YOSEMITE NATURE NOTES

The Yosemite Museum

April 1936

Volume xv Number 4

Yosemite Nature Notes

THE PUBLICATION OF
THE YOSEMITE NATURALIST DEPARTMENT
AND THE YOSEMITE NATURAL HISTORY ASSOCIATION
Published Monthly

Volume XV April 1936 Number 4

The Cause of Ghost Forests of Yosemite

(By EMIL ERNST, Asst. Forester)

With the increase of travel through the Tenaya Lake and Tuolumne Meadows area of Yosemite National Park, questions as to the cause of the "Ghost Forests" are becoming more numerous. Many false theories have been advanced explaining these dead trees. One well known book states that the cause was a disastrous fire of rather recent years. Possibly the observance of one or several fire scorched trees resulting from lightning fires was responsible for this erroneous deduction.

These famous Ghost Forests are mainly the result of epidemics of the Lodgepole Pine Needleminer, (Recurvaria milleri Busck.). It is believed that these epidemics have been present for many years and they seem to reappear at regular intervils, each having a cycle of approximately ten years. The first definite epidemic of record in the Park started about 1912 and ended about 1922. In 1932 the Needleminer again began to assume epidemic form in isolated portions of the Park. In 1934 an epidemic was well on the way at Porcupine Flat on the Tioga road. Reports from other portions of the Park show a decided increase in the numbers and the extent of occurrence of this destructive insect.

For some time it was believed that the Needleminer was the forerunner of epidemics of the Mountain Pine Beetle (Dendroctonus monticolae Hoph.) and that the latter was solely responsible for the deaths of the trees in the Ghost Forests. It is true that in many cases epidemics of the Needleminer have either been followed or accompanied by attacks of the Mountain Pine Beetle and that they hastened the death of the trees, thus giving rise to the supposition that the Needleminer was not the cause. Late observations lead to the conclusion that the Needleminer is fully capable of killing large numbers of trees without the aid of the bark beetles.

Because of the destructiveness of the Needleminer and its great importance in the well being of the Lodgepole Pine stands of the Park, attempts are being made to find some means of reducing the effect of the epidemics of this insect. An experimental control project has been set up in the badly infested area in the vicinity of Porcupine Flat. The success of this control project will not be known for some time, but it is a step in the right direction. If it is possible to reduce the loss from this destructive insect, the Lodgepole Pine Needleminer, one may be sure that the Park administration will do it.

The Lodgepole Pine Needleminer takes its name from the habit of

Dead Lodgepole Pines in Lake Tenaya Region

the insect to hollow out the needles of the host, which was originally reported to be the Lodgepole Pine. Recently, Needleminer work has been observed in other species of conifers indigenous to the Park. The whole life of the insect is spent entirely in the needles of the host except for a short period in the air during flight. The flights of the adults—grayish moths about one-half inch in length with blackish speckles on the wings, occur approximately two years apart. These normally take place during the latter part of July and the early part of August every second year. The last flight in Yosemite was in 1935 and the next one will be in 1937.

The eggs of this insect are laid in small clusters at the bases of the needles of the current year's growth. When the eggs hatch, the resultant minute larvae start mining in the needles, one to a needle. They are very small, as full-grown individuals seldom exceed one-fourth inch in length. They vary in color from a light lemon yellow to a deep orange. The larvae can be observed at work by holding the infested needle against a strong light. They mine out successive needles through two fall, winter, spring periods and one summer season. In the late second spring they go through the resting or pupal stage. This stage is spent in a dark brown sheath or cocoon within the last mined needle. During the second summer the adult moths emerge for the flights. During epidemics, the numbers are so many that they become great nuisances to campers within the infested areas, through the moths becoming enmeshed in food or falling into pots and kettles. Creeks and lakes in the vicinity become covered with the bodies of the dead adults.

Museum Scientific Collections

(By JAMES E. COLE, Museum Preparator)

The ability of naturalists in Yosemite National Park to answer correctly the numerous questions regarding plants and animals is, in a marked degree, due to the presence of the large amount of data available in the research collections. The list of named and classified specimens in the Museum is in excess of six thousand, consequently the naturalists have considerable reference material to enable them to become well informed about the natural history of Yosemite.

The size of this collection is the result of the consistent efforts of various park naturalists and their staffs since the inception of the educational work in Yosemite in 1.21. The majority of the material has been collected and presented to the museum by the Yosemite School of Field Natural History. Since the students of this unique institution spend practically all their time in the field with well-known University professors and Park Service naturalists, they have had, during

the 11 years existence of the school, excellent opportunities for collecting. Much valuable material, also, has been brought to the museum for preservation by rangers and others.

Field School students classifying materials collected on field trips.

