

Probable Cerulean Warbler x Northern Parula Hybrid in Rockbridge County, Virginia in April 2019

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ABSTRACT

We report our sighting of a probable Cerulean Warbler (*Setophaga cerulea*) x Northern Parula (*Setophaga americana*) hybrid that was located in Rockbridge County, Virginia on 20 April and 28 April 2019. Superficially, the bird resembled an after second-year male Cerulean Warbler, but it had several plumage characteristics of an after second-year Northern Parula. Additionally, the hybrid sang a Northern Parula song. This would be the first record of this hybrid in Virginia.

Keywords: Cerulean Warbler, hybrid, Northern Parula, wood warbler.

INTRODUCTION

The wood-warblers (family Parulidae) are a well-known group of small insect-eating birds. Lovette et al. (2010) have presented a recommendation for revising the relationships among the parulids. They used molecular techniques to assess phylogenetic relationships and, of interest to our paper, they show that Cerulean Warblers and Northern Parulas are very closely related. Recently, Trimbath et al. (2019) reported on a genetic analysis of Cerulean Warbler x Northern Parula hybrids from northeastern Ohio. They showed that the two individuals had the same Cerulean Warbler dam and a Northern Parula sire. The presence of hybrids poses interesting questions with respect to speciation and evolution. Hybridization can be due to a number of reasons. Most commonly, there exists a hybrid zone where the ranges of two closely related species who only recently diverged and have retained many similarities interbred. In birds, hybridization has been reported in many families (Cockrum, 1952) and interestingly there is a high rate of hybridization in waterfowl (Ottenburghs et al., 2016). The presence of hybrids in the Parulidae has long been

recognized; hybrids produced between Golden-winged Warblers and Blue-winged Warblers, Brewster's Warbler or Lawrence's Warbler being the most recognized (Short, 1963). A number of other parulid hybrids have been reported, for example: Northern Waterthrush x Blackpoll Warbler (Short & Robbins, 1967); Black-and-white Warbler x Cerulean Warbler (Parkes, 1978); Orange-crowned Warbler x Nashville Warbler (Ralston et al., 2015); Chestnut-sided Warbler x Magnolia Warbler (Burrell et al., 2016); Cerulean Warbler x Black-throated Blue Warbler (Delancey et al., 2019); Cerulean Warbler x Northern Parula (Trimbath et al., 2019). In this paper, we report on a Cerulean Warbler x Northern Parula hybrid that was discovered in Rockbridge County, Virginia in April 2019.

METHODS

Location

Rockbridge County is located in southwestern Virginia and is bordered by the Blue Ridge Mountains on the east and Appalachian Mountains on the west.

Geographically, Rockbridge County is in the Great Valley of Virginia, and it is situated at the southern end of the Shenandoah Valley. The Maury River, the principal waterway within the county, flows into the James River near the southeastern boundary of the county. The location for the hybrid was along the Maury River south of the city of Buena Vista and along River Road, which parallels the Maury River for several miles. The hybrid was found in an area (37°40'28.33"N; 79°25'31.86"W) with Sycamore (*Platanus occidentalis*) trees bordering a small creek and wet area within 100 meters of the Maury River.

Equipment

The hybrid was photographed using a DSLR camera with a telephoto lens. Sound recordings were made using a Telinga Pro parabolic dish, Sennhieser microphone (MKH 20) and a Fostex FR-2 digital field recorder. In addition, sound recordings of a Cerulean Warbler (ML 85132) and Northern Parula (ML 53302) were obtained with permission from the Macaulay Library at the Cornell Lab of Ornithology. Spectrograms from the hybrid, Cerulean Warbler, and Northern Parula songs were generated using Raven Pro 1.4 (Bioacoustics Research Program, The Cornell Laboratory of Ornithology).

