

7. The presence of bars justifies a strong suspicion that the feather is not a juvenal feather.
8. Feathers grown in late fall and winter have more pronounced bars than those grown in spring and summer.
9. The presence of a strongly barred feather in company with adjacent or corresponding feathers having no bars or but faint bars indicates that the strongly barred feather has replaced one lost from the normal plumage.

*Pasadena, California, February 12, 1938.*

NOTE.—As this paper is ready for publication, Dr. J. M. Linsdale cites to us "The Genesis of Fault-bars in Feathers and the Cause of Alternations of Light and Dark Fundamental Bars," by Oscar Riddle (Biological Bulletin, vol. 14, 1908, pp. 328-370). We recognize in Riddle's "fundamental bars" the bars described in our paper and in the results of his experimental work the information we have been wishing so much we had. However, our method of study and the results we present in addition to those presented by Riddle will justify, we hope, the presentation of this paper.—H. M. and J. R. M.

## AN HOUR IN THE LIFE OF A BROAD-TAILED HUMMINGBIRD

WITH ONE ILLUSTRATION

By A. M. WOODBURY and JOHN W. SUGDEN

A small glade 80 feet in diameter in an opening in a natural forest of spruces and aspens formed the setting for the activities of a male Broad-tailed Hummingbird (*Selasphorus platycercus*). Here he displayed his incessant "feeding, fighting and flirting" as we observed him in the mating season on June 13, 1937, at the Utah Outdoor Camp in Big Cottonwood Canyon, Salt Lake County, Utah. The glade was densely studded with twinberry bushes (*Lonicera involucrata*) in bloom (about waist-high) interspersed with grasses and herbage of many kinds. The twinberry blossoms provided the food supply and, so far as we observed, he did not feed on anything else.

After fifteen minutes of preliminary observation, we began to make detailed notes of the bird's activities. A sketch of the area was made and the perching points most commonly occupied were numbered. The area was bounded on the north and northeast by heavy conifers (spruce and fir), into which the hummingbird seldom ventured. The west boundary was provided by a clump of aspens with an opening to the northwest providing an open passageway. To the south and southeast, the twinberry brush extended some distance beyond the scene of observation along the banks of two tiny streams that converged at this point. (See fig. 43.)

We found three adjoining birds apparently maintaining territory, one on each fork of the little stream where the twinberries were thick, as shown in the sketch, and the other to the northwest, downstream. The boundaries of the adjoining territories seem to have been definitely delimited; for two birds would perch close together on opposite sides of the "line" without showing hostility.

The bird under observation seemed to perch on twigs on the sides of either trees or bushes (never on top) where he could keep the entire area under observation. Favorite perches were located on the inner sides of trees around the border of the area, or else on bushes from which he could see the surrounding trees.

Occasionally a female entered the area and the male gave her a good deal of attention, sometimes dancing in the air with her, occasionally touching bills, but more often performing his characteristic dives, in which he would spiral up about as high as the tree tops and then dive rapidly toward the ground making a sweeping curve at the bottom and come up again on rapidly beating wings. The descent was generally marked by a peculiar rattling sound which gave way at the bottom to a decided cluck just as the sweep reversed and he started to rise.

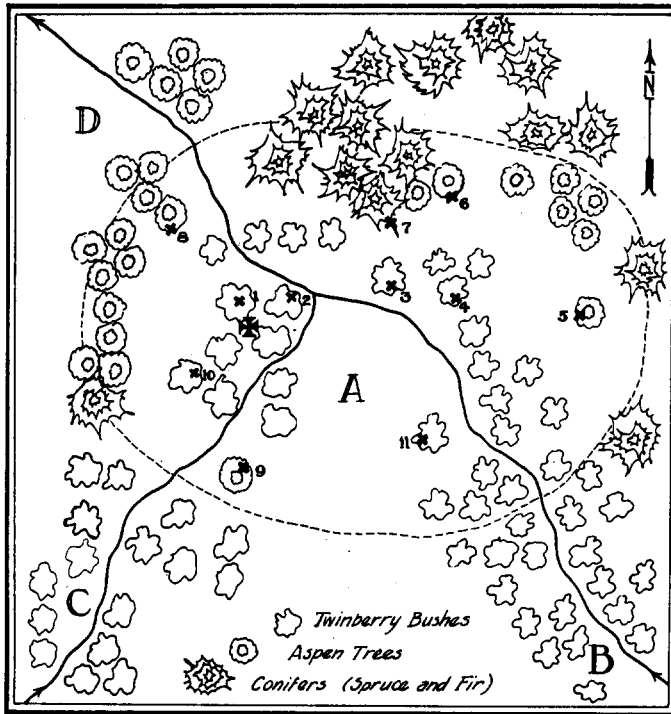


Fig. 43. Territory of a male Broad-tailed Hummingbird as observed June 13, 1937, in Cottonwood Canyon, Salt Lake County, Utah. The territory as outlined was about 80 feet in diameter. The cross indicates position of the observers. An x indicates each of the perches.