The reasons for building up a research collection are many. Often, for instance, the only way a visitor or student can be satisfied as to the name of an animal he has observed is to take him to the collection and point out a similar study skin. Temporary naturalists are able to more quickly refresh their knowledge about some of the difficult groups by studying the collection. Although Yosemite has been completely studied as to its animal forms it cannot be said that we know all about or even all the kinds of animals that live in these 1176 square miles. Such interesting data as time and length of hibernation, time and route of migration, number of young per litter, or number of litters per year, etc., is not known for many of our animals. This and additional information accumulates as the scientific collection grows and results in a better informed group of naturalists.

The following list of research collections indicates the extent of the field of knowledge represented: mammals, birds, amphibians, reptiles, fish, insects, birds nests and eggs, flowers, trees, fungi, seeds, geological specimens, research reserve and bird banding reports, and natural history notes. Inasumch as visitors to the museum do not find all these collections on exhibit, it has been suggested that many might be interested in them if they knew the purpose and extent of the assemblage. In this and subsequent articles various collections will be described.

Of the several research collections, the larger animals, since they are the most interesting to the laymen, will be described first. The larger animal group for purposes of discussion will be divided into three parts—mammals, birds, and reptile-amphibians. The specimens in the first two instances, birds and mammals, when mounted are known as scientific, or study skins.

They differ from the product of the taxidermist in not being made up in life-like poses. Instead they are mounted in a uniform manner so as to occupy as little space as possible, yet at the same time permit examination of the main characteristics. Since the skulls of mammals are very important for purposes of identification they are not left in the skins but are cleaned and stored in vials alongside the skins.

Animals larger than rabbits are too bulky for storage as study skins. The hides of such mammals are tanned, the skulls are cleaned, and both are stored in a moth-proof room. The study skins or birds and small mammals are kept in insect-proof cases, which by way of precaution against destruction by insects, are fumigated once a month. Since mounted bird and animal skins are rather fragile, the collection is not open to the indiscriminate use of the public. But like all scientific collections, study of the material by students is encouraged, while any interested person may inspect them.

The most interesting mammal to layman and scientist alike is the mummified Mountain Sheep (Ovis canadensis sierrae) found at the edge of Mt. Lyell glacier by Park Naturalists Harwell and Beatty (Yosemite Nature Notes, Vol. XII, No. 12). It is also the largest specimen and is approximately 6,000 times the size of a shrew, our smallest mammal. Bats, although obnoxious to most people, are prize specimens for Yosemite naturalists. Three Mastiff Bats (Eumops californicus) which are rare anywhere in California, are in the possession of the Yosemite Museum. Several years ago a spotted Bat (Euderma maculatum) was collected in Yosemite Valley, but because of the scarcity of this particular species, it is now on permanent loan to the Museum of Vertebrate Zoology at Berkeley. When collected in 1932, it was the fifth record of this bat. Since then one more has been found (Journal of Mammalogy, Vol. 16, No. 2, May 1935, p. 146).

M. E. Beatty
Assistant Park Naturalist,
with Mt. Sheep described in text.

Flying Squirrels (Glaucomys sabrinus lascivus) are quite numerous in Yosemite National Park, but be-

ing noctural they are seldom seen. Thus it was a fortunate coincident that a pure white albino Flying Squirrel was given to the museum for prese.vation. The collection does not possess the skin of the rarest large animal, the Wolverine, (Gulo luteus) because, so far as is known, just two specimens have been taken in the Park.

There are 624 scientific specimens of mammals in the research collection. Nineteen of these are mounted in natural poses in habitat groups and thirty-seven are in the form of tanned skins. Of the sixty-three species known to exist within the boundaries of the Park, 51, or 80 percent, are contained in the collection. Ninety-four mammalian species have been found in the Yosemite reg'on—an area about seventeen miles wide extending from the eastern margin of the San Joaquin Valley through Yosemite National Park to Mono Lake—and of this larger group the museum has 63 specimens.

The b.illiant coloration of birds' skins probably accounts for the greater interest shown in them. Many bird students have learned to know the Ruby-crowned Kinglet (Corthylio calendula cineraceus) by song and behavior but have never had a view of its ruby crest until they observed it in a mounted specimen. The first prize for beauty in the bird group naturally goes to the male Western Tanager (Piranga ludoviciana) although the Anna Hummingbird (Calypte anna) is considered by many to be of equal beauty. While this article was being written a bird was brought to the museum that few here ever expected to see in the collection. Golden Eagles (Aquila chrysaetos canadensis) are not necessarily rare in Yosemite but no naturalist would consider shooting one in order to secure a specimen. The eagle, which was caught in a coyote trap just outside the boundaries of the Park, has a wing spread of 75 inches so it is naturally the largest bird. Probably one of the large wing feathers would weigh more than an entire hummingbird.

