Bluebird

Spring 2005
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Our cover is from a painting by Dempsey Essick entitled "Carolina Blue." It is the theme artwork for the NABS 2005 convention to be held May 19-22 in Asheville, North Carolina. Convention details are on page 3.

Bluebird population numbers are examined by Partners in Flight and two knowledgable NABS members. Turn to page 4.

Predators have memories Nest boxes can become more vulnerable to predation with time. Turn to page 8.

Mealworms offer supplementary nourishment for bluebirds in early spring or when they are feeding young. Buy them now at a special NABS discount. Turn to page 12.

From the President

By Steve Garr

Over the past few years I have experienced some additional benefits of being a NABS member. When I joined, no one mentioned the lifetime friends I would get to know because of a common interest in a blue-colored bird.

As we have grown older and as time has passed, life has taken its toll on some of our closest friends. At the loss of both of my parents within the past several years, I had cards from bluebird friends from around the country. A common bond of a little bird and a kind note from friends helped ease my troubled heart.

Now a bluebird friend, Bob Benson, has lost his mother, and I know the cards and flowers sent by the people he has gotten to know as a result of bluebirds has helped him through the situation. He has heard from not just friends from NABS but friends from the email list Bluebird-L as well.

Bob mentioned that it helped ease his heart when an acquaintance that he raught about bluebirds was able to stop by the funeral home to see him and pay his respects.

* * *

Recently a great honor was bestowed upon a fellow bluebirder, Erv Davis. Erv, who lives in Montana, is a recent NABS board member and friend of anyone interested in bluebirds! On February 2, Erv received "Volunteer of the Year" award, the top honor given each year to only one of the 40,000 Fish and Wildlife Service volunteers. Bluebirders Julie Kutruff (NABS vice president) and Anne Little (NABS member and former officer) surprised Erv by attending the ceremony in Washington.

I know there are many other members of our Bluebird Family who are experiencing accolades or hardships. When I see or heat a bluebird, I always think of the friends I have because of the bluebird. Nothing opens the door to making lifelong bluebird friends like atrending a NABS Convention! The convention in North Carolina in May 2005 will be one ro remember, I'm sure!

I hope to see you there.

Letter to the editor

To the editor,

I'm puzzled by the persistent prejudice of bluebirders against golf courses. Your Winter 2004 edition had an article wherein the authors expressed surprise that golf courses can actually be a healthy environment for bluebirds.

I started a bluebird trail on my home golf course three years ago. The course superintendent is an avid supporter of the Audubon Society and had already installed wood duck boxes. I have fledged over 250 bluebirds, about 100 chickadees, and some swallows.

I have old-timers miles away now reporting that they have bluebirds for the first time. Golfers support the program.

Eastern bluebird's territorial range of 100 yards is perfect for boxes alongside the cart paths for golfers to judge their disrance. The birds don't mind the golfers. One of my mosr successful boxes is next ro the driving range with equipment and golfers ever present. I have had only one possible instance of people disrupting a nest.

With this degree of success, I've been telling everyone that golf courses are the perfect environment for a bluebird trail. How about some more support instead of the constant skepticism?

— Ron Thoreson, Old Kinderhook Golf Course, Camdenton, Missouri

See you in North Carolina for NABS '05 convention

Each NABS annual meeting is different. They are held in different parts of the continent, have different speakers, different field trips, and different menus, but veryone there is in agreement about at least one thing: They all share the love and preservation of the bluebird!

This year it is North Carolina's privilege and pleasure to share a small part of this beautiful state with the rest of the continent. We will gather in Asheville on May 19-22. It's a wonderful place to visit, even if just for a few days.

Registration forms were in the last issue of *Bluebird* (Winter 2005) and can be found on nabluebirdsociety.org and ncbluebird.com. They can also be obtained from Helen Munro of the North Carolina Bluebird Society either by email (hsmunro@ac.net) or phone (910/673-6936).

Come on Thursday, May 19, and enjoy workshops by photographer Gene Stafford, "Keep America Beautiful" representative George Stilphen, bird bander Bill Hilton, Jr. and bird watcher Simon Thompson. Simon will also lead a birding experience at Chimney Rock Park on Sunday (May 22) at 9 am.

Friday (May 20, 2005) is the day to tour the Biltmore Estate (and either the Folk Art Center or the North Carolina Arboretum) or to take a trip through the North Carolina mountains with a stop at the Cradle of Forestry. The evening "Barbeque by the Pool" will allow for socializing with old friends and meeting new ones.

Saturday's (May 21, 2005) program will start with the NABS formal meeting followed by Scott Shalaway, Douglas LeVasseur and Connie Toops. A pleasant addition to the program is Julie Zickefoose whose talk, Hummingbird Summer, will be presented after lunch.

Later in the afternoon, Claire Bryant will help participants make bluebird cards and paint bluebirds onto tote bags. Julie Ball of the Asheville Citizen-Times will help newsletter editors and others write a press release summing up the highlights of NABS 2005. A tour of Asheville on the Historic Trolley may also be available as an alternative activity.

On Saturday from 8 a.m. to 4 p.m., NABS 2005 commemorative postal cancellations will be available. This caucellation is stamped on a first class stamp aud envelope or post card. The cancellation is free and stamps and envelopes can be purchased. According to Wes Wiles of the West Asheville Station, "This is a very popular item among collectors around the country. For example, there was a special cancellation for the opening of rhe World War II Memorial in Washington, D.C." This is an unique souvenir and collectors across the country will be coutacting the Asheville post office to add NABS 2005 to their collection.

The Saturday evening banquet will feature good food, good company and Scott Shalaway's short after-dinner speech. It will be a fitting closing event for NABS 2005. Come and enjoy the hospitality of North Carolina and the beauty of Asheville.

Special thanks

Special thanks from the North Carolina Bluebird Sociery to these NABS 2005 sponsors that came in after the last newsletter was printed.

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P.O. Box 244
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Lisa Bulick
Executive Director

330-359-5511
lisabulick@nabluebirdsociety.org
www.nabluebirdsociety.org

Questions should be directed to the NABS headquarters address/telephone number shown above. The NABS web site offers answers to many questions.

Editor: James J. Williams
345 Ferndale Road N.
Wayzata, Minnesota 55391
E-mail two-jays@att.net

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Bluebird population numbers

With additional discussion on observations of Western Bluebird populations

By Jim Williams

How many bluebirds of each species do we have? What is the continental population for Eastern Bluebird, Western Bluebird, and Mountain Bluebird? How do these compare? How are the population estimates made? Do the estimated populations seem adequate for maintenance of the species?

In the Summet 2004 issue of *Bluebird*, Bernie Daniels, Ph.D., chair of the NABS research committee, wrote about Wesrern Bluebird populations. He used data published by the North American Breeding Bird Survey (BBS) and rhe bird conservation partnership Partners in Flight (PIF).

In the August 2004 issue of the American Bird Conservancy magazine, *Bird Conservation*, PIF discusses its continental plan for bird conservation, including estimates of bird population sizes. Continuing Dr. Daniel's presentation, we offer here some additional information from PIF about Eastern Bluebirds and Mountain Bluebirds, and a brief review of the Western Bluebird data. In addition, we present a discussion of the Western Bluebird siruation as viewed by a NABS member who has monitored Western Bluebirds in southern California for the past eight years. In addition, we have some further rhoughts on this subject by Dr. Daniel.

• • •

PIF has estimated the population sizes for all 448 species of landbirds that regularly breed in the U.S. and Canada. The PIF article estimates total bluebird populations in North America at 10 million for Eastern Bluebird, 5.2 million for Mountain Bluebird, and 1.4 million for Western Bluebird. These numbers are reported as being moderately accurate, and PIF calculates that the actual numbers for each species may range between 50 percent highet or lower than these values. (Keep in mind, it is not easy to closely determine the populations of animals that range over vast areas and which are capable of movement.)

In comparison to all other species of landbirds in North America, none of the bluebird species are seen to be especially vulnerable. However, the Mountain Bluebird deserves some special attention because it is relatively concentrated during the breeding season — 76 percent of its breeding population is located in the Inrermountain West Avifaunal Biome. This qualifies it as a Srewardship Species, by which PIF means that land owners and managers in the Intermountain West should consider the Mountain Bluebird in long-term planning. Although the species is not especially vulnerable at this time, we must not abandon our responsibiliry to take care of it.

The report estimates that 80 percent of the Eastern Bluebird population is in Canada and the United States and that 87 percent of Western Bluebirds are in the U.S. and Canada. (The remainder are in Mexico and Central America).

Monitoring of the populations of all three species is considered adequate by PIF.

Terry Rich is the PIF national coordinator, working for the U. S. Fish and Wildlife Service from offices in Boise, Idaho. He was asked how PIF made its bird population estimates.

"To put it simply, most estimates were derived by converting BBS data to bird densities for the survey areas and then applying some correction factors," he said. "This is a relatively direct bit of arithmetic, adjusted by professional opinion. We have been greatly encouraged by a number of independent estimates and various reviews which suggest that our numbers are very good for many species."

Mr. Rich was asked if bluebird populations are threatened in any way. Since there has been concern in the past for bluebird populations, particularly for that of Eastern Bluebird, are those concerns less today?

