

## Literature Cited

- Bailey, S.F., P. Pyle, and L. B. Spear. 1989. Dark *Pterodroma* petrels in the North Pacific: identification, status, and North American occurrence. *Am. Birds* 43:400-415.
- Clapp, R.B., R.C. Banks, D. Morgan-Jacobs, and W.A. Hoffman. 1982. Marine birds of the southeastern United States and Gulf of Mexico. Part I. Gaviiformes through Pelecaniformes. U.S. Fish Wildl. Serv., Off. Biol. Ser. 82/01. 637 pp.
- Haney, J.C., P. Brisse, D.R. Jacobson, M.W. Oberle, and J.M. Paget. 1986. Annotated checklist of Georgia birds. *Occ. Publ. No. 10. Georgia Ornithol. Soc.*
- Lee, D.S. 1986. Seasonal distribution of marine birds in North Carolina waters, 1975-1986. *Am Birds* 40:409-412.
- Lee, D.S. and J. Booth, Jr. 1979. Seasonal distribution of offshore and pelagic birds in North Carolina waters. *Am Birds* 33:715-721.
- Post, W. and S.A. Gauthreaux, Jr. 1989. Status and distribution of South Carolina birds. *Contrib. Charleston Mus.* 18.

### **Breeding Status of the Black-throated Blue Warbler in the Mountain Bridge Wilderness Area, South Carolina**

IRVIN PITTS, JR.  
S.C. State Parks  
1205 Pendleton Street  
Columbia, SC 29201

The Cairn's Warbler (*Dendroica caerulescens cairnsi*) is the local race of the Black-throated Blue Warbler that breeds in the southern Appalachians. This race was named by Dr. E. Coues in 1897 in honor of J.S. Cairns who first described it from the North Carolina mountains (cited in Bent 1953). Although similar to the northern race, *D. c. caerulescens*, the Cairn's Warbler is distinguishable by several characteristics, most notably the presence of black mottling on the male's back. Its breeding range extends from northern Maryland and central Pennsylvania south through the mountains of northern Georgia and northwestern South Carolina (Sprunt and Chamberlain 1949).

The Black-throated Blue Warbler is considered to be fairly common above 800 m but no nest has been reported in the state (Post and Gauthreaux 1989). On 26 June 1934 Hudson and Sherman (1936) discovered birds on Sassafras Mountain near the North Carolina line and reportedly took a juvenile male at that location. However, because of the close proximity to the North Carolina line and the unknown location of the specimen, this breeding record has not been accepted (Post and Gauthreaux 1989).

Prior to 1936, information concerning the status of *D. c. cairnsi* in South Carolina is scarce. Loomis (1890, 1891) apparently did not encounter this bird during his work in the South Carolina mountains, as he does not include it in his accounts. A.T. Wayne (1910) regarded this species as a transient of the state and further added that "it breeds in the higher mountains of North

Carolina". Chamberlain and Coleman reportedly took males from Caesars Head on 16 and 18 July 1927 and Chamberlain reported breeding in Pickens County in 1934 (cited in Sprunt and Chamberlain 1949). However, no other details are provided.

It appears this warbler was either largely overlooked by early observers as a breeding bird in South Carolina or its population has increased since that time. It now occurs in several mountainous regions of the state during the summer months and is considered fairly common above 800 m (Post and Gauthreaux 1989). Nevertheless, its status as a summer resident has been poorly documented.

This report documents the habits and breeding status of *D. c. cairnsi* in the Mountain Bridge Wilderness and Recreation Area. This state-owned property is located in northern Greenville County, South Carolina and contains over 4,800 hectares of contiguous mountain habitat including Caesars Head State Park, Jones Gap State Park and several Heritage Trust Preserves. From 1984 through 1989 I served as park naturalist at Caesars Head State Park and kept notes on the bird life of that area. Information in this report is derived from my recorded personal observations.

