

ROYANEH NATURE TRAIL

Written and Illustrated by

John Muir Laws



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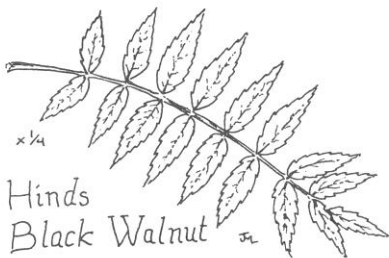
Cover illustrations:
California Prionus Beetle (*prionus californicus*),
Coast Redwood (*Sequoia sempervirens*),
Acorn,
Woodpecker feather,
Osprey,
Redwood Violet (*Viola sempervirens*).

ROYANEH NATURE TRAIL

The Royaneh Nature Trail winds through some of the most beautiful and fascinating parts of camp. Unlike the Carin Trail, you are not rewarded by how many times you have hiked the trail or how fast you can do it. In fact, we suggest that you walk slowly, perhaps taking several days. Your reward is not a badge to hang upon your uniform, but peace of mind and greater understanding of the natural world.

So that others may also enjoy the variety and abundance of plants and animals, we ask that you do not collect leaves for your merit badges at the observations and questions in this book and go on to the next station, use them as a point of departure for your own exploration and discoveries.

1) Above you is the Hinds Black Walnut (*Juglans hindsii*). It has large compound leaves with 9 or more leaflets off each stem. The nuts of this tree are edible. Many Walnuts were planted by the Native Americans and early settlers for food. This may be the only Walnut tree in camp. How did it get here? If this is the only one, why aren't there any more?



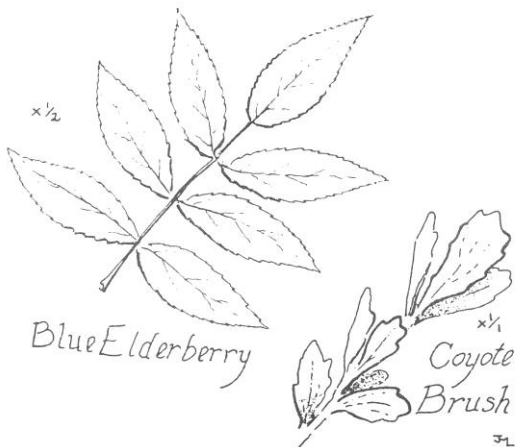
2) Here in the lush undergrowth, you can easily find Poison Oak (*Rhus diversiloba*). It can be identified by its shiny green or redish leaves with leaflets growing in threes. If you look carefully, you can see a vine winding up the side of the Redwood (*Siequoia sempervirens*) in front of you. This is a form of Poison Oak often found in dense forests. Both can give you a bad rash so be careful not to touch them! Strangely, the leaves of poison oak are edible to deer and its berries are an important source of food to many forest birds.



Poison Oak

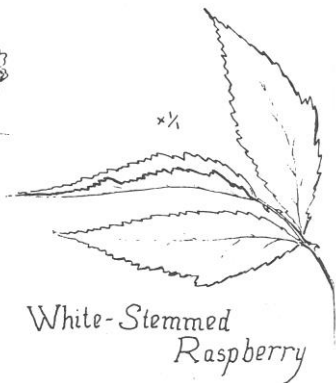
3) Note the vegetation covering the hillside in front of you. This is characteristic of the moist, north facing slopes of the northern coast range. Here the great Redwoods and gray barked Douglas Firs (*Pseudotsuga menziesii*) form a canopy above the California Laurel (*Umbellularia californica*) and Tan Oak (*Lithocarpus densiflora*). One can also find the moisture loving Big Leaved Maple (*Acer macrophyllum*). Broad Leaved Sword Ferns (*Polystichum munitum*) battle for sunlight on the forest floor. In the Northern Hemisphere, north facing slopes receive less light because of the angle of the sun. Consequently, the slopes can support plants such as the Redwood that require more water.

4) Below the road, the forest opens into a small clearing. Look around, can you tell what caused this break in the vegetation? Below you can find White-Stemmed Raspberry (*Rubus leucodermis*), California Gooseberry (*Ribes Californicum*), Blue Elderberry (*Sambucus glauca*), Coyote Brush (*Baccharis pilularis*), and Sword Fern. These plants became established after a small landslide removed many of the tall trees letting light down to the forest floor. If you look closely you can find young Redwoods beginning to grow again. With time they will shade out the lower bushes and shrubs, and the forest will return.





