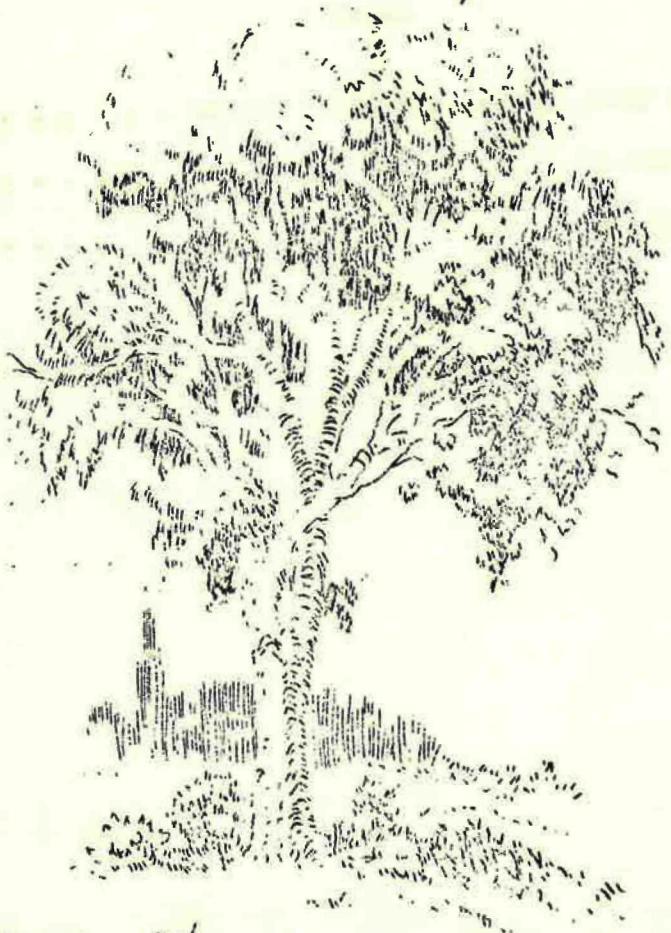
Zion and Bryce Nature Notes



Vol. 8, No. 2 - June 1936

DEPARTMENT OF THE INTERIOR
National Park Service
Zion and Bryce Canyon National Parks, Utah

Vol. 8 No. 2
Zion-Bryce Nature Notes June, 1936

This bulletin is issued monthly for the purpose of giving information to those interested in the natural history and scientific features of Zion and Bryce Canyon National Parks. Additional copies of these bulletins may be obtained free of charge by those who can make use of them by addressing the Superintendent, Zion National Park, Utah. PUBLICATIONS USING THESE NOTES SHOULD GIVE CREDIT TO ZION BRYCE NATURE NOTES.

INDEX

FOREST INSECTS IN ZION, BRYCE, AND CEDAR BREAKS

By W. Drew Chick, Jr.

ZION

In Zion National Park, we have two groups of forest insects, each of importance. They are: The defoliators and other leaf feeders, found principally on deciduous trees and shrubs; and the bark beetles, on conifers for the most part. Only those insects of major importance will be mentioned. It will be understood that there are a number of other insects feeding on these trees, but their damage is of little consequence; their presence is often beneficial to the forest.

Insects on Deciduous Trees

Cottonwood. The Great Basin tent caterpillar (Malacomsoma fragilis) feeds on the foliage of this tree from the time the buds open in the spring until mid-summer. The webby tents may always be found on the host trees along with the caterpillars during the season. These tents are not difficult to find because they generally occur near the periphery of the crown.

Eggs are laid in masses by the female moth on the twigs of the host tree in the fall of the year. When spring comes, the eggs hatch and the caterpillars commence feeding on the young leaves. In the succeeding weeks the black, hairy larvae grow larger, attaining a length up to two inches. Following a feeding period of from six to ten weeks, the caterpillars pupate emerging as adults at the end of summer.

In the early feeding stage, the insects seek the shelter of the tent during daylight hours and emerge for feeding at night. Later on, they no longer need this protection and may be found anywhere in the crown at any time of the day.

Tent caterpillars feed on the leaves, and hence their damage is confined to defoliation. We control these caterpillars by spraying a mixture of lead arsenate and lime in a water solution on the foliage. When the insects feed on the leaves, they are poisoned by the arsenic, and die.

