Wildlife Biology at Hi Mountain Lookout:

An Educator's Field Guide

by

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Riparian Health at Hi Mountain

Materials: John David Stuart and John O. Sawyer's *Trees and Shrubs of California*, field notebook or Riparian Zone Data Sheet, pen or pencil

Procedure: In the field, have students replicate the Riparian Zone Data Sheet in their field notebooks or pass out copies of the data sheet. Allow time for individual observations to be made about a selected region of riparian corridor and the immediate surroundings. Encourage students to think about the larger geographic area and make connections about the watershed in relation to the source of the watercourse.

Discussion: After observations are recorded, have the students share their findings. Discuss whether or not students believe this to be a healthy or unhealthy riparian community based on their data and by responding to the following questions.

Animals: What types of evidence were present? What animals were actually seen? What did they appear to be doing? Considering the proximity of the water, where was the animal or the evidence of the animal?

Vegetation: What plants were present? Was there a trend in the abundance or absence of plants as one approached the waterway? Was there any indication of abrasion on the vegetation in a particular area? What is a likely proportion of invasive plants to native plants in the area?

Soil: What do the soil characteristics imply about the riparian area? Does the substrate appear stable or unstable? Is the soil dark and fine, indicating a high nutrient content, or is it light in color and sandy, denoting that much of the nutrient content has been washed away? Was there an excessive sediment load anywhere along the riparian banks?

Watershed and Channel: What characteristics were noticed about the depth and width of the waterway? Was the waterway shaded? What is the likely extent of the watershed for this community? Can any hypotheses be made for the source of the water in this watercourse?

Riparian Zone Data Sheet

	Observations
Animals	
Vegetation	
Soil	
Watershed and Waterway	
Other	

The Chaparral Plant Community

The chaparral plant community is one of the most widespread communities in California. It is mostly restricted to steep dry slopes where soil fertility is poor. Waxes and resins present in chaparral vegetation accumulate in the soil litter layer and reduce the ground's permeability to rainfall. Chaparral communities experience relatively greater seasonal temperature fluctuations. The temperatures are higher in the summer and lower in the winter.

Needle leaf or broad leaf **sclerophyllous**, or hard leaf, shrubs and dwarf trees characterize chaparral vegetation. The dominant shrubs and trees of chaparral are long-lived plants with stiff and woody branches. The chaparral community is therefore often referred to as "hard chaparral." In contrast, "soft chaparral" pertains to the coastal scrub community, chaparral-like vegetation restricted to the coastal zone of California. Coastal scrub plants possess relatively soft textured stems and leaves with a majority of growth and reproduction occurring in winter and spring. "Hard chaparral" plants are mostly evergreen with growth and reproduction taking place in summer months.

A few plants in the chaparral community, though, are known as **summer deciduous**. The leaves of this type of vegetation are seasonally dropped as a mechanism to cope with the dry, hot weather associated with summer months. By shedding leaves plant photosynthesis is reduced and moisture loss is minimized during a time when water is scarce.

In mature chaparral stands with an interlaced continuous canopy herbaceous undergrowth is commonly nonexistent. The establishment of seedlings is difficult when undecomposed litter accumulates and dense shade is cast on the soil surface. Resins, waxes, and other chemicals released from living plants or from decomposing foliage may also be present in the soil. This

condition, known as **allelopathy**, reduces seed germination and seedling development. Also, herbivores foraging in the cover provided by the shrub canopy are subject to consume any seedlings attempting to become established. In chaparral that exhibits a discontinuous canopy herbaceous species form a sparse understory characteristic of grasslands.

Resinous foliage, woody stems, accumulated litter and standing dead branches make chaparral communities highly flammable and very subject to fire. Most chaparral species are **fire adapted**, though. That is, the plants have one or more features to become reestablished after fires or to actually survive fires. Thick, woody underground structures such as root-crowns, lignotubers, and basal burls are components of fire resistant species. On the other hand, adult species lacking these structures and unable to survive fires produce seeds that often retain viability for many years, and heat scarification greatly enhances germination rates of these species.

