BLUEBIRD

Journal of the North American Bluebird Society

Fall 2021
Vol. 43 No. 4

Fyn Kynd / flickr.com

Contents

Cover photo: A handsome male Mountain Bluebird hanging out by the Colorado River in western Colorado. Photo by Mudwalker via dreamstime.com.

Table of Contents photo: A photographer who goes by the name Fyn Kynd found these two Barrow's Goldeneyes in Orono, Maine. You can see more photos at https://www.flickr.com/photos/79452129@N02/.

BLUEBIRD

Bluebird/Sialia (ISSN 0890-7021) is published quarterly by North American Bluebird Society, Inc., P.O. Box 7844, Bloomington, IN 47407

Printed by Sutherland Companies
Montezuma, IA

Managing Editor: Scott W. Gillihan
nabseditor@gmail.com

Subscription is included with membership in NABS. Write for information about bulk quantities. Make checks and money orders payable to NABS in U.S. funds.

Issues are dated Winter, Spring, Summer, and Fall, and appear approximately on the 15th day of January, April, July, and October, respectively. Submissions are accepted continuously and published as space and editorial constraints allow.

General questions may be addressed to info@nabluebirdsociety.org or call **513-266-4381** between noon and 8 p.m. EST. Please leave a message if no answer, or send a text message any time. Visit us on Facebook at https://www.facebook.com/NorthAmericanBluebirdSociety/

The North American Bluebird Society, Inc. is a non-profit education, conservation and research organization that promotes the recovery of bluebirds and other native cavity-nesting bird species in North America.

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Fall Message to Our Affiliate Organizations

Mike DeBruhl

Where does the time go?? When you receive this, **our 2021 nesting season will essentially be OVER**. It seems like we were just getting started—but now it is time to wrap up the season and get our statistics consolidated, edited, and submitted. As you do, please remember to share with our affiliates and NABS.

Our communication with and between affiliates has increased nicely. Our thanks to all who have provided information, experiences, and data across NABS. If you have not yet done so, please begin doing so soon—it is worth the effort!

I learned that several affiliates are starting up educational presentations and training programs again. This is **GREAT NEWS** and I know we have missed providing these events. AND, just in time, I am pleased to announce that the NABS Education Committee and Board have been updating and reprinting several of our **NABS FACT SHEETS !** This includes "Getting Started with Bluebirds," "Monitoring Bluebird Nestboxes," and the "Welcome Back the Bluebirds" flyer. Fact Sheets found at **NABluebirdSociety.org** are available to each affiliate to use with your presentations. They are a valuable and factual source of information to assist in answering questions and educating current and prospective members. If you would like copies, please email me with subject line = **NABS Fact Sheet Request** with the desired Fact Sheet name and number requested.

Are you a NABS Sponsor yet ? Each edition of *Bluebird* contains the names, color logo, and support level of each sponsor. These sponsorships help defray cost of the magazine and other publications—with very reasonable sponsorship levels available **ONLY to NABS Affiliates**. Please bring this up to your members and consider being a sponsor in 2022. Great to show your support and affiliate publicity.

As we bring the 2021 season to a close, please continue to stress being safe, staying well, and keep engaged in looking out for our feathered friends. Good luck as you restart those education and training / information presentations ….. and, as always, keep up the good work.

See you on the trails …..

- Mike

Mike DeBruhl, 1st Vice President for Affiliate Relations

From the President
Bernie Daniel

Well, I am annoyed at myself. Recall that I made mention in the last message the meteorological predictions that the end of the La Niña cycle would probably spell a hot and dry summer in northwestern North America. Mostly I am annoyed because that is what happened and so perhaps, I am partly to blame? I will not mention that subject again!

The 2021 nesting season will be over by the time you read this. I hope most of you (well ALL of you) had a "good trail year"? Whatever kind of year you had please be sure to send your nestbox data to the Cornell University NestWatch program. Send your data other places as well if that is your habit or plan but please include NestWatch. I mention again it is important to look at bluebird production from a **continental** perspective. If we are interested in how the Mountain Bluebird did in 2021 then we need to know how the season went over the entire range of the MOBL. Local results are not useful for the population assessment. That is the value of NestWatch—it is vital. I believe that is especially true these days—so much going on now that we do not understand—changes in insect abundance, changes in weather patterns, or changes in the numbers of bluebirders? So again, please send your data to NestWatch AND write a letter to *Bluebird* telling us about your fledgling production and about any other things that happened on the trail this year.

In October of this year, I hope to present a talk entitled "The abundance and distribution of the Eastern Bluebird (*Sialia sialis*)" to the New York State Bluebird Society. First, I want to thank NYSBS for the honor of addressing their conference. And second, I want to mention that I will give the talk while sitting in the same chair I am typing from now. So NYSBS is trying a "virtual conference" this year. I am excited to see how it will turn out. If it works perhaps NABS will try something similar in 2022. We are look to the possibility of a "real" NABS conference the next year i.e., 2023.

NABS very much needs to find some individuals who are willing to assume leadership of the Society. Of course, you know that I have mentioned this topic before (more than once) and **really** I don't want to sound like I am "harping." But reality is real and facts are facts 🤔. With one exception all our officers have been in their current positions for at least 7 years. That is a long time. Our Treasurer announced—in this very journal—nearly six months ago that he would be leaving in December 2021. So, after that date NABS will not have a treasurer. As you can imagine that will not work for NABS. Further, we can be very certain that other officers will announce similar intentions to step down at some date in the **near** future. You, our membership, must help us decide the fate of NABS. Even if you are a member who feels that you do not want to step into a board or officer position perhaps you know someone who might be a candidate? Help with recruiting would certainly be very beneficial.

We have been in the process of revising/refreshing our NABS Fact Sheets over the last two years. We have several down and several to go (see pages 17–18 in this issue). We can always use help on these updates. If you have writing/clerical/editing skills and work with writing/word processing as part of your work-work, why not share some of that skill with NABS? Remember, any NABS member can join the various Society committees. Revising Fact Sheets falls to the Education Committee—we would welcome new members to our committee. Even if you do not wish to formally join a committee, you could still volunteer to help us review these new documents. There is nothing as valuable as a set of "fresh eyes" on a document being revised!!

On a lighter note, you will find in this issue a little essay that I wrote about what I call the "great nestbox hole-size debate" that happened decades ago in NABS. I hope you find it interesting and if you have thoughts on this article, please send those thoughts or comments to the editor of Bluebird!

– Bernie

From the Managing Editor

Scott W. Gillihan

Hard to believe, but it's fall already. Shorter days and cooler nights have triggered the movement of chlorophyll (which is green) out of tree leaves, leaving visible other pigments (which are yellow) and promoting the synthesis of still other pigments (which are red). In combination, these pigments provide the fall palette that is so beautiful.

"Autumn is a second spring when every leaf is a flower" – Albert Camus

For suggesting or helping me acquire materials for this issue, I thank Dick Blaine and Sylvia Wright (California Bluebird Recovery Program), Valerie Fellows (USFWS), and the NABS officers and board members. My thanks also to all of the writers and photographers who contributed material and letters to *Bluebird*. And thanks, too, to the sponsors, advertisers, and Affiliates, and the members of NABS, for supporting the conservation of bluebirds and other native cavity-nesting birds.

Please send any letters, photos, articles, or ideas to me at **NABSeditor@gmail.com** or 5405 Villa View Dr., Farmington, NM 87402.

Letters to *Bluebird*

Dear *Bluebird*:
Greetings—this is Kathy Klocke, president of the Kaw Valley Bluebird Society in Lawrence, Kansas. I have been monitoring bluebirds for 15 years and have been the president of the organization for 3 years. WOW! I recently located your website and have been so impressed with the NABS factsheets.

As a bluebird monitor I wanted to share some of the data that we have been experiencing this year (2021) in hopes that we could get a larger idea about what is happening in the bluebird population in North America. This year we have seen a large downturn in the numbers of bluebirds. I am part of a team of four who monitor about 74 boxes at our local state park. The bluebird trail was established in the mid-1970s and has had an average of 70 boxes for over 15 years. I would say that this area is home to many a happy bluebird; as a matter of fact by early to mid-June in a typical year 169 bluebird hatchlings have been observed. This year our number of hatchlings was only 30, which is about an 80% decline.

As monitoring began in early April we found so few eggs in the nesting boxes we began to put on hopes for change but that didn't happen. **What had happened to our bluebird population? What was going on? Was it widespread or just on this trail?**

In mid-June our organization gathered and shared monitoring results from area trails in Douglas County, Kansas.

Bloomington Park Trail located on the west side of Clinton Lake State Park, Kerrie Urbanek, reported a few comparisons from past years and this year.
2018: 89 potential
2019: 115 potential
2020: 116 potential
2021: 41 potential (this is about a 60% decrease.)

Mary Schnebly reported lots of sparrows. "Here we saw bluebirds in the early spring but we don't see any now."

Caryn and Nick Kramer monitor the trail at Perry Lake and shared some history of their trail.
2018: 53 potential in 63 boxes
2019: 43 potential in 40 boxes
2020: 95 potential in 34 boxes
2021: 29 potential in 50 boxes (these numbers also show decline).

Rim Rock Trail in 2021 had 2 successful nests; in a typical year there would be 19 nests by this time.

