THE NESTING OF THE PINE SISKIN IN NEBRASKA*

ALFRED E. PERRY

THE Pine Siskin (*Spinus pinus*) has been known for some time to nest sporadically in southeastern Nebraska. Swenk (1929) has shown that in some years there seems to be a correlation of certain temperature phenomena and nesting. This seems to occur when population levels are high and April temperatures are subnormal, or if supernormal April temperatures are followed by subnormal May temperatures. Weaver and West (1943) have also shown that where breeding occurs outside of the ordinary breeding range it is usually associated with high population levels.

In the early spring of 1961, large flocks of Pine Siskins could be seen almost every day at Pioneer Park in Lincoln, Nebraska. Later this same spring, nesting was observed in several places in the state. One nest was observed at Kearney, Nebraska, and five were found on the campus of Union College in Lincoln.

The writer and several students of Union College carried out observations in an effort to learn more about the nesting of this species outside of its normal breeding range. Measurements of nests and eggs were made and daily weights were taken of several young.

DESCRIPTION AND COMPOSITION OF NESTS

The process of nest building was not observed, as all nests were complete when discovered with the exception of Nest 5, which was abandoned after only the outer shell had been completed. All nests were found in small eastern red cedar shrubs (*Juniperus virginiana*) in close proximity to buildings. The distance varied from about 3 feet to approximately 8 feet from the wall of the building, and in one case the shrub was in a corner situation with the walls on two sides 3 to 4 feet away. The nests were found at varying heights (Table 1). The nest is the attached statant type and consists of three layers. The outer layer is composed of rough, coarse material, usually quite loosely woven and consisting mainly of large compound rootlets, heavier single stems of grass, and large pieces of string. The middle layer was found to consist of more tightly woven material: smaller, single rootlets; many quite long grass blades running nearly the circumference of the nest; and fine string, twine, thread, and cord. The inner layer contained almost all the "fuzz" and textile fibers and most of the hair present. Scattered throughout the nests were odds and ends of cedar,

* Contribution No. 402, Zoology Department, Oklahoma State University, Stillwater.

TABLE 1

MEASUREMENTS OF PINE SISKIN NESTS IN LINCOLN, NEBRASKA

Nest No.	1	2	3	4	5	Average (1–4)
Height from ground (ft)	5.5	9.5	6.1	4.2	15±	6.3
Distance from building (ft)	3.0	4.0	8.1	3.3	50±	4.6
Outside diameter (mm)	77	80	65	80	—	75.5
Outside depth (mm)	50	35	40	50	—	43.75
Cup diameter (mm)	50	50	40	50	—	47.5
Cup depth (mm)	25	25	25	23	—	24.5

leaf fragments, paper, and occasional dried insects. These seemed to have no particular area of concentration but were distributed at random. Table 2 shows the nest composition of two nests analyzed after the young were fledged. Numbers of individual pieces are given where counting was possible; otherwise weights are given. Table 1 gives measurements of four of the five nests found in this study.

DESCRIPTION OF EGGS

Egg-laying was complete in all nests at the time of discovery. Table 3 shows the number of eggs and young at this time, as well as measurements and weights.

The only two eggs in Nest 1 were of the Brown-headed Cowbird (*Molothrus ater*). No cowbird eggs were found in any of the other nests. The

TABLE 2

COMPOSITION OF TWO PINE SISKIN NESTS ANALYZED AFTER FLEDGING OF THE YOUNG

Nest No.	1	3
Grass blades and stems	277	146
Grass rootlets	458	527
String, fine cord, twine, thread	137	59
Feathers	3	2
Fecal matter (weight)	0.3 g	2.2 g
Hair	1,067	673
"Fuzz" and textile fibers (weight)	0.8 g	0.5 g
Leaves	1	0
Fireweed (*Kochia*)	34	75
Paper	1	0
Insects	1	1
Spruce	9	0
Eastern red cedar (*Juniperus*)	few scraps	few scraps
Unidentifiable material	1.0 g	1.0 g

TABLE 3
DATA FROM FIVE PINE SISKIN NESTS IN LINCOLN, NEBRASKA

Nest No.	1	2	3	4	5
Date of discovery	15 May	22 May	22 May	22 May	7 May
Number of eggs	2 (cowbird)	4	2	3	0
Number of young	0	0	2	0	0
Eggs:					
Long measurement (mm)		17.5 17.2		18.5	
Short measurement (mm)		13.1 13.5		13.0	
Weight (grams)		24 May 1.3		24 May 1.4 1.3 1.5	
				25 May 1.3 1.3 1.5	
				26 May 1.5	

siskin eggs had a background of a very light bluish white color with light brown spots more concentrated at the large end. There were also a few larger and much darker spots on the large end, with a winding string of pigment between these spots. The normal clutch size would seem to be three or four eggs.

