

NOTES ON THE LOCATION AND CONSTRUCTION OF THE NEST OF THE CALLIOPE HUMMINGBIRD

WITH THREE ILLUSTRATIONS

By WINTON WEYDEMEYER

ASSUMING that the nesting habits of the Calliope Hummingbird throughout the northwesternmost county of Montana, where it is a common breeder, may largely be typical of the species, I give here information obtained in studying this bird in that locality and in examining a few more than twenty nests.

In Lincoln County the Calliope Hummingbird (*Stellula calliope*) nests along streams throughout most of the Canadian zone and downward into the upper borders of the Transition zone. During the nesting season and late summer it also frequents open mountains, ranging into the Hudsonian zone, and during May and August is commonly seen in the breeding areas of lower Transition zone species. Tree associations evidently have greater influence on its range than does elevation. In the eastern part of the county I have found the species to be common during the nesting season at 7000 feet, although I have never chanced actually to see a nest above 4800 feet. In the Kootenai Valley, near Libby, I have found it nesting abundantly at an elevation



Fig. 10. TRANSITION ZONE TYPE OF HABITAT OF THE CALLIOPE HUMMINGBIRD, ALONG THE KOOTENAI RIVER NEAR LIBBY, MONTANA, AT AN ELEVATION OF 2150 FEET.

of less than 2100 feet, and I have no doubt that it breeds below 1900 feet a few miles distant, in the lower end of the valley, the only place in Montana where so low an elevation occurs. Near Fortine, at 3000 feet, it does not nest.

Its nesting range here is almost identical with that of the Dipper (*Cinclus mexicanus unicolor*) and the Northern Varied Thrush (*Ixoreus naevius meruloides*). Other common birds that breed in the same immediate vicinity are, in the higher elevations: Slate-colored Fox Sparrow (*Passerella iliaca schistacea*), Audubon Warbler (*Dendroica auduboni*), Pileolated Warbler (*Wilsonia pusilla pileolata*), Western Golden-crowned Kinglet (*Regulus satrapa olivaceus*), and Audubon Hermit Thrush

(*Hylocichla guttata auduboni*); in the lower areas: Western Flycatcher (*Empidonax difficilis*), Western Winter Wren (*Nannus hiemalis pacificus*), Ruby-crowned Kinglet (*Regulus calendula*), and Willow Thrush (*Hylocichla fuscescens salicicola*).

By far the majority of the nests are built over creeks, or over roads or trails near streams or lakes. Of the twenty-one nests listed in Table I, fourteen were overhanging streams, three were in trees on the banks of streams, and the other four were overhanging roads or trails. Probably some pairs nest in the interior of woods, but I have never been able to find a nest there. In fact, not one of these nests was farther than two hundred yards from a stream.

TABLE I. LOCATIONS OF TWENTY-ONE CALLIOPE HUMMINGBIRD NESTS: TREE AND ASSOCIATION

Nest No.	Height	Tree	Approximate elevation, in feet	Location
1	60 ft.	<i>Picea engelmanni</i>	3200	Bank of swift mountain stream, Canadian zone, thick woods of Douglas fir, lodgepole pine, western larch, and Engelmann spruce (nests 1-5).
2	50 ft.	<i>Picea engelmanni</i>	3200	
3	40 ft.	<i>Pseudotsuga taxifolia</i>	3200	
4	70 ft.	<i>Picea engelmanni</i>	3200	
5	65 ft.	<i>Picea engelmanni</i>	3200	
6	60 ft.	<i>Abies lasiocarpa</i>	4800	Canadian zone, island in mountain stream.
7	80 ft.	<i>Thuja plicata</i>	2120	Arborvitae-spruce woods.
8	50 ft.	<i>Thuja plicata</i>	2085	Mixed broad-leaf and conifer woods; bank of creek.
9	70 ft.	<i>Tsuga heterophylla</i>	2120	Creek bank, woods of spruce, hemlock, and arborvitae.
10	120 ft.	<i>Thuja plicata</i>	2170	Heavy forest of yellow pine, hemlock, and arborvitae.
11	100 ft.	<i>Tsuga heterophylla</i>	2200	Broad-leaf and conifer woods along stream.
12	60 ft.	<i>Abies lasiocarpa</i>	4100	Douglas fir and alpine fir association, by creek.
13	60 ft.	<i>Picea engelmanni</i>	4000	Creek flat; broad-leaf, spruce, and alpine fir.
16	90 ft.	<i>Picea engelmanni</i>	2080	Bank of stream, spruce and Douglas fir woods (nests 16-18).
17	35 ft.	<i>Picea engelmanni</i>	2085	
18	70 ft.	<i>Picea engelmanni</i>	2080	
19	60 ft.	<i>Picea engelmanni</i>	3200	Along stream, heavy woods of spruce, hemlock, arborvitae, and Douglas fir (nests 19-21).
20	60 ft.	<i>Thuja plicata</i>	3170	
21	70 ft.	<i>Thuja plicata</i>	3125	
22	70 ft.	<i>Thuja plicata</i>	2050	Bank of stream, woods of arborvitae, spruce, larch, and yellow pine.
23	60 ft.	<i>Tsuga heterophylla</i>	2100	Creek bank; hemlock, spruce, cottonwood, and arborvitae.

