

Sialia

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*The Quarterly Journal
Of
The North American
Bluebird Society*



THE NORTH AMERICAN BLUEBIRD SOCIETY

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S*ialia* means bluebirds. Hence, the title of this journal. It is the word which the Swedish scientist, Carolus Linnaeus (1707-1778), used to name the genus grouping for bluebirds, a subset within the thrush family (Turdidae). Technically, *sialia* is the Latinized, neuter plural version of the Greek word *sialis*, a noun meaning a "kind of bird." Since the Eastern Bluebird was the first bluebird he classified, Linnaeus gave it the species name, *sialis*. Therefore, the scientific name for the Eastern Bluebird is *Sialia sialis* (pronounced see-owl-lee-ab, see-owl-iss). Similarly, the Western Bluebird and Mountain Bluebird, the two other species within the genus, were named *Sialia mexicana* and *Sialia currucoides* (coo-roo-coy-dees) respectively, and their species names are descriptive of their locations. All three bluebirds are native only to the North American continent, although each inhabits different regions generally separated by the Rocky Mountains and by altitude preferences.

While the adult birds all show differing plumages, the young of all three species look remarkably alike, prominently displaying spotted breasts and large white eye rings. This similarity in plumage was the principal reason the SOCIETY chose the juvenile bluebird for its logo. Since bluebirds almost always choose to raise their young in small enclosed cavities, a young bluebird sitting near a nesting box seemed to symbolize our mission. The hope of any species resides in its young. Because of bluebird nesting preferences, the survival of their young may depend on the nesting box, especially since natural cavities, for a variety of reasons, are disappearing rapidly. The theme of bluebird young nurtured in man-made structures will be a recurring one in our art and literature. We hope this theme will remind all about the plight of the bluebirds, and will stimulate actions which will allow this beautiful creature to prosper.

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Sialia

The Quarterly Journal
About Bluebirds

VOLUME 1, NUMBER 4

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EDITOR
Jon Boone

CONTRIBUTING
EDITORS

Robert M. Patterson
Suzanne Turner
Lawrence Zeleny

CONTENTS

Where Do We Go From Here? Robert M. Patterson	134
Bluebird Express: an editor's mailbag Jon Boone	136
PROFILE: William G. Duncan A Prophet With Honor	138
1979 First Brood Nesting Report Society Research Program	141
A Sheltered Feeder for Bluebirds Vera Mclean Gourlay	144
Utility Companies Can Help Bluebirds Robert M. Schutsky	146
Bluebird Tales Mary D. Janetatos	148
Nesting Boxes & Platforms for Birds Benjamin P. Burt	150
Plantings for Bluebirds & Other Wildlife George N. Grant	164
Bluebird Poetry: a short anthology Katharine Braun, Edna Meudt, Helen Wohl Patterson	169
Winter Banding & Roosting Boxes Robert M. Patterson	170
The Sparrows Won The War Neil A. Case	177
Trail Work With Incubators & Foster Parents Anne Sturm	180

Cover

This bluebird, perched atop a sprig of sumac, serves to remind us that a successful nesting season is but a part of the total needs of this species. During the winter when food supplies become increasingly scarce, sumac berries become a very important factor determining bluebird survival. The berries ripen relatively late in the winter season and, in many areas, may be the only food source for bluebirds at a time when weather conditions are most severe.

**Forma autumni omnes de
sapientia mutationis monet!**

SIALIA welcomes the submission of articles, artwork and photographs for publication. Manuscripts should be neatly typed and triple spaced. All submissions will be carefully considered, but authors considering major submissions should correspond with the editor first. All manuscripts will be acknowledged. Before preparing tables, graphs or other display material, please check with the editor about the requirements of our reproduction process. The editor's address is 9505 Good Lion Road, Columbia, MD 21045.

Where Do We Go From Here?

Robert M. Patterson

With the mailing of this issue of *Sialia*, the Society completes its first year of publication. Who would have thought one year ago that *Sialia* would come so far in such a short time? We all owe a thank you to Jon Boone for the fine work he has done, not only for his excellent artwork and writing, but for the encouragement he has given to many others to submit their articles and poetry for our enjoyment.

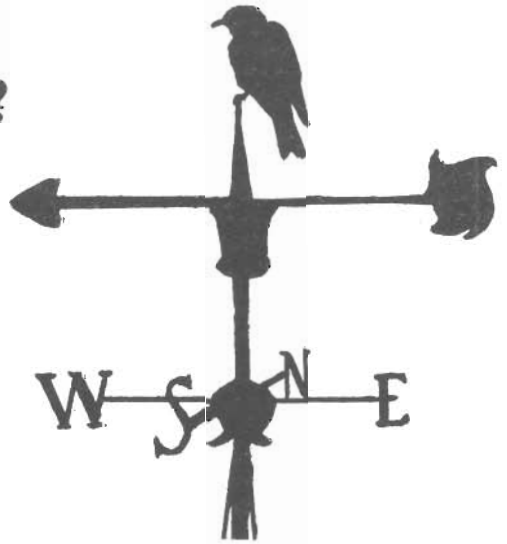
I have had a few letters from people who were somewhat reluctant to write articles for *Sialia* telling about their personal experiences on the bluebird trail. The common expression in these letters was over the fear that the individual was unable to write a "scientific" article with the further assumption that an article would be rejected for publication because it did not meet some sort of high standard. Such fears are unfounded.

In the survey of member's interests taken a few months ago, many members expressed a desire to see articles written by other members telling how they solved problems on their bluebird trail, success stories, anecdotes, tips for building nesting boxes or feeders and so forth. Such articles and stories need not be "scientifically" written. No special prior experience in writing is required. If you have an interesting story to tell, there is a high degree of probability that it will be published. We'll help with any rewriting that may be necessary and offer suggestions for improvement if possible.

In this issue we have not one but three poems written by members. Poems and articles cannot be presented in *Sialia* unless they are first submitted, so get out your pen and paper (better yet a typewriter) and put your ideas down.

Election and Ballot Forms

Accompanying this issue of *Sialia* is the official notice of the Annual Meeting, a registration form for your use in the event you will be able to attend in person, the report of the Nominating Committee listing the slate of candidates for officers and directors, a proposal for a change to the By-laws to increase the numbers of directors from outside the Washington area, and your absentee ballot form to use if you cannot attend the meeting. Please take a few



minutes to study this material and be sure to mail your ballot soon as instructed on the ballot form.

Nesting Box Record Cards

Many members requested Nesting Box Record Cards earlier this year so they could participate in reporting their bluebird data as part of the Society's research program. A number of persons have not yet sent their completed cards back to the Trails Department. It would be very helpful if everyone would take time to complete their cards and return them in the next week or two so the big job of compiling the data can begin. We hope to have at least a preliminary report based on record card data published in the next issue of *Sialia*.

Activities in the Works

At the planning meeting held in August, a number of ideas concerning special projects were discussed. Ben Pinkowski gave a presentation about blowflies, and about a research program that members could participate in next year. This possible research activity is presently being considered by the Scientific Advisory Committee, and will be further aired at the Annual Meeting in November. Jack Finch offered particularly valuable suggestions concerning the blowfly project, which would test methods of reducing insect parasitism of bluebird nests.

Education Committee Chairman Richard Tuttle made an excellent presentation of the slide program he uses to develop interest in bluebirds at nature centers in Ohio. Society members will be able to learn much about bluebird work through the Society's new slide program which Richard put the finishing touches

Sialia, Autumn 1979

on over the Labor Day weekend.

George Grant brought his collection of slides of berry-producing plants to the meeting and received many suggestions for developing this slide program from those in attendance. George will continue work on this project which should be of particular interest to garden clubs, landscapers and others.

A number of comments and suggestions were made regarding the design and function of the Society's nesting box record cards. **Paul Nistico** led a discussion about the computer programming aspects of the record card program, and more planning of the electronic end of this business awaits the return of large numbers of cards by Society members. We'll be working on this in the months ahead.

Bluebird Items for Sale

Members will find several new offerings in the merchandise advertising section accompanying this issue of *Sialia*. In keeping with the membership's requests, we are striving to locate items for sale that would appear to be of interest to bluebird conservationists and which (1) are of good quality, (2) can be offered at a reasonable price, and (3) do not require heavy outlays for inventory. For instance, the Christmas card, ceramic figurine and bird feeders are all made by Society members and are offered to the Society on consignment.

Certainly there are other members out there who are involved in various artistic or handicraft pursuits who could make interesting items available to the Society and earn money in doing so. We'd like to hear from you.

Before the nest spring rush for nesting boxes, we would especially like to hear from members or friends who can supply good nesting boxes of various designs for sale to members. Whether you can supply 25 or 2500 boxes, please write to the Executive Director and receive a copy of the Society's nesting box purchasing policy and specifications.

Bluebird artists are especially encouraged to submit their work, both for use in illustrating the cover of *Sialia* and for articles within, and for use on stationery items such as the informal notes currently being offered.

Experimental Nesting Boxes

Whether or not you are participating in the record card project by reporting data for all your nesting boxes, we urge you to submit record cards for any of the three **experimental nesting boxes** being tested by the Society this year. The three designs are (1) the open-top box, (2) the raised-top box, and (3) the PVC or plastic box. Record cards for these boxes should be submitted regardless of whether they were

used or not used, and regardless of what species may have used them. If you need record cards for this purpose, please write the Society and they will be sent to you at once.

Growth of the Society

As we approach the end of our first full year of operation, membership in the Society approaches 1,500. Additional memberships are coming in every day as more people learn about the Society and its programs. Everyone who has been working to help the Society grow is anxiously awaiting the publication of a cover story in *Parade Magazine*, the Sunday newspaper supplement, about Larry Zeleny, bluebirds and the North American Bluebird Society. It should appear sometime this fall or winter.

All Society members whose memberships expire with this issue of *Sialia* will find a membership renewal envelope in the package in which *Sialia* was mailed. We hope you will help keep the Society's membership level high by renewing your membership now. Each membership renewal is especially important to the Society, for it reduces the need to commit scarce funds for membership promotion by direct mail.

Thank You For Helping

For the last year and one-half it has been my great privilege to help guide the Society through its formative period. It has been a strenuous period involving many meetings, a lot of hard work and a lot of fun. It has also required a considerable amount of time and talent contributed by a great number of people to get us where we are today. I wish I could list the name of every person who ought to be thanked, but there simply isn't space.

My retirement as an officer of the Society does not mean I'm quitting bluebird conservation. However, I will not be tied to a desk as much as has recently been the case. In addition to the start of a new business that involves bird feeders and nesting boxes and the like, I am looking forward to much more personal experience with bluebirds next spring, and hope to spend considerable time filming the nesting cycle at nesting boxes on my bluebird trail at our county dump. That's right, DUMP! We exploit every opportunity to increase the number of bluebirds in Prince George's County, Maryland.