Western Tanager

A check of the bird skins indicates that of 192 birds observed within the Park, 137, or 72 percent, are to be found in the collection. Forty-two of those not collected are considered rare, 25 having been seen once only.

The preservation of amphibians, reptiles, and fish differs from the method used with birds and mammals in that they are preserved in alcohol or formalin and stored in glass jars. Few people other than students are much interested in this collection due probably to the

exhibit of live reptiles and amphibians maintained on the back porch of the museum during the summer. Visitors not only have an opportunity to see these animals but also to ask questions of the naturalists and so seldom have reason to refer to the alcoholic specimens.

In one respect the amphibian collection is the most important because it contains all the Mt. Lyell Salamanders (Hydromantes platycephala) in the world with the exception of about 30. These lizard-like animals are found in Yosemite National Park, and at just three isolated places. They are separated by half the world from the only other members of the same genera which live in the mountains of Southern Europe.

Fourteen Rattlesnakes (Crotalus confluentus oreganus) the only poisonous reptiles in Yosemite, are preserved in the collection. For purposes of comparison three other poisonous snakes, the Coral snake (Micrurus fulvius), the Copperhead, (Agkistrodon mokasen), and the Cotton-mouth (Agkistrodon piscivorus) have been procured from Florida so as to have representatives of all the venemous reptiles in the United States in our museum.

The alcoholic collection consists of 116 amphibians, 70 reptiles, and 12 fish. All the amphibians known to occur within the Park, with the exception of the Arboreal Salamander (Aneides l. lugubris) are represented in the collection. The reptile collection is complete as it consists of at least one specimen of every snake or lizard that has been reported in Yosemite. The collection of fishes consists mostly of record sized trout taken by fishermen, although from the scientific standpoint two specimens, a Sculpin (Cottus gulosus) and a Hard-headed Minnow (Mylophorodon cononphalus) have been preserved. They are the first and only records of such fish in the Park.

Every scientific specimen to be of value, must be accompanied by accurate data. Attached to every specimen is a label bearing on one side the number of the specimen and the scientific and common name. On the reverse side is to be found the collector's number, which corresponds to much more complete data in his note-book, also the age, sex, locality, date and measurements. For each specimen in the mammal, bird, reptile, amphibian, fish and fungi collections, duplicate 5x8 accession cards are filled out, with the above facts and such other information from the collector's notebook as is pertinent. One card is placed in the numerical index while the duplicate is filed in the subject index according to family, general and species. On a third 5x8 card, opposite the name of the animal, is indicated the number of species in the collection and the season of the year—summer, fall, winter or spring—it was collected. Finally, the locality where the specimen came from is shown by a circle in

one of four colors which correspond to a season on a park topographical map. By reference to these cards and maps it is possible to quickly determine how many animals of a given species are in the collection, what part of the park they came from or what time of the year they were collected.

Thus naturalists are always prepared, whether on field trips or at the museum, to know which animals are needed for the collection. Such data results not only in conserving the time of the naturalists, but of wild life, also.

HOW MUCH DOES A BEAR CUB WEIGH?

(James E. Cole, Jr. Park Naturalist)

A common question asked Yosemite naturalists when a bear is in sight is, "How much does it weigh?" Having learned that estimates of mature bears are usually from one to two hundred pounds greater than the actual weights, they naturally are conservative in answering such questions. Previous to this fall, no record of weights of bear cubs existed for Yosemite, consequently no positive weights could be given. The general practice was to follow Seton, E. T. "Lives of Game Animals," Vol. 11, part 1, page 121, and to give 60 to 100 pounds as the weight of a cub that was ready to go into hibernation. Some naturalists held, however, that this weight was too much and that 50 pounds would be nearer the truth. The problem was settled this fall and the answer was a distinct surprise to all concerned.

On November 20, 1935, a ten-months old female cub was found to weigh 80 pounds. She was a healthy specimen with apparently an inch of fat on her back. The following day the brother to the first cub was placed on the same scales and found to weigh 120 pounds. No explanation accounting for the difference in weight is advanced except the difference in sex. When together with their mother no dissimilarity in size was apparent, due, no doubt, to their wooly-like pelage.

The young of the American Black Bear (Ursus americanus californiensis) in the Yosemite region are born, it is thought, around the first of February. At birth they weigh one pound or less. Thus in ten months' time these cubs gained an average of 100 pounds. Our records indicate that during the next two years bear cubs will increase a similar amount each year. No additional growth data is available for Yosemite, although it is known that our largest bears weigh between 500 and 600 pounds.

Since they do not live over 16 years except in captivity (Dixon, J., Field Naturalist, N.P.S.) it is apparent that like most animals, bears obtain the majority of growth during their youth and adolescent period.