"According to our continental assessment of landbirds, the bluebirds are in generally better shape rhan many other species," Mr. Rich said. "The data show that, according ro the judgment of a number of ornithologists, the future vulnerability of Eastern and Mountain Bluebirds is not very high. Bur, the Western Bluebird is right on the edge of the Watch List.

"To answer your questions more directly," Mr. Rich continued, "I'd say that, first, bluebird populations and nearly all other bird populations on the planet are threatened. Second, concerns today are, or should be, greater than in the past. When human populations begin to decline, then I'll be more optimistic. And, third, bluebird conservation groups have a number of objectives (I hope).

"You might compare these three species and see if there is a reason that Eastern Bluebirds and Mountain Bluebirds seem ro be in good shape while Western Bluebirds are more vulnerable. I suspect there has been a great effort for Easterns, and

perhaps that explains their relatively secure situation and large population.

"But we might want to ask why Mountains are also pretty secure. And we can also ask if there has been a concerted effort for Westerns and, if so, has it failed to date?

"One caveat here is that in some ways we are comparing apples and oranges," Mr. Rich said. "What we have produced is the first-ever continental assessment which seeks to put all landbirds up against the same standards. This is not designed to be an evaluation of any particular conservation effort for any particular species or geographic area.

"On the other hand, the bluebirds provide an interesting issue. For example, it would be useful to look at some gross statistics for these three species. How many nest boxes have been built for each by year? How many trails have been operated by year? What do the data on productivity look like? What other measures of continental conservation effort for bluebirds do you have? This could be pretty interesting," Mt. Rich said.

COMMENTS FROM CALIFORNIA

Bob Franz has been an active bluebird moniror in southern California since 1997. His trail is located on four golf courses, numerous parks, a cemetery, and assorted green belts. In 2004, he monitored 208 nest boxes that fledged 872 Western Bluebirds. In correspondence to Bernie Daniel, he wrote:

I wish to continue the dialogue on the assessment of Western Bluebird population trends that you wrote about in the Summer 2004 *Bluebird*. This renewed interest was triggered by E.A. Zimmerman's bluebirding myths article in the Fall 2004 *Bluebird* in which she stated categorically that Western Bluebird populations are not increasing in response to conservation efforts like the other two species.

It is obvious from the many sources of Western Bluebird population source data that you and she cited that much work has been done over the years to try to accurately portray the population trends, not only of bluebirds, but of many other birds. Sources mentioned included the Audubon Christmas Bird Count Analysis, North American Breeding Bird Survey (BBS) Analysis, National Biological Survey, and USGS charts.

It appears that most of these analyses declare that the Western Bluebird population is in a decline. Although I cannot question these results per se, there is some evidence that indicates an increase in yearly Western Bluebird population — and some that shows a decrease. Bluebird monitors like me who place man-made nest boxes and make routine checks during the nesting season provide all of these reports. Here are some of the reports:

• **California** — The California Bluebird Recovery Program Annual Reports show a matked increase of Western Bluebird fledglings from 3,020 in 1996 to 7,611 in 2003. Granted some of the increase is attributed to an increase in the number of monitors, from 113 in 1996 to 131 in 2003 but they still show a dramatic increase of 152 percent!

• **Oregon** — Elsie Eltzroth from Corvallis reports a significant increase in fledglings from 1992 to 1998 but a larger decline in fledgling totals comparing 1998 with 2002.

• **Prescott Bluebird Recovery Project in Oregon** — Dave Flaming reports the following that covers portions of Clackamas, Washington, and Yarnhill counties: In 2001, 1,715 fledgling, in 2002, 1,232, and in 2003, 1,639.

• **British Columbia** — Sherry Linn reports, "Here in the southern area of BC we have found Westerns to be extending their territory, both in elevation and latitude. Westerns were mainly confined to the valley floor in the South Okanagan (Osoyoos to Vernon) area and extended along rhe Canada-U.S. border to the east of Osoyoos. Over the past five to six years they have nested higher and have been observed in nest boxes at the top of Anarchrist Mountain where we used to see only Mountain Bluebirds. The Westerns have also been seen as far as Kamloops. Unfortunately no trend numbers here.

Obviously, there is quite a bit of disparity when comparing population trends from so many diverse data sources. And much of this may be due to variances in numbers of reporters reporting, weather conditions when sightings are taken, and just plain anomalies when observations were taken.

Based on all of the above, I have come to the conclusion that nest-box reporting trends and the bird count trends published by the large organizations are two separate topics and that, until all these dara can be synthesized, there can be no ironclad statement made that the overall Western Bluebird population is not increasing as E. A. (Bet) Zimmerman srated.

Yes, it is possible to produce positive increases in Westetn Bluebird populations where monitors like me, and many orhers, get involved. On the other had, I'm sure that every time some stands of trees or other Western Bluebird habitat is destroyed, unknown quantities of Western Bluebirds are left homeless, unless a Wesrern Bluebird volunteer suddenly appears.

Suffice it to say, thar where man is involved in terms of placing nest boxes and monitoring them, the rrend is obvious and significant, so much so that the Western Bluebirds (we have helped produce) have become dependent on us for their continued population growth. I would expect thar that monitor's efforts for the Eastern Bluebirds are similarly productive. And maybe that is the best we can do.

BERNIE DANIEL RESPONDS

Thanks for your comments on Western Bluebirds. It is good to get the perspective of a Western Bluebirdet into this discussion of population estimates.

In my view, your comments illustrate two of the points I tried to make in the original article. First, it is very difficult to get a real handle on what's happening with a bird

population on a continental scale, and, second, it may very well be true that in some (perhaps localized) areas of the country Westerns are indeed showing increases while in other ateas the teverse is true. What we need is to be better able to assess the net (overall) trends of Westerns from across their entire range. That is, what is the overall trend in their population across all the areas they are found?

The BBS data I presented covers the entire North American range of the Western Bluebird. The BBS program is very large and comprehensive, and it is the best data we have. But it is a program that gets relatively small amounts of direct government money, and it depends on a large number of volunteer birders. As a volunteer effort the government must, to some extent, take what it gets in terms of continent-wide coverage. Nonetheless the BBS is an excellent bird survey program and it is based on a highcontrolled, scientific survey method that is staristically analyzed by national experts in avian population changes.

For example, for 10 years I have counted three BBS routes in Ohio. Each route, driven once a year, takes a half day (actually about six hours) to count. The count protocol is very strict regarding the starting time, the permitted wind and cloud cover conditions, as well as the actual time for spent counting birds (thtee minutes are spent at each site of 50 survey sits exactly placed along a 25-mile survey route). To conduct a BBS count you must be able to identify, by sight and/or sound (call and song), any bird you are likely to encounter on the route. So, except for flocking birds like blackbirds, starlings, etc., about 80 percent of the identifications are made by ear. On my Ohio routes usually I detect an average of 65 to 72 species each year.

So, the BBS data are very useful for tracking population trends in birds. But your experiences and information, from the nest box trails across the Western's range is exactly what I had hoped to learn about. Your observations add additional information to the question of the Western Bluebird's status, such questions as: Are thete hot spots for Western bluebirds that are not covered by the BBS survey?

I am sure that answer to this is yes, of course, and the information you provided seems to verify that. So is the BBS getting a broad enough coverage of the Westerns range that can really make a valid estimate of the population? We do not know for sure, but it is the only estimate we have at this time.

Also, we must keep in mind that rhe BBS is not designed to count every Western bluebird each year but rather to count a big enough section of the bird's range, in exactly the same manner each year, so we can see if population trends across the continent are occurring from year ro year.

My original article in *Bluebird* (Summer, 2004) was edited and some of the tables for national bluebird population trends were taken out because of space considerations. I have added one of these tables back for you to see here (Table 1).

This table shows what I have shown in the map I produced earlier: based on BBS analysis, the population trend for the Western Bluebird, over its entire range is negative (i.e., it is decreasing). The associated p-value, a probability estimate, indicates that this result might not be statistically reliable — nonetheless I think we can agree it is certainly in the wrong direction!

But I agtee we must try to combine all the information we have in order to get the best overall picture of the Western Bluebird's status. Looking at maps of bluebird distributions generated in my Geographic Information System (created from BBS data) I have noticed that the Mountain Bluebird range now overlaps with all but the most western edge of the Western Bluebird's range in central and western California.

Could parr of the problem be a case of the Mountain Bluebird displacing the Western? Clearly I can not say, but such a process has happened before in the avian world. For decades the Blue-winged Warbler has slowly been displacing its close relative, the Golden-winged warbler, in the northeastern U.S. Likewise, the release of the House Finch on the east coast of the U.S. appears to have pushed the range of the Purple Finch back to more northerly latitudes.

Again, thanks for your note. Through exchanges like this people start to understand the complexities of bird conservation. It is importanr that we understand what is really going on with the Western bluebird so that we can act, if we need to, in time ro do some good.

Table 1. Continent-Wide Trends for Bluebird Species 1966-2000

Species	Trend	p-Value	Routes	Birds/Route
Western Bb	-1.07	0.179	283	1.4
Mountain Bb	1.65	0.007	587	2.5
Eastern Bb	2.75	<0.001	2012	3.9

Trend is the average percent change per year; p-Value is the probability associated with the trend estimate; Route is the average number of routes per year used in the trend estimate, Birds/Route is the average number of birds detected per route

Research shows that nest predation can increase with the age of nest box

Permanent locations for nest boxes might make the boxes more vulnerable to predation over the long term

Predators of birds using nest boxes might be smarter than we think. They might be able to learn and remember from year to year where the boxes are and what they contain.