INTERSPECIFIC RELATIONSHIPS

Cowbird parasitism of the Pine Siskin has been noted by several workers. Swenk (1929) and Dales and Bennett (1929) have mentioned this, and it has also been reviewed by Friedmann (1963). In the present study one nest of five was parasitized with two eggs. One of these eggs hatched on 19 May and the other on 20 May. These two young were cared for by the adult siskins until 26 May, when the young cowbirds were found dead in the nest and a search of the area did not reveal the whereabouts of the siskins. By this time the young cowbirds were as large as the adult siskin, and in the day preceding death they could be seen with their heads sticking up above that of the brooding female siskin.

On 31 May I observed a female cowbird examining Nest 2. She stayed at

the nest about 10 seconds and then flew away. The young siskins were then 7 days past hatching.

A Robin (*Turdus migratorius*) nest containing four young was located within 20 feet of Nest 4, but the siskins seemed to pay no attention to any activity at this nest.

On several occasions the female Pine Siskin was seen to watch intently as Blue Jays (*Cyanocitta cristata*) and Common Crows (*Corvus brachyrhynchos*) flew overhead, and each time she appeared to be somewhat nervous.

PARENTAL CARE

Incubation was apparently carried on entirely by the female, and during it she was fed by the male. Feeding was by regurgitation, the female placing her bill inside that of the male. The food material appeared to be semisolid. The female was always seen to flutter her wings rapidly and open her mouth in a begging attitude as the male approached the nest to feed her. Reid (1929) has described this behavior in North Dakota. In a 2-hour observation period during incubation, the male fed the female four times. The female left the nest four times, usually just after feeding, and for 1 or 2 minutes each time. The female was seen to raise herself up off the nest and either turn the eggs or change positions some seven times. On another occasion she was seen to change positions three times during a period of an hour.

Brooding, also, is apparently carried on entirely by the female. During the early part of the nestling stage the male continued to feed the female by regurgitation, and then she in turn fed the young. During 2 hours and 10 minutes of observation at one nest, the female was fed 4 times and was seen to feed the young 15 times. In the parasitized nest, during 7 hours and 30 minutes of observation, the female was fed 7 times and fed the young 16 times. Not all of the observation time was continuous, so little valid information on number of feedings could be obtained. There did seem to be a greater number of feedings during the morning hours than at midday or in the afternoon. Dales and Bennett (1929) found that in Iowa the young were fed at 25- to 30-minute intervals. Weaver and West (1943) found that the male continued to feed the female on the nest for 8 days after hatching of the young.

Nest sanitation was continued for a period of about 5 or 6 days, the female apparently swallowing the fecal sacs. After the sixth day the excreta of the young birds rapidly accumulated around the nest, and by the end of the nestling period there was much on the nest itself (Table 2).

The instinct to protect the young and stay at the nest was exceptionally strong with the female siskin. During the weighing of the young the female had to be forced off the nest almost every time a nestling was removed. When