The female perched in the area several times, but always low in the bushes as though attempting concealment and, so far as was observed, never in an outlook position. The following notes show the detailed activities for 46 minutes.

9:59 a.m. Female entered territory and perched low in bushes. Male made two dives and sweeps, entered bushes with female, emerged and made two more dives, entered bushes again, danced in willows. Female perched low again.

10:04½. Male dived twice again and entered brush. Both emerged, flying up in the air, and both disappeared. Male soon returned and perched.

10:05. Chased a trespassing male off to NW.

10:06. Chased another male off to SE.

10:06½. Female returned, both in air together, touched bills. Female disappeared, male returned and perched. Several other males outside of territory.

10:09. Began feeding from twinberry blossoms for half minute.

10:10. Drove off neighboring male and perched. Feeding again. Sparrow flew across territory without attracting attention. Feeding again.

10:12. Perched at no. 3, preened around outside of territory.

10:13. Dived twice, perched at 5, twittering.

10:13½. Perched in conifer 7, made five dives, perched at 5. Rattles in diving and clucks at bottom.

10:15. Two fights with neighboring males; four dives; fluttering in bushes with female; another dive.

10:16. Perched in unnumbered bush.

10:16½. Feeding.

10:18. Another fight; perched at 7.

- 10:19½. Dived once, then chattered at neighboring male close to no. 9, but did not leave territory; perched at 10.
- 10:20. Repeated chattering, then perched at 3, preening. Bird flew over territory, male twittered.
- 10:22½. Chased another male off to SE; began feeding.
- 10:24. Perched at no. 1, twittering and watching.
- 10:25. Chased another male off to SE; gone some time while male B flew around perch 5 twice and returned to his own territory.
- 10:26. Returned and began feeding.
- 10:28. Perched at 3, preening and fluttering wings. Moved to 11 and then to 8.
- 10:29. Female entered territory. Male made four dives and then perched at 8. Left territory to NW and soon returned to 8.
- 10:30½. Perched in conifer 7; two dives and perched at 5.
- 10:31½. Two dives and perched at 5. Moved to 9, then to 8.
- 10:32½. Three dives, perched at 8, began feeding, perched at 4.
- 10:33½. Chased male B off to SE; female quiet.
- 10:34. Feeding; perched at 11, moved to 4.
- 10:35. Perched at 8, chased neighbor D to N, perched at 5, moved to 8 and then returned to 5.
- 10:37. Perched at 8, dived and returned to 8.
- 10:39. Feeding; perched at 3, twittering.
- 10:41½. Perched at 8, dived four times and returned to 8.
- 10:43. Chased another male (probably male B) off to SE.
- 10:44. Made four dives, then fluttered in bushes with female; made another dive and disappeared.
- 10:45. Returned and dived, then chased another male.

*Department of Zoology, University of Utah, Salt Lake City, Utah, March 1, 1938.*

## ANOTHER JAY SHOOT IN CALIFORNIA

By EMMET T. HOOPER

As representatives of the Museum of Vertebrate Zoology, Mr. F. H. Test, Mr. Frank Richardson and myself were given the opportunity to be on hand at a jay shoot held by the Associated Sportsmen of Calaveras County on January 30, 1938. This was the first organized shoot held by the association since the one of April 26, 1936, when, also, representatives of the Museum were present. The first shoot has been reviewed by Miss Mary M. Erickson (*Condor*, vol. 39, 1937, pp. 111-115).

The purposes of this brief report are, in the main, three: To review the method of conducting the shoot, particularly as differing from the one reported by Erickson; to record the number and kinds of "predators" taken; and to give certain opinions regarding wild life voiced by sportsmen interviewed.

The area covered by the shoot was approximately the same as in 1936 (about 375 square miles) and chiefly in the blue oak and digger pine belt. However, this year only a few more than one-half the number of men hunted over this same area and they returned with about one-third the number of birds. The drain on the jay population in the area was thus much less than in 1936.

Approximately 20 men took part in the shoot; about 30 men were present at a dinner held afterwards. No formal record was made by the Association of the number of men hunting, nor of each hunter's kill. The fact that fewer men, than in 1936, took part in this shoot may be explained on one or more of several counts. A dance was held the night before in San Andreas; it was said by some that the "aftermath" was a bit too much for certain individuals who normally could be expected to shoot. Some held that the inclement weather that day kept indoors erstwhile hunters. Others complained that the lack at that time of keen competition lessened the incentive to get hunters afield. Possibly all these factors can be summated in one reason, namely, lack of interest in the shoot as held.