National Park Service
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Natural Resource Stewardship and Science

Plants of Casa Grande Ruins National Monument

Natural Resource Report NPS/SODN/NRR—2012/534

ON THE COVER

Casa Grande Ruins, 2009 NPS; Insets: Right, © 2012 Patrick Alexander; Bottom, 2009-2010 NPS

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Natural Resource Report NPS/SODN/NRR—2012/534

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SONORAN DESERT NETWORK
Inventory and Monitoring Program

The Flora Project

Editor
Steve Buckley

Plants of Casa Grande Ruins National Monmument

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The ethnobotanical information in this book is included for educational purposes only. No plant or plant extract should be consumed unless you are certain of its identity and toxicity and of your personal potential for allergic reactions. Self-medication with herbal medicines is often unwise and wild foods should always be used with caution. Although every effort has been made to ensure accuracy and reliability, neither the author, the Sonoran Desert Network Inventory and Monitoring Program, the National Park Service, nor the University of Arizona are responsible for the actions of the reader or liable for any effects caused by these actions.

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Arizona Remote Sensing Center
Office of Arid Lands Studies
College of Agriculture and Life Sciences • The University of Arizona

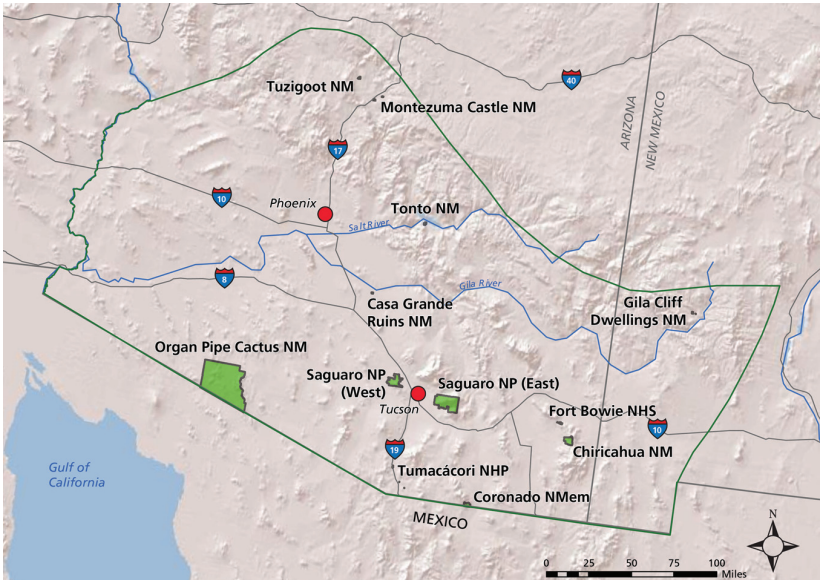
Plants of Casa Grande Ruins National Monument

The Flora Project

This field guide is part of a larger body of work known as the Flora of the Sonoran Desert Network. The Flora Project emerged from the network's vegetation mapping program, begun in 2009. Since then, we have compiled comprehensive floristic entries on upwards of 2,000 individual species, the ultimate goal being to build a comprehensive floristic database covering the more than 2,400 species, subspecies, and varieties of plants found in the national parks of the Sonoran Desert Network (SODN). These entries will ultimately be available as an online database and also translate directly into the work presented in this guide. The goal of the project is to produce (1) a comprehensive field guide for each SODN park unit, (2) a series of regional field guides tied to specific life forms, and (3) a guide to common plants for each SODN unit. These floras range from the small (around 160 species at Casa Grande Ruins National Monument) to massive (around 1,200 species in Saguaro National Park's Rincon Mountain District).

Our methodology builds upon that of inventory efforts completed in the late 1990s and early 2000s. The intention of the project is to conduct a more detailed floristic inventory while building vegetation maps for each park. We first combine the baseline inventory data with all historical studies, then proceed to a comprehensive search of all regional herbarium records. Through this process, we have identified more than 15,000 specimens collected since the creation of the national parks in the region. The herbaria search is followed by broad research in the phylogenetic, systematic, and ecological literature to sort out problematic species and genera. Finally, we scour all agency study records to develop a comprehensive portrait of the floristic research that has been undertaken in each park through the years.

The final products of these efforts are not field guides alone, but a cross-platform floristic information system that is being developed for use by land managers, researchers, and the public. Ranging from online databases to printed field guides, to apps for mobile and handheld digital devices, to a range of other digital and print educational tools and resources, the Flora Project hopes to set a standard for floristic research on federal lands in the desert southwest. Plant species checklists for Sonoran Desert Network parks are currently available at http://swbiodiversity.org/seinet/projects/index.php?proj=5 . These versions provide interactive keys that can further help in the identification of plants and provide links to other regional park species checklists.

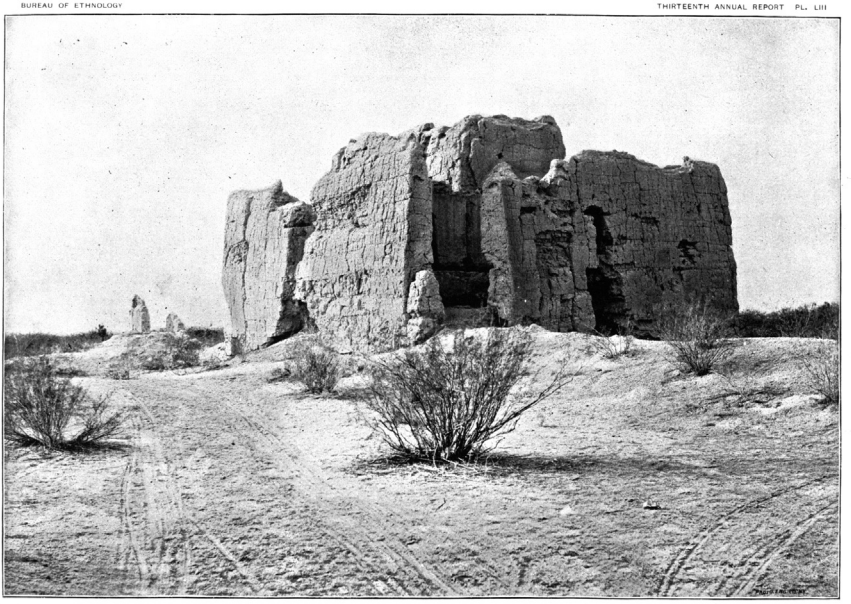


National Parks of the Sonoran Desert Network

The Sonoran Desert Network is one of 32 National Park Service inventory and monitoring networks nationwide that are implementing vital signs monitoring in order to assess the condition of park ecosystems and develop a stronger scientific basis for stewardship and management of natural resources across the National Park System.

The Sonoran Desert Network consists of 10 units in central and southern Arizona and 1 unit in southwestern New Mexico. These units are characteristic of the upper Sonoran subdivision of the Sonoran Desert Ecoregion and the Apache Highlands Ecoregion, and range in size from half a square mile to 517 square miles (147 to 133,882 hectares).

Please visit our website for more information and a full list of our active research projects, available publications, and other resources:
http://science.nature.nps.gov/im/units/sodn



GENERAL VIEW OF CASA GRANDE RUIN.

Administrative History Of Casa Grande Ruins

On June 22, 1892, President Benjamin Harrison created Casa Grande Ruins National Monument by executive order, making it the first cultural or prehistoric site in the United States to receive federal protection. The protected structures comprise a four-story Hohokam structure built during the Classic period of Hohokam habitation, from A.D. 1200 to 1450 (Clemensen 1992), and some 60 documented archeological sites surrounding it. Located on the northern edge of Coolidge, Arizona, southeast of Phoenix, the monument encompasses 191 hectares and is bounded by Arizona Highway 87 to the north and east, by the Pima lateral canal to the south, and agricultural fields to the west. Expansion lands to be acquired by the monument in the future include the prospective Adamsville unit on the opposite side of Highway 87 about 7 kilometers east of the main unit, and several small parcels of currently agricultural land adjacent to or near the main unit.

A Brief Environmental History of Casa Grande Ruins National Monument

Casa Grande Ruins National Monument is located in south central Arizona, in the Basin and Range physiographic province, where expansion of the earth's crust resulted in an alternating pattern of widely separated, steep mountain ranges with large alluvial fans or bajadas that gradually slope to the bottoms of broad, flat valleys (Reichhardt 1992). About 1 km north of Casa Grande Ruins is the Gila River, which drains a watershed encompassing much of southern Arizona along with portions of southwestern New Mexico and northern Sonora, Mexico. The monument averages 23 cm of annual precipitation in a bimodal pattern: gentle winter rains from the remnants of Pacific frontal systems, and heavy monsoon rains in summer, caused by convection of moist air from the Gulf of Mexico. Summer high temperatures usually exceed 40°C and winters are mild, rarely below freezing, with diurnal temperature extremes of 20°C or more during much of the year due to the area's extremely low humidity (Powell et al. 2006).

Human history in the Casa Grande area dates back to 5500 B.C., when Archaic peoples hunted and gathered in the area. Subsistence agriculture was not practiced until well after 1000 B.C., with the introduction of maize (corn); beans were introduced around 350 B.C. (Clemensen 1992). Agricultural expansion contributed to a more sedentary population and the beginnings of hydraulic culture. The Hohokam people, who practiced irrigated agriculture, arrived in the middle Gila River Valley about 300 A.D., and flourished there over the next thousand years. As the population grew, canals became larger and more consolidated, eventually reaching 8' deep × 16' wide in some areas; it is believed that the Hohokam were diverting up to half of the river's volume. Catastrophic flooding of the Gila River, along with several years of low flow, caused the Hohokam to move canal intakes further and further upstream, eventually reaching 18 miles from Casa Grande (Clemensen 1992). The effort to maintain their hydraulic systems, combined with more floods followed by periods of drought, brought on slow social decay that is thought to have contributed to Hohokam abandonment of the area around 1400 A.D.

For the next 400 years, habitation of the area was sparse. It was not until after 1853, when the area became part of the United States with the Gadsden Purchase, that Euro-American settlement increased. Prior to widespread Euro-American settlement, there are accounts of massive mesquite and cottonwood bosques along the Gila River in the vicinity of Casa Grande, as well as extensive grasslands (Rea 1997). With the increasing presence of Euro-Americans came the increasing pressures that accompanied livestock grazing. The monument itself was grazed until 1934, when it was finally fenced to protect the structures. With the cessation of the Apache Wars in the late 1800s, many Euro-American settlers descended on the area, rapidly expanding agriculture in the Gila River Valley. Upstream from Casa Grande, at Florence, Arizona, Mormon settlers had begun farming after 1866. The rise of their extensive, direct-diversion irrigation works, followed by groundwater pumping by the 1920s, resulted in expansive development of agricultural land as large volumes of both surface

and groundwater were used (Powell et al. 2006). By 1928, the construction of Coolidge Dam ended the era of the Gila as a free-flowing river through the area. The conversion of the landscape to agriculture continued unabated, and had encircled the monument by 1932.

Agriculture in the Coolidge area suffered greatly from overpumping of the water table, which was obvious as the water level of the park's well dropped from 128 feet below the surface, in the early 1940s, to more than 300 feet below the surface by 1956 (Clemensen 1992, Powell et al. 2006). This lowering of the water table, combined with a widespread mistletoe infestation, contributed to a large scale die-off of the Casa Grande Ruins mesquite population in the 1930s (Judd et al. 1971). The decade of the 1930s also saw the bulk of the development at the monument, with construction of the roof over the ruins in 1932 and, by the end of the decade, the visitor center, paths, roads, and several outbuildings. These are the same buildings that constitute the monument today. There has been only one major excavation of the ruin complexes; at that time, vegetation was scraped off the site entirely. Since the 1930s, little has been done to alter or manipulate the vegetation at Casa Grande Ruins. Today, some studies have questioned the negative effects of pesticide drift from neighboring agricultural land; this, combined with the edge effects of rapidly urbanizing Pinal and Maricopa counties, the continued decline of the water table, and active climate change, all have serious ecological implications for Casa Grande Ruins NM.

Clemensen, A.B. 1992. A centennial history of the first prehistoric reserve: 1892-1992. United States Department of the Interior. National Park Service, Washington, D.C.

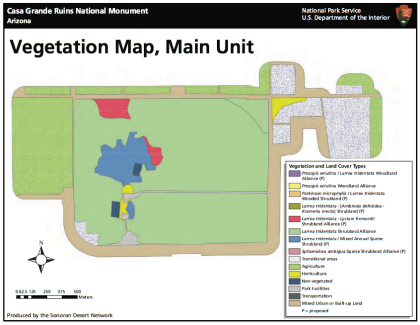
Judd, B.I., J.M. Laughlin, H.R. Guenther, and R. Handegarde. 1971. The lethal decline of mesquite on the Casa Grande Ruin National Monument. Great Basin Naturalist 31: 152-159.

Powell, B. F, E. W. Albrecht, C. A. Schmidt, W. L. Halvorson, P. Anning, and K. Docherty. 2006. Vascular Plant and Vertebrate Inventory of Casa Grande Ruins Naitonal Monument. OFR 2005-1185. U.S. Geological Survey, Southwest Biological Science Center, Sonoran Desert Research Station, University of Arizona, Tucson, AZ.

Reichhardt, K. 1992. Natural vegetation of Casa Grande Ruins National Monument, Arizona. Cooperative National Park Resources Studies Unit. Technical Report NPS/WRUA/NRTR-92/45.

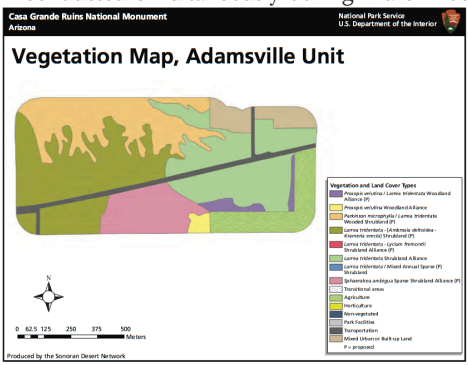
Vegetation Mapping at Casa Grande Ruins

In 2007–2008, the National Park Service, Sonoran Desert Network Inventory and Monitoring Program, in cooperation with the Arizona Remote Sensing Center (University of Arizona, Office of Arid Lands Studies), carried out classification and mapping of vegetation at Casa Grande Ruins National Monument, as part of the National Park Service–U.S. Geological Survey Vegetation Characterization Program. The primary objective of the program is to produce high–quality, standardized maps and associated data sets of vegetation and other land cover occurring within the parks (http://science. nature.nps.gov/im/inventory/veg/index.cfm). In particular, the aim of this project was to create a vegetation map at the National Vegetation Classification alliance level or finer, with a minimum mapping unit of 0.5 hectares, thematic accuracy of 80% or better per map class, and spatial accuracy meeting U.S. National Map Accuracy Standards.



Project scoping was initiated in October of 2007, at a multi–park scoping meeting held at Casa Grande Ruins NM. Quickbird satellite imagery was acquired on December 3, 2007, as a new, tasked acquisition for this project, covering both the main unit and several surrounding Arizona State Trust land parcels proposed as part of a monument expansion. The total project mapping area was 425 hectares, including a 100–m buffer zone outside monument boundaries. Image preprocessing and initial interpretation to the formation level were done at the Arizona Remote Sensing Center, University of Arizona. The draft formation–level map was produced through visual interpretation of the pan–sharpened imagery and heads–up digitizing in ArcGIS to delineate polygons. Ten formations within 44 polygons were identified, based on the percentages of tree, shrub, and herbaceous cover present.

Field verification of the draft formation map and floristic data collection was conducted simultaneously during March 2008. Crews annotated boundary changes onto hard–copy maps showing imagery overlaid with draft polygons. The monument's small size allowed for a census–style approach to each minimum mapping unit (polygons)



identified. Field edits were subsequently incorporated into the digital draft formation map (shapefile) using ArcGIS. In addition to polygon scale data, 25 plots measuring 20 × 50 m were sampled across both units with an aim to sample each of the community types identified. Plot and polygon data was entered into an Access database and quality checked before data analysis was conducted.

In total, 42 polygons were mapped and attributed with National Vegetation Classification Standard alliance–level data or land–cover classes. Urbanized environs outside the monument boundary were assigned one of seven Anderson land use classes. Full descriptions found in the final report provide both local and regional context for each vegetation type (to the extent available at the time of the report). Map thematic accuracy was assessed within the total project area by way of a field–based census. Overall thematic map accuracy for the entire effort was assessed at 96%.

While the main products of this project are the vegetation classification and the vegetation map database, a number of ancillary digital geographic information system and database products were also produced that can be used independently or to augment the main products.

This field guide is designed as a companion product to the vegetation mapping project. It is designed as both an introduction to the floristic research that accompanied the vegetation mapping effort and as an introduction to the ecological community data that were collected and analyzed in the course of creating the vegetation map. For further information about the SODN vegetation mapping effort and a copy of any of our vegetation mapping reports, please visit http://science.nature.nps.gov/im/units/sodn/vegmapping.cfm .

Toward Casa Grande Community Types

A primer

Casa Grande Ruins NM is composed primarily of desert shrubland characteristic of the Lower Colorado River division of the Sonoran Desert (Brown et al. 1979). Natural vegetation in the study area is composed of shrubland dominated by creosotebush (*Larrea tridentata*). In some areas, including the bulk of the main unit and portions of the Adamsville unit, the composition is homogeneous, with plants generally spaced a minimum of 2–3 m apart and no other shrub species present. In other areas, shrubs, such as wolfberry (*Lycium exsertum*), cattle saltbush (*Atriplex polycarpa*), triangle–leaf bursage, (*Ambrosia deltoidea*), desertbroom (*Baccharis sarothroides*), or ratany (*Krameria erecta*) form a portion of the dominant shrub stratum in association with creosote. Velvet mesquite (*Prosopis velutina*) and barrel cactus (*Ferocactus wislizeni*) are scattered throughout the shrubland, with the barrel cactus usually growing singly and the mesquite frequently in clumps of a few to several individuals. Perennial herbaceous vegetation is notably sparse in the monument, with purple threeawn grass (*Aristida purpurea*) and desert globemallow (*Sphaeralcea ambigua*) found only occasionally. Although annual vegetation may be seasonally abundant, the ground between shrubs usually appears barren. Litter accumulation and humus development are minimal except under large trees and shrubs. In wetter areas at Adamsville, mesquite and foothills paloverde (*Parkinsonia microphylla*) are abundant enough to constitute localized tree canopy above the shrubs, with mesquite occurring primarily near anthropogenic alterations to surface hydrology and paloverde occurring along ephemeral watercourses. Reichhardt (1992) conducted a vegetation classification survey in the mid–1980s, producing a baseline map of vegetation communities. This effort was complemented by the vascular plant inventory of Powell and others (2006), which established permanent monitoring plots and compiled a plant species list that was utilized by this field effort.

shrubland

This community type is composed of a creosote monoculture averaging 1.5–2.5 m tall and usually spaced 2–3 m apart on a flat, level landscape. In small depressions where runoff is concentrated, usually adjacent to roads (especially around the perimeter of the main unit) or archeological sites, shrubs are slightly taller and more closely spaced. These depressions often contain inclusions of one or more Velvet mesquite individuals, but these contribute less than 1% of total cover in this alliance type. It is notable, however, that many large velvet mesquite snags are scattered throughout areas in the main unit occupied by this type. Their decline was documented by Judd (1971). Barrel cactus is the only other common perennial found in this type, with individuals sparsely and irregularly scattered throughout, often growing underneath cresosote shrubs in apparent nurse relationships. Areas between shrubs are mostly bare soil or gravel, but may contain a variety of annual plant species during wet seasons. Litter is sparse and soil development poor, except directly under creosote shrubs, which tend to grow on low mounds of soil retained by their roots against strong aeolian erosive forces on the landscape. Within this association are two small inclusions on an old, defunct asphalt road bordering an old irrigation canal in the northeast corner of the main unit. Creosote still dominates but individuals are larger and more widely spaced than in the rest of the alliance. Desert broom and cattle saltbush are interspersed with creosote, on opposite ends of the old road. These inclusions are notable because they are the only place where either species is present in the eastern part of the Monument. Moreover, herbaceous annuals are significantly less dense in these inclusions. It is likely that these inclusions are the result of the altered soil surface in this portion of the park.

mixed shrubland

This Alliance is composed of two main polygons bisected by U.S. Highway 287 and a small corner area cut off by roads, all located at the Adamsville site (expansion lands) of Casa Grande Ruins NM. Creosote shrubs dominate here, as they do in most of the park, but are generally smaller and more widely spaced than in other areas of the park. The distinguishing characteristic of this shrubland is the presence of triange-leaf bursage and ratany as significant secondary species to creosote. Use of brackets in the type name indicates that these species are, in places, co–dominant but their relative abundance differs spatially throughout the area, ranging from absent to common. The space between shrubs contains a variety of annuals, primarily forbs, but is otherwise unvegetated. Soils contain significant gravel, but less than adjacent areas. This type is bisected by U.S. Highway 287, which places the polygon to the north slightly raised above the landscape and appears to slightly increase water runoff into areas within this alliance. Another indicator that this type may be slightly more mesic is the occasional presence of foothills paloverde. The raised highway may also provide increased protection from aeolian erosion which appears to significantly impact soils on the surrounding landscape and the more southern polygon. The southern polygon of this type differs in slightly lower density of shrubs and a more fine sandy soil, but overall composition and cover classes are the same.

shrubland

This alliance exists in two areas north of the visitor center complex in the main unit. It is characterized by the presence of Fremont's desert thorn (*Lycium fremontii*) as a co-dominant shrub alongside creosote. The relative abundance of these species may differ spatially within the type, with density of Fremont's desert thorn shrubs increasing substantially in areas gathering additional rainfall via shallow depressions. Both species tend to grow slightly larger than in the adjacent creosote shrubland, with average canopy heights often 2–2.5 m, but total canopy cover is lower with shrubs widely spaced. Wolfberry (*Lycium andersonii*) is also present to a lesser degree. Cattle saltbush is a common associate, especially along the park's northern boundary. Between shrubs, herbaceous annuals may be present seasonally during years with adequate precipitation, but bare soil predominates much of the time. Soils have higher silt and clay content and less gravel than surrounding areas. Litter is nearly absent and the soil surface has low permeability due to frequent exposure to intense sun, strong prevailing winds and impacts from heavy monsoon rain. Overall, topography is very flat, but includes several mounds and depressions associated with archaeological sites. Soil and plant composition suggest that this type exists in areas that receive a net inflow of surface runoff that is briefly retained in shallow pools.

mixed annual sparse shrubland

This alliance is found immediately north of the main visitor center complex. This alliance is mostly devoid of perennial vegetation. Shrubs are present in limited numbers (<10% cover), often in widely spaced clusters. Creosote is the most common species, but is accompanied by occasional cattle saltbush, salt bush (*Atriplex canescens*), *Lycium* spp. and barrel cactus. Shrubs generally grow on low mounds of soil retained by their roots against erosive forces. Areas between shrubs may contain annual forbs and/or grasses immediately following seasonal precipitation but will consist primarily of bare soil or gravel during all but the wettest periods. Soils are mostly sandy and poorly developed with minimal litter accumulation. The near absence of vegetative cover exposes bare soil to hot summer sun, strong prevailing winds and surface compaction due to the impact of heavy monsoon rain drops. Topography is generally flat, but contains a disproportionate number of shallow depressions where evidence exists of sheet flow and water accumulation. Some dense populations of golden crownbeard (*Verbesina encelioides*) are found in these depressions.

sparse shrubland

This alliance is found in the south–central portion of the Adamsville unit, with one half of the polygon surrounding an old cotton gin site. In the center of the northern part are the concrete remains of the cotton gin, where a single Prosopis velutina specimen is found. The remainder of the type is composed of shrubs in limited numbers (<10% cover), predominantly desert globemallow, and notable but sparse growth of creosote throughout. Associated shrub species found here are triangle-leaf bursage, desert broom, jimmyweed (*Isocoma pluriflora*) and burrobursh (*Ambrosia dumosa*). Shrubs generally grow on low mounds of soil retained by their roots against erosive forces. Areas between shrubs may contain annual forbs and/or grasses immediately following seasonal precipitation but will consist primarily of bare soil or gravel during all but the wettest periods.

wooded shrubland

This community is found in the northern portion of the Adamsville site and is defined by the dendritic, ephemeral watercourses trending north toward the Gila River. This alliance encompasses the headwaters of the washes which eventually reach 0.5–2 m deep and up to 6 m wide with sandy bottoms, steep, rocky sides and active downcutting and headward erosion. Small trees, including foothills paloverde, velvet mesquite and catclaw acacia (*Senegalia greggii*) are irregularly and sparsely scattered along these channels, becoming larger and more frequent as the channel size increases. Shrubs within the channels are larger, more densely spaced and more diverse than on the adjacent uplands. While still dominated by shrubs from the adjacent uplands (creosote, ratany and triangle-leaf bursage), this association also contains the only occurrence of longleaf jointfir (*Ephedra trifurca*) in the park. The field stratum is occupied primarily by annual forbs, in wet seasons. The most common annuals in spring 2008 were desert Indianwheat (*Plantago ovata*), and the non-natives filaree (*Erodium cicutarium*) and Asian mustard (*Brassica tournefortii*). The increased diversity, height and cover of woody and herbaceous plants in this type are an apparent consequence of the microenvironments created by the topography of the channels. These microenvironments offer increased moisture, a variety of slope aspects, some shelter from wind, and deeper soils not available in the uplands.

woodland

This alliance exists along two agricultural fencelines to the south and east of the large mound and ball court at the Adamsville site. These fencelines contain earthen berms formed by road building and maintenance to support adjacent agricultural operations. These berms capture and concentrate runoff, allowing it to saturate the soil. The moist conditions, perhaps augmented by infiltration of irrigation water from south and east of the fence, results in growth of velvet mesquite up to 7 m tall and creosote up to 3.5 m. Herbaceous annuals representative of the adjacent uplands thrive here, contributing more litter than is typical in adjacent uplands. This alliance resembles a portion of the creosote shrubland along the boundary of the main unit where runoff from adjacent roads permits similar concentrations of larger velvet mesquite.

woodland

This alliance exists only in a small patch within the 100-m study area buffer on the south side of the Adamsville unit, but extending south and southwest well beyond the buffer. The dominant feature is a cohort of young, regenerating velvet mesquite trees which are benefiting from runoff that enters from the northeast. The runoff has two sources: excess irrigation water from agricultural fields east of the patch and precipitation runoff from the large Adamsville ruin mound to the north. The runoff flows southwesterly, slowing down and spreading out to form a wide, shallow swale. Vegetation follows a coincident pattern, with the largest and densest growth concentrated in the northeast and gradually diminishing as it follows the swale. Associated shrubs include jimmyweed and saltbush. Purple threeawn grass is prominent in this type but rare in the remainder of the monument. Herbaceous diversity, percent cover and biomass are significantly higher here and include several species not found elsewhere in the monument, including carelessweed (*Amaranthus palmeri*), scarlet spiderling (*Boerhavia coccinea*) and Cuman ragweed (*Ambrosia confertifolia*). Soils are primarily silty, especially where water pools, and contain much more litter than adjacent uplands, but lack humus development.

Included as part of the mapping project for Casa Grande Ruins are five parcels of land outside the present park boundary under the ownership of the Archaeological Conservancy. These lands are under consideration for park expansion because of their archaeological importance. All of these lands are former agricultural lands, having been cultivated at various times in the past. Immediately east of the monument are several large parcels, one adjoining the commercial district, and a larger one further east on the far side of the railroad tracks. To the northeast of the park, directly northeast of the junction of U.S. Highways 87 and 187 is another site that was surveyed, and still another small site is located 200 meters east of this site to the north of Highway 187. The vegetation and soils on these lands distinctly indicate that they are abandoned agricultural fields. The transitional-area category is used here to represent land upon which former activities have ceased but future use has not been determined, and as per Anderson (1976) all that can be determined is that a transition is in progress. The vegetation is dominated by agricultural weeds, and there is little in the way of natural vegetation colonizing these sites, partly because of the lack of native vegetation immediately around them. There are several patches of jimmyweed on three of the sites, as well as rare scatterings the perennial purple threeawn grass. Annual non-native forbs such as filaree, russian thistle (*Salsola kali*) and Asian mustard dominate the sites. Rare on these sites are isolated velvet mesquite and desert broom shrubs, and desert globemallow and spiderlings.

How to use this guide

This guide is designed as a comprehensive companion volume to the vegetation mapping inventory for Casa Grande Ruins National Monument. More generally, it is an entry point to understanding basic plant systematics, the science that underlies the description, organization, and interpretation of plant diversity. Prior knowledge is neither required nor expected. The guide is divided into five general categories based on broad categories of plant lifeforms: ferns, graminoids, flowering trees and shrubs, cacti, and forbs. An explanation of each category appears on the first page of each section.

Within these lifeform categories, the plants are arranged alphabetically, first by plant family and second by genera and species. This frontispiece contains a few basic floral diagrams for flowers and grasses, along with some common leaf shapes, flowers, and inflorescence types. A glossary is also provided to aid in defining technical terms. The index includes the common and scientific names of all plants in this guide.

This field guide is not an effort to rewrite plant descriptions, but instead attempts to standardize descriptions in a way that facilitates field identification. It combines descriptions from floras, field guides, monographs, and the current scientific literature in an edited, standardized format. This work is intended to serve as an opening for an expanded awareness of the unique floristic biodiversity that the national parks conserve and preserve for future generations. There are thousands more plants in the ten other National Park units in the Sonoran Desert Network. We hope this work inspires its users to visit all these amazing parks and come to appreciate the vital work of the National Park Service in preserving these landscapes for the future.

Notes

The basics of plant systematics

The science of plant systematics organizes plants according to their evolutionary relationships. In plant systematics, those relationships are characterized by the unique traits of groups of plants, which are aggregated into what are known as orders. Immediately below the order is the family, which is the organizational foundation of this field guide. The order is the largest organizational category and can consist of several to many different families.

The family is a grouping of related plants connected by some or several specific characteristics. In systematics, some of these characteristics are called synapomorphies, or character states that developed in the ancestors of the family and can be found in all family members. For example, all plants in the Mint Family, or Lamiaceae, have opposite leaves, square stems, and ethereal oils that excrete the familiar minty smell.

Below the family level, each species has a Latin genera (or genus) name (e.g., Prosopis), followed by what is known as the specific (i.e., species) epithet (e.g., velutina). This way of organizing scientific names, known as the binomial nomenclature system, dates to the 18th century and the Swedish naturalist Carl Linnaeus. Although even generally accepted Latin names sometimes have recognized alternatives (synonyms) and, as such, are subject to a limited amount of regional variation, the Latin (or scientific) names are far more stable than common names—which, especially relative to plants, are notoriously unreliable.

The organization of plants in this guide is based on the Angiosperm Phylogeny Group III (APG III), which the Sonoran Desert Network staff considers to be the most recent and up-to-date plant systematics research. The Angiosperm Phylogeny Group III provides guidance for current information about relationships among plants and which genera are found in specific families. For more information, visit the Angiosperm Phylogeny poster at http://www2.biologie.fu-berlin.de/sysbot/poster/poster1.pdf. Further information about plant systematics can also be found in the Works Cited section of this guide.

Notes

Note on nomenclature

The science of plant systematics is undergoing considerable change due to the rise of phylogenetics (the study of plant genetics and plant evolutionary history). As a consequence, name changes from the level of family down to genera and even species are common.

The Flora of the Sonoran Desert Network project utilizes the Missouri Botanical Garden's Tropicos system (www.tropicos.org) as the standard for plant nomenclature. Tropicos is the preferred standard for this guide because it reflects the most recent scholarship in phylogenetic systematics for nomenclature and organization. As noted above, the Flora Project also follows the APG III. In some instances, specific phylogenetic literature is used to distinguish a newly recognized or newly re-named species. All scientific names are italicized as per usage in the literature. Complete citations for the literature and opportunities for further investigation can be found in the works cited section.

Recent systematic changes

Botany is undergoing considerable change as a consequence of phylogenetic study. As mentioned, this guide is organized according to the work of the Angiosperm Phylogeny Group III. Our treatment of the family structure is based on this organization because it is comprehensive and best supported by the literature. See the APG III website for continually updated information: http://www.mobot.org/mobot/research/APWEB/

Outside of this basic structure, the Flora Project relies heavily on the systematic literature to guide our placement of genera within families and even species within genera. The following is a key to some recent and well supported changes along with their relevant references. For complete references, refer to the Works Cited page in the back of the guide.

Adoxaceae: Absorbed some genera from Caprifoliaceae
Genera: Sambucus
Authority: Eriksson and Donoghue 1997

Amaranthaceae: Absorbed all of the Chenopodiaceae
Genera: Atriplex, Bassia, Chenopodium, Dysphania, Kochia, Krascheninnikovia, Monolepis, Nitrophila, Salsola, Suaeda
Authority: Muller and Borsch 2005

Amaryllidaceae: Absorbed all of the Alliaceae and some other Liliaceae
Genera affected: Allium, Nothoscordum, Zephyranthes
Authority: Chase et al. 2009

Apocynaceae: Absorbed most of the Asclepidaceae
Genera affected: Asclepias, Funastrum, Sarcostemma
Authority: Endress and Stevens 2001

Asparagaceae: Absorbed all the Agavaceae, much from the Liliaceae, and genera that at various times were placed in Nolinaceae and Ruscaceae
Genera affected: Agave, Yucca, Nolina, Dasylirion, Dichelostemma, Echeandia, Hesperocallis, Maianthemum, Milla, and Polygonatum.
Authority: Chase et al. 2009

Boraginaceae: Absorbed all of Hydrophyllaceae, but remains inconclusive
Genera affected: Emmenanthe, Eriodictyon, Eucrypta, Nama, Phacelia, and Pholistoma
Authority: Weigend 2010

Cannabaceae: Absorbed some of the Ulmaceae
Genera: Celtis
Authority: Whittemore 2005

Convolvulaceae: Absorbed Cuscutaceae
Genera: Cuscuta
Authority: Stefanovic et al. 2003, Stefanovic et al. 2002, Neyland 2001

Notes

Euphorbiaceae: No big changes or inclusions
Genera affected: All Chamaesyce is Euphorbia
Authority: Steinmann and Porter 2002

Fabaceae: *Lotus* moved to *Acmispon*, *Acacia* disintegrated to *Senegalia* and *Vachiella*
Authority: Brouillet 2008, Maslin 2003

Malvaceae: Absorbed some of the Sterculiaceae
Genera affected: Ayenia
Authority: Whitlock and Hale 2011

Montiaceae: Absorbed some of the former Portulacaceae
Genera affected: Calandrinia, Cistanthe, Claytonia, Phemeranthus
Authority: Nyffler and Eggli 2009

Onagraceae: Saw considerable generic reorganization
Genera affected: Camissonia, Camissoniopsis, Chylismia, Eremothera, and Oenothera
Authority: Wagner et al. 2007

Orobanchaceae: Absorbed some of the Scrophulariaceae
Genera: Castilleja, Cordylanthus, Pedicularis
Authority: Olmstead et al. 2001, Oxelman et al. 2005, Bennett and Matthews 2006, Tank et al. 2009

Phrymaceae: Absorbed some of the Scrophulariaceae
Genera: Mimulus
Authority: Beardsley and Olmstead 2002, Olmstead et al. 2001, Oxelman et al. 2005

Plantaginaceae: Absorbed some of the Scrophulariaceae
Genera: Penstemon, Nuttallanthus, Keckiella, Maurandella, Sairocarpus, Schistophragma, Stemodia, and Veronica
Authority: Olmstead et al. 2001, Albach et al. 2005, Oxelman et al. 2005, Wolfe et al. 2006

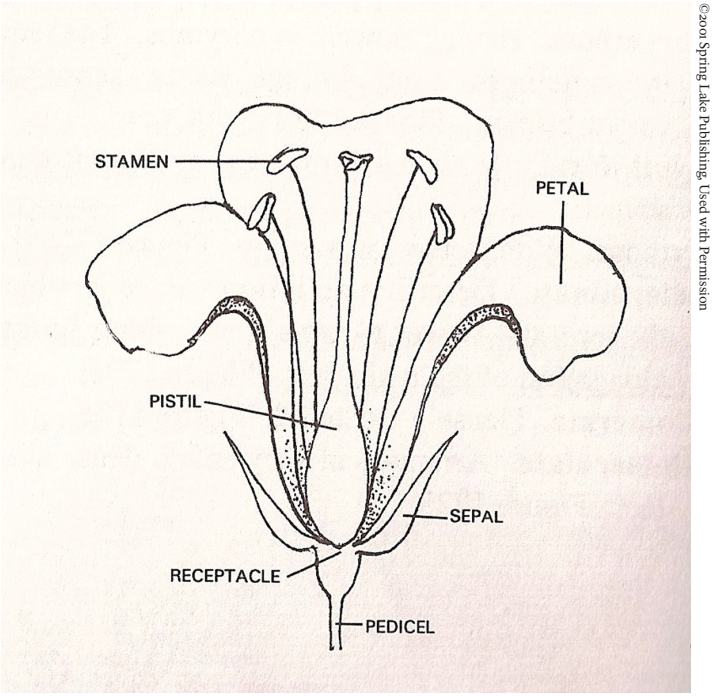
Poaceae: Several changes at the generic level
Genera: Cenchrus, Festuca, Muhlenbergia
Authority: Chemisquy et al. 2010, Columbus and Smith 2010, Peterson et al. 2010

Santalaceae: Absorbed some of the Viscaceae
Genera: Phoradendron
Authority: Der and Nickrent 2008

Talinaceae: Absorbed some of the old Portulacaceae
Genera: Talinum
Authority: Nyffler and Eggli 2009

Notes

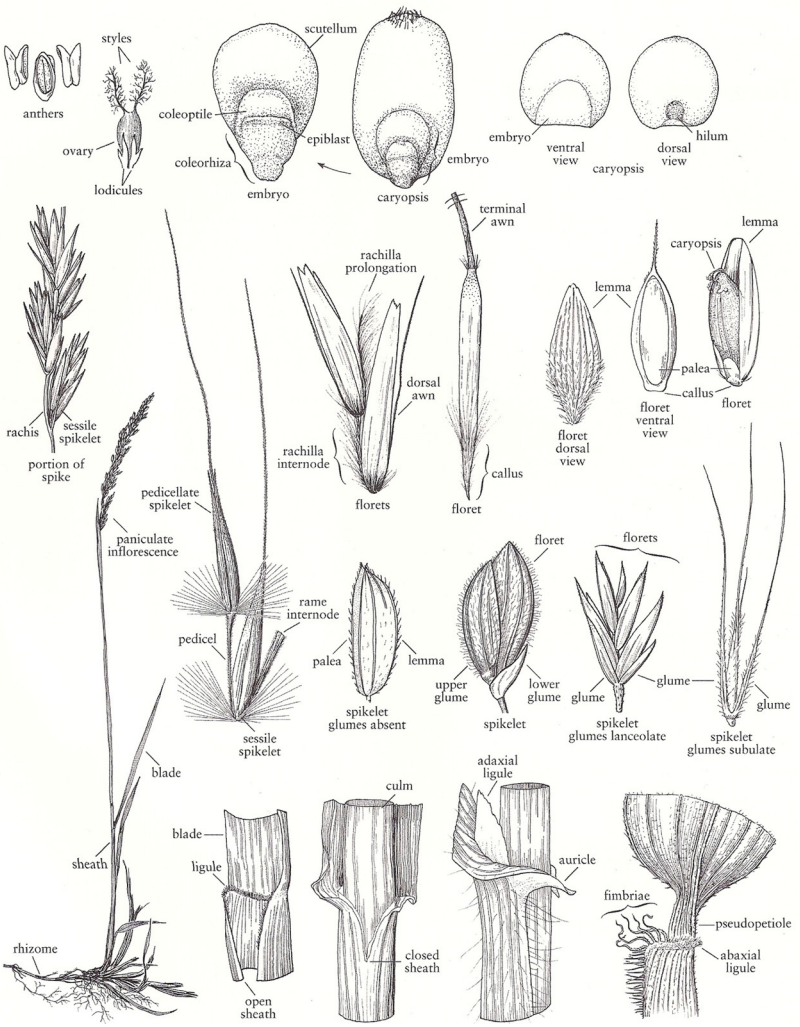
General flower structure



Basic diagram of a flower with its various parts.