Eagle Bend, Louisiana Street, The Arboretum, and Hidden Valley trails all reported largely fewer bluebird nests in comparison to former years.

23 Terrace Trail is an urban trail with 3 pairs of bluebirds that overwintered in the area. This trail had nests in a third of the boxes.

Another urban trail (Raintree School) with 9 boxes had similar numbers as past years (no change.)

After hearing the results from other trails in Douglas County, it seemed that there is definitely a decline in the bluebird population. We did notice that there may have been a small bluebird population that overwinters in the urban areas here and a few trails reflect a lesser decline than the more open park-like areas. So what happened to a large number of bluebirds resulting in this decline? Could it be the weather, or some other factor—lack of food, pesticides? A news article from Austin, Texas, suggested that an early spring storm in Texas may have reduced the population of bluebirds that migrates to Kansas thus we are seeing fewer bluebirds here.

If anyone has further information that would lend insight into the population decline here in Douglas County, Kansas, I would be most interested in learning about it.

Sincere thanks,
Kathy Klocke
Kaw Valley Bluebird Society
Lawrence, KS

To *Bluebird*:
We have seen a significant drop in the number of Mountain Bluebirds in Canada this spring. Observations of these harbingers of spring were sparse in March and April, even though we had a mild and dry spring. Sightings and nest numbers are down in Manitoba. Alberta also reports fewer bluebirds. I am checking boxes for banding. Last year in 20 nestboxes, 10 were used by bluebirds. The same boxes only contained three nests this year. Other trails also show a 60% to 70% decline in occupied boxes. These observations are at Indian Head, Saskatchewan, in the southeast area of the province.

My daughter and I operate another trail 300 miles away in the southwest corner of the province. A snow storm dumping about a foot of snow on May 20 caused many bluebirds to abandon their nests with eggs. Some have since rebuilt new nests on top of the vacated nests and laid eggs. Normally young would be old enough to band around June 7.

It appears that young will not be old enough to band until at least June 17. Hopefully in spite of the snow, the numbers of bluebirds nesting will be better than at Indian Head. It appears that the usual number of bluebirds did not return to Canada this spring. We did see on Canadian news that there were some severe winter ice storms in Texas with power outages. Has there been any indication whether there was a die-off of Mountain Bluebirds in the southern United States this past winter?

Lorne Scott
Indian Head, Saskatchewan, Canada

To *Bluebird*:
Here are some general comments on bluebird nestboxes. Any style is better than none. I have used about all styles during my 50 years or so of bluebird nestbox monitoring. Yes, I like some better than others, but if someone gives me some new or used boxes, I take them, even if they need modification and/or repair. Here follows some suggestions that are not usually mentioned. Assemble using screws. Here is why. Sooner or later, a box will need repair. Screws are easy to remove with a portable drill. Nails are difficult to remove. Staples are almost impossible to remove, and staples will rust and break after a few years' use.

Tree Swallows cannot jump up to the nest opening as high as bluebirds. I have found as many as seven dead Tree Swallows one box early in the season. One choice is to rebuild the box or as I have usually done is to stuff some dry grass or leaves on the floor very early in the season.

All of my trails are placed where deer are common. During rut season, bucks often use a mounted birdhouse as a practice opponent. Nestbox and mounting pole of steel or broken wood may be bent over or even some distance from where it was originally. Predator guard may be damaged or need replacing. Sometime during the following February or March, all this needs to be remounted or replaced or maybe relocated.

During wet weather like we are having now, ants seek to move their home up, and into nestboxes. Young birds or any bird and ants do not mix. During wet weather, I can easily lose over one half of my nests to ants. I have used a bit of gasoline in a syringe to eliminate ants, also wasps. These insects are easily discouraged by gasoline or diesel fuel. I have found that an insecticide around the base of the mounting pole works to discourage ants until the next big rain.

I am having the poorest Eastern Bluebird nestbox success ever this season, 2021. Is this everywhere or just me?

James Smith
Homer, Illinois

Lots to Like on Facebook!

Great friends, great photos, great videos, and great information are all waiting for you on the NABS Facebook page. Stay connected with NABS members and other bluebird enthusiasts at **www.facebook.com/NorthAmericanBluebirdSociety**

A Brief History of the NABS Logo and How it is Being Used (and Perhaps Misused?)

Bernie Daniel

I am quite sure most of our members are familiar with the NABS logo. For starters It is the graphic with the nestbox and bluebird that graces the upper left-hand corner of every *Bluebird* journal that you receive (Figure 1).

Figure 1. The present-day NABS logo that has been used since 2002.

Our logo, in this form, first appeared on the Spring 2002 issue of *Bluebird* (Volume 24 Number 2). In those days Doug LeVasseur of Ohio was the NABS president and NABS had just moved its headquarters from Janesville, Wisconsin, to the Wilderness Center in Wilmot, Ohio. In those days, NABS actually had a physical headquarters and office!

You will notice on the logo a small "TM" indicating that our logo is trademarked with the US Patents and Trademark Office (USPTO). NABS is currently in the process of renewing our logo with USPTO. Trademark protection is not free. NABS maintains copyright for our logo in two areas: for printed matters (e.g., our fact sheets) and for educational projects and services (e.g., NABS presentations and video products). To maintain this protection, we pay USPTO a fee of approximately $100 per year.

However, the present-day logo (Figure 1) is not the original one. The first NABS logo is shown in Figure 2. This version dates to the days when NABS was first organized and incorporated (March 20, 1978).

Figure 2. Original NABS logo first used for *Sialia* in 1979.

The original logo appeared in the first issue of *Sialia* (the predecessor of *Bluebird*), which was published in the winter of 1979 (Volume 1 Number 1). This first logo depicts a juvenile bluebird fledgling, in order to best represent all three bluebird species, and it is perched on a twig near a nestbox. I believe that this logo cleverly captures the essence of what the NABS mission is all about. On the original logo the words "Effective Conservation" were displayed below the bird. That phrase was often referred to as the "NABS slogan."

In her essay on the history of NABS, the first Executive Director, Mary Janetatos, related that the original logo was devised jointly by the first officers of NABS and that it received the endorsement of founder Larry Zeleny. It is obvious that our current logo is just a simplified version of that original.

Why the logo was changed does not seem to have been recorded. My best guess is the logo was refreshed and simplified in order to make the lettering a larger font and more easily read. It seems likely that the redesign was carried out by the Executive Director in 2001. The first time the new, revised logo would have been seen by the membership would have been in the Spring 2002 issue of *Bluebird*. That journal would have reached the membership around April 15, 2002, so that is the date NABS claims as the first official use of the revised logo.

The NABS logo appears on nearly every "official" document or item that NABS puts out for the public. This includes educational materials like the Fact Sheets, our video presentations, our web site and Factbook pages, our Journal, and all our official correspondence. The logo is NABS's brand of ownership and approval.

But, sometimes the NABS logo appears in places that we most likely neither planned nor authorized. To understand this a little background might help. Years ago (I am not sure the exact dates), NABS had a "Nestbox Approval Committee" (NAC) staffed by our members. Under this program a builder could send an example of their new ideas for a nestbox to NABS and it would be evaluated by the committee. Oft times the box itself would be sent to the committee. The NAC would examine these new nestboxes or

plans and compare them against a set of criteria considered necessary having a safe and effective nestbox. If the new box satisfied the criteria in the eyes of the committee it would be approved. In some cases, commercial builders sent their nestboxes in for evaluation. In all cases, if a box was approved by the NAC, the builder could purchase some small labels from NABS with the words "Approved by the North American Bluebird Society" and of course our logo. However, the nestbox evaluation process was time consuming and the logistics of receiving and dealing with nestboxes cumbersome. As more and more nestboxes came in the NAC became overwhelmed. In addition, there really was no place to store all the nestboxes! Therefore, around 2013 the NABS Board decided that the nestbox approval process was too time consuming and labor intensive and the program was discontinued.

Over the last several years the Board has occasionally received queries from individuals about nestboxes they purchased that carried the claim to have been "Approved by NABS" and which also carry our logo. In some cases, we are convinced that these nestboxes would not have gained approval from the NAC. In addition, some of the boxes were sold with plagiarized versions of the NABS fact sheets as well. If NABS did not approve these nestboxes then it seems quite likely that these builders are inappropriately trading on the good name and hard-earned reputation of our Society. Therefore, NABS has sought and received assistance from a law firm that handles patent and copyright matters. This firm has generously agreed to help NABS on a *pro bono* basis. Of course, we are incredibly grateful and delighted to accept this help. Sometime later when all the legal matters have been resolved we will give the members the name of the firm and provide the story of how our efforts to rein in the unauthorized use of our logo and name worked out.

You've Never Seen It All

Lee Pauser

My good friend Steve Simmons, who monitored nestboxes for 58 years, said, "You've never seen it all." If he were still with us, I'd delight in showing him this photo.

The photo is of a Violet-green Swallow in a nestbox with five Western Bluebird nestlings.

The Violet-green Swallows have returned after migrating and are looking for cavities to nest in. The swallows won't harm the nestlings, and there are reports of swallows actually assisting in feeding the nestlings.

