



1952 NATURE NOTES
from
CRATER LAKE

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The Crater Lake Natural History Association was founded in 1942 to promote and assist the ranger-naturalist program, to further the investigation of subjects of popular interest and importance and to aid in the distribution of information on all subjects pertaining to the Park. Towards this end it sponsors CRATER LAKE NATURE NOTES and operates a publications sales counter, the proceeds from which are used entirely to support this work. NATURE NOTES is distributed free to members of the Association. Reprinting of articles appearing in NATURE NOTES is encouraged. It is requested that acknowledgement of the source be made by giving the name of the author and of this publication.

H. C. Parker
Editor

John B. Wosky
Superintendent

James Kezer
Associate Editor

INTRODUCTION

In line with one of the objects of the Crater Lake Natural History Association, namely, "to aid in the distribution of information on all subjects pertaining to the Park," this 1952 number of CRATER LAKE NATURE NOTES is offered to the public.

A dedicated staff presented a very successful public program in the Park during the summer. The material in this magazine is the result of activities on the part of the staff which are seldom brought to the notice of the public - the gathering of new information in order to enrich the knowledge of our Park. The results from such efforts serve to document the talks, exhibits and other presentations by the naturalists to the public.

One of the more extensive of these, a monograph on the birds of the Park by Dr. Donald S. Farner, has recently been published by the University of Kansas Press with the Crater Lake Natural History Association as co-sponsor and the agent financing the printing. Any person interested in obtaining a copy should send \$1.40 to the Executive Secretary, Crater Lake Natural History Association, Box 97, Crater Lake, Oregon.

Harry C. Parker
Park Naturalist

The cover photograph is by the Oregon State Highway Commission.



THE BIG SNOW OF 1951-52

Louis W. Hallock
Chief Ranger

The winter of 1951-52 at Crater Lake was preceded by a long dry summer during which there was practically no precipitation after May 13 until the first general fall storms. Most of the residents of the park were anticipating an "easy" winter but by April of 1952 all of us knew we had been through a winter of record breaking snowfall and snow depths.

Weather records have been kept in the park for about 26 years except for the war years and these records show that the average snowfall for Crater Lake is 622.0 inches. This average has been exceeded each year since 1948 and for several winters previously. The record snowfall for the park occurred during the winter of 1932-33 when 879.0 inches of snowfall was recorded between October 1, 1932 and September 30, 1933, which is the weather year for the park.

Snow depths on the ground are in direct proportion to the snowfall so that recorded depths of between 100 inches and 200 inches of snow are common. These greatest depths of snow usually occur during the months of January, February, and March. For example, snow depths for March 1949, 1950, and 1951 were recorded at the Park Headquarters weather station as 171, 180, and 197 inches respectively.

The past winter, however, while not breaking any records for snowfall did result in the greatest recorded depths of snow on the ground since park records have been kept. On March 1, 1952 there was 177 inches of snow on the ground which was only 31 inches from the record. A storm which began on the 3rd and ended on the 8th resulted in 39 inches of snowfall and increased the total depth to 200 inches. It was at this point we realized that if the normal cycle of storms continued, we would break a record. Thereafter, each storm, even though adding to our inconvenience of living and working in heavy snow, was watched with interest and anticipation. Another storm moved in from the southwest on the 9th and continued through the 15th and gave us another 38 inches of snowfall. The depth as recorded reached 201 inches, only 7 inches shy of the record we still hoped would be broken. There still remained 15 days of the month of heaviest snowfall - we should see the record broken.

March 16 was clear and comparatively warm, maximum temperature 37 degrees. Still another storm crossed the Cascades on the 17th and continued through the 20th. This storm carried enough moisture to satisfy our anticipation. In four days 42 inches of snow fell. At the beginning of this four day period the measured depth on the ground was 198 inches. On the second day a total depth of 207 inches was recorded - only one inch shy of the record. Then on the 18th 6 inches of snow fell followed by 10 inches more on the 19th. This was it! At 4:00 P.M. on the 19th the measuring stake recorded 216 inches. The record had been smashed but it continued snowing, and we speculated on how much greater the depth would be. On the morning of March 20, 1952 the measurement reached 224 inches of snow on the ground. During the day, however, the storm moved on and the new snow gradually settled to 218 inches, still a record.

By the end of March there had been measured 798 inches of snowfall, and we now set our sights on the breaking of the record for total snowfall, but this was not to be. The last snowfall on June 14, brought the total to 835 inches, some 44 inches short of a record.

The snowpack for the winter, which is measured periodically to determine water content, was found to be more compact and with more water than for many years previously. Water users in the entire state of Oregon were assured an ample supply for the coming season.



The big snow of 1951-52 as shown by Chief Ranger Hallock's photographs



Macgillivray warbler photographed in the headquarters area
From a kodachrome by Ranger-Naturalist Ralph Welles and
Florence Welles.

ORNITHOLOGICAL NOTES OF INTEREST

SUMMER OF 1952

Donald S. Farner
Assistant Park Naturalist

The summer of 1952, by contrast with 1951, was unusual because of the prolonged persistence of the snow and a consequently much delayed season. Although causal relations must be assumed with the greatest of caution and with much more investigation than has been possible, it is nevertheless interesting to note certain differences between the two seasons.

Several species whose upward altitudinal limits fluctuate substantially were greatly reduced or entirely absent from elevations above 6000 feet in contrast to last summer when the snow melted early. Included in this group are the Lazuli Bunting, Passerina amoena (Say); Fox Sparrow, Passerella iliaca (Merrem); and Western Wood Pewee, Contopus richardsonii (Swainson). Also conspicuously absent at higher elevations were Turkey Vultures, Cathartes aura (Linneus).

Perhaps the most spectacular change in the avifauna from last summer was the conspicuous decline in numbers of Red Crossbills, Loxia curvirostra Linnaeus. During the summer of 1952 I saw about 0.9 crossbills per hour in the field compared to 5.5 per hour in 1951. During 1952 they were only in restless flocks whereas in 1951 singing males were observed commonly. Also in 1951 groups feeding in cones or "mineral pecking" could be observed from small distances. Pine Siskins, Spinus pinus (Wilson), however, continue to be common this summer. Huge flocks of several hundred individuals were observed frequently in the Headquarters Area during late July and early August.

It is of interest, to note further, that there was a conspicuous reduction in the numbers of Rosy Finches, Leucosticte tephrocotis (Swainson). This has been particularly noticeable on Dutton Ridge where they were very abundant during the summer of 1951.

There was also a reduction in the density of breeding Lincoln Sparrows, Melospiza lincolni (Audubon), in the higher montane meadows. The study area in the upper Munson Meadow which I have had under observation for several summers had only two, possibly three, breeding pairs compared to the usual five or six. Although I do not have quantitative data, a similar reduction appears to have occurred in other high-elevation meadows. It seems quite likely that the persistence of the snow in these areas may have been responsible. It should be noted also that there has been a noticeable reduction in the numbers of Dippers, Cinclus mexicanus Swainson, appearing in the upper portions of the streams in mid-summer. Whether this represents a reduction in population or a restrictive effect of the snow on the normal mid-summer migration to higher elevations is not clear.

Despite the fact that there was a severe reduction in the cone crop on the whitebark pine, ponderosa pine, and firs, compared with 1951, there was, during the summer of 1952, a marked increase in Clark's Nutcrackers, Nucifraga columbiana (Wilson). This is noticeable throughout the high country as well as at the Rim Village, although more pronounced at the latter. It is of interest to note that we saw a considerable number of color-banded individuals which were banded during the summer of 1950 but which failed to reappear during the summer of 1951. The movements of this species continue to be enigmatic! There was also a remarkable increase in the number of Ravens, Corvus corax Linnaeus, observed. At least three small flocks, probably family groups, were observed repeatedly. These were commonly seen in the vicinity of Park Headquarters, Rim Village, and the Watchman, respectively.

Also of interest were the substantially greater recorded numbers of Booming Nighthawks, Chordeiles minor (Forster). Mr. and Mrs. Jack D. Lee reported observing them nightly at Lost Creek in Pinnacle Valley. I confirmed this on three occasions. They were apparently similarly common in the Panhandle. I also observed nighthawks at

Arant Point on July 8 and above Castle Creek Canyon (5800 ft.) on August 5.