Researcher Karl E. Miller of Florida wanted to compare the nesting success of birds using nest boxes and birds using natural cavities. He was investigating whether nest boxes produce higher success rates than might be normal for a species.

He chose Great Crested Flycatcher as the species to study. Great Crested Flycatchers are secondary cavity nesters (they do not create their own cavities) found throughout eastern North America as far north as southern Canada. When the study was complete, he had learned something important about bird predators.

Here is the story of this study.

By Karl E. Miller

Ornithologists have used nest boxes to monitor bird populations and study bird life histories for more than 50 years. The use of nest boxes as a research tool has been criticized, however. Some researchers have argued that nest boxes are safer from predators than natural nest sites. They argue that patterns of reproductive success observed in nest-box studies may be influenced by the boxes themselves.

Few studies, however, have compared the nesting success of birds using nest boxes and those using tree cavities in the same locality during the same time period. Results from these studies have been inconclusive.

My objective in this study was to compare

Great Crested Flycatchers are secondary cavity nesters found throughout eastern North America. This Great Crested Flycatcher, with food in its mouth, was photographed in Minnesota by Jim Lind of Two Harbors, Minnesota.

nesting success of Great Crested Flycatchers using nest boxes and those using tree cavities in the same habitats during the same years.

I conducted my study in 35- to 40-year-old slash pine plantations at Camp Blanding Training Site, an Army National Guard facility in northern Florida. My field assistants and I monitored nests in tree cavities on 14 pine-plantation study plots that ranged in size from about 20 to just under 40 acres. All study plots were even-aged pine stands lacking a well-developed understory.

The Great Crested Flycatcher was the most common secondary cavity-nester species on the study area. This species is migratory, returning to the study area each year during the last week of March. The Great Crested Flycatcher normally nests only once per season, but will renest if its first nesting attempt of the season fails.

Potential nest predators in the study area included the southern flying squirrel, cotton mouse, corn snake, yellow rat snake, and Blue Jay.

I placed 160 nest boxes on eight of the study plots (20 nest boxes per plot) during late February and early March 1997. Nest boxes were constructed of rough-cut cedar with an entrance hole appropriate for Great Crested Flycatchers (two-inch diameter, 5.1cm). I placed nest boxes on live pine trees at 54-yard (50m) intervals within each plot, alternating the heights between six feet (1.8m) and 15 feet (4.8m) above ground. All boxes were oriented with the entrance hole facing east by southeast, as an easterly or southeasterly orientation often is preferred by many cavity-nesting bird species.

I inspected each nest box at least once every 10 to 14 days during April and May and at least once every 14 to 20 days during June and early July. As soon as I found nesting activity by Great Crested Flycatchers in a given nest box, I monitored that box at three-to-four-day intervals.

I recorded all species that occupied nest boxes. Southern flying squirrels were not evicted from nest boxes because they routinely use the same size tree cavities as the flycatchers, and I did not want to bias my comparison of nesting activities in nest boxes versus tree cavities. Because flying squirrels also are potential nest predators, I counted all squirrels observed in each nest box during monitoring visits to assess if flying squirrel densities changed over time. I defined primary roost sites as those nest boxes in which flying squirrels were observed on at least two occasions within a season.

I searched for Great Crested Flycatcher nests from mid-April through early July of 1997 and 1998 (I was unable to continue the experiment for additional years because of extensive tree cutting in several nest box plots during 1999-2000). I also searched a buffer strip around each study plot to ensure that birds breeding on the edges of plantation plots were monitored.

Nests located more than 13 feet (4m) above ground were reached with a stepladder and the contents observed with a light and dental mirror. In 1997, most high cavities were monitored from the ground through observation of adults carrying nest material or feed into the cavity, although a few cavities in larger, more stable snags were investigated with Swedish sectional tree-climbing ladders. In 1998, all cavities more than 13 feet high were monitored with a video probe mounted on a telescoping fiberglass pole.

I considered nestlings to have fledged if they were alive when checked within one day of expected fledging and subsequent checks showed no evidence of predation or disturbance to the nest. I visited most nest territories one or two days after the expected date of fledging to confirm that fledglings were present.

I also considered nest-site characteristics, measuring, among other things, percentage of bare ground, percentage of ground covered by grass, percentage of ground covered by shrubs, average shrub height, average palmetto height, and number of stems one to three inches (2.5-8cm) diameter at breast height.

During two breeding seasons, I monitored a total of 59 Great Crested Flycatcher nests, 32 in nest boxes and 27 in tree cavities. Most tree nests were in snags in cavities excavated by Red-bellied Woodpeckers or Northern Flickers, but six (21 percent) of the nests were in natural hollows or crevices in living trees.

Twenty-four of 59 nests (41 percent) produced at least one fledgling. Overall nesting success, was statistically determined, was nearly identical between nest boxes and tree cavity nests. However, when nesting success was broken out by year, differences were apparent. While nesting success in tree cavities did not differ significantly between the two study years, nesting success in nest boxes dropped from 53 percent in the first year to only 26 percent in the second year because of lower nest success during incubation.

Nest predation was the most common source of nest failure, accounting for at least 29 of 35 (83 percent) nest failures. Three nests failed due to abandonment (two in nest boxes in 1997, one in a snag in 1998). Cause of nest failure was undetermined for three nests in high tree cavities in 1997.

Flying squirrels preyed on three Great Crested Flycatcher nests during the incubation period. In each case, the eggs were broken or missing, the nest was in disarray, and flying squirrels were observed on top of the nest.

In addition, many depredated nests in nest boxes were disturbed in a similar fashion during the incubation period but squirrels were not subsequently observed.

Corn snakes preyed on two flycatcher nests, one containing five 12-day-old nestlings and the other containing three 13-day-old nestlings; in each case, the snake remained in the box for two or more days after consuming the nestlings. Although yellow rat snakes were not observed preying on Great Crested Flycatcher

nestlings during the study, they did prey on Red-bellied Woodpecker nestlings in the study area.

Twenty percent of all nest boxes were used by flying squirrels as primary roost sites, but I found no evidence that local squirrel popularions increased during the study.

High and low nest boxes were used by the flycatchers in similar proportions in 1997 and 1998. The tatio of successful to unsuccessful nests did not differ significantly between high and low nest boxes. Height of tree-cavity nests did not differ significantly between years or between successful and unsuccessful nests. Habitat characteristics around nest sites did not differ significantly between nest boxes and tree cavities or between years.

Several researchers have demonstrated a posirive correlation between the risk of nest predation and the age of a nest site. Other researchers present evidence that species and individuals that excavare new nest cavities have lowet rates of nest predation than do non-excavators that rely on old cavities for nest sites.

One explanation for this pattern is that nest predators may be more aware of locations of older nest sites. Researchers in 1990 found that nesting success of Tree Swallows in nest boxes decreased over time because of increasing predation by raccoons and rat snakes. Other research has demonstrated experimentally that pine martens develop long-term spatial memory of the locations of nest boxes used by Boreal Owls. In Sweden, nest boxes for Common Goldeneyes that were preyed on in a given year also tended to be preyed upon in successive years.

In my study, predation on eggs in nest boxes increased dramatically during the second year of the study. Nest success was highest in brand new boxes (i.e., one to two months after installation in 1997) than in older nest boxes or in older cavities. Nests in boxes that were reused for a second time (either by flycatchers or by other species) were more likely to fail than nests in boxes being used for the first time.

Moreover, predation rates on artificial nests placed in nest boxes (after the conclusion of the study) were higher in nest boxes that had been previously used by Great Crested Flycatchers than in nest boxes that had no previous nesting attempts.

These tesults suggest that nest predators in this study learned to exploit nest boxes as a prey resource, eithet because the predators remembered where the nests were located or because they learned to recognize nest sites.

Using cameras, researchers have documented flying squirrels and snakes returning to depredated Wood Thrush nests several days after the otiginal predation event. Such observations suggest that a variety of nest predators are capable of learning the locations of profitable prey sites and retutning periodically to them.

Although flying squirrels probably were tesponsible for most predation on eggs in my study in 1998, snakes also may have played a role. Researchers elsewhere in Florida have observed a small rat snake taking a Great Crested Flycatcher nestling from a nest box two days after another nestling had disappeared from the same box; they speculated that the snake made return visits.

Nesr boxes and tree cavity nests did not differ in any habitat variable that would influence nest concealment. Heights of successful and unsuccessful nests did not differ for nest boxes and cavity nests in either year. Thus, lower nest success in nest boxes cannot be attributed to a difference in the accessibility of these sites to predators. Ir is unknown whether nest boxes were more conspicuous than tree cavities because they were mounted externally on the tree trunk, whereas cavities are contained within the wood of the tree.

Physical dimensions of the nest cavity also did not appear to be responsible for predation differences. Most tree cavities used by Great Crested Flycatchers were old Red-bellied Woodpecker cavities, whose openings tange from two inches in diameter (5-5.7cm) to just slightly larget. Entrances at nest boxes, cut at two inches (5.1cm) in diameter were no larger or more accessible than tree cavity nests.

Parasites on the nestlings, although not measured, could not have accounted for lower nest success in nest boxes during the second year, because nest boxes were thoroughly cleaned of nesting debris in the intervening winter, and the majority of nest failure occurred because of predation on eggs.