RESULTS AND DISCUSSION

On the morning of 20 April 2019, while birding along River Road and the Maury River in southern Rockbridge Co., Virginia, we discovered the hybrid. The bird was first located by its song, which was recognized by one of us (RAR) as a Northern Parula. As a result, we began looking for a Northern Parula. The bird continued to sing and we were able to locate it in trees. Once we saw the bird, we changed our identification to a Cerulean Warbler based on its plumage presentation. We were somewhat confused, however, because we were hearing a Northern Parula but seeing a Cerulean Warbler. In an effort to get better looks at the bird, we played vocalizations for both Cerulean Warbler and Northern Parula from iBird (version 10.06). At the time, we felt that the hybrid tended to respond to the Cerulean Warbler vocalizations better than the Northern Parula. We photographed the bird (Fig. 1) and later when we reviewed our photographs we realized that there were some inconsistencies with the plumage and our Cerulean Warbler identification. As a result, we returned to the location on 28 April and quickly relocated the bird. On that date, we had the assistance of another observer and were able to record the hybrid singing while confirming that it was the hybrid singing. We used Raven Pro to

create spectrograms of the hybrid's vocalizations (Fig. 2). Additionally, we experimented with playing vocalizations of both the Cerulean Warbler and Northern Parula from iBird and noting the responses of the hybrid. It was clear that the hybrid gave a greater response to the Cerulean Warbler call by flying from perch to perch on different trees singing.

Description of hybrid

Overall, the hybrid (Fig. 1) resembled a Cerulean Warbler exhibiting a blue dorsum and head with a blue breast stripe, white belly and throat, weak blue spotting along the flanks, two prominent white wingbars, and white undertail coverts. The hybrid lacked the yellow coloration seen on the throat and breast of a Northern Parula as well as the orange wash seen below the breast band. The upper mandible was black and the lower mandible was gray, which is consistent with a Cerulean Warbler (Northern Parulas have a black upper mandible and a yellow lower mandible). The hybrid had a clear split eye-ring (a Northern Parula characteristic but can be seen in immature Cerulean Warblers), and a completely blue-gray head and neck instead of the sky-blue coloration seen in Cerulean Warblers. The hybrid lacked the white neck band that extends between the nape and cheek (seen in Cerulean Warblers at all ages), which is consistent with a Northern Parula. Also, some of our photographs appear to show a slight green tinge to the dorsum between the wings (Northern Parulas have a distinct greenish triangle between their wings), but no black longitudinal stripes were visible (a Cerulean Warbler characteristic). In addition, the photographs do not show the distinct black, longitudinal stripes seen in adult Cerulean Warblers. Unfortunately, none of the photographs provide a clear view of the back of the bird.

We recorded a total of seven minutes of the hybrid singing. A review of the spectrograms from our recordings were all consistent with the vocalizations of a Northern Parula. A representative spectrogram from the vocalizations recorded from the hybrid is presented in Fig. 2. The hybrid's spectrogram is consistent with the description of the type A Northern Parula song (see Fig. 3) described by Moldenhaur (2012) as containing a preliminary trill ending with a buzzy trill and inverted chevron terminal note. Cerulean Warblers (see Fig. 4) have an introductory set of longer notes followed by a middle section of shorter notes and ending with a final buzz (Buehler et al., 2013) but they lack the inverted chevron of a Northern Parula. We compared the vocalizations that we recorded to spectrograms from Northern Parula (Fig. 3, ML 53302) and Cerulean Warbler (Fig. 4, ML 85132) and found that the vocalizations from the hybrid are consistent with the



Fig. 1. Photographs of the Cerulean Warbler x Northern Parula hybrid taken on 20 April 2019 in Rockbridge Co., Virginia (photographs by R. A. Rowe).