In these mountains at elevations above 800 m, *D.c. cairnsi* occurs most often in heavily wooded ravines along streams, seepages and river forests. Favorite habitats include wet, shady situations with thick stands of rhododendron (*Rhododendron* sp.), *Leucothoe* (*Leucothoe axillaris*) or other dense undergrowth. This warbler tends to be somewhat gregarious, with several or more pairs occurring in suitable habitats.

Thick forested areas along upper Matthews Creek, Julian Creek and their tributaries in the Watson Heritage Preserve harbored the largest populations of this wood warbler. It was also fairly common along the Middle Saluda River and its tributaries in upper Jones Gap. I encountered summering Black-throated Blue Warblers at Caesars Head State Park in other scattered locations above 760 m including the Raven Cliff Falls Trail, along the Coldspring Branch, a major tributary of the upper Middle Saluda, and near the Caesars Head Park Headquarters.

On 20 July 1985 I saw 3 well-feathered juvenile Black-throated Blue Warblers with an adult female along the Raven Cliff Falls Trail (880 m). The young were located in a Rosebay (*Rhododendron maximum*) thicket bordering a small stream along a mature hardwood slope. This was near the present day well house.

On 9 June 1986 I saw an adult male feeding a recently fledged young near the upper Jones Gap Trail (790 m). This was in a heavily forested ravine with Yellow Birch (*Betula lenta*) and Eastern Hemlock (*Tsuga canadensis*) prevalent. The fledgling appeared to be just out of the nest and was found in a Rosebay rhododendron thicket. I watched the male forage through the understory, gathering green caterpillars to feed the young. He sang while carrying food. When I approached the fledgling, the male immediately became excited and flew closer, raised his wings and fluttered them conspicuously while uttering a sharp "chwee!" call. During this distraction display the white wing spots of the adult were quite visible.

I found fledged young on one other occasion. On 5 July 1988 I saw an adult female feeding a well-feathered juvenile in a rhododendron thicket bordering a

small stream along a steep, wooded ravine along the Rim of the Gap Trail near Caesars Head (870 m). This young appeared to have been out of the nest for at least two weeks.

On 14 June 1989 I saw a female Black-throated Blue Warbler gathering spider webs and building a nest along the Jones Gap Trail near the headwaters of the Middle Saluda River. This was located at an elevation of 854 m and about 920 m from the North Carolina line. The nest was just started and placed in a rhododendron thicket. The male accompanied the female while she gathered nesting material, but did not assist. The nest was completed in 4 days. Harrison (1975) also stated that nest building usually takes 4 days. On 18 June, it contained 1 egg.

The nest was located in a leaf clump on the outer fork of a Rosebay Rhododendron that grew along a steep bank 1.2 m from the Middle Saluda River. It was 2.7 m from the Jones Gap Trail and placed 91 cm above ground. It was also located 51 cm from the main trunk and 16 cm inward from the branch tip. The nest was concealed from above by overhanging rhododendron leaves.

The forest was relatively open, but a dense understory was present. A power line clearing was located about 8 m away. Dominant canopy species included Eastern Hemlock, Umbrella Tree (*Magnolia fraseri*), Tulip Tree (*Liriodendron tulipifera*), Red Maple (*Acer rubrum*), Sourwood (*Oxydendrum arboreum*), Northern Red Oak (*Quercus rubra*), and White Oak (*Q. alba*).

The understory consisted of Rosebay, Sweet Pepperbush (*Clethra acuminata*), Witch Hazel (*Hamamelis virginiana*), Sassafras (*Sassafras albidum*), Leucothoe, Sweet Shrub (*Calycanthus floridus*), Mountain Laurel (*Kalmia latifolia*) and tangles of Greenbriar (*Smilax* sp.).

The outer nest wall was neatly rounded and built mostly with rhododendron bark strips. Other materials included dried grasses and weed stems. The inside cup was lined with fine black rootlets, fine bark strips, grasses and some animal hair. Cairns (cited in Bent 1953) stated that "the nest's interior is neatly lined with hair-like moss, resembling fine, black rootlets." the nest's outside diameter was 6.5 cm and its height 5.8 cm. The inside diameter was 5 cm and the depth was 4.5 cm. The nest was wrapped and attached to the branch fork with spider web.