I wish that I had been able to accomplish more for bluebirds these past few months, but dreams are always larger than life, and much work remains to be accomplished. I know that, given the spirit and strength of support it has been my fortune to experience, the Society's new leadership will continue to move forward with our pressing agenda.

Thank you for helping.

BLUEBIRD EXPRESS

SIALIA welcomes the correspondence of its membership. Bluebird Express should become a forum for all who are interested in communicating their ideas and actions concerning bluebird conservation. We will attempt to publish a wide range of views in a responsible manner. Keep your letters coming!



A number of readers have inquired about deadline dates for submitting articles for possible publication in *Sialia*. I hope you will be receiving each of the quarterly issues on or about the 15th of October, January, April and July. Because of these deadlines, I need to have at least a draft of your manuscript in my hands not later than 45 days in advance of the above dates and, preferably, 60 days in advance. If the manuscript requires any significant revision, one month or more may pass before there is final agreement on content and style. Moreover, in planning the content of *Sialia*, I am trying to keep at least one issue ahead. Consequently, if manuscripts are sent and are chosen for publication, they may not appear until the next issue for which you had intended.

Several other readers have questioned why I have placed short Latin sentences in the cover description box on the title page. The answer is that, while I am no scholar of the ancient Latin language, there is considerable value in seeing how just a few Latin words can describe rather lengthy English sentiments. The first Latin expression occurred in the Spring 1979 issue of the journal, *Ver Aeternum!*, and in translation means, "Spring is eternal"—a rather natural thought for that issue. *Aestuantes hiemis frigidae mememote!*, the expression for the summer edition, should read, "In the heat of the summer, remember how cold the winter was." It seemed appropriate. In this issue, the translation is, "Beautiful autumn reminds us all of the wisdom of change." By using a brief Latin sentence, it is possible to convey a lot of meaning. It is my hope many of you will be sufficiently curious about what the Latin message contains so that you will attempt to obtain the translations yourselves. That can be a lot of fun. I will, in the future, provide the translations for each expression in the edition following the one in which it appears.

Because there are two features about the House Sparrow in this issue, I do wish to comment on the observations made by our good friend from Roswell, Georgia, Col. W. R. Robertson. It is Col. Robertson's view that House Sparrows are not as likely to nest in a nesting box intended for bluebirds if that box is placed at least 25 yards from any man-made structures, such as houses, barns, sheds, etc. However, it has been my experience, and that of many others, that House Sparrows will opportune themselves to take over a bluebird nesting box located as far away as 1/2 mile from those sites. There is evidence to suggest that the farther a nesting box is placed from buildings, the less likely House Sparrows will pay their respects. Col. Robertson strongly urges that bluebird conservationists investigate this notion. I agree. Does anyone have any recommendations?

Dear Editor:

I would like to report that when checking our bluebird trail this week, I found a clutch of five bluebird eggs and one cowbird egg. The nest appeared to be a bit raised in the box, so I wonder if another cowbird egg has been roofed over?

Mrs. Vincent Perna
St. Charles, Missouri

Dear Mrs. Perna:

As Dr. Zeleny describes in his book, *The Bluebird*, cowbirds don't, with any regularity, molest bluebird nests. The incident you have reported is apparently relatively uncommon. To determine if the bluebirds in question did in fact cover over an earlier nest, you could have

carefully raised the nest grasses and looked for a first nest near the bottom of the box. It seems unlikely, however, that there was a cover-up. But, if there were, please inform. It would also be useful to measure the diameter of the entrance hole of the nesting box to see if there is any variation on the 1½" size recommended.

I hope you will be sure to complete a Nesting Box Record Card for this box with special notations about the cowbird egg. Since there have been so few reports of cowbirds imposing upon bluebirds where the entrance hole does not exceed 1½", these observations should be very instructive. Finally, I hope you removed the cowbird egg!

Dear Editor:

This morning I came across a little vignette I had composed last spring when searching for material for one of my assignments for my journalism course. I did not use it then, but thought maybe you could use it as a "fill-in" somewhere in *Sialia*, if you think it is worthy. I call it "A thought from the blue."

"The bluebird asks nothing of us—it exists only that it be allowed to live out the purpose for which it was created—to roam the skies; bring joy and happiness to all who see its azure-blue color flashing in the sun, and hear its plaintive "Pure, Pure"; to build its nest once, twice, even three times a season, to perpetuate itself many times over, so we may continue to see, feel and experience the wonderful sense of joy and happiness, endowed by the Creator, to pass on to us as we witness its activity season after season after season—provided we respond with the lift it needs to keep it flying!"

Maybe you could have a regular section in *Sialia*,—Thoughts from the Blue—and include some thought you may receive either directly, or indirectly from correspondence from members. Just a thought!

Katharine M. Braun
Shingletown, California

Dear Mrs. Braun:

A very good thought indeed. I hope this motivates all readers to follow your lead. I think such a series of vignettes would be a first-rate addition to *Sialia*. I'm sure readers will enjoy

your beautiful poem "Pure Blue" on the poetry page in this issue, and that they will be looking forward to your article "The Fabulous Bluebird" which will appear in the Winter 1980 issue. Thank you so much, Mrs. Braun, and my best wishes to you and Charles.

Dear Editor:

I read with considerable interest Hubert Prescott's article, "Oregon's Willamette Valley" in *Sialia*, Spring 1979. Hubert's articles are always well-written and interesting. The readers of *Sialia* will be fortunate if he continues to contribute articles as time and health permit. Two generalizations in the article, however, move me to elaborate.

The Mountain Bluebird is described as keeping to eastern Oregon except for occasional strays. Although we generally think of the Mountain Bluebird as an eastern Oregon bird, it is also a regular summer resident of the mountain meadows, cutover areas, and burned over areas at higher elevations on the west slope of the Cascade Range. Since 1971 I have recorded 16 sightings of Mountain Bluebirds in the Willamette National Forest, some at points as far as 15 miles west of the Cascade Crest. This species has been documented and photographed nesting in the Cascades about 40 miles west of the Crest.

Secondly, during the past six years there have been numerous egg and nestling losses on a bluebird trail sponsored by the Eugene Natural History Society which are difficult to attribute to predators other than snakes. Our notes show that three snakes have been found in nesting boxes during this period. Based on these observations, it appears that snakes significantly influence bluebird nesting success in the southern part of the Willamette Valley.

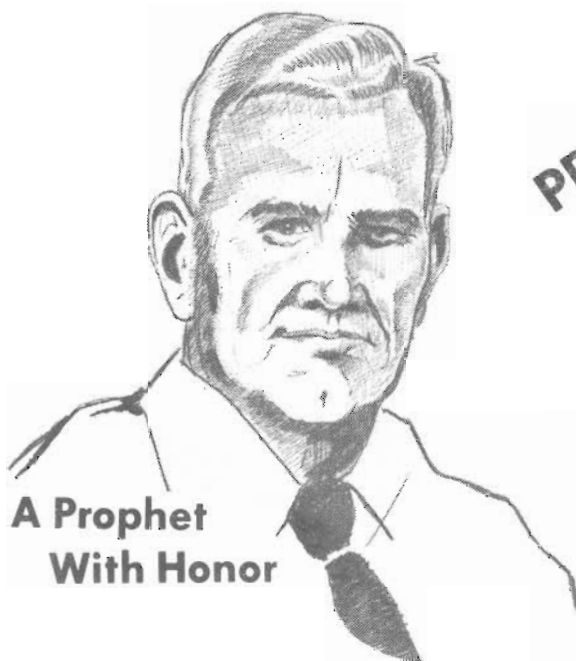
Allan A. Prigge
Eugene, Oregon

Dear Mr. Prigge:

Thank you for expanding our awareness. Shortly before we went to press, Mr. Prescott reported evidence of snake predation in that region, but could document only one such incident. Your report is most helpful.

PROFILE:

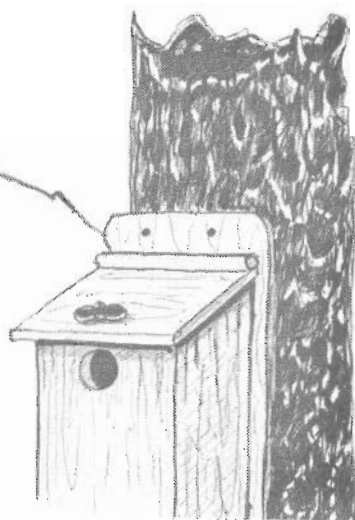
William G. Duncan



A Prophet With Honor

For a man who tries to have other people speak for him, William G. Duncan has acquired a very large audience. During the past sixty years, Bill Duncan, a life-long resident of Louisville, Kentucky, has devoted much of his time addressing environmental concerns, with particular emphasis on bluebird conservation. To Mr. Duncan, the population decline of the bluebird "is symbolic of what we are doing to the world around us." The bluebird—indeed, all life—is threatened by too many amoral people who think only of the short term, unmindful and uncaring of the consequences which follow from urban/suburban sprawl, chemical food additives, indiscriminate pesticide use and the explosion of humanity's birth rate. In Bill Duncan's view, it is more than ironic that the bluebird, a species which past generations of Americans helped toward prosperity, is now a victim of contemporary American practices. But, while Mr. Duncan laments the bluebirds' population decline, his efforts over the years have undoubtedly given conservationists hope for preserving the bluebird as an enduring link in the chain of life.

Bill's passion for conservation began down on the farm. His great-grandfather, Thomas Hite Duncan, came to Kentucky from



Virginia, settling in Hardin County, not far from the birthplace of Abraham Lincoln. His grandfather, Joseph Deweitt Duncan, fought with distinction in the Civil War, but developed tuberculosis after serving time as a prisoner of war. He died of this dread disease a generation later, when Bill's father, Stewart English Duncan was but twelve. Stewart grew to be an enterprising man and fostered a very successful wholesale business in Louisville, which allowed young Bill to have a relatively affluent childhood.

Bill himself was born in 1897, although his mother died giving him birth. His father remarried five years later. Bill remembers the summer of 1902 with fondness, because that was the year he spent the summer with family friends, the Clarkson's, at their farm outside Louisville. Two years later, the

Duncan family—Bill, his sister and his new half sister—moved to the country, and Bill became intoxicated with the sights and sounds of nature. At every opportunity, he would wander along, among the woods, streams and meadows of Mockingbird Valley, in eastern Jefferson County; for at that time, there were few homes to provide neighboring children as playmates.

As Bill's enthusiasm for nature lore grew, his parents were puzzled, yet tolerant of his unusual sojourns and rather solitary ways. His stepmother gave him a field guide to allow identification of the birds he encountered. In the midst of these halcyon days, when Bill was a teenager, he came across a tree hole excavated by a Red-headed Woodpecker. But, instead of finding the then-familiar red-white-black feathers of this bird, Bill confronted the most brilliant blue feathers he had ever seen. It was a male Eastern Bluebird guarding its nest, constructed in the woodpecker hole. He returned to the site again and again to watch until the young birds fledged. Bill never forgot this incident, for it stirred a life-long interest in the bluebird.

