early summer. They are an important food source for birds and small mammals. Native Americans use desert-olive for ceremonial purposes, and medicinally as an emetic. Fruits are used occasionally as food, and the wood is used for pahos (prayer sticks) and digging tools. **(PLATE 35)**

-BUCKTHORN FAMILY (RHAMNACEAE)-

A native shrub reaching 2 m in height, **Desert Ceanothus** (*Ceanothus greggii*) grows on desert mountains, in piñon-juniper woodlands and associated shrublands. It has flowers of white, cream, or blue, followed by globose, smooth, 3-5 mm-broad fruits. Elk and desert bighorn sheep consume desert ceanothus, and small mammals such as brush rabbits are known to feed on the twigs, stems, and leaves. The seeds are eaten by mule deer, many small mammals, chukar and

other birds, and insects. Ethnobotanical uses include medicinal remedies for stimulating lymph and inter-tissue fluid circulation. **(PLATE 36)**

Hollyleaf Redberry (*Rhamnus ilicifolia*) is a dense, sprawling native shrub up to 3 m tall, but usually much less, often found in chaparral, mixed evergreen forest, southern oak woodland, and desert foothills. The leaves have spiny, holly-like edges. Flowers are small, yellow-green, with 4 triangular sepals. The fruits ripen in summer into shiny, round, bright red drupes, about 6 mm in diameter. Hollyleaf redberry is a host plant for the pale swallowtail butterfly, and also attracts hummingbirds. Quail, thrushes, robins, finches, towhees, thrashers and jays feed on the berries. Many small mammals use hollyleaf redberry for cover and food, and it also provides good browse for deer. This species has an attractive leaf color and it is a tough, drought-tolerant plant which can be used as a background plant, screen or hedge. The Cahuilla use the berries for food. The Kawaiisu use the plant medicinally to treat several ailments ranging from headaches, rheumatism, colds and coughs to stomach, spleen, kidney and liver problems. **(PLATE 37)**

-ROSE FAMILY (ROSACEAE)-

Mountain Mahogany (*Cercocarpus montanus*) is a native shrub reaching 4 m and found on dry slopes and mesas in piñon-juniper woodlands and ponderosa pine forests. Flowers are greenish and tubular with pinkish lobes, 18 mm long, and bloom from May through July. The fruits are 9-12 mm long with white, twisted, feathery tails 5-9 cm long. Mountain mahogany is good summer and winter forage for all classes of browsing animals, and provides cover for a wide variety of wildlife species. As a heat- and drought-tolerant plant, it can be used for water-efficient landscaping in arid environments and is planted as an ornamental throughout the Southwest. Native Americans use the branches and leaves for padding in cradleboards. The wood is also used to make tool handles and weaving combs. Roots are used as a dye for buckskins, and the leaves are used as a gastrointestinal aid and a laxative. **(PLATE 38)**

Stansbury Cliffrose (*Purshia stansburiana*) is a native shrub reaching 0.3 - 7.5 m in height, growing on cliffs and other exposed, dry sites such as mesas and foothills. The attractive flowers are white to pale yellow, 2 cm across, with 5 white petals and a yellow center. They occur at the ends of small side branches in spring to early summer and are very fragrant. The fruits are achenes tipped with a long, hairy, twisted, feathery tail. Cliffrose is an important browse species for mule deer, elk, pronghorn, desert bighorn sheep, livestock, game birds, and songbirds. Rodents eat the seeds and elk and other large ungulates use it for bedding cover. Native Americans use the inner bark for making clothing and ropes, and the branches for making arrows. Hopi use it as an emetic and a wash for wounds. Cliffrose is an attractive plant when used in ornamental landscaping. **(PLATE 39)**

-HYDRANGEA FAMILY (HYDRANGEACEAE)-

Fendlerbush (*Fendlera rupicola*) is a native shrub 1-3 m tall, commonly found on rocky ledges and steep slopes of cliffs and canyons. The four-petaled, spoon-shaped flowers are white, solitary or two to three together at the ends of short branches, and bloom from March through June. The fruit is a four-celled capsule that remains on the plant all year. Fendlerbush is browsed by goats, deer, bighorn sheep, and cattle, especially during the hot, dry season (April- June), which appears to be the most critical period of the year for deer herds in the desert Southwest. Fendlerbush is grown as an ornamental and is suitable for rock gardens in well-drained, sunny situations, being able to endure intense heat and considerable drought. Ethnobotanical uses include arrow shafts, weaving forks, planting sticks and knitting needles. It is also used to kill hair lice, and can be used as a cathartic. **(PLATE 40)**

-POTATO FAMILY (SOLANACEAE)-

Wolfberry (*Lycium pallidum*) is a spiny, densely branched shrub with 1-3 m tall stems. It may be found on plains and flats, along washes, on dry rocky hills and mesas, and in canyons. The flowers are bell-shaped and are borne singly or in clusters from May to August, followed by a juicy red berry with 20 to 50 seeds. Wolfberry fruits are consumed by birds and some rodents, and the foliage may be browsed by livestock. Dense thickets provide cover for birds and small mammals. Historically, Native Americans have eaten the berries and have used the plant for a wide variety of medicinal purposes. Wolfberry can be grown as an ornamental. **(PLATE 41)**

-VERBENA FAMILY (VERBENACEAE)-

Wright's Bee-Brush (*Aloysia wrightii*) is a native perennial shrub reaching 1.5 m on dry, rocky slopes, mountains, and arroyos. The richly textured leaves are crinkled above, hairy beneath, toothed on the margins and, when crushed, smell like oregano. It has small, fragrant white flower spikes which flower from June-August and smell of lemon furniture polish. The Havasupai boil the plant and use it to treat headaches, rheumatism and slight distempers. **(PLATE 42)**

CACTI (all members of the CACTUS FAMILY [CACTACEAE])

Hedgehog Cactus (*Echinocereus* sp.) is a native stem succulent with stems occurring singly or in dense clusters or mounds with up to 500 stems. Mounds may reach 30 cm in height and 30-120 cm in diameter. Individual cylindrical stems have one joint, are 5-30 cm tall and 2.5-15 cm in diameter. It grows on rocky hillsides, ledges and canyons in desert grassland, piñon juniper woodland and montane forest communities. The scarlet flowers are diurnal, remaining open for 2 or 3 days, and are pollinated by hummingbirds. The fruit is red and juicy at maturity and has deciduous spines. Native Americans eat the fruit and also use it as an external antirheumatic. **(PLATE 43)**

Beehive Cactus (*Escobaria vivipara* var. *arizonica*) is a native succulent which may appear singularly, or in clumps of many plants up to 1 meter in diameter. Individual stems reach 5-17 cm tall and 5 cm thick. Found on dry soil, often on eroded hillsides, their natural growth habit is to rise just above the ground surface. Very showy reddish-pink flowers bloom from June to the beginning of July. This cactus is sacred to the Tarahumara. Ingesting the cactus is said to produce deep sleep accompanied by dreams during which the person travels great distances and experiences brilliant visual images. The plant is also used by Cheyenne and Blackfoot as an antidiarrheal, and eaten as candy. **(PLATE 44)**

Desert Christmas Cactus (*Opuntia leptocaulis*) is a native, upright, bushy, succulent which grows to approximately 3 m on flats, washes and the slopes of dry hillsides. Flowers are conspicuous, yellow-green, and bloom in late spring. The fruit is bright red and stays on the plant through the winter (looks like Christmas bulbs during Christmas). Apache, Chiricahua and Mescalero use crushed fruits mixed with water to produce narcotic effects, and Pima eat the raw fruits. **(PLATE 45)**

Engelmann's Pricklypear (*Opuntia engelmannii*) is a native succulent which can grow up to 3 m tall, and grows in a variety of dry, rocky habitats from lowland desert grasslands up through piñon-juniper woodlands in the foothills of the mountains. It forms irregular shrub-like mounds or small trees, and has flat, fleshy pads that look like large leaves. The pads are actually modified branches or stems that serve several functions: water storage, photosynthesis and flower production. The flowers bloom from April-June, and can vary in color from yellow or buff to orange, red, or rarely white. Many Native American tribes use the prickly pear cactus for medicinal purposes such as an anti-rheumatic, to treat burns and wounds and as a laxative for infants. However, the primary use of the prickly pear cactus is as a food source. The seeds are made into flour, and the stems are baked or steamed for food (*nopalitos*). The fruits can be made into jams, candy, beverages, syrup or eaten raw. **(PLATE 46)**

Whipple Cholla (*Opuntia whipplei*) is a native, mat forming or shrubby plant reaching 30 to 150 cm tall, found growing in deep soils of valleys and gentle slopes in grasslands, or bordering forests and woodlands. Flowers are conspicuous, yellow to yellow green, 2-3 cm wide, and bloom from spring to summer. The fruits are yellow, fleshy and strongly tuberculate, spineless, and 2-3 cm long and 1-2 cm wide. Indigenous peoples use the fruit as a thickening agent for soups. Inner stems can be eaten boiled or fried, made into a drink to treat diarrhea, or used as a dressing for wounds. Cactus juice has also been shown to reduce blood sugar. **(PLATE 47)**

GRASSES (all members of the GRASS FAMILY [POACEAE])

Desert Needlegrass (*Achnatherum speciosum*) is a large, native perennial bunchgrass that grows to about 60 cm tall and just as wide. There are many seed stalks per plant, each with a 10 cm long, tight panicle of flowers that blooms from spring to early summer. The long awns attached to the seeds are twisted and sharply bent at the middle. Desert needlegrass tends to grow in rocky soils or washes at elevations below 2200 m, and often in areas that have been disturbed in the past by grazing or other soil disturbances. Indigenous peoples use an involved process to harvest the seeds and make them into an edible mush.

(PLATE 48)

Purple Three-Awn (*Aristida purpurea*) is a warm-season, native perennial bunchgrass with 15-30 cm tall stems. Found on rocky or sandy plains and slopes, three-awn is also common along roadsides. The inflorescence is a panicle 10-25 cm long, in flower from April to October. Florets have sharp-pointed lemmas with stiff, hairy calluses and three-parted awns. The awns are 2.5-13 cm long and can cause abscesses in the mouths and nostrils of grazing animals and injury to skin when caught on fur, though the plant provides fodder in spring before the awns grow. Three-awn is grazed by jackrabbits and tolerates heavy use by prairie dogs, though it provides poor cover. The Hopi use it to make broom material, and the stems have been used to make hairbrushes. The plant is also used to decorate the faces of female katsinas. **(PLATE 49)**

Spidergrass (*Aristida ternipes*) is a native, perennial, warm season grass that can grow to 1.5 m tall. The leaf-blade surface is ribbed, and its inflorescence is a pyramid-shaped panicle 25-50 cm long. Although *Aristida* is known as the “three-awn” genus, distinct in that each spikelet of the inflorescence has three stiff-haired awns, in spidergrass two of the awns are much reduced. **(PLATE 50)**

Wild Oat (*Avena fatua*) is a non-native, tall (10-30 cm), tufted annual grass found along roadsides, fields and waste places. The inflorescence is a large panicle with spreading and curving branches and pedicels, flowering March to July. It has high browsing and grazing palatability, and is a host plant for the common wood-nymph butterfly. Parched seeds can be ground into flour and used to make mush, or the hulled kernels boiled and eaten as hot cereal.

(PLATE 51)

Cane Beard Grass (*Bothriochloa barbinodis*) is a native, robust, extremely drought-resistant, warm-season perennial bunchgrass of medium height, with straw-colored stems. Stems are erect to spreading, 0.6-1.5 m tall, and densely tufted. Beard grass occurs primarily in dry, sandy, gravelly or rocky sites, and is most common in semi-desert grasslands, oak woodlands, and chaparral. Plants usually flower between May and October, but flowering will occur throughout the year under favorable growing conditions. It is both palatable and productive, and consumed by all classes of livestock. Cattle and horses utilize this grass more

than sheep do, and it may be an important local food source for pronghorn.
(PLATE 52)

Needle Grama (*Bouteloua aristidoides*) is a native, annual grass with slender stems reaching 0.5 meters tall. It has short (2-7 cm), flat leaf blades and grows in dry sandy places below 1800 m. The lemmas of each floret are 3-awned, giving it the characteristic look of grasses in the genus *Aristida*, but the inflorescence is made up of many racemes that come off the main axis, like other species of the *Bouteloua* genus. Needle grass blooms throughout the summer from April to September. **(PLATE 53)**

As a native annual grass, **Sixweeks Grama** (*Bouteloua barbata*) is significantly smaller and shorter (30 cm) than most grasses of the area, which are usually tall perennial bunch grasses. Sixweeks grama is commonly found on mesas, rocky and sandy hillsides, steep slopes, gravelly and sandy washes, and open disturbed ground in shrub-dominated desert communities. The stems are tufted, prostrate or spreading, and 10-30 cm long. The inflorescence consists of 2 to 9 persistent branches that are 1-3 cm long, with 7 to 40 closely placed spikelets measuring 2.5 to 4 mm long. The leaves are 1-6 cm long and 1-1.5 mm wide, occurring sparingly along the stems. A variety of upland game birds and songbirds such as the brown-capped rosy-finch, chestnut-collared longspur, McCown's longspur, and Brewer's sparrow eat the seeds. Small mammals like the prairie pocket mouse, black-tailed and Gunnison prairie dogs, desert kangaroo and banner-tailed rats, eat the seeds and seed-heads. Ungulates such as the pronghorn, American bison, mule and white-tailed deer, elk, and bighorn sheep also eat grama grasses.
(PLATE 54)

Side-Oats Grama (*Bouteloua curtipendula*) is a large, native, perennial warm-season bunchgrass that grows to 35-100 cm tall on limestone outcrops, rocky slopes, woodlands and forest openings. The inflorescence consists of 20 to 50 short deciduous spicate branches 1 cm long, and flowers June-November. Side-oats grama is highly productive, providing valuable forage for all classes of livestock and wildlife. It also provides excellent nesting cover for a variety of songbirds and is readily used by a variety of small mammals. Side-oats grama provides good cover for quail species, lesser prairie-chickens, and sharp-tailed grouse, and is often a component of the open grasslands preferred by mountain sheep. Native Americans use bundled dried sideoats grama stems for brooms and brushes. **(PLATE 55)**

Black Grama (*Bouteloua eriopoda*) is a long-lived native perennial with wiry, spreading stems that reach 20-60 cm in length. Leaf blades are 2-7 cm long and 0.5-2 mm wide. Its crown foliage is compact, producing dense ground shade. It occurs on rocky or sandy mesas and dry, open ground with well-drained sandy and gravelly soils. The inflorescence is a panicle consisting of 3 to 8 spicate, unilateral branches, and flowering usually takes place in early August. Black grama is considered excellent forage for all livestock classes and wildlife. It is

also a minor component of the nests of cactus wrens in the southern Chihuahuan Desert of New Mexico and Arizona. **(PLATE 56)**

Blue Grama (*Bouteloua gracilis*) is a densely tufted, native perennial grass 25-60 cm tall, found on open rocky slopes, forest openings and grasslands throughout Arizona. Each inflorescence usually has 2 branches or spikes that extend at sharp angles from the main stem and are ascending and curved at maturity, giving a resemblance to eyelashes. Blue grama has 20 to 90 spikelets per spike and flowers from July to October. Seeds are dispersed by wind, insects, ingestion by large herbivores, and by adhesion to animal hides, fur, and feathers. Blue grama provides important winter forage for elk and provides good forage for pronghorns. Scaled quail and some songbirds eat the seeds. Small mammals such as prairie dogs, pocket gophers, and black-tailed jackrabbits also eat blue grama seeds and stems. Flower heads and seeds are also consumed by grasshoppers, which can all but eliminate an annual seed crop. Blue grama is poor cover for upland game birds and waterfowl, and fair to poor cover for small mammals. Blue grama provides fair nesting cover and is important to some prairie songbirds. The Navajo use roots for application to cuts on humans and animals. The Apache grind seeds and mix with corn and water to make mush, as well as using the plant as broom and brush material. It has also been used as a ceremonial item. **(PLATE 57)**

Japanese Brome (*Bromus japonicus*) is an introduced cool-season annual grass from 20-120 cm tall which can invade disturbed and undisturbed sites. Japanese brome is usually regarded as a noxious weed on rangelands and prairies because it competes with native perennials for water and nutrients. The inflorescence is an open panicle 12-20 cm long, branching and drooping to one side with each branch bearing several spikelets, flowering June-September. Although the plants rapidly lose palatability as they mature, Japanese brome can be an important and highly palatable fall or early spring diet item for livestock, white-tailed deer, and bison. Wild turkey have been reported to eat the seeds. **(PLATE 58)**

