

occurred in connection with our pet. One morning he escaped, carrying his leash with him. Some very thoughtless people easily caught him, cut off the strings and set him free before we arrived. We were all much upset, for we supposed that our bird was gone forever. But at the end of two days he was seen near the place where he had been released. My daughter rushed across the street toward him, and when she was about one hundred yards from the bird, he flew cackling toward her with such speed and suddenness that he startled her and she threw up her arms. The hawk flew back to his former perch on the cabin. Then my wife went out with some meat and at once the bird flew to her and started eating. He seemed very happy and satisfied to be back home. Certainly he was a very hungry bird, for apparently he had not eaten while away. Now this suggests to me that while the hunting and feeding instincts are probably present in all birds, our bird was not able actually to catch his own food, because at the age when he left the nest his parents had not yet taught him how to hunt.

Of all the family, the hawk seems to like my small son the best, being very gentle with him, uttering satisfied little notes when he comes near, and never attempting to bite or strike him. He enjoys playing with the rest of us, though he is rather rough at times, especially if we are not gentle with him. On such occasions he will strike, bite, and scream angrily, even though I really believe he likes it. He is not too gentle in his play with my wife, although he seems to like her and always goes to her more readily than to any of the rest of us. One day he escaped again, and this time flew into a large pine. All manner of coaxing by the rest of us failed to bring him down, until my wife went out and stood under the tree and called to him. At once he flew down from his perch, fully thirty feet up, and lit on her hand even though he was not hungry.

Our Sparrow Hawk has been and still is a most wonderful pet; he seems very contented, is active and healthy; and as long as he continues to thrive we shall keep him. Every day we seem to learn more about the traits and moods of this most interesting little falcon.

Claremont, California, April 1, 1937.

BEHAVIOR OF THE PINE SISKIN

WITH ONE ILLUSTRATION

By THOMAS L. RODGERS

Records of Pine Siskins (*Spinus pinus*) for the University of California campus at Berkeley, and for Strawberry Canyon, adjoining the campus, throughout the fall and early winter involve only scattered individuals. The birds are seldom heard, and when seen they are always on the move. Late in winter or early spring, however, they begin to flock, and from then on they are commonly seen foraging, or engaged in courting maneuvers prior to nesting, which begins around the middle of March.

In January, 1936, as through the rest of the winter, I made frequent trips into Strawberry Canyon, and on February 1, I saw my first flock of siskins. This flock of about seventy-five birds appeared "out of thin air" and alighted in a compact group, filling just the top six or eight feet of a leafless alder. Immediately the birds started foraging down through the tree, apparently working on the cones. They did not utter a note as they foraged, but occasionally, as if they had been frightened, there would be a high pitched *psee* and the flock would leave the tree, fly out in a loop of about

seventy-five-foot diameter and back into a nearby alder. The birds foraged actively, and often hung under the bunches of cones in chickadee manner.

On February 15, I saw a flock of about twenty, but only for a few seconds before it disappeared over the top of a large eucalyptus grove. On February 22, a very rainy day, I again observed a flock foraging in the alders in Strawberry Canyon. They foraged, as before, without uttering a note until the *psee* or *psee psee* notes would announce one of their characteristic "circle flights" ending in a nearby tree or one farther up or down the canyon. It began to appear as if the regular procedure of the birds was to alight in the top of a tree, forage down to the lower limbs, never spreading over an area more than 12 or 15 feet across, and then by means of a circular flight move to the top of another tree and forage down *it*. Although this was the commonest method, they were also seen to forage in a nearly horizontal line through a group of trees without foraging through any of them completely; they foraged up through a tree, and then moved by a direct route, at times even "flowing" from one tree to the next after the manner of a flock of Bush-tits. The direct flights of the flocks were either to trees far away or to those ten or fifteen feet off. This seems to bear out the idea that the "circle flights" are survey flights.