Several important observations were obtained on swallows. On July 28, I saw three Cliff Swallows, Petrochelidon pyrrhonota (Vieillot), within the Crater wall near Garfield Peak. This is the second record for the Park. On August 2, Ranger-naturalist C. F. Yocom and I saw two Rough-winged Swallows along the Garfield Peak Trail. These are the first records for the Park since 1937 and the first for the Lake area. On July 19 I found a nest of Violet Green Swallows, Tachycineta thalassina (Swainson), in a cavity in one of the Wheeler Creek Pinnacles. This is the first breeding record for the Park.

Despite the heavy snow, the population reproductive activity, and upward migration of Blue Grouse, Dendragapus obscurus (Say), was quite normal.

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A NEW RECORD IN THE PARK FOR THE OREGON RED SALAMANDER

James Kezer
Ranger-Naturalist

One of the rarest animals in Crater Lake National Park is the Oregon red salamander. Lawrence Bisbee, foreman of the fireguards, found the first specimen to be collected in the Park on August 7, 1951, under a pile of boards near the Annie Spring Campground. Intensive search in suitable habitats throughout the Park failed to reveal other specimens until July 5, 1952. On that evening six additional specimens of this salamander were found by a group of individuals under rocks and in rotten wood at the edge of Vidae Falls. The Oregon red salamanders that have been found in the Park are intergrades between two subspecies as is indicated by the scientific name, Ensatina eschscholtzii oregonensis x platensis. It is particularly interesting to note that the Vidae Falls collection establishes a new altitude record for this genus of salamanders - about 6700 feet in the Hudsonian life zone.



THE USE OF THE WHEELER CREEK PINNACLES BY NESTING BIRDS

Donald S. Farner
Assistant Park Naturalist

The Pinnacles of Sand Creek and Wheeler Creek have long been of interest to geologists because of their contribution to our knowledge of the pumice-scoria flows which descended the southern slope of Mount Mazama prior to its collapse. These Pinnacles are the results of the most intense fumarolic activity in the Park (Williams, 1942:89-90). In this activity pumice and scoria were hardened in vertical columns by ascending gasses. The present form of the Pinnacles is the result of the modification of these original columns by wind and water erosion. Some of the Pinnacles are actually hollow and are sometimes referred to as "fossil gas vents."

Curiously little attention has been given to the fact that the Pinnacles are of some ornithologic interest. Frequently they are used by birds as song perches in the same manner as dead trees are used. Of even

greater interest, however, is the use of small cavities in some of the Pinnacles as nesting cavities. There are at present records of the use of such cavities by three species of birds. On June 26, 1952, I saw a pair of Mountain Chickadees, Parus gambeli Ridgway, carrying material into one of these cavities. Although I was unable to be certain, it appeared that the material was items of food indicating that the eggs had already been hatched. On the same day Park Naturalist Harry C. Parker and I observed a pair of Mountain Bluebirds, Sialia currucoides Bechstein, entering repeatedly an opening in one of the Pinnacles. At the time, we could not feel certain that nesting activity was in progress. However, on July 29 I saw a female enter the same opening and on August 4, saw both male and female carrying insects into the cavity. In the vicinity were two juvenile bluebirds apparently completely independent of the adults. They were catching insects on the wing. It would appear quite possible that these juvenile birds were from the first brood with which the observations of June 26 could be associated, whereas the food-carrying observed on August 4, was doubtless in conjunction with the rearing of the second brood.

On July 19, 1952, I discovered a pair of Violet-green Swallows, Tachycineta thalassina (Swainson), carrying food into a cavity in the Wheeler Creek Pinnacles. The young could be seen and heard plainly. Although Violet-green Swallows have been observed (Farner, 1952:74) rather frequently in Wheeler Creek Canyon and elsewhere in the Park, this is actually the first breeding record.

It should be noted that both the bluebirds and chickadees normally nest in cavities in tree trunks. The Pinnacles thereby constitute a curious, although understandable, substitute for tree trunks.

It is further of interest to note that Rough-winged Swallows, Stelgidopteryx ruficollis (Vieillot), have also been known to breed in Wheeler Creek Canyon (Farner, 1952:75). However, it appears that holes in the cliffs, rather than holes in the Pinnacles, are used.

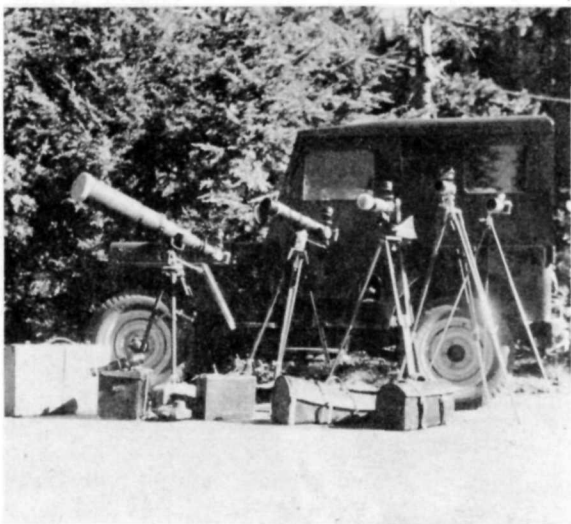
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NATURE PHOTOGRAPHY IN COLOR IN CRATER LAKE NATIONAL PARK

Ralph Welles
Ranger-Naturalist

In nature photography it is axiomatic that you must take the picture when you see it, because it may not be there the next time you look. This implies the necessity of special equipment and a special willingness to go to work at any time, because wild life has a time clock of its own.



Photographic equipment used by Ranger-Naturalist Welles and Mrs. Welles during the summer of 1952.

I recall the particularly colorful yellow-bellied marmot that used to sit in the late afternoon on a rock in the meadow back of headquarters. We never saw him except in the late afternoon when the light was almost gone. I had watched for him there several times during the day but he never put in an appearance, so I finally realized that I would have to get him on his own terms and took his picture that evening about six o'clock. The next morning a marmot was found dead on the highway in the same vicinity, and while it may be merely coincidence, a particularly colorful marmot never appeared on that rock in the meadow again.



A very young golden mantled ground squirrel taking what is perhaps his first bite of rotten wood. From a kodachrome by Ranger-Naturalist Ralph Welles and Florence Welles.

It is our belief that wild life should be photographed in the field as much as possible under natural conditions and natural light and natural habitat. In order to do this, Mrs. Welles and I carry with us most of the time a jeep-load of cameras, lenses, tripods, and miscellaneous equipment. This includes four Leicas, a Kodak Bantam, and lenses ranging in focal length from 35 mm to 640 mm. At all times we keep three Leicas mounted on telephoto lenses - a 300 mm, the 500 mm, and the 640 mm - with direct viewing reprints, each with its own special tripod. This leaves one Leica free for the interchangeable use of the 35 mm, the two 55 mm, the 85 mm and the 150 mm lenses for scenic, habitat shots and so forth. We employ flash guns, Strobe light and restrictive handling only when it appears impossible to get a picture any other way. For instance, a bat must be either held in



Two-year old bald eagle. From a kodachrome by Ranger-Naturalist Ralph Welles and Florence Welles.

the sunlight or taken with a flash because of his light shunning habits.

Photographically speaking, the 1952 season at Crater Lake National Park was highlighted by the discovery and the subsequent coverage of a den of Cascade red foxes, a nest of bald eagles and the habitat of a great gray owl.

The red foxes were first reported to me on July 7th by Assistant Chief Ranger Packard, who went with me that afternoon to their den about half a mile beyond the Rim Village off the north road. After searching the area for about half an hour and finding no evidence of foxes, we decided we must be in the wrong location, and turned to go. As is so often the case, we found that although we had not seen it, we had been under observation by one of the young foxes for some time. He was sitting on the ridge about thirty feet away, apparently as curious about us as we were about him.

I got one shot of him with the 500 mm, and with the click of the shutter he vanished back of the ridge. We saw no more of him that day, but during the following two weeks my wife and I had the opportunity of observing the entire fox family and photographing them around their various dens as they moved farther and farther away from human interference. The three young ones became for a time almost indifferent to our presence, because, as is well known, the parent foxes have a great deal of difficulty in teaching their young to be afraid. We eventually were able to photograph all three of the young almost at will, but were able to get only distant shots of the wary adults. In this connection it is of interest to note that whereas most male carnivores will eat their young if given the opportunity, the male red fox helps take care of the young until they are able to take care of themselves.

