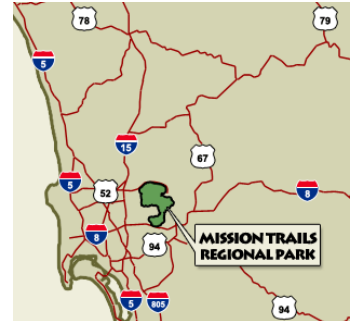


Mission Trails Regional Park

Name _____

Section _____

Mission Trails Regional Park encompasses nearly 5,800 acres of both natural and developed recreational acres. Its rugged hills, valleys and open areas represent a San Diego prior to the landing of Cabrillo in San Diego Bay in 1542.



Centrally located and only eight miles northeast of downtown San Diego, Mission Trails Regional Park provides a quick, natural escape from the urban hustle and bustle.

Mission Trails Regional Park has been called the third Jewel in the City of San Diego Park System. Along with Balboa Park and Mission Bay, it provides San Diego residents and visitors a way to explore the cultural, historical, and recreational aspects of San Diego.

Started in 1974, Mission Trails Regional Park has become one of the largest urban parks in the United States. Originally used by the Kumeyaay, the park is the site of the Old Mission Dam, built to store water for the Mission San Diego de Alcalá.

Old Mission Dam

This is a nationally registered historic landmark and a starting point for hikes into Oak Canyon, the East Fortuna Mountain region, or along Father Junipero Serra Trail and the San Diego River. This is an excellent area for bird watching and just relaxing. The pathway to the San Diego River is wheelchair accessible. There are informational displays and touchable models of the dam and surrounding terrain. An audiotape tour is available from the Visitor and Interpretive Center. Father Junipero Serra Trail and the Old Mission Dam parking lot are open 8:00 a.m. to 5:00 p.m. from November 1 through March 31, and 8:00 a.m. to 7:00 p.m. from April 1 through October 31.



Coastal Sage Scrub Plants

These plants are short (seldom taller than 15 feet), woody, with broad leathery leaves that are thick and covered with wax. The waxy leaf surface reduces water loss, particularly during the long, hot, dry summers. Due to the long, dry season the chaparral is especially prone to fire and is dependent on it for continued growth and reproduction. The deeply penetrating roots are protected from surface fires and many plant species have underground burls from which stump sprouting occurs. The seeds of many species require high temperatures before germination can take place.



Slope exposure affects plant distribution with the south-facing and west-facing slopes being hotter and drier. Unrelated plants of a specific site may appear similar to one another because of similar environmental adaptations. One often has to look at more discrete differences to identify the plants.

1. **California Sagebrush** (*Artemisia californica*)

California sagebrush is about three feet in height, and can be recognized by numerous gray-green leaves which are usually about one inch in length and very narrow.

Take a small leaf and crush it in your hand and describe the smell.



2. **California Buckwheat** (*Eriogonum fasciculatum*)

The California buckwheat is found on dry, rocky hillsides and mesas at lower elevations. It is a low-growing shrub with numerous spreading branches bearing small leaves in fascicles (bundles). The needle-like leaves are green on the upper surface and whitish on the lower surface. The tiny white-to-pinkish flowers are in clusters at the tips of leafless branches. Old flowers turn brown, giving the plant a rusty appearance. Buckwheats are important bee plants. The leaves and flowers were used by the Indians for a variety of medicinal purposes.



3. **Lemonade Berry** (*Rhus integrifolia*)

The lemonade berry is found in association with scrub oak and toyon. The reddish, flat fruits can be boiled or soaked in water to produce a sour-tasting beverage. Note that the leaves appear to be thicker and larger than the leaves of the scrub oak. Fine serrations on the margin of the leaf are usually present.

How did this plant become known as Lemonade Berry?



4. **Toyon** (*Heteromeles arbutifolia*)

The toyon is a large shrub or small tree with long narrow leaves which are dark green in color. Note the finely toothed (serrated) margin of the leaf. Clusters of red berries produced in winter at the tips of the branches are consumed by coastal birds. Complete the following table by comparing the leaves of the scrub oak, lemonade berry, holly-leaf cherry, laurel sumac, and toyon. Sometimes referred to California Holly because of its bright red berries, this plant became the source of a now famous community in the northern part of Los Angeles where the rich and famous live.



The name of the famous community is _____.