Ripgut Brome (*Bromus diandrus*) is a non-native, invasive annual to perennial grass which grows to 70 cm tall, and is most prevalent in scrub, grassland, and woodland areas. The distinctive characteristic of this grass is the straight, rigid, 3-5 cm long awn born on each floret. Dense infestations can produce more than 1000 viable seeds per square meter. Sharp awned florets stick to clothing, fur of domestic animals, in crevices in machinery, and can be spread as a contaminant in crop seed. Soil disturbance, both anthropogenic (cultivation, construction, livestock) and natural (rooting and other disturbances by animals), contributes to its establishment. Its high water use efficiency allows late season growth, and it produces abundant potential fuel which can increase frequency or severity of fires. **(PLATE 59)**

Red Brome (*Bromus rubens*) is a non-native, annual bunchgrass reaching 15-40 cm tall, often found on dry hillsides, waste areas, and roadsides. The

inflorescence is an ovoid, erect panicle (4-8 cm long), usually purplish in color, flowering April-July. Awns are harmful to livestock and wildlife. Red-shouldered hawks can be negatively affected by red brome when the sharp florets become lodged in the corners of the eyes, causing eye infections which lead to a reduction in vision and sometimes death by starvation. Burning increases its abundance, especially in areas where the land has previously undergone disturbances. Red brome is a host plant to the juba skipper butterfly. **(PLATE 60)**

Cheatgrass, Downy Brome (*Bromus tectorum*) is a non-native, annual grass reaching 30-60 cm tall. It is native to the Mediterranean region. In Europe, its habitat was the decaying straw of thatched roofs. 'Tectum' is Latin for roof, hence the name *Bromus tectorum*, 'brome of the roofs'. Introduced into the United States in packing materials and perhaps as a contaminant of crop seeds, it was first found in the United States near Denver, Colorado, in the late 1800s and during the late 1800s and early 1900s it spread explosively in the ready-made seed-beds prepared by the trampling hooves of overstocked range livestock. It is an aggressive invader of sagebrush, piñon-juniper, and other shrub communities, where it can completely out-compete native grasses and shrubs. Dense stands of cheatgrass on rangeland are highly flammable in late spring and summer after maturation, which usually occurs before native species enter summer and autumn dormancy. Mature plants are unpalatable, the characteristic drooping seed heads becoming brittle as the plant dries, shattering upon disturbance and disseminating the sharp-tipped lemmas with their barbed awns. These can work their way into eyes, nostrils, mouths, and intestines of grazers. Put succinctly by Aldo Leopold (1949), he writes "to appreciate the predicament of a cow trying to eat mature cheat, try walking through it in low shoes. All field workers in cheat country wear high boots." It does have some forage value very early in the growing season for livestock, deer and pronghorn and is also used as a green food and seed food for birds and small mammals. Cahuilla cooked it into gruel during food shortages. Fibers are used for mats, rugs and bedding. **(PLATE 61)**

Coastal Sandbur (*Cenchrus spinifex*) is an annual or short-lived perennial grass native to Arizona but often considered a weed because of its spiny burs. Found in the southern U.S., it grows to a height of between 30-100 cm tall. The flower parts are not discernable with the naked eye. The flower spikes consist of burs with very sharp spines that get into animals' feet, puncture bicycle tires, and are painful when stepped on. As its common name implies, it prefers sandy soil. **(PLATE 62)**

A native annual grass that grows to 90 cm high, **Feather Fingergrass** (*Chloris virgata*) can be an aggressive invader of degraded land and out-competes other native species, gaining the notoriety of a weedy plant. It produces abundant seed, which, being very light, is easily transported by wind and water. Its inflorescence has a feathery appearance and consists of 4-12 fingerlike, erect to spreading,

yellowish-brown spikes. It grows well in heavier soils and in open, sunny areas. **(PLATE 63)**

Pampas Grass (*Cortaderia sp.*) is a non-native, ornamental, perennial grass reaching 2.4-4.7 m tall. It grass grows best in sunny places with somewhat damp ground, though it can live in a wide variety of habitats including hard, rocky areas, flooded areas, and streambanks. The inflorescences form attractive, silvery white plumes with a pink blush that persist until mid winter. The female plants produce more showy plumes than male plants. Its leaves are only 1.3 to 2 cm wide but can be 3 m long. Due to its environmental adaptations, pampas grass has been listed as a noxious weed in several U.S. states, New Zealand, and Australia. Its rapid growth and accumulation of above-ground and below-ground biomass make it highly competitive with native plants once seedlings become established, and it poses a substantial threat to native ecosystems. Pampas grass is occasionally cultivated in some areas for its fiber, which is used in making paper. **(PLATE 64)**

Bermuda Grass (*Cynodon dactylon*) is an introduced, perennial, mat-forming, warm season grass reaching 0.4 m tall. Widespread and capable of growing in many soil types, Bermuda grass grows best on fertile, sandy to silty soils or alluvium. The panicle has two to seven fingerlike branches and flowers from July to October. Bermuda grass is highly preferred by cattle. It also increases streambank substrate stability during floods by armoring sand and thereby resisting scouring. Bermuda grass is used as a turf grass for lawns, athletic fields, and golf courses. It is suspected of having allelopathic qualities, meaning that it produces chemical compounds which inhibit the growth of other plant species nearby, thus increasing its competitive ability. **(PLATE 65)**

False Fluff Grass (*Dasyochloa pulchella*) is a native, perennial, sometimes mat forming grass reaching 4-15 cm tall. It grows in rocky soils of arid regions and flowers from March to October. The flower parts are densely hairy and silvery, located among a cluster of leaves at the end of the stem. Seeds fall at maturity, leaving a pair of papery bracts. Fluffgrass is one of the poorest forage grasses on Arizona ranges. When young and actively growing, the plants are covered with a bluish-white down that may be objectionable to livestock. Later, when the plants mature, the leaves become harsh, wiry, and sharp pointed. **(PLATE 66)**

Hairy Crabgrass (*Digitaria sanguinalis*) is a short, native annual up to 30 cm tall, which flowers in the late summer. The leaf blades of crabgrass, which turn reddish with age, are hairy above and beneath. The inflorescence is similar to feather fingergrass, but the 4-9 fingerlike branches are longer and two-rowed. Its blades are wider than those of fingergrass and the plant is generally much more prostrate and shorter. The seed can be ground to make a fine white flour used for semolina. Portions of the plant have been used as a folk remedy for cataracts and debility, in the treatment of gonorrhoea, or as an emetic. Fiber obtained from the plant is used in making paper. **(PLATE 67)**

Barnyardgrass (*Echinochloa crus-galli*) is a non-native, often weedy tufted annual growing to 1.5 m tall, and is widespread in all warmer regions of the world, both temperate and tropical. In the southwestern U.S., it occurs in moist, often disturbed loamy soil, in marshes, seepage areas, and in mud and water of lakes, ditches and flood-plains. The leaves are flat, smooth, 30-50 cm long and 1-2 cm broad. Flowering from July-September, the inflorescence forms a panicle 5-21 cm long, upright or nodding with laterally compressed spikelets 3-4 mm long. Barnyardgrass is readily grazed by livestock in Arizona, and the seeds are eaten by songbirds, waterfowl, and greater prairie chickens. Seeds are also used extensively as food by several American Indian tribes who grind them into a meal. The roasted seed can be used as a coffee substitute. **(PLATE 68)**

Squirreltail (*Elymus elymoides*) is a native perennial grass reaching 10 to 45 cm tall, and is adapted to a wide range of ecological and topographical conditions, from desert shrub to alpine plant communities. Leaf blades are 1 to 6 mm wide and are flat or can have their edges rolled in toward the middle. The inflorescence is a spike from 2 to 17 cm long, which at maturity can be over 12 cm across due to the widely spreading awns. Awns are rough to the touch and may grow from 2 to as much as 10 cm long, and often become purple with maturity. Bottlebrush squirreltail is a dietary component of several wildlife species, including pronghorn, Townsend's ground squirrels Nuttall's cottontails, and black-tailed jackrabbits, however mature awns may penetrate flesh around the mouth, eyes and ears of grazing animals, producing inflammation. Native Americans use young plants to feed sheep and horses. **(Plate 246)**

Slender Wheatgrass (*Elymus trachycaulus*) is a tufted, native perennial bunchgrass reaching 60-120 cm, growing in dry to moist, medium-textured soil. Leaves vary from 8-33 cm long and 0.6-1.3 cm wide, with basal leaves longer than upper leaves. The stems are erect, ranging from 8-120 cm in height, and bear a terminal, erect inflorescence. Slender wheatgrass is palatable and nutritious for livestock, and also makes a good quality hay. It is among the preferred wheatgrasses for elk and bighorn sheep at higher elevations. Slender wheatgrass is also grazed by sage grouse, deer, moose, mountain goat, pronghorn, and various rodents, and the seeds are eaten by various seed predators. Slender wheatgrass provides hiding and thermal cover for songbirds, upland game birds, and small mammals, and is used as nesting cover by mallard, northern pintail, and blue-winged teal ducks. Native Americans use this plant to induce vomiting in dogs, and also as horse feed. **(Plate 247)**

Nineawn Pappusgrass (*Enneapogon desvauxii*) is a native, slender-stemmed perennial bunchgrass reaching 10-40 cm tall, commonly found growing on rocky slopes and crevices in desert woodlands. The narrow leaves are rolled or folded, light green to gray-green in color, with very fine, soft hairs. The densely flowered, bristly-looking spikes are highly variable in length, but typically range from 2.5 to 5 cm long and 1.3 to 2 cm wide, and are gray-green in color. Nineawn pappusgrass flowers from August-September, and has nine feathery awns on the lemma. **(PLATE 69)**

Stinkgrass (*Eragrostis cilianensis*) is an introduced annual grass native to Europe. Its flat, hairless leaf blades are up to 20 cm long and 7 mm broad, with many minute glands on the leaf margins which can be felt or seen with a lens. Growing to 40 cm high and flowering from June to October, stinkgrass lives around streambanks, pastures and disturbed sites. The plant can be identified by its tufts of hairs at the base of the leaves and the small glands which are present on nearly all parts of the plants. The glands sometimes emit a foul odor when crushed, giving the plant the “stinkgrass” moniker. It is believed to be mildly toxic if ingested. **(PLATE 70)**

Weeping Lovegrass (*Eragrostis curvula*) is a non-native, perennial, rapidly growing warm-season bunchgrass that was introduced from East Africa. The many long, narrow leaves emerging from a tight tuft are pendulous, with the tips almost touching the ground, giving rise to the name “weeping” lovegrass. Leaf height is rarely above 30 cm. The seed heads are open panicles, reaching a height of 75-100 cm and containing numerous small, fine seeds. A deep-rooted plant, it is considered excellent for protecting terraces and for grassing water channels, and is valuable for erosion control. In Lesotho, the plant is used to make baskets, brooms, hats, ropes, and candles. **(PLATE 71)**

Lehmann Lovegrass (*Eragrostis lehmanniana*) is a non-native perennial bunchgrass, 45-60 cm tall, that is bright green and cures to a dull yellow. Introduced from South Africa to control erosion, this grass has become well adapted to the semiarid ranges of the Southwest, especially in southern Arizona, where it has become a serious pest. Its leaves are up to 15 cm long and rather stiff. The panicles are open, 15 cm long and 8 cm wide. The greatest forage value of this grass lies in its ability to remain green late in the fall and also become green early in the spring, when it is preferred by grazers to the dry native grasses. **(PLATE 72)**

Tufted Lovegrass (*Eragrostis pectinacea*) is a tufted native annual or short lived perennial grass that grows 10-40 cm tall. It is a smooth, slender grass, ascending or spreading from a decumbent base, and branching below. The leaf blades are flat and 4 to 9 cm long with slightly rough margins. The inflorescence is a pyramid-shaped, very open panicle up to 25 cm long and 15 cm wide, with slender branches with hairs at the base. Tufted lovegrass is often considered to be a weedy species. **(PLATE 73)**

Tapertip Cupgrass (*Eriochloa acuminata*) is a native annual grass up to 120 cm tall which sometimes roots at the lower nodes. The inflorescence is composed of racemes, each up to 2.5 cm long, coming off of a central axis. The leaf-blades are 7–15 cm long and have a smooth, hairless surface. The ligule of cupgrass is a fringe of hairs. This species, which prefers open ground and is often encountered as a weed in fields, is found in the Southwest and into northern Mexico, and portions of the eastern United States. **(PLATE 74)**

Hairy Woollygrass (*Erioneuron pilosum*) is a native perennial grass reaching 10-30 cm tall. It grows in dry, rocky areas and flowers from April-October. The seedhead, which is terminal on a mostly leafless stem, is typically hairy and often has short awns. It is up to 4 cm long and the numerous spikelets are compressed together closely. Its short leaves have sharp, stiff points and conspicuous white margins. **(PLATE 75)**

Needle and Thread (*Hesperostipa comata*) is a native perennial bunchgrass reaching 35-75 cm tall and found on sandy or rocky plateaus and valleys, often in association with junipers. The inflorescence is a panicle, 10-20 cm long, and flowering from May-June. Needle-and-thread grass is widespread throughout the West and can be important to livestock and wildlife, especially early in the spring. The plant is the preferred forage of black-tailed jackrabbits, black-tailed prairie dogs, northern pocket gophers, and desert cottontails, and is the host plant for the common ringlet butterfly. **(PLATE 76)**

Wild Barley, Smooth Barley (*Hordeum murinum* ssp. *glaucum*) is a non-native annual grass reaching 40 cm tall. Commonly found as a weed of waste places and fields below 1600 meters, wild barley is native to Europe. Its lemmas taper to stout awns 1.5-3 cm long, giving it a strong resemblance to wheat. This *Hordeum* blooms from April-June. Native Americans use a decoction of the plant for bladder ailments, and when other foods are scarce, its seeds can be used for pinole. **(PLATE 77)**

Perennial Ryegrass (*Lolium perenne*) is a non-native, annual or short lived perennial bunchgrass reaching 90 cm tall, adapted to a wide range of soil types and drainage conditions and distributed throughout the United States. The numerous long, narrow (up to 6 mm wide) stiff leaves arise from near the base of the plant, and have smooth, glossy undersides. Inflorescence stems are nearly naked, topped by spikes with alternating spikelets growing edgewise to the stem. Perennial ryegrass offers fair cover for upland game birds and waterfowl. **(Plate 248)**

Deer Grass (*Muhlenbergia rigens*) is a tall (60-150 cm) native bunchgrass, commonly growing on gravelly or sandy canyon bottoms or washes, often in moist soil, or less frequently on dry plateaus and meadows. The inflorescence is a panicle of dense spikes 8-40 cm long, flowering from July-August. Dense patches of deergrass provide cover during the fawning period of mule deer in mountain meadows and grassland openings. The younger palatable tufts are grazed by deer, horses, and cattle, and are particularly sought for forage by animals when first resprouting after a burn. The seeds provide food for songbirds. The plant forms a larval food source for butterflies such as the California ringlet and the umber skipper, and massive numbers of ladybugs often overwinter in deergrass clumps. Deergrass is a significant basketry material to Native Americans, who utilize the flower stalks in the foundations of coiled baskets. Seeds are also ground to make bread. **(PLATE 78)**

Vine Mesquite (*Panicum obtusum*) is a native perennial sodgrass growing to 80 cm tall, with wiry runners along the ground and bluish-green leaves. Because of its sod-forming habit, stands of this grass are often rather dense and serve to control erosion. Vine mesquite provides fair forage for grazing animals while green, but becomes coarse and unpalatable after maturity when it turns a reddish-straw color. Its ground stolons are mixed with soapweed by native tribes and used to wash the hair, as the plant is thought to make hair grow more rapidly. **(PLATE 79)**

James' Galleta (*Pleuraphis jamesii*) is a native, warm season, rhizomatous perennial grass, commonly reaching 8-60 cm in height. Tolerant of extremely arid environments, James' galleta is found on dry, sandy plateaus, most often in piñon-juniper woodlands. The inflorescence is an erect spike, generally 3-7 cm long, and flowers from May-October. When actively growing, galleta provides good to excellent forage for cattle and horses and fair forage for domestic sheep. **(PLATE 80)**

Tobosa Grass (*Pleuraphis mutica*) is a native, warm season, perennial sod-forming grass usually growing 0.3-0.6 m tall. Tobosa is common on both lowland and upland sites, but is most often found in soils that have developed from basin fill material. The inflorescence consists of an erect, white, straw colored or occasionally purplish spike 4-8 cm long. In the southwestern United States tobosa is an important forage species for cattle and horses. Tobosa may become infested with ergot, which can cause a nervous condition in cattle that eat infested plants. **(PLATE 81)**