The last time we visited their den, on July the 23rd, we saw no sign of the young foxes, nor did we hear the peculiarly eerie wild barking of the parents in the deep hemlock forest below the ridge.

In the meantime, on July 18th, former Superintendent E. P. Leavitt told us about a bald eagle's nest at Diamond Lake, and we went with him immediately to locate it. He had only visited the locality once and then by boat from Diamond Lake Lodge, and as the lake was too rough to take a boat out that day, we drove around to the near vicinity, but could not identify the nest.

Returning two days later, we inquired at the fish hatchery whether anyone knew where the eagle's nest was, and were promptly offered a boat ride across the lake by Jay Hoover of the Fish and Game, who knew where it was, and who landed us on the marshy shore about a hundred yards from the one hundred fifty foot fir in the top of which could be plainly seen the clutter of sticks we were looking for. For a half an hour or so there was no sign of life in the dense forest in which we found ourselves except for the clouds of mosquitoes which seemed to be impervious to the insect repellent we had with us.

Looking almost directly up at the nest we could see no young in it and the adults were apparently out over the lake at the time, so we occupied ourselves with a close-up telephoto shot of the nest to show its construction, and also general habitat shots.

While so doing we suddenly heard at some distance through the trees the weird, loud cacaphony of the adult eagle's cry of alarm. Moving in that direction we almost immediately came upon an extremely exciting spectacle. Close together in the high top of a dead Douglas fir, with white heads and tails gleaming in the sun were two great bald eagles. We were able to get two good shots of them before either their excitement or ours caused them suddenly to soar away out of sight.

Later that afternoon we made two discoveries that facilitated observation and picture-taking of our quarry. There was a narrow opening in the forest through which the nest could be seen from the road, and secondly, by climbing the mountain on the other side of the road about fifty yards we found that we could observe not only the nest but that there were two very young but not small nor "bald-headed" eagles in it. Although it was to be several weeks before "the babies" could fly, they were already nearly as large as their parents and their heads were still as dark as the rest of them as they would continue to be for three or four years.

From our view-point on the mountain we set up our 500 mm and 640 mm cameras and waited. It was two hours before we had the gratification of seeing and photographing a parent eagle swoop down with breath-taking swiftness and alight on the edge of the six-foot nest and proceed to tear up what appeared to be a large white bird and feed it to the young.

We saw them at weekly intervals up until the time of this writing. When last we observed them one of the adults was no longer putting in an appearance, the young were learning to fly, stretching and flapping their great wings (they already had a wing-spread of approximately six feet), sometimes rising two or three feet, then settling back down.

A more complete record of our experience with the great gray owl is contained elsewhere in this issue of Nature Notes.

It would be easy, not to say delightful, to spend an entire summer photographing the golden mantled ground squirrel, the Olympic black bear or the Clark nutcracker. A book could be written about how we came into possession of a great horned owl which we eventually banded (with the help of Ranger-Naturalist Wally Ernst, who was of invaluable aid to us on that and many other occasions) and turned loose on Dutton Ridge. I could write about the courage and tenacity for life of the badger that we found stunned and bleeding on the road where he had been struck by a passing vehicle.

You can see pictures of these and many others and hear their story when you attend the Naturalist talks at Crater Lake National Park.

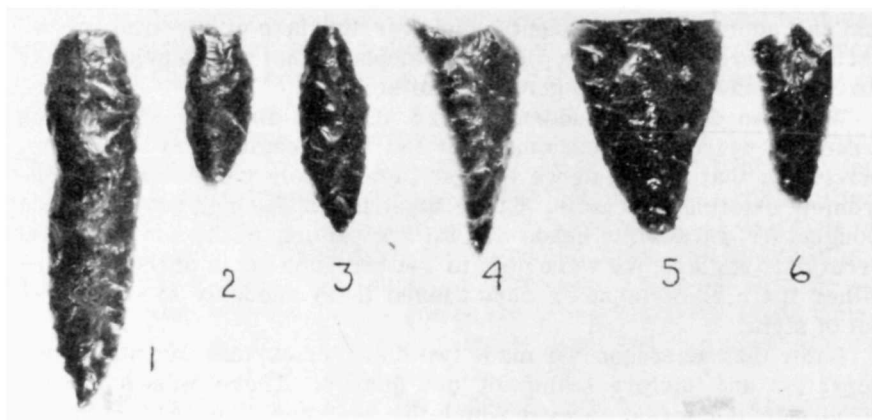


Fig. 1

INDIAN RELICS ON MT. MAZAMA

Richard M. Brown
Ranger-Naturalist

On August 11, 1952 an arrowhead (Fig. 2) was brought to the Information Building by a visitor who had found it that morning at the viewpoint near Discovery Point, not far from the plaque which calls attention to glacial scratches on rock at the Rim. It is quite possible that this arrowhead was exposed by the heavy thundershowers which occurred during a four-day period shortly before the day on which it was found. This becomes the seventh Indian point in the park collection, earlier finds having been made in Godfrey Glen (Fig. 1, Nos. 1,2,3), along the first turn in the highway leaving the Rim Village (Fig. 1, No. 4), and on the upper part of the Garfield Peak Trail (Fig. 1, Nos. 5,6). The unique feature of this arrowhead is that it has been made from opaque whitish-colored rock, whereas all of the others are of translucent obsidian.



Fig. 2

The Indians which once lived in this region are known to have been superstitious of Crater Lake and Mt. Mazama, considering the area to be the home and battleground of the gods. For this reason they established their camps a considerable distance away from the mountain and seldom ventured near this sacred abode. One of their legends, however, provides some evidence that

they occasionally hunted in the forests on the slopes of Mt. Mazama itself (Homuth, 1929). Our growing collection of Indian points contributes significantly to the belief that this and other Indian legends concerning Mt. Mazama may contain considerable basis in fact.

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THE NORTHERN MOUNTAIN LIZARD

Robert C. Wood
Ranger-Naturalist

The small lizard, Sceloporus graciosus gracilis Baird and Girard, often called "mountain swift" because of its ability to move so rapidly, is not at all common in Crater Lake National Park. It is usually found in dry, fairly open areas where there are logs or old stumps in which it seeks cover when disturbed. Because these lizards are so elusive there are many more recorded observations than there are specimens in the Park collection.

Until this year, the northern mountain lizard had been recorded in only three localities within the Park. These were Wheeler Creek Canyon, the Rim above the Palisades, and the east side of Annie Creek in the Park panhandle. The only specimens from the Park had been taken at Wheeler Creek Canyon in 1948 by D. G. Findlay and D. S. Farner. Individuals had also been observed just outside the south boundary in the dry, brushy country east of Annie Creek and it was there that Dr. D. S. Farner collected a specimen in 1948.

During the summer of 1952, several new observations were made and a specimen was collected which furthered our knowledge of the distribution of this lizard both within and adjacent to the Park. On July 29 Ranger-Naturalists Ralph Welles, Richard M. Brown, and the writer saw several individuals along the fire motorway east of Annie Creek near the south boundary but were unable to capture them. Ranger-Naturalists Brown and I returned to the area on August 4 and managed to secure two specimens. One was caught just outside the Park boundary, the other barely inside it. They were both obtained by Brown, using a snare on a fishpole.

The other record of this Sceloporus was obtained by Dr. Albert P. Blair and Arthur Barclay on August 6. They observed two northern mountain lizards at the Wineglass about 40 feet up from the lake. Both Richard Brown and the writer searched unsuccessfully for them several days later.

THE SEDENTARY HABITS OF CANADA JAYS

Dorothy C. Farner
Donald S. Farner
Assistant Park Naturalist

It has long been suspected that individual Canada Jays, Perisoreus canadensis (Linnaeus) are normally restricted throughout their lives to a relatively small area (Farner, 1952:76). Of course such a hypothesis can be definitely confirmed only by the observation of marked individuals. Results thus far obtained from the banding of Canada Jays in Crater Lake National Park strongly support the hypothesis although more data are needed to understand fully the degree of restriction of movement among these birds.

