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K. G. Smith

University of Arkansas, Fayetteville, kgsmith@uark.edu

J. C. Neal

University of Arkansas, Fayetteville

M. A. Young

Cornell Laboratory of Ornithology

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Red Crossbill Invasion of Northwestern Arkansas During 2012-2013

K.G. Smith^{1*}, J.C. Neal¹, and M.A. Young²

¹Department of Biological Sciences, University of Arkansas, Fayetteville, AR 72701

²Cornell Laboratory of Ornithology, 159 Sapsucker Woods, Ithaca, N.Y. 14850

*Correspondence: kgsmith@uark.edu

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Abstract

An irruption of Red Crossbills (*Loxia curvirostra*) occurred in primarily northwestern Arkansas starting in November of 2012 and lasting to the end of May of 2013. Based on recordings of call notes, most birds around Fayetteville were Type 2, the large-billed ponderosa pine crossbill, associated with a variety of conifer species. Birds recorded in Carroll County were Type 3, the small-billed western hemlock crossbill, and they were associated with small cones on shortleaf pine (*Pinus echinata*). One recording was obtained in Fayetteville of Type 5, the lodgepole pine crossbill, only the third recording east of the Great Plains. Crossbills at the Fayetteville Country Club were observed eating algae (*Cladophora* sp.) during the months of December and January, a behavior rarely reported for passerines. During March, crossbills appeared at sunflower bird feeders, which is a relatively recent phenomenon associated with low conifer seed abundance. The first two Arkansas specimens of crossbills (probably Type 3) were obtained from birds that struck windows near feeders. This is only the third recorded irruption of crossbills in Arkansas in the last 43 years, suggesting that crossbills rarely travel this far south in search of cone crops.

Introduction

Red crossbills (*Loxia curvirostra*) have been reported in every month of the year and have possibly bred in Arkansas, but are an irregular visitor to state (Arkansas Audubon Society 2014). The first mention is of numerous birds near Clinton (Van Buren County) in spring of 1889 and one bird in spring of 1890 (Howell 1911). Over the next 60 years, only 2 more sightings were reported: Monte Ne (Benton County) in February and March of 1932 and Monticello (Drew County) in spring of 1934 (Baerg 1951). Starting in 1969, birds have been seen sporadically near Lake Georgia Pacific

(Ashley County), primarily on Christmas Bird Counts (James and Neal 1986, Fig. 1).

Crossbills are considered to be an irruptive species, wandering great distances in search of cone crops when cone crop failures occur within their normal range (Adkisson 1996). Currently 10 call types are recognized which may relate to geographical and reproductive isolation and specialization on one or a suite of conifer species (e.g., Benkman 2007, Young 2011). Although specialized on one species, crossbill types can feed on other conifers opportunistically.

The first documented irruption in Arkansas was from September 1972 to April 1973 (James and Neal 1986). Another irruption occurred from January 1997 to June 1997 (Arkansas Audubon Society 2014). We document a third irruption that began in November 2012 and lasted to the end of May 2013 primarily in northwestern Arkansas. We recorded birds to identify call types, made observations on behaviors of the crossbills, and obtained the first specimens for the state.

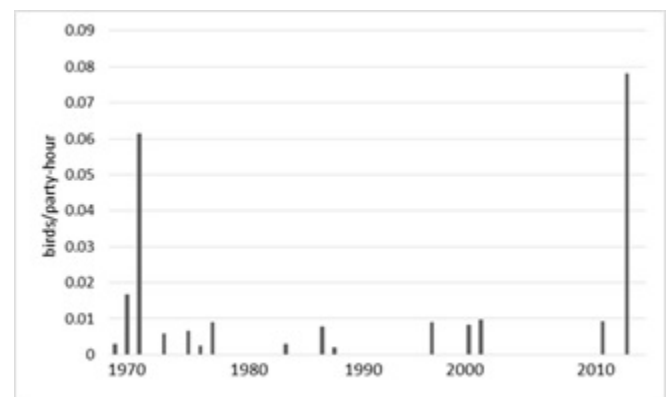


Figure 1. Number of Red Crossbills seen on Christmas Bird Counts in Arkansas from 1969, the first year they were recorded, through 2013, standardized by birds/party-hour. The greatest irruption was in 2012-2013, followed by the one in 1972-1973. The irruption of 1997 started in January after the bird counts had been completed. (data: <http://netapp.audubon.org/cbcobservation/>)

Methods

The chronology of the irruption was monitored primarily through ARBIRD-L, a list server about Arkansas birds maintained by Smith. This included both information on movement of birds and their behavior.