Bigelow Muttongrass (*Poa bigelovii*) is a native annual grass from 15-45 cm tall with thin, hairless leaves. It has a contracted, typically interrupted panicle about 10 cm long. Along with sixweeks fescue, Bigelow muttongrass appears in abundance in the early spring following wet winters. It is highly palatable to livestock but usually does not provide sufficient growth to be of importance as a forage grass. **(PLATE 82)**

Muttongrass (*Poa fendleriana*) is a native perennial grass reaching over half a meter in height. Its inflorescence is a panicle comprised of 15-60 distinct spikelets. A very common grass to the forested areas of northern Arizona, it needs fairly moist soil, ample sunlight and well-drained soil. When the bluish leaf blades are unrolled, two parallel depressed lines run along either side of the midvein, a characteristic of leaves in the *Poa* genus. It is drought resistant, palatable (even the dry growth), nutritious, and starts growth very early in the spring. Seeds of muttongrass are ground, boiled and formed into edible dumplings by the Havasupai. **(PLATE 83)**

Streambed Bristlegrass (*Setaria leucopila*) is a native, perennial bunchgrass reaching up to 1.2 meters tall. The somewhat rough and hairy leaves are about 40 cm in length and become curly and orange-brown at maturity. Its narrow, cylindrical spikes are 8-15 cm long and resemble the ragged inflorescence of

timothy grass, but are bristly with stiff hairs extending from between the spikelets. This bristlegrass is most abundant on dry plains (especially in southern Arizona), rocky slopes and along washes, often in partial shade of shrubs or trees. The tender basal leaves are highly palatable and are readily eaten by grazing animals. **(PLATE 84)**

Green Bristlegrass (*Setaria viridis*) is a non-native grass that branches at the base and can grow to 2.5 meters tall, though it is usually much shorter. Flowering from June-October, it has a dense, spikelike panicle up to 8 cm long with many green or purple-tinged bristles coming from the base of the spikelets. Green bristlegrass is a common weed of lawns, roadsides, waste areas and pasturelands. The seed can be used similarly to rice or millet, and can also be roasted as a coffee substitute. **(PLATE 85)**

Johnson Grass (*Sorghum halepense*) is a non-native, warm-season perennial grass reaching 0.5-1.5 m tall, most common on disturbed sites such as ditch banks, roadsides, fields, and waste places. The inflorescence is a 10-60 cm open panicle, flowering from June-October. Johnson grass was planted as a forage grass in wetland areas of the Southwest and has a scattered, patchy distribution on moist desert sites. Although Johnson grass is generally a good forage grass, at certain developmental stages or under adverse environmental conditions, the plant may form cyanogenetic glycosides that can poison livestock, and prolonged consumption of fresh Johnson grass can cause nitrate poisoning in all classes of livestock. Because of these problems, numerous states in the U.S. and the province of Ontario in Canada have officially declared Johnson grass as a noxious or prohibited weed. Kiowa use Johnson grass a fodder for horses and to make grass whistles used by children. **(PLATE 86)**

Spike Dropseed (*Sporobolus contractus*) is a native perennial grass growing to 0.8 m tall, and commonly found on mesas, dry bluffs and sandy soils. Blooming from June-September, the contracted panicle of single flowered, awnless spikelets is sometimes entirely enclosed in the leaf sheath. In general the forage value of the dropseeds is good to fair for cattle and horses. Aboriginal peoples use the seed raw or cooked, and it can be ground into flour and used to make gruel, bread, biscuits etc. Bunches of the grass leaves have been fastened together to make mats for covering doorways in the home. **(PLATE 87)**

Mesa Dropseed (*Sporobolus flexuosus*) is a native perennial bunchgrass with tall stems (1 meter), many leaf blades and coarse roots. It has an open panicle, with the main axis drooping or “flexing” upward, and slender branchlets with relatively few spikelets. Native Americans use seeds of this grass as food. **(PLATE 88)**

Giant Dropseed (*Sporobolus giganteus*) is a native perennial grass reaching 2 meters in height, often found on mesas, dry bluffs and sandy soils. Hopi use the seeds to make mush, and the stems to make pahos (prayer sticks). Bundles of

plant are used to cover kiva entrances during the bean ceremony, and the pollen is used in the hunting ceremony. **(PLATE 89)**

Slim Tridens (*Tridens muticus* var. *elongatus*) is a native, densely tufted, erect perennial grass with thick leaf blades up to 8 cm long. The plant grows 30-80 cm tall, is unbranched, and is often hairy at the nodes. The panicles are 6-20 cm long, narrow, and dense, with very short, appressed branches. Slim tridens grows on well-drained soils from Colorado to Missouri and from Arizona to Louisiana. **(PLATE 90)**

Small Fescue (*Vulpia microstachys*) is a native annual grass that grows from 5-40 cm tall, with hair-like leaf blades which are more or less rolled. It has an open inflorescence with purple-tinged spikelets, and branches that appear swept to one side. Small fescue occupies dry meadows, fields and disturbed sites such as roadsides. It is relatively unpalatable to most species of wildlife and livestock. **(PLATE 91)**

Sixweeks Fescue (*Vulpia octoflora*) is a small, native, loosely tufted or solitary cool-season annual grass which grows well on a variety of open, disturbed areas, but is most common on upland range sites. The plant blooms from May-July, with a narrow, densely-flowered panicle 2-10 cm long, and provides little forage for most livestock and wildlife species except for a short time during the early spring. Sixweeks fescue is relatively unpalatable to most livestock and wildlife, and its presence often indicates overgrazing. Navajo and Kayenta roast the seeds for food. **(PLATE 92)**

WILDFLOWERS

-CENTURY-PLANT FAMILY (AGAVACEAE)-

Parry's Agave (*Agave parryi*) is a native perennial succulent found on dry, rocky slopes. It grows as a tight whorl of gray-green, thick-toothed, terminally spined leaves reaching 25-40 cm long. The flower stalk is a 3-5 m tall panicle with a stout, straight stalk and approximately 20 to 35 slightly ascending branchlets on the upper half of stalk. Flowers are pink to red in bud, opening to various shades of yellow. The combination of the red and yellow blooms is very showy. Flowers are 60 to around 75 mm long, and appear in June and July. Parry's agave is a host plant for the orange giant skipper butterfly. Native Americans use the agave for making soap, and for treating indigestion, stomach fermentation and chronic constipation. Also used as a food by many tribes. **(PLATE 93)**

Bear Grass (*Nolina microcarpa*) is a native, grass-like perennial with very long (60-120 cm), narrow (6-12 mm) leaves with minute teeth along the margins. It is

found in the high desert environs of the southwestern United States and northern Mexico. Beargrass flowers from May-June, producing a dense cluster of minute, cream to tan flowers on a long stalk, up to 2 m tall. Beargrass has little value for livestock, and cattle graze the foliage only in times of drought. With extensive consumption the plant may be poisonous, especially to sheep and goats, though deer can and do eat large quantities of beargrass with no apparent ill effect. The Papago, Pima, and various Puebloan tribes use beargrass leaves to form the stuffing or warp of coiled baskets. The Isleta Pueblo in New Mexico grind beargrass seeds into flour for food, and drink a tea of boiled beargrass roots as a cure for pneumonia and rheumatism. **(PLATE 94)**

Narrowleaf Yucca (*Yucca angustissima*) is a native shrub with long (20-40 cm), narrow (less than 2 cm) leaves, and is found on desert flats or mesas, often on sandy places or on sandstone outcrops. The inflorescence is a 10-150 cm long stalk with greenish-white flowers, blooming from May-August. The flowers are pollinated by the yucca moth as she implants her eggs, and the resulting larvae feed on the developing fruit. Narrow leaf yucca is also a host plant for the Strecker's giant skipper butterfly. Apache use the plant as a snakebite remedy, while Hopi crush the root and use it in a purification ceremony. The root is also used as a strong laxative, or to make soap. The fruits are sometimes used as food, and the leaves as string, brushes, brooms, and materials for basketry. **(PLATE 95)**

Banana Yucca (*Yucca baccata*) is a native shrub with leaves from 40-75 cm long and about 5 cm wide at the middle. It occurs in canyons and on dry plains, washes, and slopes. The inflorescence is a panicle on an erect stem 35-65 cm long, rising only slightly above the height of the leaves, which blooms from the bottom up from April-June. Flowers are white to cream in color, waxy, drooping and bell shaped. Fruits are banana shaped, 8-17 cm in length and 3-6 cm wide. As with narrow leaf yucca above, yucca moths are the main pollinators, though it is also the host plant for yucca giant skipper and ursine giant skipper butterflies. The plant provides cover for upland gamebirds, and for songbirds and small mammals. Wild and domestic ungulates and rodents browse the leaves, flowers and fruit. Native Americans use the fruits for food, the roots for soap or as a laxative, and the leaves for baskets, rope, sandals, and mats. Portions of the plant are also used to make several dyes. **(PLATE 96)**

-AMARANTH FAMILY (AMARANTHACEAE)-

Prostrate Pigweed (*Amaranthus blitoides*) is a non-native annual herb, commonly found in prairies, fields, roadsides, and waste areas across the U.S., and listed as invasive in several states. The stems are prostrate or ascending, much-branched (usually from the base), and can be up to 1 m long. The leaves are numerous and oval-shaped, from 8-25 mm long. The flowers are green and 5-parted, with no petals, and form dense clusters from the base of the leaves. Prostrate pigweed is a type of tumbleweed, and when dried, the stems break off easily and are tumbled along by the wind, dispersing seeds. All *Amaranthus*

species have similar medicinal qualities. A tea can be made from the leaves to relieve stomach pain, while the stem is used to stimulate the mucous membranes. The leaves are mixed with lavender and steeped with milk for infants that are undergoing continuous vomiting. The leaves are eaten as a green and the seed is ground into a meal or flour. **(PLATE 97)**

Careless Weed (*Amaranthus palmeri*) is a native annual herb reaching 1.8 m tall. The leaves are lanceolate or egg-shaped, with prominent white veins on the undersurface. The flowers are borne on long, dense, slender spikes near the apex of the plant, with the male and female flowers on separate plants. The central spike is up to 45 cm long (much longer than the lateral ones), which makes it easy to identify because no other *Amaranth* species have terminal inflorescences of that length. Careless weed is an important food source for many Native American tribes. **(PLATE 237)**

Powell's Amaranth (*Amaranthus powellii*) is a native annual herb reaching 1.5 m tall, found on dry, open slopes, rocky places and mesas. The leaves are lanceolate to ovate, and hairy beneath, at least on the veins. The flower spikes, located near the apex of the plant, are shorter and thicker than those of careless weed, and male and female flowers are borne on the same plant. Like careless weed above, Powell's amaranth is an important food source for many Native American tribes. **(PLATE 98)**

-CARROT FAMILY (APIACEAE)-

Purple Cymopterus (*Cymopterus multinervatus*) is a native perennial herb 5-20 cm tall, typically found growing on dry, rocky or sandy hillsides. The finely divided leaf blades are 1-8.5 cm long and fleshy. As with all members of the carrot family, the inflorescence is an umbel (meaning the flowers sit on stalks radiating out from a central point). The plant blooms from March-April, with egg-shaped purplish flowers that mature to form a shallow sheath or cup with papery seeds. The Hopi use the roots for food in the spring. **(PLATE 99)**

American Carrot (*Daucus pusillus*) is a native annual herb reaching 1 m in height, commonly found in rocky places. The inflorescence is a compound umbel with small, white flowers. Upon maturity, the flower cluster closes to form a cup or bird's nest. Native Americans eat the roots raw and cooked. A poultice of the chewed plant has been applied to snakebites, and a decoction has been used to treat colds, itches and fevers. **(PLATE 100)**

MacDougal's Biscuitroot (*Lomatium foeniculaceum* ssp. *macdougalii*) is a native perennial herb reaching 10-30 cm tall and flowering from March-June. The inflorescence is a compact umbel with 2-14 rays of unequal length, and the tiny flowers have yellow petals sometimes tinged with purple. Leaves have a parsley flavor and are often used in soups and salads. Large roots are boiled, roasted and dried for later use. **(PLATE 101)**

Nevada Biscuitroot (*Lomatium nevadense*) is a native perennial herb, found on dry, open slopes, rocky places and mesas. The inflorescence is a compact umbel early on, but becomes more open, with rays elongating unequally. Flower petals are white to cream-colored, and bloom from March-May. The plant has medicinal effects against respiratory viral infections, and is said to be useful in eliminating latent viruses such as Epstein-Barr or cytomegalovirus. In combination with ginger or dandelion Nevada biscuitroot may stimulate liver function, and a tincture can also be used to treat oral inflammations and ailments. Peeled roots are often eaten fresh like radishes by the Paiute. **(PLATE 102)**

-MILKWEED FAMILY (ASCLEPIADACEAE)-

Antelope Horns (*Asclepias asperula*) is a native perennial herb reaching 10-80 cm tall, found in flats and desert swales, and sandy or rocky hillsides. Blooming from March-August, the inflorescence is solitary and terminal, usually very crowded, with rather large, pale yellowish green flowers often tinged with purple. Antelope horns is attractive to monarch butterflies because it is the primary food source for monarch caterpillars, and the flowers also attracts hummingbirds. Navajo use the plant as a ceremonial emetic, and some people chew the milky latex as gum. Used for respiratory conditions such as asthma, pleurisy, bronchitis, and general lung infections, antelope horns is also effective for stimulating menstruation. **(PLATE 103)**

Wavyleaf Twinevine (*Funastrum crispum*) is a native perennial vine climbing to 3 m high, found growing in dry sandy soil of desert washes and arroyos throughout southern and central Arizona. The plant can be a nuisance around ranches, often climbing on fences, ditches, small trees and shrubs, and spreading into gardens and cultivated fields. The leaves are lanceolate to narrowly lanceolate, 3-10 cm long, with wavy margins. The greenish purple flowers bloom from April-October in umbel-like clusters and have 5 petals fringed with white hairs. Pima and Gila River tribes make baby food by roasting the sap on coals. A gum-like candy was also made in a similar way. The Luiseno consume the plant raw with salt. **(PLATE 238)**

Texas Milkvine (*Matelea producta*) is a native perennial vine from a woody base, found growing in valleys, desert washes and arroyos throughout southern and central Arizona. The flowers are pale-green and funnel shaped and bloom from August-September. The Apache, Chiricahua and Mescalero eat the seeds fresh or boiled. **(PLATE 104)**

-ASTER FAMILY (ASTERACEAE)-

Brownfoot (*Acourtia wrightii*) is a native perennial herb reaching 91 cm in height, and found on bajadas and rocky slopes. Blooming from January-June, the flower heads are approximately 2 cm across in terminal clusters, with violet-pink flowers followed by tan-colored bristles. The flowers are attractive to many

species of butterflies. Native Americans use the plant as a dermatological aide and for problems during and after childbirth. **(PLATE 105)**

Weakleaf Burr Ragweed (*Ambrosia confertiflora*) is a native perennial herb reaching 91 cm in height, found growing in fields, foothills, along roadsides and in waste places. The grayish to silvery-green leaves are deeply pinnately lobed. This allergenic weed has separate male and female yellowish to greenish flowers in terminal inflorescences, with the male flowers near the top and the female flowers below. **(PLATE 106)**

Western Ragweed (*Ambrosia psilostachya*) is a native perennial herb reaching 20-100 cm tall, found on disturbed sites and along stream-sides. The leaves are deeply pinnately lobed, with short, stiff hairs. Flowering from July-October, the plant has yellowish to greenish flowers, with the male flowers located near the top of the inflorescence, and the female flowers below. Western ragweed is used as habitat for small mammal and birds, and the seed is eaten by upland game birds. Cheyenne use the leaves and stems to remedy painful digestion, as a laxative, for labor pain and as a cold treatment. Keres, Kiowa and Deguena tribes use a stem and leaf tonic for dandruff. The plant is also rolled with sage in Kiowa sweatlodges. **(PLATE 107)**

Field Sagewort (*Artemisia campestris*) is a native perennial herb from 2-7 cm tall, occurring in valleys and on slopes and ridges on a variety of soil textures. It grows well in sand, and is common on sand dunes and sand prairies. The flowers are narrow panicles with numerous, small heads 2.5-3.8 mm long and 2-2.3 mm wide. Flowers are green to yellowish and bloom from July-October. Navajo crushed the seeds for food and also used the plant as a disinfectant. **(PLATE 108)**