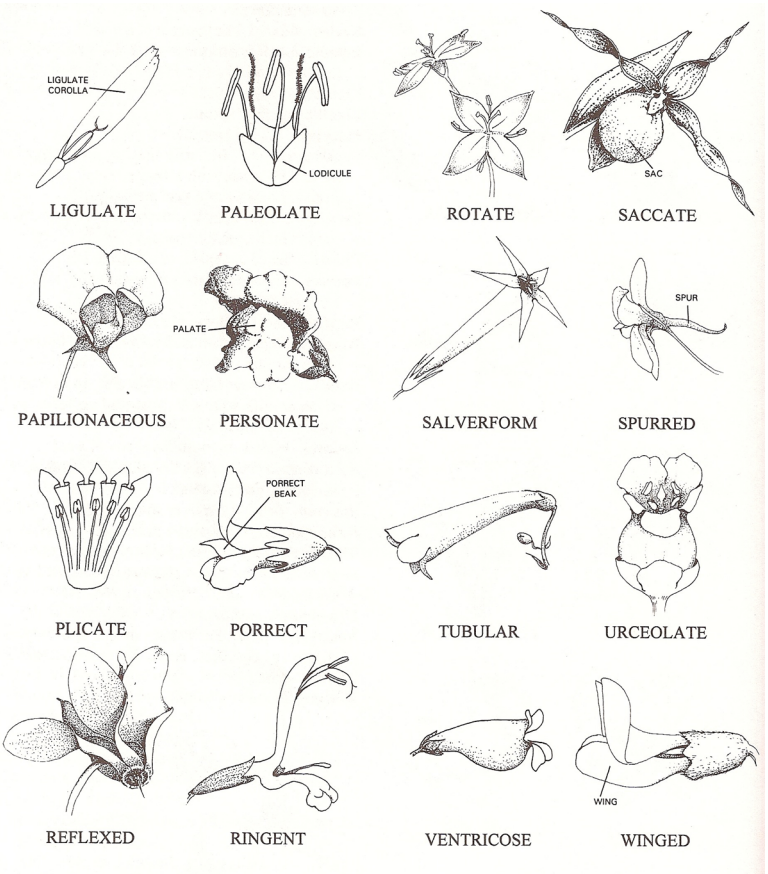
Notes

Grass structures

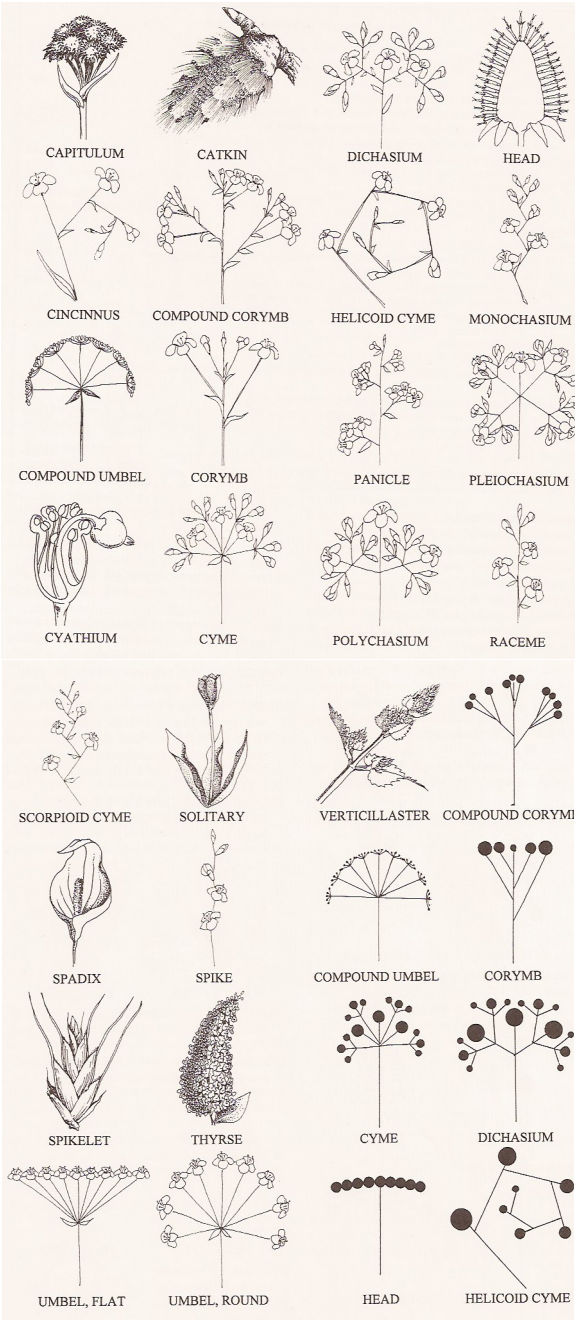


Notes

Flower types



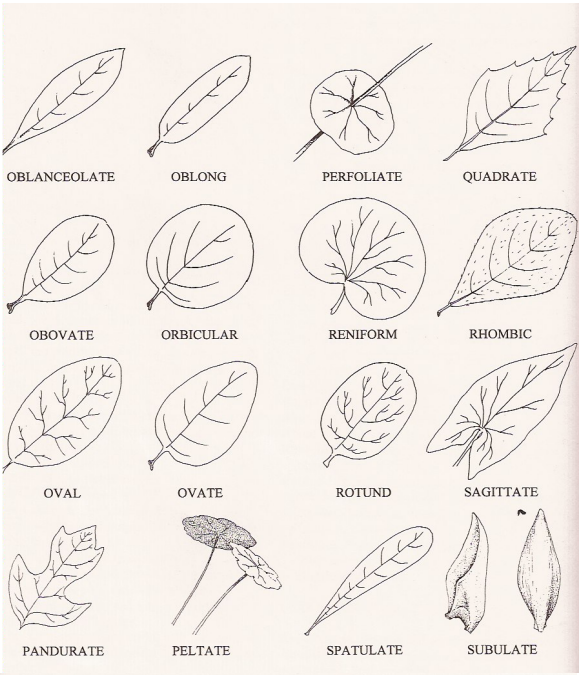
Notes

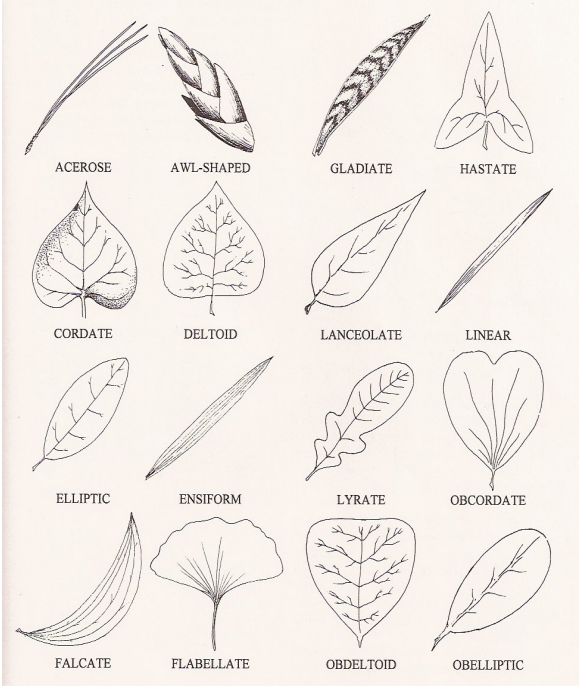


Notes

Leaf margins

Notes





Notes

Key to non-native species boxes

The high, medium, and low coding identifies the level of risk for impacting wildlands and natural resources.

H M L

Impact risk level

Eragrostis lehmanniana

Lehmann lovegrass

General: Tufted perennial, erect or ascending, sometimes decumbent and geniculate at lower nodes, 45–60 cm tall; stems bent at lower nodes. **Vegetative:** Sheaths one–third to one–half the length of the internodes, open, glabrous except for sparse pilose apex of margins; blades involute, about 1 mm wide, 2–10 cm long, stiffly ascending, sometimes grossly flexuous, 5–15 cm long; ligule ciliate, 0.5–1 mm long; collar pilose at the margins. **Inflorescence:** Narrowly oblong to lanceolate, open, 10–15 cm long, 4–8 cm wide, rachis glabrous to slightly scabrous, branches ascending to slightly spreading; spikelets slightly compressed, often dark gray–green to straw colored, several to 12–flowered, rachilla disrticulating; glumes hyaline, keeled, scarcely compressed, first lanceolate 1–1.2 mm, second ovate–lanceolate 1.4–1.6 mm long; lemmas oblong, obtuse, very little compressed or keeled; caryopsis ellipsoidal. **Ecology:** Introduced widely beginning in the 1930s, now widespread in grasslands and along roadsides from 3,000–4,500 ft (914–1372 m); flowers June–August. **Notes:** One of the most charismatic of the African introductions from earlier in the century, it was used extensively as an erosion control and range revegetation plant, but now it is changing fire–regimes and altering greater areas every year. **Etymology:** Eragrostis is from Greek eros, love and agrostis, grass, lehmanniana is named for German botanist Johann Georg Christian Lehmann (1792–1860). **Synonyms:** None

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The shaded box indicates that this species is non-native, introduced, or an invasive exotic.

Contact the Sonoran Institute for a set of field identification cards for all invasive non-native plant species in the region. http://sonoran.org

Notes

Ferns

Ferns may not be the first plant that comes to mind when you think of the Sonoran Desert. But there they are, everywhere. In patches of damp shade beneath overhanging rocks, tracing springs out of vertical faces of rock, or covering dry slopes in the oak woodlands. Some even prefer the lack of moisture and the full sun. Desert generally evokes images of endless hot plains and emptiness, not steep slopes of palo verde and brittlebush or the vibrant speckled color of spring in wet years. Wet years and wet places; apparent misnomers in the talk of deserts. But wetness abounds, from minor seeps to creeks to runoff to even the fleeting moisture and shade beneath rocks.In all of these wet places, there are ferns.

Getting to know the ferns is one part getting to know where to find them, being careful not to disturb the rattlesnake sleeping under a rock. It is one part knowing to look for the characteristic and distinctive pinnate form, to begin to see in the trim fronds and hairs the evolutionary history of plants coming out of swamps in the Cretaceous and eventually into the age of flowering plants. Ferns are genuinely from a simpler time, when there were not seeds and flowers, but only gametophytes and spores.

When we talk of ferns we are talking specifically about the roots (no pun intended) of land plants and about vasculature. The land plants all have vascular tissue; it is what marks their evolutionary emergence from the swamps and it is vascular tissue that distinguishes them from the non-vascular plants, such as the liverworts, hornworts, and true mosses. Vascular plants eventually developed the simple, spore-based reproductive systems found in ferns, which would later diversify into the woody plants and the seed plants.

What distinguishes ferns from other vascular plants is that they not only have vascular tissue, but also reproduce by spores and were the first plants to evolve prototypical leaves approximately 400 million years ago. The lycophytes, one group of early fern relatives were so-named for their lycophylls, one of the earliest prototype leaf structures. This structure evolved into more specialized ones and eventually into the euphyll structure, an early true leaf whose single mid-vein and branching system of veins represented the evolutionary separation into an increasing variety of vascular structures.

Ferns include a remarkable diversity of plants. Across the desert southwest they range from the club-mosses, such as Selaginella, to the diminutive whisk ferns in Psilotum, to the broad range of species in Cheilanthes and the other Pteridophytes, to the related but very different horsetails in Equisetum. This unique group of plants often requires closer attention than it receives, for ferns lack the showy wonder of the flowering plants. But you will nevertheless be amazed, so get yourself a good handlens and look a little closer.

Cheilanthes wootonii

beaded lipfern

General: Slender, widely creeping rhizomes 1–3 mm in diameter, densely scaly with loosely imbricated, oblong–ovate to lance–oblong, distantly denticulate, light reddish brown scales, 2–3 mm long. **Leaves:** Several fronds, scattered 7–35 cm long, noncircinate vernation, stipes slender 5–20 cm long, petiole dark brown, rounded adaxially; blade oblong–lanceolate, 3–4 pinnate at base, 2–5 cm wide; pinnate not articulate, basal pair not conspicuously larger than adjacent pair; scales firmly attached, rounded to subcordate at base, ciliate. **Sporangia:** Few, false indusia marginal, weakly differentiated, 0.05–0.25 mm wide; sori more or less continuous around segment margins; sporangia containing 32 spores. **Ecology:** Found on rocky slopes and along ledges from 3,000–9,500 ft (914–2896 m); sporulating summer–fall. **Notes:** This species can be distinguished by the leaf blades appearing glabrous adaxially, with costal scales that are only ciliate in the proximal half, and the brown and loosely appressed stem scales. **Ethnobotany:** Used as a life medicine and as a lotion for gunshot wounds. **Etymology:** Cheilanthes is from Greek cheilos for lip and anthos for flower, while wootonii is named for Elmer Otis Wooton (1865–1945), an American botanist and former curator of the National Herbarium. **Synonyms:** None

Graminoids

Graminoids are herbaceous plants, meaning that they are not woody and die back to their roots at the end of each growing season. They share the same plant structures as other flowering plants, in modified form. The grasses notably lack the vibrant color of flowers, as well as what we might recognize as petals, but once pollinated, produce seed the same as other plants do. Grasses have reduced flowers with names like florets, spikelets, and glumes instead of tepals. While sedges have spikelets and achenes, their structures are different from grasses. Rushes are altogether different again, with reduced tepals and a capsule.

Sedges have edges and rushes are round; grasses are hollow right down near the ground, goes a simple mnemonic taught to botany students. More scientifically, plants in the family Cyperaceae (sedges) have three sides and so have edges, while the family Juncaceae (rushes) are round, but not hollow like grasses. These first two families are often found in moist soils or along the margins of ponds and rivers, while grasses are widespread in moist and dry soils alike.

Grasses are the single most important plant family to human beings. If you had cereal this morning, or enjoyed bread with your sandwich, or really liked that corn tortilla you ate, then you have grasses to thank. In fact, a fairly limited number of grasses account for the majority of our food calories as a human family.

Wild grasses, on the other hand, are more diverse and constitute a significant proportion of the biomass found in forests, woodlands, and grasslands. While we might easily recognize a ryegrass or a corn plant, we are less likely to recognize purple threeawn (*Aristida purpurea*) or even the highly invasive buffelgrass (*Cenchrus ciliaris* or *Pennisetum ciliare*).

Graminoids are vital to the stability of a huge percentage of the world's surface area. Prior to the onset of human civilization, this family may have covered as much as 25% of Earth's land area. Although we have radically altered a huge percentage of this land, huge reservoirs of land are still maintained in grasses. Sedges and rushes often indicate the presence of water, as well as health in riparian systems. Either way you split the culm—square, round, or hollow, you've got in your hands a hugely important example of the world's plants.

Aristida purpurea

purple threeawn

General: Erect, small, annual to perennial bunchgrass, elliptical stem, can be (but not often) branched at lower nodes, 30–60 cm tall. **Vegetative:** Blades 0.5 mm wide, 2–8 cm long, rolled, curved, rough, ribs indistinct, margin occasonially hairy. Sheath smooth, round, open. Ligule ciliate, 0.3–0.6 mm long. Auricle none. Collar with hairy margin, bearded. Vernation folded. **Inflorescence:** Panicles 10–25 cm long, flexuous and curving in fruit, weighed down. Spikelets reddish–violet. Glumes very unequal, first glume 6–7 mm long, second glume 12–15 mm. Lemma 10–11 mm to base of awns. Awn column 1–2 mm long, awn 3–4.5 cm long, fine and delicate, deeply colored. **Ecology:** Rocky or sandy plains and slopes, found commonly along roadsides from 1,000–7,000 ft (305–2135 m); flowers April–October. **Notes:** Blades rolled, thread–like, curved, short collar bearded; ligule has conspicuous hairs, purple awns 2–5 cm long. Awns can cause abscesses to the mouths and nostrils of grazing animals and injury to skin when caught on fur. Provides fodder in spring before awns grow. Grazed by jackrabbit. Tolerates heavy use by prairie–dogs. Increases with grazing. Poor to fair livestock forage because of long awns, and provides poor cover. **Etymology:** Aristo is Greek for best. Purpurea is Latin for purple. **Synonyms:** None

Avena fatua

Impact risk level H M L

wild oat

General: Introduced, erect, tufted annual with usually smooth, thick but weak culms 30–120 cm tall. **Vegetative:** Blades thin, flat with sparsely villous margins, 5–12 mm wide, 10–30 cm long; sheath open, collar margins sparsely villous. Ligule membranous, 2–5.5 mm long, obtuse to acute and toothed. **Inflorescence:** Panicle large with spreading and curving branches and pedicels. Glumes glabrous, 2–3 cm long. Lemmas pubescent and rounded on back, firm; lowest lemma 1.5–2 cm long with a stout, twisted and geniculate awn that is 2.5–4 cm long. **Ecology:** Weed of roadsides, fields, and waste places; flowers March–July. **Notes:** Tall annual with a large panicle containing drooping spikelets, lemmas with geniculate awns that are 2.5–4 cm long. Host plant for Common Wood–nymph butterfly. **Ethnobotany:** The seeds were parched, ground into flour, boiled, pounded, eaten dry, as mush, pinole, and stored for later use. **Etymology:** Avena is Latin for oats, while fatua means foolish, insipid, or worthless. **Synonyms:** *Avena fatua* var. *glabrata*, *A. fatua* var. *vilis*

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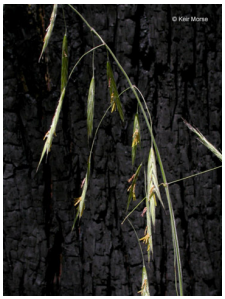
Bromus carinatus

California brome



©2008 Keir Morse

General: Tufted perennial with culms mostly 40–80 cm tall. **Vegetative:** Blades flat, glabrous or sparsely pilose, mostly 4–8 mm broad, 1–30 cm long; closed sheaths, to within a few centimeters of the ligule, throats usually hairy; ligule membranous, glabrous or sparsely hairy, acute or obtuse, lacerate, 2.5–4 mm long. **Inflorescence:** Panicle generally 12–30 cm long, lax, open to erect with long spreading branches, lower branches shorter than 10 cm, 1–4 per node, ascending to strongly divergent or reflexed, with 1–4 spikelets variously distributed; glumes large but shorter than lowermost lemma, glabrous to pubescent, unequal to nearly equal in length, first glume three–nerved, second broader, five to seven nerved; lemma glabrous or scabrous, strongly keeled distally, uniformly pubescent on margins, 10–16 mm long, with awn one–half to one–third as long, sometimes geniculate, caryopsis as thick or thicker than broad. **Ecology:** Found on woodland slopes and in forests, often in moist soil and partial shade to 9,000 ft (2743 m); flowers July–November. **Notes:** Told apart from *B. catharticus* by the lack of an awn in *B. catharticus*. **Ethnobotany:** Seeds parched, ground into flour, used also for mush. **Etymology:** Bromus is from Greek bromo, for stinking, while carinatus means keeled like a boat. **Synonyms:** *Bromus carinatus* var. *californicus*, *B. carinatus* var. *carinatus*, *B. carinatus* var. *hookerianus*, *B. laciniatus*, *Ceratochloa carinata*

H M L Impact risk level

Bromus rubens

red brome

General: Introduced invasive annual, 20–50 cm tall, often less on dry slopes. **Vegetative:** Lower sheaths and blades pubescent, blades 1–2 mm wide, 2–6 cm long, flat; sheath closed to within a few cm of ligule; ligule membranous, erose to lacerate, 1–2.5 mm long. **Inflorescence:** Panicle several–flowered, 4–8 cm long including awns, dense, branches short and erect; spikelets, especially the awns, usually dark reddish brown or purple tinged at maturity; lemma awns 1.5–2.5 cm long, straight or curved, margin of lemma hyaline. **Ecology:** Widespread exotic that spreads on overgrazed rangeland below 7,000 ft (2134 m); flowers spring. **Notes:** Very widespread, spreads with fire and overgrazing, sheep will eat it but only for a short period. **Ethnobotany:** Unknown **Etymology:** Bromus comes from Greek bromo for stinking, while rubens means red. **Synonyms:** *Anisantha rubens, Bromus madritensis* ssp. *rubens, B. matritensis* ssp. *rubens*

H M L Impact risk level

Cenchrus ciliaris

buffelgrass

General: Wickedly invasive, introduced perennial bunchgrass with erect culms 10–150 cm tall, forming thick mats or tussocks with dense, usually stoloniferous roots. **Vegetative:** Sheaths scabrous, leaf blades bluish–green, 3–30 cm long, 2–6 mm broad, papillose–hispid to occasionally hirsute; ciliate near the ligule; ligule densely ciliate, membranous portion very short. **Inflorescence:** Usually 5–10, cylindrical in outline, 2–14 cm long; spikelets clustered, surrounded by spreading bristles, slender or some flattened and broad, reddish–brown to purple, scabrous to plumose or ciliate, 1–1.5 cm long; spikelets 4–5 mm long, first glume half as long as spikelet, second glume and sterile lemma equal. **Ecology:** Found widespread in disturbed habitats, spreads very quickly on abandoned land below 3,000 ft (914 m); flowers July–October. **Notes:** This plant is rapidly altering the fire regime of the Sonoran Desert, there is enormous concern over the fate of this species. It was still being seeded into the 1980s, while the Mexicans have continued to seed depleted rangeland with this species and there is some discussion of a possible cold tolerant variety in development. **Ethnobotany:** Unknown **Etymology:** Pennisetum is form Latin penna, feather and seta, a bristle, while ciliare means edged with hairs. **Synonyms:** *Pennisetum ciliare*

Impact risk level H M L

Cynodon dactylon

Bermudagrass

General: Perennial with stolons and rhizomes, obvious internodes that forms extensive mats, culms mostly creeping and stoloniferous, short internodes. **Vegetative:** Leaves 2–ranked, flat, short, narrow, usually 1–3 mm broad, ligule a fringe of short hairs and lateral tufts of long stiff hairs. **Inflorescence:** Spikes 4–7, digitate, slender, often 2.5–6 cm, purplish to green, spikelets sessile and closely appressed, in two rows on narrow, triangular rachis. **Ecology:** Found everywhere, very widespread weed below 6,000 ft (1829 m). **Notes:** One of the most common introduced grasses in Arizona. In many places it has been planted as a pasture grass, which makes it particularly common along the Santa Cruz River and other waterways in southern Arizona. **Etymology:** Cynodon is from Greek meaning dog tooth, and dactylon is from Greek daktylos, finger or toe. **Synonyms:** *Capriola dactylon, Cynodon aristiglumis, C. incompletes, Panicum dactylon*

Impact risk level H M L

Eragrostis lehmanniana

Lehmann lovegrass

General: Tufted perennial, erect or ascending, sometimes decumbent and geniculate at lower nodes, 45–60 cm tall; stems bent at lower nodes. **Vegetative:** Sheaths one–third to one–half the length of the internodes, open, glabrous except for sparse pilose apex of margins; blades involute, about 1 mm wide, 2–10 cm long, stiffly ascending, sometimes grossly flexuous, 5–15 cm long; ligule ciliate, 0.5–1 mm long; collar pilose at the margins. **Inflorescence:** Narrowly oblong to lanceolate, open, 10–15 cm long, 4–8 cm wide, rachis glabrous to slightly scabrous, branches ascending to slightly spreading; spikelets slightly compressed, often dark gray–green to straw colored, several to 12–flowered, rachilla disrticulating; glumes hyaline, keeled, scarcely compressed, first lanceolate 1–1.2 mm, second ovate–lanceolate 1.4–1.6 mm long; lemmas oblong, obtuse, very little compressed or keeled; caryopsis ellipsoidal. **Ecology:** Introduced widely beginning in the 1930s, now widespread in grasslands and along roadsides from 3,000–4,500 ft (914–1372 m); flowers June–August. **Notes:** One of the most charismatic of the African introductions from earlier in the century, it was used extensively as an erosion control and range revegetation plant, but now it is changing fire regimes and altering greater areas every year. **Etymology:** Eragrostis is from Greek eros, love and agrostis, grass, while lehmanniana is named for German botanist Johann Georg Christian Lehmann (1792–1860). **Synonyms:** None

Festuca octoflora

sixweeks fescue

General: Erect annual, 15–30 cm tall. **Vegetative:** Blades 1–2 mm wide, 2–10 cm long; narrow, margins rolled upward. Sheath smooth to puberulent. Ligule 0.5 mm long. Vernation folded. **Inflorescence:** Narrow panicle, 2–10 cm long. Spikelets 6–8 mm long, 5–13–flowered. 1st glume 3–4.5 mm long, lance–shaped, 1–nerved. 2nd glume 3–4.5 mm long, lance–shaped, 3–nerved. Lemma 4–5 mm long, firm, lance–shaped, smooth or rough–textured. Awn 3–5 mm long. **Notes:** Annual; >5 florets per spikelet. **Ecology:** Sterile, rocky, open ground below 6,500 ft (1981 m) throughout the state; flowers May–July. Species has little forage value, with low palatability. Roots are commonly pulled from soil due to livestock trampling. Seeds collected in caches and eaten by mice. Provides poor cover for wildlife. **Etymology:** Vulpi is Latin for fox. Octoflora is Latin for 8–flowered. **Synonyms:** *Vulpia octoflora*

H M L Impact risk level

Hordeum murinum ssp. *glaucum*

smooth barley

General: Small annual, 20–60 cm, culms geniculate at the base. **Vegetative:** Sheaths glabrous, ligules short 0.2–0.7 mm long, truncate, erose or entire, ciliolate; blades flat, 1.5–4 mm broad, scabrous to pilose, auricles well developed, 1–2.5 mm long. **Inflorescence:** Spikes linear–oblong, 5.5–7 cm; rachis disarticulating; central spikelets 16–36 mm including awns, three spikelets appear pedicellate; glumes 11–22 mm long, those of central spikelet and inner glumes of the lateral spikelets broadened at the base and ciliate, with 3 scabrous nerves, outer glumes of the lateral spikelets awn–like; lemma of central spikelet 6–10 mm long, fertile and glabrous. **Ecology:** Found in disturbed areas; flowers May–June. **Notes:** Common weedy annual species in the desert. **Etymology:** Hordeum is the Latin name for barley, while murinum means of mice, mouse–gray, like a mouse. **Synonyms:** *Critesion glaucum, C. murinum* ssp. *glaucum, Hordeum glaucum, H. stebbinsii*

Impact risk level H M L

Hordeum murinum ssp. leporinum

leporinum barley, mouse barley

General: Introduced annual, geniculate and spreading at base, 15–50 cm tall. **Vegetative:** Blades mostly 3–8 mm broad, sparsely hispid, auriculate, auricles membranous, about 2 mm long; ligules short, membranous, upper sheath expanded, enclosing basal portion of the inflorescence. **Inflorescence:** Spicate raceme 4–8 cm long, about 1 cm broad excluding awns; lateral spikelets large, florets equaling or exceeding central floret; glumes of central spikelet and inner glumes of lateral spikelets broadened and flattened with ciliate margins; floret of central spikelet borne on pedicel as long as pedicels of lateral spikelets, its lemma, awn, and palea all shorter than those of lateral spikelets, awn of glumes 1.5–2.5 cm long, stiffly erect–spreading. **Ecology:** Weed of disturbed soils below 9,000 ft (2743 m); flowers April–September. **Notes:** Separated from other *Hordeum murinum* by stalked central floret, floret less than lateral florets, and lemma awn slightly less than awn of lateral floret. **Ethnobotany:** Unknown **Etymology:** Hordeum is the Latin name for barley, murinum means of mice, mouse–gray, like a mouse, while leporinum is from root lepus or leporis for a hare. **Synonyms:** *Critesion murinum* ssp. *leporinum*, *Hordeum leporinum*

Impact risk level H M L

Hordeum vulgare

common barley

General: Introduced; large cultivated annual; erect grass up to 60–120 cm tall; glabrous. **Vegetative:** Blades flat, 5–16 mm wide; sheaths smooth; auricles well developed, up to 6 mm long. Ligule 0.5–1.2 mm, erose–lacerate, ciliolate. **Inflorescence:** Spike stout, up to 10 cm long (excluding the awns) with 2–6 rowed spikelets. All 3 spikelets of the triad sessile and fertile. Glumes subequal, 6.5–20 mm long, 3–nerved, tapering into scabrous awns. Lemmas of the 3 spikelets subequal, faintly 5–nerved, glabrous, tapering into a long, stout, flattened, scabrous awns 6–16 cm long. **Ecology:** Widely cultivated and most often found as a roadside weed; flowers May–June. **Notes:** Large introduced annual; auricles well–developed up to 6 mm long; spikes with very long awns (6–16 cm long) arising from fertile lemmas. **Ethnobotany:** Papago, Pomo, and Cocopa all used the seeds for pinole and flour for food. **Etymology:** Hordeum is the Latin name for barley, vulgare means common. **Synonyms:** Many, see Tropicos

H M L Impact risk level

Phalaris minor

lesser canarygrass, littleseed canarygrass

General: Introduced annual, culms 10–100 cm, geniculate and branching at base. **Vegetative:** Blades 3–15 cm long, 2–10 mm wide, smooth, shiny; ligules 5–12 mm, truncate to rounded, often lacerate. **Inflorescence:** Panicle 1–8 cm tall, 1–2 cm wide, dense, ovate, well exserted from the sheath at maturity, spikelets borne individually, not clustered; 2 florets, disarticulates above the glumes; glumes 4–6.5 mm long, 1.2–2 mm wide, keels winged distally, wings 0.3–0.5 mm wide, irregularly dentate or crenate, occasionally entire, varies in panicle, lateral veins conspicuous, smooth. **Ecology:** Found growing in disturbed habitats generally below 3,000 ft (914 m). **Ethnobotany:** Unknown **Etymology:** Phalaris is from Greek phalaros, having a patch of white, crested, or phalos, shining, bright, white, and minor which means lesser. **Synonyms:** None

Poa bigelovii

Bigelow's bluegrass

General: Tufted annual, culms 15–45 cm tall, delicate and erect. **Vegetative:** Sheaths open, slightly keeled at bottom, broad; blades flat, soft, light green, 2–4 mm wide, 4–12 cm long, tips boat shaped, median lines present; ligule membranous, acute, lacerate, 1–3 mm long. **Inflorescence:** Contracted panicle, branches strictly erect; spikelets broadly ovate, pale green 4.5–8 mm, with 3–8 florets, overlapping and compressed against each other, spreading apart at maturity; glumes glabrous, first one to three nerved, second three–nerved, lemmas 3–4 mm long, margins white hairy and membranous, base with dense cottony tuft or web. **Ecology:** Found on rocky slopes and sandy desert washes from 1,000–5,000 ft (305–1524 m); flowers spring. **Notes:** Contracted panicle, lemma webbed and pubescent at base are diagnostic for this annual grass. **Etymology:** Poa is classical Greek name for grass, while bigelovii is named for Dr. John Milton Bigelow (1804–1878) a botanist on the Whipple expedition. **Synonyms:** None

Impact risk level H M L

Schismus arabicus

Arabian schismus

General: Low tufted annual, 10–20 cm tall, glabrous, erect to spreading or semiprostrate. **Vegetative:** Leaves mostly basal, blades soft, bright green, narrow, sheath with membranous border above, often broad and truncate at apex; ligule a ring of short and long hairs. **Inflorescence:** Compact panicle, many flowered 1–6 cm long; spikelets 5–7 flowered; glumes 3.5–5.5 mm, often tinged with purple, lemmas 1.5–2.4 mm, margin and back hairy, apex shallowly to deeply notched, lobes acute; palea shorter than lemma, usually not reaching notch; caryopsis shiny golden brown. **Ecology:** Found on dry open ground, often in disturbed soil below 4,000 ft (1219 m); flowers January–May. **Notes:** *S. arabicus* and *S. barbatus* are thought to possibly intergrade, the only difference is in the glume size, and the lemmas being more hairy in *S. arabicus*. **Etymology:** Schismus is from Greek schismos, cleaving, referring to split lemma, arabicus refers to being Arabian in origin. **Synonyms:** None

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Impact risk level H M L

Schismus barbatus

common Mediterranean grass

General: Low tufted annual, 10–20 cm tall, glabrous, erect to spreading or semiprostrate. **Vegetative:** Leaves mostly basal, blades soft, bright green, narrow, sheath with membranous border above, often broad and truncate at apex; ligule a ring of short and long hairs. **Inflorescence:** Compact panicle, many flowered 1–6 cm long; spikelets 5–7 flowered; glumes 2.5–4.5 mm long, acute or acuminate, five–nerved; lemma glabrous on back or with hairs on margin or occasionally near base, apical notch shallow or minute, palea about as long as lemma. **Ecology:** Found on dry open ground, often in disturbed soil below 4,000 ft (1219 m); flowers January–May. **Notes:** *S. arabicus* and *S. barbatus* are thought to possibly intergrade, the only difference is in the glume size, and the lemmas being more hairy in *S. arabicus*. **Etymology:** Schismus is from Greek schismos, cleaving, referring to split lemma, barbatus means barbed. **Synonyms:** *Festuca barbata, Schismus calycinus*

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H M L

Sorghum halepense

Johnsongrass

General: Perennial from stout, scaly rhizomes, culms 1–2 m tall, culm nodes glabrous or finely pubescent. **Vegetative:** Sheaths glabrous, puberulent across the collar; ligules membranous, truncate, ciliate 1.5–3 mm long; blades large, flat, 4–15 mm broad, 20–50 cm long, margins white, midvein white and prominent. **Inflorescence:** Panicle usually large, densely flowered, variable, mostly 15–35 cm long; spikelets and pedicels more or less hirsute; sessile spikelets 4.5–6 mm long, glumes broad, coreaceous, nerveless and shiny except at tip; glumes of sessile spikelet subequal, first glume smooth and shiny on back, hispidulous on the margins or sometimes all over, 5–7 nerved, second glume glabrous, smooth and shiny below and hispidulous toward apex; fertile lemma membranous, usually with a twisted, once–geniculate awn 1–1.5 mm long, this readily deciduous; pediceled spikelet staminate, awnless, lanceolate, usually as long or longer than the sessile one. **Ecology:** Common weed on moist roadsides, ditchbanks, cultivated fields, and wastelands below 5,000 ft (1524 m); flowers April–November. **Notes:** Gnarly rhizomatous weed that spreads with seemingly every effort to control it. Best bet is to continually cultivate it, exhausting its rootstock; or burn it continually. **Etymology:** Sorghum is from Italian sorgo, for a tall cereal grass, and halepense refers to being of or from Allepo, northern Syria. **Synonyms:** *Holcus halepensis, Sorghum milaceum*

Flowering Trees and Shrubs

The best way to start thinking about the flowering plants (or angiosperms) is to start with the big stuff—the trees. A conventional definition is "a woody plant with a single trunk." More specifically, trees are defined by the presence of a single main trunk that is upright, with a crown of either leaves or needles that fall (deciduous trees) or needles or even leaves that do not fall (evergreen). Think of an elm tree or a willow.

In the Sonoran Desert region, however, trees may not have just a single stem, nor a definite crown. Trees in this region often have many stems growing from one root, giving them a downright shrubby appearance, quite unlike the single-stemmed pine tree, with its single, straight trunk and pointed crown on top.

To this end, we will consider the shrubs. Conventionally, shrubs are "woody plants, shorter than a tree and with many stems." Problematically, some trees can be shrubs and some shrubs can be trees. For our purposes, it is best to simply consider trees and shrubs to be the woody plants—those which persist long after the rains have gone in the fall, whose leaves fall, and whose trunks and stems remain throughout the year. Trees and shrubs are the most common of the common plants; their sheer size and number are what we see when we look at a large landscape.