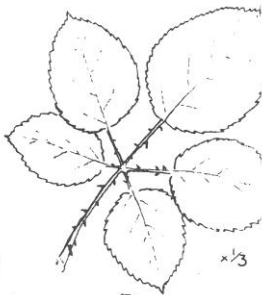
California
Gooseberry



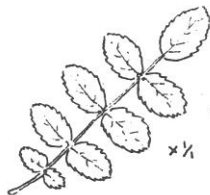
White-Stemmed
Raspberry



Pacific Blackberry



Himalaya Berry



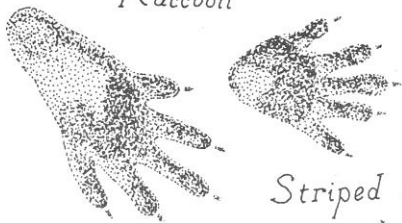
Wood Rose

5) Sharp boundaries between plant communities such as this boundary between grassland and forest creates optimal living conditions for many animals. Species such as the Black Tailed Deer, Black Tailed Jackrabbit, Striped Skunk and Virginia Opossum can forage for food in the productive grasslands and seek shelter in the dense forest. Look for their droppings and tracks in the dust of the road.

As you walk along the trails, use all your senses. A sharp eye may perceive a Black Tailed Deer, even before it is aware of your presence. The minty smell of Pennyroyal (*Mentha Pulegium*), may draw your attention to the inconspicuous purple flowers underfoot. How could a bee help but pollinate anything that smells so good? Here too, you may find the aptly named Skunkweed (*Navarretia squarrosa*). A faint cry far overhead may reveal the presence of a Red Tailed Hawk in search of prey. Taste the small plums growing in the trees at the edges of the meadow, great thirst quenchers on a hot day.

6) Serpentine, the shiny green rock seen in this jagged outcrop, is our state rock. It is called serpentine because it's mottled appearance is reminiscent of a snake's back. It is a metamorphic rock, and is found throughout Northern California. You can trace this outcrop through the middle of camp: to the outcrop by the pool, above the dining hall and below the ranger's house. Due to its unique qualities, Serpentine rock has a dramatic effect upon vegetation. It is low in essential plant nutrients such as Nitrogen, Calcium, Phosphorus and Potassium. In addition to this, it has high concentrations of Nickel and Chromium: elements which give the rock its color and are actually toxic to many plants! As a result, where Serpentine is found there is often a sharp break in the vegetation, here from mixed forests to grassland. In some parts of California, plants have specially adapted to Serpentine soil and are found only on the isolated Serpentine outcrops. A species with such a limited range is called an endemic.

Raccoon



Striped Skunk



Black Tailed Deer



Opossum



Black Tailed Jackrabbit Scat
Black Tailed Deer Scat





American Kestrel



Western Flycatcher

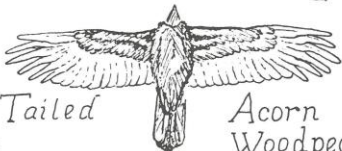


*Black-
Headed
Grosbeak*



Western Tanager

Turkey
Vulture



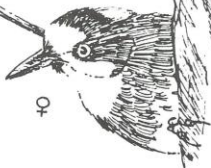
Red-Tailed
Hawk



Acorn
Woodpecker



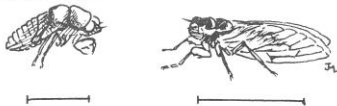
California
Quail



7) From this lookout high above camp you can see several common birds of Camp Royaneh. Look for the gray and black form of the Turkey Vulture circling on thermals of warm air. These birds are scavengers feeding upon dead animals. Its head is bare to prevent rotten meat from collecting in the feathers which could cause infection. Also look for the Red Tailed Hawk or a black Raven soaring far overhead. You may see the Red and Yellow Western Tanager or a Black Headed Grosbeak. Listen for the distinctive high "come here" whistle of the Western Flycatcher or the tapping of an Acorn Woodpecker in the Douglas Fir groves around you.

8) Here on the dryer southern slopes we find a mixed woodland, primarily consisting of broad leaved species. Here can be found Coast Live Oak (*Quercus agrifolia*), White Oak (*Quercus garryana*), and Black Oak (*Quercus kelloggi*), California Laurel, Buckeye (*Aesculus californica*), Madrone (*Arbutus menziesii*), and Douglas Fir. Many of these leaves with a waxy coating to help prevent water from leaving their tissues in a process called transpiration. What other adaptations to drought can you find?

9) Emerging from this stony outcrop is an old Buckeye. Its hand-like leaves and spikes of flowers in the springtime are distinctive. The Native Americans of California used the seeds to catch fish. If the large seeds were crushed and thrown into small pools, the fish would become stupified and float to the surface where they could be collected by the Native Americans! As you continue down the trail, keep a sharp ear out for the high continuous buzzing of the Cicada (Family: Cicadidae). An insect more often heard than seen on warm summer days.