White Sagebrush (*Artemisia ludoviciana*) is a native perennial herb growing 0.15-1.0 m tall across a wide range of habitats and soil types. The leaves are alternate and irregularly toothed, with a whitish cast. Flowering from June to October, the inflorescence is a narrow, relatively dense panicle reaching 5-30 cm in length, with many nodding flower heads between 2-4 mm in diameter. White sagebrush is a forage plant for pronghorn, mule deer, elk, and grasshoppers, and provides cover and food for greater sage grouse. It is also a host plant for the painted lady butterfly and a species of fruit fly. The plant is widely used medicinally by Native Americans. Blackfoot use leaves as a dermatological aid, while Cheyenne use leaves for headaches, and Comanche chew the leaves for insect bites. Crow use as an astringent for eczema and for underarm and foot perspiration, and Flathead use an infusion for a cold remedy. The plant is also used to flavor meats and to make mats to cover the floor of sweat houses, and is used in many ceremonies. **(PLATE 109)**

Ragleaf Bahia (*Bahia dissecta*) is a native, usually biennial, herb reaching 10-80 cm tall, found in various habitats ranging from dry open ridges, disturbed areas, and meadows, to ponderosa pine forests. The leaves are finely cut and

occur sparsely along the red or brown stems, mostly near the base of the stem. The flowers have bright yellow disks and rays and bloom from August-October. Navajo make a slow tea for menstrual pain, arthritis, and as a contraceptive, while the Zuni apply the powdered plant for headaches and rheumatism. **(PLATE 111)**

Desert Marigold (*Baileya multiradiata*) is a short-lived perennial native herb reaching 30-40 cm tall, most often found on sandy and gravelly soils on dry plains and mesas below 1500 m in elevation, and commonly on disturbed areas such as roadsides. The conspicuous flowers are bright yellow, approximately 5 cm across, and bloom from March-October. Desert marigold attracts butterflies and birds such as black-throated sparrows, which consume the pale tan seeds in fall. In May or early fall, one might find the flower heads sealed into a ball, which is attributable to larvae of the desert-marigold moth, which constructs the balls as cocoons. Native Americans use the plant as a deodorant and as a building material by mixing it with clay to form plaster. **(PLATE 112)**

New Mexico Thistle (*Cirsium neomexicanum*) is a native biennial herb reaching 1.5-2.5 m tall, commonly found in sandy to gravelly washes, and on dry, rocky slopes, mesas, canyon sides, and plains and foothills. Blooming from March-September, the attractive flower heads are solitary to few at the end of stems or branches, and are white to lavender or pink. Thistle seeds are the favorite food of goldfinches and many other birds, while the flowers provide nectar and pollen for bees. Many insect species feed on New Mexico thistle, and it is a host plant for the painted lady butterfly. Taproots of young plants can be eaten raw or roasted, and are often fried, mashed or ground into flour. The flowers may be eaten raw or cooked and have a high nutritional value. Navajo use a root infusion for chills, fever, and colds. **(PLATE 114)**

Canadian Horseweed (*Conyza canadensis*) is a native annual herb reaching 50-150 cm tall, commonly found in fields, along roadsides and in waste places. The flower heads are tiny and daisylike, with white rays and yellow disks, and bloom from July-October. Canadian horseweed attracts bees, butterflies and birds. Native Americans use dried parts of the plant to make an astringent for the face. Hopi make a poultice to rub on temples for headaches. Miwok pulverize the leaves and tender tops because the flavor is similar to onions. **(PLATE 115)**

Spreading Fleabane (*Erigeron divergens*) is a native biennial herb reaching 10-50 cm tall, located on foothills, meadows, disturbed areas and ponderosa pine forests. The flower heads, which are pink in bud and when first opening, have numerous slender white or bluish-white rays around yellow centers, and bloom from May-August. An infusion of the plant is used as an eye wash and a lotion. It is considered an omen of good fortune to have spreading fleabane in the home. **(PLATE 116)**

California Cottonrose (*Filago californica*) is a woolly, native annual herb reaching 5-35 cm high, common on dry, rocky slopes and flats. The woolly, 0.8-2

cm oblong-linear leaves are alternate and simple. The inconspicuous green flowers bloom from March-May. California cottonrose is a common food source for the desert tortoise. **(PLATE 117)**

Red-Dome Blanket Flower (*Gaillardia pinnatifida*) is a native perennial herb reaching 10-50 cm tall, located in fields, along roadsides and in waste places. The showy, 4-5 cm wide flower heads have red to maroon centers and yellow, 3-lobed rays. The seed heads are round, fuzzy, tan-colored balls. Navajo use a tonic of the plant for gout, while Hopi use it as a diuretic for painful urination, and the Havasupai grind seeds into butter. **(PLATE 118)**

Broom Snakeweed (*Gutierrezia sarothrae*) is a native perennial shrub with linear leaves, and that grows from 20-70 cm in height. It occurs on a variety of dry habitats across the Great Plains and Rocky Mountains. The yellow flower heads have 3 to 8 ray flowers per cluster and 2 to 6 disk flowers per cluster, and bloom from July-November. Broom snakeweed is utilized by mule deer, pronghorn antelope, small mammals and birds. The plant is also used by numerous Native American tribes for a variety of reasons. Blackfoot use the roots of broom snakeweed in an herbal steam as a treatment for respiratory ailments, while Dakota use a concentrate made from the flowers as a laxative for horses, and Lakota take a decoction of the plant to treat colds, coughs, and dizziness. Navajo rub the ashes of broom snakeweed on their bodies to treat headaches and dizziness, and chew the plant and apply it to wounds, snakebites, and areas swollen by insect bites and stings. The Comanche use the stems of broom snakeweed to make brooms for sweeping their residences. **(PLATE 119)**

Common Sunflower (*Helianthus annuus*) is a native annual herb reaching 30-200 cm or more in height, typically found in open and/or disturbed areas such as roadsides. The flower heads are 7-15 cm wide and at the ends of branches, with yellow rays and reddish-brown disks. The common sunflower is a host plant for the California patch, bordered patch, and painted lady butterflies, and is also a favorite food of several bird species. Native Americans use common sunflower as a drug to treat spider and snake bites, as well as for chest pains, pulmonary troubles, rheumatism, and as a disinfectant. As a food, the seeds are eaten raw or roasted, or ground to make bread, dumplings, and seed oil. The stems are used for fibers to hold plasters together or to make bird snares, and also to make candles. **(PLATE 120)**

Camphorweed (*Heterotheca subaxillaris*) is a native annual herb reaching 1.5 m tall, often found in disturbed sites, prairies, open woods, and roadsides in dry, sandy or rocky soils. The leaves are large (up to 10 cm long and 5 cm wide), rough-hairy, and smell like camphor. The inflorescence forms a loose, flat-topped cluster of numerous heads, with conspicuous yellow flowers 2.5 cm wide, and blooming from March-November. Camphorweed provides cover and protection for Montezuma quail. Livestock will not consume the plant. **(PLATE 121)**

Hairy False Goldenaster (*Heterotheca villosa*) is a native perennial herb reaching 10-50 cm tall, found on dry slopes, plains and mesas. The conspicuous yellow flower heads, about 1-2 cm wide, are solitary to several near the ends of the stems and bloom from May-October. Cheyenne and Hopi make an infusion from tops and stems of the plant for chest pains or general malaise. Navajo use the plant as a ceremonial emetic and chant lotion, and also as sheep fodder. **(PLATE 122)**

Fineleaf Hymenopappus (*Hymenopappus filifolius*) is a native perennial herb reaching 60 cm tall, and found in semi-desert foothills, woodlands, and forest openings. Flower heads are discoid (meaning they have no ray flowers), yellow, up to 1 cm in diameter and bloom from May-October. Native Americans make a dermatological aid from the plant to reduce swelling, and the leaves are boiled and rubbed with cornmeal and baked into breads. Zuni use the root as a chewing gum. **(PLATE 123)**

Loomis' Thimblehead (*Hymenothrix loomisii*) is a native, annual or short-lived perennial herb reaching 1.5 m tall. It is commonly found in open disturbed sites, prairies, open woods, and roadsides in dry, sandy or rocky soils. The leaves are dissected into 1–2 mm wide linear lobes, and are hairless or have short hairs. The cream-colored flower corollas are 5–7 mm wide, with the outer ones often larger than the inner, and bloom from June-October. **(PLATE 124)**

Cooper's Rubberweed (*Hymenoxys cooperi*) is a native, biennial or short lived perennial herb reaching 30-70 cm tall, and often growing on dry, rocky slopes and ridges. Blooming from May-September, the flower heads are few to several on the ends of stems, about 3 cm in diameter, with yellow ray and disk flowers. Hopi use the plant to make a tea, a dye and for pahos (prayer sticks). **(PLATE 125)**

Ubiquitous throughout the United States, **Prickly Lettuce** (*Lactuca serriola*) is a non-native annual herb reaching 30-150 cm tall, and often found in fields, waste places and disturbed sites. Leaves are 5-35 cm long and distinctly lobed, with prickles along the midvein on the lower surface. They emit a milky sap when cut. Flower heads are numerous, pale yellow in color, and 10-15 cm in diameter, blooming from July-September. Navajo use a decoction of this plant as a ceremonial emetic. **(PLATE 127)**

Whitedaisy Tidytip (*Layia glandulosa*) is a native annual from 10-40 cm in height, with white ray flowers reminiscent of a child's daisy drawing. Tidytip ranges from Arizona up the west coast into Canada, and prefers sandy, well-drained soil and open, sunny conditions. The seeds can be ground into a powder and used with other ground seeds in a mush or porridge. **(PLATE 128)**

Hoary Tansyaster (*Machaeranthera canescens*) is a native, biennial or short lived perennial herb reaching 10-50 cm, and commonly found in open, dry habitats. Flowers are many and conspicuous, with bright bluish-purple rays and

yellow centers, blooming from June-November. Hoary Tansyaster is a host plant for the sagebrush checkerspot butterfly. Shoshoni make a tea out of the entire plant to purify blood, and to evoke psychic properties. Paiute make a poultice out of the crushed leaves and apply it to swollen glands. **(PLATE 129)**

Grass-Leaf Tansyaster (*Machaeranthera gracillis*) is a native annual herb reaching 10-30 cm tall, and commonly found in dry, open, rocky or sandy areas. Flower heads are 3 cm wide with yellow rays and disks, and bloom from April-October. Navajo use this plant for pimples, boils, sores and as an eye-wash, and a decoction is made for internal injuries. **(PLATE 130)**

Tanseyleaf Tansyaster (*Machaeranthera tanacetifolia*) is a native annual herb growing to a height a 45 cm, and is recognizably different from many other asters by its spiny-tipped and deeply divided leaves. A hardy plant, popular to honey bees and butterflies, it excels in sandy, well-drained soils. The flower heads have purple rays and yellow centers. Roots are used in a sneeze-inducing snuff by the Navajo to reduce nasal congestion. **(PLATE 131)**

Blackfoot Daisy (*Melampodium leucanthum*) is a native perennial herb forming mounds up to 45 cm tall and 60 cm wide. The 4 cm wide flower heads have notched, white rays and yellow disks, produce a fragrant honey scent, and bloom from spring until fall. Butterflies are attracted to this common, showy desert wildflower. **(PLATE 132)**

Cottonbatting Cudweed (*Pseudognaphalium stramineum*) is an annual herb native to our area, but often occurring in disturbed places. It reaches a height of 30-60 cm. The plant has fine, long wooly hairs that help protect it from being grazed and give it a soft, cottony look and feel. The phyllaries that surround the small creamy to yellow flowers may persist through the winter after the flowers have faded, giving cudweeds the alternate title “everlastings.” A hot poultice of the leaves and stems can be applied as an analgesic. **(PLATE 134)**

Spiny Sowthistle (*Sonchus asper*) is a non-native annual forb reaching 150 cm tall, commonly found growing in fields, along fencerows and in waste places. The alternate leaves are stiff, shiny, toothed and sometimes lobed, and clasp the stem. The yellow, dandelion-like flowers are up to 2.5 cm wide and bloom from late spring to mid fall. The ribbed seeds have a fluff of white hairs attached to their upper ends to aid in wind dispersal. The Iroquois use this plant as a pediatric sedative, while the Kayenta either smoke or consume it for palpitations. Several tribes use the leaves and stems as food. **(Plate 249)**

Brownplume Wirelettuce (*Stephanomeria pauciflora*) is a perennial native herb growing up to 60 cm tall from a woody base. The slender, highly branched, mostly leafless stem is blue-green in color, and exudes a milky white sap when broken. It was once used for chewing gum. The word “pauciflora” refers to the fact that the plant produces few flowers, each of which are light pink and small (1-

2 cm across). The root of the plant has various uses, from increasing a mother's milk supply to providing a narcotic effect. **(PLATE 135)**

Pricklyleaf Dogweed (*Thymophylla acerosa*) is a bushy native perennial reaching 20-25 cm from a woody base, found in open deserts and arid, rocky plains across the Southwest. Orange glands on the phyllaries below the small yellow flowers of this plant give dogweed a very distinct, almost medicinal smell. It can bloom all year long with adequate sunlight, keeping many insect pollinators busy. Leaves can be used in baths for fever relief, or mixed with tobacco for more flavorful smoking. **(PLATE 136)**

Five Needle Prickly Leaf (*Thymophylla pentachaeta*) is a native perennial herb reaching 20 cm tall, commonly found along dry roadsides, gravelly slopes, washes and rocky places. Leaves are dark green, opposite, and pinnately cleft into narrow, spiny-tipped lobes. The pretty yellow flowers are up to 1.3 cm across, blooming from April-September and attracting numerous butterflies. The Navajo use this plant as a psychological aid to dreaming. The plant is also eaten or rubbed on the body to mask the scent of hunters. **(PLATE 137)**

Silver Puffs (*Uropappus lindleyi*) is a native annual herb reaching 30 cm tall, found in open grasslands, woods, desert, chaparral and in loose desert soils. The flower heads have pointed, green bracts that extend beyond the yellow rays creating star-like points, and bloom April-June. The seed-heads are round, silvery "puffs." **(PLATE 138)**

Golden Crownbeard (*Verbesina encelioides*) is a showy native annual herb reaching 20-100 cm, often located on open, sandy or rocky places, or pastures. The sunflower-like heads are up to 5 cm across, with 3-toothed yellow rays and yellow centers, and bloom from April-September. Golden crownbeard is a host plant for the bordered patch butterfly. Native Americans use an infusion of this plant as a gastrointestinal aid, for stomach cramps or as an emetic, and apply a poultice to snake bites. The seeds are used for food, and the flowers are hung in the hogan or worn in a hatband as protection from lightning. **(PLATE 139)**

Rough Cocklebur (*Xanthium strumarium*) is a native, broadleaved annual herb reaching 20-150 cm tall, commonly found in open riparian woodlands, intermittent streambeds, and beach habitats. It has small, green flowers occurring at the end of the branches and main stem, blooming from April-October. The fruit is a brown, woody bur about 2 cm long and covered with stout, hooked prickles. Mourning doves eat common cocklebur seeds to a limited extent. Native Americans use this plant for a wide variety of medicinal uses: as a blood medicine, an orthopedic aid, kidney aid, venereal aid and dermatological aid, a fever reducer, and to treat sores. Rough cocklebur seeds can also be used as a food by grinding and mixing them with cornmeal to make breads and cakes, or can be used to make blue paint for mask dancers. **(PLATE 140)**

-BORAGE FAMILY (BORAGINACEAE)-

Popcorn-Flower (*Plagiobothrys* sp.) is a slender, native annual herb with soft hairs on the stem and leaves. The inflorescence forms a short, often somewhat coiled spike or raceme, with tiny white flowers. The red coating on the outside of the leaves and lower stems of some species are used as a red pigment to paint the body and face. The young leaves are eaten as greens and the seeds are made into a pinole. **(PLATE 141)**

Wingnut Cryptantha (*Cryptantha pterocarya*) is a native annual herb reaching 40 cm tall, typically found in sandy and gravelly places in creosote bush scrub, piñon-juniper woodlands, and deserts. The leaves are green, linear to oblong in shape, and covered in bristly hairs. The tiny, white, tubular flowers have 5 lobes and bloom from March-June, followed by 4 nutlets, most or all being winged. **(PLATE 142)**

Bearded Cryptantha (*Cryptantha barbiger*) is a native annual herb reaching 10–50 cm tall, commonly found growing on open, sandy to rocky soils. The leaves are linear-oblong to narrowly lanceolate in shape, and from 1-7 cm long, with bristly hairs. The tiny white flowers bloom from March-June, followed by 4 nutlets. **(PLATE 143)**