Atriplex canescens

fourwing saltbush

General: Shrub, frequently 1.5–2 m, moundlike, much branched and drought deciduous. **Leaves:** Alternate, simple, gray–green, entire, narrowly spatulate to narrowly oblong, 5 cm long or less, salty tasting. **Flowers:** Inconspicuous, tiny, yellow, in clusters on stem; dioecious. **Fruit:** Small seeds enclosed by 4–winged bracts, often 1–2 cm and nearly as wide. **Ecology:** Found on sandy or gravelly soils, from desert scrub to pinon–juniper communities from 300–6,500 ft (100–2400 m) **Notes:** Browse for livestock, deer and antelope; seeds eaten by birds and rodents; very tolerant of salty soils. **Ethnobotany:** Seeds used for meal, yellow dye. Havasupai used it to make soap for hair washing and to treat itches and rashes. Hopi used the ashes as a substitute for baking soda. Navajo used it as an emetic, to treat ant bites, cough, and as a hair tonic. They also used it as feed for cattle, sheep and goats. **Etymology:** Atriplex is an old Latin name for this plant, canescens means covered with short gray or white hairs. **Synonyms:** None

Atriplex polycarpa

cattle saltbush, desert saltbush

General: Intricately branched shrub 0.5–2 m, with slender twigs and gray–green whitish leaves, becoming leafless in drought. **Leaves:** Small, oblong, fasciculate, mostly less than 1 cm long and 3 mm wide; often highly variable. **Flowers:** Dioecious with inconspicuous flowers in dense terminal panicles; fruiting bracts 4–6 mm wide, somewhat orbicular to obdeltoid, often with 7–17 finger–like blunt teeth, often obscured by dense scurfy white hairs. Often with characteristic pink galls in the upper branches and inflorescences. **Fruits:** Utricles 2–4 mm long with dentate margins and, usually, tuberculate faces. **Ecology:** Found on sandy to rocky soils of flats, washes and slopes below 3,500 ft (1067 m); flowers in various seasons. **Notes:** Notable for its symmetry and its tolerance of saline soils. **Ethnobotany:** Seri used the wood for fuel, in addition to adding the mashed leaves and twigs to water as a shampoo and for washing clothes. **Etymology:** Atriplex is old Latin name for this plant, while polycarpa means having many seeds or fruit. **Synonyms:** None

Suaeda nigra

Mohave seablite

General: Shrubby perennial, 1.2–2 m, semi–hemispherical, much branched, branches spreading and interlacing; stems slender and brittle; herbage and calyces minutely and densely pubescent to sometimes glabrous, succulent, green to glacuous blue–green and often reddish purple. **Leaves:** Alternate, thick and succulent, long–shoot leaves moderately flattened with rounded margins, often 1–3 cm, internodes often more than 2 cm, short–shoot leaves terete, usually crowded, often 3–8 mm and beadlike; leaves, especially larger ones narrowed at base to short petiole or subsessile. **Flowers:** Flowering branches slender, paniculate; flowers 1–10 per cluster, often functionally unisexual; sepals succulent with membranous margins, hooded and unequal in size in female flowers, the fruiting calyx bilateral, often 1.3–1.6 mm across; sepals of male flowers spreading. Stigmas usually 3, thickish and linear, papillose to pubescent on densely pubescent plants. **Fruits:** Seeds blackish, shiny. **Ecology:** Found in washes, arroyos, sometimes rocky slopes below 5,000 ft (1524 m); flowers July–September, other times possible. **Notes:** Indicator of soil salinity. **Ethnobotany:** Poultice was used on sores as an analgesic for bleeding bowels, as a ceremonial medicine, rubbed on chicken pox sores, and for bladder and kidney trouble. **Etymology:** Suaeda is an old Arabic name, while nigra means black, referring to the seeds. **Synonyms:** *Suaeda moquinii,* others, see Tropicos

Ambrosia deltoidea

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triangle bur ragweed

General: Shrub with numerous ascending to erect stems 30–80 cm from a woody base; rounded or flat topped, dark brown branches, ridged, strongly resinous. **Leaves:** Numerous, mostly alternate, on petioles 5–12 mm, blades deltate to lance–deltate, 12–25 mm long by 5–12 mm wide, cuneate to truncate bases, toothed margins, densely tomentose below, white or pale; above sparsely tomentulose, dark green. **Flowers:** Pistillate heads clustered, 2–3 florets, in terminal racemes or panicles; staminate heads crowded on peduncles 0.5–3 mm, more or less cup shaped involucres, 4–8 mm in diameter, tomentulose; 12–30 florets. **Fruits:** Burs broadly ellipsoidal to globose, 3–6 mm, usually stipitate–glandular, spines 15–30, scattered, 1–3 mm, tips straight, sometimes uncinate, distinctly flattened. **Ecology:** Found in sandy washes, on alluvial plains, on gravelly or rocky slopes from 1,000–3,000 ft (305–914 m); flowers December–May. **Notes:** Fruiting heads resemble cockleburs, only the spines are strongly flattened with plane of leaves. Abundant shrub among *Parkinsonia* and *Prosopis* in the Sonoran desert scrub communities. This species is often considered the dominant bursage of the Arizona Upland, while *A. dumosa* is found in the lower Colorado and Mohavean types. *A. deltoidea* is often found on the moister margins of gullies and other surface water features, while *A. dumosa* is confined to finer and drier soils. **Ethnobotany:** Unknown, but other species in the genera have many uses. **Etymology:** Ambrosia is Greek for food of the gods, while deltoidea means triangular, like the fourth letter of the Greek alphabet, delta. Synonyms: *Franseria deltoidea*

Ambrosia dumosa

burrobush

General: Much branched, rounded shrub 10–40 cm tall; stiff branches, more or less spinose, glabrate with age, bearing short stiff hairs when young, bark gray and slightly striate. **Leaves:** Alternate, on petioles 2–8 mm, blades elliptic to ovate, 2–3 pinnately lobed, both surfaces densely grayish–tomentose, 10–25 mm long by 8–15 mm wide; divisions often narrow but not linear, often variously shaped. **Flowers:** On racemose or spikelike inflorescence, staminate and pistillate heads intermingled, staminate heads on peduncles 0.2–3 mm long; involucres broadly saucer–shaped, 4–5 mm wide, strigillose cancescent, lobes 5–8, broadly trianglular ovate; corollas puberulent, yellow. **Fruits:** Burs 4–5.5 mm long, subglobose, moderately glandular–puberulent, 2 beaks, straight 1–1.5 mm long; spines 30–40, narrowly subulate, flattened toward base, 1.5–2.2 mm long, tips not hooked. **Ecology:** Found on dry, fine soils of alluvial plains and slopes below 3,000 ft (914 m); flowers February–December. **Notes:** One of the more abundant shrubs in the desert scrub. Flattened spines on the burs are a contrast to other species of *Ambrosia*. Found in much of the Sonoran and Mohavean deserts, scarce only where cool–season rainfall is low, and since warm–season rain is infrequent in its range it germinates episodically. **Ethnobotany:** Unknown, but other species in the genera have many uses. **Etymology:** Ambrosia is Greek for food of the gods, while dumosa means bushy or shrubby. **Synonyms**: *Franseria dumosa*

Baccharis sarothroides

desert broom

General: Woody shrubs often 2–2.5 m (6–8ft) with broomlike green branches, often nearly leafless. Twigs angled or striate–ridged. **Leaves:** Few, quickly deciduous leaves linear to linear–lanceolate reaching 1–3 cm, larger leaves often minutely toothed, most leaves much smaller or reduced to scales. **Flowers:** Cylindroid pistillate heads about 1 cm long, 5 mm in diameter, erose to ciliate membranous, outer phyllaries broadly ovate, inner ones linear. **Fruits:** Achene, 1.5–2.7 mm, 10–ribbed, pappus 7–11 mm. **Ecology:** Found in sandy–gravelly washes, watercourses, shallow drainages, flats, and low hills, sometimes in saline soil from 1,000–5,500 ft (305–1676 m); flowers September–December. **Notes:** Because of its evergreen nature often used as an ornamental, not particularly palatable to livestock or grazing. **Ethnobotany:** Infusions were used for coughs and stomach aches, while many stalks were tied together to make brooms and single stalks made arrows. **Etymology:** Baccharis is named for Bacchus, the god of wine, sarothroides means broom–like. **Synonyms:** None

Encelia farinosa

brittlebush, incienso

General: Compact, rounded, much branched shrub 30–150 cm, stems branched distally, tomentose. **Leaves:** Cauline, ovate–acute to broadly ovate–lanceolate, 2–5 cm long, on petioles 10–20 mm, blades silver or gray, apices obtuse or acute, faces tomentose. **Flowers:** Hemispheroidal heads on leafless stalks that appear paniculate, peduncles glabrous except near heads, more or less yellow; involucres 4–10 mm, lanceolate phyllaries, ray flowers about 1 cm long, 2 cm in diameter, the ray corollas large and conspicuous 1–1.5 cm long, disc flowers yellow to brown–purple. **Fruits:** Cypselae 3–6 mm, with no pappus. **Ecology:** Found on dry, rocky or gravelly slopes below 3,000 ft (914 m); flowers November–May. **Notes:** A very distinctive plant with its gray–green leaves and bright yellow flower heads, often turns whole hillsides yellow in spring. **Ethnobotany:** Used for toothaches, for pain, the gum was chewed by children, used to fasten arrow points, as a waterproofing gum, and melted down for a varnish. **Etymology:** Encelia is named for Christoph Entzelt (1517–1583) a German naturalist, while farinosa means mealy or powdery. **Synonyms**: *Encelia farinosa* var. *farinosa, E. farinosa* var. *phenicodonta, E. farinosa* var. *radicans*

Isocoma acradenia

alkali goldenbush

General: Erect shrub, densely branched 30–100 cm, with mostly ascending, slender, brittle, woody stems; herbage glandular punctate, copiously resinous–glutinous, young herbage with sparse, short, white hairs covered in resin. **Leaves:** Oblong to oblanceolate, entire to toothed or lobed to shallowly parted. **Flowers:** Involucral bract an apically thickened, wartlike, green area bearing minute dotlike resin glands near tip; phyllaries linear–oblong, margins narrowly transparent–membranous and erose–ciliate at tip; corolla lobes 0.5–0.7 or occasionally 1 mm long, nearly acute, bright yellow, longer than pappus. **Fruits:** Ribbed achenes, moderately to densely pubescent, pappus of many coarse persistent barbellate and uneven bristles. **Ecology:** Found on desert slopes, hillsides, and plains below 4,000 ft (1219 m); flowers August–October. **Notes:** Told apart from other *Isocoma* spp. by the characteristic wartlike resin pocket near tip of pyllaries. **Ethnobotany:** Used as a poultice applied to sores, steeped for sore throats, and as a building material. **Etymology:** Isocoma is from the Greek meaning an equal hair–tuft, referring to flowers, acradenia is from Greek for pointed–glanded. **Synonyms**: *Haplopappus acradenius*

Isocoma pluriflora

southern goldenbush, Jimmyweed

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General: Perennial shrub, woody toward base, stems erect to ascending, 40–70 cm tall, hirtellous to subglabrous branchlets. **Leaves:** Linear to linear–oblanceolate, 1.5–5 mm wide, 2–4 cm long, entire to sparsely short–dentate or lowermost sometimes laciniate–dentate, densely punctate–resinous, hispidulous along margins, thick and stiff. **Flowers:** Numerous heads, cymose, 7–15 flowered, involucres 4–5 mm high, phyllaries lanceolate to oblong–oval, appressed, mostly appressed; ray flowers none. **Fruits:** Achene about 2 mm long, silky–strigose; pappus bristles about 4–4.5 mm long, stramineous. **Ecology:** Found along washes, mesas, and sandy plains from 3,000–6,500 ft (914–1981 m); flowers June–September. **Notes:** Aggressive invader of depleted rangeland and old fields. **Ethnobotany:** Plant used as a lotion to heal infant's navel, a poultice was applied for muscular pain, and the leaves were chewed for coughs. **Etymology:** Isocoma is from Greek meaning equal hair–tuft, referring to the flowers, while pluriflora means many–flowered. **Synonyms**: *Haplopappus heterophyllus, H. pluriflorus, Isocoma wrightii*

Ephedra trifurca

longleaf jointfir, Mexican tea

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General: Erect, yellowish green shrub 0.5–2 m tall, with very fine longitudinal grooves, straight branches, alternate or whorled, 1.5–3.5 mm in diameter; angle of divergence about 30 degrees; spinose tipped branches. **Leaves:** Persistent leaf scales, sheathing to about middle or above, 5–15 mm long, acuminate to acerose, becoming white and shredded. **Flowers:** Pollen cones sessile, staminate obovate, 6–10 mm long, with 8–12 whorls of 3 thin, membranous bracts; bracts of ovulate cones in 8–10 whorls, membranous, obovate, 10–14 mm long, sessile or short–pedunculate, mature bracts orbicular, 8–12 mm long, reddish brown in center and toward base, translucent yellowish marginally, entire. **Fruits:** Seed cones one to several at nodes, seeds tetragonal in cross section, 9–15 mm long, 1.5–3 mm wide, equaling bracts, light brown, smooth. **Ecology:** Found on dry rocky slopes to flat sandy areas from 1,500–6,500 ft (457–1981 m); flowers late winter–early spring. **Notes:** Green twigs end in a spinose tip, unique among the *Ephedra*. Leaves and bracts in threes is helpful in separating this species. The plants in Ephedraceae are not well placed here. In actuality, *Ephedra* and Ephedraceae are correctly placed in a group known as the Gnetales, a relative of the gymnosperms and conifers. Since there is only the one species here, and no gymnosperms, we leave this species here for convenience. **Ethnobotany:** Used for sores, stomach troubles, kidneys and against venereal disease, often made into stimulant tea. **Etymology:** Ephedra is from Greek ephedra, used by Pliny for common mare's tail, while trifurca means three–forked. **Synonyms:** None

Calliandra eriophylla

fairyduster

General: Spreading shrub growing to 1 m high, with unarmed light gray to whitish stems. Young stems and twigs densely to moderately pubescent with short white hairs. **Leaves:** Widely spaced leaves twice–pinnate with 2–4 pairs of pinnae, each with 7–9 (occasionally 10) pairs of leaflets 2–3 mm long. Generally cold deciduous. **Flowers:** Showy, dense spherical heads 4–5 cm in diameter. Corollas 5–6 mm long and inconspicuous; stamens showy, pink, rose, or reddish purple up to 1.5 cm long. **Fruits:** Linear velvety pods 5–7 mm wide and 3–7 cm long with thickened margins. **Ecology:** Grows along washes, on slopes and mesas, typically low and creeping, from 2,000–5,000 ft (762–1676 m); flowers February–April, occasionally September–October. **Notes:** Readily identifiable because of its stamens. **Ethnobotany:** Decoction taken as a gynecological aid after childbirth by Yavapai. **Etymology:** Calliandra is from Greek kallos 'beautiful' and andra 'stamen', while eriophylla is from Greek erion 'wool' and phyllon 'leaf' referring to matted white hairs that cover the plant when young. **Synonyms:** *Calliandra eriophylla* var. *chamaedrys, C. eriophylla* var. *eriophylla*

Parkinsonia florida

blue paloverde

General: Large shrubs to small trees reaching 7–10 m tall with a well–developed trunk. Small straight spines borne singly at nodes. Bark of twigs and branches bluish green, while older trunks are often gray. **Leaves:** Leaves are pinnate with single pair of pinnae, with 2–4 pairs of obovate leaflets 4–8 mm long, darkening when dried. **Flowers:** Found in terminal racemes, 22–28 mm wide, calyx green to yellow–green, lobes reflexed; Petals bright yellow, banner with small orange–red spots basally. **Fruits:** Straw colored oblong pods 4–10 cm long moderately flattened, mostly indehiscent, seeds 1–6. **Ecology:** Generally found along washes, plains, and canyons, sometimes on slopes from sea level to 4,000 ft (1219 m); flowers March–April. **Notes:** Larger than most other species of this genus. **Ethnobotany:** The seeds were dried and roasted before being ground into meal for mush or cakes. Green pods can be eaten raw, similar to edamame (soybean) in texture. The wood was used for carving ladles. **Etymology:** Parkinsonia is named after John Parkinson (1567–1650), florida refers to either free–flowering, abundant flowers or bright. **Synonyms:** *Cercidium floridum, C. floridum* ssp. *floridum*

Parkinsonia microphylla

yellow paloverde, foothill paloverde

General: Small tree or large shrub to 6 m tall with smooth green bark on all twigs and branches except near the base, which is gray. **Leaves:** Borne on thorn tipped stems, lacking a petiole with 1 pair of pinnae, each 1–5 cm and with 4–8 pairs of leaflets, leaflets 1–3.5 mm broadly elliptic to broadly oblong or orbicular. **Flowers:** Bicolored with four yellow petals and one white banner, 12–18 mm wide. **Fruits:** Pods, sparsely pubescent, tan to straw–colored 4–8 cm long, indehiscent. **Ecology:** Abundant on bajadas, plains and hillslopes through low desert from 500–3,500 ft (152–1067 m); flowers April–May. **Notes:** This plant is very common in Sonoran Desert, where its leafless stems make it readily identifiable. **Ethnobotany:** The seeds were dried and roasted before being ground into meal for mush or cakes. Green pods can be eaten raw, similar to edamame (soybean) in texture. The wood was used for carving ladles. **Etymology:** Parkinsonia is named after John Parkinson (1567–1650), microphyllum refers to its being small–leaved. **Synonyms:** *Cercidium microphyllum*

Prosopis glandulosa

honey mesquite

General: Spiny shrub or small tree to 9 m tall. **Leaves:** Composed of 8–20 pairs of leaflets on a single pair of pinnae (rarely 2 pairs); linear–oblong leaflets, 15–22 mm long, 7–9 times as long as broad and usually spaced 5–6 mm apart; glabrous or ciliate with short, stiff hairs along the margins. **Flowers:** Small, greenish yellow flowers in spikelike racemes 5–12 cm long. **Fruits:** Compressed pods 10–25 cm long and 1–1.5 cm wide, straw colored when mature. **Ecology:** Common in bottomlands and washes, on heavy soils in uplands and coarse soils of sandy flats below 5,000 ft (1524 m); flowers in spring, rarely there is a second flowering period in late summer. **Notes:** May intergrade with *P. velutina* and *P. articulata* making it difficult to tell them apart. Typically, *P. glandulosa* can be told apart from *P. velutina* by the pinnae which are mostly 1 pair per leaf, compared to 1 or 2 pairs in *P. velutina*; leaflets are also more widely spaced in *P. glandulosa*. **Ethnobotany:** Leaves made into an eye wash, bark used as a urinary aid for children, the leaves were chewed to neutralize acid stomach, the pods were eaten raw or cooked like string beans, or dried and pounded into flour. **Etymology:** Prosopis was a Greek name for burdock (seemingly misnamed), glandulosa means provided with glands. **Synonyms:** None, but three different varieties exist.

Prosopis velutina

velvet mesquite

General: Common, shrub or tree, reaching to 17 m; with bark in dark brown, thick, long narrow strips. Hard, heavy, reddish–brown, yellow sapwood. **Leaves:** Alternate, deciduous, bipinnately compound, with 1 or 2 pairs of pinnae each with 9–30 pairs leaflets; leaflet 4–13 mm long, oblong, closely spaced on stalk; paired straight stipular spines 1–2 cm borne at nodes. **Flowers:** Greenish yellow flowers in spikelike racemes 5–12 cm long. **Fruits:** Legume 7.6–20.3 cm long, pubescent, non–dehiscent, sweetish pulp. **Ecology:** Common along washes, in bottomlands, slopes and mesas from 3,000–5,500 ft (914–1676 m). **Notes:** Diagnostic features include: bipinnate leaf with 1 or 2 pairs of pinnae; stout, straight stipular spines; pubescent leaves, twigs, pods. **Ethnobotany:** Excellent fuel, charcoal, posts, novelties, cattle eat the pods, browse, honey; grassland invader; pods make highly edible flour. **Etymology:** Prosopis was a Greek name for burdock (seemingly misnamed), while velutina refers to velvet–like. **Synonyms:** *Neltuma velutina*, *Prosopis articulata*, *P. chilensis* var. *velutina*, *P. juliflora*, *P. juliflora* var. *articulata*, *P. juliflora* var. *velutina*

Senegalia greggii

catclaw acacia

General: Native shrub or tree reaching to 6 m or more. Leaves: Alternate, deciduous, bipinnately compound; 2.5–7.6 cm long, with 2 or 3 pairs of pinnae, each with 4–6 pairs leaflets; pinnae 1–1.5 mm long. **Flowers:** Cream colored, fragrant, spikes 5.1 cm long, 13 mm diameter; summer. **Fruits:** Legume 5.1–12.7 cm long, 13 mm wide, flat, often twisted and narrowed between seeds; persists into winter. **Wood:** Hard, heavy, sapwood cream to yellow; heartwood, reddish–brown. **Ecology:** Found on flats, washes, and slopes below 5,000 ft (1524 m). **Notes:** Diagnostics include: small double–compound leaves less than 7.6 cm long; very stout recurved solitary spines; flat twisted pod constricted between seeds. **Ethnobotany:** Disagreeable because of stout spines, tool handles, fuel, good honey plant, quail, ground up into a meal. Used as an astringent, emollient, disinfectant, antiinflammatory. Havasupai used in basket making. **Etymology:** Acacia is from Greek akakie taken from ake or akis, 'a sharp point, greggii is reference to Josiah Gregg (1806–1850), a frontier trader and author who worked with Dr. George Engelman. **Synonyms:** *Acacia greggii*

Krameria erecta

littleleaf ratany

General: Low shrub often 0.3–0.5 m, usually less than 1 m across, with many short, crowded, spreading branches. Stems tough and woody with gray bark, upper branches knotty due to many short spur branches. Densely pubescent herbage and grayish with short white hairs, stems root at nodes. **Leaves:** Alternate, linear 3–9 long by .8–1.3 mm wide, drought deciduous, sessile. **Flowers:** Showy, about 1.5 cm in diameter, solitary or in short racemes with leafy bracts. Sepals bright magenta–purple inside, white hairy outside. Filaments whitish, anthers dull cream colored, styles magenta–purple. **Fruits:** Globose and moderately compressed, about 6 mm wide, with spines about 3.5 mm with small barbs more or less evenly distributed along upper part of shaft. **Ecology:** Found on sandy, gravelly plains adjacent to mountains and rocky hills from 500–5,000 ft (152–1524 m); flowers at various times during the year. **Notes:** Plant is in part a root parasite on other species. Palatable to both livestock and wildlife. **Ethnobotany:** Used predominantly as a red dye and as a poultice of root for sores. **Etymology:** Krameria named after Johann Georg Heinrich Kramer (1684–1744) and Austrian physician and botanist, while erecta means upright. **Synonyms:** *Krameria glandulosa, K. imparta, K. parvifolia, K. parvifolia* var. *glandulosa, K. parvifolia* var. *imparata*

Krameria grayi

2009 NPS/Beth Fallon

white ratany

General: Stiff, intricately branched and mounded shrubs 20-80 cm tall, young branches densely canescent; old stems terete, blue-green, with rigid spinose tips. **Leaves:** Sparse, alternate and simple, linear to oblong, sessile, acute to obtuse, often apiculate, 1-3 mm wide, 5-10 mm; occasionally completely lacking. **Flowers:** Peduncles 15-25 mm long, sericeous, bracts foliaceous, borne at middle of peduncle; sepals 5, lanceolate, acute, purple to deep red-purple, 9-12 mm long, canescent on exposed parts; lower petals 2.5-3 mm long, suborbicular, often with many small tubercules on dorsal surfaces; upper petals 3, spatulate, 4-5 mm long, slender claws, distinct and pink to purple at tip, green basally; stamens 4 curved upward and inserted at base of petals. **Fruits:** Broadly ovoid to globose, densely woolly body, spines acicular, 5.5-10 mm long, hairy below, glabrous toward apex, bearing 2-5 stout recurved barbs to 1 mm in terminal whorl. **Ecology:** Found on dry slopes along washes and on hillsides below 3,500 ft (1067 m); flowers March-September. **Notes:** Told apart from *K. erecta* by the blue-green cast of the old stems, the overall canescence of the shrub, the whorled spines at the apex of the fruit, and by the petals not being connate. **Ethnobotany:** Used as a wash for sores as a disinfectant, as an eye medicine, taken for pain, coughs, fevers, sore throats, for swelling, and the roots were boiled and ground as a dye in basket making. **Etymology:** Krameria named after Johann Georg Heinrich Kramer (1684-1744) an Austrian physician and botanist, while grayi is named for the American botanist Asa Gray. **Synonyms:** None

Eriogonum fasciculatum

Eastern Mohave buckwheat

General: Low spreading woody shrub, 0.5–1 m, compact and much branched with leafy stems and shredding bark; stems, leaves and scapes canescent–pubescent. **Leaves:** Fascicled, sessile or nearly so, 3–15 mm, white hairy on both surfaces, canescent above, densely woolly below. **Flowers:** Involucres 5–toothed, 2.5 mm, densely to moderately white hairy; flowers white to pink, 3 mm, outer perianth segments densely white hairy toward base and along broad midrib. **Fruits:** Achenes 2–2.5 mm. **Ecology:** Found on dry rocky slopes from 1,000–4,500 ft (305–1372 m); flowers March–June. **Notes:** The most common shrubby *Eriogonum* in the region. Several varieties exist in the region, take a collection if identity to this level is required. **Ethnobotany:** Used for diarrhea, as an emetic, against witchcraft, for heart medicine, to help heal wounds, for hoarseness, for stomachaches and the wood was used to pierce ears. **Etymology:** Eriogonum is from Greek erion, wool and phyllon, leaf, fasciculatum is derived from Latin word for bundles. **Synonyms:** *Eriogonum fasciculatum* ssp. *polifolium, E. fasciculatum* var. *revolutum, E. poliofolium*

Salix gooddingii

Goodding's willow

General: Deciduous, medium to large sized trees to 25 m or more. Bark is thick and gray; split into many furrows and ridges. Twigs yellowish and hairy; smooth buds with a single conspicuous bud scale margin. **Leaves:** Leaves linear to very narrowly elliptical, but widest at the base, 6–13 cm long and 0.8–1.6 cm wide; margins finely toothed; upper and lower surfaces green to yellow green and hairless. **Flowers:** Catkins yellowish, 2–8 cm long. **Fruits:** Short stalked and hairy capsules 3–7 mm long, containing many cottony seeds. **Ecology:** Along streams, and in canyons and wet meadows up to 7,500 ft (2286 m); flowers March–June. **Notes:** Can be distinguished by its lance shaped, entirely green leaves, hairy yellowish twigs and its conspicuous bud scale margins. A similar species *S. laevigata* has wider leaves, whitish leaf undersides and more reddish twigs. Rapid growth and resprout ability. Host plant for Mourning Cloak butterfly. **Ethnobotany:** Not a valuable commercial species in Arizona. Its close relative *S. nigra* has been harvested comercially in the southeast U.S. for furniture and building materials. Pima used this species in basket making. **Etymology:** Salix is the Latin name for willow, meaning 'to leap or spring', while goodingii is named after Leslie Newton Gooding (1880–1967), botanist and collector, one of the first to explore the southern Arizona area. **Synonyms:** None

Lycium andersonii

wolfberry, water jacket

General: Thorny rounded shrub 0.5–3 m high with densely branched, spinose ridgid branches and flexuous, silvery–white to tan barked twigs. **Leaves:** Alternate or clustered, sessile or on petiole 1–3 mm, mostly linear to linear–spatulate, 1–2 mm wide, 3–16 mm long, rounded to acute at apex, tapers to base. **Flowers:** Pedicel 3–9 mm long, filiform; calyx shallowly campanulate, glabrous to sparsely puberulent, 1–2.5 mm long, irregularly 4–5 toothed, teeth one–fourth as long as tube, sparsely ciliolate, stamens equaling corolla tube or exserted 2–3 mm, dingy–lavender; filaments adnate to basal one–third of corolla tube, sparsely pilose on lower part of free portion; style about equaling stamens. **Fruits:** Berry ellipsoid to ovoid, bright orange–red, 3–9 mm, juicy, with multiple seeds. **Ecology:** Found along arid washes and arroyos, bajadas, rocky slopes, mesas and foothills up to 5,500 ft (1676 m); flowers February–May, rarely August–September. **Notes:** Three recognized varieties in the area: var. *wrightii* whose leaves are broadly spatulate to obovate; var. *andersonii* whose leaves are 3–16 mm, linear terete to narrowly spatulate; and var. *deserticola* whose leaves are 20–35 mm, narrowly spatulate to spatulate. Some taxonomists place var. *deserticola* and var. *andersonii* as probably indistinct. Var. *andersonii* is the most widespread of the three species. Clarity is necessary for the genus, take a specimen and get identification. Similar to *L. exsertum* in stamens and adnate hairy filament bases, differs in non–pendulous flowers. Told apart from *L. berlandieri* by the lighter colored bark. **Ethnobotany:** Berries were eaten fresh and dried, dried for winter use, boiled into mush or ground into flour, or made into a drink. **Etymology:** Lycium is from Greek name Lykion used to describe a thorny tree or shrub, andersonii is named after Robert Clark Anderson (1908–1973) a USFS forest ranger or Dr. Charles Lewis Anderson (1827–1910) a physician and naturalist. **Synonyms:** None, just three varieties.

Lycium exsertum

2010 NPS/Steve Buckley

Arizona desert–thorn

General: Openly branched, sparingly armed shrub 1–4 m tall with densely pubescent twigs and dark gray or brown bark. **Leaves:** Spatulate to obovate 3–7 mm wide, 5–20 mm long, obtuse or rounded at apex, densely glandular–puberulent. **Flowers:** Pedicels 3–6 mm long, recurved and flowers pendent, calyx tubular–campulate, 3–6 mm long, densely glandular–puberulent, lobes 5, deltoid, acute, 1–1.5 mm long; whitish corolla, greenish or tinged with purple and brown, funnelform, slightly narrowed just above ovary, 8–12 mm long, glabrous without, lobes broadly ovate or obovate, spreading 2 mm long; filaments adnate to basal fifth of corolla tube, densely pilose on lower two–thirds of free part. **Fruits:** Ovoid berry, 6–8 mm long, 20–35 seeded. **Ecology:** Found along washes and flats below 4,000 ft (1219 m); flowers year–round, mostly January–March. **Notes:** Told apart by its densely pubescent twigs, densely glandular–pubescent leaves, and stamens exserted 2–5 mm. Is separated from *L. andersonii* by its larger size. The pendulous white flowers are also key. **Ethnobotany:** Berries used for food, eaten fresh, ground, dried, made into mush, and even boiled. **Etymology:** Lycium is from Greek name Lykion used to describe a thorny tree or shrub, exsertum means exserted or protruding out of or beyond a surrounding structure. **Synonyms:** None

Lycium fremontii

Fremont's desert–thorn

General: Stout, intricately branched, compact shrub 1–3 m tall with sparingly armed branches, spines 10–15 mm long and densely glandular–puberulent foliage. **Leaves:** In fascicles of 3–6, spatulate, 8–35 mm long, 2–15 mm wide, acute to rounded at apex. **Flowers:** Pedicels 4–25 mm long, densely glandular–puberulent; tubular calyx, 2–3 mm in diameter, 4–8 mm long at anthesis, 5 lobes 0.8–1.2 mm long; corolla tubular to funnel form, white to lavender with purplish veins, tube 8–15 mm long, 3–3.5 mm wide at apex, glabrous without, 5 lobes, rotate or spreading, 2–6 mm long, rounded, margins sparsely ciliolate or glabrous; unequal stamens; filaments adnate to basal two–fifths of corolla tube, glabrous or sparingly pilose at base of free portion. **Fruits:** Ovoid berry 5–9 mm long, bright red to black. **Ecology:** Found in washes and on rocky hillsides below 2,500 ft (762 m); flowers most of year, especially January–March. **Notes:** Common, often in colonies, an abundant fruit producer in desert, differs from *L. exsertum* in not having pendulous flowers, stamens and styles less exserted, is sparingly armed, with densely glandular–pubescent leaves. Pay attention to the corolla margins to tell it apart from *L. torreyi*. **Ethnobotany:** Berries are eaten fresh and dried and eaten like raisins; mashed and made into beverage. **Etymology:** Lycium is from Greek name Lykion used to describe a thorny tree or shrub, fremontii is named for John C. Fremont (1813–1890) an American explorer. **Synonyms:** None

Lycium torreyi

Torrey's wolfberry

General: Spreading to erect shrub 1.3–5 m tall with heavy spines 5–10 mm long, terete, leafy, glabrate branches. **Leaves:** Elliptic to spatulate, short–petioled, glabrous, pallid leaves 1–5 cm long, 3–15 mm broad; notably fleshy. **Flowers:** Slender pedicel 5–20 mm long, calyx shallowly to deeply crateriform, 2.5–4.5 mm long, 1.5–2.5 mm in diameter at anthesis, sparsely puberulent but soon glabrous, 5–lobed, lobes deltoid, acute, one–forth to one–half as long as tube; rotate, margins densely ciliate–lanate; greenish–lavender to whitish; stamens about equaling lobes; filaments adnate to lower half of corolla tube, densely pilose on basal 1.5 mm of free portion, adjacent corolla tube also pilose. **Fruits:** Ovoid 6–10 mm long, bright red, 8–30 seeded. **Ecology:** Found in river bottoms and on alluvial flats from 1,000–3,500 ft (305–1067 m); flowers March–May. **Notes:** The berries are juicy and more sweet and palatable than other species. Is told apart by the terete spines, 5–10 mm long; the leaves are glabrous and the stamens just about equal the corolla lobes. Pay attention to the margins of the corolla lobes, the densely ciliate–lanate margin appears fuzzy. **Ethnobotany:** Used as a ceremonial emetic, for toothaches and chickenpox, the berries were eaten raw or cooked, along with several other ceremonial uses. **Etymology:** Lycium is from Greek name Lykion used to describe a thorny tree or shrub, while torreyi is named for the great American botanist/chemist John Torrey (1796–1873). **Synonyms:** None

H M L Impact risk level

Nicotiana glauca

tree tobacco

General: Common weed, originally from Bolivia and Argentina, naturalized, much branched shrub to small tree growing to 8 m tall. **Leaves:** Thick and rubbery to 20 cm long, lance–shaped, smooth on short stalks, opposite on lower branches. Upper leaves lack stalks and lie on upward angle against branch. **Flowers:** Small, tubular, cream–colored, greenish white flowers form at branch ends, corolla flares at apex, 5–cleft, unequally toothed calyx. **Fruits:** Capsules contain many small brown seeds, sticky. **Ecology:** Found on disturbed soils, vacant lots, roadsides, along stream banks, washes and drainages below 4,500 ft (1372 m); flowers March–November.

Notes: Found through the range, escaped cultivar in many cases, spreads by prolific seeds. **Ethnobotany:** Plant is toxic. Contains anabasine, an alkaloid similar to nicotine which can be extracted to be used as an insecticide. **Etymology:** Nicotiana is named for Jean Nicot (1530–1600), the French ambassador to Portugal responsible for introducing tobacco to France in 1560, glauca comes form Greek meaning bluish–gray, referring to leaves. **Synonyms:** None

Impact risk level H M L

Tamarix chinensis

fivestamen tamarisk

General: Large shrub or small tree, usually glabrous throughout; to 8 m tall; branches slender and flexible, green. **Leaves:** Inconspicuous, scalelike, triangular–ovate, acute, tending to be scarious on margins, entire, somewhat keeled. **Flowers:** Pinkish–white to pink, usually many in an inflorescence, petals about 2 mm long, persistent on the fruit at maturity, filaments inserted between lobes of a hypogynous disk. **Fruits:** Capsule narrowly ovoid, 3–4 mm long. **Ecology:** Escaped cultivar found along watercourses widely below 5,000 ft (1524 m); flowers April–August. **Notes:** Widespread, but it hybridizes with other species in the genera, making its taxonomy muddy. **Ethnobotany:** You can burn it, but it is stinky. **Etymology:** Tamarix comes from the Latin name derived from the Tamaris River in Spain, chinensis refers to its origin in China. **Synonyms:** *Tamarix juniperina, T. pentandra*

Larrea tridentata

creosotebush

General: Aromatic, much branched evergreen shrub up to 3.5 m, growing from at or just above ground. **Leaves:** Alternate, persistent, composite (2 leaflets) 13–25 mm long; elliptical, dark "varnished" green, strong–scented (especially after rain). **Flowers:** Yellow, showy, 7–11 mm long. **Fruits:** Five–segmented, white silky pilose. **Ecology:** Widespread and common on dry plains and mesas below 5,000 ft (1676 m); flowers any time after adequate rain. Needs minimum 12 mm for flowering. **Notes:** Most common and widespread shrub in warm deserts of North America, ordinarily untouched by livestock; causes dermatitis in some people. Diagnostics include: dark green, lustrous, paired leaves, 13 mm long; leaves 2–pinnate; strong "creosote" odor. **Ethnobotany:** Used to treat arthritis and allergies. As a salve it is strongly antimicrobial and a moderate sunblock. **Etymology:** Larrea is named for Bishop Juan Antonio Hernandez Perez de Larrea (1731–1803) in Valladolid, Spain, while tridentata means three–toothed, the appearance of the leaves being three–toothed. **Synonyms:** None

Cactaceae
Known for their tiny leaves, which are usually deciduous and absent, these plants produce spines. Their axillary buds (called areoles) are flattened and usually spine-producing. Each areole gives rise to leaf tissue, which constitutes the spines. Solitary inflorescences occur at the top of each branch. The flowers are bisexual (or perfect) and some have a well-developed hypanthium (a fused floral cup). They have numerous tepals that are spirally arranged, with the outer ones sepaloid and inner ones petaloid, and each flower has numerous stamens.

The ovary is distinctly inferior (or borne below the flowers) and sunken into the stem tissue that bears more areoles. The ovary is comprised of two or more carpels (count styles to know), with one locule that has parietal placentation. The fruit is considered to be a berry.

Subfamilies:
Pereskoideae: Leaves broad, flat; no glochids; seeds black, nor aril (leaf cacti)
Opuntioideae: Leaves small, terete; minute glochids, almost invisible to the naked eye, spines at the base of big ones; seeds with pale aril or winged
Cactoideae: Leaves none or very small; no glochids; seeds black, no aril (the touchy feely cactuses with no glochids).

Quick guide to the genera at and near Casa Grande Ruins NM:
Carnegia: Large columnar cacti, many–ribbed stems and branches, crowded areoles bearing spines with tuft of brown felt. Flowers borne singly, often in crown at apex.

Cylindropuntia: The genus of the true chollas. Taxonomists recently separated this out of the Opuntia, to only include those species with the jointed chain structure familiar to the genus.

Echinocereus: Stem with ridges and grooves on surface, flowers produced within the spine bearing areoles at side of plant or slightly below apex of branch, length of stem 15–100 times the diameter

Ferocactus: Simple-stemmed, ovoid to cylindric, often large. Areoles large, tomentose or woolly, spines large and strong, in three distinct series, ribbed.

Escobaria: Escobaria is a small North American genus extending from the southwestern U.S. into northern Mexico. It is closely related to Coryphantha and somewhat more distantly to Mammillaria. Escobaria spp. have small, funnel-shaped flowers in the spring and summer. The flowers are generally yellow, pink, or brownish.

Mammillaria: Solitary or few-branched, with globose, short, cylindrical stems with watery to milky juice. Terete or angled tubercles, areoles crowning tubercles, central spine or spines like radials.

Opuntia: Stem a series of cylindroid or flat joints, areoles with glochids.

Carnegiea gigantea

2008 NPS/Steve Buckley

saguaro

General: Upright, simple stem with 1 to several lateral branches to 16 m tall; branches 30–65 cm in diameter, ribs 12–25, obtuse, 1–3 cm high, varies with water availability. **Spines:** Aeroles 2–4 cm apart on older growth, crowded at apex of stem; spines on top acicular, yellowish brown, extending forward; central stouter than radials, up to 7–8 cm long, dark brown to black. **Flowers:** Nocturnal, 10–12 cm long, 5–8 cm in diameter when expressed; tube 1–1.5 cm long, green; throat 2.5–3.5 cm long; perianth segments waxy–white; filaments white. **Fruits:** Berry green tinged with red; fleshy, 6–10 cm long, splitting irregularly. **Ecology:** Found on rocky or gravelly soils on slopes, rocky ridges, outwash fans, canyons, and benches from 500–3,500 ft (152–1067 m); flowers May, but rarely in August with rains. **Notes:** You know this plant; if not, you'd better learn it. **Ethnobotany:** O'odham peoples have gathered the fruits using traditional long sticks. The fruit has uses that range from mush to wine, jam, syrup, to even using the seeds for oil; the plant can be used for splints, furniture, fences and fodder. **Etymology:** Carnegeia is named for Andrew Carnegie (1835–1919), while gigantea refers to the enormous habit. **Synonyms:** *Cereus giganteus*

Ferocactus wislizeni

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candy barrelcactus, compass barrel cactus

General: Barrel cactus is about as tall as wide, to columnar plant, ribs 20–28, not markedly tuberculate. **Spines:** Hooked central spines obscure the stem, central spines red, or the surface layer of ashy gray, 4 per areole, forming cross, not flattened against the stem, strongly cross–ribbed 3–8 cm long. Radial spines ashy gray, mostly 12–20 per areole, spreading, curling irregularly back and forth, not cross–ribbed. **Flowers:** Yellow–reddish cup–shaped, perianth parts narrowly lanceolate, apically sharply acute and mucronate, borne on crowns of stem, distinct purplish middle stripe. **Fruits:** Yellow, barrel–shaped, flesh, covered by numerous almost circular, shallowly fimbriate scales. **Ecology:** Found on sandy desert soils, gravelly slopes and in grasslands from 1,000–4,500 ft (305–1372 m); flowers July–September. **Notes:** Called the compass cactus because it tends to lean south toward sun, species can live up to 100 years. Spines are said to cripple a horse unless they are treated the same day. **Ethnobotany:** The top of the cactus was lopped off and the interior pulp was crushed as a source of water in extreme circumstances; the seeds were parched, ground, and boiled into a mush; the spines were used as fish hooks by the Pima, and the fruit was made into a candy. **Etymology:** Ferocactus from Latin ferus, fierce and cactus referring to spines, while wislizeni is named after Frederick Adolf Wislizenus (1810–1889) and Army surgeon, explorer, and botanist. **Synonyms:** *Echinocactus wislizeni*

Peniocereus greggii

nightblooming cereus, Arizona queen–of–the–night

General: Slender, erect to sprawling, usually inconspicuous; roots large and turnip–shaped; stems gray–green to gray, simple or with 2–5 branches 40–120 cm tall, narrowed toward base, 4–6 prominent ribs. **Spines:** Areoles 12 mm apart along ribs, circular to elliptic 2–5 by 2 mm; 11–15 per areole, usually in 3 vertical rows, abaxially 3–5 spines appressed, yellowish white throughout or only at tips, to 3 mm, puberulent when young; adaxial spines black, subulate, to 1 mm. **Flowers:** Nocturnal, 15–25 cm; scales of flower tubes green, tipped red or brown; outer tepals greenish white with brown to reddish midstripes; inner tepals white or lightly tinged cream or pine, lanceolate–attenuate, apiculate, 4–7 cm, attenuate to mucronate; stamens 2.5 cm, anthers cream–yellow, 2 mm; style white, 10–14 cm. **Fruits:** Bright red, darkening in age, ellipsoid, 60–90 mm by 40–50 mm. **Ecology:** Found under trees and among branches of bushes and trees in sandy or gravelly loams, on edges of washes and on slopes of small hills from 1,000–3,500 ft (305–1067 m); flowers spring and summer. **Notes:** Usually flowers on one or two nights in late May, June, or July. The perfume is remarkable. Var. *transmontanus* is most likely variety, told apart by its nearly circular areoles that are 2x2 mm, with flowers 22–25 cm by 7–8 cm. This species is often found in nurse associations under *Larrea*, *Prosopis*, and *Parkinsonia*. **Ethnobotany:** Root taken as a cardiac stimulant, as a salve for sores, for diabetes, the flowers and fruits used for food, roots and stalks were eaten. **Etymology:** Peniocereus is from Latin cereus for waxy, while greggii is named for Josiah Gregg (1806–1850). **Synonyms:** *Cereus greggii*

Forbs

Forbs are non-grasslike herbaceous plants, neither woody nor persistent, that die back at the end of a growing season. Herbaceous plants can be either annual (short-lived), perennial (living longer than a single season), or biennial (living two years and only flowering in the second), but they will grow into trees or shrubs because they lack any kind of persistent woody stem.