Birds were recorded by Neal using a Sony linear PCM recorder PCM-M10. He recorded birds at the Fayetteville Country Club (FCC) (Washington County) on 7 and 10 December 2012 and 20 January 2013, at the Ninestone Land Trust (Carroll County) on 26 and 27 January and 9 February, at the University Farm in Fayetteville (Washington County) on 5 February, and at the Ozark Natural Science Center and adjacent McIlroy Madison County Wildlife Management Area (Madison County) on 19 February. Don Matt and Judith Griffith, owners of Ninestone Land Trust, also made some recordings. All recordings were analyzed and call types identified by Young. Birds were confirmed to call types via audiospectro-graphic analysis using Raven Pro 1.5 (Cornell Laboratory of Ornithology, Ithaca, NY).

Two specimens were obtained when birds were killed hitting windows near feeders. They were frozen and donated to the collection at the Louisiana Museum of Natural History at Louisiana State University. Donna Dittmann prepared the specimens and Steven Cardiff measured bill depth.

Results

Chronology of the Irruption

On 12 November 2012, a flock of 30 Red Crossbills was observed by Neal at Brentwood (Washington County). The following day, he observed a flock of 10 birds at the FCC. On 30 November, Neal found a flock of 6 birds at Shores Lake (Franklin County) in the Ozark National Forest. Scattered reports were made in other parts of the state, e.g. 4 birds at Toad Suck Ferry (Faulkner County) by Michael Linz and 6 by Leif Anderson at Felsenthal National Wildlife Refuge in south central Arkansas, both on 19 December. However, the vast majority of reports were confined to Benton, Washington, Madison, and Carroll counties in northwestern Arkansas.

High counts of crossbills were of over 50 birds at the FCC on 20 January and 10 March 2013. Flocks of 15-25 birds were seen at Ninestone Land Trust in January and February and a flock of 28 birds was seen on 17-18 February at the Ozark Natural Science

Center. The highest number of crossbills (74) ever recorded on Arkansas Christmas Bird Counts occurred during this irruption (Fig. 1). The last report was of a single female at a bird feeder at Hobbs State Park – Conservation Area (Benton County) on 27 May 2013.

Call Types

The vast majority of recordings were of Type 2 – the ponderosa pine crossbill. All calls recorded from a flock of 23 birds on 7 December at the FCC were Type 2, 17 of which were the kinked call associated with crossbills from western United States (Young 2012). Most calls recorded from a flock of 30 birds at the FCC on 10 December and all from a flock of 50 birds there on 20 January were also Type 2. All birds recorded from a flock of 14 at the University Farm in Fayetteville on 2 February were Type 2, as were those from a flock of 28 birds recorded at the Ozark Natural Science Center on 18 February.

On 10 December, a few Type 3 crossbills – the western hemlock crossbill – were recorded at the FCC in a flock with Type 2 calls (Fig. 2). Type 3 was the only crossbill recorded at Ninestone Land Trust on 26 and 27 January and on 9 February.

A third type crossbill was recorded at the FCC on 10 December (Fig. 3). Type 5 – the lodgepole pine crossbill – has rarely been reported east of the Great Plains.

Feeding on Algae

On the morning of 9 December, Smith observed small flocks of both male and female crossbills foraging on mats of algae on the banks of a pond at the FCC, apparently eating algae (Fig. 4). Due to a drought, the pond was lower than normal and had large areas of dried and drying green algae (*Cladophora* sp.). Birds were observed foraging on the mats and eating

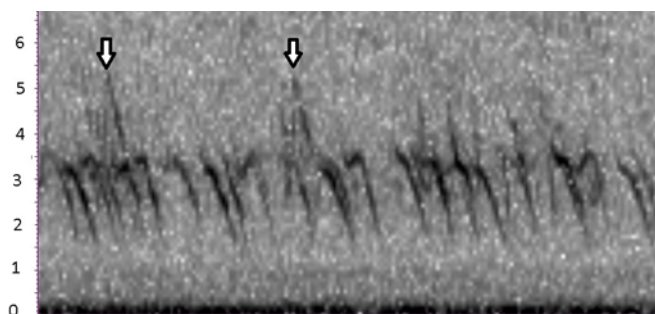


Figure 2. Spectrogram of Red Crossbill calls recorded at the Fayetteville Country Club on 10 December 2012. Most of the calls are of Type 2, but 2 of the higher frequency Type 3 calls can be seen (arrows). Y-axis is in kilohertz.