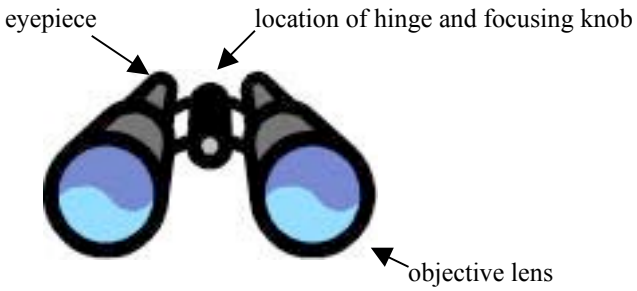
Bird Watching at Hi Mountain

Materials: one pair binoculars per student, National Geographic's *Field Guide to the Birds of North America*, Fourth Edition, field notebook or Birds at Hi Mountain worksheet, pen or pencil

Procedure:

Binocular Focusing:

1. According to the distance between the users eyes, push or pull on the two sides of the binoculars, so that they bend at the hinge, until one circular image is formed when viewing through the eyepieces.



2. Find the side of the binoculars, right or left, with the adjustable eyepiece. Close the opposite eye, i.e. if the adjustable eyepiece is on the side that the right eye looks into then close the left eye. While looking through the binoculars, adjust the focus for the open eye until the image that the user is viewing is in focus. Use the main focusing wheel, usually on the top of the binoculars near the hinge, to bring the view into focus as the user looks through the eyepiece.

3. Open both eyes and focus the adjustable eyepiece so that the image is clear in the eye that was previously closed. Note the position of the markings on this eyepiece so it can be reset if it is accidentally turned.

Bird Watching with Binoculars:

Once a bird is spotted it can often be a challenge for the amateur bird watcher to bring the binoculars up to the eyes while keeping track of the bird's position. This is a skill that becomes more natural with practice. It is important for the bird watcher's eyes to remain on the bird. With the bird in constant sight, raise the binoculars up to the eyes and they will automatically be pointed in the direction of bird.

Identifying Avian Species:

As the bird watcher is observing a bird it is important to recognize and record field marks, such as the color patterns, size, shape, habitat, vocalizations, and behaviors of the bird. Some or all of these characteristics are referenced in field guides and essential for identification of a species.

Colors and Patterns: It is important to note where a particular color is located on the body of the bird, i.e. the head, rump, breast, or in the wings. Patterns of color, such as bars, streaks, or spots, are very helpful in identification of a species.

Size: Comparing the size of an unknown bird to a more familiar bird, a crow or sparrow, for example, is beneficial for classifying the unfamiliar species.

Shape: Note the bird's overall body shape, i.e. slender, robust, or stocky. Discerning the shape of the head and the bill or beak is very useful in grouping a bird, such as a seedeater, insect catcher, or a hawk.

Habitat: Preference for specific feeding or nesting habitat varies among avifauna. It is helpful to recognize the type of plant community, chaparral or riparian, for example, in which the

bird is found. It is beneficial to notice where in the habitat the bird is located, as well, i.e. high in a tree, or on the ground.

Behavior: Describing the actions of a bird while observing it often reveals important clues to its classification. Note how the bird feeds, for example, using the beak to glean insects from leaves, or probe in the dirt. Be aware of how the species moves, such as hopping on the ground, or a "flap, flap, dip, flap, flap, dip" type of flight pattern.

Vocalizations: There are two types of vocalizations: calls and songs. Calls are brief, consisting of rarely more than four or five notes, and are used in coordinating behavior with individuals of the same species. Songs are more complex, consisting of groups of notes separated by pauses, and are associated with defense of territory and mating.

What's that bird?

by Nick Barber

[from A Bird's-Eye View, August 1998, Beginning Birding Special Issue]

http://www.birdsource.org/gbbc/learning/binocs.html

Birds at Hi Mountain

Date_____ Weather Conditions and Temperature_____

Common Name	Habitat	Description

Small Mammal Trapping at Hi Mountain

Materials: Sherman live traps, The Peterson Field Guide Series' *A Field Guide to the Mammals: North America north of Mexico*, Third Edition, flagging tape, oat and peanut butter bait, Pesola spring balance, small and large plastic bags, gloves, field notebook or Birds at Hi Mountain worksheet, pen or pencil, metric ruler, California Department of Fish and Game Collecting Permit (application obtained at http://www.dfg.ca.gov/licensing/pdffiles/fg1379e.pdf)

Procedure:

Setting the Trap Line:

1. As evening approaches, divide students into trapping groups. Each group should have at least three members: one designated the pacer, a second designated the baiter, and a third designated the flagger.