Forbs can take a variety of physical forms. They can be upright, tall, tiny, bushy, even vines. Most forbs have a consistent structure of roots and stems, leaves, and an inflorescence (flower-bearing part) of flowers and fruits enclosed in an ovary. The structures vary widely between families but tend to be similar within families. For example, all plants in the family Caryophyllaceae, the Pink family, share a common characteristic of swollen nodes with opposite leaves.

Forbs are part of a larger grouping of plants known as the angiosperms, demarcated by the presence of a seed contained within an enclosed ovary. Flower types and structure are as diverse, occur in many different colors, and all sorts different numbers of petals, seeds, and even leaves.

Atriplex elegans

wheelscale saltbush

General: Annual, rarely perennial 5–45 cm tall, stems ascending or procumbent to erect, stramineous or whitish, simple or much branched at base, obtusely angled in age, slender or stout, scurfy to glabrate. **Leaves:** Many, subsessile or shortly petiolate; blade elliptic to spatulate, oblanceolate, oblong, or obovate 5–30 mm long by 2–8 mm wide, base cuneate to attenuate, margin entire or irregularly dentate, densely scurfy abaxially, usually green and glabrate adaxially. **Flowers:** Staminate flowers with 3–5 parted perianth; pistillate flowers intermixed with staminate in small axillary clusters. **Fruits:** Bracteoles subsessile or short stipulate, orbiculate, strongly compressed, 2–4 m and as wide, united except at thin margin, margin dentate, terminal teeth often prominent, faces smooth or with appendages; seeds brown, 1–1.5 mm wide. **Ecology:** Found in alluvial soils, ditchbanks, field edges, roadsides, washes, generally disturbed soil below 3,500 ft (1067 m); flowers March–August. **Notes:** This species can be distinguished readily when fruiting because of the two bracts deeply toothed all around the margins that enclose the seed. Two varieties are recognized: var. *elegans* whose bracteole margin is dentate to incised with teeth 0.5–1 mm, found from Chihuahuan to the Sonoran deserts; and var. *fasiculata* with a finely toothed bracteole margin, 0.3–0.5 mm, and a strongly samaralike bracteole, found from Mohavean to the Sonoran deserts. **Ethnobotany:** Gila Pima ate as a famine food, or rarely boiled the plant with meat. **Etymology:** Atriplex is the Latin name for the plant, while elegans means elegant. **Synonyms:** None

Chenopodium murale

nettleleaf goosefoot

General: Introduced, erect or ascending, subglabrous annual 10–80 cm tall, bright green. **Leaves:** Leaf blades ovate to ovate–rhombic, 1.5–5 cm wide, 2.5–9 cm long, acute or obtuse, cuneate to truncate or subcordate at base, irregularly sinuate–dentate, gray scurfy farinose at least beneath in youth, soon glabrate, especially on shining upper surfaces. **Flowers:** In small axillary and terminal glomerules, farinose; calyx lobes oblong, obtuse, about 1 mm long, weakly carinate toward apex, incompletely enclosing fruit; greenish pericarp, closely adherent. **Fruits:** Seeds blackish, 1.2–1.4 mm wide, minute, devoid of dried pericarp. **Ecology:** Found as widespread weed of urban and agricultural areas below 9,000 ft (2743 m); flowers March–October, often other times of year. **Ethnobotany:** Seeds were parched, ground, and eaten as pinole. **Etymology:** Chenopodium means goose foot, murale means growing on walls. **Synonyms:** None

Monolepis nuttalliana

Nuttall's povertyweed

General: Semisucculent annual, decumbent to ascending, stems 10–35 cm long, herbage moderately scurfy–farinose in youth, soon glabrate. **Leaves:** Triangular to lanceolate hastate, 3–12 mm wide, 1–6.5 cm long, on slender petioles 0.5–5.5 cm long, lobes divergent; upper leaves often entire reduced to leafy bracts. **Flowers:** Dense sessile clusters, axiallary, sepal obovate to spatulate, keeled, partially spreading at maturity, 1–2 mm long. **Fruits:** Utricle 1–1.4 mm in diameter, about 0.5 mm thick, pericarp membranous, grayish, minutely pitted, lens–shaped. **Ecology:** Found on dry or alkaline and often heavy soil below 3,000 ft (914 m); flowers February–October. **Ethnobotany:** Used as a ceremonial emetic, as a poultice for skin abrasions, seeds were ground to make mush, pinole, the roots were boiled, and the greens were eaten. **Etymology:** Monolepis is from the Greek monos, one and lepis scale, while nuttalliana is named for Thomas Nuttall (1786–1859) an English botanist. **Synonyms:** None

Impact risk level H M L

Salsola tragus

prickly Russian thistle

General: Introduced annual; up to 100 cm; many–branched stems which detach at the base after fruiting; often with reddish, longitudinal striations; glabrous or somewhat hairy. **Leaves:** 8–52 mm; thread–like; rigid with maturity; sharp–tipped. **Flowers:** Solitary flowers located in leaf axils; no petals; sepals 2.5–3 mm. **Fruits:** Small; Seeds shiny black, 1–2 mm wide. **Ecology:** Widespread on disturbed ground up to 8,000 ft (2440 m); throughout North America. **Notes:** Native to Eurasia. This species has many–branched stems, and the leaves become rigid and sharp–tipped at maturity. A tumbleweed that disperses its seeds as entire plant blown across the ground by the wind. Extremely weedy species. Responds quickly to disturbance and disperses readily. This plant is a very problematic invasive in North America. It is also used as cover by birds and small mammals. Host plant for western pygmy blue butterfly. **Ethnobotany:** Extremely tasty as cooked spinach – eat whole plant up to 5 inches tall– double boil to remove bitterness and only eat young plants. Young plants also for sheep and horse feed. Navajos used it to treat influenza and small pox. **Etymology:** Salsola– salt, pertaining to the taste and habitat. Tragus is ancient word for goat. **Synonyms:** *S. australis, S. iberica; S. kali, S. pestifer; S. ruthenica*

Bowlesia incana

hoary bowlesia

General: Delicate winter–spring annual with stellate hairs throughout; stems weak 4–45 cm, slender, prostrate and dichotomously branching. **Leaves**: Simple, petioled, wider than long, 10–23 mm wide with 5 or 7 broad lobes, entire to dentate. **Flowers**: Borne in simple umbels, sepals and petals scalelike 0.5 mm, peduncles 2–6 flowered, shorter than petioles, sometimes vestigal, inconspicuous corolla greenish white with prominent calyx teeth. **Fruits:** Sessile or nearly so, ovate, 1–1.5 mm, stellate–pubescent, turgid. **Ecology:** Found under bushes and canopies from 100–3,500 ft (31–1067 m); flowers January–June. **Notes:** Distinguished by habit, basal and opposite leaves, and its tendency to form extensive mat; whole plant is covered in downy, star–shaped hairs. **Ethnobotany:** Unknown **Etymology:** Bowlesia is named for William Bowles (1705–1780) an Irish naturalist, while incana means grayish or hoary. **Synonyms:** *Bowlesia septentrionalis*

Funastrum cynanchoides

Hartweg's twinevine

General: Stems numerous, from woody root, slender, herbaceous above, 1–3 m long or more, somewhat glaucescent. **Leaves**: Linear to lanceolate, sometimes auriculate–lobed or even cordate–hastate at base, 1–5 mm wide, 2.5–6 cm long, short–petiolate, glabrous to puberulent. **Flowers**: Peduncles slender, 1–5 cm long, few to many flowered, pedicels 5–12 mm long, sparsely puberulent with spreading hairs; calyx lobes ovate, 1–1.5 mm long, puberulent, corollas purplish, 8–10 mm broad, lobes acute to slightly acuminate, sparsely puberulent to subglabrous without, ciliate on margins, glabrous within, corona ring rectanguloid, widest below middle, 0.5–0.8 mm high, free from vesicles. **Fruits**: Follicles slender 6–9 mm in diameter, attenuate at each end, 7–11 cm long. **Ecology**: Found along arroyos and in arid valleys below 5,500 ft (1676 m); flowers February–September. **Notes**: Leaves can be diagnostic for this species, as can its drier habitat. **Ethnobotany**: Plant was eaten raw, the sap secretions were heated over coals and eaten like gum by the Papago. **Etymology**: Funastrum is from funis, a rope, cord, or sheet and astrum, incomplete resemblance, while cynanchoides refers to being like the genus *Cynanchum*. **Synonyms**: *Funastrum cynanchoides* ssp. *heterophyllum, F. heterophyllum, F. lineare, Philibertia heterophylla, Sarcostemma cynanchoides* ssp. *hartwegii, S. cynanchoides* var. *hartwegii*

Dichelostemma capitatum ssp. *capitatum*

bluedicks

General: Perennial herb with large underground deep–seated corm (bulb), scape 20–80 cm tall. **Leaves:** Slender 2–4 mostly shorter than scape, 2–15 mm wide, scaberulous margins. **Flowers:** Bracts 8–15 mm long, broadly ovate, abruptly acuminate; slender pedicels 2–10 mm long, perianth deep violet–purple, rarely reddish purple or white, 12–18 mm long, thin tube 4–8 mm long, constricted at throat. Umbels are open with 2–12 flowers. **Fruits:** Capsule 6–10 mm long with persistent style. **Ecology:** Found on dry open ridges and grassy plains, especially on heavier textured soils such as clays and heavy loams below 5,000 ft (1524 m); flowers February–May. **Notes:** Obvious plant in spring with its violet–colored flowers. **Ethnobotany:** Corms were eaten raw or cooked and eaten. **Etymology:** Dichelostemma comes from Greek dicha, bifid, and stemma, a garland or crown, refers to appendages on the stamens, while capitatum refers to the way the flowers form in a head–like cluster. **Synonyms:** *Brodiaea capitata*, *B. pulchella*, *Dichelostemma lacuna–vernalis*, *D. pulchellum*, *D. pulchellum* var. *capitatum*, *Hookera pulchella*

Acourtia nana

dwarf desertpeony

General: Low perennial herb 5–30 cm tall from a woody, platform–like rootstock 1–5 cm below soil, densely covered with a thick brownish tomentum and bearing several to many tough woody roots 1–2 mm in diameter on lower side; stems erect or ascending, simple or moderately branched, finely scabrous with simple and gland–tipped hairs. **Leaves:** Sessile or short–petioled, leathery, pale green, obovate–suborbicular or suborbicular, 2–5 cm long and nearly or quite as wide, coarsely and unequally spinulose–dentate, scaberulous, veins conspicuous on both surfaces. **Flowers:** Solitary heads at ends of branches on stoutish peduncles 4–10 mm long or subsessile, campanulate involucre about 1.5 cm high, 9–12 mm high; broadly ovate bracts and abruptly attenuate to lance–linear and acute to apiculate in 4–5 series, inner ones narrow, often purplish, slightly scarious margins and lanate–ciliate below, fragrant pale pink flowers 10–14 mm long, glabrous. **Fruits:** Linear achene 5–6 mm long, strongly ribbed, pappus of numerous slender silky hairs 10–15 mm long, silvery white to tawny. **Ecology:** Found on mesas, arid plains, and slopes, usually under shrubs below 6,000 ft (1829 m); flowers March–June. **Notes:** Simple, grayish green leaves clasp the stems, are leathery and holly-like with rippled, spiny–toothed margins. **Ethnobotany:** Cottonlike material at root base place on a newborn's umbilicus. **Etymology:** Acourtia is named for Mary Elizabeth Catherine Gibbes A'Court (1792–1878), nana is from Greek nannos, dwarf. **Synonyms:** *Perezia nana*

Ambrosia psilostachya

Cuman ragweed

General: Colonial perennial herb arising from deep, creeping rhizomes; rough–pubescent; 20–100 cm tall. **Leaves:** Leaves all cauline, opposite below but alternate above, thick and firm, pinnatifid with broad midstripe; 2–15 cm long, 1–8 cm wide. **Flowers:** Staminate heads nodding and numerous, involucre 2–3 mm high, moderately hispidulous, only shallowly lobed. Pistillate involucres 1–flowered, 4–6 mm long, with one set of short tubercles (or tubercles obsolete). **Fruits:** Burs obpyramidal to globose, 2–3 mm, hirsutulous, spines 1–6. **Ecology:** Disturbed places and streamsides from 4,000–7,000 ft (1300–2100 m); flowers July–October. **Notes:** The leaves generally appear narrower, firmer, less dissected and less petiolate than *A. artemisiifolia*. Species may have moderate forage value, seed is eaten by upland game birds, and plant is used in habitat of small mammal communities. Also used as nesting material and habitat by small mammals and non–game birds. Although species is an invader it is native and may be used in prairie restoration. Post-fire regeneration strategy is mostly from rhizomes. **Ethnobotany:** Cheyenne used leaves and stems to remedy painful digestion, as a laxative, for labor pain and as a cold treatment. Keres, Kiowa and Deguena tribes used stem and leaf tonic for dandruff. Plant also rolled with sage in Kiowa sweatlodge. **Etymology:** Species name from ancient word psilo for smooth or bare and stachy for spike-like, while ambrosia is the word depicting food of ancient Greek gods. **Synonyms:** None

Aphanostephus ramosissimus var. *humilis*

plains dozedaisy

General: Low annual herb with several ascending branches 5–35 cm long from a rosette; herbage cinereous–puberulous. **Leaves:** Rosette of oblanceolate, pinnatifid leaves 6–10 mm wide, 3–6 cm long, these soon dying and leaving base of stems naked; cauline leaves smaller, entire to pinnatifid, teeth or lobes acute and often faintly apiculate. **Flowers:** Heads solitary at tips of branches, peduncles 1–6 cm long, bearing several reduced, bract–like leaves scattered below head; involucres 5–7 mm high, 8–12 mm wide, bracts linear, acute to attenuate, greenish and puberulent along midrib, scarious and white to rosaceous along margins; ray flowers 30–40, ligules about 1 mm wide or less, 4–6 mm long, white or often tinged with purple; disk corollas vary narrowly tubular, about 2 mm long, yellow. **Fruits:** Achenes broadly obconic, about 1 mm long, brownish, minutely and sparsely appressed–puberulent along low, rounded ribs; pappus crown barely discernible, microscopically erosulate–ciliolate. **Ecology:** Found on plains, along arroyos and river banks from 1,000–3,500 ft (305–1067 m); flowers March–October. **Notes:** Other species in genera stretch deep into Mexico; ray flowers with rounded tips help to identify this species from the other delicate flowers in genera such as *Aster*. **Ethnobotany:** Unknown **Etymology:** Aphanostephus is from Greek Aphanes, inconspicuous, while ramosissimus means very branched. **Synonyms:** *Aphanostephus arizonicus, A. humilis, A. potosinus, Leucopsidium humile*

Arida arizonica

arid tansyaster

General: Annual 10–50 cm tall, much branched from base, moderately to rather densely stipitate–glandular throughout, often with longer nonglandular hairs at least on lower part of stems. **Leaves:** Basal leaves oblanceolate, petiolate, 5–25 mm wide, 2.5–6 cm long, coarsely serrate-dentate to pinnatifid, teeth and lobes spinose-tipped, upper leaves lance-elliptic to oblanceolate, 2–8 mm wide, to about 3 cm long or less, serrate–dentate or subpinnatifid. **Flowers:** Heads terminating branchlets, somewhat corymbosely arranged; hemispheric involucres, 4–6 mm high, 5–8 mm wide at anthesis, bracts lance-ovate to lance-linear, green toward tips and outer ones along midrib also, densely glandular; ray flowers 50–80, blue-purple to whitish, mostly in two series; ligules 5–6 mm long; disk corollas very slender, about 4.5 mm long, glabrous. **Fruits:** Achenes terete–turbinate, finely striate, minutely silky-strigulose, 1.2–1.5 mm long, truncate at apex, those of ray flowers epappose, disk achenes with a pappus of capillary silky bristles 1.5–2 mm long. **Ecology:** Found on river bottoms, sandy plains and roadsides from 200–2,500 ft (61–762 m); flowers February–October. **Notes:** Purplish stems, sessile leaves with prominent midrib, the way the ray flowers curl back into flower head all help to identify this species. **Ethnobotany:** Unknown for this species, but others in the genus have several uses. **Etymology:** Name comes from the Greek machaira, meaning sword and anthera or anthers, referring to the shape of the anther–tips, while arida refers to arid. **Synonyms:** *Machaeranthera arida, M. ammophila, M. arizonica, M. coulter* var. *arida, Psilactis coulter*

Baileya multiradiata

desert marigold

General: Annual or short lived perennial with floccose stems and leaves, stems branch at base, decumbent to ascending, 20–40 cm tall, leafy on lower portion only. **Leaves:** Basal, 3–5 cm long, spatulate, 3-lobed and crenate early in season, later ones deeply 3–cleft and lobed, all densely white–floccose; upper cauline leaves linear to spatulate, entire, 2–4 cm long. **Flowers:** Peduncles 10–30 cm long, involucres 7–8 mm high, 10–15 mm broad, lanate; one head per stem; phyllaries 5.5–6.5 mm, linear–lanceolate 20–35; flower heads 3.5–5.3 cm wide including rays; rays many, bright yellow, 15–20 mm by 5–8 mm, the apex conspicuously 3-toothed, style branches truncate to slightly rounded at tips. **Fruits:** Achenes cylindrical-truncate, 3–4 mm long, evenly striate. **Ecology:** Found on arid plains, arroyos, outwash slopes, sandy plains and roadsides below 5,000 ft (1524 m); flowers March–October. **Notes:** Not always readily distinguishable from *B. pleniradiata*, but when sampled in the correct time of year the shape of the style is diagnostic. **Ethnobotany:** Rubbed under the arms as a deodorant, or mixed with clay and used in making adobes and in plaster. **Etymology:** Baileya is named for Jacob Whitman Bailey (1811–1857) an early American microscopist, multiradiata comes from the Latin for multi–radiata. **Synonyms:** *Baileya multiradiata* var. *thurberi*

Calycoseris wrightii

white tackstem

General: Plant simple and erect to much branched with spreading–ascending branches, 5–30 cm tall. **Leaves:** Lower leaves pinnately cleft to midrib in linear divisions, 0.5–2 mm wide and 2 cm long, whole blade 10 cm long, central rachis 5 mm wide or less, glabrous or essentially so, upper leaves linear and entire or with 1–3 subbasal lobes; upper one half of stems, branches, and involucres with glandular hairs, pale reddish, brownish, tack–shaped. **Flowers:** Involucres 9–15 mm long at anthesis, bracts to 2.5 mm wide, acute to slightly acuminate, ligules white with pinkish or pinkish–brown spots or streaks on under side and turning purplish or reddish when dry. **Fruits:** Achenes about 6 mm long, including beak, usually 1–1.5 mm long, body of achene dark brown, shallowly sulcate between ribs and bearing row of low, rounded bumps; pappus bristles 7–8 mm long. **Ecology:** Found on sandy plains, rocky mesas, and slopes from 500–4,000 ft (152–1219 m); flowers from March–May. **Notes:** Often growing up through shrubs. **Ethnobotany:** Unknown **Etymology:** Calycoseris is from Greek kalux, cup and seris, a chicory–like genus, while wrightii is named for Charles Wright (1811–1885) an American botanical collector. **Synonyms:** None

Impact risk level

H M L

Centaurea melitensis

Maltese star–thistle, tocalote

General: Introduced, invasive annual, 1–10 dm, gray–hairy. **Leaves:** Resin dotted, more or less scabrous, lower leaves 2–15 cm, entire to lobed, generally o at flower; cauline long–decurrent. **Flowers:** Heads 1–few, involucre 10–15 mm, ovoid, more or less cobwebby or becoming glabrous; main phyllaries straw–colored, appendage purplish, base spine–fringed, central spine 5–10 mm, slender; many flowers; corollas 10–12 mm, equal, yellow, sterile corollas slender. **Fruits:** Achene 2.5 mm, light brown, finely hairy, pappus bristles 2.5–3 mm, white. **Ecology:** Found on waste ground and open sites or disturbed ground below 7,500 ft (2286 m); flowers May–June. **Notes:** Invasive weed often associated with agriculture and roads. **Ethnobotany:** Used medicinally for the kidneys. **Etymology:** Centaurea is a Latin reference to the Centaur Chiron, while melitensis means of or from Malta. **Synonyms:** None

Conyza canadensis

Canadian horseweed

General: Native annual herb; stems simple below inflorescence, 50–150 cm tall; glabrous to spreading–hairy. **Leaves:** Alternate, numerous; basal leaves up to 10 cm long, reduced above; mainly oblanceolate and petiolate below, increasingly linear and sessile above; serrate. **Flowers:** Inflorescence terminal, open, with numerous flower heads; involucres 2–4 mm high, 3–7 mm wide; inconspicuously radiate. **Fruits:** Achene. **Ecology:** Disturbed soil from 1,000–8,000 ft (305–2440 m); flowers July–October. **Notes:** Characterized by its numerous alternate, serrate leaves and its terminal, open inflorescence with many small flower heads. Often weedy especially in disturbed and moist areas. **Ethnobotany:** Dried parts used as astringent for face. Used by Hopi as a poultice of rubbed plant on temples for headaches. Used by the Navajo for pimples, earaches, stomachaches. **Etymology:** Name used by Theophrastus, Pliny, and Dioscorides, presumably from the Greek konops (flea). **Synonyms:** *Erigeron canadensis*

Diaperia verna

spring pygmycudweed

General: Annual, diffusely branched from base with leafy, decumbent branches 5–15 cm long, these bearing small, densely crowded glomerules of heads nearly hidden by bractlike leaves. **Leaves:** Cauline leaves broadly spatulate 1.5–3.5 mm wide, 5–12 mm long, sessile, arachnoid–tomentose. **Flowers:** Heads subglobose, 2–3 mm high, bracts of fertile flowers oblong, scarious below, densely inflexed-woolly at apex, those of sterile flowers wooly farther down. **Fruits:** Achenes 1–1.2 mm long, smooth, yellowish. **Ecology:** Found in sandy soil from 1,500–3,000 ft (457–914 m); flowers March–April. **Notes:** Low taprooted annual that is woolly all over. **Ethnobotany:** Unknown **Etymology:** Verna means of spring. **Synonyms:** *Diaperia multicaulis, Evax multicaulis, Filaginopsis multicaulis, Filago nivea, F. verna*

Impact risk level H M L

Dimorphotheca sinuata

glandular cape marigold

General: Introduced, stems simple or sparingly branched from base 10–30 cm tall. **Leaves:** Less than 10 cm long, lower tapered to petiole–like base; upper sessile, blade oblong to oblanceolate, entire to coarsely dentate, upper smaller, sometimes linear. **Flowers:** Heads 3–7 cm in diameter, involucre more or less bell-shaped; phyllaries 10–15 mm, linear-lanceolate, acuminate, narrowly scarious-margined; ray flowers orange to yellow, sometimes violet at base or tip, ligules 2–2.5 cm; corollas 4.5–5.5 mm, yellow or orange, often purple–tipped. **Fruits:** Ray achenes 4–5 mm; disk achenes 6–7 mm. **Ecology:** Found on roadsides, disturbed places below 3,500 ft (1067 m); flowers March–May. **Notes:** Introduced from South Africa, thought to have escaped cultivation.**Ethnobotany:**Unknown **Etymology:** Dimorphotheca comes from the Greek dimorph, two forms and theke, ovary, while sinuata means having sinuous or wavy margins. **Synonyms:** None

Erigeron divergens

2010 NPS/Beth Fallon

spreading fleabane

General: Native biennial herb; stems branched from base and above, 5–50 cm tall; spreading-hairy. **Leaves:** Alternate; basal leaves up to 5 cm long, reduced above; oblanceolate and long–petioled below, to nearly linear above; entire to slightly lobed. **Flowers:** Heads several to many on leafy peduncles; involucres 4–5 mm high; disk 7–11 mm wide; rays 75–150, 5–10 mm long, pale blue, pink or white; disk yellow. **Fruits:** Achenes sparsely hairy, 2–4 veined, with a double pappus of 5–12 long, fragile bristles surrounded by short, narrow scales. **Ecology:** Semi-arid, open to lightly wooded areas from 1,000–9,000 ft (305–2743 m); flowers May–August. **Notes:** Lacks the numerous stolons of *E. flagellaris;* related species *Erigeron colomexicanus* (=*E. divergens* var. *cinereus*), which has leafy stolons. **Ethnobotany:** Aerial parts are sometimes used to make oil to treat pets for fleas (Hence the common name-fleabane). Many *Erigeron* spp. used similarly. **Etymology:** Name means Early Old Man, named by Theophrastus. Divergens is ancient word for diverging. **Synonyms:** *Erigeron divergens* var. *typicus*

Eriophyllum lanosum

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white Easterbonnets

General: Loosely floccose, spreadingly branched annual with slender stems 5–15 cm long, erect, ascending or the lowermost often decumbent. **Leaves:** Linear to narrowly oblanceolate, entire 1–3 mm wide, 5–20 mm long, acute to apiculate at apex, gradually narrowing toward base. **Flowers:** Slender peduncles, 1–6 cm long, campanulate involucres 5–8 mm wide, 5–6 mm high, 8–11 bracts, oblanceolate, short–acuminate, 1–1.5 mm wide floccose; ray flowers 8–10 with white ligules 6 mm long, 3–4 mm wide, yellow disk corollas, 2.5–3 mm long, sparsely glandular–puberulent, tube about equaling throat and limb. **Fruits:** Achenes, linear–obpyramidal, 3–3.5 mm long, sparsely strigose, black; pappus of 4–5 slender, lance–subulate, scaberulous awns about equaling corollas and about as many or a few more short, obtuse and whitish. **Ecology:** Found on arid mesas, gravelly slopes and washes from 1,000–3,000 ft (305–914 m); flowers March–April. **Notes:** Distinguished by its tomentose herbage, slender achenes and white to rosy rays. **Ethnobotany:** Unknown **Etymology:** Lanosum means woolly. **Synonyms:** *Antheropeas lanosum*

Geraea canescens

hairy desertsunflower, desert–gold

General: Slender annual, moderately branched, 10–60 cm tall, hirsute-canescent and stipitate-glandular throughout, stems and peduncles eventually subglabrate. **Leaves:** Alternate on narrowly winged petioles 0.5–2.5 cm long, upper ones subsessile; leaf blades ovate, obovate, to lance–oblong, 0.5–4 cm wide, 1–7 cm long, acute at apex, cuneate at base, strongly 3–nerved, dentate above middle, or smaller ones entire. **Flowers:** Few heads, solitary to paniculate, to 5 cm in diameter; involucres 8–12 mm, unequal bracts, linear–lanceolate and acute or attenuate, 7–10 mm long, densely ciliate, long white hairs along margin except at tip; densely glandular on back; rays 10–15, golden yellow, 10–20 mm long, 6–10 mm wide, disc corollas 5–6 mm long. **Fruits:** Achenes 6–7 mm long, narrowly cuneate, silky villous, black with white margins, yellowish crown. **Ecology:** Found in sandy or gravelly soils from sea level to 4,500 ft (1372 m) ; flowers October–May. **Ethnobotany:** Unknown **Etymology:** Geraea is from the Greek geraios for old, while canescens means covered in short gray or white hairs. **Synonyms:** *Geraea canescens* var. *canescens, G. canescens* var. *paniculata*

Helianthus annuus

sunflower

General: Native annual herb; stems stout, erect, 30–200 cm or more tall; rough–hairy. **Leaves:** Only the lowermost leaves opposite, otherwise alternate; long-petioled, ovate or even broader, especially below, 4–20 cm long, 3–15 cm wide, coarsely toothed to (less commonly) almost entire; rough–hairy. **Flowers:** Heads solitary or few at the ends of stems and branches; phyllaries ovate with a long narrow tip, more-or-less pubescent and ciliate-margined; disk usually 3–4 cm wide, purplish-brown or occasionally yellow; rays 15–40 mm long, yellow; central receptacle bracts inconspicuously pubescent at the tips. **Fruits:** Achenes plump, glabrous or finely pubescent, with a pappus of 2 or more awns or scales. **Ecology:** Open or disturbed areas from 1,000–7,000 ft (305–2134 m); flowers March–October. **Notes:** A related species, *H. petiolaris*, is very similar but smaller and more slender in all respects, with phyllaries lanceolate and usually not ciliate margined, and the central receptacle scales conspicuously white bearded at the tip. Host plant for California patch, bordered patch, and painted lady butterflies. **Ethnobotany:** Seed is dried, ground and mixed with water to make a coffee-like drink. It is also ground to make sunflower seed cakes or crushed and boiled to make oil. The oil relieves coughs. The pith of a sunflower stalk has also been burned and used as a wart remover. **Etymology:** From ancient root helio– for sun loving and meros– meaning part. **Synonyms:** Numerous, see Tropicos

Heterotheca subaxillaris

camphorweed

General: Erect annual to biennial herb 40–150 cm tall with striate and short–hirsute stems, moderately branched above. **Leaves:** Leaves ovate-lanceolate to somewhat lyrate in outline, 0.8–3.5 cm wide, 2.5–10 cm long, at least upper cordate-clasping, serrate–dentate, acute to obtuse and apiculate at apex, short hirsute-scabrous on both sides. **Flowers:** Heads corymbosely or broadly paniculately arranged, 6–8 mm high, 10–18 mm wide at anthesis; involucral bracts in several series, lance-linear to subulate, rather rigid, outer ones acute and apiculate, innermost attenuate and scraggly brush of spreading and ascending hairs on terminal part, pale greenish to stramineous below, tips often brownish or reddish; ray flowers 30–50, ligules about 5 mm long, 1 mm wide, yellowish but soon turning brown; corollas 4–5 mm long. **Fruits:** Achenes of ray flowers about 3 mm long, glabrous, epappose; achenes of disk flowers about as long as ray achenes but more slender, densely silky-villous; pappus bristles reddish-brown, longer inner ones about 15 mm long. **Ecology:** Found along streams, ditches, fence–rows, and in disturbed soils from 1,000–5,500 ft (305–1676 m); flowers August–November. **Notes:** Sometimes known as camphor–weed because of the odor of the plant. **Ethnobotany:** Unknown for this species, other species in this genera have medicinal, poisonous, and as a dermatological aid. **Etymology:** Heterotheca is from Greek heteros, different, and theke, ovary for the different achenes, while subaxillaris means below the axil. **Synonyms:** Many, see Tropicos

H **M** L Impact risk level

Lactuca serriola

prickly lettuce

General: Annual herb; leafy–stemmed with milky sap. Introduced from Europe. Stems 30–150 cm tall; glabrous for most of length, but prickly at bottom of stem. **Leaves:** Leaves have large prickles on the midrib on the underside, and have finer prickles on the margins of the leaves. Leaves are sometimes lobed, and are clasping. Milky sap is apparent. **Flowers:** Numerous small heads arranged in a panicle or corymb. Flowers are all ligulate and perfect, yellow, often drying to blue. **Fruits:** Achenes, white pappus **Ecology:** Wide range, weed of fields, waste places, and disturbed areas, naturalized throughout much of the U.S.; flowers July–September. **Notes:** Distinguished by milky sap, prickles on midvein of underside of leaf. Differs primarily by leaves without prickly margins and achenes that are not spinulose. The inflorescence also resembles a spike, whereas the inflorescence of *L. serriola* is an open panicle, with spreading branches. **Ethnobotany:** Navajo use steeped plant tea as ceremonial emetic. **Etymology:** Lactuca is Latin for milky sap; serriola is for ranked salad leaves. **Synonyms:** *L. scariola*

Laennecia coulteri

conyza

General: Annual herb; forming densely hairy basal rosette when young. Stems 10–100 cm tall; glandular or sticky hairs all over plant, hairs resembling spider web (arachnoid); taproot. **Leaves:** Numerous leaves, almost all cauline and clasping and with an oblong shape, many of them are irregularly toothed, especially near the base. Leaves become smaller and have many course teeth. **Flowers:** Corollas of the pistillate flowers are tubular-filiform, without a ligule. **Fruits:** Achenes, 0.5–0.8 mm long, with a very short neck. **Ecology:** Found in ditch banks, dry stream–beds and disturbed sites from 1,500–9,000 ft (500–2743 m); flowers September–October. **Notes:** Similar to *L. schiedeana* except that the achenes in *L. schiedeana* are 1–1.4 mm long, and the leaves are much less toothed. **Ethnobotany:** Unknown **Etymology:** Laennecia is named for Rene Theophile Hyancinthe Laennec (1781–1826), coulteri is named for John Merle Coulter (1851–1928) an American botanist. **Synonyms:** *Conyza coulteri*

Laennecia schiedeana

pineland marshtail

General: Annual herb; forming densely hairy basal rosette when young. Stems 10–100 cm tall; glandular or sticky hairs all over plant, hairs resembling spider web (arachnoid); taproot. **Leaves:** Numerous leaves, almost all cauline and clasping and with an oblong shape, many of them irregularly toothed, especially near the base. Leaves become smaller and have fewer teeth toward the top of the stem. **Flowers:** Heads often rather numerous in a long and narrow inflorescence; bracts of the involucre often greenish; numerous pistillate flowers; pistillate corollas have a definite short ligule about 0.5 mm long, which surpasses the style. **Fruits:** Achenes, 1–1.5 mm long, with a very short neck. **Ecology:** Found in open woods and on disturbed ground from 6,500–9,000 ft (1981–2743 m); flowers September–October. **Notes:** Toothed leaves, hairy herbage, small flower heads; *L. coulteri* is found in ditchbanks, dry stream–beds and disturbed sites in this range. Flowers are similar to *L. schiedeana*, but leaves have many coarse teeth. Herbage is sticky–glandular but not loosely hairy or resembling strands of spider web (as in *L. schiedeana*). Also pistillate corollas without a ligule. **Ethnobotany:** Unknown **Etymology:** Laennecia is named fro Rene Theophile Hyancinthe Laennec (1781–1826). **Synonyms:** *Conyza schiedeana, Erigeron schiedeanus, Leptilon integrifolium*

Lasthenia californica

California goldfields

General: Annual, simple or freely branched, more or less hairy, erect or decumbent, less than 40 cm tall. **Leaves:** Opposite, linear to oblanceolate, entire, 0.8–7 cm long, hairy. **Flowers:** Involucre 5–10 mm, bell–shaped or hemispheric; phyllaries 4–13 free, hairy; receptacle conic, rough, glabrous; ray flowers 6–13; ligules 5–10 mm; generally many disk flowers, yellow; anther tips triangular, style tips triangular. **Fruits:** Achene less than 3 mm, linear to club–shaped, glabrous or hairy, pappus of 1–7 narrow awns, wider awned scales. **Ecology:** Found on dry mesas, plains, and slopes from 1,500–4,500 ft (457–1372 m); flowers March–May. **Notes:** Variable species, slight differences in different habitats. **Ethnobotany:** The parched seeds were ground into flour and used to make mush by the Cohuilla. **Etymology:** Lasthenia is named for the Athenian girl Lasthenia, a student of Plato, while californica refers to California. **Synonyms:** *Baeria chrysostoma, Lasthenia chrysostoma, L. hirsutula*

Logfia arizonica

Arizona cottonrose, Arizona fluffweed

General: Diffuse to erect herb with slender stems 3–9.5 cm tall, slender internodes, purplish, usually 0.5 mm in diameter or less. **Leaves:** Leafless between clusters of flower heads or 1 leaf between clusters; clusters small, compact, axillary and terminal glomerules, subtended by linear, oblong or narrowly oblanceolate leaves 1–2.2 mm wide, 3–12 mm long, acute at both ends, sessile, finely landate-canescent. **Flowers:** Heads ovoid, 2.5–3.5 mm high, outer bracts boat–shaped, silky-lanate without, glabrous and shiny within, margins hyaline–scarious, each one except outermost 3–6 subtending a pistillate epappose flower, back green beneath tangled wool, hyaline tip less than one-half as long as body; inner bracts paleaceous, oblong, only slightly boat-shaped, glabrous or nearly so, white to stramineous; central flowers 4–7, perfect, glabrous, about 0.12–1.4 mm long. **Fruits:** Achenes, smooth, about 0.6–0.8 mm long, pappus bristles scaberulous, white, about 1.5 mm long. **Ecology:** Found on gravelly slopes and plains, often in fine textured soils and low places from 1,000–2,500 ft (305–762 m); flowers March–May. **Notes:** The taxonomy of this plant is under consideration. You probably know this plant as *Filago arizonica*. **Ethnobotany:** Unknown **Etymology:** Logfia is an anagram of the genus Filago, while arizonica refers to Arizona. **Synonyms:** *Filago arizonica, Oglifa arizonica*