Violet-green Swallows and Ash-throated Flycatchers are the late nesters and often have to use whatever cavities are available. I've been finding both Tree and Violet-green Swallow nest starts in boxes from which other species have fledged and before I had a chance to clean out the used nest. This is another example of the competition that occurs among birds for nest cavities. I added another nestbox nearby in hopes that the swallows will use it.

This article originally appeared in Bluebirds Fly!*, the newsletter of the California Bluebird Recovery Program. It is reprinted here with permission.*

Feathers for Tree Swallows

Margaret MacKenzie

One spring several years ago I noticed that the Tree Swallow hatchlings on my nestbox trail all survived a rainy cold spell and that their nests had a thick lining of grass and feathers. I had the darnedest time counting the young in those boxes! On other trails however, many young didn't survive that same period and many of those nests were poorly insulated with grass and a few feathers. Apparently Tree Swallows have to hunt for feathers to line their nests. I guessed that some trails had more feathers than others as the trail where the nests were amply feather-lined had a varied habitat of forest, grassland, and ponds, which would attract more birds.

Claire Christensen

The next year, armed with an old down and feather pillow from a thrift store we hiked up to our nestbox trail and let the breeze carry handfuls of feathers up in the air near the boxes. What a surprise when the swallows became excited and swooped in to grab them like they would catch flying insects. Then they flew to their boxes loudly chirping to each other and entered the nest holes carrying their feather booty. Their hatchlings did markedly better with these added feathers.

Margaret MacKenzie

Not all trails need them, but some trails benefit from tossing feathers to Tree Swallows and they love swooping in and gathering them up. If your swallow nests seem skimpy on feathers, wait until the swallows have formed their grass nest, then toss out the feathers in a breeze and watch them dive and catch them, and carry them to their boxes.

I now carry a bag of feathers with me on our weekly trail monitoring outings and when the swallows have completed their grass nest (they seem uninterested in the feathers until the grass nest is finished), I toss out the feathers. If they aren't present at the time I leave a handful close to the box, preferably off the ground on a shrub.

Claire Christensen

Margaret is the Bluebird Recovery Program coordinator for the North Okanagan Naturalists' Club in Vernon, BC. Club members and other volunteers maintain and monitor several hundred nestboxes.

Mountain Bluebird Migration Tracking

Myrna Pearman and Leo de Groot

Bird migration has long intrigued humankind. The disappearance of birds each fall—and their sudden reappearance the following spring—was especially mystifying to early observers of nature. In the 4th century BC, Aristotle theorized that some birds hibernated while others transformed into different species (e.g., redstarts morphed into robins). He considered migration as an explanation, but dismissed it as being too implausible. A few of the other many hypotheses put forward included Olaus Magnus's 16th century proposal that swallows bury themselves in the clay of rivers, and Charles Morton's 17th century claim that birds migrate to the moon and back.

These early theories were eventually disproved when ornithologists started using methods to identify individual birds. The eventual practice of affixing numbered leg bands was a simple yet innovative technique that revolutionized the understanding of bird migration. New technologies and modern computer apps—including those that can capture the input of amateur birders/citizen scientists—are now providing researchers with additional information about, and insights into, all aspects of animal migration behavior, routes, and timing.

One very popular citizen science app is eBird, sponsored by the Cornell Lab of Ornithology. The records uploaded via this app by thousands of observers have enabled researchers to continually update range, abundance, and migration details. Animation maps provide an excellent visual representation of bird abundance as well as spring and fall migration details. Mountain Bluebird information can be accessed at https://ebird.org/science/status-and-trends/moublu/abundance-map-weekly. (It is important to note that that the southern reaches of the Mountain Bluebird wintering range, in northern Mexico, are likely underrepresented due to fewer eBird participants.)

In order to better understand the migration patterns and timing of Mountain Bluebirds that nest in Central Alberta, Myrna Pearman and Alisha Ritchie of Ellis Bird Farm (EBF) teamed up with Dr. Kevin Fraser of the University of Manitoba between 2014 and 2017 to conduct a migration study using light-level geolocators.

Light-level geolocators are small devices that are mounted on the backs of birds using a thread harness. The units track data using a light sensor to record ambient light levels during the day. Longitude is derived by using the time of sunrise and the current date, while the time elapsed between sunrise and sunset (daylight length) is used to derive latitude. The devices can store enormous amounts of data (some take readings every two minutes for a full year or more), but the birds must be recaptured when they return the following spring so the units can be removed and data downloaded. Because of mortality and dispersal only a fraction of the units are recovered.

Image 1. Dr. Kevin Fraser holding the first-ever Mountain Bluebird to be affixed with a geolocator.

Image 2. A female Mountain Bluebird with a geolocator.

Image 3. The field team (from left: Brian Biggs, Alisha Ritchie, Cheyenne Knight, Shalynn Tenbrinke).

While light-level geolocators have been invaluable in providing a broad-scale map of bird migration routes and timing, they have limitations. The weather can complicate readings as a sunny sunrise will trigger the device earlier than will a heavily clouded one. As well, a bird may confound the data by staying within a forested area one day versus an open area on another day. Around the equinoxes, when day and night length are the same, it is basically impossible to determine a north/south location for a bird. As a result of these factors, the error in geolocator data is generally considered to be up to 200 km (124 mi) from the true location.

The study area for this project was located near Lousana, Alberta (AB), on the extensive bluebird trail of former EBF board member Brian Biggs. Two individual bluebirds near EBF, located northeast of Red Deer, AB, also received geolocators.

Both deployment areas are located in the Aspen Parkland region of Alberta, Canada. The Aspen Parkland, a transitional biome between the prairie and the boreal forest, is dominated by grasslands intermixed with forested areas. The primary agricultural use in the Lousana area, which is characterized by undulating topography and wetlands, is cattle grazing—a landscape that provides ideal Mountain Bluebird habitat. Thanks to the efforts of Mr. Biggs, who maintains approximately 600 boxes, the area supports a high breeding density of Mountain Bluebirds.

Deployments were conducted in 2014 and 2015. Searches for returned birds were conducted in 2015, 2016, and 2017. The field teams are shown in Images 1–7.

The breeding status of each Mountain Bluebird targeted for the study was established before field work commenced. To avoid possible nest abandonment of incubating females or premature fledging of older nestlings, adult birds at boxes containing nestlings between hatching and 13 days of age were used. The adults were trapped using in-box traps and transported to the deployment sites in banding bags where they were aged, weighed, and measured, affixed with a geolocator, and banded with both a numbered and a bright color band. Since bluebird feathers tended to hide the geolocator, color bands made field identification easier. A yellow band was used in 2014 and an orange band was used in

Image 4. "Birdie" the first-ever geolocator-bearing Central Alberta Mountain Bluebird to be retrapped.

Image 5. "Birdie" being caught by Brian Biggs and Alisha Ritchie.

Table 1. Light-level geolocator deployment summary.		
Year	**Deployed**	**Retrieved**
2014	31 Lousana 2 EBF	
2015	27 Lousana 0 EBF	8 Lousana (3 female, 5 male)
2016		7 Lousana (3 female, 4 male)
2017		0 Lousana 0 EBF

2015. The birds were then returned and released adjacent to their boxes. Sixty adults were deployed.

Geolocators are very light (about 7% of a bird's body weight) so they did not hinder normal movements or flight. However, the addition of a geolocator to a bluebird's body presented a logistical challenge because the light stalk on the unit prevented deployed birds from reentering the boxes, all of which had round 40 mm (1⁹⁄₁₆ in.) holes. In order to accommodate the deployed birds, and to ensure that returning deployed birds could access boxes the following spring (but to still exclude European Starlings), Mr. Biggs used a Dremel tool to etch a small triangle into the upper section of the entrance hole on all boxes that were currently occupied as well as in any other boxes that had been previously occupied by bluebirds. Observations of the deployed birds confirmed that access was not impeded by their backpacks.

A summary of the deployment and retrieval numbers is shown above in Table 1.

Fifteen units were recovered. Each unit was sent to the University of Manitoba, where it was determined that one unit had failed. Data from 14 units (6 female and 8 male) were downloaded and a preliminary analysis and basic maps were supplied to EBF in 2017 by Dr. Fraser's graduate students, Amélie Roberto-Charron and Laurence Lam. The maps were printed and used in interpretive displays in the EBF Visitor Centre and in public presentations.

In 2018, EBF was supplied with the raw geolocator data and Leo de Groot undertook the task of trying to create more detailed maps using Google Earth's GPSVisualizer program. In order to make the stories associated with this research more relevant and interesting to students and the public, each returned bird was given a name.

As was expected, errors were noted:

1. Overall inaccuracy, showing that the birds zig-zagged across unrealistically long distances on any given day as well as on their spring and fall migration routes.
2. An inexplicable shift of over 215 km (134 mi) to the northeast near the town of Myrnam during a two-day period following deployment.
3. A similar inexplicable shift on spring arrival to an area near Myrnam (slightly to the northeast of the post-deployment average location).

The errors described above are shown in Figures 1, 2, and 4.