Woodland Cicada

10) Directly above you is the Black Oak. Note its deeply lobed leaves each with a fine point on the end of each lobe. Oaks comprised a major portion of the diet of the Native Americans of California, the acorns of the Black Oak being one of the preferred species. Before the acorns could be eaten the hard shell had to be cracked off and the meat pounded into a fine flour which was then leached with water to remove the bitter tannic acid. The acorns were either cooked as bread or as mush by putting them in a watertight basket and boiling them with hot rocks. Compare the pointed leaves of the Black Oak with those of the White Oak a few yards down the trail. Although it too is lobed, it does not have the points at the end of the lobes. Where these two Oaks are found in close proximity, they often interbreed and produce hybrids with characteristics of each. See if you can find any such hybrids in Camp.

11) The trail descends into a stand of Douglas Fir. This species can be readily identified by the placement of the needles all around the stem and the light bracts or "tails" that hang below each cone scale. The Douglas Fir is an important lumber tree and is often used as a Christmas Tree. How old do you think these trees are? Roughly count the numbers of young, middle aged, old and dead Firs. What age are most of the trees? Why? Note the dead snags of the dead firs. Such old growth provide important habitat for many animals. With the help of many decomposing organisms, these trees are slowly decaying and returning to the soil. Can you find evidence of decomposing animals or plants on them?



California
Laurel $\times \frac{1}{2}$

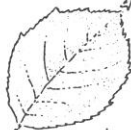


$\times \frac{1}{2}$
Arroyo Willow



California
Buckeye
 $\times \frac{1}{2}$

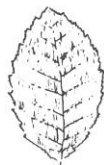
Bigleaf Maple $\times \frac{1}{3}$



California
Hazelnut $\times \frac{1}{2}$



Madrone $\times \frac{1}{3}$



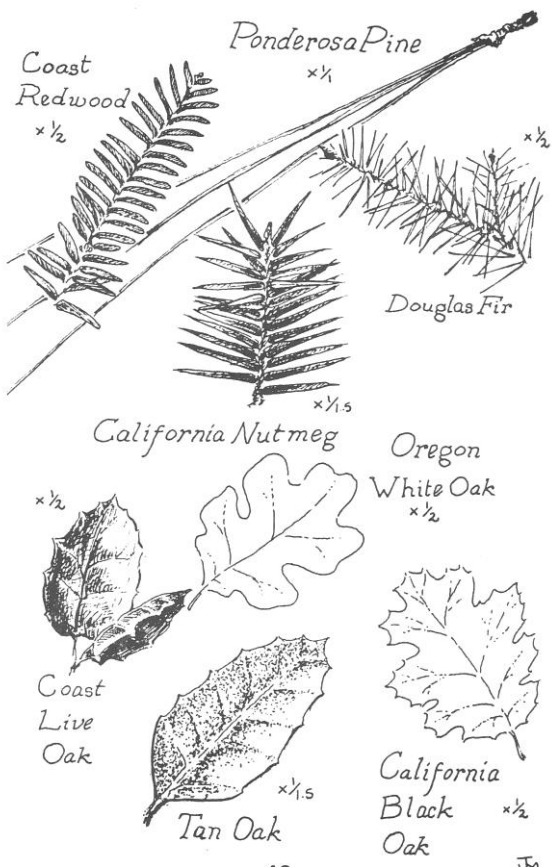
White
Alder
 $\times \frac{1}{2}$



Pacific Dogwood $\times \frac{1}{2}$



Oregon
Ash
 $\times \frac{1}{3}$



12) Although most of this ancient Madrone is dead, there still remains one living branch that stretches across the trail. Madrone, with its peeling bark, large green leaves and pink flowers or red berries is one of the most beautiful trees in camp. The berries are edible and are a favorite of forest birds. Put your hands on the living Madron's red brown bark. It always feels cool, even on the hottest days.

13) The California Hazlenut (*Corylus cornuta* var. *californica*) is a good plant to know for a refreshing snack along the trail. Look for the dried brown seed covers. Inside these you will find the hard nut containing the delicious meat. The Hazlenut can be identified by its light green fuzzy leaves. These nuts are a favorite food of the large Western Gray squirrel.

14) This region receives some of the heaviest winter rainfall in California. Slides such as these occur when the soil becomes so saturated with water that the steep slope can no longer support its weight. Here we can see two such erosional landforms. The first is a debris flow, in which the ground gives way in a semi fluid mass and washes down slope. The second is a slump. This form is created when the surface stays relatively intact and moves down slope in a rotational slip. See if you can identify any other evidence of erosion along the trail. Some may be hard to see because they are from earlier slides and have been partially revegetated.