I wondered how the siskins were getting seeds out of the apparently tough little cones; so I located some on which I was certain the birds had been feeding, and collected them. They are tough, and I did not believe that the siskins could obtain the seeds were it not for a peculiarity of the cones. The ends of the scales are thickened so that their tips are close together. As the cones dry, the seeds are shaken loose from the axis of the cone, but, instead of dropping to the ground, they are held, with their thin membranous edges projecting out from between the scales, until further drying opens the scales and the seeds can fall out. It is while they are being held that the siskins can get hold of them and pull them out. The birds themselves, alighting on the bunches of cones, must shake many seeds to the tip of the scales where they are then available. I did not see any siskins foraging on the ground under the alders. This was probably because there was a sufficient and constantly replenished supply of seeds available at the cones, or because the seeds had not begun to drop to the ground, or, the most likely suggestion, that even though the seeds had dropped, they were buried in debris. This would take the seeds out of the ecologic niche of the siskin and put them in the niche of the scratching, underbrush birds such as the Song Sparrow and the Spotted Towhee.

On March 1, my attention was drawn to a large eucalyptus tree by the notes of siskins that were uttered as the birds foraged. Occasionally I heard, for the first time this season, the raspy, harsh, drawn-out *skree*. I observed two birds nip insects out of the air, but most of the foraging consisted of picking seeds out of the pods of the eucalyptus. The flock moved in a zig-zag course down through the tree, then in a straight course back up through it. It left after an hour of foraging. This tree had dense foliage as contrasted with the alders where I had observed siskins foraging before. The birds were uttering notes constantly, which contrasted with their previous absolute silence, and they did not retain nearly as compact a formation while foraging.

It is well known that birds that forage in dense foliage in flocks utter notes constantly. These notes almost certainly serve to inform individuals of their position in relation to the rest of the flock; they are called "location notes." A species of bird that utters these notes, in my knowledge, always utters them when foraging in a flock, regardless of presence of foliage. Can it be that the Pine Siskin uses location notes only when necessary?

Grinnell and Storer (*Animal Life in the Yosemite*, 1924, p. 439) mention that a

flock of siskins may forage absolutely quietly or that they may utter notes constantly; but, nowhere have I found any mention of correlation between the utterance of notes and the particular situation with regard to foliage. It was noted that when the birds suddenly left a leafless tree (with only a warning *psee*) they almost always left two or three individuals behind. If this illustrates need for location notes it would be certain that they would be necessary when the flock is foraging in dense foliage.

After March 2, siskins were seen often, in pairs or groups of three to five; and several times I observed pairs or groups of three birds leave the dead tops of eucalyptus trees, uttering notes which closely resemble part of the song.

On March 8, I put in five hours watching siskins at a place where they were very active. Here they were foraging in Monterey cypress and eucalyptus trees. Though they were not foraging in flocks they did tend to concentrate in certain areas, and some tended to stay together while foraging through a tree. During the whole morning, I saw flying birds in flock formation (fifteen or twenty birds) only twice. Altogether I estimated that about one hundred and fifty siskins were foraging in the area. Possibly it was one large flock beginning to break up.

While in the cypress trees, where they foraged most of the time, the birds moved about on the tips of the branches, balancing on a tuft of foliage or hanging below it. They picked, pulled lightly, and at times tugged at the vegetative tips as if trying to break them off. Juncos were foraging on the same tips, but never hung below the twigs. Audubon Warblers foraged in nearly the same niche, but usually stood on the twigs and reached to the foliage for their food. Six or seven times during the last three hours of observation, I saw juncos fly at a branch tip on which one to three siskins were feeding, and in two cases the juncos actually took possession of the branch tip. Once, I saw a junco fly at an Audubon Warbler in a similar manner.

Here, among the outer twigs of the Monterey cypress, there were ground-foraging, and tree-foraging fringillids and warblers all after the same food supply. It was an interesting overlap of habitats. The Audubon Warblers foraged in true warbler style, by hopping from twig to twig and reaching out to the insects on the foliage. The juncos, normally ground feeders, were inclined to alight on the compact bunches of foliage and pick insects from the leafage at their feet. The siskins, being agile tree foragers, often hung below the foliage in chickadee style, and in this position they did not conflict with either of the other birds. However, siskins also are common ground feeders, and were inclined to forage as the juncos did. Thus, at times, they conflicted with the juncos. The juncos occasionally found the compact foliage insecure to perch on, as demonstrated by their occasional quite apparent clumsiness there. Accordingly, they resorted to the larger twigs, in spite of their poor location in relation to the food, and thus conflicted with the Audubon Warblers. The number of actual conflicts between the various birds was directly proportional to the degree of convergence of their forage beats or of their usual methods of feeding. Conflicts were observed between juncos and siskins six or seven times, between juncos and warblers once, and between siskins and warblers not at all.