Machaeranthera tanacetifolia

tansyleaf tansyaster

General: Native annual herb, 0.5–4 dm tall, highly branched when mature; taprooted. **Leaves:** Numerous, 2–10 cm long, pinnately incised to tripinnatifid. **Flowers:** Heads terminal on the branches; large, showy; involucre glandular and sometimes puberulent, imbricate bracts in several series with long, loose or reflexed green tips; 12–36 rays, blue. **Fruits:** Silky achenes 2.5–4 mm long. **Ecology:** Dry, open places and along streams and washes, lowlands from 1,000–6,000 ft (305–2300 m); flowers March–October. **Notes:** This plant also has characteristic pinnately incised to tripinnatifid leaves, sharp bracts, and blue ray flowers. This is a very distinct plant with very characteristic leaves and sharp bracts. **Ethnobotany:** Unknown for this species, other species in this genus have limited use. **Etymology:** Name comes from the Greek "machaira" meaning sword and "anthera" or anther, referring to the shape of the anther–tips. **Synonyms:** *Aster tanacetifolius, M. coronopifolia, M. parthenium*

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Matricaria discoidea

disc mayweed

General: Introduced annual, much–branched, leafy, with ascending stems 10–30 cm tall, sweet scented herbage, glabrous. **Leaves:** Leaves 2–4 cm long, twice or thrice pinnatifid into short, linear filiform divisions 0.5–6 mm long. **Flowers:** Numerous heads, terminating leafy branches, discoid; involucres deeply saucer shaped, about 3 mm high, 5–8 mm in diameter; bracts in 2–3 series, elliptic, rounded at apex, subequal, margins whitish and thin-scarious; receptacle narrowly conical, naked; disk corollas about 1.5 mm long, greenish yellow, ill defined tube only slightly longer than campanulate throat, with 4 broadly ovate lobes. **Fruits:** Achenes pale greenish brown, somewhat oblique, smooth on round back and between 4 ribs running full length of inner side; pappus a minute crown of squamellae or absent. **Ecology:** Found on roadsides, river bottoms, waste ground and disturbed areas below 2,500 ft (762 m); flowers February–April. **Notes:** Nicknamed pineapple weed for the smell. **Ethnobotany:** Prolific uses as medicinal, from gynecological aid to antidiarrheal, to cold remedy, to heart medicine, to use as food. **Etymology:** Matricaria comes from Latin matrix, the womb, and discoidea meaning without rays, discoid. **Synonyms:** Many, see Tropicos

Pectis papposa

manybristle cinchweed

General: Yellowish green annual with slender, spreading–ascending or procumbent, dichotomously branched, glabrous stems 10–30 cm. **Leaves:** Filiform or narrowly linear, 1–6 cm long, 1–2 mm wide or less, with 2–5 pairs of bristles near base and conspicuous elliptical marginal glands. **Flowers:** Heads clustered in leafy cymes; peduncles 1–3 cm long, usually shorter than subtending leaves; involucres turbinate, 3–5 mm broad, 4.5–6 mm high; bracts 7–9, narrowly linear and strongly involute, strongly keeled and gibbous at base, obtuse and scarious–margined at apex, irregularly dotted with 3–7 conspicuous glands, concentrated at apex; 7–9 ray flowers with yellow ligules 1.5–2 mm wide, 4–6 mm long; disk flowers 10–15 , corollas slender, 4–5 mm long. **Fruits:** Achenes linear–clavate, black, 4–5 mm long, sparsely strigillose, pappus of disk achenes of 12–20 sparsely short–plumose or barbellate bristles 3–4 mm long or rarely reduced to a crown. **Ecology:** Found on sandy or gravelly soils, plains and mesas below 6,000 ft (1829 m); flowers June–October. **Ethnobotany:** Used as a spice, a dye, a laxative, as eye drops for snowblindness, to the seeds being parched, ground and eaten. **Etymology:** Pectis is from the Greek pecteo, to comb while pappose is from the Latin for, with pappus. **Synonyms:** None

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Sonchus asper

spiny sowthistle

General: A simple or scantily branched annual 0.3–2.5 m tall, herbage glabrous, peduncles and involucres with tack–shaped, glandular hairs. **Leaves:** Basal leaves oblanceolate to spatulate in outline, to 30 cm long, blades lyrately or rucinately pinnatifid into broadly ovate to oblong lobes and these saliently dentate with spinulose teeth or sometimes blades only dentate; petiole often equaling blade, cauline leaves similar but usually sessile, auricles to 2 cm long, rounded and saliently toothed. **Flowers:** Heads urceolate-turbinate in bud, on peduncles 1–10 cm long, involucres 10–16 mm long and campanulate or cylindric in anthesis; main bracts lance–linear, acute to attenuate, thickened along midrib toward base in age, glabrous or sparsely glandular–pubescent, outer bracts ovate, more commonly glandular, but rarely thickened; ligules 3–6 mm long, pale yellow, quickly withering. **Fruits:** Achenes ovoid 2–2.5 mm long, about 1 mm wide, strongly compressed, each face 3–ribbed and smooth in intervals, lateral margins very thin; pappus hairs 6–10 mm long, often much tangled, holding several achenes together in cluster. **Ecology:** Widespread, along roadsides, fields, and disturbed sites from 200–8,000 ft (61–2438 m); flowers April–August. **Notes:** Told apart from *S. oleraceus* by achenes, which are strongly 3–5 ribbed on each face, thin–margined; while *S. oleraceus* achenes are striate and strongly wrinkled transversely, not thin–margined. **Ethnobotany:** Given to babies as a sedative, taken as a heart medicine, while other tribes considered this species a poison. **Etymology:** Sonchus is the Greek name for sowthistle, while asper means rough. **Synonyms:** *Sonchus asper* ssp. *asper, S. asper* ssp. *glaucescens, S. nymanii*

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Sonchus oleraceus

common sowthistle

General: Annual introduced herb; native to Europe; 10 cm–2 m tall; from a short taproot; glabrous except for an occasional spreading gland–tipped hair on the involucres and peduncles; milky sap. **Leaves:** Leaves alternate; pinnatifid to occasionally merely toothed; soft; the margins only weakly or scarcely prickly; 6–30 cm long and 1–15 cm wide; all but the lowermost prominently auriculate; leaves progressively less divided upwards. **Flowers:** Heads several in a corymbiform inflorescence; relatively small; 1.5–2.5 cm wide in flower; involucre 9–13 mm high in fruit; yellow rays; 120–150 flowers per plant. **Fruits:** Achenes 2.5–3.5 mm long; transversely rugulose and 3–5 ribbed on each face. **Ecology:** Disturbed areas, from 600–8,000 ft (185–2440m); flowers March–October. **Notes:** Two other species of *Sonchus* in the Intermountain West. *S. arvensis* is also native to Europe and widely introduced in North America; prefers fairly moist to wet soil. It is a perennial with deep-seated creeping roots and relatively large flowers. *S. asper* is an annual introduced species occurring in meadows, along streambanks and obviously disturbed habitats. It differs from *S. oleraceus* by having mature several nerved achenes that are not rugulose (mature achenes are transversly rugulose as well as several nerved in *S. oleraceus*). **Ethnobotany:** Young leaves are used in salads or cooked in curry and rice dishes. Salves are used to treat hemorrhoids and ulcers. Tea is used to treat anxiety and asthma. The milky juice is often used as eyewash. **Etymology:** Sonchus is the Greek name for sowthistle, while oleraceus means resembling garden herbs or vegetables used in cooking. **Synonyms:** None

Stephanomeria pauciflora

brownplume wirelettuce

General: Perennial, rounded plant with much branched stems 30–60 cm tall; stiff, ascending or spreading branches, base of stems slightly woody, herbage glabrous, pale green. **Leaves:** Basal leaves narrowly oblong, lanceolate to linear, 3–7 cm long, lower ones rucinate-pinnatifid, glabrous or glaucous, upper leaves entire or reduced to scales, often with tufts of woolly hairs at base of blade, otherwise glabrous or glaucous. **Flowers:** Terminal heads on branches, 3–5 flowered, ligules flesh–colored; involucre 7–9 mm high, glabrous, phyllaries about 5, linear, obtuse. **Fruits:** Achenes longitudinally striate and often transversely rugulose, pappus brownish tinged, scabrous near base, plumose above to apex. **Ecology:** Found along washes, on gravelly bajadas, plains, and arid mesas from 200–7,000 ft (61–2134 m); flowers April–October. **Notes:** Delicate looking stems and tufts of woolly hairs at the base of blade help to identify it. **Ethnobotany:** Used to increase mother's milk supply, the roots as a narcotic, as a life medicine, chewed as gum, and as a ceremonial item. **Etymology:** Stephanomeria is derived from Greek stephane, wreath or crown and meros, division, while pauciflora means with little foliage. **Synonyms:** *Lygodesmia pauciflora, Ptiloria pauciflora, Stephanomeria cinerea, S. lygodesmoides, S. neomexicana, S. pauciflora* var. *parishii, S. pauciflora* var. *pauciflora*

Verbesina encelioides

golden crownbeard

General: Strongly taprooted annual; 20–100 cm tall; simple when small and branched above or throughout when well developed; stem strigose to villous-puberulent. **Leaves:** Leaves all cauline; well distributed along stem; lower leaves opposite; others alternate, evident petioles; coarsely toothed to subentire; narrowly to broadly triangular to merely lance–ovate; strigose beneath; thinly strigose on upper surface. **Flowers:** Heads terminating the branches; erect on peduncles up to 10 cm long; phyllaries green; ligules yellow and evidently 3–toothed at the tip. **Fruits:** Achenes 5–7 mm long, thinly hairy. **Ecology:** Open, sandy or rocky places, sometimes on dunes or along roadsides from 3,000–8,500 ft (914–22591 m); flowers April–September. **Notes:** Two subspecies in Arizona: *Verbesina encelioides* ssp. *exauriculata* and ssp. *encelioides*. Most of the Arizona plants are of ssp. *exauriculata* which is the dryland, more western phase and distinguished by petioles that are not auriculate–dilated at the base. ssp. *encelioides* is native to the Gulf Coast. It has more prominently auriculate leaves and mostly longer involucral bracts. Host plant for bordered patch butterfly. **Ethnobotany:** Hopi make plant tea into wash for fever or spider bites. Navajo make lotion for similar uses. Navajo also use liquid of strained leaves for stomach trouble. It is also a good luck token. **Etymology:** Verbesina is derived from Verbena. **Synonyms:** None

Amsinckia menziesii var. *intermedia*

Menzies' common fiddleneck

General: Erect and slender annual form with rough–hispid stems and foliage, 30–150 cm tall, or under favorable conditions frequently and widely branched. **Leaves:** Basal leaves narrowly oblanceolate or oblong, entire, to 20 cm long, gradually narrowed to a slender petioled 1–6 m long, upper leaves gradually reduced to linear–lanceolate bracts 1 cm long or less, intermediate ones usually lanceolate, sessile or subsessile. **Flowers:** Spike leafy-bracted at base, 5–30 cm long or more, tip continues to produce flowers after basal nutlets have matured, calyx lobes linear lanceolate, reddish-hispid, 3–5 mm long in flower, elongating to 6–10 mm in fruit, corolla dark yellow to orange, 7–12 mm long, rotate limb 3–6 mm wide, glabrous without, short throat narrow, 10 nerved below stamens. **Fruits:** Ovoid nutlets, incurved, dorsally keeled, scabrous–rugose, grayish, 1.5–3 mm long. **Ecology:** Found on grassy hillsides, valleys, along washes, abundant on sandy or gravelly soil below 4,000 ft (1219 m); flowers March–May. **Notes:** Varieties of this species and this genus more broadly are determined by the size of the nutlets, when collecting it is critical to obtain flowers, fruit, AND seed. **Ethnobotany:** Unknown for this species, other species in genus used for food, both seeds and young leaves eaten fresh. **Etymology:** Amsinckia named for Wilhelm Amsinck (1752–1831), while menziesii is named for Archibald Menzies (1754–1842) a Scottish botanist. **Synonyms:** *Amsinckia intermedia*, *A. intermedia* var. *echinata*, several others: see Tropicos

Amsinckia tessellata

bristly fiddleneck

General: Stout, often profusely branched annual 30–80 cm tall with coarsely hispid stems and herbage, hairs conspicuously pustulate at base. **Leaves:** Linear, lanceolate, oblong or narrowly ovate, lower ones gradually narrowed to a short petiole, upper sessile, 2–10 cm long, conspicuously spreading–hispid. **Flowers:** Spikes 1–5 cm long in flower, elongating to 20 cm or more in fruit, flowering tips dense, later rather lax, calyx lobes 3–5, often of two narrow ones and one broader, 2–3 dentate at apex, 5–8 mm long in flower to 12 mm long in fruit, sparsely hispid; corona yellow or pale orange, 8–12 mm long, 20–nerved below stamens, limb 2–4 mm, broad. **Fruits:** Nutlets broadly ovoid, erect or slightly incurved 2.5–3.2 mm long, back flattened or slightly rounded. **Ecology:** Found on grassy slopes, valley floors, rocky to gravelly soil, slopes, flats, and arroyo beds below 5,000 ft (1524 m); flowers April–June. **Notes:** *A. tessellata* is told apart from *A. intermedia* by fewer calyx lobes, which are unequal in width, and the 20–nerved corolla tube base. **Ethnobotany:** The leaves and seeds were eaten raw or parched for food. **Etymology:** Amsinckia named for Wilhelm Amsinck (1752–1831), tessellata means tessellate or checkered, patterned like a mosaic, referring to the seed. **Synonyms:** None

Cryptantha angustifolia

Panamint cryptantha

General: Much branched herb 8–25 cm tall, usually with many slender, ascending or spreading–ascending, brownish stems sparsely hispidulous with slender white hairs, epidermis eventually exfoliating in irregular strips and shreds. **Leaves:** Linear, usually 1 mm wide or less, 5–30 cm long, hispidulous with white hairs from pustulate bases. **Flowers:** Inflorescence of numerous short scorpioid spikes, elongating in fruit; calyx lobes lance linear, 1–1.5 mm long at anthesis, hispid with stiff spreading hairs, white corolla about 1.5 mm long, limb 1.5–2 mm broad. **Fruits:** Nutlets, 4, heteromorphous, all ovoid, acute, brownish or pale gray; lateral angles rounded or rather sharp, ventral groove narrow above. **Ecology:** Found in gravelly or rocky soil on hillsides, along washes, and on disturbed soil below 4,000 ft (1219 m); flowers February–June. **Ethnobotany:** Other species in the genus used the plant for fatigue, coughs, against throat cancer, as sheep feed, for intestinal problems, and the plant was chewed for colds. **Etymology:** Cryptantha is from the Greek krypsis, meaning hiding, suppression, concealment, thus a hidden flower, while angustifolia means narrow foliage. **Synonyms:** *Eremocarya angustifolia*

Cryptantha barbigera

bearded cryptantha

General: Erect or ascendingly branched, 10–55 cm tall, one to several very bristly, hispid stems. **Leaves:** Lance-linear to oblong, 3–7 mm broad, 1–7 cm long, obtuse at apex, bristly hirsute. **Flowers:** Heliocoid spikes usually geminate, rarely ternate or solitary, ebracteate, to 15 cm long, densely flowered; calyx lobes linear-lanceolate to lanceolate, 4–10 mm long, converging but not fused above but tips recurved; margins conspicuously villous with white hairs, midrib hirsute; corolla inconspicuous, limb 1–2 mm broad. **Fruits:** Nutlets, 1–4, lance ovate, 1.5–2.5 long, strongly warty on rounded or obscurely angled edges and convex back, groove narrow or broad. **Ecology:** Found on desert sands, along arroyos and on hillsides below 5,000 ft (1524 m); flowers March–June. **Ethnobotany:** Unknown, but other species in the genus have uses. **Etymology:** Cryptantha is from the Greek krypsis, meaning hiding, suppression, concealment, thus a hidden flower, while barbigera means bearded. **Synonyms:** None

Emmenanthe penduliflora

whisperingbells

General: Simple to much branched plants 10–50 cm tall, heavy–scented, stipitate–glandular puberulence throughout. **Leaves:** Oblong, 5–20 mm broad, 3–8 cm long, pinnatifid with narrowly deltoid to oblong, entire or dentate lobes, decurrent at base to short winged, clasping petiole. **Flowers:** Cymes several to many, pedicels filiform, 6–15 mm long or longer in fruit, recurved, villous and stipitate glandular; sepals ovate–lanceolate, 6–10 mm long, 2–3 mm wide, corolla 8–12 mm long, 5–10 mm wide, orbicular lobes 1–2 mm long, sparsely puberulent along and below midvein of each lobe; yellow. **Fruits:** Capsule 8–10 mm long, thin walled, sparsely villous and glandular. **Ecology:** Found on gravelly or rocky soil on slopes, along streams, usually under bushes below 4,000 ft (1219 m); flowers March–May. **Notes:** Often found in burned areas; makes whispering sound with persistent dry corollas. **Ethnobotany:** No known uses. **Etymology:** Emmenanthe is from the Greek emmeno, to bide and anthose flower, refers to the blossom not falling as it fades, while penduliflora means pendant flower. **Synonyms:** None

Eucrypta micrantha

dainty desert hideseed

General: Small, dainty annual, glandular–viscid, with stalked glandular hairs intermixed with non–glandular hairs. Stems often 5–23 cm, slender, erect to ascending, sometimes spreading on large plants or when shaded. **Leaves:** Pinnatifid, 1.5–5 cm by 0.5–2.6 cm. **Flowers:** Calyx usually divided about halfway up or more to base, with stalked glandular and non–glandular hairs; not spreading open at maturing, revealing only the tip of the capsule; corolla lobes white, pale violet, or lavender, throat yellow with yellow nectarines and often nectar filled in the morning. **Fruits:** Capsule, splitting, but the 2 carpels not falling free, the halves obovoid, obtusely pointed at tip. **Ecology:** Widespread, often in shade of shrubs, dies out as soil dries out from 4,000 ft (1219 m) and lower; flowers February–May. **Notes:** Grows particularly well in years of abundant moisture, can form small mats, often in shade where ground has slightly more moisture. **Ethnobotany:** Unknown **Etymology:** Eucrypta is from Greek eu, well or true and crypta, secret, alluding to hidden inner seeds, while micrantha means small–flowered. **Synonyms:** None

Heliotropium curvassavicum

salt heliotrope

General: Perennial or rarely annuals, glabrous, semisucculent to succulent, bluish glaucous, 10–100 cm tall. **Leaves:** Leaves nearly sessile, mostly 2.5–7.5 cm, lanceolate to oblanceolate to obovate, 3–10 mm wide, to 6 cm long; acute to rounded at apex, fleshy, glabrous and glaucous, often purplish in age. **Flowers:** Terminal helicoid spikes, sometimes in 3s or 4s, tightly scorpoid at tip in youth; corollas 2–25 mm wide, white with yellow center fading purplish, inconspicuous.**Fruits:** Depressed globose, 1.5–2 mm high, 2–2.5 mm wide, ovoid nutlets, rounded and smooth to faintly rugulose on back. **Ecology:** Found in marshy soil, alkaline or saline soils, often along wetlands below 5,000 ft (1524 m); flowers most of the year. **Notes:** Found in any wetter soils, even in irrigated areas. **Ethnobotany:** Seeds were made into mush, used for diarrhea, as a diuretic, as an emetic, a decoction gargled for sore throat, pulverized roots applied to sores and wounds, for venereal disease, and as a remedy for measles. **Etymology:** Heliotropium comes from Greek helios, sun and trope, turning, while curvassicum refers to Curacao, the island in the Dutch West Indies. **Synonyms:** None

Lappula occidentalis

flatspine stickseed

General: Native annual; puberulent or shortly hirsute throughout herbage; 10–80 cm tall; often with many branches above the middle. **Leaves:** Numerous leaves; blades linear to oblong; upper blades sessile, 1–2 mm long; lower blades petioled and longer, up to 6 cm; petioles 1–2 mm long; basal leaves often deciduous. **Flowers:** Inconspicuous corolla; white to light blue or ochroleucous. **Fruits:** Marginal prickles of the nutlets in a single row; prickles often swollen and confluent toward the base, forming a cupulate border to the nutlet. **Ecology:** Dry to moderately moist, sunny, usually disturbed sites, roadsides, overgrazed areas; widely distributed to 8,500 ft (2590 m); flowers March–September. **Notes:** This may not be a showy plant but it makes itself known by attaching its many distinctive seeds to the socks of passers by. Two varieties of *L. occidentalis* are found in Arizona: var. *cupulata* is mainly found in the southwestern US and var. *redowskii* is found throughout the range. *L. squarrosa* has nutlets with marginal prickles in at least 2 rows and prickles are slender, not confluent at the base as in *L. occidentalis*. **Ethnobotany:** Navajo make poultice for insect bites and other skin irritations. **Etymology:** Lappula is from ancient root lappa meaning a bur, while occidentalis means of the west. **Synonyms:** *L. redowskii, L. texana*

Nama demissa

purple mat

General: Prostrate, diffusely branching annuals, fine to coarse, generally mealy glandular, 3–20 cm. **Leaves:** Confined to compact clusters at tips of branches; blades obovate to spatulate or linear–spatulate, 2–7 mm wide, 1–2.5 cm long, narrowed to petiole equal to blade, strigose and hirsute. **Flowers:** Subsessile in terminal, few–flowered cymes in axils of branches; lance linear calyx lobes, 2–3 mm long, glutinous and densely hirsute; funnelform-campanulate corolla bright lavender–pink, lobes ovate, 2 mm long. **Fruits:** Ovoid capsule 3–2.5 mm long, hirsutulous. **Ecology:** Found mostly among chaparral on rocky slopes and along arroyos below 3,500 ft (1067 m); flowers April–July. **Notes:** Generally forming a a dense mat. **Ethnobotany:** Seeds pounded in a mortar and boiled into mush. **Etymology:** Nama comes from the Greek nama for spring or stream, while demissum means hanging down. **Synonyms:** None

Nama hispida

bristly nama

General: First flowering as rosettes, often developing stems 5–30 cm, erect to ascending or spreading with age. Larger stem hairs 1–1.2 mm, dense, bristly, straight. **Leaves:** Narrowly spatulate 1.5–4.6 cm, gradually narrowed to a winged petioled, the upper leaves smaller, sessile. **Flowers:** Corollas lavender, 13–15 mm, 2 styles, distinct to base, calyx divided nearly to base. **Fruits:** Superior ovary, nutlets, ellipsoid-ovoid, 0.5–0.6 mm, about twice as long as wide, yellowish. **Ecology:** Widespread on gravelly, rocky and sandy soils from 5,000 ft (1524 m); flowers from February–June. **Notes:** *N. hispidum* is identifiable by larger more robust habit, usually thicker stems, stouter and stiffer hairs, especially on stems. **Ethnobotany:** Used by the Navajo as a lotion for spider or tarantula bites. **Etymology:** Nama comes from the Greek nama for spring or stream, while hispidum means rough with bristly hairs. **Synonyms:** *Nama hispidum* var. *mentzelii*, *N. hispidum* var. *revolutum*, *N. hispidum* var. *spathulatum*

Pectocarya heterocarpa

chuckwalla combseed

General: Stems prostrate to procumbent, several from base, 5–25 cm long, stigulose with finer hairs than most species. **Leaves:** Linear to narrowly oblanceolate, 0.5–1.2 mm wide, 5–25 mm long, strigulose. **Flowers:** Small, about 2 mm long, sepals elliptic-lanceolate or linear lanceolate, 1.5–2 mm long at anthesis, corolla white. **Fruits:** Two broadly margined nutlets, margins lacerate toothed and deltoid teeth tipped with uncinate hairs, other 2 nutlets unmargined and somewhat reflexed, tuft of uncinate hairs distally. **Ecology:** Found on arid, gravelly, sandy slopes, in valleys and washes and in disturbed areas below 5,000 ft (1524 m); flowers February–May. **Notes: Ethnobotany:** Unknown **Etymology:** Pectocarya from the Greek pectos, combed and karua, nut, while heterocarpa is from Greek heteros, different and karphos, a chip of wood, splinter, nail. **Synonyms:** *Pectocarya penicillata* var. *heterocarpa*

Pectocarya penicillata

sleeping combseed

General: Stems prostrate to procumbent, several from base, slender, 5–25 cm long, cinereous-strigose. **Leaves:** Filiform to linear or spatulate, 0.3–2 mm wide, 1–3 cm long, strigose. **Flowers:** Small, sepals elliptic-lanceolate or linear-lanceolate, 1.5–2 mm long at anthesis, to 2.5 mm long in fruit, strigose; corolla white, about 2 mm long. **Fruits:** Nutlets all alike, oblong, divaricate, straight or very slightly inflexed at tip, 0.5–0.8 mm broad, 1.6–2.5 mm long, cartilaginous margin upturned to incurved along length of body, unarmed on this portion, nearly entire, or undulate, rounded distal end bearing a tuft of crowded uncinate bristles. **Ecology:** Found on sandy or gravelly soil below 3,000 ft (2134 m); flowers February=May. **Notes:** Differs from *P. heterocarpa* by being smaller, with thicker hairs. **Ethnobotany:** Unknown **Etymology:** Pectocarya is from the Greek pectos, combed and karua, nut, while penicillata means having a tuft of hair like a paintbrush. **Synonyms:** *Cynoglossum penicillatum, Pectocarya linearis* var. *penicillata*

Pectocarya platycarpa

broadfruit combseed

General: Annual with slender stems, stiff and prostrate to spreading-ascending, 10–20 cm long, cinereous-strigulose. **Leaves:** Linear to linear-oblanceoate, 0.5–1.8 mm broad, 1–3.5 cm long, strigose. **Flowers:** Pedicels slender, 1–2 mm long, sepals 2.5–3 mm long, body linear or oblong or spatulate–oblong, 0.6–1 mm wide, 2.5–3 mm long, 3 of them usually conspicuously margined with a broad, deeply lacerate wing that is glabrous within, teeth coarse, broadly deltoid, pallid, tipped with short uncinate bristles shorter than width of supporting margin. **Fruits:** Four nutlets, fourth if different, with narrower, more dissected wing and closely puberulent body. **Ecology:** Found on arid gravelly benches, hillsides, and mesas below 5,000 ft (1524 m); flowers February–April. **Notes:** Closely related to *P. penicillata*, so similar features, different scales. **Ethnobotany:** Unknown **Etymology:** Pectocarya is from Greek pectos, combed and karua, nut, platycarpa means broad–nutted, with broad fruits. **Synonyms:** *Pectocarya gracilis* var. *platycarpa*, *P. linearis* var. *platycarpa*

Phacelia crenulata

cleftleaf wildheliotrope

General: Annual, pungent, allergenic, stems 10–40 (up to 80) cm tall, erect, openly branched, stems and leaves with copious stalked glands as well as non–glandular hispid hairs, glands are yellow to orange and odiferous. **Leaves:** Oblong in outline, 2–12 cm, reduced upwards, mildly to deeply lobed, with crenate lobes. Lower sinuses quite deep, upper sinuses becoming shallow. Lower leaves petiolate, cauline leaves becoming sessile. Leaves bearing numerous stalked glands as well as hispid hairs. **Flowers:** Inflorescence of dense terminal and lateral scorpioid cymes. Cymes several to many flowered. Corolla showy, blue to purple to lavender to occasionally white basally. Stamens conspicuously exserted and with yellow anthers. **Fruits:** Globose capsule with 4 seeds. **Ecology:** Dry, gravelly hillsides and flats, sandy and clay soils from 3,500–7,000 ft (1065–2135 m); flowers April–September. **Notes:** Positive field identification of *Phacelia* is quite difficult as specific delimitations usually rely on seed morphology. **Ethnobotany:** Keres make root tea for sore throat and into rub for swellings. **Etymology:** Phacelia from Greek phacelo– for bundle; crenulata from crenata for toothed margins. **Synonyms:** *P. corrugata*

Phacelia distans

distant phacelia, caterpillar phacelia

General: Annual forb 15–45 cm, erect and simple to much branched and spreading to procumbent; herbage moderately sticky and often scabrous with conspicuous white hairs, sometimes with swollen white bases and also sessile glands, golden when fresh; stems leafy, semisucculent and relatively stout. **Leaves:** Usually relatively thin and fernlike, 6–17 cm, 1 or 2 times pinnatifid, segments pinnately lobed or toothed to pinnatifid. **Flowers:** Cymes helicoids, calyx lobes enlarging moderately in fruit, reaching 6 mm; corollas 8–9.5 mm, pale violet to blue, the lobes spreading; stamens usually not or scarcely exserted. **Fruits:** Seeds 4 or fewer around 2 mm, red–brown, narrowly ovoid, pitted, the back convex, the ventral side angled and convex. **Ecology:** Found under bushes along washes and along sandy–gravelly washes and bajadas and less often rocky slopes from 1,000–4,000 ft (305–1219 m); flowers from February–May. **Notes:** Delicate foliage and bright–blue flowers are indicative of this species, plants often disappearing quickly along with soil moisture. **Ethnobotany:** Leaves were steamed and eaten as greens by Kawaiisu. **Etymology:** Phacelia from Greek phacelo– for bundle, distans means separated, apart, widely–spaced in reference to the long, exserted stamens. **Synonyms:** *Phacelia cinerea, P. distans* var. *australis*

Plagiobothrys arizonicus

lipstick weed, Arizona popcornflower

General: Annual herb with 1 to several stems from base, these usually simple, erect, ascending or slightly decumbent, 10–30 cm long, hispid herbage with slender spreading hairs 1–2.5 mm long; sparsely puberulent with tangled, mostly appressed, delicate hairs among bases of spreading hairs, stems, roots, and leaves, particularly midribs, which are distinctively purplish–red. **Leaves:** Lanceolate to linear-oblanceolate, 1.5–5 mm broad, 1–6 cm long, basal ones gradually narrowed to slender base, acute to obtuse at apex, strigose and with some spreading hairs, not noticeably pustulate. **Flowers:** Spikes compact at anthesis, elongated and lax in fruit, to 15 cm long, naked or few bracteate toward base; calyx lobes ovate, distinct about one–half way to base, densely tawny–hirsute; calyx 3–4 mm long in fruit, at length circumscissile, lobes equal; corolla 2 mm long, 1.5–2 mm broad, white. **Fruits:** Nutlets usually 2, sometimes fewer, ovoid, short–acute, 1.5–2 mm long, transversely rugulose, reticulate dorsal and lateral keels. **Ecology:** Found on arid sandy hillsides and plains below 5,000 ft (1524 m); flowers February–May. **Notes:** Lipstick red leaf midribs and margins are tell–tale for this species. **Ethnobotany:** Red coating on outside leaves and lower stems used as a red pigment to paint the body and face. **Etymology:** Plagiobothrys is derived from Greek plagios, oblique or placed sideways, and bothros, a pit or scar, arizonicus is named for Arizona. **Synonyms:** None

Impact risk level H M L

Brassica tournefortii

Asian mustard, wild turnip

General: Introduced exotic, coarse winter annual with well–developed taproot, stems simple to many–branched above, flowering branches spreading, 30–120 cm; lower part of plant hirsute with coarse, rough white hairs, especially lower leaf surfaces, veins and margins. **Leaves:** Basal rosette 15–30 cm, petioled, pinnatifid with the terminal lobe usually largest, or leaves of stunted plants often obovate and merely toothed; stem leaves reduced upwards. **Flowers:** Sepals 3.5–4 mm, pale, almost translucent, drab purple–brown, slightly swollen basally; petals, stamens, and stigma pale yellow; petals 6–8 mm, corolla bilaterally symmetrical. **Fruits:** Silique on pedicel 12–16 mm, spreading; silique linear, terete, 2.1–2.4 mm wide, 3.7–6 cm long with well–developed beak 11–14 mm; finely netted inside. **Ecology:** Found in open, sandy soils, waste ground and disturbed sites below 3,000 ft (914 m); flowers January–June. **Notes:** One of the most widespread exotics in the region. Think daikon radish in appearance, only with a much smaller root. **Ethnobotany:** Unknown **Etymology:** Brassica is the Latin name for cabbage, tournefortii is named for Joseph Pitton de Tournefort (1656–1708). **Synonyms:** *Brassica tournefortii* var. *sisymbrioides*

Descurainia pinnata

western tansymustard

General: Native annual herb; stems 10–70 cm tall, usually branched, sparsely to densely pubescent. **Leaves:** Lower leaves mostly bipinnate and upper leaves pinnate; leaflets usually pinnatifid, pubescent like the stem. **Flowers:** Racemes terminal; flowers with pedicels 3–20 mm long, spreading; petals 2–3 mm long, white to yellow. **Fruits:** Siliques 4–20 mm long, more or less club–shaped; seeds numerous, in two rows. **Ecology:** Found on a variety of soils and conditions from 3,000–7,000 ft (914–2134 m); flowers April–August. **Notes:** Distinguished from other *Descurainia* by some of the siliques (at least) having seeds in two rows (vs. in one row in *D. sophia*) and the lower leaves bipinnate (vs. once pinnate in *D. obtusa*). Toxic to livestock, although lightly consumed by mule deer in winter and spring. Rodents and lagomorphs graze on it, while it is larval food for several butterflies. Host plant for spring white, checkered white, pearly marble, and Sara orangetip butterflies. **Ethnobotany:** Edible greens and seeds. Tansy mustard appears in clan names and migration tales as an important plant. **Etymology:** Named for French physician Franscois Descourain. Pinnat means feathered or winged. **Synonyms:** None

H M L Impact risk level

Descurainia sophia

herb sophia

General: Exotic annual herb, naturalized from Europe; stems 25–75 cm tall, branched, stellate pubescent. **Leaves:** Leaves 2 or 3 times pinnate, 2–9 cm long, the ultimate divisions linear. **Flowers:** Racemes terminal; flowers with pedicels 8–15 mm long; sepals 2 mm long; petals greenish–yellow, about as long as the sepals. **Fruits:** Siliques linear, 1–3 cm long, often curved, loosely ascending; seeds numerous, 10–20 in each locule. **Ecology:** Found on open and disturbed ground from 3,000–7,500 ft (914–2285 m); flowers April–June. **Notes:** Distinguished from other *Descurainia* by some of the siliques (at least) having seeds in one row (vs. in two rows in *D. pinnata*); leaves bipinnate to tripinnate; siliques larger (10–30 mm long). Species is often found in dry and disturbed areas. Species may be dominant on sites due to large seed crops. This attribute may increase browse potential. Species is rapidly killed by fire but will re–establish quickly due to large seed crops. Toxic to livestock, and is larval food for several butterflies. Host plant for checkered White and Becker's White butterflies. **Ethnobotany:** Edible greens and seeds. Tansy mustard appears in clan names and migration tales as an important plant. **Etymology:** Commemorating Francois Descourain, famous French physician. Sophia translates to wisdom. **Synonyms:** *Sophia sophia*, *Sisysibrium sophia*

Lepidium lasiocarpum

shaggyfruit pepperweed

General: Annual from 5–20 cm, larger plants much–branched, herbage with simple, spreading, white, rather thick hairs less than 0.4 mm. **Leaves**: Alternate, basal rosette 2.5–6 cm, oblanceolate leaves, quickly withering as stems develop; stem leaves smaller, oblanceolate, variable, withering as plant matures. **Flowers**: Racemes 2–10 cm, numerous and often crowded on larger plants, pedicels conspicuously flattened, glabrous or pubescent; flowers bisexual, sepals 4, less than 1 mm, wide margins, petals white, 6 stamens, superior ovary, quickly deciduous. **Fruits**: Orbicular and flattened, 2–celled pod, 2–3 mm across, with tiny notch at apex, gelatinous when wetted. **Ecology**: Found on playas, washes, arroyos, beaches, saline soils, roadsides and other disturbed areas below 6,500 ft (1981 m); flowers February–May. **Ethnobotany**: Plant used as a disinfectant, seeds were gathered and ground, parched, eaten in a variety of ways. **Etymology**: Lepidium is from Greek lepidion, meaning little scale, a reference to the shape of the fruits, lasiocarpum means having woolly seeds or fruits. **Synonyms**: None

Physaria gordonii

Gordon's bladderpod

General: Densely stellate-canescent annual with several to many decumbent stems 10–30 cm long. **Leaves:** Basal leaves narrowly oblanceolate to spatulate, entire to slightly repand (rarely lyrate), 1.5–3.5 cm long, acute at apex, gradually narrows to slender petiole nearly equal to blade; numerous cauline leaves, 1–3 cm long, linear to narrowly oblanceolate, entire or faintly wavy. **Flowers:** Racemes compact in flower, elongating later; stout pedicels, slightly recurved, 7–10 mm long; petals yellow, narrowly obovate, claw slightly dialated basally. **Fruits:** Pod globose and glabrous, 3.5–4 mm diameter on a tip 0.5–0.8 mm long. **Ecology:** Found on sandy plains, mountain slopes and mesas below 5,000 ft (1524 m); flowers February–June. **Notes:** This is widespread in the desert and some years has truly remarkable blooms. **Ethnobotany:** Unknown for this species, however, other species have wide medicinal and ceremonial uses. **Etymology:** Lesquerella is named for Leo Lesquereaux (1805–1889) an American botanist, and gordonii is named for Alexander Gordon (c. 1795?) an English horticulturalist and nurseryman. **Synonyms:** None

Physaria tenella

Moapa bladderpod

General: Annual, sparsely to densely stellate pubescent with some simple hairs, finely glandular; stems slender 15–60 cm tall, decumbent to erect, often branched in larger plants; clambers through small shrubs. **Leaves:** Narrowly elliptic to obovate, entire to wavy, or shallowly or sometimes coarsely toothed; other stems leaves elliptic to linear, entire and sessile above. **Flowers:** Racemes 9–20 cm, flowers widely spaced, bright yellow, showy, 9–10 mm wide; petals 8–10 mm. **Fruits:** Fruiting pedicels S-shaped, often 15–18 mm; globose fruit 3.5–4.8 mm wide. **Ecology:** Found on sandy and rocky soils in washes and on slopes below 4,000 ft (1219 m); flowers February–March. **Notes:** *L. tenella* is told apart from *L. gordonii* by the stellate hairs of the ovary and fruits, and by the margined seeds. **Ethnobotany:** Unknown **Etymology:** Lesquerella is named for Leo Lesquereaux (1805–1889), an American botanist, while tenella is Latin for quite delicate, dainty. **Synonyms:** *Physaria tenella*

H M L Impact risk level

Sisymbrium irio

London rocket

General: Erect annual, strict or branching from above base, glabrous or sparsely pubescent on part of herbage and pedicels. **Leaves:** Petioled, pinnatifid, larger ones 7–20 cm, blades thin. **Flowers:** Flowering stems usually branched, sepals green, petals, filaments, and anthers yellow; petals 3–4 mm, slender, spreading pedicels 5–14 mm. **Fruits:** Siliques linear, slender, 0.5–0.6 or rarely 1 mm in diameter, 2–5 cm long, curving upward. **Ecology:** Fairly widespread weed of all disturbed areas below 4,500 ft (1372 m); flowers February–May.