The shift of the birds to Myrnam is an obvious error, because we knew that the birds were still on the

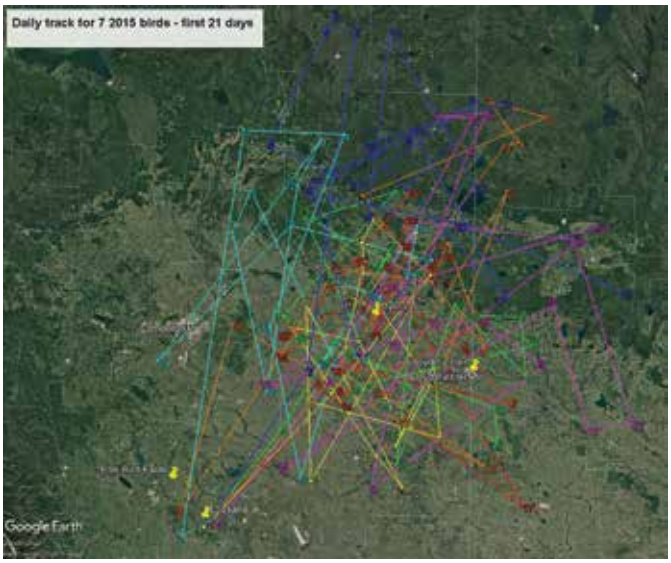


Figure 1. Raw data tracks showing daily zigzagging (2015 cohort) for 21 days after deployment.

Figure 2. Raw data tracks showing the northward shift to Myrnam during a two-day period following deployment.

Image 6. From left: Myrna Pearman, Alisha Ritchie, and Cari McGillivray with the 2016 retrieved geolocators.

breeding grounds. The raw data also showed that the birds remained around Myrnam as a midpoint until they departed on their southbound migration.

To more clearly illustrate the helter-skelter movements based on the raw data, we mapped the supposed movements of one bird ("Owen"; Band #2531.05075), shown in Figure 3.

As noted above (and shown in Figure 4), the subsequent return location for all 14 birds was also shown to be around Myrnam, at a location slightly to the northeast of the post-deployment area.

In order to obtain less scattered tracks, we smoothed the raw data to show the average location over each full week for each bird's travels, rather than a daily location. Furthermore, in order to deal with the obvious errors related to both release and recapture locations, we corrected the data by resetting the average deployment location of the birds back to Lousana/EBF. We also made a similar adjustment to the spring return locations. All the intermediate locations between release and recovery, representing spring and fall migration, were thereby automatically adjusted.

To illustrate the detailed differences between the weekly/smoothed uncorrected and corrected tracks, we have again highlighted Owen (Band #2531.05075) in Figure 5.

After applying the formulas to all 14 birds, we were able to produce two maps showing the smoothed migration tracks of the deployed Mountain Bluebirds. Figure 6 shows the corrected tracks for the 2014–2015 cohort while Figure 7 shows the corrected tracks for the 2015–2016 cohort.

Of the 14 birds tracked, the average overwintering locations were shown to be in Texas (2) and in the Mexican states of Sonora (1), Chihuahua (6), Coahuila

Figure 3. Raw data daily track for 2531.05075 (Owen).

Figure 4. Raw data average daily movement of Mountain Bluebirds after 2014 deployment (yellow) and 2015 return (red).

Figure 5. Corrected (green) vs uncorrected (red) smoothed tracks for 2531.05075 (Owen).

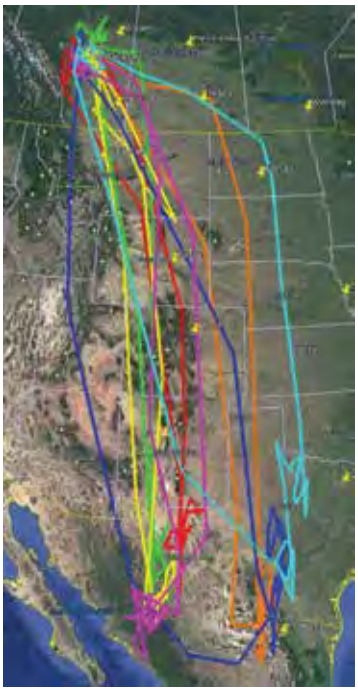


Figure 6. Smoothed and corrected Mountain Bluebird migration tracks for the 2014-2015 cohort.

Figure 7. Smoothed and corrected Mountain Bluebird migration tracks for the 2015-2016 cohort.

(2), and Durango (3). Although our sample size is small, it appears that the Mountain Bluebirds from Central Alberta prefer to overwinter in northern Mexico.

It is also interesting to note that the females in this study (denoted by green pins) wintered farther south than the males (denoted by yellow pins). The actual locations for males and females, as well as the average locations for each (denoted by orange pins) are shown in Figure 8.

Conclusion

Despite the shortcomings of the data provided by light-level geolocators, this technology has enabled a first-time picture of the migration of Central Alberta's Mountain Bluebirds. The use of geolocators has provided valuable data and the issues we outlined do not negate the significant value of these findings. It is anticipated that more detailed analyses of the data will be forthcoming.

Acknowledgments

We are grateful to NABS for providing a research grant to help fund this project. We are also grateful to the Red Deer and District Community Foundation, the New York State Bluebird Society, and to Sherry and Marion Linn for also supporting this research.

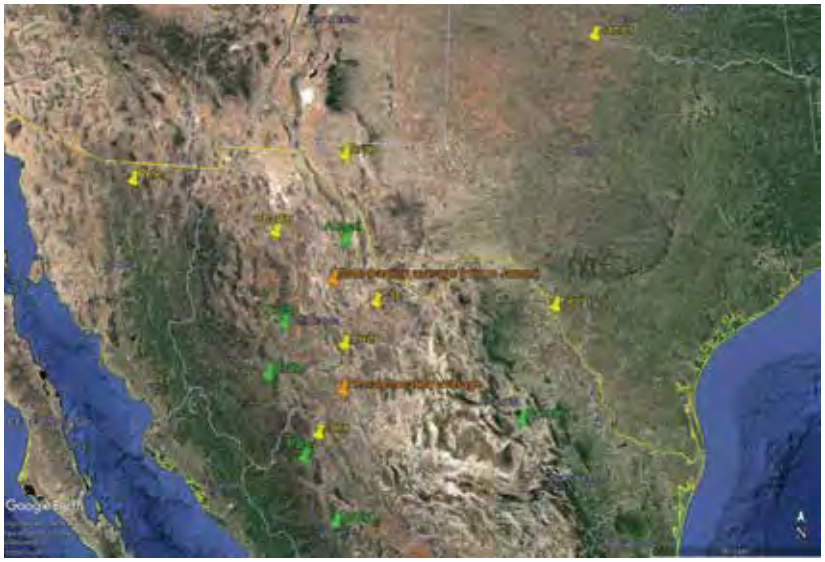


Figure 8. Male vs. female overwintering locations.

We would like to thank the following: Dr. Kevin Fraser, Amélie Roberto-Charron, and Lawrence Lam of the Avian Behaviour and Conservation Lab (abclab.ca), Department of Biological Sciences, University of Manitoba; Brian Biggs for allowing us access to his bluebird trail and for his able assistance in handling logistics; and the field team—Alisha Ritchie, Gordon Johnson, Scott H, Shalynn Tenbrinke, Cheyenne Knight, and Cari McGillivray.

Myrna Pearman recently retired as the Ellis Bird Farm Biologist and Site Services Manager. Leo de Groot is a former member of the EBF Research Committee.

Image 7. A male Mountain Bluebird bearing a geolocator.

The Great Nestbox Hole-size Debate – Revisited

Bernie Daniel, Ph.D.

We bluebirders believe that we know bluebirds. Collectively, over the decades we have acquired massive quantities of nestbox data and natural history information on bluebirds. We are especially knowledgeable about their behavior during the nesting season. We learn things about bluebirds by personal observation, by sharing information, and often by having discussions or friendly debates about aspects of biology and nesting behavior. We are also sometimes opinionated about these things. Thus, we occasionally have debates about bluebirds and bluebirding.

One of the greatest (or most famous at least) differences of opinion in bluebirding was the "great nestbox hole-size debate." This debate took the form of a long-running discussion about what is the best nestbox hole size for the western bluebird species. Specifically, Art Aylesworth of Montana insisted that Mountain Bluebirds (MOBL) did better with larger nestbox entrance holes. Aylesworth believed his field experience had shown him that MOBL prefer 1 9/16" holes over the smaller, 1½" holes traditionally used (and recommended!) by NABS and other individuals working with Eastern Bluebird (EABL) trails. Doctor Lawrence Zeleny, founder of NABS, took issue with Aylesworth's contention that the smaller holes lead to what Aylesworth called "feather wear." Zeleny thought the larger holes were unnecessary for any bluebirds and that the hole size only served to make the nestboxes more susceptible to commandeering by European Starlings. We will not get into all the arguments pro and con here save to say that, over time, Zeleny came to accept Aylesworth's position, and the larger hole size is now most often recommended for MOBL nestboxes. Because the range of the Western Bluebird (WEBL) often overlaps with MOBL range, the larger size nestbox hole is generally used by all bluebirders working with the two western species.

I have long speculated about the basis of the argument. By this I mean that I have wondered about the actual comparative size of the three bluebird species. Several times I set about to "look it up" and came away frustrated because of all the overlap in the reported mass and length (body length and wingspan) of the three species. But recently, I decided to make another attempt to address this question. I settled on a "light-scientific" approach because I determined that the data required to make a rigorous assessment is not readily available (albeit I think a more definitive data might exist in the files of bird banders across the continent?). So, I do not consider my comparative bluebird size investigation herein to be a "final statement" on this topic. I am sure conclusions could easily change as we gather more information. In fact, with that very thought in mind if you come across body mass, body length, or wingspan data on bluebirds please send it to me so I can add it to this database.