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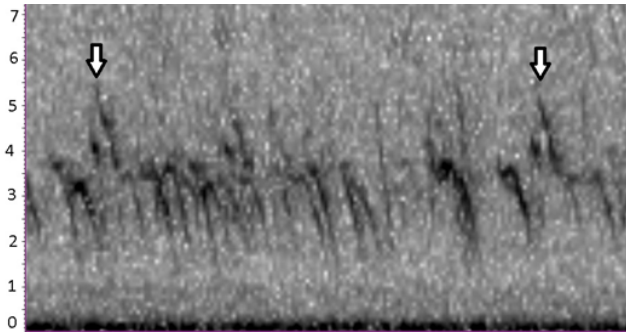


Figure 3. Spectrogram of Red Crossbill calls recorded at the Fayetteville Country Club on 10 December 2012. Most of the calls are of Type 2, but the higher pitched Type 5 call can be seen (arrows). Y-axis is in kilohertz.

algae through January 2013, usually in the mornings by numerous observers.

Moving to Sunflower Feeders

In mid-March, people started reporting Red Crossbills at bird feeders containing sunflower seeds throughout Benton and Washington counties. Birds were commonly seen at feeders during April and early May.

Specimens

The first two Arkansas specimens of Red Crossbill were obtained from birds that struck windows near feeders: a female was collected by Kathy Ross on Redbud Lane in Rogers (Benton County) on 9 April 2013 and a male was collected by Betty and Wes Whittington on Gary Turner Road in Siloam Springs (Benton County) on 15 April. At the time of preparation, the female (LSUMZ 184762) weighed 25.9 g and the male (LSUMZ 184763) weighed 29.9 g. The bill depth of both birds was 8.6 mm. Putatively, these 2 specimens are Type 3 as their bills are too small to be Type 2 (see Benkman et al. 2009), but are within the range of Type 3 bill sizes (e.g., Groth 1993).

Discussion

Our spectrographic analyses suggest the most common call type during the invasion was Type 2. The large-billed Type 2 form is generally widespread, e.g., it was found in several locations in both the Great Plains and the Northeast during fall of 2012 and spring of 2013 (M. A. Young, *unpubl. data*). The ubiquity of Type 2 may be due in part to their ability to utilize a variety of conifer species (Groth 1993) as they are capable of eating both soft and hard cones. Type 2 birds were found in a variety of conifer species at the

FCC; they used shortleaf pines (*Pinus echinata*) at the Ozark National Science Center.



Figure 4. Red Crossbills eating algae (*Cladophora* sp.) at the Fayetteville Country Club on 10 December 2012. This behavior continued for nearly 2 months.

Type 3 was also wide spread during the same time period (M. A. Young, *unpubl. data*), waging a massive large-scale irruption from coast to coast starting summer of 2012 and lasting through spring 2013 (e.g., Kolbe and Brinkley 2013). Although detected early in the irruption at the FCC, this type persisted at the Ninestone Land Trust in stands of shortleaf pine. Type 3 has the smallest bill of any North American crossbill type and shortleaf pine has the smallest cone of any typical conifer found in the southeastern United States.

The detection of call Type 5 is only the third record of this type east of the Great Plains. The first was in New York in 2006 (Young 2010). The second record occurred one week earlier than ours on 2 December 2012 at Rocky Fork Lakes Conservation Area (Boone County) in Missouri (<http://ebird.org/ebird/view/checklist?subID=S12204977>). Lodgepole pine (*Pinus contorta*) forests in western United States are being decimated by the mountain pine beetle (*Dendroctonus ponderosae*) (Man 2012), which may account for the eastern movement of this call type. The brief appearance of Types 3 and 5 at the FCC may be related to the difficulty these smaller crossbills would have finding suitable cones to forage on (C. Benkman, *pers. comm.*).

Passerines have rarely been reported to eat algae and this is the first report of crossbills eating algae. American Goldfinches (*Spinus tristis*) are the only other passerines reported to consume algae (*Spirogyra*

sp.) in North America (Digioia 1974, Kilham 1988:124-125). Why crossbills were eating algae remains unclear. *Cladophora* harbors a wide variety of insects (A. Alverson, *personal communication*), and crossbills do eat insects (Groth 1993:89), but usually in spring and summer (Adkisson 1996). We speculate that, due to a possible cone shortage, birds supplemented their diet with algae. Dried algae may provide crossbills with salt, a known attractant, and grit, a dietary requirement (Adkisson 1996). On 11 February 2013, 2 crossbills were observed on the ground eating red soil at the FCC by Neal.