Narrowleaf Stoneseed (*Lithospermum incisum*) is a native perennial herb reaching 5-30 cm tall, commonly located in semi-desert foothills, canyons, woodlands and shrublands. The abundant flowers are long, trumpet shaped, and lemon-yellow in color, bloom from March-June, and attract many species of insects. The root has been chewed by some Native Americans as a treatment for colds. Finely powdered leaves, roots and stems have been rubbed on the body in the treatment of paralyzed limbs. An infusion of the root has been used in the treatment of stomach aches and kidney problems. The plant has been eaten as an oral contraceptive, and also as a treatment for lung hemorrhages. A cold infusion of the pulverized root and seed has been used as an eyewash. **(PLATE 144)**

-MUSTARD FAMILY (BRASSICACEAE)-

Tower Mustard (*Arabis glabra*) is a native biennial to perennial herb reaching 40-150 cm tall, often found in dry soil in fields, open woods, and ledges. The pale yellow or cream flowers are 4-petaled, small (3-4.5 mm), and bloom from May-July. The fruits are erect, narrow capsules appressed to the stem. Tower mustard is a host plant for numerous butterflies. An infusion of the plant has been used to prevent or treat colds. **(PLATE 145)**

Perennial Rockcress (*Arabis perennans*) is a native perennial herb reaching 60 cm, commonly found growing in semi-desert foothills, canyons, woodlands and shrublands. The 6-9 mm long violet flowers have 4 petals, and bloom from March-July, followed by slender, wide spreading or pendulous capsules. Perennial rockcress is a host plant for the Stella orangetip and southwestern

orangetip butterflies. This plant is used by the Navajo to soothe the effects of nightmares, or made into a tea to treat dry throats, hiccups and colds. **(PLATE 146)**

American Yellowrocket (*Barbarea orthoceras*) is a native biennial or perennial herb reaching 15-100 cm tall, located in damp meadows, wet rocky places, moist woods, streambanks, and montane coniferous forests. Blooming from April-June, the inflorescence forms a dense raceme with yellow, 4-6 mm long flowers. American yellowrocket is a host plant for the mustard white, large marble and Sara orangetip butterflies. Leaves from the plant are cooked or eaten raw in salads by Alaskan tribes. **(PLATE 239)**

Crossflower (*Chorispora tenella*) is an invasive, non-native annual herb with an unpleasant odor, reaching 10-50 cm tall, often found in semi-deserts, dry disturbed sites, open fields, roadsides and waste places. Introduced from Russia and adjacent regions of Asia in 1929, crossflower has become a problematic weed throughout the central U.S. and southern Canada. Flowers are 10-13 mm long, with 4 pale purple to bluish-purple petals. It blooms from March-June. **(PLATE 147)**

Western Tansymustard (*Descurainia pinnata*) is a native annual herb reaching 70-100 cm in height, located in open woods, disturbed sites, prairies, and along roadsides. The inflorescence is a raceme of flowers with four yellow petals 2 mm long and 1 mm wide. Tansy-mustard is a host plant for the spring white, checkered white, pearly marble, white cabbage and Sara orangetip butterflies, and is grazed by rabbits and other rodents. Native Americans make an infusion of the leaves for sores. Widely used as a food to make cakes, porridge and teas, the flowers are also used to make paint for pottery. **(PLATE 148)**

Wedgeleaf draba (*Draba cuneifolia*) is a native annual herb reaching 4-25 cm tall, located on dry, rocky ledges and open areas in sandy or limestone soils. The small white flowers are arrayed in clusters at the tips of hairy stems that emerge from the base of the plant, and bloom from February-May. **(PLATE 149)**

Shaggyfruit Pepperweed (*Lepidium lasiocarpum*) is a thick-stemmed, native annual mustard reaching a height of 30 cm, and commonly found in sandy washes, roadsides and disturbed areas, often among weeds introduced from Europe. Above the basal rosette of deeply divided leaves, shaggyfruit pepperweed has tiny flowers that, because of the sepals, appear purple. The seeds are used to make bread or are kneaded into a butter and spread onto bread by the Havasupai. **(PLATE 150)**

Peppergrass (*Lepidium virginicum*) is a native annual herb growing to 15-70 cm, and located in fields, disturbed areas, pastures and along roadsides. Blooming from February-August, the plant produces a dense inflorescence at the end of the stem with tiny, inconspicuous flowers with four white petals. Native Americans use the root to make a poultice for sores and for poison ivy, or mix it

with whiskey to treat tuberculosis. Cherokee boil and then fry the plant for food. **(PLATE 151)**

Bladderpod (*Lesquerella cinerea*) is a native perennial herb reaching 15 cm in height, and found on rocky slopes and mesas. The showy flowers are in short, yellow clusters with four petals, and bloom from April-May. This very adaptable and tiny bladderpod is a great plant for a rock garden, growing equally well in sunny scree with regular water or a dryland bed with cacti. **(PLATE 240)**

Gordon's Bladderpod (*Lesquerella gordonii*) is a hairy, native annual herb with a silvery-gray appearance, found in gravelly or sandy soil in pastures, open fields, hillsides and along roadsides. Its stems, up to 40 cm long, may be trailing or erect and are often much-branched. The leaves are lanceolate in shape with small silvery hairs. The 4-petaled yellow flowers, which often color extensive desert areas in the spring, bloom from March-June and are followed by spherical, inflated fruit pods on curving stalks. **(PLATE 152)**

London Rocket (*Sisymbrium irio*) is a non-native annual herb reaching 90 cm in height, and found growing in fields, roadsides, and waste places. The small flowers are pale yellow and bloom from June-August. Native Americans use the seeds as an expectorant, restorative and stimulant. Seeds can be eaten raw or cooked as pinole, or mixed with water to make a drink. **(PLATE 153)**

Twist Flower (*Streptanthus cordatus*) is a native perennial herb reaching 20-90 cm tall, found in semi-deserts, canyons, woodlands and openings. The inflorescence forms a terminal raceme of brown or purple-brown flowers with petals 10-15 mm long, blooming from March-May. A juice made from the roots has been used to treat sore eyes. **(PLATE 154)**

Sand Fringepod (*Thysanocarpus curvipes*) is a native annual herb reaching 75 cm tall, and often located on dry, sunny slopes, flats, meadows, valley floors and pastures. Blooming from January-May, the inflorescence forms a raceme with attractive, small white flowers tinged with purple. The flat, green seed pods appear fringed, with perforations around the edges. The Mendocino Indians used a decoction of the whole plant for stomachaches, and the seeds were used in pinole mixtures. **(PLATE 155)**

-BLUEBELL FAMILY (CAMPANULACEAE)-

Glandular Threadplant (*Nemacladus glanduliferus*) is an easily overlooked, native annual desert plant commonly found growing in sandy desert washes. The zig-zag structure of the dainty red stems (*Nemacladus* is Greek for having "thread-like branches") and simple, linear leaves help in the recognition of this 25 cm tall plant. The tiny but colorful flowers are white with 3 red-tipped upper lobes, 2 curved lower lobes and yellow centers, and bloom in the spring. **(PLATE 156)**

-PINK (CARNATION) FAMILY (CARYOPHYLLACEAE)-

Sleepy Catchfly (*Silene antirrhina*) is a native annual herb reaching 50 or more cm tall, found growing along roadsides, railroads, pastures, fields, waste ground and streamside woods. The branched, terminal inflorescence bears flowers with five white, purple or bicolored petals 4-5 mm long and 1-1.5 mm wide, and blooms from April-September. Many types of flies and small bees visit the flowers for nectar. **(PLATE 157)**

-GOOSEFOOT FAMILY (CHENOPODIACEAE)-

Lambsquarters (*Chenopodium album*) is a non-native annual herb reaching 10-200 cm tall, typically found growing in fields, along fencerows and in wastelands across North America. The leaves are roughly diamond-shaped and often somewhat toothed toward the point, with a mealy whitish coating, especially on the undersides. The tiny green flowers lack petals (5 sepals only), and are clustered into tight panicles at the tips of branches and upper leaf bases, blooming from June to September. Lambsquarters serves as a host plant for the western pygmy blue, painted lady and common sootywing butterflies, while many wild birds and small mammals eat the seeds. Originally introduced to the U.S. as a pot herb, this plant is edible and delicious, with a taste similar to spinach. Lambsquarters is very high in vitamin A, calcium, potassium, and phosphorus, and is also a good source of protein, trace minerals, B-complex vitamins, vitamin C, iron, and fiber. The seeds can be cooked as a cereal, ground into flour to mix with wheat flour, or used whole in cooking. **(PLATE 158)**

Jerusalem Oak Goosefoot (*Chenopodium botrys*) is a weedy, non-native annual growing to 0.7 meters tall, typically found in disturbed habitats that receive a lot of sunlight. The leaves are elongate, lobed, sticky, and smell of turpentine. The small, clustered, yellow-green flowers bloom from late summer to early fall. The fresh plant can be cooked and eaten (leaves and seeds) or used to make a green or gold dye. The dried goosefoot plant can be used as a moth repellent or put into necklaces, pillows, clothes, etc., for its pleasant scent. **(PLATE 241)**

Fremont's Goosefoot (*Chenopodium fremontii*) is a native annual herb growing 20-100 cm tall, typically in moist soils of shrublands and coniferous forests. Leaves are green and broadly triangular, and the inconspicuous flowers form spike-like clusters near the top of the plant. Fremont's goosefoot is a host plant for the golden headed scallopedwing butterfly. Leaves and young shoots can be cooked and used like spinach. Seeds are cooked and ground into a meal and used with water as a mush, or mixed with cereal flours in making bread and other baked goods. **(PLATE 159)**

Russian Thistle (*Salsola tragus*) is a non-native weed from Russia, reaching 120 cm in height and typically infesting sandy soils on disturbed sites, waste places, roadsides, and cultivated and abandoned fields. As the classic

“tumbleweed,” the plant grows to form a large, rounded bush, which later detaches from the ground and tumbles in the wind, scattering seeds. Russian thistle is an alternate host for the beet leafhopper, which can carry the virus causing curly-top of sugarbeets, tomatoes, melons, and many other crop and native plants. The plant is eaten by livestock and native grazers, and the seeds are consumed by numerous birds and small mammals. Russian thistle also provides cover for small birds and mammals, and is a host plant for the western pygmy blue butterfly. Native Americans use an infusion of plant ashes for smallpox and influenza. **(PLATE 160)**

-MORNING-GLORY FAMILY (CONVOLVULACEAE)-

Ivyleaf Morning-glory (*Ipomoea hederacea*) is a non-native annual vine from the Tropics, found on roadsides, cultivated areas, waste places, and woodland borders, and listed as noxious in several states. Vines range from 1-2.5 m in length, with heart-shaped or deeply three-lobed leaves; both stems and leaves are hairy. The funnel-shaped, 5 cm-wide flowers are generally blue, but can show traces of purple or white, and bloom from June-October. This pretty vine is often grown on fences or patio enclosures, but where it escapes it can become a serious pest. **(PLATE 242)**

-CUCUMBER FAMILY (CUCURBITACEAE)-

Gila Manroot (*Marah gilensis*) is a native perennial vine that can twine to be over 2 meters long, known only from Arizona, Sonora and possibly New Mexico. Its star-shaped, cream-colored flowers mature into spiny green gourds about 5 cm in diameter. This plant has a very large underground tuber and needs ample water for survival, so it is typically found growing near streambeds in sandy soil. The anthropomorphic common names "manroot" & "old man in the ground" derive from the swollen lobes and arm-like extensions of the unearthed tuber. On old plants, the tuber can be several meters long and weigh in excess of 100kg! The name *Marah* comes from a Hebrew word meaning "bitter", and was given because all parts of these plants tend to have a bitter taste. Some species in this genus are toxic and deaths have been reported from ingesting them. **(PLATE 161)**

-SPURGE FAMILY (EUPHORBIACEAE)-

Fendler's Sandmat (*Chamaesyce fendleri*) is a native perennial herb with more-or-less prostrate stems 5-15 cm long, commonly found growing in dry, open places in valleys and foothills, in rocky and sandy soils. The smooth margined leaves are oval to spade shaped, and 3-11 mm long. The complex flowers are tiny, with white “petals” (actually part of the nectar glands), and flower from May-September. The Hopi give young roots of Fendler's sandmat to mothers with nutrient-deficient milk, and the dried plants are made into a lip balm. The Navajo make a whole plant tea to treat stomachaches, warts, or poison ivy, and for ceremonial purposes. **(PLATE 162)**

Hyssopleaf Sandmat (*Chamaesyce hyssopifolia*) is a native annual herb reaching 10-120 cm tall, with smooth, red or green stems and milky sap, typically found growing on dry, open places in valleys and foothills in rocky and sandy soils. The elliptical, 1-3 cm-long leaves have finely toothed margins and short petioles, with 2 pale, fringed stipules at the base. Blooming from August-November, the complex flowers have tiny white “petals” (actually part of the nectar glands). **(PLATE 163)**

Native to the Eastern United States, **Prostrate Sandmat** (*Chamaesyce prostrata*) is an annual herb with glabrous, prostrate stems (often red) and milky sap, Growing to 10-35 cm tall, it is commonly found in disturbed sites, waste places, roadsides, cultivated and abandoned fields. The leaves are opposite, oblong to elliptical, 3-11 mm long and 1.5-4.5 mm wide. The flowers bloom from May-September, and are inconspicuous. **(PLATE 164)**

Texas Croton, Doveweed (*Croton texensis*) is a native annual herb reaching 30-150 cm tall. It grows best in disturbed land and is sometimes considered an indicator of archaeological sites. The plant has narrow, drooping, lance-shaped leaves that are covered with fine silvery-white hairs. Small clusters of inconspicuous flowers appear in late summer, and each female flower produces a round, lobed capsule with three large seeds. Doveweed gets its name from the affinity mourning doves have for its fruit. The plant contains toxic croton oil, a cathartic, which in liquid preparation has been used to treat stomachache and body aches, as a laxative, and as a general cathartic cleanser. The Hopi use the plant to make a very strong eyewash. The Navajo and Ramah place the plant on a large fire to smoke clothes in order to remove skunk smell. **(PLATE 165)**

-PEA FAMILY (FABACEAE)-

Halfmoon Milkvetch (*Astragalus allochrous*) is a native annual or biennial herb reaching 10-20 cm tall, typically found growing on dry, rocky or sandy flats. The leaves are 2–12 cm long, divided into 11-19 leaflets 5–20 mm long with shallowly notched or rounded tips. The inflorescence blooms from March-July, with 4–10 whitish flowers. Halfmoon milkvetch is toxic to both livestock (cattle and sheep) and wildlife. The Navajo and Ramah use the leaves as a ceremonial emetic. **(PLATE 166)**

Torrey’s Milkvetch (*Astragalus calycosus*) is a small, native perennial herb which is widespread on dry, rocky, barren valley floors and lower foothills, in sagebrush and piñon-juniper forests. The leaves are 1–7 cm long, divided into 3-7 elliptic to obovate leaflets. The white to bright purple flowers are ascending or spreading, and bloom from April-July. Torrey’s milkvetch is a great species for a rock garden because it can grow in a variety of soils and needs little attention. American Indians use this plant as a ceremonial emetic. **(PLATE 167)**

Turkeypeas (*Astragalus nuttallianus* var. *imperfectus*) is a native annual herb reaching 15-30 cm tall, and is very common in the lower elevations of the Four Corners region, often carpeting the ground in sandy or gravelly flats or washes. The leaves, which can reach 7.5 cm in length, are divided into 5-13 leaflets. The flowers, which bloom from February-May, may be white, pink, lavender or light blue and are 6-12 mm long with a tall, spreading upper (banner) petal. The fruit is a curved, slender pod about 2.5 cm long. Turkeypeas is toxic to cattle, sheep, and goats, causing symptoms including loss of weight, lack of coordination and (eventually) paralysis. **(PLATE 168)**

Foothill Deervetch (*Lotus humistratus*) is a native annual herb reaching 2.5 cm tall, typically forming low mats on the ground. Blooming from February-April, the tiny 3 mm wide flowers are pea-like and yellow, turning red with age. Foothill deervetch is a favored food of the desert tortoise. Native Americans used an infusion of the plant as a gynecological wash for women in labor. **(PLATE 169)**

Elegant Lupine (*Lupinus concinnus*) is a native annual herb reaching 20 cm in height, found growing in sandy or gravelly areas. The green leaves are soft-hairy and palmately compound. The reddish-purple to light purple, pea-like flowers are 6 mm long, with the petals edged in deeper colors and fading to white near their bases, and bloom from March-May. **(PLATE 170)**