Tent caterpillars also defoliate aspen, willow, service berry, and chokecherry in the park.

Ash. A caterpillar defoliates both species of ash. By one authority, the moth was classed as one of the Noctuids.

The life history is much the same as that for the insect described above, but no tents are formed, and the caterpillars feed openly on the branch in daylight. Each individual egg in the mass may be seen; they are laid about the terminals (and even on the buds) of the twigs. The caterpillars have an interesting habit of dropping from one limb to another by means of a finely-spun silky thread. It is often possible to see immense numbers of these hanging threads by getting in the proper perspective relative to the sunlight.

By using the same type of spray as mentioned above, we are able to control this caterpillar.

Boxelder. The boxelder bug (Leptocoris trivittatus) does little damage to the host. It is principally a nuisance to campers; it is present in campgrounds in large numbers. The bug does not sting or bite, but simply is obnoxious because it crawls over everything much like the common house fly. This bug is about half an inch long, rather flat, black on the upper surface with red on the margins of the wings; the lower side is bright red. During the spring they may be found sunning themselves on the patches of fallen leaves on the ground under the trees. The insect lives by sucking juices from the leaves.

Insects on Coniferous Trees

Yellow Pine. Of the many bark beetles feeding on the yellow pine in Zion, the most important is Dendroctonus barberi, the southwestern pine beetle. Although we have had no serious losses by this insect, it is capable of taking heavy tolls at intervals.

The adults bore through the bark, and lay eggs on the margins of the winding or serpentine galleries which they mine in the cambium, thereby shutting off the flow of sap. An attack by these insects in sufficient numbers causes the foliage to fade, to turn yellow and then red, which is indicative that the tree is dying. Exudation of pitch, hardening into masses on the trunk, marks the point of entrance of the adult.

To control infestations of bark beetles, it is necessary to fell the trees, peel, and burn the bark. Since the trees so attacked are doomed anyway, it is considered wise to reduce the numbers of insects in this manner, and so lessen the chances for loss of more trees. Since tens of adults laying hundreds of eggs are required to kill a tree, reduction of the numbers of insects is an effective control.

It must be remembered that the southwestern pine beetle has always been present in the stand and takes a certain annual toll of old, weak trees to make way for young growth. Only when this annual toll is enlarged to greater proportions through some disturbance of conditions do we consider it necessary to institute control measures.

Double-leaf Pinyon. A species of engraver beetle, Ips, attacks and kills some of the trees in the stand each year. Thus far, it has caused us no concern, but may in the future, judging from serious infestations elsewhere, particularly in the Colorado National Monument (1935).

The work of a moth, Petrova sp., dwarfs the terminals by mining out the pith. It is conspicuous in its damage, but not serious.

Single-leaf Pinyon. No insect does serious damage to this tree.

Douglas Fir. The fir flathead (Melanophila drummondi) is a bark beetle which frequently attacks and kills the Douglas fir. Often, mistletoe-infested trees are preferred. It appears that outbreaks in this region are local and sporadic.

White Fir. Scolytus ventralis, the fir engraver beetle, attacks and kills white fir. The transverse, often wing-shaped, parental galleries are engraved on the sapwood. They may be seen to advantage on the trees in Refrigerator Canyon.

Utah Juniper. Very infrequently, a flathead will kill one of these trees. The conspicuous galls on the leaves attract comment, but as yet the insect which causes them is not known.

Of course, there are a number of other forest insects which attack these plants, but their damage does not ordinarily endanger the life of the tree. In fact, many of these are strictly beneficial in that they prey on other insects. After a tree dies, a whole host of other insects aid in separating the bark from the wood, thereby allowing rot and heartwood-inhabiting insects to complete the process of returning the stored chemicals in the woody structure to the soil.

BRYCE CANYON

Although the Great Basin tent caterpillar (see Zion) is found on aspen, gooseberry, service berry, and possibly on slender-leaved cottonwood in Bryce Canyon National Park, the bark beetles on the conifers concern us most.

Yellow Pine. Of all the bark beetles affecting yellow pine, those belonging to the genus Dendroctonus are most important.