This study demonstrates that nest boxes are not always safer sites than tree cavities. My results also underscote the importance of looking at the time dynamics of nest predation. Comparisons of nest success between natural sites and nest boxes that do not consider each year separately may give incomplere ot misleading results.

If my two years of work were pooled in this study, then one would have concluded that Great Crested Flycatchers had nearly identical nesting success in nest boxes and tree cavities. Many researchers do not report annual differences in nest success and/or nest predation in nest boxes. This may weaken their conclusions about nest boxes. Other researchers present evidence that nest predation increases over time in nest boxes without discussing the significance of this pattern.

Evidence indicates that nest predation may increase with the age of a nest box. The predictable, permanent locations of nest boxes may actually make them more vulnerable over the long term to nest predators than tree cavities.

Further research is needed to identify the factors that determine how predators will respond to nest boxes. For example, predation by martens on Boreal Owl nests appears to be influenced by the abundance of alternative prey. The martens are less likely to prey on the owls when other prey is readily available.

I predict that, within a given area, nest predation rates will tend to be higher in

nest boxes than in tree cavities if cavities in that area are relatively short-lived (i.e., they do not persist as long as the nest boxes). Another factor in higher predation rates is how important bird eggs and nestlings are in the seasonal diet of nest predators.

Tree cavities can vary considerable across a species' range or within a study atea in height, age, size, structural integtity, accessibility to predators, and in the densities at which they occut. Nest boxes ate useful tools that allow manipulation of many of these factors in controlled experiments. They make possible the study of particular mechanisms or ecological relationships that otherwise would be difficult or nearly impossible to study. The use of nest boxes in carefully designed experiments should be increased rather than decreased.

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(Dr. Miller was with the Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, when he conducted this work. His current address is Wildlife Research Laboratory, Florida Fish and Wildlife Conservation Commission, 4005 S. Main St., Gainesville, FL 32601. He can be reached by email at Karl.Miller@MyFWC.com.)

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Mealworms

NABS members can buy them at discount

By Pauline Tom

This is about mealworms, a favorite food for bluebirds now available to NABS members at a discount and available as a free offer for new members.

As members of NABS, you probably know the joy that comes from watching the process that transpires in a nest box. As you open your nest box to monitor every week or so during nesting season, you watch the wonder of the cycle which produces a fledgling almost the size of the parent from a tiny blue egg – in just over a month's time.

But, have you longed to take closer looks at bluebirds and see them throughout the year? If so, consider feeding mealworms. In many parts of the continent, bluebirds are present year-round, and they will visit backyards if food and water are available.

Mealworms provide a way to enjoy bluebirding at a new level. Small and round, mealworms are actually larval forms of the darkling beetle, and are a favorite food of bluebirds and many other birds.

Supplemental feeding of birds is not necessary, although it is helpful when one parent is missing or during a sudden cold snap. Researchers at Cornell (through The Birdhouse Network) are examining the reproductive performance of birds that have access to supplemental feeding versus those that don't. A definitive answer on the value of mealworms (or lack thereof) for bluebirds may be on the horizon. In the meantime, the value of mealworms to bluebirders is not questioned.

One February morning in 2002 when an ice storm hit the Dallas/Fort Worth area, Doug Rohde wrote,

"It has been a wonderful morning for bird-watching. Our four bluebirds, two pairs that haven't yet agreed who owns the yard) haven't left the yard, eating mealworms and drinking at the heated birdbath. We just had a first as both a male and female came and fluttered at the kitchen window to "tell us" they were out of mealworms. They watched as Karen refilled the feeder and flew in to eat before she could get inside. They've been joined by their usual companions, the goldfinches. And in addition their cousins, the robins (five) have spent the morning. And the towhees have been in and out too. It has been hard to leave the window."

Look closely and you will see this White-breasted Nuthatch snatching a mealworm from this feeder. Bluebirds can benefit from supplemental feeding of mealworms during breeding season, and also as overwintering or early-spring guests at your feeders. Several other bird species will benifit from the worms, however. Mealworms offer needed fat and protein. (Photo by Jim Williams)

At my own window, each day a Canyon Wren and a Curved-billed Thrashet "tell me" they want mealworms. These birds began frequenting my yard when I began feeding mealworms.

The easiest way to care for mealworms is to store them in the refrigerator, inside a shallow container that allows air circulation (holes in the cover) so the mealworms can breathe. They will remain alive, in a dormant state. If mold is not a problem, adding a few pieces of apple or banana peel about once a week will provide moisture for the worms. Whether mealworms are stored inside or outside the refrigerator, do not allow mold to form: it will kill mealworms.

If you have any doubt whether birds in your area like mealworms, you can perform this simple test run suggested by Dr. Scott Shalaway in a recent newspaper column.

Scatter a sizable amount of mealworms – 100 or 200 ought to do it – on the ground beneath your seed feeders. In minutes your backyard will be covered with birds as they take advantage of their unexpected meal. Then they will leave as quickly as they came. But don't worry – they have taken note of your generosity and will probably stay close by in case you decide to put our some more.

When you're ready to feed mealworms to your backyard birds on a regular basis, place several dozen in a container with slick sides, so they won't crawl away before the

birds can find them. A glass custard dish on a ledge works, or even an implanted empty soup can, with both ends cut out.

In freezing weather, mealworms may be placed in a glass bowl over hot water, to keep the mealworms active.

Place the feeder a good distance from your house to begin with; as the birds become aware of the food source, you can bring the mealworms closer for better bird-watching, even to your window with an acrylic stick-on feeder.

If you'd like something sophisticated, wild bird stores sell mealworm feeders.

Elizabeth Zimmerman has great instructions for a do-it-yourself "mobile feeder" at www.sialis.org/feeder.htm. The project takes less than three minutes to construct and uses common household materials that cost around $3.

Those who feed mealworms deem them well worth the cost, since they allow close-up views of birds. And now, a new program from the North American Bluebird Society makes it more affordable to feed with mealworms. Members of NABS receive a 15 percent discount on mealworms from two leading distributors, The Nature's Way and Sunshine.

According to Catalog Chair Anne Little, NABS members will order mealworms directly from the provider, giving the provider their NABS membership number (located on the label of their *Bluebird* magazine).

Throughout 2005 new NABS members will receive an additional bonus in their membership packet — a coupon for 1,000 free mealworms.

This plan provides NABS with the opportunity to introduce some members to the joys of supplemental feeding of bluebirds and other species with mealworms. And, it provides an opportunity to introduce NABS and bluebirders to those seeking a discount on purchases of mealworms.

(Pauline Tom is membership chair of NABS, president of the Texas Bluebird Society, and chair of the 2006 NABS convention, to be held in Texas.)

RECIPE

Bluebird Crumble: Birds just love it

Every once in a while, we offer a recipe for a songbird food mix you can prepare in your kitchen. This recipe comes from the newsletter of the Ohio Bluebird Society. Its name is Bluebird Crumble, so that tells you its target audience, but don't be surprised when you find other bird species enjoying it. Linda Janilla Peterson of Minnesota first introduced this mixture in the 1980s, so it has been time-tested by both bluebirds and bluebirders.

- 1 cup peanut butter
- 1 cup flour
- 1 cup chopped nuts
- 1 cup melted rendered suet
- 4 cups cornmeal
- 1 cup sunflower hearts
- 1 cup chopped raisins

Combine the peanut butter, cornmeal, and flour in a big mixing bowl. Stir until a crumbly mixture forms. Stir in the sunflower hearts, nuts, and raisins.

Drizzle the melted suet over the mixture, stirring now and then as you do. Let it cool. Store this in the refrigerator until ready to use.

The idea is to get a crumbly mixture of pea- and bean-sized lumps. If the mixture seems too sticky or doesn't form lumps, add more flour. If it seems too dry, forming crumbs instead of lumps, add more melted suet.

Attaching a "birdfood" label to the bowl as an alert to other members of the household is optional.

What do nestling bluebirds eat?

What do nestling Western Bluebirds and Mountain Bluebirds eat? Well, in central Oregon, here is what diet research shows:

40 percent grasshoppers

20 percent crickets

9 percent spiders

8 percent caterpillars

5 percent cicadas

The remaining 23 percent was composed of sow bug, millipede, worm, dragonfly, katydid, stinkbug, lacewing, beetle, grub, moth, butterfly, fly, crane fly, bee, ant, and berry squaw current.

This was reported in a recent issue of the Prescott Bluebird Recovery Program newsletter, as taken from *Nestling Diets of Western and Mountain Bluebirds in Central Oregon*, Charlotte C. Corkran, NW Ecological Research Institute, Portland, Oregon.

Looking for inspiration when you talk about bluebirds?

NABS speakers know how to do it

By Ron Kingston

What inspires those wonderful NABS members who generously volunteer their time to tell the bluebird srory to others? What might motivate you to go out and do the same thing? Here are some answers.

In January 2004, questionnaires (Survey of the 2003 Programs) were sent to each member of the NABS Speakers' Bureau. Every year the speakers are asked for a summary of the past year's programs, and this year they also were asked "What inspired you to become a NABS Speaker?"

In this review of the past presentations, we hope the following information will inspire all bluebirders to communicate to the public about bluebirds and other cavity nesters and increase an awareness of bluebird conservation across their area and all North America. Here are some of the comments we received.