Canada Jays have been banded at Park Headquarters and at Annie Spring. Most of them have been marked with the numbered aluminum bands of the U.S. Fish and Wildlife Service and with colored aluminum bands supplied by the Massachusetts Audubon Society. Using two- and three-band combinations, always with at least one numbered aluminum band, it has been possible to give each bird a distinctive combination allowing identification without recapture.

Twenty-seven banded Canada Jays have been observed at least once after banding. Of these, ten were not seen after the season of banding. Of the remaining seventeen one was recorded nine years after banding; two, four years after banding; three, three years; two, two years; and nine, one year after banding. At least nine of the seventeen are known to be alive at the time of this writing.

In seeking banded Canada Jays we vigorously inspect three areas: the Rim Village and Rim Campground, Annie Spring Campground, and Park Headquarters. In the course of field work in other parts of the Park all Canada Jays encountered are carefully examined with field glasses for bands.

It is quite amazing to note that with only one exception all twenty-seven birds, involving more than a hundred observations, invariably have been observed within 200 yards of the banding site. The single exception (Farner, 1947:31) was a bird banded by W. T. Frost at Annie Spring on December 27, 1937, and recovered on August 6, 1947, about one mile from the banding locality.

It is of interest to contrast our experience with Canada Jays and our experience with Clark's Nutcracker, Nucifraga columbiana (Wilson). Nutcrackers have been banded at Rim Village, Park Headquarters, and Annie Spring. It is by no means an uncommon experience to find Nutcrackers banded at one station appearing at the other two, either in the same or different seasons. In two cases we found evidence of almost daily movements between Annie Spring and the Rim Village. We also have observed banded Nutcrackers along the West side of the Rim several miles from the banding site at the Rim Village. This

experience with Nutcrackers is cited primarily as evidence to indicate that were there similar movement by Canada Jays, we would have detected them. Although more data are needed in order to be conclusive, there is certainly every reason to believe that the Canada Jays of this area are extremely sedentary.

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CRATER LAKE FISHING, 1952

C. Warren Fairbanks
Ranger-Naturalist

During most seasons many of those who visit Crater Lake National Park go down the trail to the lake. Usually quite a number of these people try their hand at fishing, either from boats or from the shores. Hasler and Farner (1942) report that 1270 anglers who fished from boats on Crater Lake in 1937 took 1302 fish—an average of a little more than one fish per angler for the season, which included the months of July and August. The same authors made similar reports for the seasons of 1938 through 1940. In 1940 their observations show that 837 anglers caught 4188 fish, or an average of about 5 fish per fisherman. In addition to these records, the creel census report for 1950 (Crater Lake National Park files, no author) states that in July and August of that year, 229 anglers averaged 1.12 fish per person. Since it is obviously very difficult to obtain records of shore fishing, none of the above figures include such data.

From the standpoint of the fisherman—to say nothing of those who just wanted to view the lake from the shore, or to ride upon its surface—the 1952 season was a great disappointment. Excessive shows of the previous winter, coupled with a late spring, made it evident very early that the lake trail would not be opened by the beginning of the season. A more thorough investigation indicated August 1 to be the probable earliest date that the 1.6 miles of trail could be made passable. That meant, of course, that July, the best fishing month (Hasler and Farner, 1942) would pass with the lake inaccessible to visitors.

According to plan, therefore, a crew began to clear snow and repair damaged portions of the trail. The work, in spite of great difficulties, progressed about on schedule. Then, with completion anticipated to be only one or two days away, the final blow fell. Several daily rains had loosened the soft material along the face of the wall, and a particularly heavy storm released an avalanche of many tons of rocks, debris, and water which rushed down the slopes and washed out completely the lower part of the trail. This made necessary so much new permanent construction that the lake remained closed to visitors for the entire season.

Although Crater Lake is by no means a fishing resort, it is of scientific interest to make yearly observations of the fish and of conditions which affect their existence there. Along this line there was planned for 1952 an extensive investigation of limnological conditions and of life in the lake in order that more might be known of the fish population. It was hoped, also, to be able to learn something of how large a fish population the lake might support. Difficulty of reaching the lake, however, greatly hampered such operations. Very few data, therefore, have been collected.

The first trip of the year to the lake—and to Wizard Island—was made by the author on July 13 in company with Paul Herron, who was to have operated the launches for the Crater Lake National Park Company, and Wallace Ernst, one of the other ranger naturalists. Since the trail at this time still was almost completely covered with snow, descent was made along one of the ridges where trees were of great assistance in maintaining footholds. Despite this, however, much of the way was over snowbanks with travel on "all-fours." At the lake shore a row boat had been secured high in a tree the previous fall to protect it from snow damage. This was lowered and placed in the water for the trip to Wizard Island.

Before heading across the lake, we rowed around to a point where Joseph Diller, who made the first extensive geological studies of Crater Lake, was supposed to have placed a bronze tablet on a rock face. The tablet has apparently been gone for some years but the imprint remains clearly marked. If the information is correct that the bottom of the tablet was at water level at that time, 1873, the present water level is an estimated six feet below that point. According to Paul Herron, however, the water appeared to be considerably higher than last season. At Wizard Island, also, evidence of the higher water was observed. One of the government boathouses, constructed in 1942 with its lower sill eighteen inches above water level, is now so nearly submerged that the gunwale of the rowboat would just slip under its eaves. Later in the season—August 19—the water level was measured by Paul Herron and the author. It was found to be 11 feet 1 inch below the October 1, 1942 level. Also, it was estimated from pollen deposits, that the water was about three inches lower than on July 13 of this year.

In 1952, surface temperature readings, taken with a standard laboratory thermometer, were obtained from shore on August 3, 7, and 17. These were, respectively, 17.3° C. (63.14°F.), 16.8° C. (62.24°F.), and 16.9° C. (62.42°F.). The first and last of these were taken below the Wineglass, and the other near the foot of the government trail. At this writing, only one open-water surface temperature reading had been taken. This was between government trail and Wizard Island on August 7 and was 16.3° C. (61.34°F.). Thus, temperatures this season appear to be nearly the same as maximum for 1937.

Although only official personnel were permitted access to the lake, there was some fishing this season by local residents who managed to get down to the lake. Fortunately, a few of these records were obtained. Seasonal Ranger Bob Morris contacted one group of anglers who had taken 31 fish—30 Rainbow trout (Salmo gairdnerii irideus) and one Sockeye salmon (Oncorhynchus nerka kennerlyi)—on July 27. These were caught with dry flies cast from shore. The trout ranged from ten to sixteen inches in length, and the salmon was ten inches long. No viscera were obtained but the fishermen said that some of the Rainbows were spawning, while others had already completed this function.

The following week, Ranger Morris also contacted a group of three anglers who had caught seven Rainbows with similar tackle. Records of four other Rainbow trout and two salmon were obtained by the author. The trout were from nine to slightly over thirteen inches in length, and the salmon between eight and nine inches. This total of 42 fish undoubtedly does not include all those taken but it is an interesting comparison with the figures cited in the introductory paragraph.

At the date of this writing, three—two Rainbow trout and one Sockeye salmon—of four fish stomachs collected had been examined to study food habits. The trout had been caught from shore, and the salmon was taken on a troll line from Skell Channel. It is of interest to observe that availability of a food item would appear to be the important factor in its selection by the fish. These fish were taken at the time of the California Tortoise Shell butterfly emergence when great numbers of these insects were flying over the lake. Many of them could be seen floating on the water where they had probably fallen exhausted. The stomachs of the salmon and one trout contained, respectively, nine and six of these butterflies.

One further item of some note was the finding of a single specimen of a copepod, Cyclops serrulatus, in the stomach of the salmon. This, in itself, would not seem important since microcrustaceans of the copepod group usually are found in most lakes and ponds. In looking through the available literature on previous studies of Crater Lake, no reference to this particular group of animals could be located, although their near relative, *Daphnia* (the water flea), was mentioned

by several authors. It is not known, therefore, if copepods were not in the lake when the other investigations were made, or if they were overlooked. Microcrustacea are important food items, particularly for small fish, and sometimes compose a portion of the diet of larger fish. Consequently, it is gratifying to note their occurrence here.

The foregoing is a very meager gleanings as compared with many previous seasons. The only indication of fish abundance seen this year was the observance of considerable surfacing by the fish one day in late July. This does, however, give some indication of present conditions in Crater Lake.