5. **Mountain Mahogany** (*Cercocarpus betuloides*)

Mountain mahogany is found in the chaparral on dry slopes below 6,000 feet. This medium to large shrub is characterized by smooth gray bark and dark green foliage. The ovoid leaves are about an inch in length and serrate at the tip. Note the distinctness of the veins on the lower leaf surface. The mountain mahogany is often confused with the wild lilac because of its similar growth form. Compare the leaves of mountain mahogany with buckbrush or cupleaf lilac.



The distinctive fruit can be recognized by an elongate, feathery projection. The bark has been used as a flavoring for tea and as a cure for respiratory problems. A reddish dye is produced from the root and bark.

6. **Laurel Sumac** (*Malosma laurina*)

This medium-sized shrub, common in the canyons and mesas, is often found in association with the chamise and, at lower elevations, the yerba santa. Examine the leathery leaves of a representative of this species, noting their long, pointed, folded, and slightly curled shape. Young spring growth appears reddish in color. Clusters of white flowers at the tips of the branches are favorite sources of nectar for bees.



What is the adaptive advantage of the curled and folded leaf? _____

7. **Black Sage** (*Salvia mellifera*)

The aromatic black sage grows to about four feet in height, but is much more shrubby in appearance than the previously described species. The medium-green leaves are about two inches in length, about half the size of the leaves of the white sage. The leaves also appear quite roughened on the upper surface. It grows on dry hillsides and mesas below 2,000 feet, often in association with more dry adapted chaparral species. Like the white sage, this species is also an important source of nectar for the manufacture of honey.

Describe the leaf arrangement and shape of the stem of Black Sage.

Leaf Arrangement _____

Stem Shape _____



8. **White Sage** (*Salvia apiana*)

White sage is characteristic of drier hillsides and mesas below 5,000 feet from the coast to the desert margin. This strongly aromatic, rounded shrub is readily recognized by its oblong, whitish, opposite leaves that are covered by tiny hairs.

The white flowers, often tinged with lavender, are about 3/4 of an inch in length and loosely grouped on long erect branches. All other California sages have the flowers in dense clumps or clusters on the stems.

Squeeze a leaf sample and describe the smell. _____

What does Black Sage and White Sage have in common (look at the foliage).



9. **Coyote Bush** (*Baccharis pilularis*)

This shrub is a member of the Coastal Sage Scrub that has large showy leaves as compared to Chaparral Broom. Although smaller in height than the former, it is often referred to as Dwarf Chaparral Broom. It is a fall bloomer, showing flowers from September through January.



How do the leaves of Coyote Bush compare with the leaves of Chaparral Broom?

10 **Chaparral Broom** (*Baccharis sarothroides*)

Representatives of this species are characteristic of sandy washes and dry mesas at lower elevations in the coastal sage scrub. This woody-stemmed shrub with broom-like branches often appears leafless after flowering in the summer and early fall.



11. **Coastal Prickly Pear** (*Opuntia littoralis*)

The joints of the prickly pear cactus are flattened into pads that usually bear well-developed spines. The thick waxy cuticle on the surface of the pad reduces water loss from the plant surface. The cacti spines may repel grazers, intercept the sun's rays, create shadows on the stem, and serve as collection sites for droplets of water falling to the ground around the cactus. The typical coastal prickly pear will form a clump two or three feet high and several feet in diameter. The pads are usually about seven inches long and three to four inches in width. Bright yellow flowers about three inches in diameter are produced in the early summer. Purple fruit about one and one-half inches in length can be peeled and eaten raw or boiled to make syrup for jelly and candy. The pads can be stripped of their spines and boiled or pickled. Split pads have also been used as a poultice for wounds.



Is prickly pear cactus a cane cactus, a pad cactus, or barrel cactus?

A part of the cactus can be eaten. What part of the plant would be eatable? _____

12. Coastal Cholla (*Opuntia prolifera*)

Cholla cacti are characterized by cylindrical stems several inches in diameter. Coastal cholla is common in lower elevations along the coast. It usually attains a height of about three or four feet. The succulent stem is jointed; each joint is characterized by small bumps that bear very sharp spines located in specific regions called areoles. Note the absence of leaves, although they may occur in immature plants. The stem joints are easily detached and often root to form new plants.



Reddish flowers about one inch in diameter are produced in late spring. The greenish fruit may remain on the plant for several years, with additional fruit and flowers produced by the retained fruit.