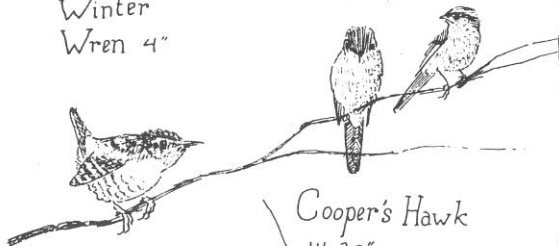
15) The mixed coniferous forest has a fauna (animal population) that is distinct from the upper meadows. The high clicking alarm note of the Dark Eyed Junco may draw your attention to the small, sparrow sized bird with a black head/brown back and white outer tail feathers. Listen also for the recus call of the black crested Steller Jay and the beautiful song of the Winter Wren. Also look for small flocks of Chestnut Backed Chickadees or Bushtits looking for insects in the branches above you. Here too you will find the Red Breasted Nuthatch slowly spiraling down the trunks of trees. You may even catch a glimpse of the Cooper's Hawk darting through the trees in hot pursuit of another bird. The deep forest also has it's own reptile and mammal fauna including the small RingNecked Snake and the Townsend Chipmunk.

16) This long leaved tree is the California Laurel. The Laurel's leaves can be used as a spice when cooking. Crush one of the leaves between your fingers and smell it. Because of this strong odor and flavor it is also called the California Bay.

17) You have just walked out of the forest and into an open space. A quick look around will reveal the cause for this break in the vegetation. Several years ago this area was logged and was replanted to prevent erosion. Here we find two species of Ceanothus (Ceanothus sp.). Look for the blue flowered shrubs and their thorny relatives. Here too you can find a species of tree that is found nowhere else in camp, the Ponderosa Pine (Pinus ponderosa).

Winter
Wren 4"

Bushtit 4 1/2"



Cooper's Hawk

14-20"



Western
Screech-
Owl

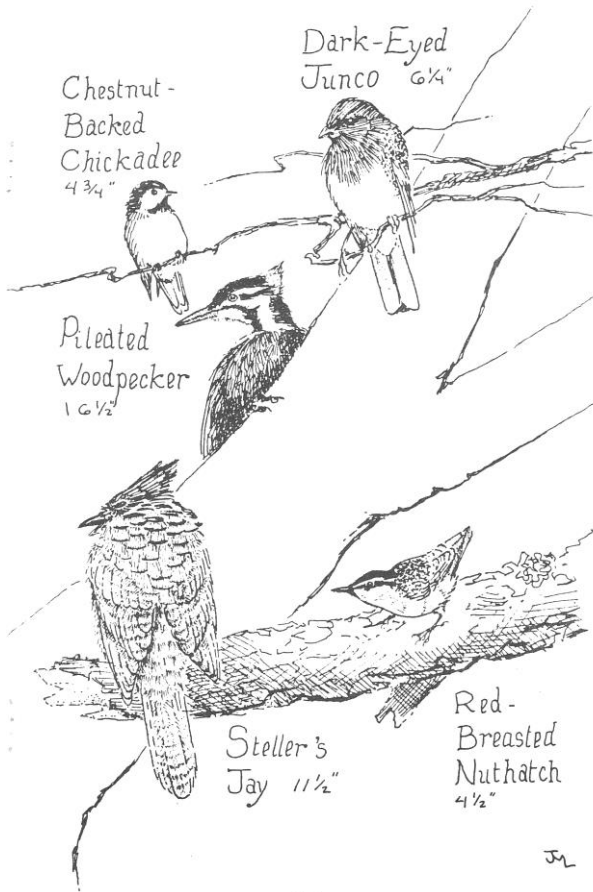
Chestnut -
Backed
Chickadee
4 3/4"

Dark-Eyed
Junco 6 1/4"

Pileated
Woodpecker
16 1/2"

Steller's
Jay 11 1/2"

Red-
Breasted
Nuthatch
4 1/2"



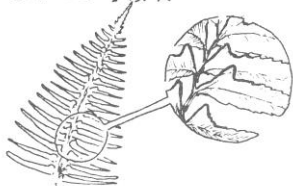
JL

18) On the right side of the Douglas Fir stump is evidence of one of the most impressive birds in camp. The Piliated Woodpecker is our largest woodpecker, almost as large as a crow. The large holes cut into this stump are a testimony to the bird's powerful bill. Its all black back, white streaked face and neck and its red crown are distinctive. Its call is a loud repetitive laugh. Consider yourself lucky if you should spot one grasping a tree trunk and drilling after insects, sending wood chips flying with every stroke.

19) During the winter a small creek runs through this glen. During winter storms, it can become a rushing torrent. But with the onset of summer the creek dries up. The plants that inhabit the creek bottom must be able to adapt to these changing conditions. Pioneer species such as the White-Stemmed Raspberry do particularly well in the disturbed conditions after a flood. Raspberry can be told by its small downcurved thorns and the whitish undersides of the leaves. It creates excellent habitat for smaller animals. They can feed upon the sugar rich fruits and take shelter amongst the thorny brambles. In what other disturbed area on the trail have you also seen White-Stemmed Raspberry?