2. For each habitat, chaparral and riparian, establish several strait-line or meandering transects. The number of trap lines and traps per line will vary depending on the number of traps and students available.

3. The flagger first ties two pieces of flagging tape to a sturdy shrub or tree at the first capture station in the trap line while the baiter and pacer set the trap(s) (see Setting the Traps).

4. The pacer then walks a set number of paces, usually 20, to the next capture station. Set the trap(s) but do not tie up any flagging tape.

5. Next, the pacer paces the same set number of steps. Set the trap(s) while the flagger ties one piece of flagging tape to a tree or sturdy shrub at this capture station.

6. Repeat steps 3 and 4 until the end of the trap line.

7. At the last capture station, set the trap(s) as the flagger ties two final pieces of flagging tape to nearby sturdy vegetation.

Setting the Sherman Traps:

1. Unfold the Sherman trap and push down the front door until it catches on the treadle. In order for small rodents to trip the treadle set the trap lightly by bending the metal catch mechanism inside the trap so that the front door is barely being held down. If the trap is set lightly, the trap should spring when light tapping is applied to the roof.

2. Holding the trap vertically, with the open front end pointing up, drop the bait in so that it falls down to the back door (see "Baiting the Traps).

3. Level and clear debris from a spot on the ground with a sturdy shoe near likely places of animal activity such as bushes, rocks, an active runway, or any area that appears as good habitat for a small mammal. Also look for sites of disturbance, trampled vegetation or litter, for example, to place the trap. Set the trap down horizontally so that it is stable and won't rock or wobble in the event that an animal enters.

Baiting the Traps

In small mammal live trapping bait has two purposes: to sustain the animal while it is held captive in the trap, and to serve as an attractant for the animals, increasing the probability of capture. The types of bait used vary and depend largely on the species being trapped. The small mammals most likely to be trapped in the Hi Mountain riparian and chaparral habitats are rodents. Whole oats or peanut butter mixed with rolled oats is recommended for these species. The amount of bait placed in each trap should be sufficient to nourish a small rodent through the

night; at least one heaping tablespoon. Also, the designated baiter is encouraged to use the same single hand for each trap that is baited in order to reduce human odor present in the trap, possibly decreasing the chances for capture.

Checking the Trap Line:

1. With the pacer leading and retracing his/her steps, check the traps the following morning as early as possible to minimize trap stress and mortality for the animal.

2. If the trap door is closed:

    a) Pick up the trap and hold it vertically so the door points upward.

    b) Fold the open end of a plastic bag around the front end of the trap and hold it tightly with one hand.

    c) With the opposite hand, push the front door down until it catches on the treadle.

    d) Using both hands, slightly bend the trap frame so the door stays open and can't be tripped as the animal exits the trap

    e) Quickly invert the trap to release the species from the box into the plastic bag.

    f) Close off the bag and remove the trap.

    g) Record the appropriate data for the animal and release it in the same location as it was captured after all observations have been made (see "Using the Field Guide").

3. If the trap door is open, lightly tap the roof in order to close the door and prevent diurnal species from being caught in the trap and exposed to thermal stress.

4. Repeat steps 2 and 3 for each capture station in each trap line.

Identifying Small Mammalian Species

After a small mammal has been trapped, it is important to collect and record data, such as head-and-body length, tail length, weight, color patterns, habitat, sex and age. Some or all of these characteristics are referenced in field guides and essential for identification of a species.

Colors and Patterns: It is important to note where a particular color is located on the body of the small mammal, i.e. the dorsal color compared to the ventral color. Patterns of color, such as stripes, or spots, are very helpful in identification of a species.