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A NEW HORNED TOAD RECORD FOR CRATER LAKE NATIONAL PARK

Donald S. Farner
Assistant Park Naturalist
James Kezer
Ranger-Naturalist

Although horned-toads are quite common in suitable habitats at lower elevations around Crater Lake National Park and at isolated localities in the Cascade Mountains (Gordon, 1939:68), they are obviously rare within the Park. Prior to this season there have been only two records for the Park (Farner and Kezer, M.S. 1951).

Campbell (1934:2) states that he saw a specimen "which had been caught by the CCC boys of the Wineglass Camp in the woods several miles down the Motorway which leaves Wineglass and goes toward the North boundary." This locality is in good horned-toad habitat.



Pigmy Horned Toad.
Photograph of a pre-
served specimen.

Unfortunately this specimen was not preserved. Joseph S. Dixon obtained a specimen (MVZ 40761) collected by James Tucker "on August 15, 1944, at 6000 feet on pumice desert 5 miles north of Crater Lake about half way between Grouse Hill and Timber Crater." We have searched this area for this lizard numerous times without success. One must not exclude the possibility that the specimen obtained by Dixon had escaped or was released by a visitor since the collecting locality is near a highway and since these little reptiles are frequently acquired and kept as pets.

On 26 June 1952 Park Naturalist Harry C. Parker and Assistant Park Naturalist Donald S. Farner collected a specimen (CLNP 523) along the Rim of Wheeler Creek Canyon at 5550 feet. Although this specimen was taken near the East Entrance Highway it can nevertheless be safely regarded as a legitimate record for the Park since the highway had not yet been opened to public travel for the season.

The horned-toads of Crater Lake National Park and vicinity are referred to Phrynosoma douglassii douglassii (Bell), the Pigmy Horned Toad (Farner and Kezer, M.S. 1951).

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THE 1952 INVASION OF CALIFORNIA TORTOISE SHELL BUTTERFLIES

Donald S. Farner
Assistant Park Naturalist

At irregular intervals Crater Lake National Park is visited by huge numbers of Tortoise Shell Butterflies, Aglaia californica Bdv. Previous invasions have been described by Scullen (1930), Constance (1931), and Lowrie (1951). Doubtless others have occurred without being recorded. The chronology of the 1952 invasion was very similar to that of 1951. The butterflies first began to appear about July 30 and seemed to reach their maximum abundance during the first week in August when prodigious numbers were to be observed in flight and resting on buildings. They were observed in abundance at the summits of Mt. Scott, the Watchman, and Dutton Cliff.

Doubtless these butterflies constitute an abundant source of food for several species of animals. During the last week of July and the first week of August there was a pronounced increase in the numbers of Clark's Nutcrackers, Nucifraga columbiana (Wilson), along the Rim Highway. On several occasions I have noted them feeding on the California Tortoise Shells which had been killed by automobiles. The same observation has been made by Ranger-Naturalist R. M. Brown. On August 10, Ranger Naturalist C. Warren Fairbanks saw three ravens, Corvus corax Linnaeus, feeding on these butterflies on the highway near Lla-o Rock. He also found six in the stomach of a Rainbow Trout, Salmo gairdnerii Richardson, caught near Eagle Cove on August 17. Ranger-Naturalist Brown also observed a Golden-Mantled Ground Squirrel, Citellus lateralis (Say), taking one on August 7 near Hillman Peak. These ground squirrels were frequently observed to take butterflies which dropped from the radiators of automobiles at the checking stations. The use of butterflies as food by the Golden-Mantled Ground Squirrel, however, is apparently not unusual (Gordon 1943:27).

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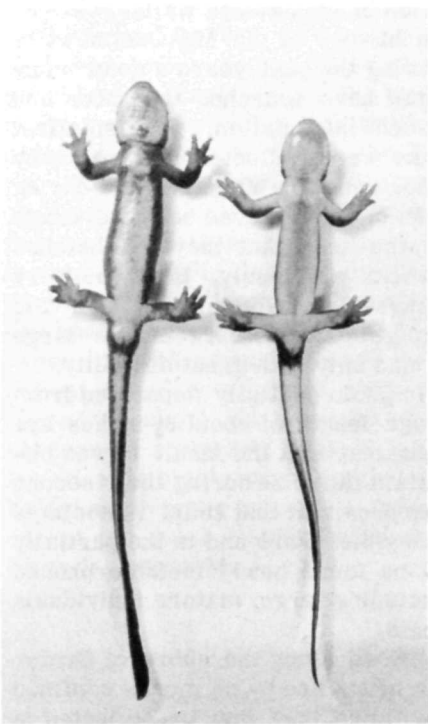
THE MAZAMA NEWT: A UNIQUE SALAMANDER OF CRATER LAKE

James Kezer
Ranger-Naturalist
Donald S. Farner
Assistant Park Naturalist

During the past two seasons many of the visitors to Crater Lake National Park have been able to get some first hand contact with one of the most distinctive and interesting animals of the Lake. This is a salamander or water-dog, oftentimes called the Mazama newt or

Crater Lake newt; it is found no place in the world outside of the waters of Crater Lake. Believing that many of the visitors to the Park would be interested in this unusual animal, we have frequently exhibited living specimens during lectures in the lodge and the community building and the excitement that is invariably caused by the circulation of the jars of newts has indicated to us that these salamanders are indeed a real source of interest to our visitors.

If one compares the Mazama newt (Triturus granulosus mazamae) with the common Oregon newt (Triturus granulosus granulosus) it is clearly evident that the two are very closely related. Indeed, the difference between the two is simply a matter of the pigmentation of the lower surface; the immaculate orange-yellow of the Oregon newt is replaced in the Mazama newt with varying amounts of dark pigment that appears to invade the under surface of the animal from the sides. This difference in pigmentation is illustrated in the photograph in which the under surfaces of the



Under-surfaces of two closely related newts. A Mazama newt from Crater Lake at the left and a common Oregon newt on the right.

two kinds of newts are shown. It should be pointed out that the amount of black pigment on the lower surface of a Mazama newt is highly variable; some individuals have lots of it and others approach closely the pigmentation of the common Oregon newt.

Our best interpretation of the Crater Lake newt population assumes that hundreds of years ago some common Oregon newts were able to get into the Lake through an unknown route, probably during a period when the climate was much wetter. The steep, dry walls of the Lake Rim have apparently served as an isolating mechanism, allowing the Crater Lake newts to develop a different genetic composition and resulting in the pigmentation differences that now separate this group of water-dogs from the common Oregon newt. It is a very interesting fact that a specimen of the common Oregon newt collected within the Park boundaries as close as two and one-half miles from the Lake showed none of the under-surface black of a Mazama newt. This is surely a tribute to the isolating function of the caldera walls.

Our present knowledge of the life history of the Mazama newt is fragmentary, despite the fact that during the past years a good many members of the ranger-naturalist staff have searched the water and the shoreline of Crater Lake for such information. The smallest larvae that we have found in the Lake were collected in a partially cut-off pool behind the Government Boathouse on Wizard Island during the first week of September, 1951. Ten of these larvae had an average length of about $3/4$ inch which indicated to us that they had hatched from the egg mass at least three weeks previously. It seems very probable that the eggs from which these larvae came had been laid during the summer, perhaps back in the spaces between the large blocks of lava where they would be found only with great difficulty.

In the water along the shore and in pools partially separated from the Lake, large larvae with an average length of about $3\frac{1}{4}$ inches are commonly found. Our limited data suggest that the small larvae observed in the pool on Wizard Island attain this size during their second season of growth, undergoing metamorphosis at that time. Associated with the large larvae in the water along the shore and in the partially cut-off pools on Wizard Island, may be found newly metamorphosed newts and adults of various sizes, including large, mature individuals averaging about $6\frac{3}{4}$ inches in total length.

If one lifts up the rocks and driftwood along the shore of Crater Lake he soon learns that the Mazama newts are by no means confined to the actual water of the Lake. Oftentimes they may be collected in large numbers under the debris along the shore, frequently in association with the long-toed salamander, Ambystoma macrodactylum. In this non-aquatic environment they appear desiccated and sluggish with extremely granular skins. We have considered the possibility that these semi-terrestrial individuals represent a definite stage in the life history of this newt; however, since no single age group is

involved, it seems more probable that a transitory semi-terrestrial existence represents an aspect of the behavior of the Mazama newt at various times during its life.