13. Fuchsia-flowered Gooseberry (*Ribes speciosum*)

This spiny-branched shrub grows to a height of about six feet. It is usually found in protected canyons below 1500 feet. The gooseberry has leaves that are shiny green on the upper surface and paler on the lower surface. The leaves are about one inch wide and exhibit a three-lobed margin. The bright red fuchsia-like flowers are about two inches long.



Subshrubs

1. **Bush Sunflower** (*Encelia californica*)

Bush sunflower is a yellow-flowered perennial common to the coastal bluffs and mesas to about 2,000 feet in elevation. The flowers have yellow rays with a dark purple disc and are about 2 ½ inches in diameter. The oval to elongate leaves are about 2 inches long and half as wide. California *Encelia* flowers in the spring from March through June.



2. **San Diego Sunflower** (*Bahiopsis laciniata*) old genus (*Viguiera*)

A common perennial shrub in the coastal scrub vegetation, the yellow flowers are showy in the late spring into summer. The petals are yellow similar to Bush Sunflower but the center disc is not purple but yellow.



The leaves of the two sunflowers are distinctly different. Compare the leaves of Bush Sunflower with that of San Diego Sunflower.

Bush Sunflower Leaves _____

San Diego Sunflower Leaves _____

3. **Bush Monkeyflower** (*Mimulus aurantiacus*)

This semiwoody plant is common in the area. The leaves are sticky and dark green. The flowers vary in color from dark red to orange to almost yellow in color. The flowers are unusual in that they have a split stigma which responds to touch. It will close down on an insect's body to pull off and pollen that might be available.



Touch the stigma of monkeyflower and describe the action of the split parts.

Common Spring Plants (check off the species seen)

 <p>Bird's Foot Fern</p>	 <p>Blue Dicks</p>	 <p>Borrego Bedstraw</p>
 <p>California Bee Plant</p>	 <p>California Blackberry</p>	 <p>California Suncups</p>
 <p>California Croton</p>	 <p>Common Phacelia</p>	 <p>Field Mustard</p>



Miner's Lettuce



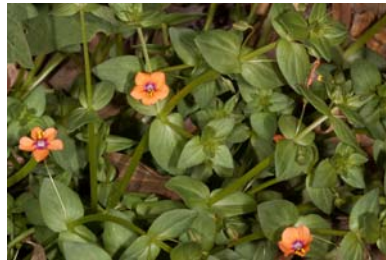
Hore-hound



Yellow Sweet Clover



Miniature Lupine



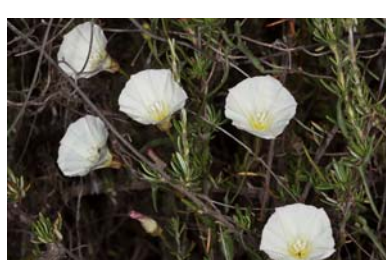
Scarlet Pimpernel



Storksbill



Spiny Redberry



Western Bindweed



Grab Lotus



California Rose



Golden-top Grass



Italian Thistle

Commonly Seen Mammals



Coyote



Mule Deer



Ground Squirrel



Brush Rabbit

Birds of Mission Trails (Check off the birds seen.)



Bell's Vireo



Yellow-breasted Chat



Black Phoebe



Hooded Oriole



Common Yellowthroat



Lesser Goldfinch



House Finch



Northern Mockingbird



Tree Swallow



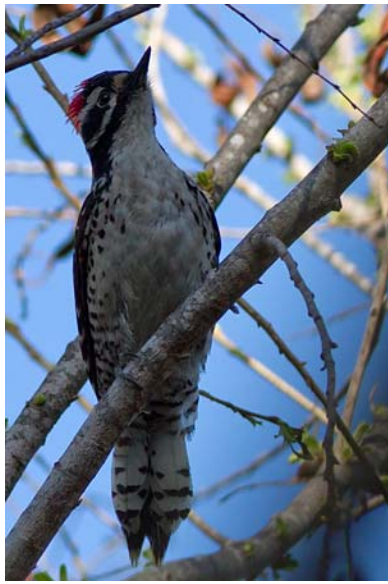
California Gnatcatcher



Spotted Towhee



California Thrasher



Nuttall's Woodpecker



Ash-throated Flycatcher



Say's Phoebe



Phainopepla



California Towhee

Reptiles - Common Lizards of Mission Trails

Check off the lizards seen.