The use of bird feeders by Red Crossbills is a relatively recent phenomenon (Benkman 2011). Periods of low seed availability (e.g., late spring and summer) could leave crossbills food stressed. Benkman (1988) demonstrated that crossbills can consume sunflower seeds, but their intake rate has to be quite high to substitute for conifer seeds. Benkman (2011) speculated that current increases in temperature may cause conifers to drop their seeds earlier, further stressing crossbills. Bird feeders with sunflower seeds may be one of the only food sources available to crossbills before insects become available. Crossbills will also eat tree buds and were observed doing that in mid-April at the FCC (M. Pruitt, *pers. observ.*).

The first documented irruption in Arkansas occurred in 1972-1973, starting in September and lasting to April (James and Neal 1986). This coincided with a larger-spread irruption of several species across the United States (Koenig and Knops 2001) and could have been associated with the massive eastern spruce budworm (*Choristoneura fumiferana*) outbreak in eastern Canada at that time (Bolgiano 2004). The second irruption in 1997 was unusual in that it did not start until January, but lasted until June (Arkansas Audubon Society 2014). This also was a geographically wide-spread irruption with many crossbills throughout the Northeast (Bolgiano 2004, Young 2011). This third irruption started in November of 2012 and lasted until May of 2013, and was wide-spread across the eastern United States. Irruptions of western crossbill call types into the eastern United States suggest cone crop failures in the West as the cause. Furthermore, the paucity of crossbill irruptions in Arkansas in the past 43 years suggest that crossbills usually find large cone crops to the north when they wander east, and rarely search as far south as Arkansas, at the southern edge of their range (see map in Adkisson 1996).

Acknowledgments

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Literature Cited

- Adkisson CS.** 1996. Red Crossbill (*Loxia curvirostra*), Birds of North America Online Cornell Lab of Ornithology, Ithaca (NY). <http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/256/>
- Arkansas Audubon Society.** 2014. Arkansas bird records database. Version 14.4 http://www.arbirds.org/aas_dbase.html.
- Baerg WJ.** 1951. Birds of Arkansas. University of Arkansas Agricultural Experiment Station Bulletin no. 258 (revised).
- Benkman CW.** 1988. Seed handling ability, bill structure, and the cost of specialization for crossbills. *Auk* 105:715-719.
- Benkman CW.** 2007. Red Crossbill types in Colorado: Their ecology, evolution, and distribution. *Colorado Birds* 41:153-163.
- Benkman CW.** 2011. Keep a look out for banded birds: Crossbill populations decline but are more common at feeders. *Focus on Citizen Science* 7:16.
- Benkman CW, JW Smith, PC Keenan, TL Parchman and L Santisteban.** 2009. A new species of the Red Crossbill (Fringillidae: *Loxia*) from Idaho. *Condor* 111:169-176.
- Bolgiano NC.** 2004. Changes in boreal bird irruptions in eastern North America relative to the 1970s spruce budworm infestation. *American Birds* 58:26-33
- Digioia HG.** 1974. American Goldfinches eating algae. *Oriole* 39: 47.
- Groth JG.** 1993. Evolutionary differentiation in morphology, vocalizations and allozymes among nomadic sibling species in the North American red crossbill (*Loxia curvirostra*) complex. *University of California Publications in Zoology* 127:1-143.
- Howell AH.** 1911. Birds of Arkansas. United States Department of Agriculture, Biological Survey, Bulletin no. 38.

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- James DA** and **JC Neal**. 1986. Arkansas birds. University of Arkansas Press, Fayetteville. 402 p.
- Kilham L**. 1988. On watching birds. Chelsea Green Publishing Company, Chelsea Vermont. 208 p.
- Koenig WD** and **JMH Knops**. 2001. Seed-crop size and eruptions of North American boreal seed-eating birds. *Journal of Animal Ecology* 70:609-620.
- Kolbe SR** and **ES Brinkley**. 2013. The 2012-2013 irruption of finches (Fringillidae) as monitored at Kiptopeke State Park, Northampton County, Virginia. *Raven* 84:32-46.
- Man G**. 2012. Major forest insect and disease conditions in the United States: 2011 update. FS-1000. United States Department of Agriculture Forest Service, Washington. D.C.
- Young M**. 2012. North American Red Crossbill types: Status and flight call identification. <http://ebird.org/content/ebird/news/recrtype/>
- Young MA**. 2010. Type 5 Red Crossbill (*Loxia curvirostra*) in New York: first confirmation east of the Rocky Mountains. *North American Birds* 64: 343-346.
- Young MA**. 2011. Red Crossbill (*Loxia curvisrotra*) call-types of New York: their taxonomy, flight call vocalizations and ecology. *Kingbird* 61:106-123.