The Black Hills beetle (D. ponderosae) has caused serious losses in the Kaibab National Forest (1920-1925), and in the Black Hills (1898-1905). In Bryce Canyon National Park, large numbers of trees have been killed by this beetle from time to time. As yet, the outbreaks within the park have been confined to relatively local areas such as canyon bottoms, or portions of a hydrographic basin. It kills a few scattered trees each year. The adult gallery is vertical, while those of the larvae branch out, centipede-like, from it.

D. approximatus, the round-headed pine beetle, makes large serpentine galleries. It is frequently found in trees attacked by the Black Hills beetle.

As at Zion, the southwestern pine beetle (D. barberi) attacks and kills yellow pine. For the most part, its activities are limited to the area under the rim.

Of the other insects affecting yellow pine, those which are likely to cause comment feed on the foliage. The pine leaf scale (Chionaspis pinifoliae) is often found in the stand. Heavy infestations give the tree a white-washed appearance. Scales feed by sucking the juices from the needles.

A scarab (Dichelonyx sp.), and a weevil (Scythropus sp.) bite chunks out of the side of needles. Their work is very common in the yellow pine forest.

Limber Pine. The Black Hills beetle sometimes attacks and kills this tree. Red pitch tubes on the bark are indicative of the presence of this insect. Twig beetles, of the genus Pityophthorus, are active in pruning the terminals, and often whole limbs.

Pinyon Pine. Terminals of pinyon pine are killed very frequently. A moth caterpillar (Petrova sp.) mines in the pith at the tip of the branch, causing death.

Bristlecone Pine. No serious insect pests have been noted as affecting this tree.

Douglas Fir. The douglas fir beetle (Dendroctonus pseudotsugae) kills a large number of trees, particularly those which are infested with mistletoe. A centipede-type gallery, similar to that made by the Black Hills beetle in yellow pine and limber pine, is indicative of the presence of the Douglas fir beetle.

A scolytid beetle (Pityophthorus abietis) mines and kills the tips of branches. This results in a dwarfing of the terminals.

Frequently, the cones are malshapen and fail to produce seed because of the activities of Petrova taxifoliella, the cone moth.

White Fir. The fir engraver beetle (Scolytus ventralis) frequently attacks and kills white fir trees or portions of them. It is very difficult to tell when a tree is infested during the current season because the foliage does not fade until the following year. Streams of pitch associated with numerous shot hole-like borings in the bark show the presence of the beetle.

Blue Spruce. Only a very few insects attack this tree. The most notable in this region is Adelges cooleyi, a gallmaker. This louse has two host trees: Douglas fir, and blue spruce. On the former, there are certain stages in the life history of the insect which remain on the tree the year round. Only the winged females go to the spruce to lay eggs in the terminals. The young feed on the needles, causing the strange greenish or purplish cones to form, and then fly back to the fir where they remain until the following season.

Utah Juniper. Galls are occasionally found on the foliage of this tree, but the insect causing them has not yet been determined.

CEDAR BREAKS

Although Engelmann spruce, alpine fir, bristlecone pine, limber pine, and aspen occur on the rim at Cedar Breaks National Monument, only the first two are seriously affected by insects at this high elevation.

Engelmann Spruce. The spruce gallmaker (Adelges cooleyi) dwarfs the terminals of this tree by causing the cone-like galls to form at the tips. These galls are very numerous on all the spruce trees. For details see the article on Bryce insects under "Blue Spruce".

The spruce beetle, Dendroctonus engelmanni, has been found in the stand. No serious consequences are evident as yet, although in a similar forest, on the Aquarius Plateau, fully ninety per cent of the spruce timber was killed in the six years from 1921 to 1927 by this beetle.

Alpine Fir. This tree is frequently attacked and killed by Dryocetes confusus, the fir bark beetle. It is this insect and a disease, (Melampsorella) which are responsible for the large number of dead and dying trees at Cedar Breaks.

BIBLIOGRAPHY FOR FOREST INSECTS

There is only one readily available published reference which contains descriptions and life histories of the forest insects known from this area. Little has been done to summarize the entomological data of this region in a popular form. See

Essig, E. O. "Insects of Western North America", published by The Macmillan Company, New York, in 1929.