Arroyo Lupine (*Lupinus succulentus*) is a native annual herb reaching 30-120 cm tall, abundant in open, disturbed areas, road banks, and heavy soils of grassy slopes and flats. The succulent, compound leaves have 7 to 9, broad, fleshy, blunt-tipped leaflets with hairless upper surfaces. The showy flowers are in whorls along unusually thick, hairless flower stalks. The upper (banner) petal has a large white patch that turns magenta when pollinated. Arroyo lupine is useful for bank stabilization as it has a 3 foot root system. The Pomo and Kashaya tribes make wreaths with the flowers to wear in the flower dance at the Strawberry Festival in May. **(PLATE 245)**

Sweet Clover (*Melilotus* sp.) is a non-native annual or biennial herb reaching 1.5 m tall, commonly found growing in semi-deserts, foothills, roadsides, fields, and disturbed areas. The leaves are divided into three oval, minutely toothed leaflets. Plants produces numerous racemes of yellow or white pea-like flowers from 4-7 mm long, blooming from May-October. The species provides good forage for domestic livestock and wild ungulates, and a good source of nectar for honeybees. Sweet clover offers both habitat and food for many bird species, and is a host plant for spring azure and eastern tailed-blue butterflies. Young leaves have a vanilla flavor, and are used in cooking or to make a tea with medicinal uses in preventing blood clots and healing soft tissue inflammation. **(PLATE 171)**

Slender-Flower Lemonweed (*Psoraleidium tenuiflorum*) is a native perennial herb reaching 10-60 cm tall, typically located on dry slopes and plains. The

inflorescence is a dense, spike-like raceme with violet to blue-violet flowers 4-7 mm wide, blooming from May-September. Native Americans make a decoction of the plant for a tuberculosis remedy, and an infusion of the roots can be used for headaches. Yavapai use the plant as an ingredient in mescal-derived beverages. Plant tops have been made into garlands to be worn on the head as protection from the sun, or smudged for use against mosquitoes. **(PLATE 172)**

Twinleaf Senna (*Senna baubinioides*) is a native perennial herb from 30-60 cm tall, commonly found on dry, disturbed soil throughout the state along roadsides and waste places, on rocky slopes, mesas, and desert washes. The grayish green leaves are 2.5-5 cm long, including the stalks, and have two leaflets each. There are also 2 flowers in each stalked cluster, which arise from the base of the leaves. The flowers have 5 large yellow petals about 12 mm long, with reddish veins, and bloom from April-September. The 2 to 9 cm long, slightly curved pods are tipped by a stiff point about 3 mm long, and pop open with force when mature, throwing the seeds some distance from the plant. Twinleaf senna is primarily pollinated by large carpenter bees and bumble bees. **(PLATE 173)**

White Clover (*Trifolium repens*) is a non-native perennial herb reaching 15 cm tall, common on roadsides, bare ground, foothills and grasslands. Stems are creeping and prostrate, rooting at the nodes; leaves are divided into three leaflets. The inflorescence is a globe-shaped head on a long bare stem, with the flowers white or tinged with pink, blooming from June-September. White clover is a highly palatable, nutritious forage plant for livestock, deer and elk, and the seeds are consumed by waterfowl, upland game birds and songbirds. However, this plant may become weedy or invasive and displace desirable vegetation. White clover is a host plant for numerous butterflies. Indigenous peoples make a tea to treat Bright's disease, fever and liver spots, or a poultice to treat paralysis. **(PLATE 174)**

Slender Vetch (*Vicia ludoviciana*) is a native annual herb with climbing stems from 15-90 cm long, found growing on grassy, brushy or wooded slopes. The lavender-blue flowers are less than 6.5 mm in length, and bloom from March-May. Slender vetch is valuable as a nutritious browse for wildlife and as a soil builder through nitrogen fixation. The leaves and seeds are eaten by white-tailed deer, cattle, bobwhite quail, and Rio Grande turkeys. **(PLATE 175)**

-GERANIUM FAMILY (GERANIACEAE)-

Redstem Stork's Bill (*Erodium cicutarium*) is an invasive non-native annual herb reaching 30 cm tall, found in semi-desert foothills, meadows, shrublands, and lawns. The inflorescence is an umbel with 2-5 pink, lilac, or rose-lavender flowers held high above the foliage, and blooming in spring, summer and fall. The fruits are long, slender, and beak-like, giving rise to the common name. Stork's bill provides seasonal forage for rodents, desert tortoises, big game animals and livestock, and the seeds are consumed by upland gamebirds, songbirds, and rodents. Indigenous peoples make a cold leaf tea to treat typhoid

fever, and a chewed poultice is used to disinfect and treat sores, rashes and animal bites. **(PLATE 176)**

Texas Stork's Bill (*Erodium texanum*) is a native annual herb reaching 60 cm tall, which can be found on rocky or sandy calcareous soils of hillsides, disturbed areas, prairies and other open areas. The leaves are scalloped and three-lobed, with a large middle lobe, and appear wrinkled due to their deep veins. Blooming from March-May, the bright magenta flowers have 5 petals and are up to 3 cm across, opening late in the day and closing in the morning. The fruits are long, slender, and beak-like. **(PLATE 177)**

-WATERLEAF FAMILY (HYDROPHYLLACEAE)-

Limestone Phacelia (*Phacelia affinis*) is a native annual herb reaching 6-30 cm tall, typically found growing in sandy and gravelly places in creosote bush scrub, piñon-juniper and Joshua tree woodlands. The leaf blades are 1-7 cm long, narrowly oblong, and deeply lobed to compound. Blooming from March-June, the flowers are white to lavender and narrowly bell-shaped, with a yellow throat, arranged on a slender, slightly coiled inflorescence at the end of the stem. **(PLATE 178)**

Distant Phacelia, Wild Heliotrope (*Phacelia distans*) is a native annual herb with reddish, hairy stems reaching 46 cm tall, commonly found growing in desert washes, slopes and roadsides. The leaves are variable and once or twice pinnately divided. The violet, bell-shaped flowers are approximately 1.3 cm wide with 5 round, united petals in hairy, terminal coils, and bloom from March-June. The Kawaiisu use the plant as a vegetable by steaming the leaves. **(PLATE 179)**

-MINT FAMILY (LAMIACEAE)-

Drummond's False Pennyroyal (*Hedeoma drummondii*) is a native annual or short lived perennial herb reaching 45 cm in height, found growing on dry, rocky soils. The flowers, in groups of 1 to 5 along the upper stem, are 7-15 mm long, blue with a whitish throat, and flower from May-October. Indigenous peoples eat the leaves of this plant as flavoring in soups, and make an infusion to treat influenza. **(PLATE 181)**

Oblongleaf False Pennyroyal (*Hedeoma oblongifolia*) is a native perennial herb with rather hairy stems, reaching 10-50 cm tall, and typically found growing on hillsides in dry, rocky soils. The opposite leaves are oblong to ovate in shape and 5-15 mm long. The tiny purple flowers are located between the leaf and stem. **(PLATE 243)**

-LILY FAMILY (LILIACEAE)-

Winding Mariposa Lily (*Calochortus flexuosus*) is a native perennial herb reaching 30-60 cm tall, located on hot, dry stony slopes, desert hills and mesas.

Three lovely cream-colored to lavender petals have a band of yellow and a purple spot near the base. Native Americans roast the bulbs in hot ash pits or steam them prior to eating. **(PLATE 182)**

Bluedicks (*Dichelostemma capitatum* ssp. *pauciflorum*) is a native perennial herb reaching 30-90 cm tall, and found in dry, often disturbed areas, frequently after fire. Flowers have six lilac petals united at the base, and bloom from March-May in radiating clusters at the end of leafless stalks. The plant produces corms (enlarged underground structures consisting of stem tissue and thin scales), which are eaten by both small and large mammals including black bears, mule deer, exotic wild pigs, and pocket gophers, and form an important starch source in the diet of many native peoples as well. **(PLATE 183)**

-FLAX FAMILY (LINACEAE)-

Flax (*Linum* sp.) is an annual or perennial herb with attractive blue or yellow flowers common to the western United States. Plants have many small, narrow leaves. The showy flowers are borne in loose clusters at the end of the stems, and bloom from May-July. Flax provides desirable forage for deer, antelope, and birds, and may also provide some cover for some small bird species. Indigenous peoples make an infusion of the plant to treat stomach disorders and kidney disease, and a poultice to reduce swelling in bruises. A decoction of stems and flowers is used to wash hair and face. The fibers are used to make cords for the mesh on snowshoes and fishing nets. **(PLATE 184)**

-LOASA FAMILY (LOASACEAE)-

White-stem Blazingstar (*Mentzelia albicaulis*) is a white-stemmed, native annual herb reaching 1 m tall, commonly found growing in sandy soils of desert valleys and foothills. The leaves are 1–11 cm long, entire to pinnately lobed, and very sticky from minute, curved hairs on the surface. The small, yellow, five-petaled flowers are 6-25 mm across and bloom from March-June. Native Americans use this plant to treat burns, toothaches and snakebites. The oily seed can be parched, ground into a meal and then mixed with water to make a mush, or it can be kneaded into butter and used as a spread on bread. **(PLATE 185)**

-MALLOW FAMILY (MALVACEAE)-

Cheeseweed (*Malva neglecta*) is a non-native annual or biennial herb with prostrate stems to 60 cm long, found growing in waste areas, lawns, roadsides and fields. The leaves are round or obscurely lobed, with wavy margins. Pinkish flowers with darker pink lines bloom from April-October. The fruit which follows is a flattened, round disc, 5 to 8 mm in diameter, resembling a wheel of cheese. Cheeseweed is a host plant for gray hairstreak, painted lady, westcoast lady and common checkered skipper butterflies. Native Americans apply an infusion of the plant to swellings and broken bones, as well as to a baby's swollen stomach or sore back. **(PLATE 186)**

Spreading Fanpetals (*Sida abutifolia*) is a low-growing, non-native perennial herb with hairy, often reddish stems trailing to 60 cm long. Leaves are dark green, hairy, and lanceolate to rounded with scalloped edges. Blooming from March-October, the 2.2 cm-wide yellow, pale orange, to almost white flowers emerge singly from near the base of the leaves and have 5 fan-shaped petals with notched tips. Spreading Fanpetals is a larval plant for the desert checkered skipper and common streaky skipper butterflies, and is also attractive to birds and bees. **(PLATE 187)**

Globemallow (*Sphaeralcea* sp.) is a genus of native perennial herbs, generally under 1 m tall, with over 10 different species in the Southwest. Leaves are variably lobed and covered with starlike hairs, which sometimes give the vegetation a whitish color. The flowers have 5 petals and vary from white to pink to purplish, or commonly orange, and typically bloom in the summer (though some may bloom year 'round). The Hopi either chew the root or make a decoction of the plant as an antidiarrheal and to treat broken bones. The Luiseño use a decoction of the leaves as an emetic. **(PLATE 188)**

-FOUR O'CLOCK FAMILY (NYCTAGINACEAE)-

Trailing Windmills (*Allionia incarnata*) is a low-growing native perennial herb with reddish, sticky stems trailing to 3 m in length, often found growing in open arid areas on sandy or gravelly soils. The oval leaves are sticky, hairy and up to 5 cm long. Flowers are pinkish-purple, with each cluster of 3 irregular flowers grouped together so that they appear like one regular flower to 2.5 cm wide. Trailing windmills flower year-round, but primarily from March-October. The plant is used by indigenous peoples to treat swellings, added to baths to reduce fever, and also prepared as a decoction to treat diarrhea and kidney ailments. **(PLATE 189)**

Scarlet Spiderling (*Boerhavia coccinea*) is a native perennial herb with sticky stems and leaves, which trails along the ground and can spread over more than a meter, commonly found along washes or in disturbed waste areas. The broadly oval leaves are opposite along the stem, and unequal in size within each pair. Its small but beautiful magenta flowers bloom from the spring into the late fall. **(PLATE 190)**

Fivewing Spiderling (*Boerhavia intermedia*) is a native annual herb up to 70 cm tall. It differs from scarlet spiderling by growing mostly upright, rather than spreading, yet is a less robust plant overall, with white-pinkish flowers rather than the deep red of scarlet spiderling. **(PLATE 191)**

Narrowleaf Four-O-Clock (*Mirabilis linearis*) is a native perennial herb reaching 20-100 cm tall, found growing on dry, rocky or sandy soil of plains, hillsides, and roadsides. The funnel-shaped, pale pink to magenta flowers are 2 cm wide with 5 lobes and 3 long stamens that are often coiled in the flower, and

bloom from July-September. Indigenous peoples make a tea from the roots for urinary problems and stomach disorders, and a poultice from roots to treat burns. The seeds and fruits are also consumed as food. **(PLATE 192)**

Colorado Four-O-Clock (*Mirabilis multiflora*) is a native perennial herb reaching 30-100 cm tall, found growing in semi-deserts, foothills, roadsides, and open canyons. The funnel-shaped magenta flowers, 2.5-8 cm long and about 2.5 cm across, protrude from a papery floral cup which is made up of greenish bracts (modified leaves) that resemble floral sepals. Since the flower opens late in the afternoon and throughout the night, this plant attracts hawkmoths. Native Americans have used the plant for dyes or medicinal properties. The roots of older plants are used to make a blood-strengthening tea for pregnant women, or to treat colic, eye infections, muscle soreness, body swellings, rheumatism and indigestion. **(PLATE 193)**

-OLIVE FAMILY (OLEACEAE)-

Rough Menodora (*Menodora scabra*) is a native perennial up to 30 cm tall, found on sandy or rocky mesas, in deserts or occasionally oak woodlands. The yellow, 5-petaled flowers are followed by round, translucent reddish fruits that come in pairs. Ornamentally, rough menodora offers a fine texture in the flower garden, providing a nice softening contrast to more sculptural desert plants. It also provides good forage for livestock and wildlife. Navajos use menodora to ease backbone pain and to facilitate labor. **(PLATE 194)**

-EVENING-PRIMROSE FAMILY (ONAGRACEAE)-

Scarlet Beeblossom (*Gaura coccinea*) is a perennial herb with white flowers that fade to a pretty red, and have a sweet honeysuckle scent to them. Short, lance-shaped leaves are crowded on the stem below the slender, many-flowered tops. Scarlet beeblossom is sometimes called "waving butterfly" because the four white-to-red petals are twisted and move like wings in the slightest breeze, and the stamens and style look like insect antennae. A drought resistant perennial, this plant makes an excellent addition to any xeriscape plot. Scarlet beeblossom is given by the Navajo to children to settle the stomach after vomiting. **(PLATE 195)**

White-stem Evening-Primrose (*Oenothera albicaulis*) is a native annual herb growing to 40 cm in height, usually in disturbed soils on sandy slopes and along roads. Its scented flowers are white, 4-petaled, and pollinated by moths, butterflies and bees. The oil from the plant is one of the world's richest sources of natural unsaturated fatty acids, which are often helpful in cases of obesity, mental illness, heart disease and arthritis. A decoction of the root can be used as a lotion for muscle strain. **(PLATE 196)**

Large White Desert Primrose (*Oenothera caespitosa* var. *marginata*) is a native perennial herb reaching 30 cm tall, found growing in rocky or sandy sites

in piñon-juniper woodlands. Flowers are white, turning pink with age, and 2-5 cm long. Blooming from April-September, the flowers open at sunset and are pollinated during the night by hawkmoths before wilting the next day. Indigenous peoples use this plant as a treatment for sore eyes or toothache, and smoke the plant as an alternative to tobacco. **(PLATE 244)**

-POPPY FAMILY (PAPAVERACEAE)-

Creamcups (*Platystemon californicus*) is a native annual herb with hairy stems and leaves, reaching 10-30 cm tall. The opposite, linear leaves are up to 4 cm long, and found mostly on the lower part of the plant. Each flower is solitary at the end of a mostly leafless stalk, with three hairy sepals and six cream-colored petals, flowering from June-August. Mendocinos eat the leaves of the creamcup as greens. **(PLATE 197)**

-SESAME FAMILY (PEDALIACEAE)-

Devil's Claw (*Proboscidea parviflora*) is a native perennial herb sprawling to 90 cm long, found growing on roadsides, disturbed ground and mesas. The five-lobed flowers range from white to pink, and are up to 4 cm long and 2 cm wide. These desert plants, after blooming from April-October, produce fruits with prominent beaks or claws up to 18 cm long. The claws of the mature seedpods are collected in autumn and used to create black basketry designs by many southwestern tribes. The Papago use the young pods as food, while the Pima crack the seeds between the teeth and eat them like pine-nuts. **(PLATE 198)**

-PLANTAIN FAMILY (PLANTAGINACEAE)-

Woolly Plantain (*Plantago patagonica*) is a native annual herb reaching 20 cm tall, found growing in semi-deserts, foothills, roadsides, and open canyons. The plants are woolly throughout, with narrow, linear leaves at the base. The inconspicuous white flowers are clustered in fuzzy green spikes, and bloom from May-July. Native Americans use an infusion of this plant for headaches and as a gastrointestinal aid, while a poultice is applied to sores. The seeds are made into mush and used for food. **(PLATE 199)**