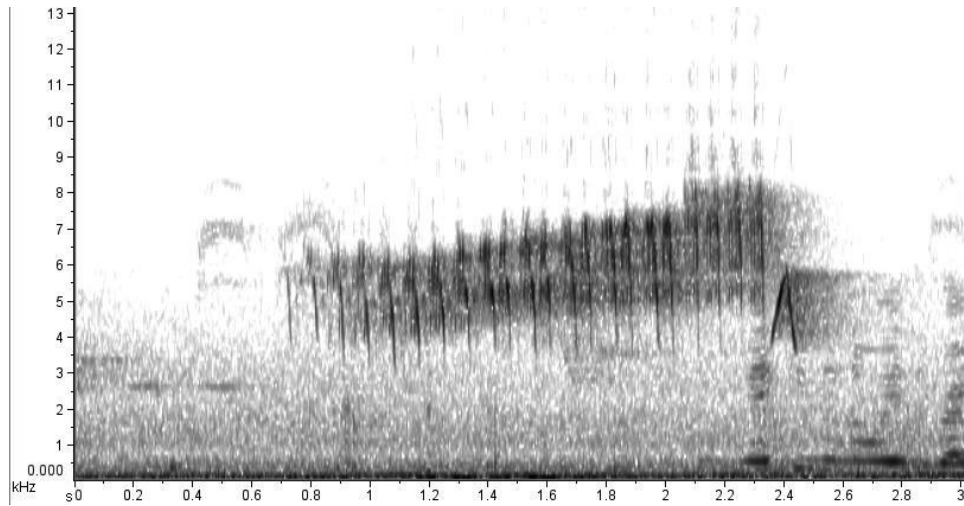


Fig 2. Spectrogram from Cerulean Warbler x Northern Parula hybrid recorded on 28 April 2019 along the Maury River south of Buena Vista, VA. Spectrogram created using Raven Pro 1.4 (Bioacoustics Research Program, Cornell University).

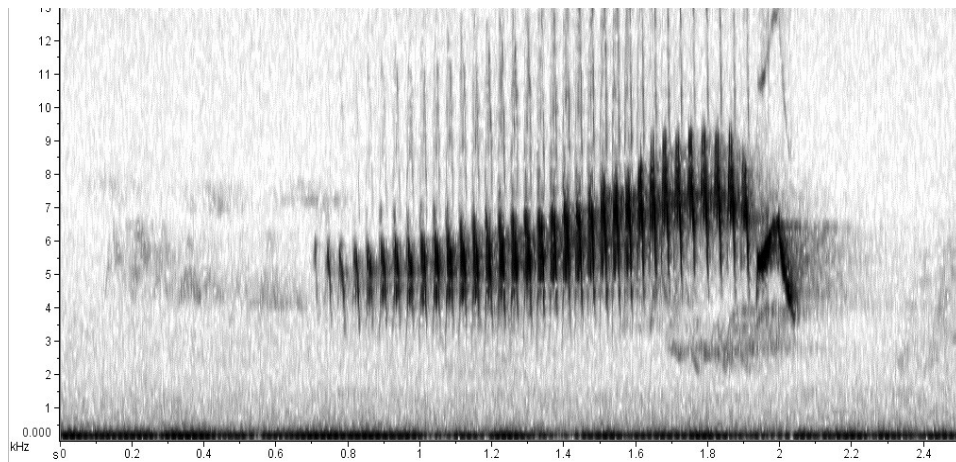


Fig. 3. Spectrogram from a Northern Parula (ML 53302, with permission Macaulay Library at Cornell Lab for Ornithology) created using Raven Pro 1.4 (Bioacoustics Research Program, Cornell University).