While Bill was honing his skills as a naturalist, he was also becoming quite a student. He attended Louisville Male High School, and was greatly influenced by the school principal, Rubin Post Halleck, a prominent historian. Bill took his studies very seriously, particularly enjoying Greek, Latin, history and literature. After his high school commencement, Bill traveled east, leaving his beloved Jefferson County ambience for Princeton University. At Princeton, besides combing every inch of the nature preserve, Bill majored in history and politics, earning his bachelors degree in 1918. He became an avaricious reader and developed extremely broad interests.

After leaving Princeton, Bill returned to the Southland and began work as a salesman. Eventually, he hired on with Devoe Company, going from town to town across the southern states selling Devoe painting supplies. He was a very successful salesman, becoming the company's sales manager and then its vice president. He retired in 1960.

In his early working years, Bill Duncan rarely had time for birds and even less time

for women. He did not marry until age 32. But his wife, Azalea, was a perfect match, and shared his love of wildlife and conservation. They established a home base in suburban Louisville which became a 3-acre wildlife refuge. They raised two sons—one now a successful banker in Louisville, the other heading his own law firm in Chattanooga, Tennessee. For many years, Bill and Azalea would travel long distances to speak at women's clubs, garden clubs and any group which would listen about conservation techniques and bluebird husbandry.

About 1930 Mr. Duncan began what came to be a life-long series of correspondence with Dr. T. E. Musselman of Quincy, Illinois. Bill had read of Dr. Musselman's concern for the dwindling number of bluebirds and became very interested in nesting box design and the concept of bluebird trails. With Musselman's encouragement, Bill began to make his own boxes, setting them along the Jefferson County countryside. And he got bluebird tenants. Over the years, he erected hundreds of these nesting boxes, communicating his observations with Dr. Musselman, and a small group of associates. He incorporated his discoveries into his talks. Gradually, as the work spread, Bill and Azalea began receiving inquiries about bluebirds from people all over the country.

Consequently, in the 1950's, Duncan began to distribute his unique "newsletter." It was, and is, a one or two-page compendium of conservation news—culled from news reports, magazine articles, books and letters—which Bill felt were significant. He added quotations from Thoreau, Athos Menaboni, Lord Keynes, Aldo Leopold, Rachel Carson and others whom he felt distilled the essence of his own thinking. Of course, he added specifications for his famous "Duncan" nesting box design, which he devised over the years. Its hallmark is a removable top held in place with a wing nut. Bill and Azalea now send the newsletter to over 1,500 persons around the country, all at their own expense. The newsletter certainly reflects Duncan's wide range of interests. For example, one letter will focus on population control; another will address

the issue of nuclear power; and still another will encapsulate the effects of local habitat changes. Occasionally, Bill will speak directly on a subject, as he did upon the death of his father. Mainly, however, he will reprint the thoughts of others.

Today, Bill maintains a card file, arranged alphabetically by state, of each person with whom he has corresponded. Almost all of these receive his letter. William Highhouse, who for the last 25 years has organized one of the most productive bluebird trails in the nation from Warren, Pennsylvania, credits Duncan with providing the necessary information and expertise to keep his motivation high.

Bill Duncan estimates that he personally made, purchased or delivered at least 5,000 nesting boxes for other people to use. Since his retirement, his principal goal has been to get other people involved in bluebird conservation. Through his newsletter and his nesting box design, he informs all who write about how they can help bluebirds by establishing nesting box trails. However, his tips on habitat selection and his warnings about uses of pesticides are important reminders that nesting boxes alone provide no panacea. He continues to stress plantings which provide fruits helpful to bluebird survival during the winter. And he warns about competition from alien cavity nesting birds.

It is important to recognize that Duncan considers himself no scientist in these matters. In fact, he prides himself in taking a layman's approach. He has never used binoculars when watching birds and compiles no life list of birds seen. He befriended Rachel Carson, even anticipating her concern about the indiscriminate use of pesticides and herbicides. He still corresponds regularly with Mrs. Carson's daughter about mutual personal and social concerns. But he has no particular desire to document any thesis himself. He plays his hunches and waits for others to prove the correctness of his notions.

Nonetheless, at 82, he seems remarkably fit. He has never been seriously ill, and he says he feels as good as he ever has, although he is not quite as mobile. (He doesn't like to drive at night.) Azalea, a superb homemaker, cooks his favorite

meals, mostly vegetables grown organically. About ten years ago, he converted to Christian Science, a religion which blends well with his feeling that there should be a kind of moratorium on technological advance, a period of assessment in which people should place more reliance upon themselves and the processes of nature as those processes worked before the technological advances of this century. That doesn't quite mean we should turn back the clock to that summer 77 years ago when Bill Duncan stayed on the Clarkson's farm. But it certainly calls into question the conventional definition of progress.

Three years ago, the Duncans gave up their three-acre home in Louisville (the growth of the city had swallowed them, anyway) in exchange for smaller living quarters. Bill gave away much of his considerable library because he couldn't find room for all the books he had accumulated over the years. It was a very hard thing for him to do. The Duncans haven't seen a bluebird around their home for the last ten years, which is an extreme disappointment but hardly a surprise. Bill Duncan saw it coming.

But the Duncans have made many friends over the years and certainly have raised the consciousness of thousands, a little bit at a time. Bill himself at times doubts whether his contributions have made any difference. Most of us can't devote the many years the Duncans gave to bluebird conservation, but we can do something, if only making a nesting box and placing it in a good location or, at least, instructing someone else in how to do it. Bill Duncan himself was a successful businessman and he found the time. He is 82 years young and he still gives a good pep talk.

Perhaps David H. Kennemur of Spartanburg, South Carolina, summarized Bill Duncan's life work best when he wrote:

"One small nestbox for bluebirds,
A better world for mankind."

Bill Duncan quotes this often enough in his newsletter. Even ten years after Neil Armstrong's lunar footprint, it seems a good prescription for the future.

FIRST BROOD SUMMARY — 1979

An Indication of Winter Survival

Severe winters have long been known to reduce bluebird populations in various parts of North America (James 1961, 1962, 1963). This is particularly true when the wild berries that constitute the main source of food for wintering bluebirds become coated with ice from freezing rains. Bluebirds have relatively soft bills and are unable to crack away heavy coatings of ice.

The winters of 1976-77 and 1977-78 were two of the most severe in the history of weather records throughout most of the United States east of the Rocky Mountains. Wildlife suffering was extensive, especially among those creatures that neither hibernate nor go south to escape the rugged weather. Since most Eastern Bluebirds normally spend their winters in the southern half or two-thirds of the United States east of the Rockies rather than migrate to the tropics like many of our birds, they could not escape the effects of these two consecutive terrible winters.

Surveys were conducted among Eastern Bluebird trail operators in the springs of 1977 and 1978 to determine how many of their nesting boxes were occupied by bluebirds for the season's first broods as compared with the preceding year (Zeleny 1977, 1978). Reports were received from over 55 trail operators in 25 states and provinces, most of whom are readers of "The Purple Martin News." The purpose was to obtain with some degree of objectivity an indication of the gains or losses in bluebird population along these trails from one year to the next. Heavy losses were indicated in a belt through the middle latitudes of the United States, representing the northern part of the bluebird's normal winter range. These losses are presumed to have resulted largely from the almost unprecedented severity of the preceding winters. Several trail operators were convinced that the bluebirds were unable to survive the long continued subzero temperatures, often accompanied by howling winds, in spite of adequate supplies of food. Bluebirds were

frequently found dead in nesting boxes where they had sought shelter from the weather (Table 1).

In analysing the bluebird mortality data contained in Table 1, the fact that the regions (North, Middle, South) are structured differently than the other Tables should be considered. In Table 1 the North was considered to include Illinois, Indiana, Iowa, Massachusetts, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania and Wisconsin. The Middle States included Kansas, Kentucky, Maryland, Virginia and West Virginia. This arrangement was felt to more nearly represent a proper division of the Eastern Bluebird's winter range.

Since bluebirds are less common in the northern third of their winter range than in the middle or southern thirds, it stands to reason that fewer dead birds will be found in the North. However, even the South "won out" in terms of having the highest average of dead bluebirds per 100 boxes reporting for the winter of 1977-78, pointing up the fact that individual storms, regardless of locality, can have devastating effects. The data also show the relative severity of the three winters studied on a year-by-year basis and against the three-year average.

The winter of 1978-1979 was again colder than normal in the northern parts of the Eastern Bluebird's winter range, but not nearly as cold as the preceding two winters. Extreme cold prevailed farther north but fortunately did not penetrate very far into the bluebird's winter quarters. Freezing rains, however, occurred as far south as Texas and South Carolina. These can sometimes be more deadly to bluebirds than subzero temperatures.

A 1979 first brood nesting survey was conducted by means of a questionnaire in the Spring 1979 issue of *Sialia* (pages 89-92). This survey was similar to but much more detailed than the surveys of the preceding two years. Reports were received on 58 bluebird trails consisting of

nearly 2,000 nesting boxes in 18 states. 57 of these trails are in the range of the Eastern Bluebird and one (in Oregon) involved only the Western Bluebird. Comparison data for nesting box usage in 1978 and 1979 is summarized in Tables 2-4.

In summarizing the data, the questionnaires were segregated by region, with reports from Michigan, Minnesota and New York representing the North Region, and those from Louisiana,

Table 1. Dead Eastern Bluebirds found in nesting boxes reported by readers of Purple Martin News and N.A.B.S. first-brood nesting reports.

Winter of 1976 - 1977				
Region	No. of Trails	No. of Boxes	Dead Birds	Per 10 Boxes
North	20	1071	39	3.64
Middle	28	1300	67	5.15
South	6	194	0	0.00
Totals	54	2565	106	4.13

Winter of 1977 - 1978				
Region	No. of Trails	No. of Boxes	Dead Birds	Per 10 Boxes
North	29	1088	15	1.38
Middle	23	1484	45	3.03
South	9	230	13	5.65
Totals	61	2802	73	2.61

Winter of 1978 - 1979				
Region	No. of Trails	No. of Boxes	Dead Birds	Per 10 Boxes
North	41	1244	12	0.96
Middle	31	1909	20	1.05
South	14	384	1	0.26
Totals	86	3537	33	0.93

Summary for period 1976 - 1979

Region	No. of Trails	No. of Boxes	Dead Birds	Per 10 Boxes
North	90	3403	66	1.94
Middle	82	4693	132	2.81
South	29	808	14	1.73
Totals	201	8904	212	2.38

North and South Carolina, Tennessee and Texas representing the South Region. Reports from the other states were considered to represent the Middle Region. The data were further separated to allow analysis of nesting box occupancy in 1979 as against the occupancy of the same group of nesting boxes in 1978. These data are shown in Table 2. Another analysis was made regarding nesting boxes mounted after the 1978 first-brood period **within** the area of existing nesting box trails to determine what effect the added boxes might have in attracting additional birds. The data relevant to this investigation are shown in Table 3. Yet another analysis was made of trails that were expanded beyond the limits of the 1978 trail, that is, where expansion took place **outside** the trail into new territory. These data are displayed in Table 4.