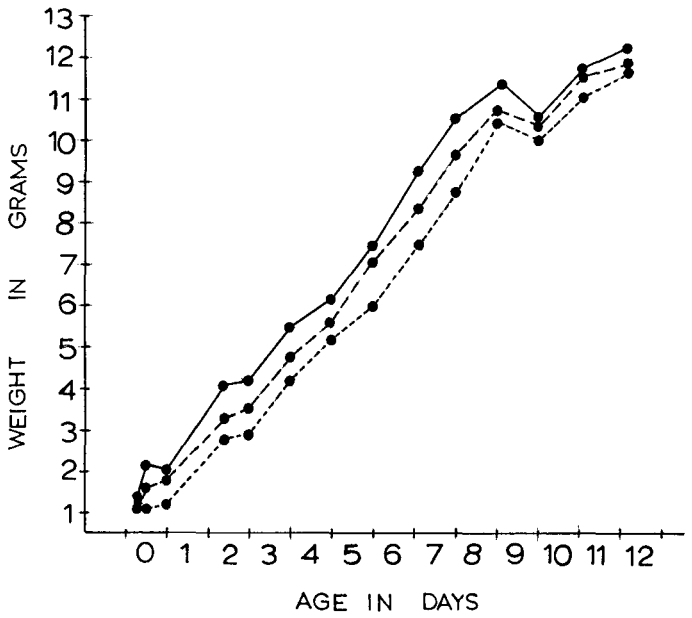

FIG. 1. Weight increase of marked young Pine Siskins in Nest 2 on Union College Campus, Lincoln, Nebraska.

forced off the nest she would fly only a short distance, and then return to the nest before the young could be replaced and another taken. This procedure did not seem to bother the female, and where it was carried out there was no nest desertion or decrease in nesting success. At the parasitized nest, also, the female had to be lifted off on several occasions in order to observe the eggs and young.

During several periods of rainy weather a female was seen to brood the young with her wings extended over the sides of the nest to keep the young dry.

Two of the nests were exposed to the direct rays of the afternoon sun, and during several days of quite warm weather the female was seen to perch on the west side of the nest with her wings outspread, shading the young from the direct rays of the hot sun. She was also seen to flap her wings slowly during this time.

GROWTH AND DEVELOPMENT OF YOUNG

Observations were made on the growth and development of young in three of the five nests found. Daily weights of the marked young in two nests were taken with a triple beam balance. Figures 1 and 2 show weight

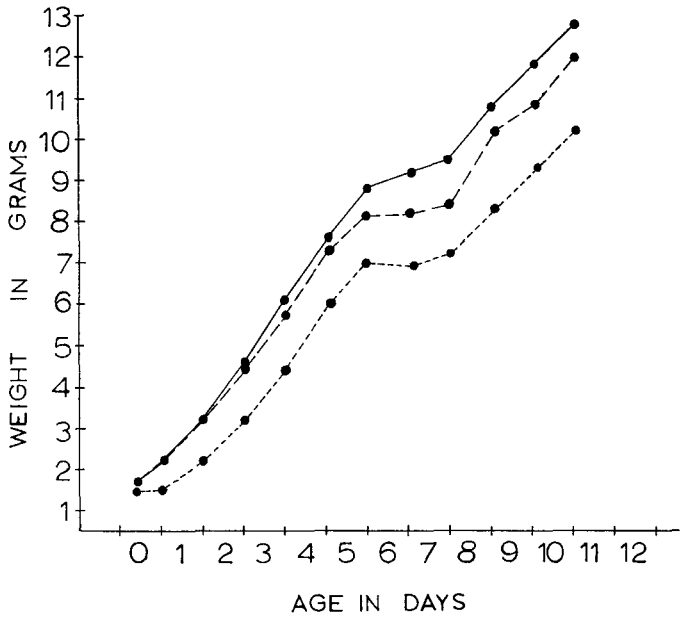

FIG. 2. Weight increase of marked young Pine Siskins in Nest 4 on Union College Campus, Lincoln, Nebraska.

increase in these young. Weaver and West (1943) have indicated that incubation begins with the laying of the first egg and lasts 13 days. In the three nests observed during the present study, the young all hatched within a maximum of 36 hours. In Nest 2 the first egg hatched between 6:00 PM and 10:30 AM the following morning. By 11:00 AM the second young hatched and by 6:00 PM the third hatched. This spanned 24 hours and seems to indicate that incubation might not have begun with laying of the first egg, as reported by Weaver and West (1943). The shell is apparently removed from the nest immediately after hatching as no shell or fragments were ever seen in the nests. The exact length of time between pipping and hatching was not determined; however, in Nest 4, where the third egg was pipped at 5:00 PM, a check at 6:00 AM the following morning revealed this egg had hatched and the young was still wet and matted.

Day zero and one.—The young at hatching were a yellowish orange color. The abdomen appeared to be quite distended and the internal organs showed through the thin body wall. Dark grey down was present on the head and back region. Weight at hatching was 1.1 g. The young had the ability to hold their head erect for a short period of time during the day of hatching, and gaping was observed the following day.