I was unable at first to determine, by observation, exactly what the birds were eating, so I collected one hundred cypress tips, averaging three inches long and representative of places all over the side of a tree on which I had watched many siskins foraging. Examination of the cypress tips showed many psocid-like insects, many scale insects, a few small green caterpillars, and many yellow larvae that were inside thin-walled cavities in enlarged green vegetative tips. There were few indications of broken-off vegetative tips, but some were damaged, which probably indicated that some of the yellow larvae had been torn from their chambers. The indication was

quite definite that the siskins were taking only insect food. I tasted the green tips and the yellow larvae; the green tips were bitter and the yellow larvae were rather sweet. Grinnell and Storer (*op. cit.*, p. 439) report that siskins eat tips of conifers. I wonder if they chose the insects in preference to the young tips of cypress because the cypress tips were bitter and the insects sweet.

On March 8, I noticed that many of the siskins that were foraging in eucalyptus trees were not foraging on seeds, but on the blossoms. Several times, I saw siskins approach blossoms from above, lean over and reach into them. I had supposed that they were after insects attracted by the flowers, but twice I noticed that after reaching into the blossoms, they raised their heads after the manner of a chicken drinking. I gathered a large bunch of the blossoms and in every one examined found several drops of clear sweet liquid, with only a slight eucalyptus flavor. Later, I saw more siskins drinking from flowers, also a junco. Since then, many flowers of eucalyptus have been examined, and most of them contained a good supply of the sweet liquid. Since early in February, I had noticed that the siskins were feeding on eucalyptus seeds. Robertson (*Condor*, vol. 33, 1931, p. 139) and Gander (*Condor*, vol. 31, 1929, p. 251) also have reported siskins feeding on these seeds. One author says that the seeds of eucalyptus make up the larger part of the diet of siskins throughout the year. The drinking from flowers, however, puts a new light on the story.

The need of a water supply for birds on a strictly seed diet is well known. During this period of observation of the Pine Siskin, I often wondered where they were getting liquid, because it was not until March 31 (with one exception) that I saw a siskin on the ground, and for much of the time before insects were plentiful the diet must have consisted largely, if not entirely, of seeds. Since the old pods of the eucalyptus hang on the trees at least through the blooming season, it seems quite likely that the siskins could eat a steady diet of eucalyptus seeds and never have to come to the ground for water.

Twice on the morning of March 8, I witnessed the first definite courting maneuvers. A siskin was seen circling in a slow, fluttering flight around the top of a cypress tree, repeating in fast succession, notes that resemble the incomplete song. Three other siskins were perched in the top of the tree. The circle followed had a diameter of about ten feet, just included the top of the tree, and sloped up away from the tree about twenty-five degrees from the horizontal. The top was circled at least four times; then the singing bird alighted just below the other three; but as they were approached, they all flew, leaving the pursuer there alone.

On March 15, on the University of California campus, I heard a siskin in full song. On March 18, a flock of eighty or more siskins was seen in Strawberry Canyon. A week later several smaller flocks were reported there foraging in the live oaks. The next week I saw many siskins in pairs; they were not foraging, but were singing. Two siskins singing, and uttering all their notes, can sound like a whole flock. They sing mightily, and hop around through a tree, one following the other; then they fly off, one after the other.

By April 9, siskins in pairs, or alone on the lawn eating dandelion seeds, were a common sight on the campus. This was the first ground foraging I had seen in this season.

A summary of the activities of the Pine Siskin from January until early April is as follows: Birds that have been widely scattered and wandering all winter, form flocks of 70 to 120. These flocks forage together wherever there is an abundant source of food. They tend to break up into smaller and smaller flocks, until they are commonly seen in groups of three to five; and finally, about March 20, pairs are dominant.

However, many birds are still foraging in flocks. While the birds are in flocks, they spend nearly the whole day foraging, but as they begin to pair off, they seem to put most of their energy into singing and courting maneuvers; in fact, except for the birds that are still in flocks, a foraging bird, at any time of day, is a rare sight at this stage. By this time the nesting cycle is under way, and nest building has begun.

Although Pine Siskins usually nest in places that are inaccessible for detailed study of their habits, in the spring of 1934, on the campus of San Jose State College, I located a nest that was near the top of a small redwood tree about forty feet from the ground and which was so situated that I could look down into it from the trunk, about eight feet away. In the period of my observations the siskins experienced adverse weather conditions. Had it not been for my presence, they would probably not have succeeded in raising even part of their brood.