In interpreting these data it must be realized that they apply only to the trails for which reports were received and that they do not necessarily reflect the true situation in the region where the trails are located. The data may reflect the gains or losses fairly well in the Middle and Southern States where the reports represent large numbers of nesting boxes in widely scattered areas. But in cases where reports are received from only a few trails representing a small number of nesting boxes, the data are naturally of relatively little significance and could be somewhat misleading.

The results of this survey justify a degree of cautious optimism. The severe losses in the numbers of Eastern Bluebirds nesting on bluebird trails in 1977 (-34%) and 1978 (-9%) have begun to be replaced by new breeding birds in 1979 (+4%). It must be understood, however, that not all of the same trails were included in the three surveys.

Regional Differences

In examining the data in Tables 2-4, note must be taken of the fact that the greatest fluctuations in increase or decrease of first brood breeding occur in areas where the sample size is small. Where sample sizes include hundreds of nesting boxes, the data probably represent more nearly what actually is happening. Thus, while range-

wide data may be viewed with some degree of confidence in their accuracy, some of the regional data may be inaccurate to a substantial degree.

In viewing the data two points appear to stand out. First, that Eastern Bluebird population recovery probably is proceeding at a more rapid rate in the South, and, if at all, at a less rapid rate in the North. This would seem understandable if the southern populations were less affected by recent winters and if those populations have a larger base from which to grow. The second point may be more obvious, that bluebirds appear to be more quickly attracted to new nesting boxes placed outside the area of existing trails. That is, it appears to be more fruitful to extend the length of a trail rather than to fill in spots within a trail area. This point, however, requires much more investigation, for there are many factors that influence nesting box selection that cannot be answered by this survey.

Bluebirds continue to be very scarce in the central parts of their breeding range where the greatest losses occurred during the recent severe winters. A return to more normal winters should result in a marked recovery. Properly managed bluebird trails will surely speed this recovery. Properly managed bluebird trails will surely speed this recovery.

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 _____. 1978. Bluebirds Dealt Another Blow by Winter of 1977-78. Purple Martin News 13:7 pages 1-2.

Table 2. Comparison of first brood nesting attempts by Eastern Bluebirds in 1978 and 1979 in the same groups of nesting boxes, based on N.A.B.S. first brood reporting data. 57 trails reporting.

	Northern States		Middle States		Southern States		Range-wide	
	Boxes	Used	Boxes	Used	Boxes	Used	Boxes	Used
1978	252	66	956	221	183	55	1391	342
1979	248	58	905	239	181	59	1334	356
± Change	-4	-8	-51	+18	-2	+4	-57	+14
% change	-1.6	-12.1	-5.3	+8.1	-1.1	+7.3	-4.1	+4.1

Table 3. Comparison of first brood nesting attempts by Eastern Bluebirds in 1978 and 1979 on trails that expanded the number of boxes within the original trail areas. 19 trails reporting.

	Northern States		Middle States		Southern States		Range-wide	
	Boxes	Used	Boxes	Used	Boxes	Used	Boxes	Used
1978	199	55	337	97	64	20	600	172
1979	248	59	397	93	104	26	749	178
± change	+49	+4	+60	-4	+40	+6	+149	+6
% change	+24.6	+7.3	+17.8	-4.1	+62.5	+30.0	+24.8	+3.5

Table 4. Comparison of first brood nesting attempts by Eastern Bluebirds in 1978 and 1979 on trails that expanded the number of nesting boxes outside the original trail area. 24 trails reporting.

	Northern States		Middle States		Southern States		Range-wide	
	Boxes	Used	Boxes	Used	Boxes	Used	Boxes	Used
1978	90	13	532	103	40	15	662	131
1979	154	10	655	126	94	27	903	163
± change	+64	-3	+123	+23	+54	+12	+241	+32
% change	+71.1	-23.1	+23.1	+22.3	+135.0	+80.0	+36.4	+24.4

A SHELTERED FEEDER FOR BLUEBIRDS

Vera McLean Gourlay

In 1969 my sister in Augusta, Georgia, sent me an article about bluebirds written by Dr. Lawrence Zeleny. In reading that article, I learned about the bluebird's plight. I just couldn't imagine a world without bluebirds.

I ordered copies of the nesting box plans and the booklet "Bluebirds for Posterity," and began giving them to friends. My supply of literature was soon gone, and the booklet was out of print. With Dr. Zeleny's permission, I summarized information from the booklet and had the information sheets and nesting box plans sheets printed by the thousand.

By writing letters to the Asheville (North Carolina) Citizen asking others to join in the effort to help bluebirds, I soon received mail from hundreds of people from all walks of life, rich and poor, from tiny children to one dear old man of 96!

In 1969 our local bluebird count was 11, but grew to 75 in 1977. More people are joining in this effort, and more nesting boxes are going up. My husband and I take the plans wherever we go and by now we have mailed or handed our literature to people in all 48 states and several provinces in Canada.

I especially enjoyed the wonderful article by Col. Robertson (Spring, 1979) and appreciated his sharing his experiences and success with us. We in the South have the responsibility and joy of feeding our bluebirds and those that migrate from the North.

We have some bitter winter weather here in the mountains, and I kept wishing we had a feeder for the bluebirds where their food would be kept dry and that the larger birds could not dominate. The feeder illustrated here is one that I designed especially for bluebirds and is successfully used by them each year.

This feeder is only 12 inches long, and the two entrance holes are close enough together so the birds can get in and out easily and quickly. In longer feeders the bluebirds sometimes become disoriented and beat their bodies against the glass sides. This plan may be used to make a

bluebird shelter by using wood or exterior plywood instead of glass for the sides.

Some people have had no problem getting the bluebirds to use this feeder as early as the 1st of August in this area, especially if they had bluebirds nesting near their property. Sometimes it requires a bit of enticement to attract the birds. We stick raisins, bits of dried fruit or apples on a small piece of thorn, barberry or rose bush stem and place it in one of the entrance holes. The bluebirds spot the food on the thorns and quickly find additional food in the feeder.

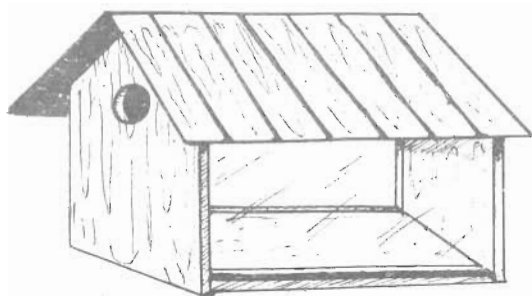
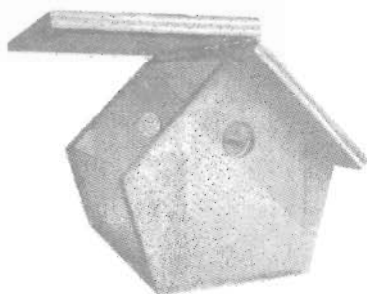
We also harvest our dogwood berries and some twigs with berries attached and put a piece or two in a hole. We gather them by the bushel before the Starlings come in flocks and strip the trees in one feeding. Other winter foods include fresh ground beef, canned dog food, a stiff mixture of suet or grease mixed with corn meal, peanut butter, oat flakes or pieces of nuts. These may be made into small cakes if you like, but the amounts or recipe is not important, just so they have plenty of good food for the winter.

In addition to our bluebird feeder we have a hanging feeder for sunflower seeds, and a big feeder mounted for larger birds that is stocked with grain, suet and bread crumbs. We buy day-old bread and freeze it until needed. We also have a "Have-a-Hart" trap that is wired opened and set on the ground for doves, robins and other species. The Starlings are wary of this trap and won't go in it. After three years of working to foil the Starlings, their numbers are the fewest we've ever had. Finally, we have a feeder for hummingbirds to use in the summer. I make a nectar using three parts water to one of sugar and a few drops of food coloring, boiling the mixture for 3-5 minutes.

Our work to help the bluebirds has been one of the most rewarding and enjoyable experiences of my entire life. I hope that bluebird friends in many other places will experience similar rewards by putting up a bluebird feeder this year and by being blessed with the bluebird's presence throughout the winter.

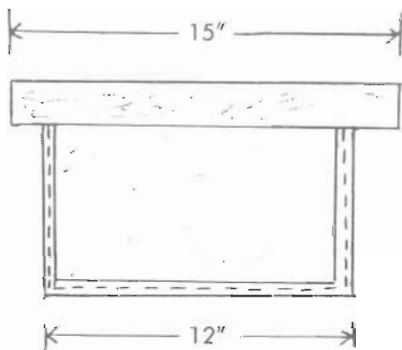
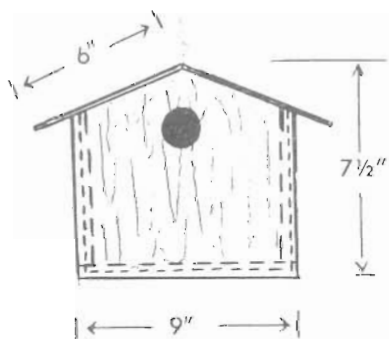
Sialia, Autumn 1979

**Bluebird Feeders are Available for Purchase
See Order Form Enclosed
with This Issue.**

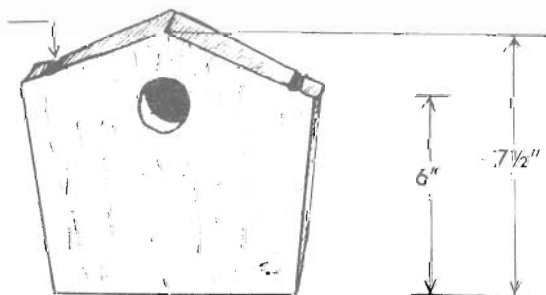


Top is made of $\frac{3}{4}$ " or heavier ext. plywood or lumber. One side is hinged.

Floor is made of $\frac{1}{2}$ " ext. plywood or $\frac{3}{4}$ " lumber.



$\frac{3}{16}$ " groove for glass or plastic



Ends are made of $\frac{3}{4}$ " wood or ext. plywood.

Construction details for enclosed bluebird feeder. Glass or plastic sides drop into grooved ends and bottom. $\frac{1}{2}$ " diameter entrance holes in each end prevent use of feeder by large birds.