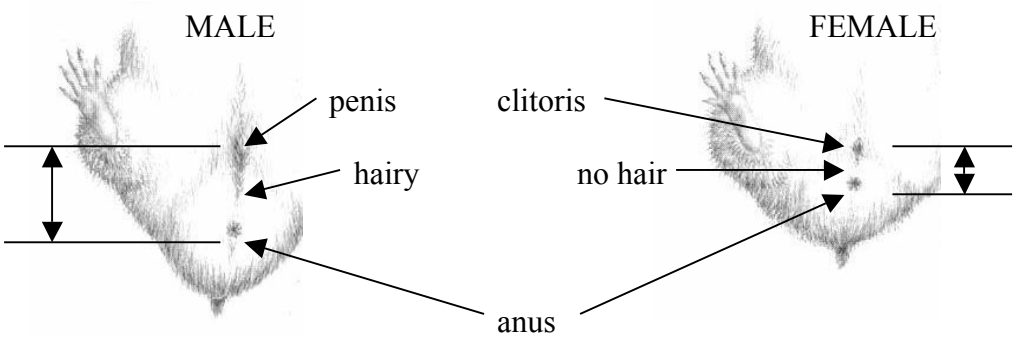
Length: A small mammal is defined as having a head-and-body length of less than a human's foot, 12-14 inches, or 300-350 millimeters (Roest, 2001). Species of small mammals can often be differentiated by comparing length ratios, for example, the length of the tail is four times the length of the hind legs.

Weight: A small mammal weighs less than two pounds, or about one kilogram (Roest, 2001). The weight of various small mammal species frequently overlaps, but the data should still be documented for record keeping purposes.

Habitat: Preference for specific feeding or nesting habitat varies among small mammals. It is helpful to recognize the type of plant community, chaparral or riparian, in which the animal is trapped. The location of a mammal reveals important clues to its classification, particularly with animals confined to limited sets of conditions; tree squirrels, for example, are restricted to wooded areas and desert woodrats to areas of low, scattered vegetation.

Sex: Lactating females with obvious nipples, or adult males with scrotal testes are simple to sex. Younger animals or non-breeding adults may not be so easy to sex. In many species of small mammals the clitoris of females is nearly as large as its homologue in males, the penis. The relative distance between the penis or clitoris and the anus will indicate sex, as the gap

between the anal and genital orifices is generally much smaller in a female than in a male (Roest, 2001). There is also hair in the gap between the penis and the anus; hair is absent between the clitoris and anus.



Age: Juvenile small mammals can be distinguished from adults by the lack of reproductive organs. Testes of young male mammals, for example, first develop in the body cavity, but descend into the scrotum, a skin pouch, as they reach maturity. Therefore, most adult males will have scrotal testes as opposed to abdominal testes. Reproductive adult females will have evident mammary glands, or nipples. Young animals are also often differently colored than adults. Juveniles tend to have a more washed out shade of the adult coloration. A molt line, an area of old hair being replaced with newly grown hair, may also be present across the back in maturing small mammals.

Camping at Hi Mountain Lookout

Hi Mountain Lookout volunteer coordinator, Steve Schubert, must be contacted at (805) 528-6138 or s_schub@webtv.net and informed of visitors before arriving at the Lookout. Visiting the Hi Mountain Condor Lookout Homepage on the internet at http://www.condorlookout.org/ is also recommended before traveling to the site.

Overnight field trips require significant planning, coordination, and student participation. Transportation to the site is inaccessible by bus. The dirt road that leads to the Lookout is rough, often steep, and crosses a small stream. Therefore, depending on your school's liability rules, student, parent, or faculty drivers with vehicles capable of clearing ten inches of water will be needed.

Students will be responsible for their own meals on the field trip. Lunch should be a no cooking meal, but be prepared for camp cooking at breakfast and dinner since the class will be camping out. It is helpful to form food groups of about six to eight people for meal planning. Members of a food group should plan to get together a few days in advance for field trip planning. Determine who will buy what food, who will prepare the food, who will acquire the necessary cooking implements, and other important details. All food supplies must be purchased in advance as there are no grocery stores near the site.

Since students will be camping out a sleeping bag, a pad, and a ground cloth will be needed at the very least. It can get chilly at night so warm clothing and a sleeping bag sufficient enough to keep warm is required on the trip.

A Field Trip Equipment Checklist is attached for the students' convenience. The list is provided in order to help prepare for the camping trip.