The nest, then containing two eggs, was found on May 16. It was placed about two-thirds of the way out on an eleven-foot limb. There it straddled the single main stem where it was about three-fourths of an inch in diameter, and where there were some leaves, but no side branches, large enough for support. The body of the nest was built of weed stems and redwood petioles, and it was thickly lined with soft grass.

During the first two or three days of incubation the wind blew so hard that it tilted the nest, and I fully expected the eggs to roll out. The wind then quieted down, but the nest remained tilted at an angle of about fifteen degrees. The weather was better until May 29, the day the young hatched.

On the afternoon of May 29, a stiff wind began to blow, and by the next day it developed into a gale. The limb on which the nest was built was blown to as much as 50 or 60 degrees from its normal position, and the nest was tilted so badly that the brooding bird struggled constantly to keep from being blown from the nest. On this day, while I was watching the birds, one of the young fell out of the nest, but I was able to catch and return it. The nest was badly damaged by this day's wind, but still the storm continued. The next day one bird was missing; I saved another bird that toppled over the edge of the nest. In spite of the fact that the nest was becoming increasingly damaged by the wind, the parent birds made no effort to strengthen or repair it. On June 1, another bird was missing.

On June 2, I made a ring of grass and fastened wires to it so that I could place it down over the nest and attach it securely by twisting the wires together under the limb. In this way I intended to build up the sides of the nest, and at the same time to hold it more securely to the limb and to make it level. As I put the ring down over the nest the adult bird left, but it returned immediately and stayed within 14 inches of my hand as I adjusted the ring. As I fastened the wires, the bird went back on the nest, and it defiantly pecked at my finger as I put it against her side.

In spite of the storm, the damaged nest, and my constant interference, feedings took place regularly. During the brooding period it required the constant attention of one bird to keep the young from being dumped out by the wind.

After the brooding bird sat for several minutes to an hour, during which time it uttered no sound but occasionally wiggled a bit as if adjusting the young, the silence suddenly was broken by a *ti-er, ti-er*, coming from another tree about one hundred feet away. The brooding bird perked up and answered "*ti-er*." The birds would call back and forth from three or four to a dozen times according to how cautiously the approach was made. The bird carrying food flew to a position only a few feet from the nest and there uttered from one to three or four of the more plaintive *psee* notes. Then the approaching bird hopped quietly from twig to twig toward the brooding bird. During this part of the approach, both birds were absolutely silent as if trying

not to attract attention to the exact location of the nest. The young birds could be heard uttering a fine, high-pitched, almost insect-like note from the time of the first calls of the approaching bird until they were finally fed.

As soon as the bird bringing food was within a foot of the nest, the brooding bird lifted its wings a little, bent its head back, with its bill up and toward the approaching bird, and quivered. This quivering continued until after food had been received. The bird bringing food approached to the edge of the nest, stopped, drew its neck up short as if gulping or swallowing, clapped its bill gently together several times and food was brought into the mouth. The food could usually be seen along the edges of the bill. It was a thick paste and was yellowish or, as I saw it twice, light green. The light green paste may have been aphids, since I later saw a siskin picking aphids from the leaves of a tree and feeding a young bird just out of the nest. The feeding process continued by the clasping of the bills of the two birds, the upper and lower mandibles of one just closing the complete gape of the other. Three or four such contacts were made, and, between each, the bird doing the feeding gulped as if bringing more food into its mouth. The bird then flew away, and the brooding bird sat quietly for eight or ten seconds before proceeding to feed the young. The brooding bird fed the young at five of the six feedings that I witnessed.