UTILITY COMPANIES CAN HELP BLUEBIRDS

Robert M. Schutsky

There were the bluebirds, sitting on the fence again. It had become a regular event to see them at the entrance to the Muddy Run Ecological Laboratory, perched on the fence or nearby utility wires. Frequently I observed as many as five or six birds at one time. The problem was that the birds were not nesting. It was late March and the males were not defending a territory. No sign of breeding activity could be found.

I related this information to Jesse Grantham, a bluebird enthusiast from neighboring Chester County. Jesse suggested that I put up a nesting box. He believed that there were no natural cavities available and that the birds would quickly occupy a box placed in the proper habitat. The following day (1 April 1977) I placed the first bluebird nesting box at Muddy Run. No sooner had I walked away than a male bluebird flew to the box, singing loudly. A female immediately joined him, and together they explored their newly found home.

That year I placed two additional boxes at Muddy Run. Two pairs of bluebirds fledged a total of 12 young, all of which I banded with U.S. Fish and Wildlife Service leg bands. Encouraged by these results, I prepared a brief proposal describing the plight of the Eastern Bluebird and my ideas for restoration of the local population. Philadelphia Electric Company, owner of the Muddy Run Project Area, readily agreed to fund this conservation effort. The Muddy Run Bluebird Nesting Trail was officially underway.

In March 1978, 20 additional nesting boxes were placed at the Muddy Run Recreation Park. One of the coldest winters on record in the eastern United States had

finally begun to release its icy grip on the countryside. The first male bluebird was seen the fourth week in March, late for this area. By the second week in April three pairs had established territories. It was a small increase over the previous year, but better than I had expected considering the severity of the winter. All three pairs nested successfully and fledged a total of 21 young. Philadelphia Electric accepted my proposal to continue the project in 1979 and expand the trail to include 28 nesting boxes.

In 1979 the Muddy Run nesting trail was very successful. Eleven pairs fledged a total of 73 young bluebirds, a significant increase over the 12 young fledged the first year. The trail was also utilized by House Wrens and Black-capped Chickadees. A nesting attempt by Tree Swallows failed due to interference by a territorial House Wren.



N.A.B.S. member Robert Schutsky and David Ellenberg, superintendent of Philadelphia Electric Company's Muddy Run Recreational Park discuss bluebirds and nesting box trails with workshop participants in Lancaster County, Pennsylvania. Mr. Schutsky (left) conducts workshops throughout the Lancaster County area to help others help bluebirds.

I intend to increase the number of nesting boxes at Muddy Run in 1980. Much of the land at Muddy Run is parkland and old field habitat, ideal for nesting bluebirds. Philadelphia Electric cooperates in a habitat management plan. Occasional mowing prevents fields from reaching a successional stage unsuitable as bluebird habitat. This habitat management is also conducive to propagation and survival of important game species such as Whitetail deer, Eastern cottontail, Ring-necked Pheasant and Bobwhite.

Through my involvement with the North American Bluebird Society an article entitled "The Fragile Bluebird" appeared in a local newspaper. This article described some of the problems faced by the bluebird, its low numbers in Lancaster County and efforts to aid in its restoration. As a result of the article I received inquiries from residents throughout the county who had nesting bluebirds or wanted to know how to attract them. I decided to conduct a workshop to provide people with the information to establish their own bluebird nesting trails. The workshop, held at the Muddy Run Recreation Park, was well attended and due to its success, future workshops are planned.

Herbert H. Beck in "A Chapter on the Ornithology of Lancaster County, Pennsylvania" published in 1924, described the bluebird as "Very abundant up to the latter part of the nineteenth century, it is now one of the less common species of farmland and village." In 1979 I was able to pinpoint the locations of nearly 250 bluebird nesting boxes in the county. However, I found only 29 pairs of nesting bluebirds. Eleven pairs were at Muddy Run with the remainder widely scattered, mainly in the southern portion of the county. Two pairs nested at Middle Creek Wildlife Management Area in northern Lancaster County. One pair occupied a nesting box while the other pair utilized a flicker hole in a lamp post located 25 feet above a parking area. Although there are approximately 75 bluebird nesting boxes at Middle Creek, nearly all are occupied by Tree Swallows. There is limited use of natural cavities by bluebirds throughout the county which I was not able to quantify.

The local bluebird population is slowly



Philadelphia Electric Company is actively involved in environmental education and conservation projects such as the bluebird nesting box trail at Muddy Run. Workshop participants get "hands-on" experience making nesting boxes and learn how to mount and maintain them. David Ellenberg (left) of PECO's Corporate Communications Department, enjoys a review of workshop activities with other participants.

rising. It is hoped that through future news releases and more workshops that county residents will become more aware and aid the bluebird with backyard boxes and nesting trails. Perhaps the Eastern Bluebird may once again be a common sight throughout Lancaster County.

Bluebird Workshop

A workshop entitled "How to Attract Nesting Eastern Bluebirds" is now available to individuals, groups and organizations in Pennsylvania and nearby states. Principles crucial to initiation and maintenance of successful bluebird nesting box trails are thoroughly demonstrated during the one-day workshop. A variety of teaching aids (slides, tools, materials, etc.) provide participants with "hands-on" experience in such areas as site selection, nesting box construction and predator control.

Robert M. Schutsky, a charter member of the North American Bluebird Society and author of the preceding article directs the workshop. Interested persons may obtain more information, including workshop costs, by contacting Mr. Schutsky at:

Muddy Run Ecological Laboratory
P.O. Box 10
Drumore, PA 17518
Phone (717) 548-2121

BLUEBIRD TALES

Mary D. Janetatos

If bluebirds are not yet "busting out all over," wherever they are their ears must be burning. A lot of people are talking about them, looking for them, finding them (with delight), not finding them (with disappointment) and even using their pictures on wedding invitations! Yes indeed, **Cliff Perry** and **Chere Thompson** of Portland, Oregon, became Mr. & Mrs. on July 8, and friends who were notified spied a lovely Western Bluebird perched on the original wedding invitation. We wish Cliff and Chere many years of happiness graced by the symbol of happiness, the bluebird.

In June, the 7th Annual Vermont Bird Conference, sponsored by N.A.B.S. member organization the **Vermont Institute of Natural Science**, at Johnson State College, Johnson, Vermont, had as their first speaker, **Lawrence Zeleny**. I was fortunate enough to go to Vermont with **Larry and Olive**, and we were all very pleased to see the high interest in bluebird conservation there, as shown in two S.R.O. workshop sessions in the afternoon. Our warm welcome was augmented by meeting many bluebird friends there. At last we met **Olympia LeBeau**, with whom there had been much correspondence, **Eleanor Ellis**, whose down to earth remarks on the N.A.B.S. nesting box record cards bore out the traditions of her State, and **Fran Howe**, whose TV show **Across the Fence** mention of the book **Bluebirds Seven** had sparked a sudden demand for that book. Since the program does not reach Maryland, we here at the Executive Director's office could only speculate as we hurriedly shipped the books off to Vermont.

After the pleasant days in Vermont, we went to Apalachin, New York, where Larry had accepted an invitation to speak at the



Fred L. Waterman Conservation & Education headquarters. This group is also a N.A.B.S. member, and proved to be a hotbed of bluebird activity and interest. At the behest of member **Sadie Dorber**, local newspaper columnist **David Rossie** had highlighted Larry's upcoming visit in a previous column. This column had mentioned that Larry's work with bluebirds paralleled **Johnny Appleseed's** with apples, and it succeeded in turning out an impressive audience, which filled the center's auditorium to overflowing. Throughout their questions to Larry on the theme of Tree Swallows vs. bluebirds competing for nesting sites, with Tree Swallows frequently winning out. I was asked to give a report on the Society's beginnings and current activities. In these remarks, I rather despairingly spoke of the difficulty of navigating through New York State's red tape to reach the pertinent people in environmental matters. In the audience, listening to my remarks, was **Alan Hicks** of the State's Department of Environment and Conservation. After the audience chuckled at my discomfiture, he admitted that he was embarrassed by the eight copies of everything needed before the Department could order and pay for one copy of **The Bluebird**, by **Larry Zeleny**. A nice surprise topped off a euphoric evening. A gift was made to N.A.B.S. of the money donated by the audience at the door, in the amount of \$120.00! Any other conservation or birding groups out there interested in

doing the same thing? Just call us and we'll try to come!

Among those hustling to increase interest in helping the bluebirds, **Anna Hinajosa** of Lake Jackson, Texas, managed to cause a flurry of activity when her local paper, the **Brazosport Facts** printed a very fine article about bluebirds, the Society, and Mrs. Hinajosa's involvement in the bluebird cause. It also told readers how to get their own bluebird house, by sending \$7.50 to N.A.B.S. Quite a number of them did so, and we now have visions of an in-town bluebird trail along Azalea, Fig, Hyacinth, Persimmon, Balsam, Lily (where Mrs. Hinajosa lives) and other streets in Lake Jackson.

Now assisting in filling orders for bluebird nestboxes are members **Orville Rowe**, of Elkhart, Indiana, who has built thousands of nestboxes to date, and **Art Ruitberg** of Germantown, Maryland, who is an enthusiastic beginner...So, keep those orders coming—we'll provide you with the latest and finest in nestbox design!

The Society also acquires nestboxes, which may not be standard, from youth groups in the Greater Washington, D.C. area. These we may give to persons telling us they've seen bluebirds "just today" and need a nesting box "right away!" Member **Dennis Brezina** benefitted in this way when he spied bluebirds in the Spring investigating his Anne Arundel County property. The bluebirds moved right in when he erected a box of non-standard design, after placing a raccoon guard over the entrance hole to compensate for the shallow depth. Bluebirds successfully fledged two broods in it, while a chickadee claimed the standard cedar box he had later put out.

This seems to be the season for more reported odd-bird usage of various man-made nestboxes. **Bob Hahn** reported a pair of Prothonotary Warblers fledging a brood from a bluebird nesting box in northern Virginia; **Ruel Broyles** sent a picture of a robin's nest atop a wren box in Springfield, Missouri. **Mark Wallace** told of bluebirds successfully nesting in a swinging hollowed log in Howard County,

Maryland; and various experimental boxes have been reported to be successfully used by birds. Among these are the Zeleny trail usage of the raised-top nesting box (to foil sparrows) where two broods of House Sparrows were fledged; an open-top box used by bluebirds; and two instances where painted plastic bleach jugs were successfully used by bluebirds this year after several years' lapse since they were last used. How frustrating it is to peek into the plastic jug at the fully feathered young, just ripe for banding, and know that only they can remove themselves, and the bander will not have a chance to bracelet their legs with a number this time.