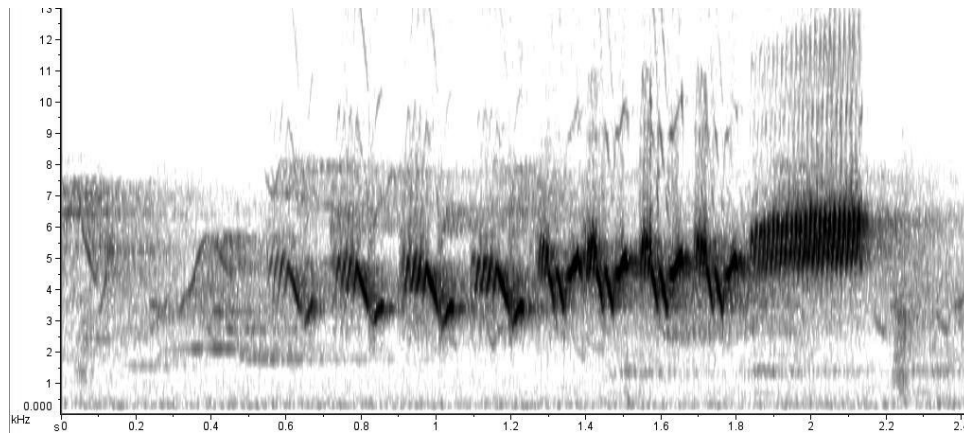


Fig. 4. Spectrogram from a Cerulean Warbler (ML 85132, with permission Macaulay Library at Cornell Lab for Ornithology) created using Raven Pro 1.4 (Bioacoustics Research Program, Cornell University).

vocalizations of a Northern Parula (Fig. 3) and not a Cerulean Warbler (Fig. 4). In addition, we compared our recordings of the hybrid bird to those reported by Trimbath et al. (2019) and note that there is a striking similarity between the two hybrid's vocalizations. If we apply the interpretations of the vocalizations reported by Trimbath et al. (2019) to our recordings, we suspect that our hybrid had a Cerulean Warbler dam and a Northern Parula sire.

There are only a few reports of Cerulean Warbler x Northern Parula hybrids. Pooth & Johnson (2004) reported a suspected hybrid in Dutchess Co., New York, and Nirschl (2004) reported a hybrid in Toledo, Ohio. Lindsey & Vezo (1995) described a suspected interbreeding between a female Cerulean Warbler and a male Northern Parula on Long Island, New York. Trimbath et al. (2019) documented genetic hybridization in two individuals captured in northeastern Ohio. Reports of suspected hybrids have been submitted as photographs and/or sound recordings via eBird to the Macaulay Library at the Cornell Lab of Ornithology. These reports are from various locations with multiple reports from some locations submitted via eBird. In total, there appear to be five individuals being described (Kane, Illinois with photographs or recordings from April and May 2019 at the same location and most likely the same bird: see for example - ML 156727611, 6 May 2019; ML 155845381, 4 May 2019; ML 155532821, 1 May 2019; ML 63231511, 14 May 2017; Cape May, New Jersey ML 139279761, 4 May 2009; ML 63156701, 13 May 2009; Muscatine Iowa ML 59905421, 13 May 2017, Marion Co (Indianapolis), Indiana ML 27567461, 21 April 2016). It is interesting to note that photographs of proposed Cerulean Warbler x Northern Parula hybrids available at the Macaulay Lab show plumage characteristics that are remarkably similar to the bird that we located.

In addition to the Cerulean Warbler x Northern Parula hybrids, other hybrids involving Cerulean Warblers have been reported: Cerulean Warbler x Black-and-white Warbler (Parkes, 1978) and Cerulean Warbler x Black-throated Blue Warbler (Delancey et al., 2019). Hybrids involving Northern Parulas include: Northern Parula x Yellow-throated Warbler, known as Sutton's Warbler (Anich et al., 2012) and Northern Parula x Yellow Warbler (Graves, 1993).

Hybridization in the family Parulidae is not uncommon as shown by the many reports of hybrids in this group. The bird we located exhibited plumage characteristics that are consistent with both Cerulean Warblers and Northern Parulas. Additionally, while the bird superficially resembled a Cerulean Warbler, it sang a Northern Parula song. A few reports of a Cerulean Warbler x Northern Parula hybrid can be found in the

literature or at the Macaulay Library. In these cases, the birds show a mix of plumage characteristics and primarily resemble a Cerulean Warbler. When the song was described or recorded, the hybrids tended to sing a Northern Parula song. Without genetic analysis, we cannot confirm that the bird we discovered was truly a hybrid, but we believe the evidence is compelling that this bird is a Cerulean Warbler x Northern Parula hybrid.

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