Common Side-blotched Lizard



Western Fence Lizard



Alligator Lizard



Granite Spiny Lizard



Orange Throated Whiptail



Tiger Whiptail

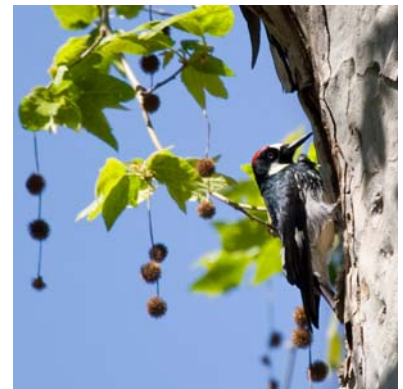
COASTAL RIPARIAN COMMUNITY (Stream)



1. **California Sycamore** (*Platanus racemosa*)

Sycamores are found below an elevation of 4,000 feet along stream beds and water courses. This large tree grows to a height of about 75 feet and has an irregularly rounded crown. The multi-branched trunk is characterized by a patchy, scaly bark that is usually whitish in color and easily peels from the trunk. The large deciduous leaves are palmately five-lobed and light green in color.

The leaves usually feel slightly woolly, particularly on the lower surface. The rounded, one-inch fruit is easily recognized by its spiny appearance.



2. **Cottonwood** (*Populus fremontii*)

Cottonwoods are also members of the willow family. This deciduous tree grows to a height of 40-90 feet and has a trunk diameter of two to five feet. The thick bark is deeply furrowed and dark in color on an old tree. The crown is open and broad. The bright green leaves are almost triangular in shape and about three inches in width. The margin of the leaf is coarsely toothed and the apex is sharply pointed. The catkins are about two inches in length. The seeds are attached by cottony hairs and are easily carried by the wind. Cottonwoods are usually found below 6500 feet in stream-side or moist valley habitats from the coast to the desert.



3. **Coast Live Oak** (*Quercus agrifolia*)

This evergreen oak grows in valleys and on semi-dry foothills below 3,000 feet. It grows to a height of about 75 feet. The crown is quite rounded and the thick trunk is usually dark gray in color and smooth, although very old trees may exhibit slightly roughened bark. The oval leaves are usually about two inches long and slightly less in width. They are cupped (convex on the upper surface), leathery and spiny. The upper surface is dark green and the lower surface is paler and finely pubescent. The slender acorns produced every fall are about 1 to 1 ½



inches in length.

4. **Blue Elderberry** (*Sambucus mexicana*)

The blue elderberry varies in size from a large shrub to a small tree. The pinnate leaf is divided into leaflets that usually number three to five, are finely toothed on the margin, and are about three inches in length. The small white flowers form a broad cluster at the tip of the branch. The berries are usually bluish in color. This species of elderberry is usually found below 4500 feet in flats and valleys. A related species (*S. coerulea*) with five to nine leaflets is found in higher elevations in the coniferous forest.



The berries are used for making wine, jelly and pies. The Indians used the branches for arrow shafts and ate the fruit fresh or dried and stored it. They used other parts of the plant for medicinal purposes.

5. **Mule Fat** (*Baccharis glutinosa*)

The mule fat is a woody-stemmed shrub found along the moist stream-side habitat below 3500 feet. It grows to a height of about 10 feet. The leaves are usually about three inches long, sparsely toothed on the leaf margin, and sharply pointed at the tip. Many small whitish flower heads are produced at the ends of the branches.



6. **Arroyo Willow** (*Salix* sp.)

A number of species of willow are found in moist habitats along ponds and streams in the coastal area, although they range from sea level to the alpine slopes of the western mountains. Willows can be recognized by their alternate narrow leaves and short stems. The leaves are usually much longer than broad, and smooth on the leaf margin. The sexes are separate and the flowers are borne in separate catkins (spikes of small flowers), which are about two inches long. Willows range in size from large shrubs to medium-sized trees. They tend to form dense thickets and are used in many states for erosion control. The stems are often used in basketry.



THE GRASSLAND COMMUNITY



Originally our grasslands consisted mostly of perennial species such as needle grass, melica, wild rye, native bluegrass, and deer grass, along with a variety of legumes, sunflowers, and annual wild flowers. The following species represent examples of native and introduced grasses, and non-grass members typical of the grasslands and the southern oak woodland.

1. **Wild Oats** (*Avena fatua*)

Hillsides covered with wild oats have become symbolic of southern California grass-lands, even though this species was introduced at an early date from temperate areas of Europe and Asia. Oats is an annual with tall, weak stems and flat blades, and is closely related to commercial varieties of oats.