As a sub-permittee birdbander under Larry's Master Permit, this season I have been able to band a few bluebirds in nearby suburban Maryland. Twice this took me to the Quaker Friends' House in Sandy Spring, Maryland, where, at **Mildred Shephard's** request, I banded bluebirds in open-top boxes monitored by **Jim and Peggy Hunter**. On the first occasion, a nesting box mounted on a fence at the edge of the Hunters' garden contained five young. Banding was completed, and a few days later the five fledged, and the open-top nesting box was cleaned out. The next time, a different box in a horse pasture contained the candidates for bands. When the chore was finished, the group strolled past the box which had been used earlier. Reminiscing on that brood, Peggy and Mildred assured the N.A.B.S. visitors that no birds had re-nested in the garden-side box. As I glanced in through the open top, I saw something which gave me pause. I invited my two hostesses to peer in. Peggy exclaimed "Why, another brood of bluebirds! Is my face red! The Executive Director of the Bluebird Society would have to be the one to find my bluebirds!"

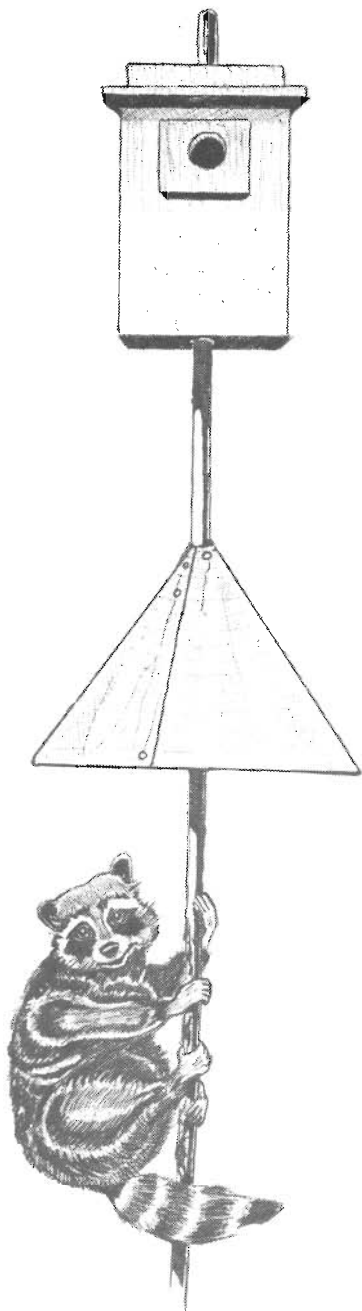
It's fine with me, dear readers! It's great fun to find bluebirds where we don't expect them. Something must be working!

P.S. I hope to see many of you at the Second Annual Meeting, November 9, 10, 11. There's still lots of room!

NESTING BOXES AND PLATFORMS FOR BIRDS

Benjamin P. Burt

6161 Smokey Hollow Road
Jamesville, NY 13078



While most birds build their nests in the crotch of a shrub or tree or on the ground, there are about 50 species that have used man-made nesting boxes or platforms. Of these, about two dozen regularly use such devices.

The bluebird is of special interest to many people and is the focus of their nesting box efforts. However, many persons find increased enjoyment by providing nesting opportunities for other species as well. Some species are rather particular about the size of the nesting cavity and its entrance hole. Nesting boxes having the correct dimensions and supplied in quantity can often greatly increase the local populations of these birds.

PROPER DESIGN IS IMPORTANT

Several designs of nesting boxes are acceptable. Figure 1 shows a basic nesting box design that can be utilized by most cavity nesting birds. By altering nesting box dimensions as shown in Tables 1 and 2, you can most nearly tailor the nesting box to the species you wish to attract.

Using the same basic parts, nesting boxes can be constructed either as top-opening or front-opening boxes. In part, the model you choose may depend on how often you plan to open the box while it is in use.

If you do not intend to open the nesting box frequently, the front-opening type is the most convenient. It is very easy to clean. One merely reaches in and pulls out the old nesting material. The top-opening box is more difficult to clean, for the bits of sticks, grass and debris must be picked out of the corners.

If you intend to monitor nesting activities frequently, you may find it difficult to see into the nest when using the front-opening type box. Also, it may be difficult to replace

nearly grown nestlings during the banding operations without one or more of them escaping before the box can be closed. In such cases, the top-opening box may be more suitable. Some people who do a lot of banding still prefer the front-opening box

because it is easier to service. If they band the birds early enough, they have no trouble handling them during the banding process.

It is easier to seal the roof of a front-opening box against the rain than it is to

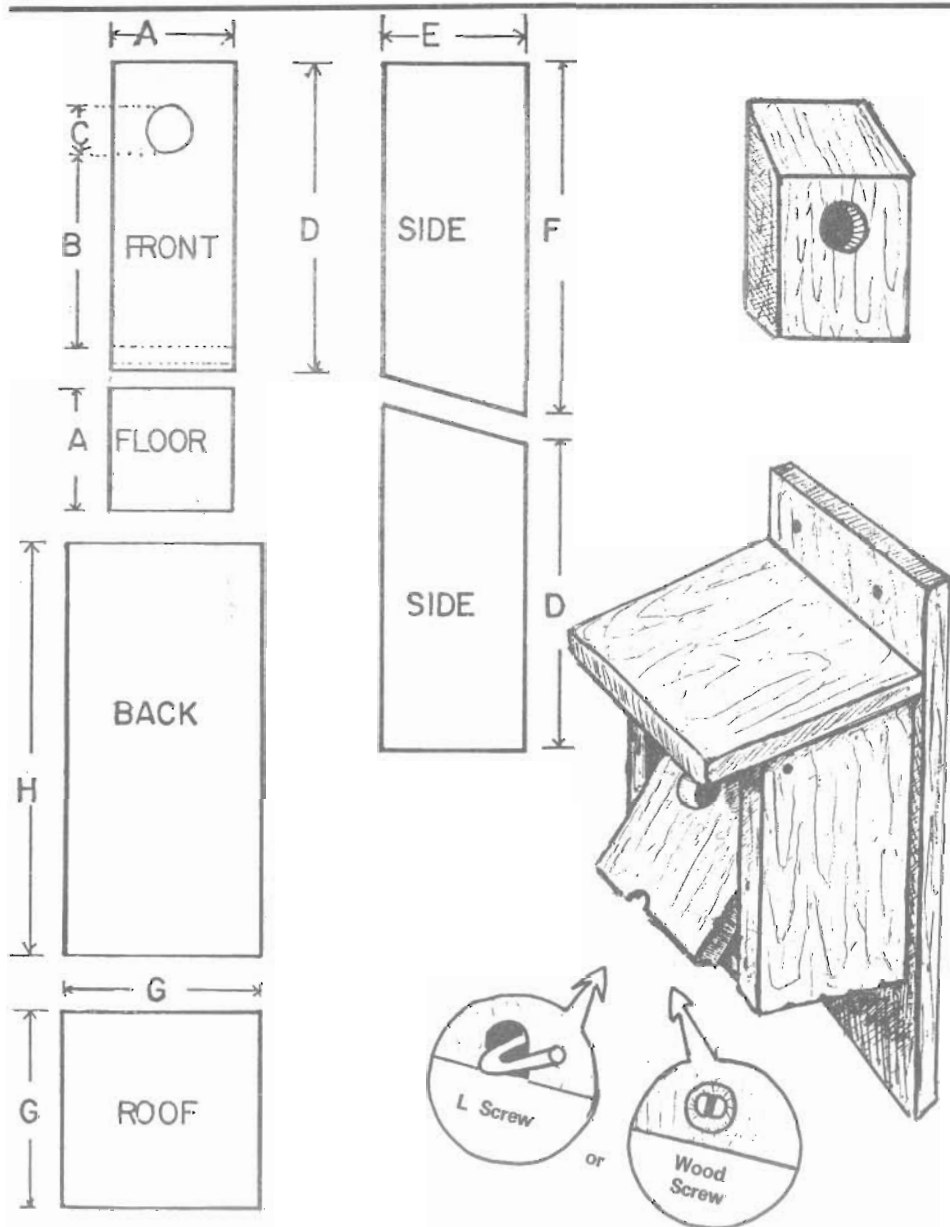


Figure 1. These parts can be used to construct either a front opening box as shown here, or a top-opening box as shown in Figure 2. Refer to Table 1 and the formula on page 154 for the proper dimensions for each species. Predator guard wood build-out (upper right) is used to increase thickness of box at entrance hole and should be used where raccoons are common.

keep a top-opening box dry. Also, as a nesting box gets older and the wood warps a bit, the top-opening type may develop leaks.

Whichever design you choose, the parts can be cut to the same dimensions. The only real difference is whether the front or the top is permanently fixed in place.

Sometimes a situation exists where a nesting box can only be approached from the rear. For instance, a box may be mounted on a post of a fence line facing onto a pasture, and you will normally approach the box from a nearby road. In such a case you may find that a side-opening box is preferred, since it might be difficult to see in the front, and the box might be mounted a bit too high to allow inspection through the top. The North American Bluebird Society has nesting box plans available that will help you to easily construct such a box.

CORRECT SIZES HELP

Whether you make or purchase a nesting box, be sure that it is of the correct size for the species you wish to attract. If the floor area is too small, the target species may reject the box since it will not be able to fit inside easily during the long period of incubation and brooding. Also, egg production may be lower due to the small cavity size, and good nest sanitation is more difficult. If the floor area is too large, the bird will often give up when too much nesting material is needed to fill the space. And there is evidence that the incidence of insect parasitism of nests and young is markedly increased in proportion to the amount of nesting material present in the box.

The entrance hole should be no larger than needed by the tenant. A larger hole will often allow a larger and more dominant species to take possession, and may make the nest more accessible to predators.

The design shown in Figure 1 is easy to construct. The critical dimensions are (A) the width of the square floor, (B) the distance from the floor to the bottom of the entrance hole, and (C) the diameter of the entrance hole. The values of these dimensions for 26 species are given in Tables 1 and 2.

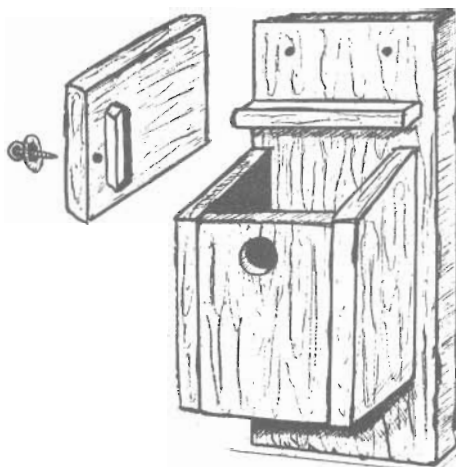


Figure 2. This top-opening model can be constructed from the parts shown in Figure 1. Refer to Table 1 and the formula on page 154 for the proper dimensions for each species.

While these dimensions seem to be the ones most often chosen by the birds themselves, they are really only approximate values. A few species are capable of digging their own nesting cavity to the desired size, but most must find one they can use without further excavation. Consequently, if the entrance hole and cavity size are equal to or slightly larger than their preferred dimensions, the species will be able to use it.