Field Trip Equipment Checklist

Required Items	*Optional Items*
Field Equipment	
- field notebook	- personally owned field guides
- field trip itinerary	
- pencils or pens	
- road map	
Camping Gear	
*Individual	
- sleeping bag	- pillow
- ground cloth/pad or air mattress	- blanket
- flashlight	- cot
- plate, cup, silverware	- wash basin
- water bottle	- tent
*Group	
- stove	- lantern
- matches	- fire wood
- fuel	
- cooking utensils	
- pots, pans	
- can opener	
- ice chest with ice	
Personal Gear	
*Clothes	
- pants	- gloves
- shirts	- stocking cap
- belt	- poncho or rain coat
- socks	- hat
- field shoes or boots	- sunglasses
- sweatshirt	
- jacket	
- underwear	
*Toiletries	
- toothbrush	- aspirin or aspirin substitute
- toothpaste	- band aids
- soap	- sunscreen
- washcloth and towel	
- comb or brush	
- toilet paper	
*Miscellaneous	
- wallet	- camera
- cash	- spare lenses
- pocket knife	- film
- keys	- binoculars

Driving Directions to Hi Mountain Lookout

The Lookout is approximately 60 minutes from San Luis Obispo. You will need enough auto clearance to cross a creek with about 10 inches of water. DRIVE SAFELY!! (Andreano, 2002)

1. Take US 101 from north or south to Santa Margarita, Highway 58 exit.
2. Drive through Santa Margarita and follow Highway 58 east toward Pozo (right at railroad tracks).
3. Continue on Highway 58 until it forks toward Santa Margarita Lake. Take the right fork, West Pozo Road and continue on West Pozo until you reach Hi Mountain Road (just before Pozo Saloon). There is a United States Forest Service (USFS) station to your left just as you turn onto Hi Mountain Road. Allow approximately 30 minutes from Santa Margarita.
4. Stay on Hi Mountain Road, it will become a graded dirt road, cross a creek, and begin to climb up toward the Lookout. Use extreme caution and drive slowly, many mountain bikers and OHV's use this road.
5. Before you reach Hi Mountain Campground, the road forks. Take the right fork and continue up the hill.
6. Approximately 1_ miles above the campground you will reach another split in the road. The USFS gate, and the Lookout entrance (Andreano, 2002).

Hi Mountain Lookout Field Trip Itinerary

Friday

4:00 pm Arrive at the Lookout and set up camp (i.e. unload gear, assemble tents, etc.).

4:30 pm As a class review "Setting the Trap Line," "Setting the Sherman Traps," and "Baiting the Traps" from Small Mammal Trapping at Hi Mountain. Split into two teams: the Chaparral Team and the Riparian Team. Travel to designated chaparral and riparian trapping areas, respectively, and set up traps.

7:15 pm Arrive back at the Lookout for dinner, socializing, and, eventually, sleeping.

Saturday

Be geared up and ready to check all trap lines as a class by 6:00 am. Equipment for the day's field activities and a sack lunch is required in order to be prepared.

6:00 am Review "Checking the Trap Line" from Small Mammal Trapping at Hi Mountain. Travel to each trapping area and check the Sherman traps that were set out the previous evening. Record data and observations in the worksheet Small Mammals at Hi Mountain.

9:30 am Review Bird Watching at Hi Mountain. Visit an area of riparian habitat (different than the one in which small mammal trapping occurred) and bird watch. Record data and observations in the worksheet Birds at Hi Mountain.

12:45 pm Locate a pleasant, shady area in the riparian area to sit down, have lunch, and relax.

1:30 pm Conduct the activity Riparian Health at Hi Mountain and follow up with the discussion. Review The Riparian Plant Community to reinforce the characteristics and attributes of a riparian zone.

2:45 pm Return to the Lookout for rest and relaxation.

4:00 pm Split class up into the same Chaparral Team and Riparian Team from the previous day. Travel to the respective communities to set and bait the Sherman traps.

6:00 pm Arrive back at the Lookout for dinner, socializing, and, eventually, sleeping.

Sunday

Be geared up and ready to check all trap lines as a class by 6:00 am. Equipment for the day's field activities and a sack lunch is required in order to be prepared.

6:00 am Travel to each trapping area and check the Sherman traps that were set out the previous evening. Record data and observations in the worksheet Small Mammals at Hi Mountain. Collect all traps as they are checked and after data and observations are recorded.

9:30 am Return to the Lookout to drop off equipment collected from trapping small mammal.

9:45 am Travel to a nearby chaparral community. Conduct the activity Chaparral Plant Adaptations and follow up with the discussion. Review The Chaparral Plant Community to reinforce the characteristics and attributes of a chaparral zone.

11:00 am Return to the Lookout to pack up camping gear and return home.