Notes: Introduced from Europe, this is an abundant weed. **Ethnobotany:** Used by the Pima as food, as seeds were parched and made into pinole, while leaves were eaten raw and boiled or fried. **Etymology:** Sisymbrium is from a Greek name for some plants of the mustard family, irio is a reference to an old kind of cress. **Synonyms:** *Norta irio*

Cucurbita digitata

fingerleaf gourd

General: Perennial prostrate vine with deep root, slender branches distantly run, but rarely climb; slender stems, glabrous, ribbed, whitish–pustulate with flat oval trichomes on anges, tendrils shot–petiolate, 3–5 parted, branches gland tipped. **Leaves:** Leaves 5–cleft nearly to base of blade, lobes 4–10 cm long, linear–lanceolate to linear–oblanceolate, variably sublobed, green, bearing conic trichomes above and below, sometimes paler below; stout petioles, ribbed, shorter than lobes, muricate and hispid. **Flowers:** Calyx cylindric to narrowly campanulate, 4–6 cm long, sparsely hispid, tube 2.5–3 cm long, lobes subulate, 3–5 mm long, corolla sparsely hispid, bright yellow. **Fruits:** Globose, vivid dark green with 10 narrow stripes and variably speckled. **Ecology:** Found mostly in sandy alluvial soil of washes and valleys or on dry plains and mesas below 5,000 ft (1524 m); flowers June–October. **Notes:** Smell it, if it smells terrible you'll know it is the coyote gourd (*Cucurbita foetidissima*), rather than this species. **Ethnobotany:** The Gila Pima roasted the seeds and ate them. **Etymology:** Cucurbita is the Latin name for gourd, digitata means lobed like fingers. **Synonyms:** None

Euphorbia albomarginata

whitemargin sandmat

General: Perennial herb with glabrous and often glaucous herbage; stems prostrate and freely branched, sometimes creeping below ground and rooting at the nodes, 5–40 cm long; mat forming. **Leaves:** Leaf blades orbicular to oblong, entire, 3–8 mm long; stipules united into a membranous, white scale with entire or lacerate margins. **Flowers:** Cyathia solitary at the nodes, with 1 female and 15–30 male flowers; glands oblong, dark brown, 0.5–1 mm long, petaloid appendages consipicuous, white, entire or subcrenate. **Fruits:** Capsule ovoid, 2 mm long, acutely angled and glabrous; seeds 4–sided, oblong, whitish, 1–2 mm long. **Ecology:** Open, sandy or gravelly dry places up through the pinon–juniper zone from 1,000–7,000 ft (305–2134 m); flowers April–September. **Notes:** Distinctively marked from other species in our range by the prominent interpetiolar stipules. **Ethnobotany:** Diegueno brew plant into tea to treat sores. Shoshoni and Kawaitsu use leaves and flowers for snakebite. Keres treat eye problems by rub from plant. Navajo use slow tea from whole plant for colds or stomachaches. **Etymology:** Euphorbia is named for Euphorbus, which derives from eu, good, and phorbe, meaning well–fed, while albomarginata refers to white margins. **Synonyms:** *Chamaesyce albomarginata*

Euphorbia capitellata

head sandmat

General: Perennial with ascending to erect, slender stems 3–40 cm long, 0.5–1.5 mm diameter; from slender woody taproot; herbage puberulent to glabrous. **Leaves:** Ovate to linear-lanceolate, 4–25 mm long, puberulent to glabrous, gray–green, markedly asymmetrical basally, acute to obtuse at apex, serrate along lower margin, entire on upper, less commonly alike on both margins. **Flowers:** Cyathia rarely solitary, usually in cymose glomerules, peduncles 0.5–3 mm long, involucres campanulate to obconic, 1.3–1.7 mm in diameter, hairy on inside of narrowly triangular lobes, these exceeding glands; glands orbicular to transversely oval, 0.2–0.5 mm wide, stipitate; appendages entire, white or pinkish. **Fruits:** Capsule 1.3–1.9 mm long, seeds quadrangular in cross section, ovate vertically; back wrinkled with small irregular, transverse depressions. **Ecology:** Found on hillsides, in washes and on dry sites from 1,500–5,000 ft (457–1524 m); flowers March–October. **Notes:** The ovate leaves with only half–serrate margins and more or less puberulent to villous capsules help to identify this species. **Ethnobotany:** Unknown, but other species in the genera have multiple uses. **Etymology:** Euphorbia is named for Euphorbus, which derives from eu, good, and phorbe, meaning well–fed, while capitellata means having a small head. **Synonyms:** *Chamaesyce pycnanthema, Chamaesyce capitellata, Euphorbia pycnanthema*

Euphorbia micromera

Sonoran sandmat

General: Prostrate, glabrous to puberulent annual with stems 2–25 cm long and internodes extremely variable in length. **Leaves:** Petioles 0.5 mm slender, leaf blades 1.5–7 mm long, ovate to oblong, base oblique in larger leaves, rounded in smaller ones, glabrous to sparsely puberulent, margins entire. **Flowers:** Pubescent to glabrate peduncles 1.2 mm long; campanulate involucres, slightly constricted above, about 1 mm long, crispate-hirsutulous without, or less commonly glabrous, lobes minute, deltoid, about equaling glands; glands 0.12–0.25 mm wide, dotlike, rounded or sometimes oval, maroon, without appendages; rarely appendages represented by minute white margin. **Fruits:** Globular capsule, 3–angled, 1.2–1.4 mm long, puberulent to glabrous. **Ecology:** Found on flats, washes, bajadas, and hillsides from 500–5,000 ft (152–1524 m); flowers throughout the year. **Notes:** Very similar to *E. polycarpa*, consult more detailed flora if uncertain. *E. polycarpa* is found in more specifically desert habitats. **Ethnobotany:** Unknown for this species, other species in genera have medicinal use. **Etymology:** Euphorbia is named for Euphorbus, which derives from eu, good, and phorbe, meaning well–fed, while micromera means having a small number of parts. **Synonyms:** *Chamaesyce micromera*

Euphorbia polycarpa

smallseed sandmat

General: Prostrate or erect perennial herb from slender woody taproot, herbage and capsules glabrous or hairy; much branched to 25 cm tall. **Leaves:** Orbicular to lance–oblong, oblique at base, 1–10 mm long petioles 1–2 mm long; stipules deltoid, 0.3–0.5 mm long, ventral ones united, usually ciliate–margined. **Flowers:** Involucres campanulate, 1–1.5 mm wide, lobes narrowly to attenuately deltoid, about equaling the narrow, transversely oblong glands, dark maroon, latter 0.5–0.7 mm long, conspicuous appendages present, white to reddish, equaling or slightly exceeding glands, entire to crentate; bracteoles opposite each gland; staminate flowers 15–32 in each cyathium. **Fruits:** Seeds 0.8–1 mm, fairly smooth but dull. **Ecology:** Found on desert slopes and washes from 500–3,000 ft (152–914 m); flowers year round. **Notes:** Stems markedly zig–zag. **Ethnobotany:** Poultice of the plant is applied to scorpion and snake bites, roots chewed to promote vomit and loosen bowels for stomach trouble. **Etymology:** Euphorbia is named for Euphorbus, which derives from eu, good, and phorbe, meaning well–fed, polycarpa means having many seeds or fruit. **Synonyms:** *Chamaesyce polycarpa* var. *hirtella*, *Euphorbia polycarpa*, *E. polycarpa* var. *hirtella*

Acmispon humistratus

foothill deervetch

General: Annual forb with erect, ascending, or decumbent stems 0.5–20 cm long, whole plant is densely villous with white to slightly tawny, soft hairs. **Leaves:** Petioles short, rarely over 5 mm long, rachises of leaves flattened, 5–8 mm long, leaflets 3–5, broadly elliptic to obovate, 2–6 mm wide, 4–15 mm long, cuneate at base, acute to rounded at apex. **Flowers:** Subsessile, solitary or in paris in axils of leaves, calyx tube 2–2.5 mm long, yellow tinged with red or rose. **Fruits:** Pods 2–3 mm wide, 5–10 mm long densely villous. **Ecology:** Found on dry gravelly slopes and sandy flats from 5,000 ft (1524 m) and below; flowers March–June. **Notes:** Notable for its low ground loving habit and its tiny flowers. Recent stuides place *Lotus* in *Acmispon* (Brouillet, 2008), but for ease we refrain from that designation here. **Ethnobotany:** Infusion of plant taken and used as a wash by women in labor by Karok (CA). **Etymology:** Lotus from the Greek and originally applied to a fruit said to make those who tasted it forget their homes, while humistratus means low layer. **Synonyms:** *Lotus humistratus, Hosackia brachycarpa*

Acmispon strigosus

strigose bird's foot trefoil

General: Prostrate or decumbent annual with several spreading branches 5–35 cm long, sparsely strigose but only youngest parts cinereous; stems essentially glabrate or nearly so. **Leaves:** Rachis of leaves 3–8 mm long, leaflets 5–7 or rarely only 3, broadly obovate, cuneate at base, retuse or truncate–rounded at apex, 1–5 mm wide, 3–10 mm long. **Flowers:** Peduncles slender, equaling or slightly exceeding leaves, 1–2 flowered; bracts unifoliolate or reduced to a gland; calyx tube narrowly campanulate, 1.5–2.5 mm long, teeth triangular–subulate to lanceolate, 1–2 mm long; corolla 4–5 mm long, yellow, tinged with rose or drying rose. **Fruits:** Pods 2–2.5 mm wide, 1–2 cm long, nearly straight or gently curved upward toward apex, strigose; seeds pale buff or light green or mottled with purplish brown. **Ecology:** Found on sandy or gravelly soil below 3,000 ft (914 m); flowers February–May. **Notes:** The thickish, slightly succulent leaves are one feature to pay attention to. Recent studies place *Lotus* in *Acmispon* (Brouillet, 2008), but for ease we refrain from that designation here. **Ethnobotany:** Used for greens. **Etymology:** Lotus is from the Greek and is originally applied to a fruit said to make those who tasted it forget their homes, strigosus means covered in straight, flat–lying hairs. **Synonyms:** *Lotus strigosus, Hosackia tomentella, Lotus intricatus, L. tomentellus*

Astragalus didymocarpus

dwarf white milkvetch

General: Annual, generally slender, minutely grayish strigose stems, prostrate to erect, 3–30 cm. **Leaves:** Leaflets 9–17, 2–14 mm each, linear to oblanceolate, tips notched; 0.8–7.5 cm. **Flowers:** Inflorescence head–like, flowers 5–30, less than 9 mm, erect or ascending. **Fruits:** Ascending, included in calyx, 2–4 mm, 2 mm wide, spheric, 2 lobed in cross-section; minutely strigose, rarely glabrous, coarsely wrinkled, drying stiffly papery. **Ecology:** Found on open sites, gravelly to sandy soils from 1,000–2,500 ft (305–762 m); flowers February–April. **Notes:** An inconspicuous plant, differentiated from all other *Astragalus* spp. by the hard sharp transverse ridges of the small pods. **Ethnobotany:** *Astragalus* spp. used medicinally for chest cough, colds. **Etymology:** Astragalus is from Greek astragalos meaning ankle bone and is an early name applied to the genus because of the shape of the seeds, didymocarpus means with fruit in pairs. **Synonyms:** None

Lupinus sparsiflorus

Coulter's lupine, Mohave lupine

General: Annual 20–40 cm, short-appressed and long spreading hairy stems. **Leaves:** Petiole 3–4 cm, leaflets 7–11, 15–30 mm, 2–4 mm wide, linear to oblanceoate, upper surface hairy at least near margins. **Flowers:** Spiraled raceme, 15–20 cm tall, sometimes appearing more or less wide, linear to oblanceoate, upper surface hairy at least near margins; flowers 10–12 mm, calyx 3–6 mm, lips equal, upper lip deeply lobed; petals generally blue, drying darker, banner spot whitish becoming magenta, lower margins of keel ciliate near claw. **Fruits:** Pods 1–2 cm, 5 mm wide, coarsely hairy. **Ecology:** Found in washes and in sandy areas below 4,500 ft (1372 m); flowers March–May. **Notes:** Common in spring with favorable rains, when vigorous they are semisucculent. **Ethnobotany:** No known uses. **Etymology:** Lupinus comes from Latin for wolf, sparsiflorus means sparsely flowered. **Synonyms:** None

H M L Impact risk level

Medicago polymorpha

burclover

General: Decumbent annual with numerous spreading branches to 80 cm long, glabrous stems and foliage, whitish stipules, asymmetrically ovate-lanceolate to 1 cm long, bearing several slender teeth 2–3 mm long. **Leaves:** Petioles 1–2 cm long, leaflets obovate to obcordate or suborbicular, 5–13 mm wide, 10–15 mm long, broadly cuneate to obtuse at base, dentate almost to base. **Flowers:** Peduncles 2–5 flowered, 2 cm long or less, calyx about 5 mm long, petals yellow, only slightly exceeding calyx. **Fruits:** Pods to 1 cm in diameter, tightly coiled into 2–3 spirals, reticulate on sides, margins keeled and keel armed on each side by a row of curved or hooked prickles 2–3 mm long. **Ecology:** Widely established, occasional in waste areas, old fields; flowers March–June. **Notes:** Introduced from Europe, widely naturalized at present. **Ethnobotany:** Seeds parched, ground to make mush; leaves eaten for forage. **Etymology:** Medicago derived from medike, or medick, the Greek name for alfalfa, while polymorpha means many forms, or variable. **Synonyms:** Numerous, see Tropicos

H M L Impact risk level

Melilotus indicus

annual yellow sweetclover

General: Erect annual to 1 m tall with glabrous herbage or leaves and inflorescences sparsely appressed–pubescent when young, stipules subulate or narrowly lanceolate, 3–8 mm long. **Leaves:** Slender petioles to 5 cm long, leaflets cuneate–oblong to obovate, 3–12 mm wide, 1–2.5 cm long, obtuse, rounded or truncate, denticulate. **Flowers:** Peduncles surpass subtending leaves, racemes numerous, 2–10 cm long, about 5 mm in diameter; flowers 2.5 mm long, calyx half as long, its teeth triangular, sparsely ciliolate, pealike, petals yellow. **Fruits:** Ovoid pods 2–2.5 mm long, reticulate, glabrous, usually 1–seeded. **Ecology:** Occasional along roadsides, ditches, in fields, and in disturbed areas; flowers April–September. **Notes:** Widespread introduced ruderal. **Ethnobotany:** Used as a bed bug repellant, as a strong laxative, and for games. **Etymology:** Melilotus is from Greek meli, honey and lotos, a leguminous plant, while indicus refers to India. **Synonyms:** *Melilotus indica*

Impact risk level H M L

Erodium cicutarium

redstem stork's bill

General: Annual herb; thought to be introduced from Europe, naturalized throughout U.S.; herbage glandular-villous; stems are erect initially becoming prostrate, few to several, often reddish with swollen nodes; slender taproot. **Leaves:** Pinnately and finely dissected; blade bipinnatifid (twice pinnately cleft), lance-shaped stipules. **Flowers:** Usually 2–5 flowered umbel, glandular-pubescent; rose–lavender, pink, or lilac petals; often spotted; mature stylar column exserted. **Fruits:** With beak of fruit 2.7–3.8 cm. **Ecology:** In disturbed, often dry places from 2,500–8,000 ft (762–2438 m); naturalized throughout the West and much of the U.S.; flowers February–July. **Notes:** Glandular-pubescent annuals of disturbed areas, 20–50 mm long stylar column, pink or lavender petals, finely dissected leaves. Told apart from *E. texanum* by its leaves which are simple and 3–lobed, plants are also without glands. Seasonal forage for rodents, desert tortoise, big game animals, and livestock. Seeds eaten by upland gamebirds, songbirds, and rodents. Plant is sensitive to pollution. Low intensity burns may allow plant survival. **Ethnobotany:** Costanoan make cold leaf tea to treat typhoid fever. Navajo use plant to disinfect and treat bobcat and mountain lion bites. Zuni make chewed leaf poultice for sores and rashes. Navajo also use it to treat excessive menstruation. **Etymology:** Erodium is Greek for heron, which comes from the bill–like fruit. Cicut means pertaining to hemlock. **Synonyms:** None

Erodium texanum

Texas stork's bill

General: Winter spring ephemeral, stems reaching 25 cm, but usually shorter and stemless. Herbage with small, coarse white hairs, not glandular. **Leaves:** Blades 9–21 mm, ovate to heart–shaped or rounded in outline, usually 3–lobed or parted, margins toothed, petioles 10–42 mm. **Flowers:** Umbels 2–3 flowered, petals pink to purple, readily falling, longer than the sepals; fruiting sepals 5.5–9 mm. **Fruits:** Beak of fruit 3.2–5 cm long. **Ecology:** Widespread, mostly at lower elevations on sandy or fine textured soils, sometimes among rocks from 1,000–5,000 ft (305–1524 m); flowers February–April. **Notes:** Common as *E. cicutarium*, but easily distinguishable by the flowers. **Ethnobotany:** Unknown **Etymology:** Erodium is Greek for heron, which comes from the bill–like fruit, texanum refers to Texas. **Synonyms:** None

Salvia columbariae

chia

General: Annual with one to several erect, naked, peduncle-like stems 10–60 cm tall. **Leaves:** Basal leaves, blades 5–15 cm long, 1–2 pinnatifid into toothed or irregularly incised divisions, cinereous-tomentose, petioles equal blade; 1–4 nodes above base also bearing somewhat reduced leaves, plant cinereous with short recurved hairs, purplish. **Flowers:** In capitate verticils 2–4 cm in diameter, subtended by suborbicular, green to purplish, awn tipped bracts 6–14 mm long, sparsely ciliate along margins; calyx 8–10 mm long, upper lip of oblique orifice about three times as long as lower; corolla blue, 10–13 mm long, upper lip erose-denticulate and shallowly cleft, erect. **Fruits:** Nutlets 2–2.22 mm long. **Ecology:** Found on sandy, gravelly, or rarely clay soil on slopes, common in sandy washes below 3,500 ft (1067 m); flowers March–July. **Notes:** Distinctive capitate verticils and blue flowers help to identify this plant. **Ethnobotany:** Poultice of seed used for infections, to cleanse eyes, for fevers, for irritation and inflammation; the seeds are edible, and can be used to make a beverage, to render water palatable by removing alkalines; also used for pinole and mush to eat. **Etymology:** Salvia comes from Latin salveo, or I am well, while columbariae is a reference to Columbian, or of western North America. **Synonyms:** None

Teucrium cubense ssp. *densum*

small coastal germander

General: Small annual, several stems 20–50 cm tall, branching, pubescent with white curly hairs. **Leaves:** Broadly lobed near base and to middle of stem, 3–5 lobed, nearly to midrib, upper leaves 3–parted, 1.5–3.5 cm long; irregularly and shallowly toothed toward apex. **Flowers:** Slender pedicels, sparsely pubescent 4–12 mm long; campanulate calyx 5–6 mm long, teeth lance–subulate, about equal; corolla 7–15 mm long, white often with purple lines or spots at base of lobes, pubescent without, tube 1–2 mm long, lower lip 5–8 mm long. **Fruits:** Nutlets 2.5 mm, high reticulately ridged and spreading–puberulent. **Ecology:** Found in sandy or silty soil along arroyos, washes or stream banks below 4,000 ft (1219 m); flowers March–May. **Ethnobotany:** No known uses. **Etymology:** Teucrium, perhaps from the Greek teukrion, for Teucer, an ancestor of the Trojans, while cubense means of or from Cuba. **Synonyms:** *Teucrium cubense* ssp. *depressum, T. depressum*

Mentzelia multiflora

Adonis blazingstar

General: Perennial to 80 cm tall, usually producing branches along the entire length. **Leaves:** Narrowly elliptic to lanceolate, occasionally oblanceolate, to 15 cm long, to 3 cm wide, sessile, margins toothed to lobed, sometimes pinnatifid, sometimes approaching entire in very narrow leaves; upper leaves commonly with broad, clasping bases and sometimes with clasping basal lobes. **Flowers:** Pedicellate, subtended by 0–2 linear-lanceolate entire or few–toothed to lobed bracts, these sometimes fused to ovary; petals yellow, rarely nearly white, 9–23 mm long, 3–10 mm wide, with trichomes at apex only; staminodia 5, occasionally more or fewer, slightly smaller than petals; outer several whorls of stamens with broadened filaments; style 10–14 mm long; stigmatic papillae forming a slight tuft. **Fruits:** Cylindric capsule, sometimes broadly so, mostly 10–20 mm long, sometimes shorter when depauperate. **Ecology:** Widespread, without specific soil preferences, commonly on sand or gravel bars from 100–7,500 ft (30–2286 m); flowers March–October. **Notes:** Considered to be a very plastic species, it is morphologically variable and often polymorphic. Hybridizes with other species in the genus. Two varieties exist in the region: var. *integra* and var. *multiflora*, if further clarity is necessary beyond the species level, it is advisable to collect a specimen to do so. **Ethnobotany:** Taken as a diuretic, as a tuberculosis remedy, an emetic, the seeds were eaten, as a ceremonial offering, a dermatological aid, a gastrointestinal aid, and as an eyewash. **Etymology:** Mentzelia named for Christian Mentzel (1622–1701), a 17th century German botanist, botanical author and physician, while multiflora means many–flowered. **Synonyms:** None, but two varieties have several

H M L Impact risk level

Malva parviflora

cheeseweed mallow

General: Introduced, trailing or ascending herb, slightly pubescent to glabrate. **Leaves:** Orbicular or reniform, 2–7 cm long, crenate, undulate, or 5–7 lobed. **Flowers:** 1–4 in leaf axils, short–pedicellate, calyx 3–4 mm long, accrescent to 7–8 mm in fruit, petals lavender or white, 4–5 mm long. **Fruits:** Nearly glabrous, mericarps around 10, rugose or wrinkled dorsally and winged at the angle between the dorsal and lateral walls. **Ecology:** Found on roadsides and in fields, disturbed ground and urban habitats from 1,000–7,000 ft (305–2134 m); flowers most of the year. **Notes:** Similar to the other weed species *Malva neglecta*, which is generally found at higher elevations, but can also be told apart by the pedicels being shorter than the calyx in *M. parviflora*, along with shorter petals, and fewer mericarps. **Ethnobotany:** Decoction of leaves used as a rinse for dandruff and to soften hair, used for enema and bath for babies with fevers, and for swelling, sores, or boils. **Etymology:** Malva is the Latin name for mallow taken from Greek malache, referring to the leaves; parviflora is from Greek parvus, small and flora, flower, hence small–flowered. **Synonyms:** None

Sphaeralcea ambigua

desert globemallow

General: Perennial subshrub, erect 50–100 cm tall, grayish pubescent. **Leaves:** Blades 15–50 mm, triangular, weakly three-lobed, green or yellowish green, three-veined, base wedge shaped, truncate, cordate, crenate and wavy margin. **Flowers:** Open long branched panicle, petals orange, 2–3 cm, white anthers. **Fruits:** Mericarps 9–13, less than 6 mm, 3.5 mm wide, truncate-cylindric, dehiscent. **Ecology:** Found on dry, rocky slopes, and along sandy washes below 3,500 ft (1067 m); flowers throughout the year. **Notes:** Most xerophytic of the *Sphaeralcea*, stems woody below and very numerous, one of the largest flowered species, with petals reaching 3 cm, and leaves extending along the stalk. **Ethnobotany:** Used medicinally for upset stomach, as an antirheumatic, as a cathartic, for colds, as birth control, for venereal diseases, as a poultice for swellings and sores, and as an eyewash. **Etymology:** Sphaeralcea is from Greek sphaira, a globe, and alcea, a related genus, while ambigua means doubtful, or of uncertain identity. **Synonyms:** None

Sphaeralcea coulteri

Coulter's globemallow

General: Slender annual, sprawling to erect, 5–60 cm; hairs few, long, soft, with well developed taproot. **Leaves:** Usually greenish, ovate to orbicular, 15–45 mm, wider than long, triangular or cordate, thin, lobes 3–5 coarsely toothed. **Flowers:** Generally raceme-like, flowers clustered in axils, tip generally leafy; pedicel longer than calyx, petals 8–15 mm, salmon–orange, anthers yellow. **Fruits:** Mericarps one seeded, about as long as wide, 2–2.7 mm, dehiscent section smaller than body. **Ecology:** Found on desert flats, in sandy or fine textured soils, and along arroyos below 2,500 ft (762 m); flowers January–May. **Notes:** One of the more common spring wildflowers, often carpeting large areas. **Ethnobotany:** Unknown for this species, many other uses for other plants in the genus. **Etymology:** Sphaeralcea is from Greek sphaira, a globe, and alcea, a related genus, while coulteri is named for Dr. Thomas coulter (1793–1843) an Irish botanist who was the first to collect in Arizona. **Synonyms:** None

Sphaeralcea emoryi

Emory's globemallow

General: Perennial, stems several, canescent, to 1 m or taller; stems erect to floppy and curving. **Leaves**: Leaves broadly ovate to ovate-oblong, somewhat cordate at base, angulate to 3–parted or 3–cleft, crenate or dentate on margins, 2–9 cm long. **Flowers:** Three or more per node, in many–flowered interrupted raceme, pedicels shorter than sepals; calyx 5–10 mm, densely stellate–tomentose, lobes acute to acuminate; petals grenadine–pink to pale red–orange, 10–20 mm long. **Fruits:** Mericarps 2–or–3 seeded, 2.7–4.3 mm, longer than wide, dehiscent section about as large as the body. **Ecology:** Found in sandy or loamy soil, sandy plains or waste places below 3,000 ft (914 m); flowers April–June. **Notes:** Big ovate leaves, 3–cleft, helps to identify this species. **Ethnobotany:** Taken as a decoction of root for diarrhea by Pima. **Etymology:** Sphaeralcea is from Greek sphaira, a globe, and alcea, a related genus, while emoryi is named for Maj. William Hemsley Emory (1811–1887) Director of the Mexican Boundary Survey. **Synonyms:** Many, see Tropicos

Sphaeralcea laxa

caliche globemallow

General: Perennial from a woody crown, stout taproot, stems erect to 1 m tall, densely stellate–tomentose with short–rayed, white hairs; stipules filiform, 35 mm long, caducuous. **Leaves:** On slender petioles 0.5–3 cm long, leaf blades ovate to deltoid, truncate to deeply cordate at base, acute to obtuse at apex, crentate to coarsely dentate, 8–50 mm long, nearly as wide, green above with stellate hairs mildly interlacing, paler beneath. **Flowers:** Inflorescence is lax, few flowered panicle, pedicels 2–5 mm long in flower, to 1.5 cm in fruit, densely tomentulose, calyx stellate-tomentulose; filiform bracteoles, 3–5 mm long, often dark red; petals grenadine, 10–18 mm long. **Fruits:** Truncate ovoid mericarp, 5–6 mm high, 5–9 mm wide; seeds 1–3, copiously puberulent. **Ecology:** Found on caliche soils in the open from 2,000–6,000 ft (610–1829 m); flowers March–November. **Notes:** Variable species, from thin, bright–green, shallowly lobed leaves to thick, whitish–tomentose, deeply dissected leaves; open, relatively few flowered inflorescence and dark–purple anthers are distinctive. **Ethnobotany:** Unknown, but others in the genus have many uses. **Etymology:** Sphaeralcea is from Greek sphaira, a globe, and alcea, a related genus, while laxa means growing loosely. **Synonyms:** None

Sphaeralcea orcuttii

Carrizo Creek globemallow

General: Erect annual or biennial to 120 cm tall, densely stellate–tomentulose with yellowish canescent, 12–20 rayed hairs; stipules lance–subulate, 5–7 mm long, caducous. **Leaves:** Stout petioles, 1–3 cm long, leaf blades deltoid–ovate, 2–4 cm wide, 3–6 cm long, shallowly three-lobed near base with rounded lobes, subcordate to truncate, irregularly crenulate on margins, rugose or nearly plane, moderately to densely stellate–tomentulose on both surfaces, canescent. **Flowers:** Inflorescence narrow, many flowered, glomerate thyrse or elongate lower branches racemose; pedicels 5 mm long, some subsessile, calyx densely stellate–puberulent, 4.5–6.5 mm long at anthesis; lobes ovate, acuminate, 3–4 mm long, petals orange to flame–scarlet, 8–12 mm long. **Fruits:** Hemispherical, usually 3 mm high, 4–6 mm in diameter prominently reticulate–fenestrate. **Ecology:** Found on sandy desert flats and rocky slopes below 1,000 ft (305 m); flowers March–May. **Notes:** Plant notable for being annual or biennial, with tall, wandlike stems and many small flowers. **Ethnobotany:** Unknown, but other species in this genus have many uses. **Etymology:** Sphaeralcea is from Greek sphaira, a globe, and alcea, a related genus, while orcuttii is named for Charles Russell Orcutt (1864–1929). **Synonyms:** None

Boerhavia coccinea

scarlet spiderling

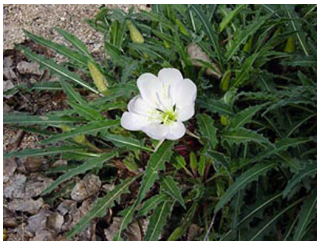
General: Decumbent or prostrate perennial, branching from base with many stout stems 30–140 cm long, viscid-pubescent and sometimes glandular–hirsute below, more or less glandular above, occasionally glabrate. **Leaves:** Opposite, 2–6 cm long, ovate–orbicular to oblong, rounded to acute at apex, green above, pale below, with a brown–punctate margin, glabrous to hirsute, often viscid. **Flowers:** Cymose, much branched, branches slender, glandular-pubescent, flowers in heads on slender peduncles, bracts minute, lanceolate; perianth purplish red, 2 mm long; stamens 1–3, barely exserted. **Fruits:** Obovoid, 2.5–3.5 mm long, densely glandular–puberulent with dark, blunt, usually gland–tipped hairs. **Ecology:** Found in sandy soil along drainages, washes, roadsides, disturbed areas below 7,000 ft (2134 m); flowers April–November. **Notes:** This plant tends to take over areas, so it is identifiable often by the large patches. **Ethnobotany:** Unknown **Etymology:** Boerhavia is for Hermann Boerhaave (1663–1738) a Dutch botanist, while coccinea means scarlet or bright, deep pink. **Synonyms:** None

Chylismia claviformis ssp. *peeblesii*

Peebles' browneyes

General: Small annual with stems several, erect or ascending, unbranched from base 15–50 cm tall; covered in translucent glandular hairs 0.1 mm, sparse to moderately dense, appressed; strigose new growth to glabrate older stems. **Leaves:** Thick, chiefly basal, simple and irregularly dentate to deeply pinnatifid; drying dark green or dark bluish green, 0.6–3 cm wide, 2–8 cm long; basal leaves often withering by time of flowering and fruiting. **Flowers:** Raceme to 25 cm long, only a few flowers open at a time, vespertine; sepals with caudate or apiculate tips project from end of sepal, or tips absent; petals white, pink with age, drying pale purple, obovate to nearly orbicular. **Fruits:** Capsule clavate over 2 mm in diameter, 12–30 mm long, curved, ascending; on pedicel 8–25 mm long. **Ecology:** Found in washes and open desert, especially in sandy soils below 3,500 ft (1067 m); flowers March–June. **Notes:** Type specimen collected near Casa Grande. **Ethnobotany:** Leaves were used as greens. **Etymology:** Chylismia is a new name and of uncertain orgin, while claviformis is from Latin for club–shaped, a reference to the capsules. **Synonyms:** ***Camissonia claviformis* ssp. *peeblesii***, *Oenothera claviformis* ssp. *peeblesii*, *O. claviformis* var. *peeblesii*

Oenothera caespitosa



tufted evening primrose

General: Taprooted perennial, acaulescent or nearly so, to 30 cm; becoming loosely colonial by spreading roots emerging from stout taproot; herbage mostly peuberulent or villous-hirsute especially on leaf margins, occasionally glabrous. **Leaves:** Long petiole, lanceolate to elliptic, crowded on the very short stem and forming a basal cluster, mostly 3–30 cm long, including petiole, 0.5–4 cm wide, variously entire to often dentate or raggedly pinnatifid. **Flowers:** Borne singly in axils, sessile or on a stout pedicel up to 3 cm long, mostly erect in bud, self–incompatible, nectariferous and sweet scented, adapted to pollination by hawkmoths, ephemeral, opening near or shortly after sunset and wilting the next day; 4 large sepals, mostly 2–4.5 cm long, reflexed at anthesis; 4 petals white, turning pink or pinkish to rose–purple in age or in drying, mostly 2–5 cm long. **Fruits:** Capsule more or less erect and forming clumps at the base of the plant, lance–ovoid or elliptic–ovoid to sub–cylindric, mostly 2.5–5 cm long and up to 1 cm thick; numerous seeds. **Ecology:** Found in a wide range of habitats from 3,000–7,500 ft (914–2286 m); flowers April–September. **Notes:** Acaulescent or almost so, tufted, leaves basal and long petioled, elliptic, toothed, margins densely pubescent, flowers large and white. Numerous subspecies found in the region, probably a good plant to collect. **Ethnobotany:** Used for healing, for ceremonies, as a gynecological aid, and for sores. **Etymology:** Oenothera is from Greek oinos, wine and thera, to imbibe, caespitosa means having a densely clumped, tufted or cushion–like growth form. **Synonyms:** None

Oenothera primiveris

desert evening–primrose

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General: Annual in basal rosette, nearly stemless or often developing stout leafy stems 10–20 cm; thick taproot; dense pubescence of spreading papillate–based white hairs. **Leaves:** Blades 5–27 cm, larger ones 3.5–7 cm wide, mostly pinnatifid into toothed or rounded lobes, narrowed to long, winged petiole expanded at very base. **Flowers:** Yellow, petals 3.5–5.5 cm, notched at apex; opening at dusk closing the following morning. **Fruits:** Ovary and capsule densely hairy with spreading white hairs; capsules 3–4.5 cm long by 6.5–7.5 mm wide at base, thick and woody, upright, straight, four-angled, tapering to conspicuously narrowed tip. **Ecology:** Found on sand flats, playas, gravelly–sandy washes, common but not very abundant below 4,500 ft (1372 m); flowers March–May. **Notes:** Plants are easy to know by their caespitose habit, yellow flowers and pinnatifid leaves. **Ethnobotany:** Dried flowers used for ceremonies and poultice applied to swellings. **Etymology:** Oenothera is from Greek oinos, wine and thera, to imbibe. **Synonyms:** None

Castilleja exserta

exserted Indian paintbrush

2009 NPS

General: Stems simple to diffusely branched from near base and closely ascending 10–40 cm tall, villous–pubescent. **Leaves:** Sessile 1–5 cm long, parted into few or many linear or filiform divisions 1–12 mm long or lower ones entire, linear, villous–pubescent with shining, white, spreading hairs. **Flowers:** Spikes 2–20 cm long, dense, bracts 10–20 mm long, central portion lanceolate, 2–4 pairs of linear or filiform divisions palmately or pectinate–ascendingly disposed, upper lobes crimson to purple, conspicuously pilose with shining white hairs at base; calyces 12–20 mm long, four-lobed to middle or slightly below, lobes resemble bracts in shape and color; corolla 12–30 mm long crimson, lower lip purple, crimson, pink, yellow or white, usually purple tipped with yellow, 3–5 mm wide, 3–7 mm long; bilabiate. **Fruits:** Ovoid capsule 8–15 mm long. **Ecology:** Found on grassy valley floors and hillsides from 1,500–4,500 ft (457–1372 m); flowers March–May. **Notes:** Sometimes this species can be found covering large areas. One subspecies found in our area, ssp. *exserta*. **Ethnobotany:** Unknown for this species, many other species have medicinal or food uses. **Etymology:** Castilleja is for the Spanish botanist Domingo Castillejo (1744–1793), while exserta means exserted or protruding out or beyond surrounding structure. **Synonyms:** *Orthocarpus purpurascens*

Argemone pleiacantha

southwestern pricklypoppy

General: Stems purplish, rather closely to sparingly prickly throughout. **Leaves:** Prickly mainly on vein, less so above, essentially smooth between the veins; lower and middle cauline leaves lobed one–half to five–sixths to the midrib, the lobes one to two times as wide, the margin angular at the apex, the sinuses and lobes subequal in width, uppermost leaves either not clasping or subclasping. **Flowers:** Buds subspherical to obovate; calyx with few to many perpendicular prickles per sepal, the sepal horn 6–10 mm long, flattened or angular in cross–section when fresh, the apical prickle usually flattened and indurated at its base; petals white, stamens 150 or more. **Fruits:** Ovate to elliptic capsule, sparsely to closely prickly. **Ecology:** Found on dry gravelly soil, foothills and mountain valleys from 2,500–7,500 ft (762–2286 m); flowers April. **Notes:** Two subspecies found in the region ssp. *pleiacantha* and ssp. *ambigua*, ssp. *pleiacantha* is much more prickly than ssp. *ambigua*. **Ethnobotany:** Unknown for this species, but many other uses for species in this genus. **Etymology:** Argemone from Greek argemos, a white spot (cataract) on the eye, what it was supposed to cure, pleiacantha is from Greek pleios, many, more than one and akantha, thorn. **Synonyms:** None

Corydalis curvisiliqua ssp. *occidentalis*

curvepod fumewort

General: Erect or prostrate forb, stems simple or branching from taproots from 2–35 cm tall. **Leaves:** Compound leaves, glacous blade with 3 orders of leaflets and lobes, ultimate lobes elliptic, 1.5 times or more longer than wide, margins incised. **Flowers:** Inflorescence not exceeding leaves; flowers 13–16 mm long, spurs 4–5 mm long, erect in bud, then spreading; pedicels 1–5 mm long, sepals 1–3 mm long, petals 14–18 mm long, yellow. **Fruits:** Capsule 12–20 mm long, usually cuved, erect; seeds with marginal rings. **Ecology:** Found on loose, often dry soil from 2,500–4,000 ft (762–1219 m); flowers April–June. **Notes:** Told apart by erect fruit with margin ring and inflorescence exceeding leaves. **Ethnobotany:** Used as a rheumatic remedy, for stomach and as a lotion for backache. **Etymology:** Corydalis is from Latin, corydalus for crested or tufted lark, while curvisiliqua is from curvi for curved, and siliqua, for the narrow many seeded capsule from the mustards. **Synonyms:** *Capnoides montanum, Corydalis aurea* ssp. *occidentalis, C. aurea* var. *occidentalis, C. montana*

Eschscholzia californica ssp. *mexicana*

California poppy

General: Annual with leaves forming rosette, stems mainly scapose. **Leaves:** Mainly 3–15 cm long, segments oblong, mostly 1 mm wide, faintly glaucous, glabrous, flabelliform dissected blade usually one–third as long as petiole or less. **Flowers:** Calyptra broadly ovoid–undulate, mostly 1 mm wide or less, petals flabelliform–obovate 1.5–3.5 cm long, yellow to deep orange or rarely white tinged with pink. **Fruits:** Capsule 4–6 cm long, longitudinally ridged, the grooves glaucous. **Ecology:** Found on sandy or gravelly soil, widespread below 4,500 ft (1372 m); flowers February–May. **Notes:** Closely related to *E. californica* but it is smaller, more scapose, probably always annual plant and in having a narrower, sometimes nearly obsolete, outer rim of the hypanthium. **Ethnobotany:** Unknown for this species, other species in the genera widely used medicinally. **Etymology:** Eschscholzia is named for Dr. Johan Friedrich Gustav von Eschscholtz (1793–1831) a Latvian or Estonian surgeon and botanist, while californica refers to California, and mexicana refers to Mexico. **Synonyms:** *Eschscholzia californica*