BIRD BANDING IN 1935-36

By Henry Grantham

Intermittent banding characterized the year's operations, accounting in part for the much smaller number of birds banded this season than last. Compared to last year's one hundred twenty-five days of actual banding operation, there were only ninety-eight days this year, although the period of time over which the operations extended this year was considerably greater than last year (about two weeks greater). To account for this apparent disparagement we must consider the time lost this year; first, by bad weather, chiefly rain, causing a total loss of twenty-eight days; and second, by absence of the operator on Saturdays, Sundays and holidays, which accounted for an additional loss of twenty days to the operations.

The extremely large number of returns this season was especially gratifying and counteracts the rather discouragingly small number of new banded birds, one hundred and four returns being recorded, which is nearly five times the number of returns taken last year. All trapping was carried on in the same areas as last year, thus making possible some valuable observations on bird habits. This article depends for its information upon the reports which were kept of the entire operation.

The following list illustrates quite well, in synopsis, the results of the year's work:

Scientific name	Common Name	Banded	Returns	Repeats
Junco oreganus shufeldti	Shufeldt Junco	102	66	263
Zonotrichia leucophrys gambelii	Gambel Sparrow	131	20	443
Aphelocoma woodhousei	Woodhouse Jay	3	5	14
Melospiza melodia fallax	Desert Song Sparrow	13	8	18
Junco hyemalis hyemalis	Slate-colored Junco	7	4	10
Pipilo megalonyx megalonyx	Spurred Towhee	3	0	9
Passer domesticus	English Sparrow	4	0	0
Geococcyx californianus	Road-runner	2	0	0
Falco sparverius deserticola	Desert Sparrow Hawk	0	1	1

White Fir. The fir engraver beetle (Scolytus ventralis) frequently attacks and kills white fir trees or portions of them. It is very difficult to tell when a tree is infested during the current season because the foliage does not fade until the following year. Streams of pitch associated with numerous shot hole-like borings in the bark show the presence of the beetle.

Blue Spruce. Only a very few insects attack this tree. The most notable in this region is Adelges cooleyi, a gallmaker. This louse has two host trees: Douglas fir, and blue spruce. On the former, there are certain stages in the life history of the insect which remain on the tree the year round. Only the winged females go to the spruce to lay eggs in the terminals. The young feed on the needles, causing the strange greenish or purplish cones to form, and then fly back to the fir where they remain until the following season.

Utah Juniper. Galls are occasionally found on the foliage of this tree, but the insect causing them has not yet been determined.

CEDAR BREAKS

Although Engelmann spruce, alpine fir, bristlecone pine, limber pine, and aspen occur on the rim at Cedar Breaks National Monument, only the first two are seriously affected by insects at this high elevation.

Engelmann Spruce. The spruce gallmaker (Adelges cooleyi) dwarfs the terminals of this tree by causing the cone-like galls to form at the tips. These galls are very numerous on all the spruce trees. For details see the article on Bryce insects under "Blue Spruce".

The spruce beetle, Dendroctonus engelmanni, has been found in the stand. No serious consequences are evident as yet, although in a similar forest, on the Aquarius Plateau, fully ninety per cent of the spruce timber was killed in the six years from 1921 to 1927 by this beetle.

Alpine Fir. This tree is frequently attacked and killed by Dryocetes confusus, the fir bark beetle. It is this insect and a disease, (Melampsorella) which are responsible for the large number of dead and dying trees at Cedar Breaks.

BIBLIOGRAPHY FOR FOREST INSECTS

There is only one readily available published reference which contains descriptions and life histories of the forest insects known from this area. Little has been done to summarize the entomological data of this region in a popular form. See

Essig, E. O. "Insects of Western North America", published by The Macmillan Company, New York, in 1929.