TWO BASIC SIZES

Except for the few larger species, two basic floor sizes, 6" x 6" and 4" x 4", will satisfy most birds. Instead of making many different nesting boxes of slightly different dimensions, it is suggested that you make some of the bluebird size and some of the Red-headed Woodpecker size. These two compromise sizes will work for most of the birds listed in the tables. The entrance hole may be a bit larger than the smaller birds need, but they face common problems in finding natural nesting sites, and a slight difference in hole size will probably not discourage them. People who put out bluebird houses find all sorts of species using them, as noted in the tables.

KEEP THEM COOL

The thicker the wood, the better it keeps

the nest cool in the hot sun. Rough, one-inch lumber from the sawmill is very good. It actually measures one inch in thickness. Most wood purchased at lumber yards has been planed or dressed to what is called one-inch thickness, but it actually measures about $\frac{3}{4}$ -inch thick. In shaded locations or in cooler climates you can get by with wood that is as thin as $\frac{1}{2}$ inch. However, to be on

the safe side it is recommended that nesting boxes be made of wood at least $\frac{3}{4}$ -inch thick. Since nesting boxes may also be used for wintertime roosting, the additional thickness will help to keep birds warm in cold weather.

The other measurements of the pieces of wood shown in Figure 1 can be determined from A, B and C. Since the sides overlap the

Table 1. Dimensions for nesting boxes having a circular entrance hole. The boxes are listed in descending order by floor size, and when the floor is the same, by entrance hole size.

SPECIES	A	B	C	Depth of Interior (inches)	Height Above Ground or water'	Chips or Sawdust (inches) ***	Preferred Habitat ***
	Floor Area (inches)	Floor to Entrance (inches)	Diam. of Entrance (inches)				
Wood Duck	12x12	17	4	22	10-20G 6W	2-3	3,6
Barn Owl	10x18	4	6	15-18	12-18	1	4
American Kestrel	8x8	9-12	3	12-15	10-30	1	1, 4, 5
Screech Owl	8x8	9-12	3	12-15	10-30	2	2
Common Flicker	7x7	12-16	2½	16-18	6-30	2	1,2
Saw-whet Owl	6x6	8-10	2½	10-12	12-20	1	2
Purple Martin x	6x6	1	2¼	6	10-20	—	1
Red-headed Woodpecker	6x6	9	2	12	10-20	2	2
Golden-fronted Woodpecker	6x6	9	2	12	10-20	2	2
Great Crested Flycatcher	6x6	6-8	1½	8-10	8-20	—	1,2
Hairy Woodpecker	6x6	9-12	1½	12-15	12-20	2	2
Ash-throated Flycatcher *	6x6	6-8	1½	8-10	8-20	—	1,7
Violet-green Swallow *,x	5x5	4	1¾	6	5-15	—	1
Tree Swallow *,x	5x5	4	1¾	6	5-15	—	1
Bluebirds	4x4	7	1½	9	3-15	—	1
Nuthatches *,xxx	4x4	7	1¾	9	5-15	1	2
Prothonotary Warbler *	4x4	4	1¾	6	2-4W	—	3,6
Downy Woodpecker *	4x4	7	1¼	9	5-15	2	2
Titmice *	4x4	7	1¼	9	5-15	1	2
Chickadees *	4x4	7	1¾	9	5-15	1	2

* the standard bluebird nesting box is used by these species.

+ See text for notes about providing adequate egress form box.

+++ Brown-headed and Pygmy Nuthatches (1-½), Red-breasted Nuthatch (1¼) and White-breasted Nuthatch (1-¾) will all use the same box. However, the smaller opening sizes where appropriate may discourage use by House Sparrows.

*** Preferred habitat. The numbers in the last column of Table 1 refer to the habitat types listed here:

1. Open areas in the sun (not shaded by trees).
2. Woodland clearings or the edge of woods.
3. Above water, or if on land, the entrance should face water.
4. On trunks of large tree, or high in little-frequented parts of barns, silos, water towers or church steeples.
5. On buildings or barns.
6. Moist forest bottomlands, flooded river valleys, swamps.
7. Semi-arid country, deserts, dry open woods and wood edge.

Table 2. Nesting boxes with slot-like entrances.

SPECIES	A	B	C	Depth of Interior (inches)	Feet Above Ground
	Floor (inches)	Floor to Entrance Hole	Entrance Hole Size		
House Wren*	4x4	4	1x1½	6-8	5-10
Bewick's Wren*	4x4	4	1x1½	6-8	5-10
Carolina Wren*	4x4	4	1½x3	6-8	5-10
Tree Swallow*†	5x5	4	1½x3	6	5-10

* The standard bluebird nesting box is used by these species.

† See text for notes about providing adequate egress from box.

front, the other dimensions will depend on the actual thickness of the wood you use. With wood that is actually ¾-inch thick, the measurements of the pieces of the nesting box may be determined from the following formula:

D equals B plus C plus 2¼

E equals A plus ¾

F equals D plus 1

G equals A plus at least 2½

H equals F plus at least 5

ASSEMBLY PROCEDURE

Cut the pieces as shown. In localities where swallows may be expected to use the nesting box, the inside of the front board should be roughened to aid the birds in getting out. A series of horizontal saw cuts or a number of small holes ⅛-inch deep will do, or tiny cleats like a ladder can be tacked on. A piece of half-inch mesh hardware cloth will also do well. Except where swallows or martins may use the nesting boxes, this roughening of the front board is unnecessary. Other species can get out of boxes even if the inside of the front is quite smooth.

Boxes made with iron nails will last several years. Such nails do rust and become loose in time. Brass or stainless steel screws are preferred. Even nails made of aluminum or those that are galvanized will be better than regular iron nails. You may wish to use a good exterior glue in the joints prior to nailing. This will further strengthen the box and help to seal these joints against the rain.

Some types of wood have a tendency to split when nailed close to the edge or end of a board. To avoid this, it is helpful to drill pilot holes in the board through which you

are nailing. A pilot hole will help steer the nail straight into the adjacent board. The pilot hole should be slightly smaller than the diameter of nail you are using. If you are using wood that is actually ¾-inch thick, a six-penny nail is the proper one to use.

FRONT-OPENING MODEL

To allow the front to pivot, fasten each side to the front with one nail or screw, about one inch down from the top. Make

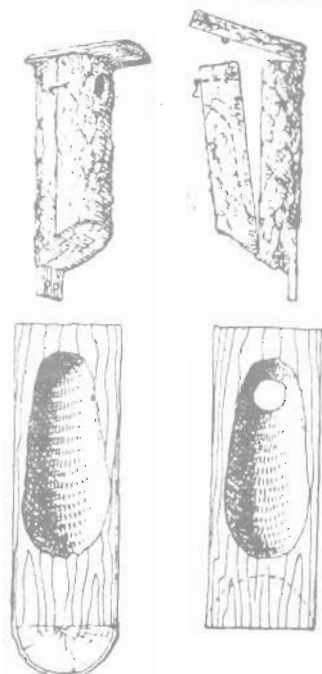


Figure 3. This hollowed out log is a style that may be a bit more attractive to woodland birds such as woodpeckers, nuthatches and flycatchers. Consult Table 1 and the formula on page 154 to determine minimum cavity size for the species you want to attract.

certain that the nails or screws are positioned exactly the same distance from the top on both sides so the front will pivot properly and not bind when opened. Also make certain that the front board has about $\frac{1}{8}$ " clearance at the top to keep it from binding against the roof when the box is opened. The clearance space also provides needed ventilation.

The square floor board should be installed so that the grain of the wood runs from side to side. This will ensure that the screw used to hold the front shut will thread against the grain of the wood, preventing premature wear of the screw hole. Insert the floor board and recess it slightly so the sides and front extend below the bottom of the box. Nail the floor in place through the sides, leaving the front free to swing open. Nail the back and roof in place. If possible, the back edge of the roof should be beveled to fit snugly against the back board. Beveled or not, the crack where the roof joins the back should be calked, and a piece of scrap wood may be fastened to the backboard just above the roof to provide protection from the rain.

To hold the front shut, a single screw is inserted through a pilot hole drilled near the bottom edge of the front board and screwed into the bottom of the box. A washer should be used under the head of the screw. Only this single screw has to be removed to open the nesting box. The pilot hole should be slightly larger than the shank of the screw. It is best drilled in two steps, using a smaller drill bit first. The smaller hole should continue through the front board into the bottom board. This will serve to guide the screw into the bottom and to prevent splitting that piece of wood.

If the box is to be located where it is unlikely to be disturbed by humans, you may prefer to use an easy-opening arrangement with an L-screw or bent nail that passes through a slot in the front and into the floor (Fig.1). On public lands the screw and washer method is a must. In either case, the fastener must be attached in such a manner to require some dexterity and force to open the box. Otherwise you may find that a raccoon will discover how to open the box and rob it.

TOP-OPENING MODEL

1. Fasten the sides to the front and back, using the floor board to control spacing during the nailing operation. Do not nail the floor yet.
2. Next, place a cleat (Figure 2) on the

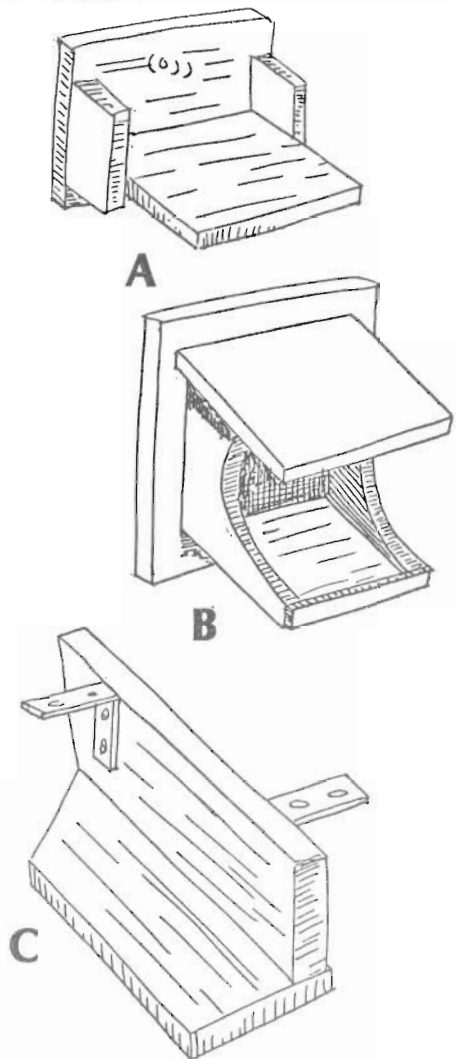


Figure 4. Some birds such as robins, phoebes and some swallows will not use a nesting box but will nest on an open or covered shelf. (A) is placed in sheltered spots under the eaves of buildings. (B) is for use where there is no overhead shelter. Clearance between floor and roof is 7 inches. (C) is a special shelf for mounting under bridges or in culverts where modern construction has provided no ledges for birds to nest.