On several different occasions we have observed large aggregations of the Mazama newt along the shore of the Lake. Usually these aggregations consist of semi-terrestrial individuals in groups of about twelve to fifteen out of the water and under rocks or pieces of driftwood. A somewhat different kind of aggregation was observed September 6, 1951, on the east side of Eagle Point where the shore of the Lake consists of a rocky beach covered with willows. Two hundred and fifty-nine newts were massed together in an area of water not more than thirty feet square, the vast majority of these being under a single flat rock about nine feet square, resting on other rocks in approximately one foot of water. Making up the aggregation were adults of varying sizes, large larvae and newly metamorphosed individuals.

On August 7, 1952, an enormous aggregation of Mazama newts was observed under rocks in the shallow water of about 15-20 feet of shoreline in Eagle Cove. We estimated that at least three hundred newts were involved in this aggregation and, as previously noted, all sizes from large larvae to the largest adults were present. At this time the significance of these aggregations is not understood.

From the zoological standpoint, the newts of Crater Lake are particularly interesting because they provide material for the determination of the time required for the genetical change that is necessary for the development of a subspecies. The collapse of Mt. Mazama has been accurately established by modern technics as occurring between six and seven thousand years ago. This information clearly indicates that newts could not have entered the water of Crater Lake more than about six thousand years ago; moreover, considering the subsequent eruptions that brought about the formation of Wizard Island, it is highly probable that the Lake newt population was established much more recently. Indeed, the Mazama newts are doubtless one of the most clearly dated cases of subspeciation available any place in the world.

SNOW CRATER - NATURE'S CALENDAR

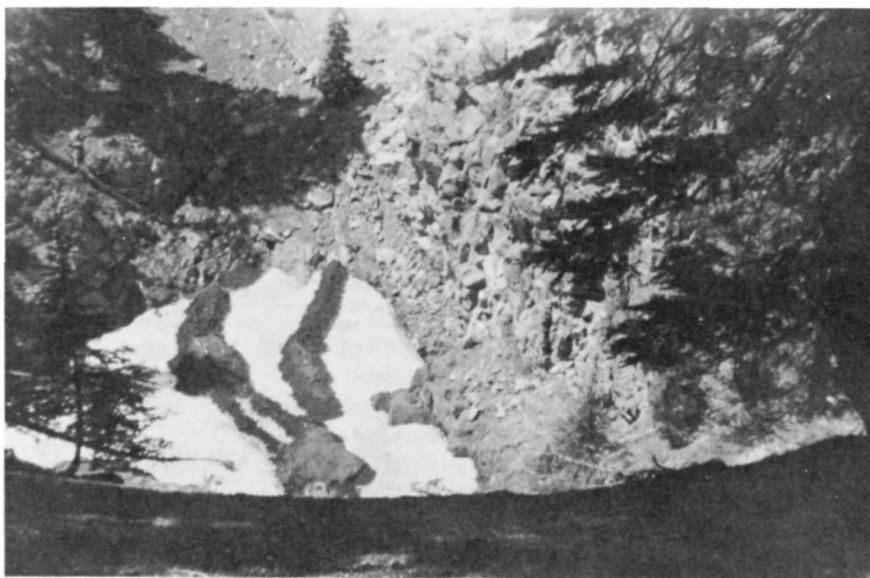
James Richards
Ranger

Snow Crater is a unique and interesting feature of Crater Lake National Park. It is located in the summit of Scoria Cone in a remote section of the Park near the South Boundary. It may be reached by traveling about one and a half miles on the Red Blanket Motorway, and then about one and a half miles in a southeasterly direction. Regardless of the heat of the summer season, the snow that has fallen in this crater from the previous winter never entirely melts; thus over a period of years a sizable mass of snow has accumulated in the depression at the top of the cone. It is particularly interesting to note that a season's accumulation of snow in the crater constitutes a distinct layer, clearly demarked from the younger layers above and the older layers below.

The layers or "varves" of snow remind one of the varves that are often deposited by lake waters and from which it is possible to learn much regarding the time and conditions during which the lake existed. Varves deposited by a lake consist of alternating layers of dark and light sediments. During the summer, the life in a pond or lake is on the increase because of good growing conditions, and likewise, is on the decline in late fall and winter. As winter approaches and organic matter dies, it settles and turns dark, thus creating a dark layer of sediment. During the colder months, the sediments laid down are of an inorganic nature and much lighter than the previous ones. Thus one layer of both dark and light constitutes the sediments laid down during a one-year period and gives rise to a single varve from which a geologist may read certain facts regarding the conditions prevailing in the lake during the deposition.

The accumulation of snow and debris in Snow Crater here in the Park is in many respects analagous to the formation of the varves of a lake. Each winter brings about an accumulation of snow, and then during the summer, a layer of rocks, dirt, and debris from the trees forms on top of the snow. In this manner there is developed a "snow varve," representing one year of deposition.

As far as I have been able to determine, Snow Crater has been visited only about four times since 1948: During 1948, Rangers William Kinsley, Richard Marquis, and a third person visited the Crater at least twice. On the second trip, an exploration was made in a crevice between the snow and the rock wall and, according to the report of Ranger Marquis, about 75 snow varves were counted, representing as many years of snow accumulation. In 1949 Ranger Kinsley and I visited Snow Crater but we were unable to make any further



Looking into Snow Crater from the summit of Scoria Cone about fifty feet above the surface of the snow. The streaks are mud that has washed over the snow from heavy rains.

studies because of the unusually heavy snowfall of the preceeding winter. During the summer of 1952 I was able to make a second trip to this remarkable crater. The accompanying photograph was taken at that time. The near record snowfall of the 1951-52 winter had hidden all of the possible exposures at which the snow varves might have been counted. It seems very possible that further exploration will be fruitless until perhaps mid-September, barring an early winter.

Snow Crater is one of the many out-of-the-way features of Crater Lake National Park rarely visited by any of the thousands of individuals who come to the Park each summer. I hope that this Nature Notes article will serve to call this interesting accumulation of snow to the attention of hikers and those who are interested in geology. I am sure that there are many Park visitors who will find a trip to Snow Crater a fascinating experience.



A flight of Pintails as seen from Sinnott Memorial. Pen and ink sketch by Ranger-Naturalist Charles F. Yocom.

AMERICAN PINTAIL ON CRATER LAKE

Charles F. Yocom
Ranger-Naturalist

Although many ornithologists have investigated the bird life of Crater Lake National Park over a period of years, only one sight record for the American pintail (*Anas acuta tzitzihua*) had been recorded until this season. Farner (1952) states that J. C. Wright, fireguard on Mount Scott, on August 22, 1949, observed a flock of 20 to 30 Pintails flying southward toward Upper Klamath Lake.

From July 28 to August 3, 1952, several hundred waterfowl were seen on Crater Lake or flying out over the rim of this lake by ranger naturalists. Apparently most of these ducks were Pintails, for all flocks seen by the writer at close range were this species. The following records indicate the large number of waterfowl that were seen:

<u>Date</u>	<u>Number</u>	<u>Location</u>	<u>Observer</u>
AM 28 July	100	on surface near Phantom Ship	D. S. Farner
AM 30 July	1 flock	on surface out from Sinnott Memorial	Robert Wood
AM 31 July	2 flocks	near Rim Village flying south	Warren Fairbanks
*AM 1 August	150	near Wizard Island	C. F. Yocom
AM 1 August	large flock	east of Wizard Island	C. F. Yocom
AM 2 August	60	near Wizard Island	C. F. Yocom
*PM 2 August	200-500	feeding and flying near Garfield Peak	Yocom and Farner
PM 2 August	300+	feeding west of Phantom Ship	Yocom and Farner
*AM 3 August	200	flying near Sinnott Memorial	Robert Wood
AM 3 August	200+	on surface out from Sinnott Memorial	Robert Wood
PM 3 August	3 flocks	far out in lake	C. F. Yocom
*PM 3 August	800+	beyond Wizard Island	D. S. Farner

*These flocks were identified as Pintails. The large flock seen by Farner and the writer on August 2 flew very close and were seen under favorable light so that unmistakable markings were seen.