Scientific Name	Common Name	Banded	Returns	Repeats
Toxostoma rufum	Brown Thrasher	1	0	4
Junco canicops	Grey headed Junco	7	0	0
Accipiter velox velox	Sharp-shinned Hawk	1	0	0
Zonotrichia coronata	Golden-crowned Sparrow	1	0	0
Amphispiza nevadensis nevadensis	Sage Sparrow	1	0	0
	Totals	276	104	762

Similar to last year, Gambel Sparrows and Shufeldt Juncos far exceeded any and all other species in number of new-banded birds, hence the records of these two species give us most of our valuable facts. Five new species were added this year to the total number of species banded in Zion Canyon. They were: road-runner (Geococcyx californianus); brown thrasher (Toxostoma rufum); sharp-shinned hawk (Accipiter velox velox); golden crowned sparrow (Zonotrichia coronota); and sage sparrow (Amphispiza nevadensis nevadensis). This brings the total number of species banded in Zion in the last two years to twenty-four. Perhaps at this point it would be advisable to define a "return" and a "repeat". A bird retrapped any number of times after being banded is considered a repeat. A bird repeating three months or more after being banded or recorded as a return is a return; one banded at more frequent intervals is considered a repeat. The reason for fewer birds being banded this year than last is probably two-fold: first, the returns and repeats for this year were proportionately far better than last, which would lead us to presume that Zion Canyon harbors a limited number of wintering birds (especially juncos), and that most of them have now been banded; and second, snow last season provided excellent circumstances under which to band (during the storm and for a few days following). This winter there was a minimum amount of snow.

Four types of traps were used this season: government sparrow trap; two cell drop trap; original design elastic band trap; and false bottomed bail locked trap. The first three types were used last year and the last type was developed and used this season. A total of fifteen traps were used throughout the operations. It might be of interest to study the relative efficiency of each type. To do this we divide the number of birds caught or handled by the total number of traps, and compare with this the average number of birds handled by the average trap of each type. Since all types were changed from one area to another very frequently, this method of comparison should give fair representation to them all. The average trap of all types handled two hundred fifty-nine birds; the average drop trap handled eighty-two of this number; the average government sparrow trap handled seventy-seven; the average false-bottomed trap handled sixty-three; and the average elastic band trap handled thirty-seven. It must be noted in studying these comparative figures that the two-celled drop trap is capable of catching

two birds at one setting, and the government sparrow trap can catch from one to twenty birds without the necessity of resetting, while on the other hand the latter two types can capture but one bird at a setting. This statement should explain the apparently higher efficiency of those two types. The false bottomed trap has proven that it can be recommended for use in operations where frequent visits can be made to the traps. This type is easily and cheaply constructed, and if banding is continued in Zion a number of traps of this type should prove very useful to the operator.

New banded birds place more potential material in the field, and in this respect alone the year's banding was well worth while. In addition to this value, the operations yielded many important new facts and observations. Of prime importance are the two new state records made possible by banding. They were: a female brown thrasher (Toxostoma rufum) taken December 9, 1935 (so far as determinable this is the second record west of the Rockies); the other new record was a juvenile golden-crowned sparrow (Zonotrichia coronota) taken January 16, 1936. Of equal value and interest is the record of returns, and since by far the most returns were for the Shufeldti junco, in summarizing the results we shall deal wholly with that species. These returns were taken almost invariably in the area in which they were originally banded and in which they usually repeated a number of times. In fact, of the sixty-six returns recorded, all but one returned to the area in which they were banded. This fact helps us to prove very definitely that the areas frequented by certain flocks, as located last year, are correct. All but one of the seven woodhouse jays banded last year returned. Of interest too is the record of the one sparrow hawk (Falco sparverius deserticola) banded last year. This bird was caught in the same trap and the same manner as last year - that is, lured into one cell of the drop trap by a trapped junco.

A few sidelights on bird psychology attracted our attention during the year. One gambel sparrow proved to be a unique case in that it depicted a bird which had formed the trap habit. This particular bird repeated a total of thirty-six times, thirty-three times in the same government sparrow trap. The career of this unusual bird ended quite suddenly when it repeated in the trap (which some well meaning person had set during the absence of the operator) and died of exposure during the following night. Should a predator kill a bird in any certain trap, it is quite some time before any birds return to that trap, even the bait remains unmolested. It is quite impossible to even hazard a guess at this reaction, but every kill is followed by a period of time from three to six weeks during which no birds are taken in that location where the kill was made. Birds and bait have their relation, too. At times when bread bait was unobtainable, cracked corn was substituted for bait, but proved far less satisfactory than bread. This of course might be expected, but the peculiar part of the bait story is a marked bait preference shown by all birds. Both brown and white bread were often fed together for bait, and without failure the white bread would be eaten before the brown.