Plantago ovata

desert Indianwheat

General: Highly variable annual to 40 cm tall, with well developed, slender taproot; herbage, stems, densely pubescent with loose woolly and silky silvery–white hairs. **Leaves:** Usually no distinct petiole, blades linear to linear–lanceolate, 1.5–15 cm long, 0.2–0.9 cm wide, attenuate at base, acute at apex, sparsely to densely villous, obscurely three–veined, margins entire. **Flowers:** Peduncle 1.5–29 cm long, villous, with hairs spreading at right angles from stem; spike 0.5–5.5 cm long; bracts broadly ovate, 1.6–3 mm long, broadly scarious–margined; midvein densely villous; corolla lobes spreading or reflexed, broadly ovate, 1.8–2.4 mm long, membranous–papery and brown. **Fruits:** Capsule breaking at or slightly below middle. **Ecology:** Found in wide ranging habitats in desert, ubiquitous from 200–6,500 ft (61–1981 m); flowers from March–May. **Notes:** Can be confused with *P. patagonica* by virtue of their both being common desert annuals with similar looking leaves, but they can be separated by size and shape of floral bracts. 1.6–3 mm long and broadly ovate in *P. ovata* vs. 2–16 mm long and linear triangular to subulate. **Ethnobotany:** Taken for diarrhea, used as fodder, and the seeds were eaten. **Etymology:** Plantago translates to foot–sole in reference to leaf habit on ground, ovata refers to the ovate leaves. **Synonyms:** Many, see Tropicos

Eriastrum diffusum

miniature woollystar

General: Annual 3–35 cm tall, erect and simple to diffusely branching. **Leaves:** Subglabrous to sparsely woolly, entire or with 1–2 pairs of lobes near the base of the rachis, 1–3 cm long. **Flowers:** Calyx 6–7 mm long, corolla actinomorphic, narrowly funnelform to slightly zygomorphic, throat white to yellow, lobes white to pale blue or bluish lavender, tube and throat 4–7 mm long, slightly longer that the calyx tube, lobes 3–5 mm long, stamens inserted on throat near sinuses, less than corolla lobes, filaments unequal in length, pistil 5–7 mm long. **Fruits:** Capsule 2–4 mm long **Ecology:** Found in open sites, desert shrublands, sagebrush, and piñon–juniper woodland from 500–5,500 ft (457–1676 m); flowers February–June. **Notes:** Distinguished by its shorter corolla lobes. **Ethnobotany:** Unknown for this species, others in genera have medicinal use. **Etymology:** Eriastrum is form Green erion, for wool and astrum, star, meaning woolly with starlike flowers, while diffusum means diffuse. **Synonyms:** *Eriastrum diffusum* ssp. *jonesii*

Gilia scopulorum

rock gilia

General: Erect annual, 10–30 cm tall, stems simple to paniculately branched from base, pubescent with straight, translucent hairs, often gland–tipped, becoming shorter and more glandular in inflorescence. **Leaves:** Lower 3–9 cm, 5–20 mm broad, coarsely toothed or incised or pinnately divided, lobes pinnatifid, ultimate divisions often acute, pubescence same as on stems; upper sessile, shorter, fewer divisions, uppermost 2–5 mm, three toothed. **Flowers:** Paniculately branched with many flowers borne singly on glandular pedicels of variable lengths, longer than 1 cm; glandular calyx, 3–4.3 mm long, enlarging with maturing capsule, calyx lobes needle–shaped, half as long as calyx tube; funnelform corolla 10–14.5 mm long, tube white, yellow or pale violet, narrow 1.4–3.4 mm long. **Fruits:** Ovoid capsule, subglobular, 4.5–5.5 mm long, dehiscent from top to bottom between 3 valves. **Ecology:** Found along desert washes and on dry, rocky slopes below 2,500 ft (762 m); flowers March–May. **Notes:** The pubescence of the plant, along with the length of the corolla tube can assist in the identification of this species. **Ethnobotany:** Unknown, but other species in genera have many uses. **Etymology:** Gilia is named for Filippo Luigi Gilii (1756–1821) an Italian naturalist, while scopulorum means growing on cliffs. **Synonyms:** None

Impact risk level H M L

Polygonum argyrocoleon

silversheath knotweed

General: Erect annual 10–60 cm high with simple or moderately branched, finely striate stems. **Leaves:** Elliptic-lanceolate to oblong, or oblanceolate, 5–20 mm long, 1.5–5 mm wide, acute or rarely obtuse, cuneate at base, glabrous. Stipule sheath 3–6 mm long, lacerate, hyaline to faintly rosaceous. **Flowers:** In 1–6–flowered axillary fascicles, pedicels 1–4 mm long, calyx 1.5–2 mm long, oblong, greenish with white or pinkish margins, erect, surpassed by achene, 8 stamens, 3 style branches. **Fruits:** Trigonous achene, 2.2–2.5 mm long, minutely granular-striate, dark brown, dull. **Ecology:** Found on roadsides and in disturbed habitats from 100–3,500 ft (30–1067 m); flowers April–October. **Notes:** Plant resembles *P. ramosissimum* but the inflorescences are more spicate. Naturalized from central Asia. **Ethnobotany:** Seeds were parched, ground, and eaten by the Cocopa. **Etymology:** Polygonum is derived from Greek polys, many, and gonu, knee or joint, while argyrocoleon means silvery and is from the Greek work koleos meaning sheath. **Synonyms:** None

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Polygonum aviculare

prostrate knotweed

General: Introduced prostrate or decumbent annual (rarely biennial) with blue–green, striate, wiry stems 10–50 cm long. **Leaves:** Lanceolate, oblong, or oblanceolate, 5–20 mm long, 1.5–5 mm wide, acute or rarely obtuse, cuneate at base, glabrous; stipule sheath 3–6 mm long, more or less lacerate, faintly rosaceous. **Flowers:** In axillary fascicles with 1–6 flowers, on pedicels 1–4 mm long, calyx lobes 1.5–2 mm long, oblong, greenish with white or pinkish margins, erect, surpassed by tip of achene. **Fruits:** Achene trigonous, 2.2–2.6 mm long, minutely granular–striate, dark brown. **Ecology:** Found in disturbed areas from 1,000–8,000 ft (305–2438 m); flowers April–October. **Ethnobotany:** Ingested for painful urination, for pain, diarrhea, for swollen parts, and to prevent abortion. **Etymology:** Polygonum is derived from Greek polys, many, and gonu, knee or goint, aviculare means relating to small birds. **Synonyms:** *Polygonum aviculare* var. *vegetum, P. heterophyllum, P. monspeliense*

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Delphinium parishii

2009 NPS/Beth Fallon

desert larkspur

General: Perennial with erect stems, 1–several, 30–60 cm, base reddish sometimes, glabrous and glaucous or minutely and sparsely puberulent, arising from a woody rootstock. **Leaves:** Scattered on lower third of stem, blades pentagonal, 3–5 parted, 3–5 cm broad, divisions narrowly to broadly cuneate, toothed or again cleft into narrow often linear lobes, usually glabrous but sometimes sparsely puberulent. **Flowers:** Racemes 10–40 flowered, cylindric, ascending pedicels 1–2 cm long, sepals dark blue to pale lavender, pink or white, 6–10 mm long, finely puberulent without, lateral sepals reflexed or spreading; spurs decurved, ascending about 20–45 degrees above the horizontal, 7–15 mm long; lower petal blades elevated, exposing stamens, blue or white to pink, usually matching sepal color, 3–6 mm, with clefts 1–3 mm; hairs near base of cleft, centered, or on inner lobes, white. **Fruits:** Follicles 9–21 mm long, 2–4 times longer than wide, glabrous to puberulent. **Ecology:** Found on rocky hillsides or along washes below 12,000 ft (3658 m); flowers April–June. **Notes:** One subspecies in Arizona, ssp. *parishii*. Told apart by the reflexed lateral sepals, which are bright to more or less sky blue. This is the most xerophytic of the larkspurs in North America. **Ethnobotany:** Unknown, but other species in the genera have uses. **Etymology:** Delphinium is Discorides' name for dolphin–head, while parishii is named for the brothers Samuel Bonsall Parish (1838–1928) and William Fletcher Parish (1840–1918) both botanical collectors who lived in San Bernadino, California. **Synonyms:** None, but for ssp. *parishii: Delphinium amabile, D. amabile* ssp. *apachense, D. amabile* ssp. *clarianum, D. apachense*

Delphinium scaposum

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tall mountain larkspur

General: Native perennial; stems leafless; 20–50 cm tall; glabrous. **Leaves:** Leaves mostly basal, occasional reduced stem leaves; 3–5 divisions; divisions lobed; 2–3 cm wide. **Flowers:** Raceme 5–15 flowers; sepals 5, petal–like, 10–15mm, blue; petals 4 in 2 unequal pairs, white; spur as long as sepals, bronze tipped. **Fruits:** Follicles 10–20 mm long, glabrous; seeds dark brown. **Ecology:** Exposed rocky areas from 1,500–8,500 ft (460–2590m); flowers March–June. **Notes:** Distinguished from other *Delphinium* by more or less leafless stems and flowers with blue sepals and white petals. **Ethnobotany:** Hopi use as emetic in Po–wa–mu ceremony. Also used as after birth wash. Navajo make blue dye from flower. **Etymology:** Delphinium is Discorides' name for dolphin–head. Scaposum is ancient word referring to leafless stems. **Synonyms:** *D. andersonii* var. *scaposum*

Oligomeris linifolia

lineleaf whitepuff

General: Erect and strictly or profusely branched from base, 5–40 cm tall. **Leaves:** Linear, 1–3.5 cm long, in fascicles, fleshy, glaucous or green. **Flowers:** Densely flowered spikes, bracted, 1–10 cm long, terminal; greenish flowers 1–1.5 mm, petals white or greenish white, 1 mm long, oblanceolate or oblong, entire or faintly lobed. **Fruits:** Capsule four-lobed, four-beaked, 1.5–2 mm wide, broader than high. **Ecology:** Found on sandy, sometimes saline soil of desert flats and along margins of washes below 2,500 ft (762 m); flowers March–June. **Ethnobotany:** No known uses. **Etymology:** Oligomeris is from Greek oligos, a few and meris, part or parts, while linifolia means linear–leaved. **Synonyms:** None

Phoradendron californicum

mesquite mistletoe

General: Branches arching to drooping, often forming much branched masses in desert trees, especially legumes. Stems terete, at first silvery–green pubescent with minute, appressed scalelike hairs, soon glabrous and green to reddish green. **Leaves:** Closely appressed to stem, 1–2.5 mm, at first green or yellow–green and quickly drying as persistent scales or remaining green only at base. **Flowers:** Dioecious or occasionally monoecious. Fragrant, calyx thick, fleshy, and yellow–green. Anthers short and yellow. **Fruits:** Globose, 4.5–5.5 mm when fresh, the fresh pulp viscid and translucent white, salmon colored on exposed surfaces and whitish to yellow–white when not exposed to sunlight. Explosive dehiscence. **Ecology:** Found on host plants through southwest; flowers December–February. **Notes:** Flowering and fruiting non–seasonally, birds love this species and help to spread. **Ethnobotany:** Decoction of the berries was taken as purge by the Pima. It was used for washing sores, for stomachaches, boiled, dried and stored for food. **Etymology:** Phoradendron is from Greek phor, a thief and dendron, tree—hence tree thief because of its parasitism, while californicum refers to California. **Synonyms:** *Phoradendron californicum* var. *distans*, *P. californicum* var. *leucocarpum*

Nicotiana obtusifolia

desert tobacco

General: Erect, simple and branched biennial or perennial 20–90 cm tall, glandular–pubescent throughout. **Leaves:** Lower leaves petiolate, oblanceolate or spatulate, 1–4 cm wide, 5–15 cm long, tapering gradually to winged petiole; upper leaves lanceolate to oblong–ovate, sessile, auriculate. **Flowers:** Laxly paniculate–racemose, pedicels 5–10 mm long, calyx campanulate–ovoid, 3–4 mm wide, 7–10 mm long, teeth lance-triangular, 3–5 mm long, about equaling mature capsule; corolla white, tubular, 12–18 mm long, constricted at orifice, limb 8–10 mm broad. **Fruits:** Two-valved capsule, seeds dark reddish brown. **Ecology:** Found in sandy soil and along washes below 6,000 ft (1829 m); flowers year–round. **Notes:** The glandular hairs and beautiful long white corolla help to identify this plant. **Ethnobotany:** Used for cuts, bruises, earaches, as chew, smoked, used widely as a ceremonial, and for protection. **Etymology:** Nicotiana is named for Jean Nicot (1530–1600), the French ambassador to Portugal responsible for introducing tobacco to France in 1560, obtusifolia means obtuse or blunt leaved. **Synonyms:** *Nicotiana trigonophylla*

Physalis acutifolia

sharpleaf groundcherry

General: Erect or ascending annual 10–100 cm tall with strongly angled, much branched stems and sparingly pubescent to subglabrous foliage. **Leaves:** Slender petioles 1.5–5 cm long, lanceolate, 6–35 mm wide, 2.5–8 cm long, deeply sinuate-toothed, cuneate at base, acute, attenuate at apex, margins finely ciliate. **Flowers:** Pedicels 5–20 mm long, finely puberulent at anthesis, campanulate calyx, scarcely angular, 3–5 mm long with narrowly deltoid lobes, rotate corolla 12–20 mm diameter, whitish or light yellow with deeper yellow center; greenish anthers, linear, 3–4.5 mm long. **Fruits:** Ovoid globose berry 1.5–2.5 cm long. **Ecology:** Found on roadsides, fields, ditches from 100–4,000 ft (30–1219 m); flowers April–September. **Notes:** Smaller, low growing habit help identify this species. **Ethnobotany:** Fruit eaten primarily by children as a snack food by the Gila River Pima; eaten raw, cooked into sauces, preserves and jams, dried and stored as food. **Etymology:** Physalis from Greek physallis, a bladder or bubble, due to inflated calyx, while acutifolia means pointed leaves. **Synonyms:** *Physalis wrightii*

Impact risk level H M L

Tribulus terrestris

puncturevine

General: Prostrate annual herb with diffusely branching stems 10–80 cm long; herbage sparsely silky strigose throughout or upper surfaces of leaflets nearly glabrous; stipules subulate, 2–3 mm long. **Leaves:** Each 2–5 cm long, with 3–9 pairs of elliptic or oblong leaflets 3–13 mm long, oblique, acute to obtuse at apex; leaflets of the lower pair unequal in size. **Flowers:** Peduncles axillary to the shorter of the pair of leaves and exceeded by subtending leaf; sepals narrowly lance–ovate, 3–3.5 mm long, caducous; petals pale yellow, 4–5 mm long. **Fruits:** Exclusive of spines, 15–18 mm broad, breaking into 5 spiny nutlets, each with 2 larger spines, after separation the vicious tacklike nutlets land with the larger spines upward. **Ecology:** Introduced and abundant in cultivated areas, along roads, disturbed sites; flowers July–October. **Notes:** Introduced and weedy where established. **Ethnobotany:** Used by the Navajo as a ceremonial medicine. **Etymology:** Tribulus is Latin for three–pointed, a caltrop, while terrestris in Latin means on land. **Synonyms:** None

A

Abaxial: the side away from the axis
Acaulescent: stemless
Accumbent: a term referring to seeds in which the embryonic root is wrapped around and lies along the edges of the two cotylodons (compare **incumbent**)
Acerose: needle-shaped
Achene: a small, dry, one-seeded, indehiscent fruit (i.e. one that does not split open), deriving from a one-chambered ovary, typical of the Asteraceae
Acicular: needle-shaped, as applied to some kinds of foliage
Acorn: hard, dry, indehiscent with a single large seed and a cupule
Actinomorphic: radially symmetrical
Aculeate: pointed or prickly
Acuminate: tapering gradually to a pointed apex with more or less concave sides along the tip
Acute: tapering to a sharp-pointed apex with more or less straight sides along the tip
Acyclic: with the floral parts arranged spirally rather than in whorls
Adaxial: the side toward the axis
Adenophorous: gland-bearing
Adherent: two or more organs appearing to be fused but actually separable
Adnate: grown together, used only to describe unlike parts (compare **connate**)
Adventitious: occurring in unusual or unexpected locations such as roots on aerial stems or buds on leaves. Also meaning: out of the usual place, introduced but not yet naturalized
Aestivation: the arrangement of floral parts in a bud
Aggregate: densely clustered
Albumen: the nutritive tissue in a seed
Alkaline: soils that contain high amounts of various salts of potassium and/or sodium, as well as other soluble minerals, and are basic rather than acidic with a pH greater than 7.0
Allelopathy: a characteristic of some plants according to which chemical compounds are produced that inhibit the growth of other plants in the immediate vicinity
Allopatric: occupying different geographic regions
Alternate: a leaf arrangement along the axis in which the leaves are not opposite to each other or whorled
Alveolate: Honeycombed, with pits separated by thin, ridged partitions
Ament: an inflorescence consisting of a dense spike or raceme or apetalous, unisexual flowers, another name for a catkin
Ammophilous: sand-loving
Amplexicaul: describing a sessile leaf that has its base completely surrounding the stem
Anandrous: without stamens
Ananthous: without flowers
Androecium: a collective term for the stamens of a flower (compare **gynoecium**)
Androgynous: having staminate and pistillate flowers in the same inflorescence
Anemophilous: wind-pollinated
Angled: sided, as in the shape of stems or fruits
Angular: having sharp angles or corners, generally used in reference to structures such as stems to contrast them with rounded stems

Annual: a plant that completes its life cycle from the its germination as a seed to the production of new seeds in a single year and then dies
Anterior: on the front side away from the axis
Anther: the pollen-bearing portion of a stamen
Anthesis: time during which the flower is open
Antrorse: pointing forward or upward (compare **retrorse**)
Aperturate: with one or more openings or apertures
Apetalous: lacking petals
Apex: the tip of a plant part
Aphyllous: without leaves
Apiculate: ending in an abrupt slender tip which is not stiff
Applanate: flattened
Appressed: lying flat against or nearly parallel to, as leaves on a stem or hairs on a leaf
Arborescent: approaching the size and habit of a tree
Arcuate: arching or curved like a bow
Areole: a raised area on a cactus from which spines develop
Aristate: with an awn or stiff bristle, typically at the apex
Armed: provided with prickles, spines or thorns
Ascending: growing obliquely upward
Asymmetrical: not divided into like and/or equal parts
Attenuate: gradually narrowing to a tip or base
Auricle: a small earlike lobe or appendage
Auriculate: having earlike appendages
Autophilous: self-pollinated
Awn: a slender, stiff terminal bristle attached at its base to another structure or organ such as a leaf or grass stem
Axil: the upper angle formed between two structures or organs, such as a leaf and the stem from which it grows
Axillary: borne or carried in the axil
Axis: the main stem

B

Banner: the upper petal of a pea flower
Barbed: with a backward-facing tip
Barbellate: with short, stiff hairs or barbs
Basal: at or near the base, often describing leaves and where they attach
Basifixed: attached by the base (compare dorsifixed, versatile)
Beak: a firm, pointed terminal appendage
Berry: a fleshy, indehiscent fruit in which the seeds are not encased in a stone and are typically more than one
Biennial: a plant that takes two years to complete its life cycle, usually growing vegetation in the first year and producing flowers and seeds in the second, then dying
Bifurcate: divided into two forks or branches
Bilabiate: two-lipped
Bipinnate: twice pinnately compound
Bipinnatifid: two times pinnately cleft
Bisexual: having both stamens and pistils
Bladdery: thin-walled and inflated
Blade: the expanded terminal portion of a leaf, petal or other structure, i.e. that portion of the leaf that does not include the stalk

Bloom: a white, powderlike coating sometimes found on a leaf or stem surface
Bole: the trunk or stem of a tree
Brackish: a mixture of salt and fresh water, somewhat saline
Bract: a modified leaf which may be reduced in size or different in other characteristics from the foliage leaves and which usually subtends a flower or an inflorescence
Bracteole: a small bract, often secondary in nature, a bractlet
Bristle: a stiff hair, usually erect or curving away from its attachment point
Bud: a developing leaf, stem or flower
Bulb: an underground plant part derived from a shoot that is enclosed in numerous overlapping thickened leafy scales whose purpose is to store food
Bundle scar: scar left on a twig by the vascular bundles when a leaf falls
Bur: a prickly or spiny seed or fruit
Burl: a woody swelling where the stem joins the roots

C

Caducous: falling off very early compared to similar structures in other plants
Caespitose (Cespitose): having a densely clumped, tufted or cushion-like growth form with the flowers extending above the clump
Callus: a hardened or thickened area at the point of attachment
Calyptra: a hood or lid
Calyx: the outer whorl of the perianth, composed of the sepals, usually but not always green, which enclose other flower parts in bud
Campanulate: bell-shaped
Canescent: with gray or white short hairs, often having a hoary appearance
Capillary: very slender and hairlike
Capitate: in a globular or head-shaped cluster
Capsule: a dry, generally many-seeded fruit divided into two or more seed compartments that dehisces or splits open longitudinally with the line of dehiscence either through the locule (**loculicidal**) or through the septa (**septicidal**), or, less commonly, through pores (**poricidal**) or around the circumference (**circumscissile**)
Carnose: with a fleshy texture
Carpel: a simple pistil, or a single unit of a compound pistil, the ovule-bearing portion of a flower
Caruncle: a protuberance or appendage near the hilum of seed
Caryopsis: the grain or fruit of grasses
Catkin: a spikelike, often pendulous, inflorescence of petalless unisexual flowers, either staminate or pistillate
Caudate: bearing a tail or slender tail-like appendage
Caudex: the persistent, often woody base of an otherwise annual herbaceous stem
Cauline: attached to or referring to the stem, as opposed to 'basal', often used to describe leaf position
Ceraceous: waxy in texture or appearance
Cernuous: drooping or nodding
Chaff: thin scales or bracts subtending individual flowers in many species of the Asteraceae
Chaparral: an area characterized by dense, leathery-leaved, evergreen shrubs
Chartaceous: with a papery texture, usually not green
Cilia: marginal hairs

Ciliate: with a row of fine hairs along the margin of a structure such as a leaf
Ciliolate: with a marginal fringe of minute hairs
Cinereous: ash-colored, light-gray due to a covering of short hairs
Circumboreal: distributed around the globe at northern latitudes
Circumsessile: dehiscing along a transverse circular line around the fruit or anther, so that the top separates or falls off like a lid
Clasping: having the lower edges of a leaf blade partly surrounding the stem
Clavate: club-shaped, gradually thickened or widened toward the apex
Claw: the narrow, basal stalklike portion of some sepals and petals
Cleft: deeply cut, usually more than one-half the distance from the margin to the midrib or base
Cleistogamous: flowers which self-fertilize without opening
Collar: found in grasses, the outer side of the leaf at the junction of the sheath and blade
Colleter: a glandular hair
Column: a structure formed by the union of staminal filaments
Coma: a tuft of hairs, often at the tip of seeds
Complete: describing flowers that contain petals, sepals, pistils and stamens
Compound: made up of two or more similar parts, as in a leaf which has leaflets
Compressed: flattened
Concolor: of uniform color
Conduplicate: folded together lengthwise with the upper surface within, as the leaves of many grasses
Cone: a dense cluster of sporophylls on an axis
Confluent: running together or blending of one part into another
Connate: Describing similar structures that are joined or grown together (compare **adnate**)
Connivent: converging, but not actually fused or united
Contracted: narrowed or shortened as opposed to open or spreading
Convergent: meeting together, as leaf veins which come together at the apex
Convex: rounded or curved outward on the surface
Convolute: rolled up longitudinally, with one edge inside the other and the upper surface on the inside (compare **revolute**, **involute**)
Coppice: a thicket of bushes or small trees; sprouts arising from a stump
Cordate: heart-shaped
Coriaceous (Coreaceous): leathery in texture
Corm: an enlarged underground structure of stem tissue and thin scales
Corneous: horny
Corniculate: having little horns or hornlike appendages
Corolla: the inner whorl of the perianth, between the calyx and the stamens, a collective term for the petals of a flower
Corolla tube: the hollow, cylindric portion of a corolla of united petals
Corona: petal-like or crown-like structures between the petals and stamens in some flowers
Coroniform: crown-shaped
Corrugated: wrinkled, folded
Corymb: a broad, flat-topped inflorescence in which the flower stalks arise from different points on the main stem and the marginal flowers are the first to open (compare **cyme**)
Costa (pl. costae): a rib or prominent mid-vein
Cotyledon: a primary leaf of the embryo; a seed leaf
Crenate: with shallow roundish or bluntish teeth on the margin, scalloped

Crenulate: similar to crenate, but with smaller, rounded teeth
Crisped: curled on the margin like a strip of bacon
Cristate: with a terminal tuft or crest
Crosier: the curled top of a young fern frond
Cruciform: cross-shaped
Crustaceous: dry and brittle
Cucullate: hooded or hood-shaped
Culm: a hollow or pithy slender stem such as is found in the grasses and sedges
Cultivar: a form of a plant derived from cultivation
Cuneate: wedge-shaped, with the narrow part at the point of attachment
Cupule: a cup-shaped involucre, as in an acorn
Cuspidate: tipped with an abrupt short, sharp, firm point (compare **mucronate**)
Cuticle: the waxy layer on the surface of a leaf or stem
Cyathiform: cup-shaped
Cyathium: the specialized inflorescence characteristic of the Euphorbiaceae, consisting of a flower-like, cup-shaped involucre which carries the several true flowers within
Cyme: a broad, flat-topped inflorescence in which the central flower is the first to open (compare **corymb**)
Cymose: with flowers in a cyme
Cypselae: dry, single-seeded, indehiscent fruit with an adnate calyx, essentially an achene

D

Deca-: a prefix meaning ten
Decompound: more than once-compound, the leaflets again divided
Decumbent: prostrate at the base but ascending at the end
Decurrent: adnate to the petiole or stem and extending downward, as a leaf base that extends downward along the stem (compare **surcurrent**)
Decussate: arranged in pairs along the stem with each pair at right angles to the one above and below
Deflexed: Bent downward or backward
Defoliation: the shedding of leaves
Dehiscent: opening spontaneously when ripe to discharge the seed content (compare **indehiscent**)
Deltoid: broadly triangular in shape
Dendritic: with a branching patter similar to that in a tree, describes a hair type
Dense: congested, describing the disposition of flowers in an inflorescence (compare **open**)
Dentate: with sharp, outward-pointing teeth on the margin
Depauperate: starved or stunted, describing small plants or plant communities that are growing under unfavorable conditions
Determinate: describes an inflorescence in which the terminal flower blooms first, thereby halting further elongation of the flowering stem (compare **indeterminate**)
Dextrorse: turned to the right or spirally arranged to the right (compare **sinistrorse**)
Di-: prefix meaning two or twice
Diadelphous: stamens united into two, often unequal, sets by their filaments
Diandrous: having two stamens
Dichasium: a cymose inflorescence in which each axis produces two opposite or

subopposite lateral axes
Dichotomous: branching regularly and repeatedly in pairs
Diclinous: with the stamens and pistils in separate flowers, imperfect
Dicotyledon: a plant having two seed leaves, one of the two major divisions of flowering plants (compare **monocotyledon**)
Didymous: twinned, being in pairs
Didynamous: with two pairs of stamens of unequal length
Diffuse: looosely branching or spreading
Digitate: radiating from a common point, having a fingered shape, i.e. a shape like an open hand
Digynous: having two pistils
Dimorphic: having two forms
Dioecious: having staminate and pistillate flowers on separate plants (compare **monoecious**)
Diploid: with two full sets of chromosomes in each cell
Disarticulating: separating at maturity at a joint
Disciform: having a flowering head that contains both filiform and disk flowers, referring to members of the Asteraceae
Discoid: having only disk flowers, referring to flower heads in the Asteraceae
Disjunct: separated from the main distribution of the population
Disk: the central portion of composite flowers, made up of a cluster of disk flowers
Dissected: finely cut or divided into many, narrow segments
Distal: the end opposite the point of attachment, away from the axis (compare **proximal**)
Distichous: two-ranked, that is with leaves on opposute sides of a stem and in the same plane
Distinct: having separate, like parts, those not at all joined to each other, often describing the petals on a flower (compare **united**)
Disturbed: referring to habitats that have been impacted by the actions of people
Dithecal anthers: anthers lacking septi between the loculi, so there are only two anther cells
Diurnal: growing in the daytime
Divaricate: widely diverging or spreading apart
Divergent: diverging or spreading
Divided: cut deeply, nearly or completely to the midrib
Dolabriform: ax-shaped or cleaver-shaped; pick-shaped; attached at some point other than the base, usually near the middle
Dorsal: referring to the back or outer surface
Dorsifixed: attached at the back (compare **basifixed**, **versatile**)
Drooping: erect or spreading at the base, then bending downwards
Drupe: a fleshy indehiscent fruit enclosing a nut or hard stone containing generally a single seed such as a peach or cherry

E

E-: prefix usually meaning without, from, or away
Echinate: prickly
Ecotone: transition zone between two adjoining communities
Ecotype: those individuals adapted to a specific environment or set of conditions

Edaphic: due to, or pertaining to, the soil
Elater: structures attached to spores to aid in dispersal
Elliptic: broadest near the middle and tapering gradually to both ends
Elongate: stretched out, many times longer than broad
Emarginate: with a shallow notch at the apex
Endemic: confined to a limited geographic area
Endocarp: the inner layer of the pericarp, which is the wall of the ripened ovary or fruit (compare **mesocarp**, **exocarp**)
Endogenous: growing from, or originating from within
Ensiform: sword-shaped, as applied to a leaf
Entire: describing a leaf that has a continuous, unbroken margin with no teeth or lobes
Entomophilous: insect-pollinated
Ephemeral: describes a plant or flower that lasts for only a short time or blooms only occasionaly when conditions are right
Epi-: meaning upon
Epicalyx: an involucre which resembles an outer calyx
Epigynous: with stamens, pistils, and sepals attached to the top of the ovary (compare hypogynous)
Epipetalous: attached to the petals
Episepalous: attached to the sepals
Equilateral: with sides of equal shape and length
Equitant: overlapping or straddling in two ranks, as in *Iris*
Erose: having an irregular margin as if it has been gnawed
Erosulate: more or less erose
Escapee: a plant escaped from cultivation that now reproduces on its own
Esculent: edible
Estipulate: without stipules
Evanescent: fleeting, lasting for only a short time
Even-pinnate: a pinnately-compound leaf ending in a pair of leaflets (compare **odd-pinnate**)
Excurrent: extending beyond the apex, as the midrib in some leaves
Exfoliating: peeling off in thin layers or flakes
Exocarp: the outer layer of the pericarp of a fruit (compare **endocarp**, **mesocarp**)
Exotic: not native, introduced from another area
Exserted: projected from or extending beyond, as stamens from a flower
Extant: still surviving, not completely extinct
Extirpated: destroyed or no longer surviving in the area being referred to, but may survive outside of that area
Extrorse: turned or opening outward away from the axis (compare **introrse**)
Exudate: a substance exuded or secreted from a plant

F

Falcate: scimitar- or sickle-shaped
Farinose: covered with a mealy or whitish powdery substance
Fascicle: a small cluster or bundle, a fairly common leaf arrangement
Faveolate: honeycombed or pitted: **alveolate**
Fenestrate: with small slits or areas thinned so as to be translucent
Ferruginous: rust-colored
Fertile: having the capacity to produce fruit, having a pistil
Fetid: with an offensive odor, stinking

Fibril: a delicate fiber or hair
Filament: the basal, sterile portion of a stamen below the anthers
Filiform: (1) threadlike; (2) a type of flower in the Asteraceae which is pistillate and has a very slender, tubular corolla
Fimbriate: having fringed margins
Fistulose: hollow like a tube or pipe
Flaccid: soft and weak, limp
Flagellate: with long, slender runners
Flange: a projecting rim or edge
Fleshy: thick and pulpy, succulent
Flexuose or **flexuous**: with curves or bends, somewhat zigzagged
Floccose: bearing tufts of long, soft, tangled hairs
Floret: a small individual flower in a flower head
Fluted: with furrows or grooves
Foliar: pertaining to the leaves, leaf-like
Foliolate: of or pertaining to, or having leaflets
Follicle: a dry, many-seeded fruit derived composed of a single carpel and opening along one side only like a milkweed pod
Forb: a non-grasslike herbaceous plant
Fringed: with hairs or bristles along the margin
Frond: a fern leaf
Fructiferous: fruit-bearing
Frutescent: shrubby or bushy in the sense of being woody
Fugacious: falling or withering early; ephemeral
Fulvous: dull yellowish-brown or yellowish-gray, tawny
Funiculus: the stalk connecting the ovule to the placenta, the stalk of a seed
Funnelform: gradually widening upwards, as in the flowers of morning glory
Furcate: forked
Fuscous: dark grayish-brown, dusky
Fusiform: spindle-shaped, thickest in the middle and drawn out at both ends

G

Galbulus: a cone of *Cupressus*
Gall: an abnormal growth on a plant that is caused by insects
Geniculate: bent abruptly like a knee or a stove pipe
Gibbous: swollen or enlarged on one side, ventricose
Glabrate: becoming glabrous in age
Glabrous: smooth, without hairs
Gland: a depression or protuberance that exists for the purpose of secreting
Glandular: producing tiny globules of sticky or oily substance
Glans: a dry dehiscent fruit borne in a cupule, such as the acorn
Glaucescent: slightly glaucous
Glaucous: covered with a thin, light-colored waxy or powdery bloom
Globose: globe-shaped, spherical
Glochids: barbed bristles on cacti
Glomerate: crowded, congested or compactly clustered
Glume: in grasses, the bracts (generally two) that form the lowermost parts of the spikelet
Glutinous: having a sticky surface
Gracile: slender and graceful
Grain: the fruit of grasses
Gregarious: growing in groups or colonies

Gynobase: an elongation or enlargement of the receptacle that supports the carpels or nutlets, as in many species of the Boraginaceae
Gynoecium: a collective term for the pistils of a flower (compare **androecium**)

H

Habit: the overall appearance of a plant
Halophyte: a plant that can tolerate an abnormal amount of salt in the soil
Haploid: with a single full set of choromosomes in each cell
Hastate: spear- or arrowhead-shaped with the basal lobes facing outward
Haustorium: a specialized root-like organ used by parasitic plants to draw nourishment from host plants (*Phoradendron*)
Head: a dense cluster of sessile or subsessile flowers, found in Asteraceae
Helicoid: coiled spirally like a spring or a snail shell
Heliotropic: the movement of plant parts in response to a light source
Hemiparasite: a plant that derives its energy both from parasitism and from photosynthesis
Herbaceous: fleshy-stemmed, not woody
Heteromorphic: of one or more kind or form
Heterostylous: having different kinds of style (and stamen) lengths
Hexa-: a prefix meaning six
Hibernal: flowering or appearing in the winter
Hilum: a scar on a seed indicating its point of attachment
Hip: a fleshy, berry-like fruit, as in some members of the Rosaceae
Hirsute: pubescent with stiff, coarse hairs
Hirsutulous: pubescent with very small, coarse, stiff hairs
Hispid: rough-haired with firm, stiff hairs
Hoary: covered with white or gray, short, fine hairs
Holosericeous: covered with fine, silky hairs
Homomorphic: all of the same kind or form
Hood: a hollow, arched covering, found in *Asclepias*
Hooked: abruptly curved at the tip
Host: a plant providing nourishment to a parasite
Humifuse: spreading along or over the ground
Humistrate: lying on the ground
Hyaline: thin, translucent or transparent
Hydrophytic: adapted to growing in water
Hypanthium: a cup-shaped enlargement of the receptacle, creation by the fusion of sepals, petals and stamens
Hypogynous: with stamens, petals and sepals attached below the ovary (compare **epigynous**)

I

Imbricate: overlapping, like shingles on a roof
Imparipinnate: odd-pinnate, unequally pinnate
Imperfect: describes a flower that has stamens or pistils but not both
Implicate: twisted together, intertwined
Incised: cut, often deeply, usually irregularly, but seldom as much as one-half the distance to the midrib or base
Incumbent: a term referring to seeds in which the embronic root is wrapped around and lies adjacent to the back of one of the two cotylodons (compare **accumbent**)
Indehiscent: not opening by itself, said of a seed pod (compare **dehiscent**)
Indeterminate: describes an inflorescence in which the outer or lower flowers

bloom first, allowing an indefinite elongation of the flowering stem (compare **determinate**)
Indigenous: native to an area
Induplicate: with petals or sepals edge to edge along their entire length, the margins rolled inward
Indurate: hardened and/or stiffened
Indusium: a scale-like outgrowth on a fern leaf which forms a covering for the sporangia
Inferior ovary: one that is situated below the point of attachment of the sepals and petals, and possibly below the point of attachment of all other flower parts and embedded in the floral stem
Inflexed: turned abruptly or bent inwards
Inflorescence: the flowering portion of a plant
Infra-: a prefix meaning below or beneath
Infraspecific: below the species level
Infundibular: funnel-shaped
Innate: borne at the apex
Inserted: attached to or growing out of
Integument: the covering of the ovule which will become the seed coat
Inter-: a prefix meaning between or among
Internode: the portion of a stem between two successive nodes
Interrupted: not continuous, with gaps
Introrse: turned or opening inward toward the axis as an anther toward the center of a flower (compare **extrorse**)
Invaginated: sheathed, folded
Involucel: a secondary involucre as in the Apiaceae
Involucre: a set of bracts subtending a flower or an inflorescence
Involute: with both edges inrolled toward the midnerve on the upper surface (compare **revolute**)
Irregular: describes a flower that is not radially symmetric, the similar parts of which are unequal in size or form

J

Joint: the point on a plant stem from which a leaf or leaf-bud grows, more commonly termed a node
Jugate: with parts in pairs
Junciform: rush-like in appearance

K

Keel: the two lower petals of most pea flowers, united or partially joined to form a structure similar to the keel of a boat
Knee: a joint or articulate, as in grass
Krummholz: literally crooked forest, low wind-contorted forest that can be found at timberline

L

Labellum: lip, an exceptional petal found in some flowers, like Orchidaceae
Labiate: lipped
Lacerate: irregularly cut or cleft
Laciniate: cut into slender lobes
Lacustrine: growing around lakes

Laevigate: lustrous, shining
Lamella: erect scale inserted on the petal in some corollas and forming part of the corona
Laminar: thin, flat, and expanded, as the blade of a leaf (laminar stamens)
Lanate: with long tangled wooly hairs
Lanceolate: significantly longer than wide and widest below the middle, gradually tapering toward the apex
Lanulose: with very short hairs, minutely downy or wooly
Lateral: borne at or on the side of
Latex: a milky sap
Latifoliate: with broad leaves
Leaflet: one segment of a compound leaf
Legume: a dry, dehiscent fruit derived from a single carpel and usually opening along two lines of dehiscence like a pea pod
Lemma: in grasses, the lower and usually larger of the two bracts of the floret
Lenticel: Raised, corky , lens-shaped area on the surface of a young stem.
Lepidote: covered with small scurfy scales
Liana: a herbaceous or woody, usually perennial, climbing vine that roots in the ground and is characteristic especially of tropical forests
Ligneous: woody
Ligule: strap-shaped organ, membranous appendage arising from inner surface of leaf at the junction with the leaf sheath in many grasses and some sedges
Ligulate: (1) Describing a floral head in the Asteraceae that contains only ray flowers, or ligules; (2) strap-shaped
Limb: the upper, expanded portion of a corolla which has fused petals
Linear: long and narrow with sides that are parallel or nearly so
Lingulate: tongue-shaped
Lip: one of the two projections or segments of an irregular, two-lipped corolla or calyx
Littoral: growing along the shore
Livid: pale grayish-blue
Lobate: in the form of a lobe, lobed
Lobe: usually a rounded segment of an organ
Lobed: more or less deeply cut but not as far as the midrib
Lobulate: with small lobes
Locule: a cavity of the ovary which contains the ovules
Loculicidal: said of a capsule, longitudinally dehiscent through the ovary wall at or near the center of each chamber or locule (compare **poricidal**, **septicidal**)
Lodicule: paired, rudimentary scales at the base of the ovary in grass flowers
Loment: a legume which is constricted between the seeds
Lunate: crescent-shaped
Lurid: pale brown to yellowish-brown
Lustrous: shiny or glossy
Lyrate: lyre-shaped, pinnatifid with the terminal segment large and rounded and the lower lobes increasingly smaller toward the base