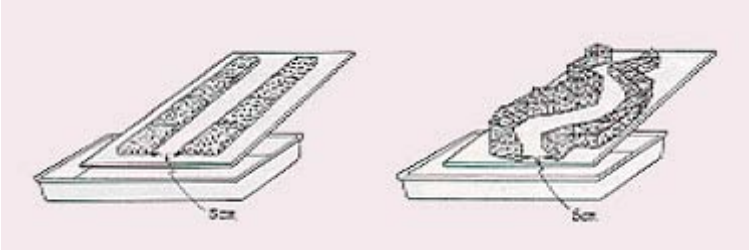
Riparian Health in the Classroom

Materials: measuring cup, several large sponges, cookie sheet, wide pan to accommodate the width of the cookie sheet, water, scissors

Procedure:

To simulate an unhealthy riparian zone, lay the dry sponges end to end for the length of the cookie sheet in two straight rows. Leave about five centimeters between the two rows of sponges. Place one end of the cookie sheet in the pan and hold the opposite end so that a low angle is formed. Slowly pour a cup of water down between the two rows of sponges lined up on the cookie sheet. Note how much water soaked into the sponges and measure the quantity of water that collected in the pan.

To simulate a healthy riparian zone, cut dry sponges into several pieces so that two continuous parallel rows can be laid on the cookie sheet with a series of curves. Leave about five centimeters between the two rows of sponges. Place one end of the cookie sheet in the pan and hold the opposite end so that an identical low angle is formed. Slowly pour a cup of water down between the two curving rows of sponges lined up on the cookie sheet. Note how much water soaked into the sponges and measure the quantity of water that collected in the pan.



Discussion:

A healthy riparian system will exhibit a meandering waterway that is conducive to greater water retention. Hearty and sturdy riparian banks act like giant sponges, soaking up slowly moving water through the course way and allowing it to percolate into the stream bottom. During periods of low water flow the banks and stream bottom serve as a reservoir and provide a buffer to riparian dependent plants and animals by releasing water.

Many riparian areas, however, have become damaged by cattle and sheep, logging and mining activities, road building, poor agricultural practices, removal of woody vegetation, pavement in urban areas, industrial use of streams, and recreation activities such as hiking, camping, boating, or biking. Both animals and people are drawn to the water, especially in arid regions. These popular areas become quickly degraded when overused, resulting in erosion and water pollution.

Compare the results of the amounts of water collected for the straight rows of sponges versus the curving rows of sponges. Discuss which system soaked up more water and which system allowed for more water to run into the pan. Encourage students to consider the indications of a riparian zone with a winding waterway and a direct, uninterrupted waterway. How are plants and animals specifically affected by the unhealthy riparian zone? What are some possible causes for a healthy riparian zone becoming an unhealthy riparian area? To further the discussion, experiment with the angle of the cookie sheet and talk about the effects of different stream gradients.

The Schoolyard Habitat

Factors such as climate, topography, land use and a site's history all affect the particular habitat of an area. By using observation, data processing, investigation, and critical thinking skills, students will conduct a comprehensive survey of the environmental and physical factors that affect a nearby schoolyard habitat. Examining the characteristics and factors that influence the suitability of the area will allow the class to be able to possibly further develop the site with native plants found in similar environments. The data acquired from inventorying the site can be used to improve the habitat and attract various wildlife to the schoolyard.

Materials: Schoolyard Habitat worksheets, pen or pencil, thermometers, pH testing kits, local vegetative field guide or reference (available online at http://www.enature.com/localguide/localguide_home.asp)

Procedure: Choose a designated area that will serve as the study site in the schoolyard on or near school grounds. Divide the class into small groups and assign one or more of the following worksheets to each group. Complete all of the components of the site inventory and discuss the results of the data collected as a class. Develop and follow through with a plan to improve the schoolyard site and advance the area into a fitting habitat for local flora and fauna.