To me this last-named fact seems strange. Why should this Hummingbird, which evidently feeds principally on open hillsides or in park-like country near lakes, place its nest in the dark, thick woods along creeks? In the upper part of the Canadian zone, in alpine fir associations, this does not seem so curious; for here the feeding grounds in many places reach down to the very edges of the creeks. But in the Transition zone region near Libby, where the species breeds much more abundantly, the nests are at considerable distances from the open hills. Considering the insects, probably more Diptera can be caught along the streams, but I believe that the greater share of the species of Hymenoptera, and possibly of Hemiptera, will be found in less dense woods. Likewise, most of the flowers which attract the Hummingbirds grow at a distance from the streams. In the creek flats, during the nesting season, the commonest flowers are white or faintly-tinted kinds—*Limnorchis viridiflora*, *Clintonia uniflora*, *Tiarella unifoliata*, *Fatsia horrida*, *Cornus canadensis*, *Pyrola* species, *Chima-*

phila umbellata, *Philadelphus Lewisii*, *Bossekia parviflora*, and *Linnea americana*; in the more open woods on the hillsides grow brightly-colored species of *Aconitum*, *Rosa*, *Lupinus*, *Vicia*, *Chamaenerion*, *Castilleja*, *Campanula*, and *Aster*.



Fig. 11. CANADIAN ZONE TYPE OF HABITAT OF THE CALLIOPE HUMMINGBIRD IN WESTERN LINCOLN COUNTY, MONTANA. THE SPECIES NESTS IN THE HEAVY TIMBER ALONG THE NUMEROUS MOUNTAIN STREAMS.

The inferences concerning the feeding habits of the species that are suggested by the preceding information are substantiated by what few observations I have made. During the nesting season I have commonly noted individuals feeding on the hillsides or on cultivated land, at a considerable distance from any nest; and have but rarely seen any birds feeding in the thick woods where the nests are located. This may in part be due, however, to the greater activity of males that may feed where they choose during this period.

The nest of this Hummingbird is placed in a coniferous tree. Within this limit, the choice of an individual tree appears to depend more upon the location than upon the species. In the higher elevations of Lincoln County, nests are placed in alpine firs. Along the streams of the Transition zone, the trees most commonly used are the Engelmann spruce, western hemlock, and arborvitae. I have found one nest in a Douglas fir, but have seen none in pines. Near Libby I have observed nests in three species of trees within a few yards of each other along a stream. Evidently, to suit the requirements of the birds, the tree must be a conifer standing on the bank of a creek, or beside a road or other opening in the forest, with one of its lowermost branches swinging free from all other foliage and commanding a clear view in practically all directions.

The word "lowermost" is used with a purpose. All the nests of this species that I have seen have been placed on the lowermost living branch on its side of the tree. This habit determines the height of the nest above the ground or water. In the region considered here the distance generally ranges from four to ten feet.

The nest is placed near the end of the branch, usually saddled on the main stem or on a horizontal fork, but often semi-pensile from lateral twigs. Table II gives these particulars for some Lincoln County nests.

TABLE II. SITUATION OF TWENTY-ONE CALLIOPE HUMMINGBIRD NESTS

Nest No.	Height from ground or water (feet)	Distance from trunk of tree (feet)	Distance from tip of branch (inches)	Situation and method of support
1	10	5	48	Over creek, saddled on lowest limb.
2	6	4	12	Over creek, saddled on lowest limb.
3	8	4	24	Over creek, saddled on lowest limb.
4	7	6	36	Over stream, semi-pensile from lateral twigs.
5	5	8	18	Over stream, saddled on branch.
6	8	5	10	Over stream, saddled on branch.
7	9	10	24	Over road, saddled on lowest limb.
8	6	4	24	Over road, near creek, saddled on limb.
9	8	6	24	Over creek, placed on fork of branch.
10	4	10	18	Over trail, on fork of branch.
11	7	7	30	Over road, saddled on branch.
12	8	6	24	Over road, saddled on branch.
13	10	4	3	Over creek, saddled on tip of lowest branch.
16	4	8	18	Beside creek, saddled on branch.
17	8	8	18	Over creek, semi-pensile from lateral twigs.
18	11	10	24	Over creek, saddled on lateral branch.
19	10	8	12	Over creek, semi-pensile from small branches.
20	10	4	18	Over creek, saddled on limb.
21	6	3	12	Beside creek, semi-pensile from small twigs.
22	8	4	14	Over creek, saddled on limb.
23	7	0	72	On limb, against leaning trunk, over creek.
Average	7.6	6	23	