These flocks of Pintails were undoubtedly migrants that are known to pass through Washington and Oregon and arrive in California during the last of July and the first part of August. This early flight of Pintails is not understood by waterfowl biologists in the Pacific flyway, but banding will assist in unraveling this problem. There are many later flights of Pintails as indicated by Yocom (1951). As a matter of fact the writer has seen migrating Pintails 465 nautical miles west of Cape Blanco, Oregon, on August 30, 1945.

It is not unusual that Pintails should pass over Crater Lake National Park in migrating, but it is unusual that large flocks alighted on the lake and remained for some time, as Pintails are pond ducks which normally feed by means of tipping in shallow marshes and lakes. Flocks observed on Crater Lake appeared to be feeding. They remained in close-knit bunches and swam over the surface quite rapidly, often times flying a short distance, then milling about in compact groups. Evidently these birds were securing some desirable food items on the surface of the lake.

No large flocks of ducks were seen after August 3rd except a flock of over 100 individuals noted on the Lake east of Wizard Island on August 17, by D. S. Farner. The birds observed leaving the Lake flew out over the Rim between Sun Notch and The Watchman, going

toward Klamath Lake and it is believed that all of the flocks seen between July 28 and August 3 passed on South.

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TWO INTERESTING ORNITHOLOGICAL OBSERVATIONS

Charles F. Yocom
 Ranger-Naturalist
 Donald S. Farner
 Assistant Park Naturalist

During the month of August we recorded two observations which are of considerable interest since they add materially to our knowledge of the avifauna of the Park. On August 23, 1952, a juvenile English Sparrow, Passer domesticus (Linnaeus), was seen near the Information Building at the Rim Village. Since this is considerably out of the altitudinal range and habitat of this species the possibility of this individual having been liberated in the vicinity should not be precluded.

Farner (1952: 167) includes this species in the supplemental list of birds of the Park on the basis of observations by Joseph Dixon in 1945 near the South Boundary.

On August 31, 1952 we saw two Band-tailed Pigeons, Columba fasciata (Say), perched in the dead top of a mountain hemlock at about 7400 feet on Dutton Ridge. This is a particularly significant record since this species was admitted to the Park list (Farner, 1952: 50) solely on the basis of the remains of a single bird found on July 24, 1945 by Joseph Dixon near the head of Castle Creek. This species must still be regarded as a rare straggler in Crater Lake National Park.

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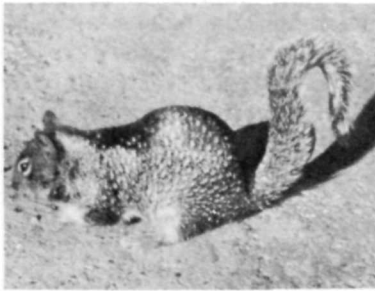
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GRAY

DIGGERS

AND

MUSKRATS



Gray Digger

Richard M. Brown
Ranger-Naturalist

An adult male Douglas ground squirrel, Citellus beecheyi douglasii Richardson, was found dead along

the west entrance highway about four miles within the park boundary, on July 15, 1952. This animal, also known as the gray digger, was noticed by Art C. Toth, forman of the fire guards, who brought it to Park Headquarters to be added to our mammal collection (CLNP #522). Although these ground squirrels have been observed occasionally along the western and southern boundaries of the park, the only other collection was made in 1937 at the south entrance (Wallis, 1947:53). Since the previous observations within the park have all been made near the west entrance (4800) feet and the south entrance (4400) feet, the finding of this mature individual, apparently killed by a car, at an elevation of about 5700 feet establishes a new record for Crater Lake National Park.

The gray digger lives principally in sagebrush areas of the Upper Sonoran Zone and open forests of the Transition Zone. Somewhat similar to the silver gray squirrel, Sciurus griseus griseus Ord, which is rare within the Park, the gray digger is distinguished by his less bushy tail and the conspicuous black patch which extends from between the shoulders to the middle of his back. In addition, the silver gray squirrel usually stays fairly high in the trees, while the ground squirrels rarely climb more than a few feet off the ground.

On June 12, 1952 a muskrat (CLNP #519) was found by Chief Ranger L. W. Hallock and Assistant Chief Ranger James W. B. Packard, frozen in a snow bank about twenty-five yards east of the intersection of the north road with the rim drive. Later this year, on July 24, a live muskrat was seen by Rangers Edmund J. Bucknall, John C. Wright, and Merrill H. Newman in the headlights of their car at the Annie Spring traffic circle. These are the most recent of several collections and observations which have been made since 1933 (Wallis 1947:73).

Many of these records have been in areas in which it seems unlikely that muskrats, which prefer regions having abundant water, would establish permanent homes. However, the known occurrence of three of these animals within the park in the last two years would

lead one to suspect that they have become established in one or more restricted localities (Yocom 1951). Since the natural range of the native muskrats does not extend into this region, the most reasonable explanation as to the origin of these individuals is that they are descendants of animals which were introduced several years ago in the Upper Klamath Lake region for purposes of fur farming (Huestis 1938).

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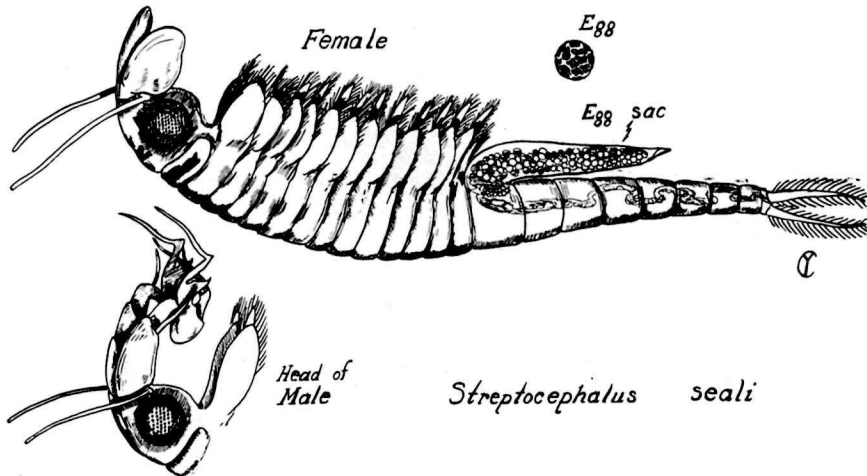
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PHOTOGRAPHING THE MARTENS

Florence Welles

My husband and I sometimes think that as photographers we are like fishermen with stories of "the big one that got away." For several days we thought that this was to be the case with the martens. Martes caurina caurina, related to the weasel and the mink, was reported by the "powder man" who was a member of the road crew working on the rock slide at Anderson Point. This slide kept the Rim Road from being open all the way. We were told the interesting fact that a marten would come out every day while the men were having lunch to share their meal with them. Furthermore, to top this tantalizing bit of information, it seems that the day before the report was made, the marten had come out from under her usual rock followed by four frisky young martens.

There followed many discouraging days during which we would leave for Anderson Point whenever time could be spared, but without result. It seemed impossible that the martens stopped appearing the exact day we started trying to photograph them. Then, on August 16th, with a day to devote to it, we began our watch at nine in the morning. At noon, at three-thirty and from then on until dark the martens were back and forth and in and out. Fortunately, they paused from time to time, because when they were in motion we were not able to focus our cameras on them, so swift and undulating were their movements. The kodachromes that we obtained of this family of martens will be available for use in the naturalist lectures during 1953.

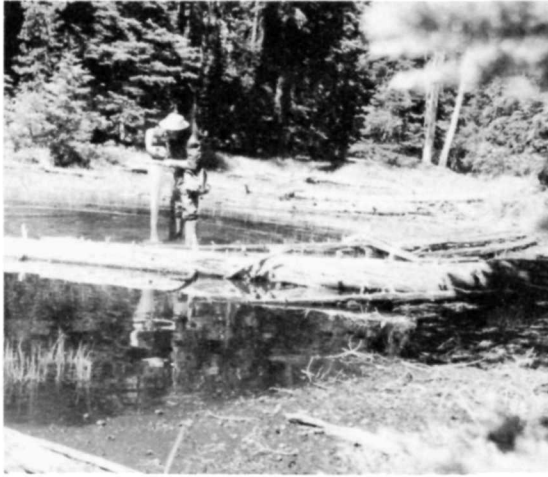


Pen and ink sketch of Fairy Shrimp by Ranger-Naturalist Charles F. Yocom.