-PHLOX FAMILY (POLEMONIACEAE)-

Miniature Woollystar (*Eriastrum diffusum*) is a native annual herb reaching 20 cm tall. The shiny, green leaves are linear and narrow, with sharply pointed tips and woolly bases. The terminal inflorescence forms a woolly, spiky head that blooms from March-May. The tubular, pale blue flowers are up to 1.3 cm long, with 5 flaring lobes and yellow centers. **(PLATE 200)**

Lesser Yellowthroat Gilia (*Gilia flavocincta*) is a native annual herb reaching 45 cm tall, found growing on rocky slopes and sandy washes. Its white to

lavender flowers are 7 mm wide, with 5 petals, and are distributed on an open panicle of thin, nearly leafless stems. **(PLATE 201)**

Rosy Gilia (*Gilia sinuata*) is a native annual herb reaching 10-40 cm tall, and found growing in dry, open, often sandy places in the lowlands and foothills. The flowers are 7-9 mm long and bluish-lavender in color, with five flaring lobes, blooming from April-June. A cold infusion of this plant is used as a lotion for fevers. The seeds are parched, ground, and kneaded into seed butter to be eaten with fruit drinks or spread on bread. **(PLATE 202)**

Golden Linanthus (*Linanthus aureus*) is a native annual herb reaching 15 cm tall, typically found growing on desert flats and sandy soils. The stems are slender and thread-like, with tiny leaves divided into 3 to 7 pointed linear lobes. The yellow, funnel-shaped flowers have golden-orange centers and 5 broad, rounded lobes, and bloom from March-June. **(PLATE 203)**

Bigelow's Linanthus (*Linanthus bigelovii*) is a native annual herb reaching 5-20 cm tall, found growing in semi-deserts, foothills, roadsides, and open canyons. The cream or white funnel-shaped flowers, with purplish shading on the back of the corolla, open in the evening and bloom from March-May. **(PLATE 204)**

Slender Phlox (*Phlox gracilis*) is a native annual herb reaching 3-15 cm tall, and in bloom from March-August. Its small flowers are white or pink with yellow centers, and the five petals are slightly notched at the tips. Indigenous peoples make a poultice of mashed plant for wounds and bruises, and a cold infusion for mouth sores. **(PLATE 205)**

-MILKWORT FAMILY (POLYGALACEAE)-

Broom Milkwort (*Polygala scoparioides*) is a native perennial herb with several stems, reaching 5-20 cm tall. The leaves are linear, 3-10 mm long by 1 mm wide. The white flowers have five petals and bloom from March-October. **(PLATE 206)**

-BUCKWHEAT FAMILY (POLYGONACEAE)-

Abert's Buckwheat (*Eriogonum abertianum*) is a native annual herb reaching 70 cm tall, and commonly found on sandy, gravelly, or clayey flats, or on the floodplain or margin of washes and slopes. The leaves are broadly oblong or oval, occasionally with toothed margins, and are covered with fine white hairs. The flowers are 3-4.5 mm wide, white to pale yellow early and becoming reddish or rosy with age, and bloom all year. The crescent metalmark butterfly gets nectar from the flowers. The Navajo make a decoction of these plants for skin cuts on both themselves and their horses. **(PLATE 207)**

Little Desert-trumpet (*Eriogonum trichopes*) is a native annual herb reaching 45-60 cm tall, typically found growing in dry washes or sandy to gravelly flats and

mesas. The leaves are basal only, with broadly oblong blades with wavy margins and dense, short hairs on both surfaces. The tiny yellow flowers bloom from April-August, in a flat topped inflorescence with slender, reddish branches.

(PLATE 208)

Bastardsage (*Eriogonum wrightii*) is a native perennial herb reaching 45 cm in height, commonly found growing on dry, gravelly slopes and rocky hillsides. The stems are whitish and branched, with silvery leaves covered with dense, whitish hairs on the lower half of the plant. The white to pale pink flowers, blooming from June-October, form clusters along wiry stems above the leaves. Bees and butterflies utilize bastardsage for nectar or as a host plant, and birds enjoy the seeds. The plant is also an excellent buckwheat for the garden, with small clusters of exceptionally bright white flowers blooming through fall. Native Americans use the plant to induce vomiting, while the seeds are eaten or used to make a beverage. **(PLATE 209)**

Prostrate Knotweed (*Polygonum aviculare*) is a non-native annual herb with prostrate stems reaching 1 m long, found growing in waste areas, lawns, roadsides and fields. Clusters of 1 to 5 inconspicuous, white to pinkish-white flowers arise from the base of the leaves, and bloom from June-October. An important food for deer and waterfowl, prostrate knotweed is also a host plant for the Acmon blue and purplish copper butterflies. Indigenous peoples have many medicinal uses for the plant: the Cherokee use it as an analgesic for painful urination, and make a poultice for swelled and inflamed parts, while the Choctaw make an infusion of the entire plant to prevent abortion, and the Iroquois use an infusion for children with diarrhea and a poultice for cuts and wounds. The leaves have also been rubbed on children's thumbs to prevent thumb sucking. **(PLATE 210)**

Douglas' Knotweed (*Polygonum douglasii*) is a native annual herb reaching 40 cm tall, found growing in dry forests and open rocky areas. Small clusters of 1-3 reddish or yellow-green flowers arise from the base of the leaves, and bloom from June-September. Douglas' knotweed is an important food for deer and waterfowl, and is also a host plant for the purplish copper butterfly. Native Americans parch the seeds and eat them raw, or mix them with water to make a porridge. **(PLATE 211)**

Curly Dock (*Rumex crispus*) is a non-native perennial herb reaching 50-100 cm tall, typically found growing in moist soils of grasslands, mixed-grass prairies, and montane meadow communities. The elliptic to oblong leaves are 10-30 cm long and 1-5 cm wide, with conspicuously wavy margins, and decrease in size up the plant. The tiny, red and green flowers are clustered in a tall, dense inflorescence atop the stem, and bloom from April-August. Curly dock is a host plant for the purplish copper butterfly, and provides some cover for small mammals and birds. The Native Americans use a poultice of the plant for sores, warts and bruises, and a tea to purify the blood and stimulate the liver. The seeds, stems and leaves are used for food. **(PLATE 212)**

-PURSLANE FAMILY (PORTULACACEAE)-

Fringed Redmaids (*Calandrinia ciliata*) is a native annual herb varying in height from 15 to 35 cm, which thrives in open grasslands as well as disturbed areas and cultivated fields. These low growing, spreading plants may become weedy or invasive in some situations and displace more desirable vegetation. The showy, rosy red flowers have five notched petals with darker veins, and bloom in the early spring. Many insects, small mammals, and birds eat the seeds, and cattle readily graze on the vegetation. Native Americans use the plant primarily as a food source: the seeds are considered a staple and are often parched, then pulverized and made into pinole cakes. **(PLATE 213)**

Shrubby Purslane (*Portulaca suffrutescens*) is a native perennial herb reaching 30 cm tall, often found growing on rocky slopes, flats, grasslands, roadsides, and along streams. The green, fleshy, succulent leaves are cylindrical and taper to a point at the tip. Blooming from July-September, the 2.5 cm-wide orange flowers have 5 notched petals with red-orange bases, and open in the morning and close by midday. **(PLATE 214)**

-PRIMROSE FAMILY (PRIMULACEAE)-

Western Rock-Jasmine (*Androsace occidentalis*) is a low-growing native herb (usually less than 8 cm tall), typically found growing in full sun in well-drained, exposed situations, such as ledges and sand barrens. Western rock jasmine is a winter annual that usually germinates in late fall; the stems elongate and flowers and fruit develop the following spring. There are no leaves on the stem, but simply a rosette of small oblong leaves at ground level. The five to ten tiny (2.5 mm) five-lobed white flowers, each on a long stalk, radiate from the tips of multiple stems. The Navajo and Ramah use a decoction of this plant for postpartum hemorrhage and for any birth injury incurred by the baby. **(PLATE 215)**

-MAIDENHAIR FERN FAMILY (PTERIDACEAE)-

Spiny Cliffbrake (*Pellaea truncata*) is a native perennial fern which can reach 40 cm tall, and usually grows in shadows or crevices among rocks. The stiff, triangular, compound fronds have bluish green, narrowly oval, leathery leaflets on dark brown petioles. During the hot, dry times of the year, these ferns will become dry and brown, but with sufficient rain, will quickly turn green and leaf out again. **(PLATE 216)**

-BUTTERCUP FAMILY (RANUNCULACEAE)-

Desert Windflower (*Anemone tuberosa*) is an elegant, native perennial herb reaching 40 cm tall, found growing on rocky slopes and streamsides between 800-2500 m in elevation. The leaves are mostly basal and highly dissected, with

segments oblong to ovate, and 4–8 mm wide. Flowers have broad, linear to oblong petal-like sepals which are white above and pinkish below, and bloom from February-May. The species name refers to the large, subterranean tuber produced by the plant, which helps it survive through harsh conditions. **(PLATE 217)**

Barestem Larkspur (*Delphinium scaposum*) is a beautiful, native perennial herb reaching 20-50 cm tall, found growing in exposed rocky areas across Arizona. The inflorescence forms a long leafless raceme with 5-15 sky blue to royal blue flowers, irregularly shaped with modified blue sepals and white petals forming a spur projecting backward, and blooms from March-June. Avidly sought after by bees and hummingbirds for its nectar, this plant is poisonous to livestock and humans. The Hopi use barestem larkspur as an emetic during Po-wa-mu ceremonies, and the Navajo make a blue dye from the flower. **(PLATE 218)**

-RUE FAMILY (RUTACEAE)-

Rue Of The Mountains (*Thamnosma texana*) is a sprawling, bushy, native perennial herb that grows 15-30 cm high from a woody base. The linear leaves measure 6-10 mm in length. The small, yellow, urn-shaped flowers have four petals and four sepals, and bloom from March-May. The unique fruit is shaped like inflated "breeches" with the legs projecting upward. Rue of the mountains is a host plant for the eastern black swallowtail butterfly. The leaves are occasionally eaten by white-tailed deer, but are poisonous to sheep, cattle, and goats. This plant was used medicinally by American Indians of the Southwest, being consumed as a tonic and used in the treatment of gonorrhea. **(PLATE 219)**

-SANDALWOOD FAMILY (SANTALACEAE)-

Bastard Toadflax (*Comandra umbellata*) is a native perennial herb growing 7-50 cm tall, located in semi-deserts, foothills, meadows and woodland openings. The plant is hemiparasitic, in that its roots attach to the roots of other plants and derive some nutrients from them; yet the green leaves also photosynthesize. Blooming from April-August, the white, star-shaped flowers are clustered at the stem tips, with 5 ovate to oblong pointed lobes and greenish centers. The Cherokee apply juice from the stem to sores and cuts, or submerge the plant in boiling water and use it for kidney ailments, while the Meskwaki make a leaf tea for lung pains. Immature flowers are also licked to relieve congestion. **(PLATE 220)**

-FIGWORT FAMILY (SCROPHULARIACEAE)-

Wavy-Leaf Indian Paintbrush (*Castilleja applegatei* ssp. *martinii*) is a native, perennial, woody-based herb reaching 10-40 cm tall, growing primarily on dry, rocky slopes in open pine forest and sagebrush scrub. The plant is

hemiparasitic, deriving some of its nutrients from the roots of nearby plants, while the green leaves also photosynthesize. Blooming from May-September, the showy terminal clusters of flowers are dense with scarlet-tipped calyces and two-lipped corollas, subtended by 3-lobed, scarlet-tipped bracts. Wavy-leaf Indian paintbrush has a medium fire tolerance and a high drought tolerance. **(PLATE 221)**

Purple Owl-Clover (*Castilleja exserta* ssp. *exserta*) is a native annual herb reaching 45-60 cm tall, and found growing in the springtime, often abundantly on hillsides, roadsides, flats and sandy plains. Like Indian paintbrushes, to whom this plant is related, owl-clover is hemiparasitic, deriving many of its nutrients from nearby plants. The flowers have a magenta, beak-like upper lip and broad lower lip with 3 yellow pouches, surrounded by magenta bracts, and bloom from March-May. The Navajo and Ramah use this plant as a cathartic and as a ceremonial medicine. A cold infusion of the plant can be made and taken for heartburn. **(PLATE 222)**

Purple Bird's Beak (*Cordylanthus parviflorus*) is a native annual herb reaching 20-40 cm tall, found growing on dry, rocky limestone slopes, in sagebrush scrub and piñon-juniper woodland. The oddly-shaped pink flowers with yellow tips, found at the end of branches from August-October, are said to resemble a bird's beak; hence the common name. The bark has numerous medicinal properties: a tea can be made from the bark to treat digestive problems, while the outer bark, specifically, was traditionally smoked for lung ailments, and the inner bark for its pain-reducing qualities, apparently with narcotic effect. The branches are used in basket-weaving and wreath making. **(PLATE 223)**

Dalmatian Toadflax (*Linaria dalmatica*) is a highly invasive, non-native perennial herb from horizontal rootstocks, reaching 30-120 cm tall, and most commonly found in cultivated fields, roadsides, railways, waste areas, clearcuts, overgrazed pastures and rangeland. The flowers are bright yellow with orange markings and long, downward-pointing spurs, and occur in simple racemes along the stems, flowering from May-September. A single plant may produce several hundred thousand seeds. Dalmatian toadflax also reproduces vegetatively, from adventitious buds originating on horizontal roots. Cattle will casually browse flowering shoots, while domestic sheep utilize it as a major food source. Deer graze it, and seeds are eaten by some species of birds and rodents. Native Americans dry the whole plant and make a tincture for liver ailments. **(PLATE 224)**

Roving Sailor, Twining-Snapdragon (*Maurandella antirrhiniflora*) is a native perennial vine, twining to 2.4 m high, typically found growing on limestone hills and sandy dunes. The flowers, produced in abundance from stalks near the base of the leaves, resemble violet garden snapdragons, with white or yellow throats, and bloom from March-September. Twining-snapdragon is charming, attractive and well worth cultivating as a small, dense vine or even a

groundcover. It is a larval host plant for the common buckeye butterfly.
(PLATE 225)

Little Redstem Monkeyflower (*Mimulus rubellus*) is a native annual herb reaching 1-20 cm tall, found growing in semi-deserts foothills, roadsides, sandy washes and forest openings. The small yellow or magenta flowers have 5 notched lobes and a red-spotted patch in their tubular throats, blooming from February-April. Native Americans use the leaves and stems as flavor enhancers, and a juice from the leaves makes a soothing poultice for minor burns and skin irritations.
(PLATE 226)

Eaton's Penstemon (*Penstemon eatonii*) is a native perennial herb reaching 40-100 cm tall, commonly found on dry slopes and flats in sagebrush, piñon-juniper, mountain mahogany, and ponderosa pine communities. The oppositely arranged leaves are broadly ovate at the plant base, narrowing somewhat and clasping the stem higher up. Blooming from February-June, the 2.5 cm-long, tubular red flowers are clustered along tall flower stalks. Eaton's penstemon flowers are utilized heavily by hummingbirds and butterflies, and the plant provides desirable forage for deer, antelope, and birds, either as herbage or seed. American Indians use this plant for stomach troubles, backaches, snake bites, burns, and to treat livestock with colic. **(PLATE 227)**

Scented Beardtongue (*Penstemon palmeri*) is a native perennial herb reaching 50-120 cm tall, found growing in dry, open, often sandy places in the lowlands and foothills. The showy, pink, fragrant flowers have a large mouth with two lips (the lower lined with magenta), and flower from March-September. Pollinated primarily by bumble bees, scented beardtongue is also frequented by butterflies and birds. The Navajo and Kayenta use a poultice of the plant for snakebites. **(PLATE 228)**

Rosy Desert Beardtongue (*Penstemon pseudospectabilis*) is a long-blooming, native perennial herb reaching 30-100 cm tall, typically located in desert washes, canyons and hillsides. The lavender-red to pink, 2.5 cm-long flowers have 5 spreading lobes and a tubular corolla which bulges outward near the mouth, and bloom from spring-summer. Like many *Penstemons*, rosy desert beardtongue is very attractive to hummingbirds. **(PLATE 229)**