When the young were to be fed, the adult moved back to one side of the nest,

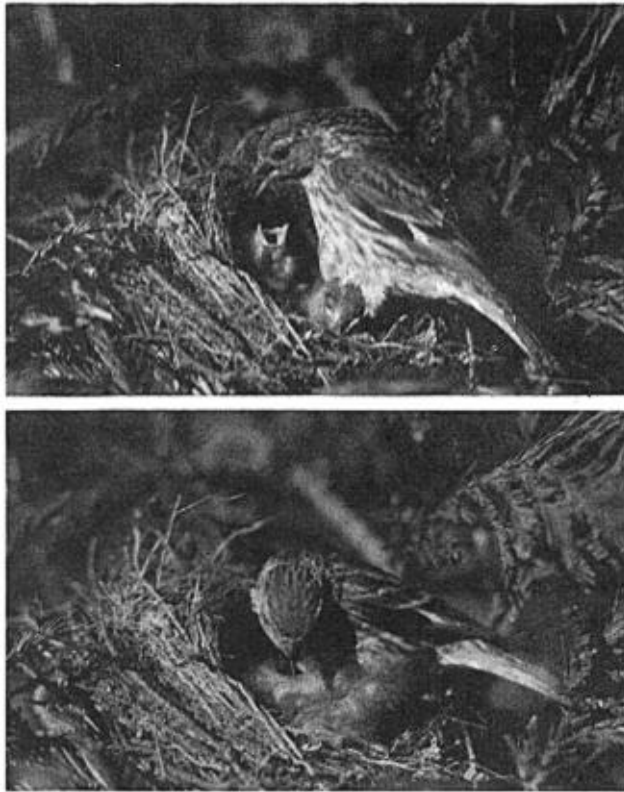


Fig. 44. Parent Pine Siskin at nest, regurgitating food to be distributed among young (upper), and watching for droppings (lower).

raised up as if sitting on the edge of the nest, drew its neck back and regurgitated food (fig. 44, upper), passing from one open mouth to another. Some of the twice-partly-digested food was put into each of the mouths, around and around and back and forth, about four to six times to each. Food was strung from one to the other in a very sloppy manner. After each feeding, the parent cleaned up the nest.

During the first eight days of brooding, the nest was kept absolutely clean, and, as far as I could determine, all the droppings were eaten. Every time, after the young were fed, the brooding bird would search around in the nest and pick up the droppings and eat them (fig. 44, lower). Twice, once on May 30, and once on June 1, a young bird was observed to elevate its posterior end toward the parent's bill and exude a dropping. The parent bird received it directly and ate it. On the ninth day droppings estimated to be those of about twelve hours accumulation were on the edges of the nest. They were judged to be droppings of the parent bird. During the next thirty-six hours, until the two young left the nest, no droppings were seen taken from the nest, and, judging from the accumulation on the edges, none was removed.

Berkeley, California, March 30, 1937.

THE WHITE-CHEEKED GOOSE IN CALIFORNIA

WITH THREE ILLUSTRATIONS

By JAMES MOFFITT

The A. O. U. Check-list (1931, p. 37) gives the range of the White-cheeked Goose (*Branta canadensis occidentalis*) as "The Queen Charlotte Islands, British Columbia, and along the coast of southeastern Alaska to the vicinity of Prince William Sound." This statement implies that the bird is non-migratory, a contention justly questioned by Alfred M. Bailey (Auk, vol. 44, 1927, p. 190) and definitely disproved at the time this goose was named by Baird (Pac. Railroad Reports, vol. 9, part 2, 1858, p. 766); for the type was collected at Port Townsend, Washington, which is south of the bird's breeding range. Jewett (Condor, vol. 34, 1932, p. 136) recorded winter-taken specimens of *occidentalis* from Netarts Bay, Salem, and Eugene, Oregon, and wrote of others shot at the mouth of the Rogue River, Oregon; this last locality is the southernmost recorded occurrence of the subspecies. The present paper will, for the first time, definitely extend this goose's known range into California, where it has recently been found to be a regular winter visitant.

Branta canadensis occidentalis has, it is true, in former years many times been recorded as occurring in California, but always erroneously. Swarth (Univ. Calif. Publ. Zool., vol. 12, 1913, p. 9) sums up these ascriptions with the conclusion that none was founded upon substantial evidence. He decided that only one race of large-sized *Branta canadensis* inhabited California, namely *B. c. canadensis*, the Common Canada Goose or Honker. Grinnell (Pac. Coast Avif. No. 11, 1915, p. 39) accepted Swarth's contentions, as have subsequent authors.

Swarth, in the same paper (*op. cit.*, p. 10), stated that if the White-cheeked Goose "occurs in this state at all it should be found along the extreme northern coast." This challenge to field observers seems to have remained unanswered for many years. With my interest in geese, which commenced in 1928, there grew a desire to investigate the matter. This, however, was not realized until early in 1932.