Larry D. Rohrbaugh, Pennsylvania: I've been speaking about 25 years and use slides, NABS brochures, and state park brochures, nests, and a bluebird carving. I speak about bluebirds because of my love for the birds, and because I am a successful trail monitor. I saw that people were really interested in finding more about these beautiful birds and the knowledge I gained from it. I felt that I could further help them by putting on programs. This summer I did three shows for the National Wild Turkey Federation's "Women in The Outdoors" program. The women that came to this program were very interested in this type of information. Each woman built a bluebird box to take home. Everyone left very excited.

Jim Gephardt, Maryland: I became a speaker at the Marshy Point Nature Center when the chief naturalist at the center asked if I would assist one of his staff members three years ago. He realized I was an enthusiastic bluebirder when we first met. I told him I was a NABS member. The trail at the nature center is registered with the TBT, and I explain that to the people who attend the program. I use the slide show which was purchased from NABS a few years ago. I also belong to the Bluebird Recovery Program (BBRP) and have read and studied every book I could find on the subject of bluebirds after joining NABS.

Elaine Crossley, New York: I've been speaking 22 years on bluebirds. I use slides, video (Stokes Bluebird Basics), NABS info sheet, salvaged nests and eggs, and a tape recorder. I presented seven programs last year.

Nancy Kay Duncan, Georgia: I've been giving programs for about 10 years, and was inspired to become a speaker by my dad and his love for bluebirds. I present my programs to high school students. I was amazed to see how much they learned from the slides. I use my own, as well as NABS and BBRP slides combined to give my own narration. The groups are of 350 students. After the slides I go to classrooms a week later and show nest boxes and answer questions.

Jean Rutan, Ohio: I speak on bluebirds because of the love of Bluebirds – will talk about them every chance I get. As a member of the Ohio Association of Garden Clubs, I was able to use the NABS slides when they firsr came out. I purchased my own set. But I used the Stokes video in the five programs that I gave last year. I've been a speaker for15 years.

June Parks, Iowa: By using houses, poles, feeders, hand-outs, and a lot of other tools available to county coordinators in Iowa, I gave 14 programs in 2003. Library displays and articles in local happenings are always a good place to introduce others to bluebirds. Thanks to Bluebirds Across Nebraska and NABS, a group of birders in southwest Iowa are organizing the Iowa Bluebird Conservationist.

Erv Davis, Montana: Using nest boxes, books, and pamphlets I gave seven talks last year. I became a speaker because I had been doing workshops in schools, etc.

James Berry, Arkansas: I'm new at bluebird presentations. For many years I gave programs on Racing Pigeons, but now the club has disbanded and I turned to helping the bluebirds. I feel that through presentation I can further educate some of the local population regarding the joys and experiences of bluebirds and the proper means and methods of constructing nest boxes and maintaining a bluebird trail, as well as, the importance of making sure that our bluebird population maintains a steady, improving and healthy stock base from which to draw on in future generations.

Lorna Beasley, Florida: I've been helping bluebirds all my life. That's the reason I've

been speaking on bluebirds for 15-plus years. Besides giving presentations to 7th grade science classes at school, garden clubs, retirement homes, etc. We bring people to our property and let them walk our bluebird trail with us, looking in the nest boxes.

Helen Munro, North Carolina: Pinehurst Garden Club-Holly Branch, Academy Heights Elementary School and the Foxfite Garden Club are three of the six places where I gave programs last year. I met a woman who had heard me speak about bluebirds. She bought her husband a nest box for Christmas and watched two broods fledge the next summer. As a result she asked me to speak at her garden club. We gather bluebirders one at a time!

Kathleen Krum, Indiana: I come by speaking about bluebirds naturally. I am a teacher plus I am an avid nature lover. I use a variety of visual aids. A picture is worth a thousand words. Seeing is believing. The school has its own bluebird trail which all of the students take care of. In 2002, our outdoor lab at school was chosen as the best in the state of Indiana.

Mary Janetatos, Virginia: I use bluebird color art prints in the programs. I will be speaking at the Pennsylvania Bluebird Society annual meeting in March. I've been speaking on bluebirds for over 25 years and am the co-founder of the North American Bluebird Society.

Chuck Bliss, North Carolina: For 20 years, I've been giving programs on bluebirds and became a speaker for NABS because of the connection of NABS and the North Carolina Bluebird Society. Local newspaper articles in January and February generate considerable interest in bluebirds and bring me invitations to speak.

Robert Walshaw, Oklahoma: The reason I gave 11 talks in 2003 is because I love bluebirds and I want to pass on my knowledge. I like hands-on activities with bluebird nest boxes, traps, hanging rods, bluebird books, nest examples, and news articles.

Joan Watroba, Pennsylvania: My interest in bluebirds, my former positions as teacher and media director, and the joy of talking with groups of people all are reasons why I became inspired to speak on bluebirds. I bring to my programs a slide show, replica eggs and nests, Cornell nest box/songbird poster, Roberta Lee Bluebird print, nest boxes (different styles), handouts of the brochure Basic Bluebirding, and nest-box plans.

Barry Whitney, South Carolina: With nest boxes, mealworms, posters, and past issues of the *Bluebird* magazine, I give programs because of my love of bluebirds. Kids' Earth Day was a big success.

Bill Ryan, Washington: I am a NABS speaker because Yakima Audubon Chapter needed speakers on the subject of bluebirds, so I joined the speaker group. In one program I spoke to 30 people at a garden club using slides and nest boxes, posters and maps. Both Western and Mountain Bluebirds use our boxes.

Bill Abbey, North Carolina: I became a speaker for the bluebirds because I gain an immense pleasure from talking about the birds we all love. And you twisted my arm: I gave seven programs last year: two for the public, one for the Audubon society, two for the schools, one for the senior center, and one for the Cub Scouts at the Tanglewood Park. I give out NABS and NCBS brochures and special bookmarks.

Art Kennel, Pennsylvania: I became a speaker because I had been a NABS member for many years and enjoyed the bluebirds. I gave six programs last year and have been speaking about bluebirds for 25 years. I give programs in Pennsylvania and Maryland on migrants, but include slides of my own of bluebirds. I still get calls about bluebirds, and I make boxes for friends and clubs. I just joined the Pennsylvania Bluebird Society. I remember the NABS meeting and programs at Gettysburg in October of 1990.

Catherine Traylor, North Carolina: Because of the love of the bluebirds, I give programs in which I use the video "Bluebirds, Inside the Nest Box" for seniors and private showings. I have the educational poster mounted between pieces of Plexiglas with the nesting box diagrams. It makes a nice easy-to-read display and no mess. Also, I have used packet field guides as a gift for children.

Janice Petko, Ohio: I was inspired to become a NABS speaker to spread the word about putting out nesting boxes for the bluebirds. I gave programs at the Canton Garden Club, Girl Scout Troop, Fichtner Nature Center, New England Garden Club, The Wilderness Center (along with Lisa Bulick) Wilmot, Ohio, the North Canton Garden Club, the East Rochester Garden Club, and the Antique Car Club. I used sparrow traps, bluebird puppets, and many informational handouts.

Amy Waite, Georgia: I gave two programs to about 30 people each last year, using the

Edward Gray, Georgia: The reason I became a speaker and gave 14 programs in 2003 was the love, love, love of bluebirds and the nest box distribution system. I built my first box 72 years ago for a merit badge (Boy Scouts) and carved the entrance hole with a pocket-knife.

beautiful and affordable NABS slide set (I culled about half to shorten the program), suet, sample of nesr boxes, predator guards, bird barh, bluebird feeder, nest and eggs (I have permits for rhe larter). I became a speaker for NABS because of working with LuAnn Craighton at Calloway Gardens in Pine Mountain, Georgia, where NABS met at their annual meeting 1993. By the way, the NABS website is a fantastic resource -- thank you.

Jerry Hovas, Mississippi: I did a presentation on how to build a bluebird nest box and a bird feeder (rray-type), and showed how to actually construct a box (two different ones) with pieces that I had precut. It's not *what* inspired me to become a NABS speaker, but *who* — Tena Taylor, presently a NABS board member from Mississippi.

Jean Lister, Ontario, Canada: I have been speaking about bluebirds since 1987. I have an educational session for bluebirders planned for early next year. I became a speaker because of my interesr in having bluebirds thrive in Thunder Bay (on the northwest shore of Lake Superior).

Ken Karnes, New Jersey: Whenever I give a program I tell the story "Father Bluebird," my own short story. This past year I gave a program at the Wanrage School "Learning Circus," a Sarurday morning program for elementary students. I was inspired to become a NABS speaker because Junius Birchard previously (1970's and 1980's) gave programs and upou his death, I continued for my school community.

Sue Ansley, Tennessee: I give many, many bluebird programs here at Owl's Hill Nature Sancruary. I have developed slide presenrations and programs using marerials from many sources, including NABS and other nature/bird/conservation otganizations. I have been teaching adult education classes, garden club programs, scout programs, youth programs, etc, and all these came abour as the result of establishing bluebird trails at Owl's Hill Nature Center near Nashville. We do Cornell programs — The Bluebird Network and Project Feeder Watch — under the citizen science program.

The following individuals returned their 2003 questionnaires which helped NABS determine what works and what doesn't. I want to thank all the speakers for taking time to fill out and return the form by mail or email and also for all they do for the bluebird conservation.