FAIRY SHRIMP

C. Warren Fairbanks
Ranger-Naturalist

On July 27, while making some investigations of a group of small, shallow ponds on top of Whitehorse Bluff, the author, with Assistant Park Naturalist Donald S. Farner and Ranger-Naturalist James Kezer, found all five of the ponds visited thickly populated with fairy shrimp. Fairy shrimps belong to the animal group known as phyllopod crustaceans—small relatives of the crayfish, crab, and lobster. Many species of them are found only during the spring season, frequently in temporary ponds which may be in existence for only a few weeks. They emerge rapidly from eggs which were laid the previous season, soon grow to maturity, mate, lay their eggs, and thus complete their cycle.



Ranger-Naturalist Fairbanks collecting in a temporary pond on Whitehorse Bluff. Photograph by Art C. Toth.

The Whitehorse ponds, four of which were sampled, lie at an approximate elevation 6250 feet above sea level. They are mostly temporary, and some of the basins were completely dry before mid-August. At the time of the first visit to them, they were being fed by water from melting snowbanks along their shores. None was over thirty inches deep, and they were nestled in a forest of lodgepole pine and mountain hemlock.

The first pond, so-called North Whitehorse Pond, did not at first appear to have any of the fairy shrimp, and

none were noticed until we had moved on to the second. Closer examination of the first sample, however, revealed a large number of very small, immature specimens. It may possibly be that this pond was formed later than those in which older individuals were found, although there was no further evidence to indicate that this was the case.

All specimens mature enough to be identified proved to be *Streptocephalus seali* (See Figure). Thanks are due Dr. Ralph W. Dexter, Professor of Biology at Kent State University, Kent, Ohio for the identification. Thanks are due also to Ranger-Naturalist Charles Yocom for the illustration which accompanies this note.

This same species was found by Ranger-Naturalist Kezer in Lake West, a small, permanent body of water about a mile beyond the park boundary, just outside the northwest part of Crater Lake National Park. He first observed them there during the last week in September, 1951, when they occupied the entire lake. On July 24, 1952 he again found them. This time, however, they were confined to the northwest section of the lake.

"THE MARBLE HALLS OF OREGON"

Marvin E. Wilson
Seasonal Ranger

Oregon Caves, long known as the "Marble Halls of Oregon," and 480 acres surrounding them were set aside as the Oregon Caves National Monument in 1909. Since 1934, the Monument has been administered by the National Park Service as an adjunct to Crater Lake National Park. Rooms, meals, and cave guide service are provided by a concessioner, the Oregon Caves Resort Company, operating under contract with the National Park Service.

The first record discovery of the caves was made by Elijah Davidson, while out hunting in the fall of 1874. Davidson wounded a bear with one of his shots and tracked the bear to an opening in the side of a mountain. With a few splinters of pitch for a torch, and with an old muzzle-loading rifle, Davidson followed the bear into the opening, thus making his remarkable discovery. It was not until the next spring that Davidson and a party of associates returned to explore the caverns further. Four different levels or floors were found by Frank M. Nickerson of nearby Kerby. A number of galleries were opened which had been blocked by stalactites and stalagmites, forming columns. It was not until 1884 that title to the caves was sought, when two brothers "squatted" near the entrance. Their attempt to exploit this natural wonder failed, due to the remoteness of the area, the nearest railroad being over 200 miles distant. A short time later, a group of California promoters became interested in developing the caves, but abandoned their plan when they discovered that they were located in Oregon instead of California.

The area was visited by Joaquin Miller, "Poet of the Sierras," in 1907. Miller did much to attract public attention to the caves by his frequent reference to them as "The Marble Halls of Oregon."

According to "Old Dick" Rowley, who inaugurated guide service at the caves in 1910, it was the particularly energetic efforts of a group of promoters, interested in exploiting the caves, which stimulated the Forest Service in Grant's Pass and Portland early in 1909 to press the Federal Government to set the area aside as a National Monument. This was done by President Taft on July 12, 1909, and the caves, along with 480 acres of beautifully wooded land comprised the Monument, which was administered by the Forest Service under the Department of Agriculture. It was not until 1934, that the Oregon Caves National Monument was transferred to the National Park Service, to be administered by the Superintendent of Crater Lake National Park.

Dick Rowley, long a resident of southwestern Oregon, who had engaged in mining, hunting, and forest-patrol in the vicinity, was selected by the Forest Service to serve as guide to the Caves. To Rowley goes

the credit for the major development of the Caves. Until two years ago, "Old Dick," as he is affectionately known to young and old, headed the guide service. During the past thirty years, Dick has trained over 300 seasonal guides. In spite of his 82 years, "Old Dick" still spends the early part of each season at the Monument, breaking in a new crop of guides. During his more than 40 years at the Caves, he has become exceedingly familiar with the topography, flora, and fauna of the Monument. He assisted Dr. Elmer Applegate, the well-known botanist, in making a botanical survey of the Monument and the surrounding region. This survey, revealing rare species of trees outside the Monument, has served as a major basis for the current consideration being given to expanding the area.

The geological story of Oregon Caves goes back over a vast period of time to an age when an ancient ocean covered the southwestern part of Oregon. Over the floor of this ocean, thick deposits of lime were laid down and eventually pressed into limestone. This limestone, during a period of mountain building, was transformed, under terrific pressure and heat generated within the earth, into marble and was raised above the sea as a part of a mountain range.

During the mountain uplift, the marble was broken and fractured in many places. Although they may have been small, these openings were sufficient to allow water to seep into them. Rain water and water from melting ice and snow leached carbonic and other acids from decaying vegetation. Such acid-charged water found its way along the small fracture planes, and with the patience of the ages,



Photograph Courtesy Laurie Ann Creations, Edmonds, Wash.

dissolved out the softer portions of the marble in the interior of the mountains, thus creating giant chambers and extensive passage ways. The present visited section, Oregon Caves, makes up the most spectacular known part. Within these caverns are to be found the usual features of marble caves, such as stalactites, stalagmites, frescoed ceilings, and smoothly-paved marble floors. Some of the formations resemble flowers, vegetables, frozen waterfalls, and even animals, all of which have been given fanciful names.

In addition to this exhibit of marble sculpturing, Oregon Caves National Monument boasts of one of the most beautiful and interesting wooded areas in this part of North America. It is rich in the variety of plant and animal life. Many species of plants find the caves area the southern limit of their range, while species otherwise limited to California, find here the northern limit of their range. The area includes transition, Canadian, and Lower Hudsonian zones. Because of the extremely broken topography, species are often found here outside of their normal habitat. Thus the drouth-loving incense cedar occurs on high dry ridges along with mountain hemlock and noble fir. Among the more noteworthy species of trees within the Monument are the Port Orford Cedar, Tanbark Oak, Chinquapin, Knobcone Pine, and green-leaved Manzanita. On the north slopes occur pure strands of Douglas fir with sparse undercover. In addition, there are to be found sugar pine, grand fir, Oregon Maple, Nuttall's dogwood, California hazel, and Sadler's oak. The weeping spruce, (*Picea breweriana*), a tree of exceptional beauty, does not occur in the Monument, but is to be found in the area just outside to the South. It is to include such species of beauty and rarity, that the current plans for expanding the Monument are being pressed.

Among the fauna of the area, are to be found blacktailed deer, black bear, cougar, coyote, beaver, fisher, marten, Pacific mink, Pacific raccoon, gray fox, Douglas pine squirrel, silver-gray squirrel, Siskiyou chipmunk, and the golden-mantled ground squirrel. There is also an abundance of birds in numbers and species due to the diversity of cover types, making this an attractive spot for the bird lover.

Oregon Caves National Monument is located in the heart of the Siskiyou, 50 miles from Grants Pass. From Cave Junction, on the famous Redwood Highway, No. 199, it is only 20 miles to the Monument over scenic State Highway No. 46. The National Park Service maintains a parking area and picnic grounds nearby. No camping is permitted in the Monument, but adequate campground facilities are located at Greyback campground along the approach highway, 8 miles from the Monument. During the summer season, the concessioner operates a modern Chateau and cabins near the entrance of the Caves.



Phantom Ship

Oregon State Highway Commission Photo