20) On this lush shady hillside you can see many of the fern species that we have here in camp. The ferns are shade tolerant and have broad leaves, or fronds, designed to gather the faint sunlight that reaches the forest floor. Here can be seen Sword, Coastal Wood (*Dryopteris arguta*), California Maiden-Hair (*Adiantum fordani*), Lady (*Athyrium filix-femina* var. *californicum*), and Gold Back Ferns (*Pityrogramma triangularis*). Turn over several fronds and look for the small black or brown sori that contain the fern's spores. These are equivalent to seeds in other plants.

Sword Fern



Coastal Wood Fern

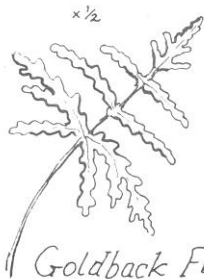


California Maiden-Hair Fern

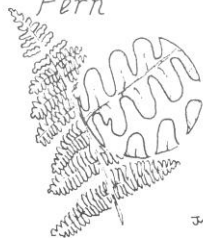
Lady Fern



Western Bracken Fern



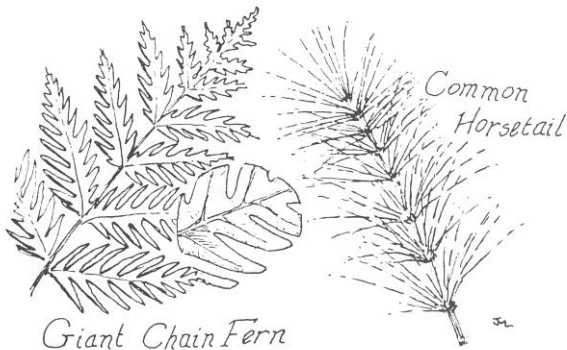
Goldback Fern



21) Below you is East Austin Creek. Water is essential for all forms of life. Many animals and plants are only found in and around the water. Many other animals must come to the creek at some time during the day or night to drink so be especially alert to the sights, sounds and signs of wildlife. As you explore see if you can discover what makes the riparian, or creek, environment so unique. The broad leaved tree in front of you is Big Leaved Maple. It is found in moist areas and is often found along streams where it can easily get water throughout the summer. Look for the Maple's winged seeds. When they fall from the tree, the wings cause the seed to slowly spiral down like a miniature helicopter. This way they can be carried farther by the wind, dispersing the Maple's seeds.

22) To your left you can see some of the plants that are characteristic of the creek environment. Look for the jointed stems of the Common Horsetail (*Equisetum arvense*). This is a very primitive plant form; similar plants have been found in fossil records, more than 300 million years old! You can also find the spreading fronds of the Giant Chain Fern (*Woodwardia fimbriata*), the largest fern in camp. Both of these plants are always found in association with water.

23) This tree is a beautiful example of a Coast Redwood, the tallest trees in the world. The Coast Redwood (not to be confused with the Big Trees {*Sequoiadendron giganteum*} of the Sierra) is found in a narrow belt along the coast from California to Alaska. Fog is very important to the Redwood's survival. These trees have special leaves that allow them to collect up to 40 inches of moisture from the fog.

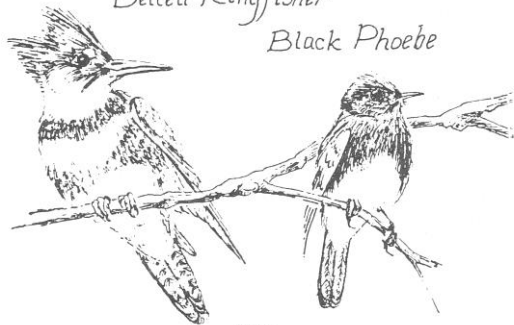


The Redwood's thick bark allows it to resist fires that destroy many other trees in the area. You may find old Redwoods with huge fire scars at their bases that are big enough to sit inside of! These fires actually help the Redwoods compete with other plants. The fire kills other trees and incinerates the heavy layer of fallen redwood needles, exposing the bare soil. Any Redwood seeds which then fall have very good chances of germinating. although we often think of fires as destructive and bad they have always been a natural part of the environment and help to renew many ecosystems. Can you find any evidence of fire on this old Redwood?

24) As you approach the creek you can see several more riparian plants. To your left you will find Western Azelea (*Rhododendron occidentale*). If its fragrant flowers are in bloom be sure to stop and smell them. Further downstream is another common creek plant. This is White Alder (*Alnus rhombifolia*). Look for the small female cones or catkins.