The approach I took was simply to collect all the bluebird body mass, body length, and wingspan data I could find. From the table below you can see I used nine, supposedly separate, sources of information for this effort. Some of the sources were online websites and some were books including field guides, etc.

I made the decision to treat all the data with equal respect. That is, body mass and length and wingspan data from the Cornell Laboratory of Ornithology was given no more weight than data found in a bird resource published nearly 120 years ago. I made the simple (and hopefully, correct?) decision that no one has published data on the size and mass of bluebirds without some reason or some supporting information. If a range of values was given, I recorded them as simply the minimum and maximum estimate for that parameter. If the source gave only one value, I used that same value as both the maximum and minimum estimate. The median value for each set (i.e., the maximum and minimum) for all three parameters was computed, and then presented in the table shown below:

Size Measures for the Three Bluebird Species

Species	Body Mass (grams)	Body Length (cm)	Wingspan (cm)
Eastern Bluebird	28–32	16.3–18.8	25–32
Mountain Bluebird	28.5–32.6	16.2–18	28–32
Western Bluebird	25.5–30.5	16–18	30–33

Results shown are the median values. Sources of data: "Birds of Ohio" Dawson; Bluebird Society of Pennsylvania; Cornell Lab of Ornithology website; the National Geographic, Golden, and Peterson Field Guides; "Bluebird Trails" D. Scriven; "Eastern Bluebird" Gowaty; Animalia website; Avian Report website. Median instead of mean values were computed as they are less sensitive to outliers especially in small data sets like this. The results are very similar using mean values instead of medians.

First, I thought the results were interesting but not "exciting." To my thinking the most reasonable take-home message of that table is that there are only small differences in body mass, body length, or wingspan between these three bluebird species? Also, note that the ranges for all three size measures overlap between the species.

Second, perhaps one conclusion we might draw from the table is that, in general, the WEBL is a smaller bird than the other two? The WEBL tends to have the least mass and the shortest body length—this would suggest that it is overall smaller. But less mass and shorter body notwithstanding, WEBL may have a slightly greater wingspan than the other two species? Going into this exercise I had thought that that MOBL would have the longer wings? The published data on the three birds tells a different story.

Third, it is very difficult to make a definitive statement about any differences when comparing the mass, body length, and wingspan of the EABL and the MOBL. The lowest and highest values for each of the measures and the range (difference in highest and lowest values) is very similar between the two species. So, I conclude that perhaps the best way to interpret this observation is to suggest that the EABL and MOBL are essentially the same size. But do MOBL have a slightly greater wingspan than EABL?

I think here would be a good point to factor into this discussion another interesting aspect to the relationship between the three bluebird species. In 2005, a molecular phylogenetic analysis (Fig. 1) was conducted on 54 species of the family Turdinae (i.e., true Thrushes). Luckily, this study included all three species of North American bluebirds (members of Turdinae). The scientists examined the numbers of base pair changes (mutations) at two well-studied loci in the mitochondrial DNA (cytochrome B and NADH-Ubiquinone Oxidoreductase) of these bird species.

For these evolutionary studies mitochondrial DNA is preferred because it is inherited directly from the mother (i.e., from the egg) and thus provides a more direct genetic linkage—i.e., there are no complications from recombination with the male DNA, which occurs at fertilization. Therefore, mitochondrial DNA yields a less ambiguous result. Using this approach, the scientists can estimate when new species have branched off the thrush genetic line (see explanation below Fig. 1). The results show that the prototype

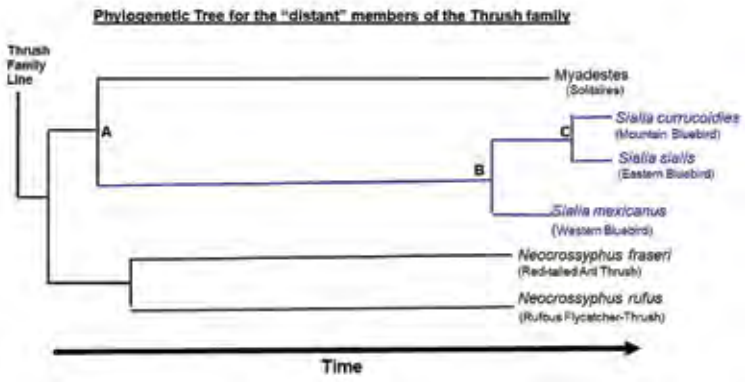


Figure 1. Part of the phylogenetic tree for the Turdinae Family derived from a figure by Klicka et al. (2005, Molecular Phylogenetics and Evolution 34:486–500). The "distance" along the timeline is computed by quantifying the number of DNA base pair changes (mutations) in the gene selected for the analysis. Mutations occur randomly over time, so the more mutations found the longer the time interval for them to occur. Thus, the scientists can determine that the prototype *Sialia* bird first appeared about 11 million years ago, our current birds, the EABL and WEBL, split off from that common ancestor about 2.5 million years ago. Later, about 1.5 million years ago, the MOBL split off from the EABL side of the line. For this reason, the EABL and MOBL are more closely related, genetically, to each other than they are to the WEBL. The letters indicate the approximate time each event occurred (i.e., A ~ 11 million years ago (MYA); B ~ 2.5 MYA; and C ~ 1.5 MYA).

(or ancestral) *Sialia* genus branched off (i.e., first appeared) about 11 million years ago in the period known as the Miocene Epoch.

Much later, around 2.5 million years ago in the Pliocene Epoch, this early *Sialia* ancestor itself diverged and gave rise to two species, the EABL (*Sialia sialis*) and the WEBL (*Sialia mexicanus*). So, these common two bluebird species (of genus *Sialia*) evolved into existence roughly around the same time as we humans (i.e., genus *Homo*)!

Then, approximately a million years later (e.g., about 1.5 million years ago), yet another species evolved, this time from the *Sialia sialis* (EABL) line splitting to give rise to a new species, *Sialia currucoides* (MOBL). Therefore, as recently as 1.5 million years the EABL and the MOBL were a single species. In contrast, both have been genetically separated from WEBL for about 2.5 million years. Thus, perhaps it is not surprising that EABL and MOBL might be very similar in size, perhaps because they are much more closely related to each other than either is to the WEBL.

This molecular analysis seems to explain some aspects of the bluebird interspecies variations but fails to explain other aspects. Perhaps it explains the similar feather coloration patterns of the EABL and WEBL—i.e., they both evolved from a common ancestor. Likewise, since the EABL and MOBL were the same species as "recently" as 1.5 million years ago, maybe it is not surprising to see the similar size estimates in the table above? One curious thing NOT explained by the evolutionary story is, given their relatively close genetic connection, why are the EABL and MOBL so different in their feather colorations?

It is well established that, where their ranges overlap, hybrid mating between EABL and MOBL occurs and has frequently been observed. Those interested in this can find a video on YouTube documenting the mating behavior of a male EABL and a female MOBL that happened a few years ago in Wisconsin (search YouTube for a video entitled: "Extremely special bluebird couple??").

So, to my thinking all this information begs the question—was there really any physical basis for the great nestbox hole size debate in the first place? It seems that the MOBL and the EABL are closely related genetically, and that they are nearly the same size. So, did (do) MOBL really "need" the larger 1⁹⁄₁₆" hole? That is, was Zeleny correct? Or is it that just that MOBL **prefer** the larger hole? But if MOBL really prefer the larger hole why not offer it to them? So maybe it was Aylesworth who really had the right idea? I'm not taking a stand on that!

We must consider these two great bluebirding pioneers did not have access to the information we have now in the 21st century. And it is not important which of them was "right." There probably is no right answer. Furthermore, it seems to me that we could look at this question from the opposite direction and suggest that really perhaps we should also offer the larger 1⁹⁄₁₆" nestbox holes to EABL as well? That is, since they are the same size as MOBL? Of course, many of us already do just that. I have used the 1⁹⁄₁₆" nestbox hole here in Ohio since the early 1990s with good results.

Well, I hope this little essay might inspire more opinions and thoughts—pro or con! If you have some thoughts about the size of bluebirds or the choice of hole size, please send your thoughts to ***Bluebird***. But remember this is not a "life-or-death" matter and bluebirds are mostly doing just fine with the nestboxes we supply—let's keep the debate fun and light! 😂

Cause for Concern

This summer the US Fish & Wildlife Service released its 2021 Birds of Conservation Concern List and an accompanying report. The list identifies the bird species (beyond those already designated as federally threatened or endangered) that represent the Service's highest conservation priorities based on an assessment of several factors, including population abundance and trends, threats on breeding and nonbreeding grounds, and size of breeding and nonbreeding ranges. This year's list includes a number of cavity-nesting species that are conservation concerns at the continental scale:

- Flammulated Owl
- Whiskered Screech-Owl
- Lewis's Woodpecker
- Red-headed Woodpecker
- Arizona Woodpecker
- Gilded Flicker
- Mexican Chickadee
- Gray-headed Chickadee
- Oak Titmouse
- Prothonotary Warbler

According to Bob Ford, Coordinator of the Partners in Flight network of governmental, nongovernmental, and industry partners working on bird conservation issues, "This report will be used for cooperative research, monitoring and management actions that can directly or indirectly affect migratory birds with the help of international, federal, state, Tribal and private partners."