M

Machaerantheroid: having involucral bracts with recurved tips
Macro-: prefix meaning large or long
Macrophyllous: having large leaves
Maculate: spotted or blotched

Malvaceous: mallow-like
Mammilate: with nipple-like protuberances
Manicate: with a thick, interwoven pubescence
Margin: the edge, as of a leaf blade
Marginate: distinctly margined
Mealy: describing a surface that is covered with minute, usually rounded particles
Medial: of the middle, situated in the middle
Mega-: prefix meaning large
Membranous: thin, flexible and more or less translucent, like a membrane
Meristem: undifferentiated, actively dividing tissues at the growing tips of shoots and roots
-merous: a suffix utilized to indicate the number of parts or divisions in a particular structure or organ, as in 4-merous or 4-parted
Mesic: describes a habitat that is generally moist throughout the growing season (compare **xeric**)
Meso-: prefix meaning middle
Mesocarp: the middle layer of the pericarp of a fruit (compare **endocarp**, **exocarp**)
Mesophytic: adapted to growing under medium or average conditions, especially relating to water supply
Micro-: prefix meaning small
Microphyllous: bearing small leaves
Midnerve: the central nerve
Midrib: the main or central rib or vein of a leaf, a midvein
Monadelphous: having stamens with filaments united in a single group, bundle or tube
Mono-: prefix meaning one
Monocarpic: flowering and bearing fruit only once and then dying, the term may be applied to perennials, biennials, or annuals
Monochasium: a type of cymose inflorescence with only a single main axis
Monocotyledon: a plant having only one seed-leaf (compare **dicotyledon**)
Monoecious: having both male and female flowers on the same plant (compare **dioecious**)
Monotypic: describing a genus that contains only a single species
Montane: of or pertaining to, or growing in, the mountains
Mucilaginous: slimy and moist
Mucro: a short, sharp, abrupt point, usually at the tip of a leaf or other organ
Mucronate: having a short projection at the tip, as of a leaf
Mucronulate: tipped with a very small mucro
Multi-: prefix meaning many
Multifid: cleft into very many narrow lobes or segments
Multiflorus: many-flowered
Multifoliate: bearing many leaves
Muricate: rounded or roughened with short, hard or warty points
Mycorrhizal: having a symbiotic relationship between a fungus and the root of a plant

N

Nacreous: having a pearly luster

Naked: lacking hairs, structures or appendages, as in a flower lacking a perianth
Nascent: in the process of being formed
Nebulose: indistinct, as in a fine, diffuse inflorescence
Nectariferous: with nectar
Nectary: a plant part that secretes nectar, a sweet liquid that attracts bees, insects and birds
Needle: a slender, needle-shaped leaf
Nerve: a prominent, simple vein or rib of a leaf or other organ
Net-veined: in the form of a network, reticulate
Netted: same as reticulated, in the form or pattern of a network
Neuter: lacking a pistil or stamens
Nidulent: lying within a cavity, embedded within a pulp
Nitid: lustrous, shining
Nocturnal: functioning at night, as in flowers which open at night
Nodding: hanging down
Node: a point on a stem where leaves or branches originate
Numerous: eleven or more, same as 'many'
Nut: a dry, usually one-seeded, indehiscent fruit with a hard-walled exterior
Nutlet: a small nut or one of the sections of the mature ovary of some members of the Boraginaceae, Verbenaceae or Lamiaceae

O

Ob-: prefix signifying inversion or reversal of normal direction
Obcordate: inversely heart-shaped, attached at the point
Oblanceolate: inversely lanceolate
Oblate: spheroidal and flattened at the poles
Obligate: restricted to particular conditions or circumstances
Oblique: with sides unequal, usually describing the base of a leaf
Oblong: two to four times longer than broad with nearly parallel sides, but broader than 'linear'
Obovate: inversely ovate
Obovoid: inversely ovoid, with the attachment at the narrower end
Obtuse: blunt or rounded at the apex
Obverse: describing a leaf that is narrower at the base than at the apex
Obvolute: a vernation in which two leaves are overlapping in the bud in such a manner that one-half of each is external and the other half is internal, i.e. each leaf both overlaps the next and is in turn overlapped by the one before
Ochroleucous: yellowish-white; cream-colored
Ocrea: a sheath around the stem derived from the leaf stipules, primarily used in the Polygonaceae
Octo-: prefix meaning eight
Odd-pinnate: describing a pinnately-compound leaf with a single terminal leaflet (compare **even-pinnate**)
Open: uncongested, usually describing the organization of flowers in an inflorescence (compare **dense**)
Opposite: describing leaves that are situated in pairs at each node along an axis
Orbicular: circular
Oval: broadly elliptic, the width over half the length
Ovary: the basal portion of a pistil where female germ cells develop into seeds after germination
Ovate: egg-shaped, wider below the middle

Ovoid: an egg-shaped solid
Ovule: the structure that develops into the seed inside the ovary

P
Palate: an appendage or raised area on the lower lip of the corolla which partially blocks the throat
Palea: in grasses, the upper and generally smaller of the two bracts of the floret
Pallid: pale
Palmate: radiating from a single point like the spreading fingers of an outstretched hand
Palmate-pinnate: with the primary leaflets palmately arranged and the secondary leaflets pinnately arranged
Palmatifid: palmately cleft or lobed
Palustrine: same as paludose
Pandurate: fiddle-shaped
Panicle: a compound inflorescence in which the branches are racemose and the flowers are pedicelled on the branches
Papilla: short, rounded nipple-like bump or projection
Pappose: pappus-bearing
Pappus: collectively, the bristles, hairs or scales at the apex of an achene in the Asteraceae
Parasite: a plant which derives most or all of its food from another organisim to which it attaches itself
Parietal: attached to the wall of the ovary instead of the axis
Paripinnate: even pinnate, lacking a terminal leaflet
Parted: lobed or cut in over half-way and often very close to the base or midrib
Pectinate: describing a pinnatifid leaf whose segments are narrow and arranged like the teeth of a comb
Pedicel: the stalk of a single flower that is part of an inflorescence
Peduncle: the stalk of a flower cluster, or of a solitary flower not associated with others in an inflorescence
Pellucid: transparent or translucent
Peltate: a type of leaf having its petiole attached to the center of the lower surface of the blade
Pendent: hanging downward or drooping
Penicillate: with a tuft a short hairs at the end, like a brush
Penta-: prefix meaning five
Pepo: a fleshy, indehiscent fruit with a hard, more or less thickened rind and a single many-seeded locule, characteristic of the Cucurbitaceae
Perennial: a plant living for more than two years
Perfect: containing both stamens and pistils
Perfoliate: the stem apparently piercing the leaf or surrounded by basally joined opposite leaves
Perianth: a collective term for the calyx and corolla
Pericarp: the outer wall of mature fruit
Perigynous: situated around but not attached to the ovary directly, describing a flower whose stamens and pistils are joined to the calyx tube and the ovary is superior

Pernicious: harmful, destructive, or deadly in nature
Persistent: remaining attached after the usual time of falling
Petal: a single segment of a divided corolla
Petaloid: having the appearance of a petal
Petiole: the stalk of a leaf
Petiolule: the stalk of a leaflet of a compound leaf
Phloem: the food conducting tissue of vascular plants, bark
Phyllary: one of the bracts below the flowerhead in the Asteraceae
Pilose: having long, soft, straight hairs
Pilosulose: bearing minute, long, soft, straight hairs
Pinnate: with separate segments which are arranged feather-like on either side of a common axis
Pinnatifid: so deeply cleft or cut as to appear pinnate
Piriform: pear-shaped
Pistil: the central reproductive organ of a flower, consisting of ovary, style and stigma
Pistillate: a female flower that has two or more pistils but no functional stamens
Pith: the spongy central tissue in some stems and roots
Plane: with a flat surface
Planoconvex: flat on one side and rounded on the other
Plumose: appearing plumelike or feathery from fine hairs that line two sides of a central axis
Pod: any dry, dehiscent fruit, especially a legume or follicle
Pollinum: a mass of waxy pollen grains, in *Asclepias* and Orchidaceae
Poly-: prefix meaning many
Polyandrous: with many stamens
Polyanthous: with many flowers
Polycephalous: with many flower heads
Polygamous: having both unisexual and bisexual flowers on the same plant
Polyploid: with three or more complete sets of chromosomes in each cell
Pome: a fleshy indehiscent fruit derived from an inferior, compound ovary and consisting of a modified floral tube surrounding a core with several seeds, such as an apple
Poricidal: opening by pores, like a poppy capsule (compare **loculicidal**, **septicidal**)
Posterior: on the side next to the axis (compare **anterior**)
Praemorse: terminating abruptly, as if bitten off
Prehensile: adapted for grasping, as in a tendril
Prickle: a superficial, sharp-pointed outgrowth of the bark or epidermis
Procumbent: lying flat or trailing but not rooting at the nodes
Prostrate: lying flat
Proximal: nearest the axis or base (compare **distal**)
Prurient: causing itching
Ptero-: prefix meaning winged
Pterocarpous: with winged fruits
Puberulence: fine, short hairs
Puberulent: minutely pubescent
Pubescent: covered with short, soft hairs
Pulvinus: a swelling or enlargement at the base of a petiole or petiolule
Punctate: dotted with pits or with translucent, sunken glands or colored dots

Puncticulate: minutely punctate
Punctiform: reduced to a point
Pungent: tipped with a sharp, rigid point
Pustulose: with small blisters or pustules, often at the base of a hair
Pyrene: the stone or pit of a drupe or drupelet
Pyriform: pear-shaped
Pyxis: a circumscissile capsule, the top coming off as a lid

Q

Quadrate: square, rectangular
Quadri-: prefix meaning four
Quilled: with tubular florets, especially in cases whre the florets are typically ligulate, as in some Asteraceae
Quinate: with five nearly similar structures from a common point
Quinque-: prefix meaning five

R

Raceme: an elongate, unbranched inflorescence with pedicelled flowers on the main stem
Racemose: raceme-like or bearing racemes
Rachilla: a small rachis, in particular the axis of a grass spikelet
Rachis: the main stalk of a flower cluster or of a compound leaf, also that part of a fern frond stem that bears the leaflets
Radical: belonging to or proceeding from the root
Radiate: describing a flower head in the Asteraceae that contains both ray and disk flowers
Radicant: rooting from the stem
Radicle: part of the plant embryo which will develop into the primary root
Ramose: with many branches, branching
Rank: a vertical row usually of leaves or bracts that can be either opposite or alternate
Ray: strap-like portion of a ligulate flower in Asteraceae
Receptacle: the expanded apex of a flower stalk which bears the floral organs, either such structures as individual petals, sepals etc., or entire flowers in head-like inflorescences such as is typical of the Asteraceae
Recumbent: leaning or reposing upon the ground
Recurved: curved backwards or outwards
Reflexed: abruptly bent or curved downward
Regular: describes a flower with petals or sepals all of equal size and shape, i.e. radially symmetrical or capable of being divided into mirror images on either side of any plane that passes through the center
Reniform: kidney-shaped or rounded with a notch at the base
Repand: with an undulating margin, less strongly wavy than 'sinuate'
Replum: partition or septum between the two valves or compartments of silicles or siliques in the Brassicaceae
Resupinate: upside down due to twisting of the pedicel
Reticulate: having a netted pattern
Retrorse: bent backward or downward, reflexed (compare **antrorse**)
Retuse: having a rounded apex with a shallow notch
Revolute: having the margins inrolled toward the underside (compare **convolute**, **involute**)

Rhizomatous: rhizome-like, with rhizomes
Rhizome: an underground stem capable of producing new stems or plants at its nodes
Rhombic: with the shape of a diamond
Rosette: a cluster of leaves in a circular arrangement at the base of a plant, often called the basal rosette
Rostrum: a beak-like structure
Rotate: a rotate corolla is wheel-shaped with a short tube and a wide horizontally flaring limb
Ruderal: growing in disturbed habitats, weedy
Rudiment: an imperfectly developed organ, a vestige
Rufous: reddish-brown
Rugose: wrinkled
Rugulose: slightly wrinkled
Rucinate: sharply pinnatifid or cleft, the segments directed downward
Runner: a slender stolon or prostrate stem rooting at the nodes or at the tip

S

Saccate: with a sac, or in the shape of a sac
Sagittate: arrowhead-shaped, with two retrorse basal lobes
Salient: projecting outward
Salverform: with a slender tube abruptly expanded into a rotate limb
Samara: dry fruit with wings that do not open when mature, as in maple trees
Sanguineous: blood-red
Saponaceous: soapy
Saprophytic: deriving food from dead or decaying organic material in the soil and usually lacking in chlorophyll
Scaberulent: slightly scabrous
Scabrous: rough to the touch
Scale: a greatly reduced leaf or other outgrowth on a plant surface
Scape: a leafless flowering stem arising directly from the ground
Scapose: with flowers borne on a scape
Scarify: to roughen, score or scrape the hard, outer coating of a seed to assist in the absorption of moisture before germination, a process that many desert wash seeds require
Scarious: thin, dry, membranous and more or less translucent
Schizocarp: a dry, indehiscent fruit which splits into separate one-seeded segments (carpels) at maturity
Scissile: splitting easily
Sclerphyllous: with stiff, firm leaves
Scobina: the zigzag rachilla of some grass spikelets
Scorpioid: describing a coiled inflorescence
Scurfy: covered with small scale-like or bran-like particles or projections
Secund: borne from only one side of an axis
Semi-: prefix meaning half
Sepal: a single segment of a divided calyx
Septicidal: said of a capsule, longitudinally dehiscent through the ovary wall at or near the center of each septa, preserving each locule as an intact entity (compare **loculicidal**, **poricidal**)
Septum: any kind of a partition, specifically the wall between chambers in a compound ovary
Seriate: arranged in rows or series

Sericeous: covered with long, soft, straight, appressed hairs giving a silky appearance
Serpentine: refers to soils that are low in calcium and high in magnesium and iron, derived from greenish or gray-green rocks that are essentially magnesium silicate, other characteristics of which are a high nickel and chromium content, and a low content of nutrients such as nitrogen
Serrate: having sharp, forward-pointing teeth on the margin
Serrulate: serrate with very small teeth
Sessile: attached directly and without a petiole, pedicel or other type of stalk, said of either leaves or flowers
Setaceous: bristle-like, with bristles
Sheath: leafy, tubular structure on a sedge or grass that envelops the stem
Shrub: a small, woody plant with several stems
Silicle: fruit similar to a silique, but much shorter, not much longer than wide
Silique: a type of capsule found in the Brassicaceae, either half of which peels away from a central, transparent, dividing membrane
Simple: a leaf that has one part, not subdivided into leaflets
Sinuate: strongly or deeply wavy, usually referring to a leaf margin
Sinuous: of a wavy or serpentine form
Sinus: the space or division, usually on a leaf, between two lobes or teeth
Sori: clusters of spore sacs on a fern frond (singular: sorus)
Sp: abbreviation for 'species'
Spadix: a floral spike or head in which the flowers are borne on a fleshy axis
Spathe: a large bract or pair of bracts subtending and usually partially enclosing an inflorescence
Spatulate: spoon-shaped, gradually widening to a rounded apex
Specific epithet: second part of a scientific name which identifies the species
Spicate: arranged in a spike
Spike: an elongated, unbranched inflorescence with sessile or nearly-sessile flowers
Spikelet: in grasses, the smallest aggregation of florets plus any subtending glumes
Spine: sharp-pointed rigid structure, usually a highly modified leaf or stipule
Spinose: having a stiff and tough acuminate tip
Spinulose: bearing very small spines
Sporangium: a spore-case or sac in which spores are produced in a fern
Spore: a reproductive cell resulting from meiotic cell division in a sprangium, representing the first cell of the gametophyte generation
Spp: abbreviation for the plural of 'species'
Spray: a slender shoot or granch with its leaves, flowers, or fruits
Spur: a hollow extension of a petal or sepal such as characterizes the larkspurs, and which often produces nectar
Squarrose: having spreading, recurved tips
Ssp: abbreviation for 'subspecies'
Stamen: the male or pollen-bearing organ of a flower, composed of filament and anthers
Staminate: describing a male flower that contains one or more stamens but no functional pistils
Staminode: a sterile stamen or other nonfunctional structure occupying the position and having the overall appearance of a stamen
Standard: also called a banner, this is the upper petal or segment of a papilionaceous flower

Stellate: starlike, with radiating branches and often referring to the pattern of hairs on the surface of a leaf
Stem: the main upward-growing axis of a plant which bears the leaves and flowers
Stigma: the terminal portion of a pistil, which receives the pollen
Stipe: that portion of a fern frond below the rachis, i.e. below where the leaflets are attached
Stipitate: borne on a stipe or stalk
Stipule: an appendage at the base of a petiole, usually in pairs
Stolon: an elongated horizontal shoot above or below the ground, rooting at the nodes or apex
Stomate: a small pore or opening on the surface of a leaf through which gaseous exchange takes place, i.e. the diffusion of carbon dioxide, oxygen and water vapor
Stone: the hard, woody endocarp enclosing the seed of a drupe
Stramineus: straw-colored
Strap-shaped: elongated and flat
Striate: with fine longitudinal lines or ridges
Strigose: covered with rough, stiff, sharp hairs that are more or less parallel to a particular surface
Strobilus: a cone-like cluster of sporophylls on an axis, a cone
Style: the narrowed portion of a pistil between and connecting the ovary and the stigma
Sauveolent: fragrant
Sub-: prefix meaning under, slightly, somewhat or almost
Suber: cork
Suberose: corky in texture
Subshrub: a suffrutescent perennial plant
Subspecies: a group of plants within a species that has consistent, repeating, genetic and structural distinctions
Subtend: to occupy a position below and adjacent to
Subulate: awl-shaped
Succulent: fleshy, juicy and thickened
Sucker: a shoot originating from below ground
Suffrutescent: somewhat shrubby, slightly woody at the base
Sulcate: with longitudinal grooves or furrows
Summer annual: plant with seeds germinating in spring or early summer and completing flowering and fruiting in late summer or early fall (compare **winter annual**)
Superior ovary: one that is located above the perianth and free of it
Surcurrent: extending upward from the point of insertion, as a leaf base that extends up along the stem
Surficial: growing near the ground, or spread over the surface of the ground
Suture: a junction or seam of union, or a line of dehiscence
Swale: a depression or shallow hollow in the ground, typically moist
Sympatric: growing together with, or having the same range as
Sympetalous: having the petals more or less united
Syn-: prefix meaning united
Synandrous: with united anthers
Synoecious: having male and female flowers in the same flowerhead
Synsepalous: having the sepals more or less united

T

Taproot: the primary root continuing the axis of the plant downward often quite deeply into the ground
Taxon: any group of plants occupying a particular hierarchical category, such as genus or species
Tendril: a slender portion of a leaf or stem, modified for twining
Tepal: a collective term for sepals and petals, used when they cannot be easily differentiated
Terete: round in cross-section, cylindrical
Terminal: at the end of the branch or stem
Ternate: in three's, as a leaf which is divided into three leaflets
Tetra-: prefix meaning four
Thallus: a plant body which is not obviously differentiated into stems, roots, and leaves
Theca: a pollen sac or cell of the anther
Thorn: a short, stiff, sharp-pointed branch
Three-ranked: in three vertical ranks or rows around an axis
Throat: in some corollas with fused petals, the point of juncture between the tube and limb, a somewhat difficult point to distinguish
Thryse: a compact, cylindrical, or ovate panicle with an interderminate main axis and cymose subaxes
Tiller: in grasses the young vegetative shoots
Tomentose: wooly, with long, soft, matted hairs
Toothed: having small lobes or points along the margin (as on a leaf)
Transpiration: emission of water vapor from the leaves
Transverse: at a right angle to the longitudinal axis of a structure
Tri-: prefix meaning three
Triad: a cluster of three, as spikelets of Hordeum or Hilaria
Triandrous: having three stamens
Trichome: a hair-like outgrowth from the epidermis
Trichotomous: three-forked
Trifid: three-cleft to about the middle
Trifoliate: having three leaves
Trifoliolate: having three leaflets
Tripinnate: thrice divided
Tripinnatifid: thrice pinnately cleft
Tropism: the turning of a plant part such as a leaf in response to some external stimuli
Truncate: with a base or apex appearing as if cut straight across
Tube: the lower or narrower portion of a corolla or calyx
Tuber: a short, thickened underground stem which bears numerous buds
Tubercle: a knoblike projection
Tufted: in a dense cluster
Tumescent: somewhat tumid, swelling
Turbinate: shaped like a top or inverted cone
Turgid: swollen, expanded or inflated
Twining: climbing by coiling around some support
Two-ranked: in vertical ranks or rows on opposite sides of an axis (compare, **distichous**)

U

Umbel: a flat-topped or convex inflorescence with the pedicels arising more or less form a common point, like the struts of an umbrella
Umbellulate: in the form of or having the appearance of an umbel
Unarmed: lacking thorns or prickles
Uncinate: hooked near the apex or having the form of a hook
Unctuous: greasy, oily
Undulate: wavy
Uni-: prefix meaning one
Unilocular: having only a single locule in the ovary
Uniseriate: arranged in one row or series
Unisexual: bearing either stamens or pistils but not both
United: describes petals that are fused together
Urceolate: urn-shaped or pitcher-like, contracted at the mouth
Utricle: a small, thin-walled, single-seeded, bladdery-inflated fruit
Uva: a grape-like berry formed from a superior ovary

V

Vaginate: provided with or surrounded by a sheath
Valvate: opening by valves or provided with valves
Valve: one of the parts or segments into which a dehiscent fruit splits
Varicose: swollen or enlarged in places
Variegated: having a variety of colors
Vascular: containing both xylem, the principal water and mineral-conducting tissue, and phloem, food conducting tissue
Vein: the vascular portion of a leaf
Velutinous: velvety
Venation: the arrangement of veins in a leaf
Ventral: on the inner or axis side of an organ or the upper surface of a leaf
Ventricose: inflated or swollen unequally on one side
Vermicular: worm-shaped or wormlike, or of worm-eaten appearance
Vernation: the arrangement of leaves within a bud
Versatile: referring to an anther which attaches at or near its middle and is able to turn freely on its support (compare **basifixed**, dorsifixed)
Verticil: an arrangement of similar parts around a central axis or point of attachment, a whorl
Verticillate: same as 'whorled'
Vesicle: a bladder or cavity
Vespertine: opening or functioning in the evening
Villous: with fine, long, unmatted hairs
Vine: a plant with the stem not self-supporting, but climbing or trailing on some support
Virgate: wand-like, straight, slender, and erect
Viscid: sticky or greasy
Vitreous: transparent

W

Wanting: absent, lacking, nonexistent
Weed: a troublesome or aggressive plant that intrudes where it is not wanted, especially a plant that vigorously colonizes disturbed areas
Whorl: a circle of three or more structures radiating outward from the same node

Wing: a thin, paperlike flat margin bordering or extending from a seed capsule, stem or flower
Winter annual: plant with seeds germinating in late summer or fall and completing flowering and fruiting in spring or summer (compare **summer annual**)
Woolly: having soft, woollike hairs

X

X: a symbol which when placed before a specific epithet indicates a hybrid of two species
Xeric: pertaining to arid or desert conditions, implying a minimal water supply throughout most of the year (compare **mesic**)
Xero-: prefix meaning dry
Xerophytic: adapted to dry or arid conditions, places where fresh water is scarce or where water absorption is difficult due to an excess of dissolved salts
Xylem: the water-conducting tissue of vascular plants
Xylocarp: a hard, woody fruit such as the coconut

Z

Zygomorphic: with inequality in the size or form of similar parts, specifically bilaterally symmetric and capable of being bisected into equal mirror-image halves along one plane only

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Botany is an aggregative science and it is impossible to write a field guide without liberally depending upon the work of others. The entries in this field guide are to be considered edited because they are compilations of other descriptions. In compiling entries, multiple sources were used to get the best description for field identification. In most cases, language was used that is directly from the work of others. The frequency in which editorial choices were made renders in-text attribution impossible due to space limitations. Please consider this list for further consultation and as a complete listing of those resources utilized in the editing of this volume. Any errors are the editors and you have our apologies.

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Web resources

The single best online resource for collections information in Arizona is the Southwest Environmental Information Network. This website is a digital archival project of all the herbariums in Arizona with a searchable database, plant photos, descriptions, and distribution data.

http://seinet.asu.edu/seinet/index.php

SEINet is also an online repository for NPS checklists from this and other public lands in the region. All these lists are associated with all known collections found on NPS lands and include photographs and interactive keys to help identify plants. Visit the NPS Flora page at:

http://swbiodiversity.org/seinet/projects/index.php?proj=5

Plant etymology information is drawn from:
Charters, Michael L. 2003-2008 California Plant Names.

http://www.calflora.net/botanicalnames/index2.html

Most ethnobotanical information is drawn from:
Moerman, Daniel. 2003. Native American Ethnobotany.

http://herb.umd.umich.edu/

eFloras is the portal to the online Flora of North America. The site is also a link to many other useful floras.

http://www.efloras.org

Nomenclature and synonymy come from these sources:

Tropicos: http://www.tropicos.org
The Plant List: http://www.theplantlist.org
Integrated Taxonomic Information System: http://www.itis.gov
USDA Plants DB: http://plants.usda.gov

Y

Casa Grande Ruins NM Plant Checklist

This park checklist is part of the Flora of the Sonoran Desert Network, a project of the Vegetation Mapping program at the Sonoran Desert Network (http://science.nature.nps.gov/im/units/sodn).

This checklist has been derived from baseline inventory data, herbarium records, the phylogenetic and ecological literature, and agency study records. All non-native species are in bold. Voucher status codes: X = voucher in regional herbaria, O = observed in park, U = unconfirmed

		Voucher Status
Amaranthaceae		
Atriplex canescens (Pursh) Nutt.	fourwing saltbush	X
Atriplex elegans (Moq.) D. Dietr.	wheelscale saltbush	X
Atriplex polycarpa (Torr.) S. Watson	cattle saltbush	U
Chenopodium murale Linnaeus	nettleleaf goosefoot	X
Monolepis nuttalliana (J.A. Schultes) Greene	Nuttall's povertyweed	X
***Salsola tragus* Linnaeus**	**prickly Russian thistle**	**X**
Suaeda nigra (Raf.) J.F. Macbr.	Mojave seablite	X
Apiaceae		
Bowlesia incana Ruiz & Pavon	hoary bowlesia	X
Apocynaceae		
Funastrum cynanchoides (Decne.) Schlechter	fringed twinevine	X
***Nerium oleander* Linnaeus (not treated)**	**oleander**	**O**
Asparagaceae		
Dichelostemma capitatum ssp. *capitatum* (Benth.) Wood	bluedicks	X
Asteraceae		
Acourtia nana (A. Gray) Reveal & King	dwarf desertpeony	X
Ambrosia deltoidea (Torr.) Payne	triangle burr ragweed	U
Ambrosia dumosa (A. Gray) Payne	burrobush	U
Ambrosia psilostachya DC.	Cuman ragweed	O
Aphanostephus ramosissimus var. *humilis*	plains dozedaisy	X
Arida arizonica (R. C. Jackson & R. R. Johnson) D. R. Morgan & R. Hartmann	arid tansyaster	X
Baccharis sarothroides A. Gray	desertbroom	X
Baileya multiradiata Harvey & A. Gray ex A. Gray	desert marigold	X
Calycoseris wrightii A. Gray	white tackstem	X
***Centaurea melitensis* Linnaeus**	**Maltese star-thistle**	**U**
Conyza canadensis (Linnaeus) Cronq.	Canadian horseweed	U
Diaperia verna Raf.	spring pygmycudweed	X
Dimorphotheca sinuata DC.	glandular cape marigold	U
Encelia farinosa A. Gray ex Torr.	brittlebush	X
Erigeron divergens Torr. & A. Gray	spreading fleabane	X
Eriophyllum lanosum (A. Gray) Rydb.	white easterbonnets	X

Geraea canescens Torr. & A. Gray	hairy desertsunflower	X
Helianthus annuus Linnaeus	common sunflower	X
Heterotheca subaxillaris (Lam.) Britt. & Rusby	camphorweed	X
Isocoma acradenia (Greene) Greene	alkali goldenbush	X
Isocoma pluriflora (Torr. & A. Gray) Greene	southern goldenbush, Jimmyweed	U
Lactuca serriola Linnaeus	prickly lettuce	U
Laennecia coulteri (A. Gray) Nesom	conyza	X
Laennecia schiedeana (Less.) Nesom	pineland marshtail	X
Lasthenia californica DC. ex Lindl.	California goldfields	X
Logfia arizonica (A. Gray) Holub	Arizona cottonrose	X
Machaeranthera tanacetifolia (Kunth) Nees	tanseyleaf tansyaster	X
***Matricaria discoidea* DC.**	**disc mayweed**	**X**
Pectis papposa Harvey & A. Gray	manybristle chinchweed	X
***Sonchus asper* (Linnaeus) Hill**	**spiny sowthistle**	**X**
***Sonchus oleraceus* Linnaeus**	**common sowthistle**	**X**
Stephanomeria pauciflora (Torr.) A. Nelson	brownplume wirelettuce	X
Verbesina encelioides (Cav.) Benth. & Hook. f. ex A. Gray	golden crownbeard	X
Verbesina encelioides ssp. *exauriculata* (Cav.) Benth. & Hook. f. ex A. Gray	golden crownbeard	X

Boraginaceae

Amsinckia menziesii var. intermedia (Lehm.) A. Nelson & J.F. Macbr.	common fiddleneck	X
Amsinckia tessellata A. Gray	bristly fiddleneck	X
Cryptantha angustifolia (Torr.) Greene	Panamint cryptantha	X
Cryptantha barbigera (A. Gray) Greene	bearded cryptantha	X
Emmenanthe penduliflora Benth.	whisperingbells	X
Eucrypta micrantha (Torr.) Heller	dainty desert hideseed	X
Heliotropium curassavicum Linnaeus	salt heliotrope	X
Lappula occidentalis (S. Watson) Greene	flatspine stickseed	X
Nama demissa A. Gray	purplemat	X
Nama hispida A. Gray	bristly nama	X
Pectocarya heterocarpa (I.M. Johnston) I.M. Johnston	chuckwalla combseed	X
Pectocarya platycarpa (Munz & Johnston) Munz & Johnston	broadfruit combseed	X
Phacelia crenulata Torr. ex S. Watson	cleftleaf wildheliotrope	X
Phacelia distans Benth.	distant phacelia	X
Plagiobothrys arizonicus (A. Gray) Greene ex A. Gray	Arizona popcornflower	X

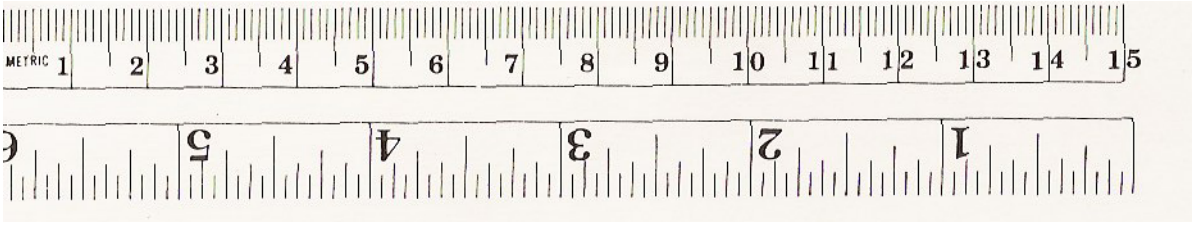
Brassicaceae

***Brassica tournefortii* Gouan**	**Asian mustard**	**X**
Descurainia pinnata (Walt.) Britt.	western tansymustard	X
Descurainia sophia (Linnaeus) Webb ex Prantl	herb sophia	U
Lepidium lasiocarpum Nutt.	shaggyfruit pepperweed	X
Physaria gordonii (A. Gray) O'Kane & Al'Shehbaz	gordon bladderpod	X

Physaria tenella (A. Gray) O'Kane & Al'Shehbaz	Moapa bladderpod	X
Sisymbrium irio Linnaeus	London rocket	X
Cactaceae		
Carnegiea gigantea (Engelm.) Britt. & Rose	saguaro	O
Ferocactus wislizeni (Engelm.) Britt. & Rose	candy barrelcactus	X
Peniocereus greggii (Engelm.) Britt. & Rose	nightblooming cereus	U
Cucurbitaceae		
Cucurbita digitata A. Gray	fingerleaf gourd	X
Ephedraceae		
Ephedra trifurca Torr. ex S. Watson	longleaf jointfir	U
Euphorbiaceae		
Euphorbia albomarginata (Torr. & A. Gray) Small	whitemargin sandmat	X
Euphorbia capitellata (Engelm.) Millsp.	head sandmat	X
Euphorbia micromera (Boiss. ex Engelm.) Wooton & Standl.	Sonoran sandmat	X
Euphorbia polycarpa (Benth.) Millsp. ex Parish	smallseed sandmat	X
Fabaceae		
Acmispon humistratus (Benth.) D.D. Sokoloff	foothill deervetch	X
Acmispon strigosus (Nutt. ex Torr. & A. Gray) Brouillet	strigose bird's-foot trefoil	X
Astragalus didymocarpus Hook. & Arn.	dwarf white milkvetch	X
Calliandra eriophylla Benth.	fairyduster	X
***Canavalia ensiformis* (Linnaeus) DC.**	**wonderbean (not treated)**	**X**
Lupinus sparsiflorus Benth.	Coulter's lupine	X
Medicago polymorpha Linnaeus	burclover	X
Melilotus indicus (Linnaeus) All.	annual yellow sweetclover	X
Parkinsonia florida (Benth. ex A. Gray) S. Watson	blue paloverde	U
Parkinsonia microphylla Torr.	yellow paloverde	X
Prosopis glandulosa Torr.	honey mesquite	U
Prosopis velutina Wooton	velvet mesquite	O
Senegalia greggii (A. Gray) Britton & Rose	catclaw acacia	X
Geraniaceae		
***Erodium cicutarium* (Linnaeus) L'Hér. ex Ait.**	**redstem stork's bill**	**X**
Erodium texanum A. Gray	Texas stork's bill	X
Krameriaceae		
Krameria erecta Willd. ex J.A. Schultes	littleleaf ratany	U
Krameria grayi Rose & Painter	white ratany	X

Lamiaceae		
Salvia columbariae Benth.	chia	X
Teucrium cubense ssp. *densum*(Jacq.) Jeps.	small coastal germander	X
Loasaceae		
Mentzelia multiflora (Nutt.) A. Gray	Adonis blazingstar	X
Malvaceae		
Malva parviflora Linnaeus	cheeseweed mallow	X
Sphaeralcea ambigua A. Gray	desert globemallow	X
Sphaeralcea coulteri (S. Watson) A. Gray	Coulter's globemallow	X
Sphaeralcea emoryi Torr. ex A. Gray	Emory's globemallow	X
Sphaeralcea laxa Wooton & Standl.	caliche globemallow	U
Sphaeralcea orcuttii Rose	Carrizo Creek globemallow	U
Nyctaginaceae		
*Boerhavia coccine*a P. Mill.	scarlet spiderling	U
Onagraceae		
Chylismia claviformis ssp. *peeblesii* (Munz) W.L. Wagner & Hoch	Peebles' browneyes	X
Oenothera caespitosa ssp. *marginata* (Nutt. ex Hook. & Arn.) Munz	tufted evening-primrose	X
Oenothera primiveris A. Gray	desert evening-primrose	X
Orobanchaceae		
Castilleja exserta ssp. *exserta*	exserted Indian paintbrush	X
Papaveraceae		
Argemone pleiacantha ssp. *pleiacantha*	southwestern pricklypoppy	X
Corydalis curvisiliqua ssp. *occidentalis* Engelm.	scrambled eggs	X
Eschscholzia californica ssp. *mexicana* (Greene) C. Clark	California poppy	X
Plantaginaceae		
Plantago ovata Forsk.	wesert Indianwheat	X
Poaceae		
Aristida purpurea Nutt.	purple threeawn	X
***Avena fatua* Linnaeus**	**wild oat**	**U**
Bromus carinatus Hook. & Arn.	California brome	X
***Bromus rubens* Linnaeus**	**red brome**	**X**
***Cenchrus ciliaris* Linnaeus**	**buffelgrass**	**U**
***Cynodon dactylon* (Linnaeus) Pers.**	**Bermudagrass**	**X**
***Eragrostis lehmanniana* Nees**	**Lehmann lovegrass**	**U**
Festuca octoflora Walter	sixweeks fescue	X
***Hordeum murinum* ssp. *glaucum* (Steud.) Tzvelev**	**smooth barley**	**X**
***Hordeum murinum* ssp. *leporinum* (Link) Arcang.**	**lepor barley**	**X**
***Hordeum vulgare* Linnaeus**	**common barley**	**U**
Phalaris minor Retzius	littleseed canarygrass	X
Poa bigelovii Vasey & Scribn.	Bigelow's bluegrass	X

Schismus arabicus **Nees**	**Arabian schismus**	**X**
Schismus barbatus **(Loefl. ex Linnaeus) Thellung**	**common Mediterranean grass**	**X**
Sorghum halepense **(Linnaeus) Pers.**	**Johnsongrass**	**U**
Polemoniaceae		
Eriastrum diffusum (A. Gray) Mason	miniature woollystar	X
Gilia scopulorum M.E. Jones	rock gilia	X
Polygonaceae		
Eriogonum fasciculatum Benth	eastern Mojave buckwheat	X
Polygonum argyrocoleon Steud. ex Kunze	silversheath knotweed	X
Polygonum aviculare Linnaeus	prostrate knotweed	U
Pteridaceae		
Cheilanthes wootonii Maxon	beaded lipfern	X
Ranunculaceae		
Delphinium parishii ssp. *parishii* A. Gray	Parish's larkspur	X
Delphinium scaposum Greene	tall mountain larkspur	X
Resedaceae		
Oligomeris linifolia (Vahl) J.F. Macbr.	lineleaf whitepuff	X
Salicaceae		
Salix gooddingii Ball	Goodding's willow	X
Santalaceae		
Phoradendron californicum Nutt.	mesquite mistletoe	X
Solanaceae		
Lycium andersonii A. Gray	water jacket	O
Lycium exsertum A. Gray	Arizona desert-thorn	X
Lycium fremontii A. Gray	Fremont's desert-thorn	X
Lycium torreyi A. Gray	squawthorn	X
Nicotiana glauca **Graham**	**tree tobacco**	**X**
Nicotiana obtusifolia Mertens & Galeotti	desert tobacco	X
Physalis acutifolia (Miers) Sandw.	sharpleaf groundcherry	X
Tamaricaceae		
Tamarix chinensis **Lour.**	**fivestamen tamarisk**	**X**
Zygophyllaceae		
Larrea tridentata (Sessé & Moc. ex DC.) Coville	creosote bush	X
Tribulus terrestris **Linnaeus**	**puncturevine**	**O**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Plants of Casa Grande Ruins National Monument

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National Park Service

Sonoran Desert Network
Inventory and Monitoring Program

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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