Common Mullein (*Verbascum thapsus*) is a non-native biennial forb which produces a basal rosette of large, thick, fuzzy oval leaves in the first year, which often survive through the winter under snow. In the second year mullein sends up a stoutly erect, sometimes branched flower stalk up to 2.5 m tall, which is also fuzzy, with smaller fuzzy leaves. Common mullein is typically found along roadsides, in old fields, disturbed areas, vacant lots, and wood edges. The yellow flowers appear in densely packed spikes, and bloom at random, a few at a time, from spring until fall. The flowers are small, 2.5 cm or less across, with five petals, and smell fragrant and taste sweet. Mullein attracts a wide variety of pollinators including bees, flies, and butterflies. Many Native American tribes

use this plant for a multitude of reasons. Common mullein is used to remedy teething babies, to treat rheumatism, colds, coughs and fevers, to stop hiccups, purify the blood and treat ear aches, asthma, mumps, tuberculosis and toothaches. Raw leaves are applied to cuts, swellings and bruises. The plant is consumed for a heart stimulant, and is also used for ceremonial purposes. **(Plate 250)**

-POTATO FAMILY (SOLANACEAE)-

Greenleaf Five-Eyes (*Chamaesaracha coronopus*) is a native perennial herb reaching 25 cm tall, found growing on bajadas, valleys and along roadsides. The leaves are narrowly lance-shaped, with shallow teeth or lobes. Blooming from April-September, the 5-lobed, pale yellowish-green flowers have fused petals and sepals and a raised white spot at each petal base. The Navajo and Hopi Indians eat the seedpods, and use the plant medicinally to reduce swelling. **(PLATE 230)**

Sacred Datura (*Datura wrightii*) is a sprawling native perennial herb reaching 50-180 cm tall, found growing in desert sandy flats, arroyos and plains, and commonly seen along southwestern roadsides. The dark grayish-green leaves are oval to heart-shaped. The white, trumpet-shaped flowers are up to 15 cm long, often tinged with purple or lavender around the margins, and bloom from March-November. While sacred datura has long been used by native peoples of the Southwest in puberty and other ceremonies because of the plant's hallucinogenic alkaloids, people trying to imitate Native American ways have often poisoned themselves, in many cases fatally, with this beautiful but highly dangerous plant. Aside from uses related to its narcotic properties, various Southwest tribes use portions of the plant as an antidote for tarantula, snake, spider and poisonous insect bites, for setting bones, and as a disinfectant. **(PLATE 231)**

Desert Tobacco (*Nicotiana obtusifolia*) is a native biennial or perennial herb reaching 90 cm tall, usually found growing in dry, sandy washes. The 5-15 cm-long leaves are oval to lance-shaped, and are hairy and sticky like the stems. The cream colored tubular flowers are 2.5 cm long, with 5 spreading lobes, and flower from March-June. Like all wild tobaccos, desert tobacco is poisonous, strong-smelling and bad-tasting, and usually not eaten. **(PLATE 232)**

Groundcherry (*Physalis* sp.) is a native perennial herb, often located in disturbed, open places, waste areas, fields, roadsides, cultivated fields. Groundcherries are erect, bushy, or sprawling plants, with yellow to cream-colored flowers which bloom from June-October, and berries which are completely enclosed in loose papery husks. A few species are cultivated for their edible berries, but unripe fruits of some species may be toxic if ingested. While the foliage is suspected of being toxic to livestock when ingested, definitive studies concerning the toxicity of foliage and fruits are lacking. **(PLATE 233)**

Silverleaf Nightshade (*Solanum elaeagnifolium*) is a robust native perennial herb reaching 90 cm in height. The silvery leaves are oblong to lance-shaped with wavy edges. The attractive, violet blue flowers are 2.5 cm across, with 5 pointed lobes and 5 bright yellow protruding stamens, and bloom from spring through fall. Silver-leaf nightshade is rather shade tolerant, often becoming quite abundant under trees and beside farm buildings. Because the plant is poisonous and avoided by livestock, it tends to become more prevalent in overgrazed areas. The Navajo use this plant to remedy sore eyes, nose and throat, while the Zuni use it as a snakebite remedy. The Hopi and Keresan use the yellow fruits to make jewelry. **(PLATE 234)**

-VERBENA FAMILY (VERBENACEAE)-

Goodding's Verbena (*Glandularia gooddingii*) is a native perennial herb reaching 30 cm tall, found growing on desert slopes and along roadsides. The leaves are toothed and cleft into 3 main lobes. Head-like clusters at the ends of the stems are made up of numerous purple to pink, 1.3 cm-wide flowers with 5 notched lobes, and bloom from February-October. Goodding's verbena is visited by many species of butterflies for its nectar. Native Americans use the plant as a sedative, diaphoretic, diuretic, bitter tonic and as an antispasmodic. **(PLATE 235)**

-CREOSOTE-BUSH FAMILY (ZYGOPHYLLACEAE)-

Puncturevine (*Tribulus terrestris*) is a prostrate non-native annual that forms dense mats less than 2.5 cm high and up to 1.3 m across, found on sandy, dry, or gravelly sites, and listed as a noxious weed in nine states, including Arizona. Blooming from April-October, the bright yellow flowers are 5-petaled, 1.3 cm wide, and borne singly from near the bases of the leaves. Fruits are roughly circular, splitting into 5 sections, each with 2 large, divergent spines. These sharply pointed burs stick painfully in bare feet and cause bicycle flats, reducing the recreational potential of many areas. The Navajo use this plant as a traditional ceremonial medicine. **(PLATE 236)**

TREES



1 Desert Willow

Max Licher



2 Crucifixion Thorn

Max Licher



3 Arizona Cypress

Max Licher



4 One-Seed Juniper

Max Licher



5 Utah Juniper

Max Licher



6 Paloverde

T. Beth



Max Licher

7 Velvet Mesquite



Max Licher

8 Wright's Silktassel



Max Licher

9 Velvet Ash



Max Licher

10 Piñon Pine



Max Licher

11 Arizona Sycamore



Mark Daniels

12 Fremont Cottonwood



13 Wingleaf Soapberry



14 Five stamen Tamarisk



15 Netleaf Hackberry

SHRUBS



Max Licher

16 Sugar Sumac



Max Licher

17 Skunk Bush Sumac



Max Licher

18 Shortleaf Baccharis



Mark Daniels

19 Spearleaf Brickellbush



Max Licher

20 California Brickellbush



Max Licher

21 Littleleaf Brickellbush



22 Virgin River Brittlebush



23 Turpentine Bush



24 Red Barberry



25 Four-Wing Saltbush



26 Spiny Greasebush



27 Mormon Tea



Max Licher

28 Pointleaf Manzanita



Max Licher

29 Catclaw Acacia



Max Licher

30 Bird-Of-Paradise Bush



Mark Daniels

31 Feather Dalea, Indigo-Bush



Max Licher

32 Shrub Live Oak



Max Licher

33 Ocotillo



Max Licher

34 Narrowleaf Yerba-Santa



Max Licher

35 Desert-Olive



Max Licher

36 Desert Ceanothus



Mark Daniels

37 Hollyleaf Redberry



Max Licher

38 Mountain Mahogany



Max Licher

39 Stansbury Cliffrose



40 Fendlerbush



41 Wolfberry



42 Wright's Bee-brush

CACTI



43 Hedgehog Cactus



44 Beehive Cactus



45 Desert Christmas Cactus



46 Engelmann's Pricklypear



47 Whipple Cholla

GRASSES



Max Licher

48 Desert Needlegrass



Max Licher

49 Purple Three-awn



Max Licher

50 Spidergrass



Max Licher

51 Wild Oat



Max Licher

52 Cane Beard Grass



Max Licher

53 Needle Gramma



Max Licher

54 Sixweeks Grama



Max Licher

55 Side-Oats Grama



Max Licher

56 Black Grama



Max Licher

57 Blue Grama



Max Licher

58 Japanese Brome



Max Licher

59 Ripgut Brome



Max Licher

60 Red Brome



Max Licher

61 Cheatgrass, Downy Brome



Max Licher

62 Costal Sandbur



Max Licher

63 Feather Fingergrass



Max Licher

64 Pampas Grass



Max Licher

65 Burmuda Grass



Max Licher

66 False Fluff Grass



Max Licher

67 Hairy Crabgrass



Max Licher

68 Barnyardgrass



Max Licher

69 Nineawn Pappusgrass



Max Licher

70 Stinkgrass



Max Licher

71 Weeping Lovegrass



Max Licher

72 Lehmann Lovegrass



Max Licher

73 Tufted Lovegrass



Max Licher

74 Tapertip Cupgrass



Max Licher

75 Hairy Woollygrass



Max Licher

76 Needle and Thread



Max Licher

77 Wild Barley, Smooth Barley



78 Deer Grass



79 Vine Mesquite



80 James' Galleta



81 Tobosa Grass



82 Bigelow Muttongrass



83 Muttongrass



Max Licher

84 Streambed Bristlegrass



Max Licher

85 Green Bristlegrass



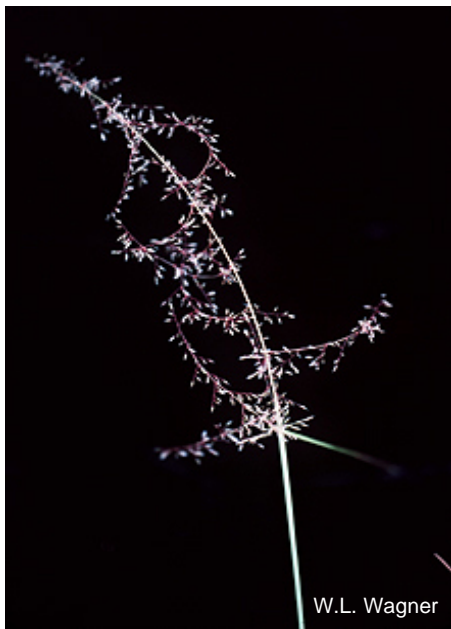
Max Licher

86 Johnson Grass



Max Licher

87 Spike Dropseed



W.L. Wagner

88 Mesa Dropseed



A.S. Hitchcock

89 Giant Dropseed



90 Slim Tridens



91 Small Fescue



92 Sixweeks Fescue

WILDFLOWERS



Max Licher

93 Parry's Agave



Max Licher

94 Bear Grass



Max Licher

95 Narrowleaf Yucca



Mark Daniels

96 Banana Yucca



Max Licher

97 Prostrate Pigweed



Max Licher

98 Powell's Amaranth



Mark Daniels

99 Purple Cymopterus



Max Licher

100 American Carrot



Mark Daniels

101 MacDougal's Biscuitroot



Mark Daniels

102 Nevada Biscuitroot



Max Licher

103 Antelope Horns



Max Licher

104 Texas Milkweed



105 Brownfoot



106 Weakleaf Burr Ragweed



107 Western Ragweed



108 Field Sagewort



109 White Sagebrush



110 Mule Fat



Max Licher

111 Ragleaf Bahia



Mark Daniels

112 Desert Marigold



Max Licher

113 Chihuahuan Brickellbush



Max Licher

114 New Mexico Thistle



Max Licher

115 Canadian Horseweed



Max Licher

116 Spreading Fleabane



Max Licher

117 California Cottonrose



Mark Daniels

118 Red-Dome Blanket Flower



Max Licher

119 Broom Snakeweed



Max Licher

120 Common Sunflower



Max Licher

121 Camphorweed



Max Licher

122 Hairy False Goldenaster



Max Licher

123 Fineleaf Hymenopappus



Max Licher

125 Cooper's Rubberweed



Max Licher

127 Prickly Lettuce



Max Licher

124 Loomis' Thimblehead



Max Licher

126 Alkali Goldenbush



Max Licher

128 Whitedaisy Tidytops



Max Licher

129 Hoary Tansyaster



Max Licher

130 Grass-leaf Tansyaster



Max Licher

131 Tanseyleaf Aster



Mark Daniels

132 Blackfoot Daisy



Max Licher

133 Mariola



Max Licher

134 Cottonbatting Cudweed



Max Licher

135 Brownplume Wirelettuce



Max Licher

136 Pricklyleaf Dogweed



Max Licher

137 Fiveneedle Prickly Leaf



Max Licher

138 Silver Puffs



Max Licher

139 Golden Crownbeard



Max Licher

140 Rough Cocklebur



141 Popcorn-Flower



142 Wingnut Cryptantha



143 Bearded Cryptantha



144 Narrowleaf Stoneseed



145 Tower Mustard



146 Perennial Rockcress



Max Licher

147 Crossflower



Max Licher

148 Western Tansymustard



Max Licher

149 Wedgeleaf Draba



Max Licher

150 Shaggyfruit Pepperweed



Max Licher

151 Peppergrass



Mark Daniels

152 Gordon's Bladderpod



Max Licher

153 London Rocket



Max Licher

154 Twist Flower



Max Licher

155 Sand Fringepod



Max Licher

156 Glandular Threadplant



Max Licher

157 Sleepy Catchfly



Max Licher

158 Lambsquarters



Max Licher

159 Fremont's Goosefoot



Max Licher

160 Russian Thistle



Mark Daniels

161 Gila Manroot



Max Licher

162 Fendler's Sandmat



Max Licher

163 Hyssopleaf Sandmat



Max Licher

164 Prostrate Sandmat



165 Texas Croton, Doveweed



166 Halfmoon Milkvetch



167 Torrey's Milkvetch



168 Turkeypeas



169 Foothill Deervetch



170 Elegant Lupine



Max Licher

171 Sweet Clover



Max Licher

172 Slender-Flower Lemonweed



Max Licher

173 Twinleaf Senna



Max Licher

174 White Clover



Max Licher

175 Slender Vetch



Max Licher

176 Redstem Storks Bill



177 Texas Stork's Bill



178 Limestone Phacelia



179 Distant Phacelia, Wild Heliotrope



180 Littleleaf Ratany



181 Drummond's False Pennyroyal



182 Winding Mariposa Lily



Mark Daniels

183 Bluedicks



Max Licher

184 Flax



Max Licher

185 White-stem Blazingstar



Max Licher

186 Cheeseweed



Max Licher

187 Spreading Fanpetals



Mark Daniels

188 Globemallow



Mark Daniels

189 Trailing Windmills



Max Licher

190 Scarlet Spiderling



Max Licher

191 Fivewing Spiderling



Max Licher

192 Narrowleaf Four-O-Clock



Mark Daniels

193 Colorado Four-O-Clock



Max Licher

194 Rough Menodora



Mark Daniels

195 Scarlet Beeblossom



Mark Daniels

197 Creamcups



Mark Daniels

199 Woolly Plantain



Max Licher

196 White-stem Evening-Primrose



Max Licher

198 Devil's Claw



Mark Daniels

200 Miniature Woollystar



Max Licher

201 Lesser Yellowthroat Gilia



Max Licher

202 Rosy Gilia



Mark Daniels

203 Golden Linanthus



Max Licher

204 Bigelow's Linanthus



Max Licher

205 Slender Phlox



Max Licher

206 Broom Milkwort



Max Licher

207 Abert's Buckwheat



Max Licher

209 Bastardsage



Max Licher

211 Douglas' Knotweed



Mark Daniels

208 Little Desert-Trumpet



Max Licher

210 Prostrate Knotweed



Max Licher

212 Curly Dock



213 Fringed Redmaids



214 Shrubby Purslane



215 Western Rock-Jasmine



216 Spiny Cliffbrake



217 Desert Windflower



218 Barestem Larkspur



219 Rue of the Mountains



220 Bastard Toadflax



221 Wavy-Leaf Indian Paintbrush



222 Purple Owl-Clover



223 Purple Bird's Beak



224 Dalmatian Toadflax



Max Licher

225 Roving Sailor, Twining-Snapdragon



Max Licher

226 Little Redstem Monkeyflower



Max Licher

227 Eaton's Penstemon



Mark Daniels

228 Scented Beardtongue



Max Licher

229 Rosy Desert Beardtongue



Mark Daniels

230 Greenleaf Five-Eyes



Max Licher

231 Sacred Datura



Mark Daniels

232 Desert Tobacco



Max Licher

233 Groundcherry



Max Licher

234 Silverleaf Nightshade



Max Licher

235 Goodding's Verbena



Max Licher

236 Puncturevine

Addendum



Max Licher

237 Careless Weed



W.D. Bransford

238 Wavyleaf Twinevine



Michael L. Charters

239 American Yellowrocket



Bob Skowron

240 Bladderpod



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241 Jerusalem Oak Goosefoot



Steven J. Baskauf

242 Ivyleaf Morning-Glory



Max Licher

243 Oblongleaf False Pennyroyal



W.L. Wagner

244 Large White Desert Primrose



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245 Arroyo Lupine



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246 Squirreltail



North Dakota State University

247 Slender Wheatgrass



Oregon State University
Jed Colquhoun photo

248 Perennial Ryegrass



249 Spiny Sowthistle



250 Common Mullein

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