2. **Slender Wild Oats** (*Avena barbata*)

Similar to Wild Oats above except the spikelets are not bent and the Wild Oats spikelets are.



3. **Red Brome** (*Bromus rubens*)

This is an abundant, weedy species which, along with a close relative the ripgut grass, has a notorious reputation for causing mechanical injury to the mouthparts and eyes of grazing animals. The spikelet, a part of the typical flowering structure of a grass, possesses barbed parts in this species that facilitate the ease of its entry and difficulty of removal from victims. The red brome is a relatively short annual grass that becomes reddish late in the season.



4. **Ripgut Brome** (*Bromus diandrus*)

A common naturalized grass, with flattened spikelets of seeds, often getting into your clothes as you walk through the 2 foot tall grasses.



List the grassland Forbs found (non grasses)

1. _____
2. _____
3. _____
4. _____

Plants of Mission Trails

Indicate with a check mark the habitat of the following plants. In the blank spaces write down any plants not included in the list.

Plant	Coastal Sage Scrub	Riparian	Grassland
Arroyo Willow			
Black Sage			
Blue Elderberry			
Bush Monkeyflower			
California buckwheat			
California sagebrush			
California Sunflower			
California Sycamore			
Chaparral Broom			
Coast Live Oak			
Coastal Prickly Pear			
Cottonwood			
Coyote Bush			
Laurel Sumac			
Lemonade Berry			
Mountain Mahogany			
Mule Fat			
Red Brome			
Ripgut Brome			
Slender Wild Oats			
Toyon			
White Sage			
Wild Oats			

Summary of Birds of Mission Trails

Bird	Coastal Sage Scrub	Riparian	Grassland
Bell's Vireo			
Yellow-breasted Chat			
House Sparrow			
Hooded Oriole			
Common Yellowthroat			
Lesser Goldfinch			
House Finch			
Northern Mockingbird			
Blue-gray Gnatcatcher			
California Gnatcatcher			
Spotted Towhee			
California Thrasher			
Nuttall's Woodpecker			
Ash-throated Flycatcher			
Say's Phoebe			
Black Phoebe			
Phainopepla			
California Towhee			

Summary of Lizards of Mission Trails

Species	Coastal Sage Scrub	Riparian	Grassland
Side-blotched Lizard			
Western Fence Lizard			
Alligator Lizard			
Granite Spiny Lizard			
Orange Throated Whiptail			
Tiger Whiptail			

Summary

Term	Definition	Example
alien/exotic/nonnative/introduced	species that did not evolve in the region	
endemic/native	species that evolved in the region	
naturalized	nonnative species that are entrenched in the natural system so that they now constitute what is considered “natural” (ex: annual grasses in California)	
annual grass	grasses that complete their life cycle (from seed to seed) in one year.	
perennial grass (bunchgrass)	grasses that live more than one year, tend to have a clumped appearance due to annual regrowth	
convergent evolution	species that are not necessarily closely related may appear very similar if similar environmental conditions cause them to evolve similarly, i.e. to converge in their features (ex: to have small leaves)	
divergent evolution	closely related species may diverge in appearance or other features if they evolved in very different environments (ex: leaf size may vary)	
ecotone	transitional area between two vegetation types ex: mixed grassland/shrubland transitional area	

fire adapted	species that are evolutionarily adapted to survive fire, may even depend on fire	
forb	herbaceous vegetation other than grasses (ex: a dandelion)	
invasive	nonnative species that spread aggressively into natural areas	
resprouter	a shrub that resprouts quickly after fire, frequently found in chaparral and coastal sage scrub (but not all shrubs in these systems are resprouters)	
riparian	vegetation growing along the banks of a stream or river, a type of wetland vegetation	
shrubland/scrub	typical Mediterranean climate vegetation, dominated by shrubs, low moisture system, various types	
rush	a grasslike plant characterized by a filled stem (grasses have hollow stem) and no nodes	Draw Cross-section
sedge	a grasslike plant characterized by triangular leaves and no nodes	Draw Cross-section
upland	vegetation types a higher altitude than wetlands, typically shrublands or grasslands in this region	

Answer the following Questions:

Typical features of coastal sage scrub plants are:

Typical features of riparian habitat plants are:

Which grassland type (annual or perennial) is native to California?

Which grassland type (annual or perennial) is naturalized in California?

Describe one way in which plants in the coastal sage scrub plants are adapted to fire.

What types of plants and animals – riparian, grassland, other? - would you expect to find in an ecotone?