Belted Kingfisher

Black Phoebe

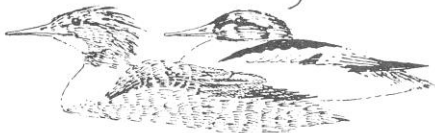


*Green-
Backed
Heron*

Wilson's Warbler



*Common
Mergansers*



Spotted Sandpiper



Killdeer



American Dipper JL

25) Besides having unique plant life, the creek is the home of several species of birds that can be found nowhere else in camp. If you listen for a loud rattling call over the stream, you may find the Belted Kingfisher. Look for the white and black Black Phoebe catching flies over the water. If you are very lucky, you may catch a glimpse of the secretive Green-Backed Heron, perhaps flushed from its perch by your approach. Along the edge of the stream you can find the Spotted Sandpiper or the American Dipper. The Dipper feeds by running under the water and picking small insects off the rocks. Early in the morning, you can sometimes find a small flock of Common Mergansers floating in some of the larger pools in the stream. Along the bank, listen for a descending trill of notes: the call of the yellow breasted Wilson's Warbler.

26) Many years ago, this area was heavily logged. Most trees die when they are cut down. This is not the case with the Coast Redwood. The Redwood has a very powerful growth hormone. If this hormone were allowed to act freely it would send up hundreds of new shoots from the tree's existing root system. These new shoots could inhibit the growth of the main trunk. To counteract this hormone, the redwood creates a growth hormone suppressor in the terminal bud at the top of the tree. This keeps such wild growth in check.

If however, the top of the Redwood is broken off in a storm or cut down by the logger's axe, the growth hormone suppressor is no longer produced and the redwood sends up many new shoots. This is called stump sprouting. Of the hundreds of shoots produced, only a few will become dominate, crowd out the others and grow up from the same root base to become new trunks of second generation Redwood. Sometimes the sprouts form a large circle called a "fairy ring". Look around you. How many examples of stump sprouting can you find ?

27) Feel the air around you. Even on a hot day it is always cool in the heart of the Redwood forest. Note how little sun reaches the forest floor. The environmental conditions created by the

Redwoods is called a microclimate. There are several species of plants that have adapted to these conditions and are constant companions of the Redwoods. See how many you can find. Remember, please do not pick the plants along the nature trail. You already recognize many ferns. They are well adapted to such low light conditions. One of the most abundant understory plants is the clover shaped Redwood Sorrel (*Oxalis oregona*). The Sorrel is so adapted to the low light conditions of the Redwood forest that its leaves fold back in direct sunlight. Another common species is Coast Trillium (*Trillium ovatum*). Look for its three broad leaves. Because it is one of the first flowers to bloom in the spring the Trillium is also called Wake Robin. Similar to the Trillium but usually bearing four or five smaller leaves is the Pacific Starflower (*Trientalis europaea* var *latifolia*). Two similar plants are False Solomon's Seal (*Smilacina stellata* *sessilifolia*) and Fairy Bells (*Disporum hookeri*). The alternating leaves of the False Solomon's Seal are spear head shaped as opposed to heart shaped in the Fairy Bells and its stem is green as opposed to red brown. If you look carefully, you may be able to find the broad leaves and shiny blue berries of the Red Clintonia (*Clintonia andrewsiana*).





Coast
Trillium



Pacific
Starflower



Redwood
Sorrel



Fairy Bells



False Solomon's
Seal

28) Pacific Dogwood (*Cornus nuttallii*), is another common riparian plant. Look for the trees with opposite leaves growing near the stream. The leaves of the Dogwood are smaller and hairier than those of the Spice Bush (*Calycanthus occidentalis*) which grows closer to the road. When it's red/brown flowers are in bloom, the Spice Bush is distinctive. Can you tell the difference?

29) Here the nature trail turns down into the gully created by the intermittent stream behind you. Watch your step! Note the extensive root systems of the redwoods above you. Instead of having a deep tap root, Redwoods' roots spread laterally, up to 80 feet. These shallow roots aid the Redwoods in collecting the fog drip that provides the moisture during the dry summer. As you near the end of the gully, move silently and carefully. You may be able to see some raparian birds as you come out onto the creek bed.

Many animals besides birds have made their homes in and around the creek. As you near the water look for the shiny green Carabid Ground Beetles (Family:Carabidae) and the small brown Toad Bugs (Family:Gelastocoridae). Several insects rest upon the surface of the water eating other insects that get caught in the surface tension. These include the long legged Water Striders (Family:Gerridae) and the Whirligig Beetles (Family:Gyrinidae), found spinning in small schools. Other species live under the water. The most common of these are the flat Creeping Water Bugs (Family:Naucoridae). In quieter waters you can find oval Scavenger Water Beetles (Family:Hydrophilidae) and the small Backswimmers (Family:Notonectidae). You may be lucky enough to see a Water Scorpion (Family:Nepidae). In spite of their formidable appearance and name, these insects are harmless.