CANADA
Ray Harris
Sherry Linn
Jean Lister
Myrna Pearman
ARKANSAS
James Berry
James Janssen
CALIFORNIA
Donald Yoder
COLORADO
Robert Pliester
CONNECTICUT
Frederick Comstock
FLORIDA
Bill Davis
Donna Legare
Lorna Beasley
GEORGIA
Emory Brooks
Peggy Chaney
Lyn Davies
Nancy Kay Duncan
Edward Gray
Terry Johnson
Frances Sawyer
Amy Waite
Thad Weed
ILLINOIS
Joan Harmet
Loren Hughes
Lloyd Wilson
INDIANA
Jerry Hunefeld
Ken Jankowski
Arthur Jeffries
Kathleen Krum
IOWA
June Parks
Pat Schlarbaum
LOUISIANA
Evelyn Cooper
John McBride
MARYLAND
Jim Gephardt
Jerry Newman
Kathy Woods
MASSACHUSETTS
Lillian Files
MICHIGAN
Kurt Hagemeister
Maynard Sumner
MISSISSIPPI
Jerry Hovas
Tena Taylor
MONTANA
Ervin Davis
Bob Niebuhr
Roger Siemens
NEBRASKA
Steve Eno
Toni Lynn Merchen
Bill and Sandy Seibert
John Holm
NEW HAMPSHIRE
David Eastman
NEW JERSEY
Ken Karnas
NEW YORK
Kevin Berner
Raymond Briggs
Ricky Bruce
Elaine Crossley
Joseph Giunta
David Heidenreich
Ron Howe
Sam Phelps
Evelyn Rifenburg
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Post-breeding flock numbers offered as better way to assess populations

A seasoned bluebirder tells us that the number of birds fledged is not the best indicator of how bluebird populations are doing. Post-breeding flock number and size offer a better way to assess overall populations.

By Dr. Harry Powers

The year 2003 was a reproducrive disaster for bluebirds on my nest box rrail in the Little Belr Mountains south of Great Falls, Montana. Most young appeared to fledge (leave the nest) successfully, but a careful review of nest records showed that nearly all had fledged prematurely. Worse, there were few post-breeding flocks, and the few that existed were unusually small. The net effect is that few young were added to the pool of bluebirds able to breed in 2004.

2003 is an example of how the number of bluebirds leaving the nest (the number fledging) is a misleading indicator of reproductive success. Reproductive success is what counts since it determines how many young birds are recruited into future breeding populations.

Most bluebirdets use *fledging* success as the indicator of *nesting* success because it is the easiest indicator to measure. Unfortunately, if we look at our annual nest-box trail reports, we get the impression that we are increasing the bluebird population very rapidly because nearly every year we seem to produce more fledglings than the year before.

But, in fact, bluebird populations are stable to only slightly growing. Clearly, fledging success overestimates population growth.

Why?

Because more young bluebitds die after leaving the nest than during the nestling stage. We need a better way to measure true reproductive success.

Bettet indicators of what is really happening to bluebird populations are post-breeding flock number and size.

The best way a bluebitder can determine these measures is simply to patrol his/her nest-box trail once or twice a week for about a month after most young fledge. Record the number of post-breeding flocks encountered and their approximate sizes. While these are crude measures, they give a more accurate indication of how successful (or not) a given year has been than is provided by the number of young leaving the nest.

Bluebirders should not confuse post-breeding flocks with migratory flocks. The former are made up of local birds, mostly family members, examining nest sites as prospective breeding location for the next year. (It is because bluebirds choose their nest sites the summer before that they can arrive so early at those sites the next spring; they already know where to go!)

Migratory flocks are far larger, and mostly conrain unrelated birds gathered from a large area. Post-breeding flocks begin forming as young fledge in the summer, while migratory flocks usually arrive not earlier than mid- to late-August.

We could improve the accutacy of our annual records by including in published reports the flock number and size, and the number of patrols a bluebirder completes in a season.

In that way it would be possible to determine how successful a particular year really has been, and in what nesting stages mortality was concentrated. For example, if there were many eggs but few nestlings, hatching failure was common. But, if there were many fledglings but few flocks and those flocks were small, post-fledging survival was low.

Only by knowing the pattern of mortality can we modify our practices to further grow bluebird populations.

(Dr. Powers teaches at Rutgers University in New Jersey. This article first appeared in Bluebird Trails, newsletter of Mountain Bluebird Trails. It is used with permission. It has been edited for use here.)

April 30 is next deadline for Bluebird

The deadline for the Summer 2005 issue of *Bluebird* will be April 30. Earlier submissions always are appreciated. The editor prefers to receive material by e-mail (no attachments, please) at two-jays@. att.net. Postal address is Jim Williams, 345 Ferndale Road N, Wayzata, MN 55391. Include a self-addressed stamped envelope if you wish return of manuscripts or photographs. Letters to the editor are welcome. Letters may be edited for length and content.

When is it time to leave home?

This study examines the factors that influence the age at which Burrowing Owls leave their natal burrow

By Victoria Garcia and Courtney J. Conway

Western Burrowing Owls nest in abandoned ground cavities dug by mammals such as ground squirrels badgers, prairie dogs, and marmots. In non-migratory populations, adult Burrowing Owls sometimes remain at a nest burrow year-round. In contrast, juveniles usually disperse from their natal burrow.

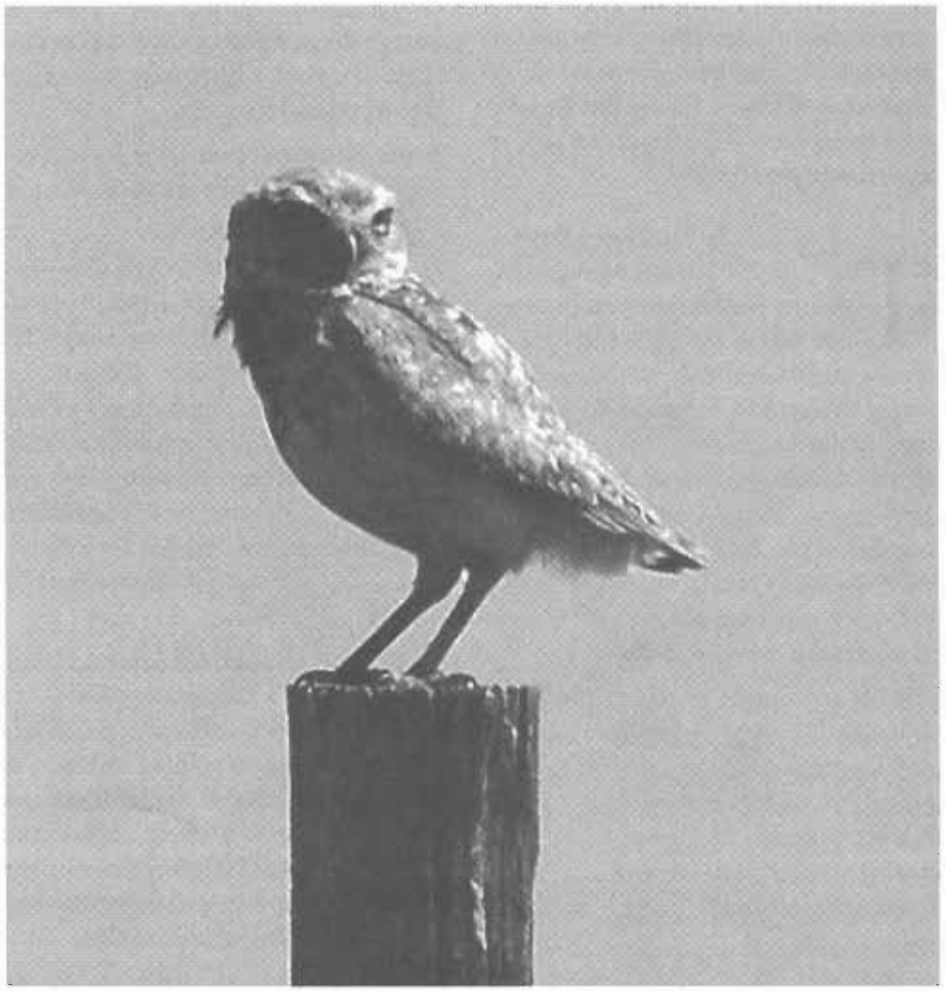
Juvenile owls usually move to another burrow or to a succession of burrows after leaving their nest site. Eventually, juveniles settle at a burrow where they will make their first breeding attempt.

This type of dispersal, called natal dispersal (the movement from the hatching burrow to the site of the first breeding attempt), diffets from breeding dispersal (movement from the site of one breeding attempt to the site of the next breeding attempt).

Despite the need to disperse and set up their own territory, juveniles of many bird species remain on their parents' territory well after they have fledged, and even after they have become independent. Like many of these species of birds, juvenile Burrowing Owls do not all initiate natal dispersal around the same time.

Some of these birds begin this movement very soon after they fledge while others remain near their natal burrow for months after fledging. Some stay at their natal burrow so long that their plumage and behaviot is indistinguishable from that of adults.

This variation in age at which dispersal is initiated is interesting because in a world of limited nest cavities, potential mates, or food resources, the time when a juvenile initiates dispersal could influence its survival and future breeding opportunities.