Day two.—Gaping was more prevalent and the skin coloration became somewhat darker. The egg tooth was present on some young. Eye slits became visible and the amount of down increased slightly.

Days three and four.—By the third day pinfeathers were visible. Small projections were visible on the hind margin of the wing where the primaries and secondaries develop. By the fourth day, the primary pinfeathers were about 3 mm long. The skin continued to darken. The eyes opened on the third or fourth day. The lining of the mouth was bright red.

Days five and six.—During these days the most apparent development was an increase in body weight and in the length of pinfeathers. By the end of the sixth day, the primary pinfeathers were about ½ inch long, and pinfeathers on the back about ¼ inch long. Pinfeathers also started to develop around the head region. Most nest sanitation stopped, and the young were able to grasp with their feet.

Days seven and eight.—The pinfeathers increased in length to about ¾ inch on the wings, and the body feathers started to break the sheath. The skin continued to darken and tail feathers were developing. By the end of the eighth day, the young were able to perch on a finger, and wing flapping was observed.

Days nine and ten.—Feathers were opening and folding over to cover the ventral apteria. By the end of the 10th day the young were almost fully feathered, and streaking was becoming apparent on the breast. Yellow on the wings was slightly visible. Siskin-like noises were heard; however, they were coarser and deeper than that of the adult. A little down persisted on the head. When disturbed the birds attempted to leave the nest.

Days eleven and twelve.—Disturbance caused young to leave the nest. When returned to the nest they still attempted to leave. As the adults came with food, the young in the nest could be heard from over 100 feet away. By the end of the 12th day, the streaking on the venter and the yellow on the wings was plainly visible. The young were fully feathered and leaving the nest. Nest leaving was probably earlier than normal and caused by disturbances. Weaver and West (1943) in New Hampshire found that the young left the nest on the 15th day.

Day thirteen.—This is the last day that young were seen in the nest. Several were observed on the 13th day 75 to 100 feet from the nest location, being fed by parent birds.

SUMMARY

Nesting behavior of the Pine Siskin, and development of the young in four nests was studied at Lincoln, Nebraska during the spring of 1961. Nests, consisting of three layers of readily available material (grass, rootlets, and hair), were constructed in small shrubs in close proximity to buildings. The normal clutch size appeared to be three or

four eggs. Incubation did not appear to begin with the laying of the first egg as all eggs in the nest hatched within a maximum of 36 hours. Incubation and brooding was apparently carried on entirely by the female. During incubation and the first part of the nestling stage the male fed the female on the nest and the female than fed the developing young. Feeding was by regurgitation. Nest sanitation continued for 5 or 6 days. Throughout the incubation and nestling stages the female siskin demonstrated a strong instinct to protect the eggs and young.

Weight of the young at hatching was 1.1 grams and development to fledging was complete in 13 days. Nest leaving was probably earlier than normal due to repeated disturbance and observation.

One nest studied was parasitized by the cowbird and the young cowbirds were cared for by the adult siskins for about 6 days at which time they were apparently deserted.

ACKNOWLEDGMENTS

I wish to acknowledge the assistance of Barbara Virgin in nest analysis and the help of Judy Gray and Gary Hickman in routine observation of the nest sites. Thanks are also given to Dr. F. M. Baumgartner and Dr. Bryan P. Glass for reading the manuscript.

LITERATURE CITED

Dales, M., and W. W. Bennett
1929 Nesting of the Pine Siskin in Iowa with remarks on regurgitative feeding. *Wilson Bull.*, 41:74–77.

Friedmann, H.
1963 Host relations of the parasitic cowbirds. *U.S. Natl. Mus. Bull.* 233.

Reid, R.
1929 Nesting of the Pine Siskin in North Dakota. *Wilson Bull.*, 41:72–74.

Swenk, M. H.
1929 The Pine Siskin in Nebraska: its seasonal abundance and nesting. *Wilson Bull.*, 41:77–92.

Weaver, R. L., and F. H. West
1943 Notes on the breeding of the Pine Siskin. *Auk*, 60:492–504.

Department of Zoology, Oklahoma State University, Stillwater, Oklahoma. (Present address: Department of Biology, Memphis State University, Memphis, Tennessee), 16 November 1964