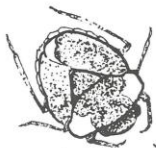
You can also find the larval stages of many insects such as:

Water Beetles (Family: Psephenidae)

Caddisflies (Family: Trichoptera)

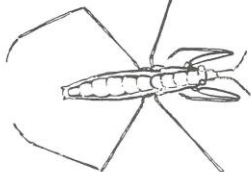
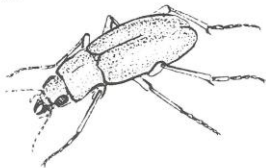
Black Flies (Family: Simuliidae)

attached to rocks.

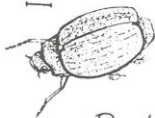


Toad Bug

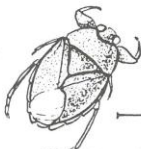
Carabid Ground
Beetle



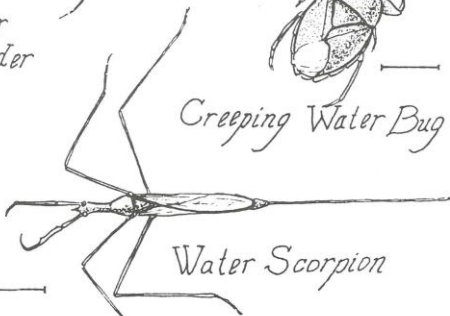
Water
Strider



Whirligig Beetle



Creeping Water Bug



Water Scorpion



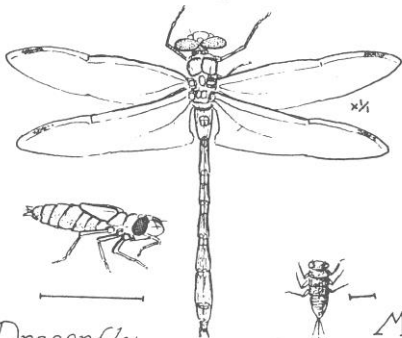
Water
Penny
Beetle



Caddisfly



Black Fly



Dragonfly



Mayfly



Damselfly



Other larvae such as those of the:

Mayflies (Family: Ephemeroptera)

Dragonflies (Family: Anisoptera)

Damselflies (Family: Zygoptera)

are free living. Look for the adults in the air around the creek. The creek is also home for many other animals including the lobsterlike Crayfish and Yellow Legged Frog.

30) Being the largest body of water in camp, the Canoe Base attracts its own variety of animals. Western Pond Turtles can be seen sunning themselves on the rocks at the upstream end of the base. Large Steelhead Trout can often be seen swimming in the deep pools below Roman Plunge. These large fish sometimes attract predators such as the River Otter or rarely an Osprey, a fish eating bird. Several species of Swallows can be seen circling through the air, darting after small insects. Listen in the evenings for the chorus of frogs calls. Can you pick out the high chirping calls of the Pacific Tree Frogs; the "ribbit" of the Yellow legged Frogs,; or the deep "jug o`rum of the Bullfrogs?

31) This is White Water Creek. It is the watershed which drains the central part of camp. A watershed is the whole area that is drained by any waterway. Thus the White Water Creek has a watershed which empties into the East Austin Creek watershed which in turn empties into the Russian River which finally empties into the Pacific Ocean. What is the largest watershed that you can think of? What is the smallest?

As you proceed down the trail be sure to sample the red Thimbleberries, (*Rubus parviflorus*), growing on the left side of the trail. When you pick one of the berries see if you can guess how this plant got its name. Even without it's berries, it is easy to recognize Thimbleberry by its broad fuzzy leaves.



Thimbleberry
x 1/2

32) As you peer through the tangle of riparian plants see if you can pick out the compound leaves of the Oregon Ash (*Fraxinus oregona*). What other riparian plants can you find?

33) On the right side of the trail you can find a young California Nutmeg (*Torreya californica*). Many people have trouble telling it from the Redwood. Feel the leaves. Can you tell the difference? The Nutmeg has needle sharp leaves. Compare the feel of these leaves with some of the Redwoods around you. These plants are very rare in camp so once again please do not pick the leaves.

34) Oregon grape (*Vitis Californica*) is a climbing vine. Not being a sturdy woody plant, the grape must use other methods to compete with the tall trees for sunlight. As it grows it sends out twisting tendrils that attach themselves to the branches of other plants. Using these tendrils to climb, the grape can completely cover the tree on which it grows. Sometimes the host tree is completely shaded out and dies from a lack of sunlight. Later in the year the Oregon Grape will produce clumps of edible berries which give it its name. What other plants have you seen that use similar techniques to get to the sun?