Two roadrunners (Geococcyx californianus) were captured and banded, both of them being caught in an unexpected manner. The first one was captured at his own game (running), being driven into a semi-inclosed tennis court and caught while trying to force his head through the small mesh wire fence around the court. The other roadrunner was trapped in one cell of a drop trap. When found, the bird presented a very grotesque figure, its head, neck and tail folded over its body and all packed so tightly into the trap that movement would have been impossible. A mystery still remains as to how the bird entered the trap, since the openings of these traps are about half the size of the compartment.

Interference with operations caused by hawks, squirrels and chipmunks was very slight this year as compared with last season. The only new trouble element was wild house cats, and this condition only kept birds out of the vicinity in which the cats hunted. The real difficulties this season came mainly from two sources: first, rock squirrels, which killed few birds, but made a nuisance of themselves by springing the traps, thus keeping birds from being trapped that otherwise would have been; and second, the problem which caused more bird deaths than all other interferences taken together, the setting of traps by well meaning persons during the absence of the operator, thus causing birds to be trapped, and since no one visited the traps, to die of exposure.

Banding was attempted in Bryce Canyon National Park last summer. Surprisingly excellent results were obtained, considering that only one trap was in operation for a period of less than two weeks. The following list tells most of the Bryce banding story:

Scientific Name	Common Name	Banded	Returns	Repeats
Spizella passerina arizonica	Western Chipping Sparrow	44	1	29
Penthestes gambeli gambeli	Mountain Chickadee	2	0	0
Sitta carolinensis nelsoni	Slender-billed Nuthatch	4	0	4
Sitta pygmaea melanotis	Black-eared Nuthatch	7	0	4
Junco caniceps	Grey-headed Junco	1	0	0
	Total	58	1	37

These results naturally suggest that banding in Bryce on a larger scale would be very profitable. Chipmunks are the big nuisance to counteract there, and should banding be contemplated, chipmunk-proof stands would have to be constructed upon which to place traps and bait, otherwise banding would not be feasible.

In conclusion, the writer wishes to express his ardent desire that this work be continued by some interested person in the seasons to come. A total of 854 birds have been banded in the last two years, thus making available much material for further study if it can be used while those banded birds are still alive. Clear, complete and accurate records have been kept of the entire operations and are available to the next operator. The writer would also like to commend the excellence of this work for the practical training it has afforded him in the field of nature study.

ALONG NATURE'S HIGHWAY

Two unusual animal observations were made this spring, as follows. On May 19th a venturesome party of visitors at Cedar Breaks hiked over the snow ahead of the snow plow to Point Perfection, 10,400 feet. There they saw an adult black bear, and hurried back to the road crew to report their find. Joe Wright, foreman, accompanied them back to the Point, but could find nothing but tracks, which he described as those of a large adult. This is the first report of a bear in the Cedar Breaks region since 1925, according to available records.

On June 8 two boys from the CCC camp were motoring down the Mt. Carmel road below the tunnel when their lights showed a large cougar in the road. It was not in a hurry to get away, and gave the boys a fine chance to observe it before it disappeared in the brush above the highway. This occurred at 3:00 A.M. -- C.C.P.

On the rims of Zion Canyon there is a yellow pine stand which is of great interest from the forestry point of view. Visitors to the park seldom see these forests because yellow pine grows best at elevations from 6000 to 8000 feet in southern Utah. Foresters recognize a number of agents which affect the vitality of these trees. Among the plant parasites are mistletoe and rust.

Mistletoe is a flowering plant which lives in the tissues of the host. The tree, in its effort to minimize the drain on its "life sap" throws out a dense tangle of shoots forming a heavy mass of branches called "witches broom". This mistletoe differs from our Christmas variety in that the leaves are dwarfed or scaly like those of the Utah juniper.

Rust attacks the branches, likewise, but the tree is not able to ward off its attacks by producing malformations. The fungus does not give it a chance. The branch dies the season following the initial attack as the result of girdling.

Fortunately, at least at present we are not particularly concerned over the damage or the toll taken by these parasitic plants. The yellow pine host is still holding its own. Even if we could control the damage, would the expenditure and the effort be justifiable when the rust and the mistletoe are as much a part of the natural picture as the yellow pine itself? -- W.D.C.