An adult Burrowing Owl on watch atop a South Dakota fence post. Photos by Jim Williams.

For example, if suitable nest cavities are limited, juveniles who initiate dispersal earlier may have a greater chance of finding a nest burrow for the next breeding season. On the other hand, juveniles who delay dispersing until they are older may have a greater chance of surviving their eventual dispersal movement because they can continue to grow feathers, store fat, and gain experience at their natal site, where they are familiar with food resources and predators.

The age that natal dispetsal is initiated is also an important component of many ecological and evolutionary processes. For example, delayed dispersal is thought to be a stepping-stone to the evolution of coop-

erative breeding systems in which juveniles remain at their nest and help rear siblings in later breeding seasons. This sometimes occurs with Western Bluebirds.

Juvenile male Western Bluebirds sometimes remain on their natal territories through the winter, and some of them even stay through the first breeding season and help their patents (sons help rear theit siblings). One hypothesis for why some Western Bluebird sons remain on their natal territory to help (rather than try to breed themselves) has ro do with the availability of mistletoe, a food resource that occurs in clumps and varies in abundance among territoties.

Given that the age when juveniles initiate natal dispersal can have important implications to the individual, why do individuals vary in dispersal age? If leaving as soon as possible is besr, why doesn't every juvenile leave as soon as possible? Or, if delaying dispersal is best, why doesn't every juvenile delay dispersal?

Our on-going Burrowing Owl research, conducted in eastetn Washington State, suggests that the age in which juveniles initiate dispersal varies according to local conditions.

For example, a resource (i.e., food) may be plentiful in one natal area, causing juveniles there to disperse at a given age. That same resource may be limited in another natal area, causiug rhose juveniles to disperse at a different age. Moteover, the specific conditions that will influence the decision to disperse from the natal atea at any given time are context-dependent.

Thar is, juveniles may decide to disperse based on the availability of one resource within the natal area one year, but respond to another factor when making that decision the following year.

For example, if food is limited one year, food may influence dispersal age that year. If food is plentiful but ectoparasites are especially ttoublesome one year (like other cavity-nesting species, Burrowing Owls tend to have high densities of ectoparasites such as fleas and feather mites), then relative ectoparasite load may influence dispersal age, rather than the availability of food. In another year, food may be abundant, ecroparasites may be low, but predators may be especially abundant. In that year, relative risk of deptedation may be the major influence on dispersal age.

Dispersal is an important stage in an owl's life, and the decision of when to initiate dispersal seems to be influenced by a variety of factors. Results from this study will contribute to our understanding of how intentional man-made changes in the environment are likely to affect dispersal behavior in Burrowing Owls.

Addirionally, the results can be used to manage Burrowing Owl populations in areas where those populations are declining. Burrowing owls are listed as endangeted in Canada and are listed as a *Bird of National Conservation Concern* in the United States. They are also listed as *Endangered, Threatened*, or a *Species of Concern* in nine states. In Washington, Burrowing Owls are a *State Candidate* for listing as *Endangered, Threatened or Sensitive.*

Understanding the causes and implications of variation in natal dispersal age could be used in population recovery efforts. If, for example, delayed dispersal of juveniles tends to increase local recruitment, and increased food around the nest area tends to delay dispersal, then perhaps planting crops that atttact Burrowing Owl prey near nests will allow juveniles to remain in the natal area longer. Hence, local recruitment would increase, thereby increasing population size.

Acknowledgments: This research was supported by an NABS Research Grant. Other sources of funding included: USGS; Budweiser Conservation Scholarship; Frank M. Chapman Memorial Grant; Silliman Memorial Research Award; Mewaldt-King Student Research Award; Marcia Brady Tucker Travel Award. K. Altvater, L. Ellis, J. Jarrell, R. Keck, A. Mitchell, W. Morgan, C. Nadeau, E. Sullivan, and J. Thalamus assisted with field work.

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(Victoria Garcia is at the School of Natural Resources, University of Arizona, Tucson, Arizona. Courtney J. Conway is with the U.S. Geologic Survey, Arizona Cooperative Fish and Wildlife Research Unit, School of Natural Resources, University of Arizona, Tucson, Arizona. Ms. Garcia was recipient of a NABS research grant.)

Two juvenile Burrowing Owls keep a sharp eye on the photographer at the edge of their nest hole in a South Dakota pasture.

What do you do when donated nest boxes are not monitored?

Evelyn Cooper, president of the Louisiana Bayou Bluebird Society (LBBS), recently wrote about nest-box trails and monitoring. If you or your bluebird group helps someone establish a trail, how should you handle the monitoring issue?

By Evelyn Cooper

How does one handle the situation that arises when nest boxes donated to trails, public or private, are not monitored?

The LBBS sponsors 11 trails across the state. Our board decided to write a letter to each project manager and tell them we plan to include a page on our website with the year-end totals for their trail. If they fail to report, we will take their trail off our website. If they continue to fail to report it, we no longer will be a sponsor. We also ask them to sign a pledge that they will faithfully monitor and maintain the boxes, and report to LBBS the nesting results. We also ask that the participants take down the nest boxes if they cannot be monitored.

We include in our package weekly and year-end summary sheets and monitoring instructions.

I have talked personally to three trail managers, and found they really do want to do it right.

Our board has come up with an idea to give an award at the end of each nesting season to the trail that does the best job of monitoring, maintaining, and reporting. A story about the award will be sent to newspapers statewide for recognition. (The papers in Louisiana really are most helpful to us!)

We recently took 12 complete nest-box units to the Jimmie Davis State Park in Jonesboro, Louisiana. And, I recently received a call from a state park in the northwestern part of the state saying staff members there are planning a project to make their park more bird-watching friendly. They asked me to advise them on plants to put out and places to put nest boxes. They said they had been in communication with the Jimmie Davis State Park. I told the lady that monitoring was the very most important thing that should be done.

It is our desire to have LBBS trails across the state in our state parks and on other trails. We are hoping that by providing good groundwork and detailed instructions on exactly what we expect (with some firmness), we will be successful.

(Evelyn Cooper can be reached by email at emcooper@bayou.com.)

A list of birds of Continental Importance

This is a list of North American cavity-nesting bird species designated as of Continental Importance by Partners in Flight (PIF). All are on what PIF calls the Watch List, meaning these species are most in need of conservation attention.

Species for which there are multiple causes for concern across the entire range:

Red-cockaded Woodpecker
Ivory-billed Woodpecker

Species moderately abundant or widespread with a decline or high threats:

Red-headed Woodpecker
Oak Titmouse
Brown-headed Nuthatch
Protonotary Warbler

Species with restricted distribution or low population size:

Flammulated Owl
Spotted Owl
Lewis's Woodpecker
Nuttall's Woodpecker
Arizona Woodpecker
White-headed Woodpecker

Additional stewardship species, those with a high percentage of the global population in a single biome (during breeding season or winrer):

Red-bellied Woodpecker
Williamson's Sapsucker
Yellow-bellied Sapsucker
Red-naped Sapsucker
Red-breasted Sapsucker
Black-backed Woodpecker
Chestnut-backed Chickadee
Boreal Chickadee
Black-crested Titmouse
Mountain Bluebird

(For related article, see page 4.)

Bluebird News Shore to Shore

The Brice Prairie Conservation Association, Onalaska, Wisconsin, wanted to fledge 2,500 fledgling Eastern Bluebirds last year. It exceeded its goal by recording 3,066 bluebird fledglings. In addition, members of the group counted 504 Tree Swallows, 26 Chickadees, and 101 House Wrens fledged from its boxes. This increase resulted from placing 228 new houses, recruiting several new bluebird trail masters, and moving nonproductive houses to more ideal locations. There was no apparent mortality from heat, cold, or insects, according to the Brice report, but considerable mortality remained unexplained. Production was measured at 4.14 bluebirds per nest box and about 5.0 birds of all species per box.

Eastern Bluebirds fledged from nest boxes monitored by members of the Indiana Bluebird in 2004 teached a high of 7,505, according to the organization's annual report. Boxes tended numbered 2,369, with 9,056 eggs, and 7,835 hatchlings. In addition, 3,148 Tree Swallows were fledged.

Bluebirds Actoss Nebraska is entering the second year of its planned three-year effort to help restore Wood Ducks to the Nebraska landscape. Working with the Nebraska Environmental Trust Fund, 50 Wood Duck nesting boxes were distributed last year, with 100 the target this year. A participation fee covers a nest box, wood shavings to put in the box, mounting hardware and pole, predator guard, educational packet, a wotkshop session, membership in The Wood Duck Society, and a starling trap if needed. Participants must agree to monitor the boxes.

During the 2004 nesting season, birds using nest boxes tended by members of Mountain Bluebird Trails (MBT) fledged an even 16,000 youngsters. According to a report in the MBT newslettet, 13,908 of these fledglings were Mountain Bluebirds, 2,073 were Western Bluebirds, and 19 were Eastern Bluebirds. The Easterns came from boxes tended by MBT member Justin Hoff of Richardson, North Dakota.