The report with a complete bird list is available online at https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

Prothonotary Warbler by Miki Jourdan / www.flickr.com

NABS Factsheet

Mealworms

Mealworms are actually not worms at all. They are the larval form of the darkling beetle (Tenebrio molitor). They are a nutritious food supplement relished by bluebirds. They are clean and easy to keep. They do not carry human diseases. Mealworms can be offered to bluebirds to:

- Entice them to use a nestbox.
- Help the incubating female find food quickly so she does not have to leave the eggs unattended for long periods of time.
- They can serve as supplementary nutrition for nestlings if food becomes scarce, e.g., when weather conditions prevent the parents from finding insects.
- Help birds survive during spells of severe weather.
- To serve as a supplemental food when one of the parents is missing.

Carolyn Lind Hockman

SOURCES FOR MEALWORMS

Mealworms can be supplied as living organisms or in a freeze-dried condition. When they are to be used as a food source for bluebird nestlings however, **only live mealworms** should be used. **Never supply freeze-dried mealworms as a food source for nestlings!** Food items are the only source of water for nestlings and freeze-dried mealworms contain little moisture – a diet of mostly freeze-dried mealworms could be harmful to nestlings.

Live mealworms can be relatively easily raised and maintained at home using grain (e.g., wheat bran, corn meal, chicken mash or oatmeal) or a piece of bread. It is easy to find guidance on the internet (e.g., YouTube videos) on how to start and maintain a colony of mealworms.

Alternatively, both live and freeze-dried mealworms can be purchased from commercial suppliers. We recommend using a North American supplier where you can better ascertain the quality of the product and communicate directly with the laboratory supplying the worms if necessary. We recommend against purchasing mealworms sourced from other countries (e.g., China) because it is much harder to assure the quality of the worms supplied.

FEEDING MEALWORMS TO BLUEBIRDS

Perhaps the biggest challenge is to attract bluebirds with mealworms. Just plain luck might be the biggest factor here. However, if you already have bluebirds and just want to ensure they stay, mealworms can be an effective enticement. If you have never or rarely seen a bluebird in your yard, chances are they will not show up just because you put out mealworms. What will probably happen is that other birds in your yard will find them and quickly consume the mealworms. In summary, unless you already have bluebirds around, it could be a costly and unrewarding venture to offer mealworms in the hopes of attracting them. However, in cold climates, small overwintering songbirds like bluebirds, chickadees, nuthatches, etc. do appreciate a small hanging tin cup of mealworms as much as you enjoy watching them come to get them!

For bluebirds it is advisable to use a mealworm feeder and there are several types of feeders that can be used. If you put mealworms on the ground, they may burrow into the dirt, or other birds like robins will probably eat them all. The best type of feeder is a hopper style where the mealworms can be placed inside the feeder, with the bluebirds entering from a hole at either end. Naturally curious, bluebirds will readily explore this type of feeder and quickly recognize it as a food source. A 1 1/2 inch or 1 9/16 inch hole at each end will effectively exclude larger birds. A cage-style feeder (see picture) can also be used to exclude larger birds. Other small birds will soon catch on too, but an aggressive male bluebird will usually defend "his" feeder, especially if he and his mate are nesting nearby.

Fatbird.com

To prevent the mealworms escaping from the feeder, put them in a tuna or cat food can or in a dish (glass or ceramic) with smooth sides. Some find that putting a flat saucer with a few worms on top of the feeder will help draw the bluebird's attention to the location. Once they become familiar with the routine, the mealworms should be placed inside the feeder. The location of the feeder can also be varied. Initially one can place the feeder close (~25 feet) to the nestbox. Then incrementally move it farther away (to ~100 feet) as the bluebirds become familiar with it. Ideally it can be moved to a spot where it is easy for you to watch them feed. One of the highlights of feeding mealworms to bluebirds is watching the fledged young start coming down to the feeder, first begging to be fed and eventually figuring out for themselves how to get the tasty treats on their own.

Mealworms are an excellent food -- rich in fat and protein – but it is important to realize that mealworms do not provide a complete diet. They are low in calcium and therefore should be used as a **supplemental** food source only. A diet of only mealworms could leave nestlings calcium deficient leading perhaps to weak bones or causing egg binding in laying birds. To counter this, put your mealworms in a plastic bag with calcium carbonate or calcium citrate powder, and shake it gently to coat them. Both of those calcium salts are available from health food stores or on-line. Other individuals sterilize eggshells, then dry and grind them to a powder to use as a calcium supplement with mealworms.

It is best to offer mealworms in limited quantities, just once or twice a day, unless poor weather conditions dictate more frequent feeding. A hundred or so worms offered per day (half in the morning, half in the afternoon) should be adequate for a pair of bluebirds with a box of nestlings.

Alternatively, **except for the nesting** season one could offer commercially available freeze-dried mealworms. They are mostly maintenance-free and may last longer so they are considered by some to be a more cost effective approach. However, bluebirds may ignore the lifeless freeze-dried mealworms unless other options for food are limited (e.g., during poor weather). Rehydrating the worms with a little water or vegetable oil may make them more attractive to birds. As noted earlier never offer freeze-dried mealworms to nestlings.

This document is about feeding mealworms, but we mention that the larvae of the **Black Soldier Fly** (Hermetia illucens), are another good food supplement and, unlike mealworms, these larvae are naturally high in calcium and protein making them a great supplemental food for nesting birds. There is a lot of information online about Black Soldier Fly larvae as a supplemental food for birds and pets. *(NOTE: these are not the same as Black Flies, i.e., family **Simuliidae**, aka "Buffalo Gnats" the biting flies from streams).*

The North American Bluebird Society, Inc. is a non-profit education, conservation, and research organization that promotes the recovery of bluebirds and other native cavity-nesting bird species in North America.

www.nabluebirdsociety.org **https://www.facebook.com/NorthAmericanBluebirdSociety**

Perseverance

Have you ever seen a dog pick up an overly long stick, then try his hardest to get it (sideways) through a narrow doorway or gate? In spite of his enthusiasm and his best efforts, he just keeps hitting the sides of the opening with the stick and bouncing back. This female Eastern Bluebird is facing a similar battle with these loblolly pine needles. Fortunately, her determination wins the day, and she finally gets them into the nestbox to form the basis of her nest.

These photos come to us courtesy of Tom Crockett of Gloucester, Virginia.






Reducing the Internal Temperature of Exposed Nestboxes

Lee Pauser

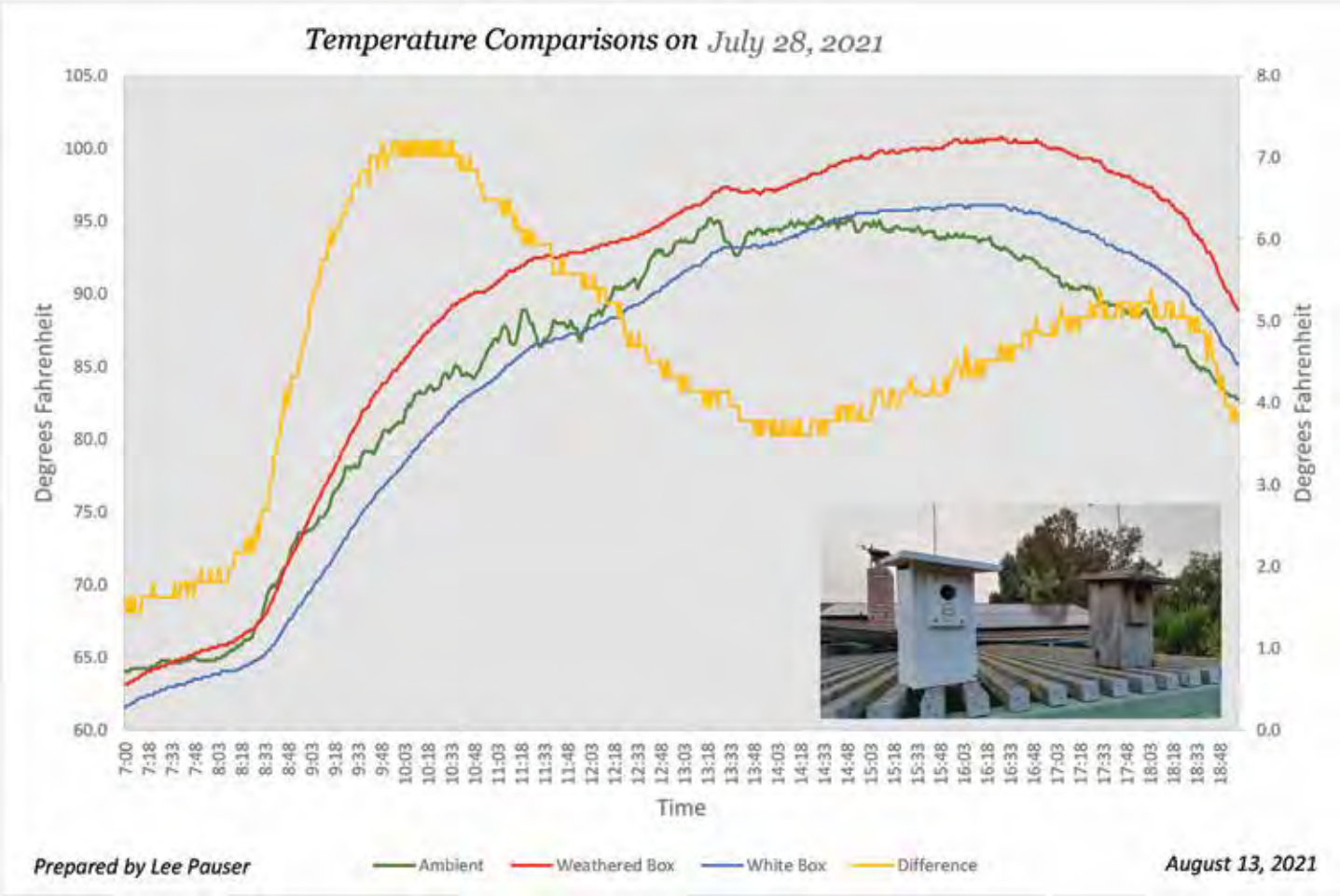
The following two charts document the results of placing temperature probes inside two exposed bluebird nestboxes and a third probe capturing the ambient temperature. Exposed in this case means the nestbox is exposed to direct sunlight the entire day. Exposure during part of the day will produce different results.