The total clutch size was 3 and incubation began on 21 June. Incubation was mostly, if not entirely, by the female. The male was usually located singing nearby. The incubation period lasted 12 days and hatching occurred on 2 July. Harrison (1975) stated that incubation is by the female and lasts 11-13 days, typically 12.

Both adults fed the young, particularly small caterpillars. The adults gathered food most actively in the morning, often at frequent intervals. H. Mousley (cited in Harrison 1984) remarked on feeding frequency of this species in Quebec. He stated that during one period the female was observed feeding nestlings on the average every 2.4 min. and added that feeding was predominately by the female. In the South Carolina nest the male actively participated in feeding the young. During one active feeding period on 7 July I saw the male bring food to the nest every 5 to 10 minutes. Between foraging there was normally a period of inactivity, particularly in mid-afternoon.

The young fledged on 12 July, 10 days after hatching. They moved to a nearby brush pile with greenbriar tangles and remained there for the next sev-

eral days. The male continued to actively feed the young. When I disturbed the nest or approached the fledged young, the female frequently gave a thin, musical "tseet" which apparently was an alarm note. Another call, given by both adults, was a flat, sharp "chwee!". The a male sometimes gave a junco-like "thit" while near the nest. No distraction display was observed.

The male sang diligently throughout the nesting period into mid July. He frequently sang near the nest and sometimes while gathering food for the young. Other territorial males were heard singing nearby. A typical rendition of the male's song can be described as a lazy, drawing "zroo zroo zroo zreeeee". These phrases were sometimes shortened to "zroo zroo zreeeee" or "zroo zreeeee".

Territorial male Black-throated Blue Warblers ordinarily arrive in these mountains by mid April, ahead of the main spring passage of migrants. Two singing males observed in Jones Gap on 14 April 1988 represent the early arrival date. Referring to *D. c. cairnsi*, J.S. Cairns stated that "they arrive from the south nearly 10 days earlier than those that pass through the valleys..." (cited in Bent 1953). During the peak of spring migration in late April and early May, this species was quite common. On 9 May 1987 I found 24 singing males along a stretch of Matthews Creek on the Watson Heritage Preserve. Most appeared to have been on territory.

My observations indicate that the 1989 nesting occurrence was largely consistent with previous documented breeding habits of this species. Considering this, the 9 June 1986 record suggests that nesting began in mid May. My observations also indicate that, in these mountains, the time of nesting varies. The disparity in dates might suggest that two broods are possibly reared. Furthermore, *D. c. cairnsi* seemed to show a decided preference for rhododendrons when nesting.

#### LITERATURE CITED

- Bent, A.C. 1953. Life Histories of North American Wood Warblers. Part 1. U.S. Natl. Mus. Bull. 203., Washington, D.C.
- Harrison, H.H. 1975. A Field Guide to Birds' Nests of 285 Species Found Breeding in the United States East of the Mississippi River. Boston, Houghton-Mifflin.
- Harrison, H.H. 1984. Wood Warblers' World. New York, Simon and Schuster.
- Hudson, G.E. and F. Sherman. 1936. Some Miscellaneous Notes on South Carolina Birds. Auk 53:314.
- Loomis, L.M. 1890. Observations on some of the Summer Birds of the Mountain Portions of Pickens County, South Carolina. Auk 7:30-39; 124-130.
- Loomis, L.M. 1891. June Birds of Caesar's Head, South Carolina. Auk 8:323-333.
- Post, W. and S.A. Gauthreaux, Jr. 1989. Status and Distribution of South Carolina Birds. Contrib. Charleston Mus. 18.
- Sprunt, A., Jr. and E.B. Chamberlain. 1949. South Carolina Bird Life. Columbia, University of S.C. Press.
- Wayne, A.T. 1910. Birds of South Carolina. Contributions from the Charleston Mus. I.