Erv Davis, former NABS board member and past president of Montana's Mountain Bluebird Trails (MBT) organization, has been honored as the 2004 National Wildlife Refuge System Volunteer of the Year. Our congratulations to Erv. He was in Washington, D.C. in February to receive the honor. Erv, 78, who lives in Charlo, Montana, has been active as a volunteer at the National Bison Range, part of the refuge system, for over 35 years. He also has helped with spring duck-banding. But his labor of love, he said in a newspaper interview, is with the bluebirds he finds on the buffalo range. He monitors over 40 boxes there, and has created a trail system linking them for the enjoyment of visitors. With MBT, he helps band over 2,000 bluebirds each year, and helps maintain another 400 nesting boxes. He and a friend also build 500 to 600 boxes each year.

A Western Bluebird aged six years and two months was trapped for banding last year by a member of the Prescott Bluebird Recovery Program in Oregon. A check with the federal bird-banding laboratory revealed no older Western Bluebird on record.

The Prescott bluebirders also counted 652 nesting attempts in 2004 in their nest boxes, a record number. This reflects continued recovery for the species after a sharp decline was noted in 2002. A total of 1,878 Western Bluebirds fledged from these nests.

The North Carolina Bluebird Society reports that nest boxes tended by its members fledged 4,761 Eastern Bluebirds in 2004. Boxes totaled 1,255. Three nestings were recorded in 107 of those boxes.

Commenting on the golf-course study presented in the Wintet 2004 issue of Bluebird, tegular correspondent Jim Janssen tells us that the Bella Vista (Arkansas) Bluebird Society now boasts 388 nest boxes on eight different golf courses. The program began on a golf course, he says, and the total number of bluebirds fledged since 1981 numbers 24,987. Chickadees, Tree Swallows, Carolina Wrens, and Tufted Titmice also have successfully used the boxes. Mr. Janssen notes that the swallows are Johnny-come-latelys, none recorded in the 20 years prior to 2002. Only NABS boxes are used on the various ttails, he says. Cooperation from the golf courses, he notes, includes mowed trails to box locarions.

Editor's note: I receive a number of newsletters from state and regional bluebird groups. The content of this column is drawn from those newsletters. My thanks for being on the mailing lists. My compliments to the editors, all of whom do wonderful work and offer a valuable service to their organizations and readers. If I am not on your mailing list, please add my name. I would very much like to see each and every issue. Send them to Jim Williams, 345 Ferndale Road N., Wayzata MN 55391. Thank you.

Book Reviews

By Jim Willliams

Two birds we think are gone forever

Bird books that tell an exciting, compelling story are hard to find. "The Race to Save the Lord God Bird" (Farrar, Straus, Giroux, $20) is one of rhose rare books. But it's not as rare as its subject: the Ivory-billed Woodpecker, a species believed by most experts to be extinct.

Author Phillip Hoose tells the story of the Ivory-billed Woodpecker's path to extinction and of one man, James Tanner, who worked to save it. (The book's name comes from one of the nicknames for rhe woodpecker, which refers to a common response on seeing one for the first time: "Lord God, whar a bird!")

The book covers a lot of ground — from the early days of the 19th century, when John James Audubon painred his Ivory-bills, to possible sightings of the birds in 2001. And it reveals a lot abour the hows and whys of extinctions and our changing attitudes about wildlife and wild places.

It also includes a list of dares important ro the history of bird protection, beginning in Bermuda in 1607 and continuing to 2002, when a team of experrs searched a Louisiana swamp for a month, looking without success for a surviving Lord God Bird.

This is a good read, an informative book thar moves with the intensity of an adventure novel.

Two more new books, yet anorher about Ivory-billed Woodpeckers and one telling the story of Carolina Parakeets, leave ever so small a hole in the common belief that both of these bird species are extinct. Although the odds are very long, it might be simply that we don't know where they ate.

Following Phil Hoose's fine book, 'The Race to Save the Lord God Bird" is Dr. Jerome Jackson's "In Search of the Ivory-billed Woodpecker (Smithsonian Books, $24.95). Dr. Jackson recounts more than 20 years of research on and search for the Ivory-bills here and in Cuba. His account is thorough, with a taste of adventure.

"The probability of Ivory-bills still existing in the United States or Cuba is slight," he writes, "but there is a possibility."

"The Carolina Parakeet, Glimpses of a Vanished Bird" by Noel Snyder (Princeton University Press, $29.95) discusses the fate of the only parrot native to the U.S. This green, yellow, and orange bird once flew in flocks from Florida to New York and as far west as Colorado. The last living Carolina Parakeet died in the Cincinnati Zoo in 1918, with the last wild sighting, commonly believed for many years to have been 100 years ago in 1904.

Snyder, like Jackson, spent decades researching his subject. He interviewed old men, hunters and trappers and guides, in South Carolina and Florida about their recollections of the bird. He turned up stories that date surviving wild birds to 1938 (a nesting record) and 1944. He suggests that parakeets might have survived into the 1950s.

"The Carolina Parakeet, so far as is known, is gone," Snyder writes, leaving us that shorr thread of hope. And then he deals with reality: "In the lasr analysis, the vast majority of coming extinctions, like the extinction of the parakeet, will surely be due in one way or another to the sheer numbers of our own species and to the increasingly severe and diverse impacts we are having on natural systems."

These are not bright and cheerful books, but they offer adventures worth sharing and lessons we need to learn.

Garden projects

Projects for the Birder's Garden" (Rodale Press, $17.95) boasts more than 100 "easy things you can make to turn your yard and garden into a bird-friendly haven." And this book delivers on its promise.

Feeders, birdbaths, drippers, nest boxes, seed selection and storage, even dealing with squirrels and cars - it's all clearly covered here and augmented with helpful drawings. There are sidebars and helpful hints on almost every page, and the do-it-yourself projects, particularly construction of feeders and nesting boxes, are well chosen. They'll appeal to the budget-minded among us, nor a bad thing when you can easily spend 50 bucks for a feeder in the store.

While this book is aimed at beginning or intermediate birders, it has a trick or two to teach long-time birders, as well. It could serve not only as a guide for your to-do list but also as a handy reference to add to your bird bookshelf.

Spring Celebration in Louisiana

Louisiana Bayou Bluebird Society (LBBS) invites you to its Spring Celebration Saturday, May 7, at Waddill Wildlife Refuge Center, 4142 North Flannery Road, Baton Rouge, from 2 to 4:30 p.m.

Kenny Kleinpeter, vice president of LBBS and LBBS 2004 Bluebirder of the Year, bluebird trail monitor, and Purple Martin expert, will be guest speaker, discussing attracting and managing secondary-cavity nesters with emphasis on bluebirds, martins and Wood Ducks.

There is no admission charge or tegisrtation fee.

BLUEBIRDING SUPPLIES FROM NABS HEADQUARTERS

ITEM #	DESCRIPTION	AUTHOR/SOURCE	COST	QTY	TOTAL
B-1	The Bluebird Monitor's Guide	Griggs, Kridler, Berger	$15.00		
B-2	Bluebird Trails – A Guide to Success	Dorene Scriven	$12.00		
B-3	The Bluebird Book	Don & Lillian Stokes	$13.00		
B-4	Enjoying Bluebirds More	Julie Zickefoose	$4.00		
B-5	Mountain Bluebird Trail Monitoring Guide	Myrna Pearman	$4.00		
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EP1	Educational Poster & Pocket Field Guide	NABS	$7.00		
PFG1	Pocket Field Gnide	NABS	$1.50		
EP2	Education Packet	NABS	$6.00		
SP1	NABS Bluebird Slide Program	NABS –80 slides & script	$55.00		
T1	Van Ert Universal Sparrow Trap	Floyd Van Ert	$11.00		
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OTHER SOURCES OF BLUEBIRD RELATED ITEMS

In order to make bluebird nest boxes and related items available to NABS members at the lowest possible cost, we have listed the names of reliable suppliers who sell quality goods at reasonable prices. A portion of the profits from these items is donated to NABS. Please Contact these suppliers directly; **do not send these orders to NABS**. These companies do not take credit cards. Visit our website www.nabluebirdsociety.org for photos of items listed here.

Nest Boxes, Nest Box Kits, Bluebird Feeder – from Ahlgren Construction Inc.

PRODUCT	DESCRIPTION	COST	SHIPPING	SHIP EA ADD
Peterson Nest Box – Kit Form	Solid Cedar with Hardiboard Sides	$10.00	$8.00	$2.00
Peterson Nest Box Assembled	Solid Cedar with Hardiboard Sides	$12.00	$8.00	$2.00
NABS Style Box – Kit Form	Solid Cedar, side opening, bottom hinged	$10.00	$8.00	$2.00
NABS Style Box – Assembled	Solid Cedar, side opening, bottom hinged	$12.00	$8.00	$2.00
Noel Predator Guard	Wire Cat/Coon Guard	$2.00	$6.00	$0.25
Noel Guard for Peterson Boxes	Wire Cat/Coon Guard w/ Adaptor	$3.00	$6.00	$0.25
Jail Style Mealworm Feeder	Solid Cedar with Dowels	$12.00	$7.00	$2.00

Send check or money order to: **Ahlgren Construction Inc**, 12989 Otchipwe Ave. N., Stillwater, MN 55082. Cannot ship to a post office box, must have a street address. Cannot ship outside USA. MN residents add 6.5% sales tax. To receive these special prices, put "NABS DISCOUNT" on your order.

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PRODUCT	DESCRIPTION	COST	SHIPPING	SHIP EA ADD
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Repeating Sparrow Trap	Large Wood and Wire Trap	$45.00	$10.00

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