The charts display results from 7 AM until 7 PM. The two nestboxes are of the same design and provide flow-through ventilation. One box is painted white and the other is an unpainted weathered box.

The first chart compares temperatures using the boxes as described above while the second chart compares temperatures with the weathered box having the addition of a sun shield. The sun shield is larger than the box's roof and is attached to the box using screws that pass through the shield and 5/8″ spacers into the roof. The shield provides shade for the box's roof and the spacers permit airflow between the shield and roof. Flow-through ventilation is most effective if there is a breeze.

Photos in each chart show the two nestboxes positioned to be isolated from nearby objects. As positioned the sun rose from the right side of the boxes, arced over the top, and set on the left side of the boxes.

In both charts note that the inside temperature difference rose rapidly as the sun hit the side of the weathered box. The temperature inside the painted box was always lower than in the weathered box.



Comparing temperatures inside a painted white nestbox and a weathered nestbox.

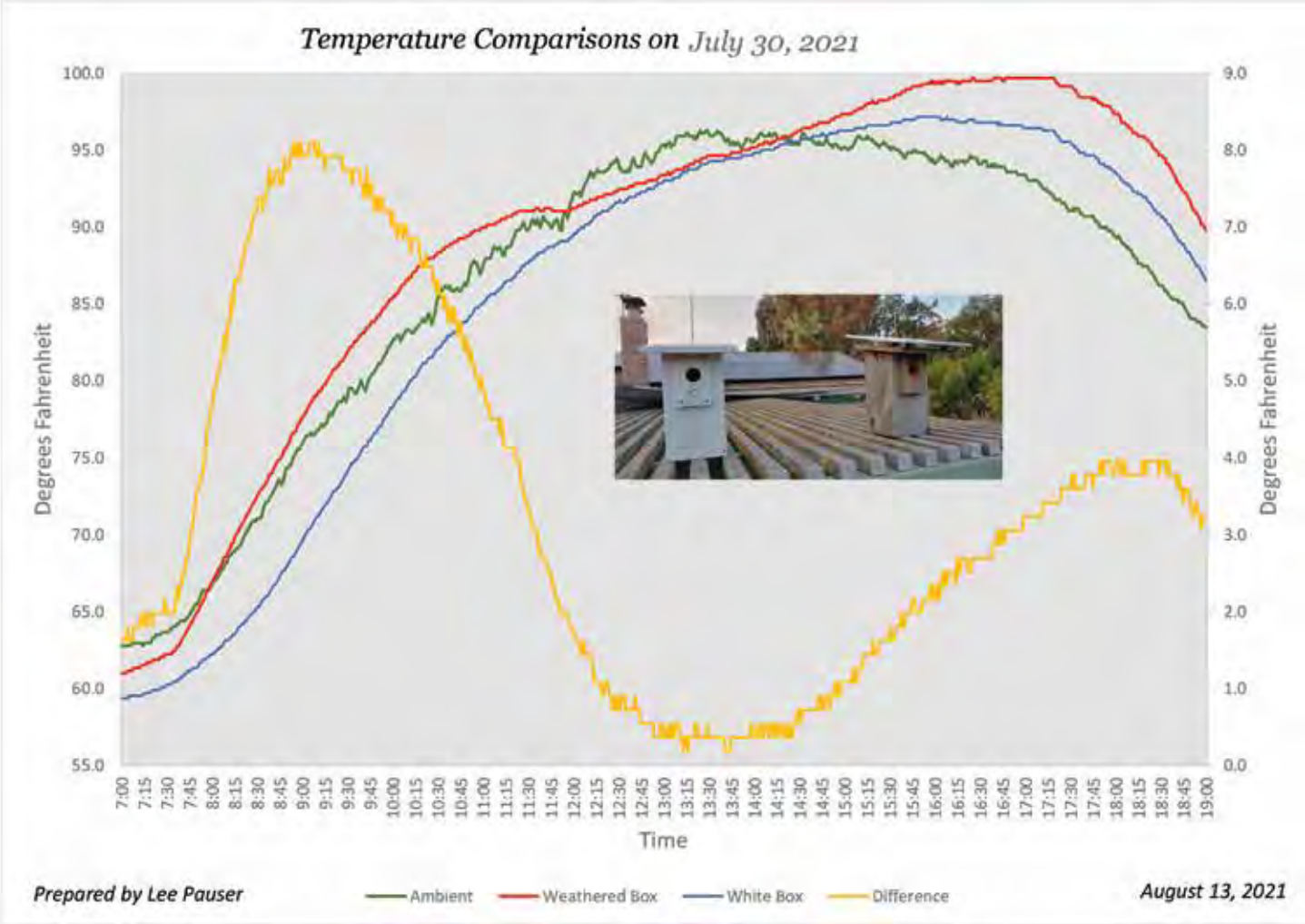
Temperatures inside both boxes rose above ambient temperature and remained so as they cooled.

In the first chart the temperature inside the weathered box quickly rose above the ambient temperature and remained so while the temperature in the painted box didn't rise above ambient temperature until after 2 PM.

The second chart has similar results with a major notable difference—the sun shield made a significant difference in limiting the internal temperature of the weathered box when the sun was overhead.

The conclusion is that a sun shield installed on nestboxes can make a difference in limiting the temperature inside nestboxes. Shields could be installed on the west side of the box to help during the hottest part of the day. Painting the boxes white or even a lighter earth tone is effective. Hanging nestboxes in the canopy of trees could negate the need for painting the boxes or installing a sun shield.

Mick Thompson / Flickr CC



Comparing temperatures inside a painted white nestbox and a weathered nestbox with sun shield.

How Nine Western Bluebird Nestlings Were Saved!

Georgette Howington

As the nestboxes tumbled to the ground chaos ensued. Parent birds swooping, fright-filled chirping and then, at nightfall, the dreadful quiet of giving up all hope. "I was not told that orchard trees on one of my trails at Putah Creek were slated to be cut down," Melanie Truan reported. "Fortunately, we discovered the downed boxes the next morning, on June 5th, during one of our usual nest checks. Miraculously, the chicks survived their falls, were still alive, though fading fast. No parents were in attendance. We rushed the nine Western Bluebird chicks and two Tree Swallow chicks to Wildlife Care Association for Sacramento (www.wildlifecareassociation.com) and then they were transferred to Native Songbird Care and Conservation." Melanie Truan, PhD, is founder and Director of the Putah Creek Nestbox Highway and the Davis Nestbox Network as well as Staff Research Associate with the Museum of Wildlife and Fish Biology at the University of California at Davis.

Veronica Bowers, founder of Native Songbird Care (www.nativesongbircare.org), in Sebastopol, received the nine nestlings on June 6th. After the nestlings were examined and stabilized, she was confident they were good candidates for renesting. She then sent a message alert through the California Bluebird Recovery Program Facebook page. Veronica says, "Wild fostering is a tool we use at our facility to keep healthy orphans out of our facility whenever possible. Bluebirds and a few other species make great foster families and are very accepting of healthy young that are not their own. Great care must be taken when fostering orphans into wild nests. Correct age, health, brood size, available food resources, etc., must be considered. We take this very seriously and evaluate each foster family with great care before executing a wild foster project."

She adds, "Food costs for insectivorous birds is approximately $300.00 per bird for 5–6 weeks of care. So, not only is it more beneficial for healthy orphans to be raised by wild foster families, but it helps us save vital resources. Our work is funded solely by donations."

Mike Azevedo, the FB page administrator and Naturalist for the California Bluebird Recovery Program (www.cbrp.org), read Veronica's plea to help the orphaned nestlings on June 12th, and acted promptly. He emailed a list of bluebirders he suspected might be able to help. I immediately contacted Lee Pauser in San Jose. Lee is a secondary-

(Left) Samantha Dustin and Ariana Nahidi, interns at Native Songbird Care & Conservation. (Right) Sam and Ariana tending to the nestlings. *All photos by Lee Pauser*

cavity-nester expert who has fledged 16,858 birds, 6,670 of which were Western Bluebirds, and keeps detailed records of each nestbox.