The Schoolyard Habitat:

Topography

1. Measure or estimate the dimensions of your schoolyard habitat site. _____

2. Describe the size and location of any hills, valleys, or slopes on the site. _____

_____

_____

_____

3. Determine run off paths for rainfall. Note any areas that usually hold puddles. _____

_____

_____

_____

4. Approximately how often does the site get rainfall per month? _____ per year? _____

6. How will the topography of the site affect future plans for the habitat area? _____

_____

_____

_____

The Schoolyard Habitat:

Soil

At least three days after the last rain gather a minimum of five soil samples from different areas of the schoolyard habitat site. Note the location and choose areas with different types of vegetation growing or different slope aspects. For example, a hill covered with shrubs, under a tree, by a stream, or on the open ground. Compare the color, texture and moisture content of each sample. Determine the acidity of the soil using the pH testing kits for each location. The kinds of plants that grow in a particular locale can be largely determined by soil acidity.

Sample Number	**Location**	**Color**	**Texture** (sandy, silty, clay-like, clumpy, etc.)	**Moisture** (dry, damp, saturated)	**pH** (basic, acidic, neutral)
1					
2					
3					
4					
5					
6					

Refer to a local vegetative field guide and list which plants will grow best in the types of soils collected. _____

_____

_____

_____

_____

The Schoolyard Habitat:

Vegetation

Record the numbers and types of plants found in the designated study site. Use plant field guides to aid in identifying individual species by common or scientific name. Describe the vegetation using characteristics such as shape, relative size and position of leaves, flowers, stems, or seeds. Note whether the plant is deciduous or evergreen. Record if it is native, existed in California before visitation or colonization of the state by Europeans, or non-native, brought into the state in the past few centuries by humans (Holland and Keil, 1995). Also, consider the wildlife for which the plant provides food and/or shelter, and spend some time observing which animals use which plants.

1. Catalog the large trees found in the schoolyard habitat.

Description	**Deciduous/ Evergreen**	**Name**	**Total Number**	**Native/ Non-native**	**Food For whom?**	**Shelter For Whom?**

2. Catalog the small tress and shrubs found in the schoolyard habitat.

Description	Deciduous/ Evergreen	Name	Total Number	Native/ Non-native	Food For whom?	Shelter For Whom?

3. Catalog the most abundant wildflowers found in the schoolyard habitat.

Description	Name	Total Number	Native/ Non-native	Food For whom?	Shelter For Whom?

4. Identify and list all the areas in the schoolyard that are covered with grass or lawn, weeds or other ground cover. _____

_____

_____

5. Which types of vegetation are most prevalent in the schoolyard site? Rationalize why this might be. _____

_____

_____

_____

_____

_____

_____

_____

The Schoolyard Habitat:

Sun and Shade

As a class, develop a scale using the numbers one through five to determine the amount of solar exposure an area received. For example, the number one represents places under bright sunlight with no shade at all. Sections that are completely shaded and aren't exposed to any sunlight get a ranking of five. Decide as a class what numbers two, three, and four denote.

On a sunny day, record how much sun is falling on at least four different areas of the schoolyard habitat site. Document air and soil temperatures at each location using thermometers. Insert the thermometer about three inches into the ground when taking soil temperatures. Repeat these observations and measurements at two other times during the day.

Location	**Time Recorded**	**Sun/shade Rating**	**Air Temperature**	**Soil Temperature**

What is the importance of knowing the exposure of a site to solar radiation before choosing plants for a potential habitat? _____

_____

_____

The Schoolyard Habitat:

Land Use

1. How is the potential schoolyard habitat currently being used? _____

_____

_____

2. How do the residents adjacent to the area use their land? _____

_____

_____

3. How might current uses, on or near the site, affect future plans for the schoolyard habitat?

_____

_____

_____

_____

Note and record any buildings, bodies of water, forests, etc. near the potential site.

Direction from site (N,S,E,W)	**Land Use** (road, parking lot, yard)	**Possible effects on schoolyard habitat site** (generate noise, fumes, hazardous runoff)

4. How might adjacent land use help and/or hinder possible habitat improvements?_____

_____

_____

_____

_____

_____

The Schoolyard Habitat:

Traffic Patterns

Observe the potential schoolyard habitat site at different times of the day for several different days. Compile the following information.

1. How is the site used by pedestrians (i.e. walking, jogging, or bicycling)? _____

_____

_____

_____

_____

2. Describe any vehicle traffic on or near the site. _____

_____

_____

_____

_____

3. Describe any existing pathways or wildlife trails. _____

_____

_____

_____

_____

4. Describe potential conflicts within the schoolyard area that would inhibit habitat development. _____

_____

_____

_____