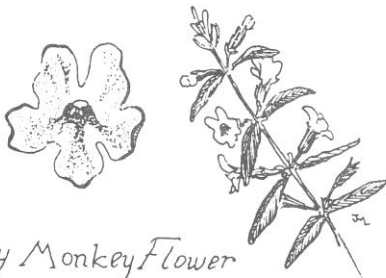
Oregon
Grape

x 1.5

35) Within this Redwood grove is the C.O.P.E. course. C.O.P.E. stands for Challengeing Outdoor Physical Encounters. It consists of high and low course obstacles ranging from trust falls to high zip lines. Project C.O.P.E. tests group cooperation and individual skill. For your and others safety, please stay on the trail until you are out of the C.O.P.E. area. If you wish to participate Project C.O.P.E., you can sign up with your other merit badges.

36) This is part of the sewage system of Camp Royaneh. The heavy sludge is stored in large underground tanks in the middle of camp. The lighter effluent is diverted to these ponds. Here it slowly percolates into the ground and is broken down by bacteria and natural oxidation. The lower two ponds are drying ponds where chlorinated waste water evaporates. The upper ponds provide a resting place for some animals including many Bullfrogs which can be heard late in the evening. Occasionally ducks will rest in these ponds. How is sewage treated in your town? This is a question that is seldom considered yet wastes, both municipal and industrial, are the cause of many environmental problems today.

37) This is Sticky Monkey Flower (*Mimulus aurantiacus*). Feel its leaves. (Please don't pick them). That sticky coating on the leaves helps the plant conserve water in the hot sun. This adaptation allows the plant to grow in dry areas. Note the shape of the flowers. Some people see the face of a monkey in them. The pale structure in the middle of the flower is part of the pistil or the female parts of the plant. The orange structures behind it are called stamens, the male structures of the plant. When a bee comes to the flower, pollen is rubbed off onto the end of the pistil (called the stigma). The stigma then closes so that the bee will not rub any of that flowers' own pollen onto it as the bee searches for nectar and pollen. As the bee flies to other flowers it will carry with it more pollen, insuring cross pollination. After the bee has left, the stigma may open again to receive more pollen. Touch the stigma with your finger and you can actually see the stigma close to prevent self pollination.



Sticky Monkey Flower

Barn
Swallow



Western Bluebird



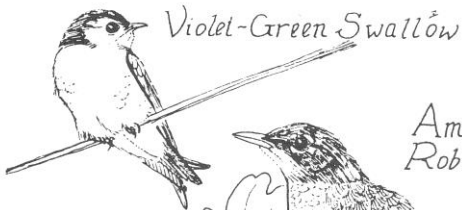
Song
Sparrow



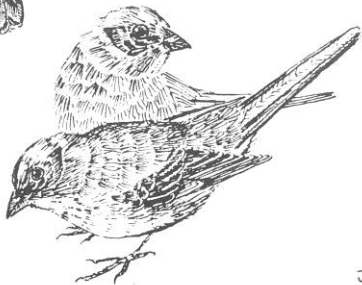
Chipping
Sparrow



Mourning
Dove



Brown Towhee



38) Above the road you can see a stand of mature tanoaks. These shade tolerant trees do perfectly well under the canopy of the redwood forest but can also be found growing on their own as we see here. Tanoak can be easily recognized by the furry brown hairs that dust its hard leaves. The bark contains large amounts of tannin. This is extracted to make tannic acid which is important for tanning leather.

39) The Diamond R. Corral and the fields surrounding it are an excellent place to observe wildlife. It is not uncommon to see a Back Tailed Jackrabbit crossing the large fields. In addition to many of the same species of birds seen in the upper meadows, this is also a good place to observe ground feeding birds such as the Mourning Dove and Brown Towhee.

40) Look carefully in the branches of this White Oak. Notice the brown and green balls hanging from the branches. Often call "oak apples" these are growths (called galls) caused by the developing larvae of the California Oak all Wasp (*Andricus californicus*). Look for small holes on the older brown galls, these are the emergence holes of the tiny, red brown adults.

41) Because of the many flies and other insects found near the corral, it is also the home of several insectivorous birds. Look along the powerlines for the Blue and red/orange Western Bluebird. Search the air above you for Violet Green Swallows and the forked tailed Barn Swallows. If a staff member is present and classes are not in session, ask if you can see the Barn Swallows' mud nests inside the corral.

We hope that the trail has been of use to you either in studying for your classes or helping you to develop a greater appreciation for the environment. If you have any questions, comments or suggestions please stop by the nature glen and talk to a staff member. When you are finished using the nature trail guidebook, please return it to the box at the start of the trail so the others may use it. If you wish, you may purchase one at the trading post to bring home with you or to use during your stay in camp and then donate it to the box in the nature glen. Thank you.

#1) White Oak

Carrn Pools