Lee emailed back immediately that he had active Western Bluebird nests in the same age group as the orphaned nestlings and shared his records with Veronica. "As of today, I have 24 boxes having WEBL nestlings with estimated ages that range from 4 to 18 days. I would not foster more than one nestling per box so as not to overload the adults. Some of these 24 broods have already experienced deaths likely due to starvation."

An example of Lee's record keeping:

Box ID	SA	B#	DH	#H	C#N	Age	Comment
CH97	WEBL	1	6/4/2021	1	1	8	6/7 2E,1N; 5/17 1E;
AR10	WEBL	1	6/4/2021	4	4	8	6/10 4N; 6/3 4E; 5/21 3E;
SG248	WEBL	1	6/1/2021	3	3	11	6/12,5 3N; 5/15 3E;
AU02	WEBL	1	6/1/2021	4	4	11	6/4 4N; 5/22 ON,A1E;
AR94	WEBL	1	6/1/2021	4	4	11	6/4 ON,A4N; 5/28 ON; 5/15 2E;
SG77	WEBL	2	6/1/2021	3	3	11	6/12 3N; 6/5 Fl,3N; 5/22 RUN,ON,A1E;
SG03	WEBL	1	5/31/2021	5	3	12	6/12 3L,1D,1Mi; 6/5 5N; 5/29 5E@78; 5/15 5E;
AR209	WEBL	1	5/31/2021	5	5	12	6/10 5N; 6/3 A5N; 5/21 5E; 5/14 3E;
SG38	WEBL	1	5/29/2021	4	4	14	6/12 4N; 6/5 ON,Saw2N; 5/29 ON; /15 ON,A1E;
SG24	WEBL	1	5/29/2021	3	2	14	6/12,5 3E,2N,1NMi; 5/29 5E,1N>A6N; 5/15 5E;

"I've been putting dried mealworms and ripened elderberries in some of the boxes to help the parents. I order the mealworms in 5 lb. bags online. I tried using the live mealworms but keeping them alive is a problem whereas the dried have a long shelf life and can be rehydrated. Usually but not always the mealworms placed inside the box are gone by the next week. I place them on the side of the nest. Mealworms are a calcium depletant so caution should be exercised to not feed them too many. Dusting the mealworms with calcium carbonate or calcium citrate powder reduces this effect." (http://www.sialis.org/feeder.htm)

After carefully examining his records and discussions with Veronica, Lee decided he would renest all NINE nestlings!

At this point the delicate process of preparing and transporting the nestlings began. Two interns at Native Songbird, Samantha Dustin and Ariana Nahidi, were assigned the project of safely handling the baby birds and taking them on the long, two-hour car trip from Sebastopol to San Jose.

Samantha recently graduated from Humboldt State University with degrees in Wildlife Biology and Conservation. She decided to become an intern at Native Songbird Care "not only because of my love and interest for songbirds but also to get more hands-on

(Left) Nestlings during the transfer to Lee Pauser. (Right) Two orphaned WEBL nestlings in their foster nest.

and real-world experience of the threats songbirds face from humans and the conservation efforts we can do to help protect these birds."

She says, "With help from Veronica, the bluebird nestlings were placed in a plastic bowl lined with a washcloth. The nests were placed in a plastic hospital basket with the bottom lined with linen, then covered with a towel to lessen the stress of light and other visual stressors for the nestlings during transport. Mealworms, water to place them in to hydrate the nestlings, and extra washcloths to replace the nest linings when they got too dirty, were also prepared for the transport."

Ariana Nahidi, a senior at Dominican University of California, became an intern at Native Songbird Care because she "is passionate about caring for animals and making a difference. I was offered a hybrid internship to be involved in songbird care as well as working with my Communications and Media Studies major experience to provide content for their social media pages."

During the long drive, Ariana sat in the backseat with the nestlings, "I fed them every 30 minutes while Sam drove to San Jose. I would grab a few worms at a time and dip them in a container of water before blotting them off on a towel and then feeding to the nestlings."

She adds, "The nestlings did not seem stressed at all. Throughout the drive they were gaping well and eating normally. They rested comfortably in their nests and once we arrived at the location remained calm throughout the whole process." Sam said during the drive they limited the amount of noise in the car such as loud talking and no music/radio.

"We evaluated each of the nestlings with Lee while he explained which nestbox each nestling would go into. He mapped out the boxes that could take two or three nestlings." Ariana reported, "We drove golfcarts to each nestbox with the nestlings, placing those with the same hatch dates into each box. Lee placed rehydrated mealworms into the nestboxes to provide food for the nestlings. Each one did not show any signs of stress."

Over the following weeks, Lee monitored the nestboxes carefully to see how the nestlings were faring. He reported that all but one of the nestlings (renested and new siblings) fledged. Sadly, there was one death.

Veronica Bowers says, "We are overjoyed with the outcome! We are grateful for our newfound partnership with CBRP to work on future WEBL fostering. Our interns received an incredible experience being part of a process in wildlife rehabilitation that is underutilized, and they were able to learn from a generous, experienced bluebird monitor. Nine beautiful WEBLs were raised by their own species!"

Georgette Howington is a County Coordinator for the California Bluebird Recovery Program.

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If you have a car, truck, motorcycle, RV, boat, or even an airplane that you no longer need, NABS would like to receive it as a tax-deductible charitable donation.

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Thank you for supporting the conservation of bluebirds and other native cavity nesters!

Photo Gallery

The Pygmy Nuthatch of western North America is cousin to the Southeast's Brown-headed Nuthatch. During winter, flocks of pygmies travel together through Ponderosa and other long-leaf pine forests searching for food, all the while giving their "squeaky-toy" calls to stay in touch.
Photo taken by Doug Greenberg on the University of California's Berkeley campus and reprinted here under a Creative Commons license.

Bill Taylor wrote: "I had never encountered a male MOBL sitting in the nest, over many years of monitoring and banding MOBL and TRES in Alberta. This one was keeping warm a small clutch of newborn second-brood hatchlings. I assume Mama was out for a brief rest/massage/bath/visit to the insect farm! I did not move him to check for a possible band."

The Northern Pygmy-Owl is a pugnacious little owl of western North America. A daytime hunter, it is known to capture prey (birds and rodents) up to three times its own size!
Photo taken in British Columbia.
https://flickr.com/photos/nechakoriver/

Amazing how well some birds can blend into their environment. This Yellow-bellied Sapsucker is all but invisible, especially to any predators that happen to be color-blind and unable to see the red crown. Photo by photographer/artist Laura Wolf:
https://laurawolfartist.squarespace.com/

Bluebirds Everywhere

"**Bluebirds Everywhere**" is a feature that celebrates the widespread and creative uses of bluebird images and the word "bluebird" itself. We invite you to submit your own images and ideas—simply email them to **NABSeditor@gmail.com** or mail them to NABS Editor, 5405 Villa View Dr., Farmington, NM 87402. Let's see what bluebirds you can find!

Bluebird BOOKS

The owner of Bluebird Books converted a vintage 1966 camper trailer to a mobile bookstore, bringing books to the good people of the Charlottsville/ Crozet area of central Virginia. Visit the website for a peek at the cool trailer! www.bluebirdbookstop.com

As you can tell from the name, Bluebird Pediatric Dentistry of West Jefferson, North Carolina, specializes in children's dental care. Their logo is sure to make you smile! www.bluebirdpediatricdentistry.com

BluesNews

Junior Duck Stamp

Each year the U.S. Fish and Wildlife Service hosts a contest for budding young bird artists. The winner is honored by having their artwork grace the Junior Duck Stamp for that year. This year's winning art, featuring a pair of (cavity nesting) Hooded Mergansers, was painted by Margaret McMullen of Kansas. Proceeds from the sale of the duck stamps are used to educate and engage youth in wildlife and wetlands conservation and outdoor recreation. You can buy your Junior Duck Stamp online from the US Postal Service or in person at some national wildlife refuges. Image ©USFWS

Nuthatches Show Their Mettle in the Show-Me State

You may remember the article we printed in the Winter 2020–2021 issue of *Bluebird* about the efforts to reintroduce the Brown-headed Nuthatch to Missouri, from which the species had been absent since the early 1900s due to habitat loss. The reintroduction is moving along well: 46 nuthatches from Arkansas were released in 2020, whereupon they settled in and sucessfully nested. Another 60 nuthatches will be released this year to bolster the population. This may seem like a small story, but it is a true conservation success story!

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Author

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Affiliates of the North American Bluebird Society

The North American Bluebird Society serves as a clearinghouse for ideas, research, management, and education on behalf of bluebirds and other native cavity-nesting species. NABS invites all state, provincial, and regional bluebird organizations to become NABS Affiliates in a confederation of equals working together in a partnership in international bluebird conservation. No cost is associated with affiliating with NABS. Your affiliated organization will be listed on the NABS website and in *Bluebird*. To find out more about becoming a NABS Affiliate please contact Mike DeBruhl at **cmdebruhl@atlanticbb.net**. If your organization is listed below, please review your listing to ensure it is current and send any changes to Mike. Thanks!

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