Examination of fourteen nests showed that two of them had been used for three years, and three others for two different seasons. A new layer of down within the cup, and in some cases additions to the sides, prepared each nest for its second occupancy. The successive layers of down were easily separable, the surface exposed to use in every case being soiled, compacted, and covered with fragments of egg-shell and a few uneaten remains of insects. Scattered conifer leaves between the layers, together with noticeable differences in the amount of winter-weathering, proved that the nests had been occupied during different years, not for two broods during the same season. If any one of these nests was used twice in one summer, no additional material was added preceding the second occupancy.

I cannot with certainty say that these nests were used in successive years by the same birds, but I believe this to be the case. Substantial evidence in support of this supposition was disclosed by a careful examination of the nests. Considering individually the entire fourteen, a distinct variation in materials was found: some contained exclusively one species of moss, others contained another kind only; some were strengthened with conifer needles, whereas the rest contained none of this material; in some, all materials were correspondingly coarser than in the others. In contrast, the nests which had been added to during second and third years were of uniform construction, the different sections containing the same kind and quality of materials.

Of the twenty-one broods of young represented by these fourteen nests, twelve were raised in nests used more than one year, and only nine in those used but once. Moreover, some of these latter nests would probably have been used a second time had they been left undisturbed. It seems certain, therefore, that this repeated use of a single nest is a normal habit of the species.

But little variation occurs in the general types of materials used in constructing the nests. In comparative bulk the average nest is composed approximately as follows: plant down, 60 per cent; tree lichens, 20 per cent; ground and rock mosses, 10 per cent; tree mosses, 5 per cent; spider webs and fibers of insect cocoons, 1 per cent; miscellaneous material, 4 per cent.



Fig. 12. WINTER VIEW OF A TYPICAL NESTING SITE OF THE CALLIOPE HUMMINGBIRD. THE NEST IS PLACED NEAR THE END OF A LOWER BRANCH OF A CONIFER, OVERHANGING THE WATER.

The "shell" of the nest is formed principally of ground and rock mosses mixed with more or less plant down, strongly bound together with cocoon fibers, especially at the rim. Many species of moss are utilized, but generally only one kind is used in an individual nest. In many cases black fibrous tree moss also is used. This part of the nest contains the "miscellaneous material". In the fourteen nests examined this included conifer needles, grass, aspen bark, rotted wood, feathers (from the birds themselves), small leaves, and pieces of spider and insect skeletons (Diptera, Coleoptera, and Hymenoptera).

The exterior of this framework is thickly covered with gray or greenish lichens of the kind occurring on the tree in which the nest is placed. The pieces are bound to the moss by shreds of insect webs and cocoons, or by fibrous tree moss. The main body of the nest, within the sustaining framework, is composed of a thick, soft layer of various kinds of plant down, firmly compacted to form the interior cup. This down retains its shape without being bound with any other material.

Second year additions to a nest are composed mainly of down. Often the only added material is a thick layer of down in the bottom of the cup, and a thinner one on its sides. This method of addition decreases the depth of the cup about a quarter of an inch. In other cases, the rim of the nest is heightened also. If this is done, a new layer of lichen is added to the outside of the nest, making it impossible to determine, from the appearance of the exterior, how many years the nest has been used.

The average dimensions, in inches, of the fourteen nests measured are given in the following table.

Dimension	Minimum	Maximum	Average
Depth, upper side	.500	1.250	1.0
Depth, lower side	1.000	2.500	1.4
Width at top	1.625	2.000	1.8
Width at bottom	1.750	2.500	2.0
Width of cup	.875	1.250	.9
Depth of cup	.500	.875	.6

As all but one of these nests were collected after the young had grown and left, and five of them after they had been used more than one year, the average cup measurements may give a slightly greater width and lesser depth than the typical nest when first constructed. In the main, however, the dimensions were quite uniform. The width of the cup, before the young are hatched, is slightly greater at the center than at the top. The exterior depth is influenced by the method of support, being less in nests saddled on limbs than in those semi-pensile, and by the slope of the branch.

From these data the nest location and construction of the Calliope Hummingbird, at least in Lincoln County, Montana, may be described thus:

Nest: In the Canadian or Transition zone, placed near the end of a lower limb of a coniferous tree, usually overhanging a stream or at the edge of a forest opening. Compactly made of plant down, held in shape by a framework of green moss bound together by spider web and insect cocoon fibers; exterior protectingly colored with a thick layer of lichen scales.

Moccasin, Montana, February 23, 1926.