underside of the roof as follows. Put the roof in position temporarily and reach up through the bottom and scribe a line on the roof with a pencil at the joint between the front and the roof. The cleat should be $\frac{1}{8}$ " shorter than dimension A, the width of the floor. Tack it into place leaving $\frac{1}{8}$ " of space behind the scribe line. This space will allow

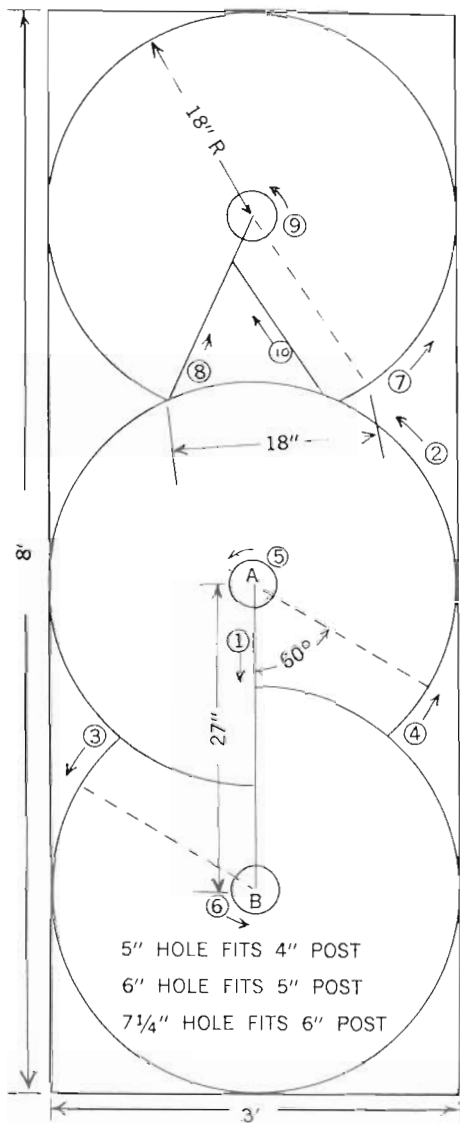


Figure 5. Cutting pattern for making conical predator guards from sheet metal. Numbered arrows indicate cutting sequence and direction. See Figure 6 for assembly and mounting details.

for the swing of the roof when opening the box. Leaving space around the cleat will also prevent binding if the wood swells later.

This cleat is a must if the roof is to be held down with a hook and eye for the cleat keeps the roof from sliding off. If a screw is used to hold the roof down, the cleat is not absolutely necessary, but it helps position the roof over the screw hole whenever the roof is replaced after inspecting the box.

3. Insert the floor board and nail or screw it into place remembering to elevate it slightly above the bottom of the front and sides. If you wish to mount the floor so that it can be opened for cleaning, put a screw through the side and into the bottom on each side about one-half inch from the back. These screws act as pivots so the bottom can be tilted down to dump out the old nesting material. The floor is held in place with a screw through the front into the floor. Some edges of the floor piece will

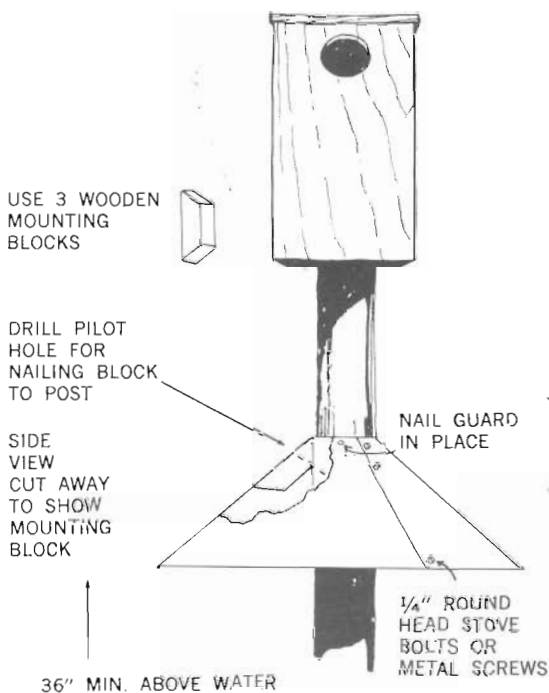


Figure 6. Assembly and mounting details for conical predator guard. See Figure 5 for cutting pattern.

have to be rounded so it will not bind when tilted down for cleaning. The grain of the floor should run from front to back so the pivot screws will hold firmly.

4. Place the roof in position and put a strip of wood against the back board, slightly above the roof. Seal it with glue or caulk and then nail the strip in place.

Drill a pilot hole in the roof at a point centered over the front board. Fasten the roof in place using a single screw and washer. The following construction details may be useful: the pilot hole must be drilled at an angle so that the fastener that holds the roof in place will be pointing straight down into the front board. Drill a smaller hole into the top of the front board to receive the hold-down screw, making sure the hole is well centered in the wood. Since you will probably be screwing with the grain rather than against it, you may wish to take some precaution against premature wear of the screw hole. One method of doing this is to use a plastic screw anchor inserted into the top of the front board. Use one that is sized for a number eight sheet metal screw. Another method of prolonging the life of the screw hole is to use a number 10 sheet metal screw to anchor the top, waxing the screw before screwing it in place the first time.

If the box is to be placed in an area unlikely to be disturbed by humans, you may wish to use a hook and eye or some other simple arrangement to hold the roof fast, remembering that the fastener must be strong enough to resist strong winds or tampering by raccoons.

To facilitate mounting, $\frac{1}{4}$ " holes should be drilled at the top and bottom of the back board through which nails, screws, bolts or wire may be put to fasten the box to fences or posts. In some cases to gain greater height, you may wish to set the box on top of a fence post and fasten it there. In these cases, there will be no place above the box for attachment and the back board should extend quite a distance below the box so that it can be fastened at two different points to the post.

DRAINAGE AND VENTILATION

For drainage, bore some $\frac{1}{4}$ " holes in the floor or cut about $\frac{3}{8}$ " from each of the four corners before you nail it into place. Since

there is some evidence that certain birds (the American Kestrel is one) will reject a box if too much daylight enters the cavity, it would be best to bore the holes at an angle.

The floor is recessed slightly for better protection from rain (the dotted lines on the diagram represent the position of the floor). The roof is wider than the box and extends well over the entrance hole.

If the nesting box becomes too hot, eggs may be spoiled or young birds may die. On the front-opening box, the $\frac{1}{8}$ " clearance at the top of the front board lets hot air out. On the top-opening box the front is installed so that its top edge is about $\frac{1}{8}$ " above the front edge of the two side pieces, leaving a narrow space between the roof and the sides for ventilation. Additionally, a few $\frac{1}{4}$ " holes may be bored high on the sides of the box. If this is done, the holes should be sloped upward toward the inside of the box to keep rain out.

PAINTING THE WOOD

A weathered, unpainted nesting box is the nearest thing to a natural cavity. You may wish to protect the wood from rotting, especially if the box is not made of decay-resistant cedar, redwood or cypress. If paint

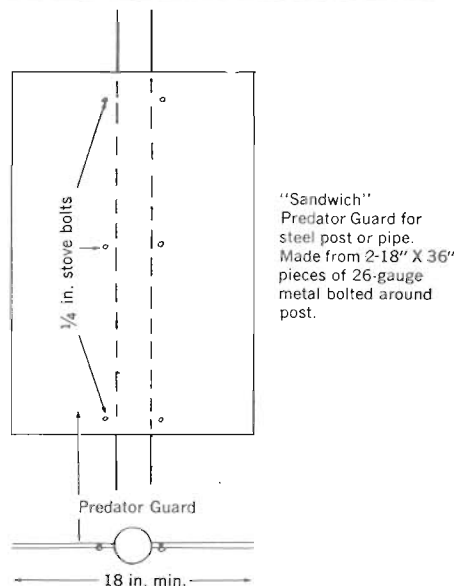


Figure 7. Construction and mounting details for flat predator guard used on posts and pipes.

is used, select a **light shade** of brown, green or gray exterior latex paint, and **paint only the outside of the nesting box**. Subdued colors are less likely to be conspicuous and invite vandalism, are less prone to absorbing solar heat, and may be less noticed by roaming predators.

One of the best ways to protect the wood is to paint it with raw linseed oil (containing no additives). Treat the box inside and out and repeat the treatment until the wood is well saturated. Pine boxes treated this way have lasted 20 years. Raw linseed oil reacts slowly with the oxygen of the air to form a tough, hard material that does not vaporize or harm the birds in any way. However, it may take a month to set up, after which there will be no odor.

Do not use any other wood preservative on the inside of a nesting box where occupants can come in contact with it. Most preservatives are highly toxic, and little is known about possible long-term genetic effects that may occur. If you wish, some stain or a bit of green oil-based paint (containing no lead) may be added to the raw linseed oil and, if it is applied without stirring, will give a mottled, natural appearance.

PLACING THE NESTING BOX

Best results in attracting desired species will be obtained through careful selection of habitat in which to mount the nesting boxes. Tips on habitat preferences are provided in the Tables and in the literature listed at the end of this article.

Bluebirds prefer open, sunny locations where the box may be seen from foraging and perching areas. Perches are an important element for the successful nesting of Eastern and Western Bluebirds and should not be overlooked when planning nesting box locations. Areas short of vegetation with scattered trees are favored, although powerlines and fences are adequate substitutes for treeless areas. The Mountain Bluebird, which has the capacity to hover while hunting for food, is less demanding when it comes to having hunting perches in the nesting territory. Boxes may be mounted to trunks of trees that do not have low-hanging branches. However, it is not advisable to nail boxes to the trunks of living trees.

To avoid competition from House Sparrows and wrens, keep bluebird nesting boxes a considerable distance from buildings and away from brushy places. Pastures with grass that is kept short and lawn areas such as golf courses, cemeteries and turf farms are ideal. Areas of heavy pesticide use should be avoided.

Tree Swallows help keep fly and mosquito populations under control, and may be better than Purple Martins in this respect. Within the nesting range of the Tree Swallow (and the Violet-green Swallow in the western U.S. and Canada), swallows may be easier to attract to nesting boxes than are bluebirds, especially if there is a well established swallow population.

In many areas bluebird lovers are discouraged by the apparent success of the swallows. In most areas where bluebirds and swallows compete for cavities, the natural rivalry exists on nearly even terms. However, bluebird conservationists may be able to lessen the effects of this competitive situation by placing nesting boxes in pairs within 15 to 25 feet of each other. The two species have been known to nest in boxes mounted back-to-back on the same pole. Because both bluebirds and swallows defend nesting territories against others of their own species, there is little chance that both of the paired nesting boxes will be used by swallows. This leaves the other box for bluebirds. Recent experimentation in New York state seems to show this method of pairing boxes to be an effective management technique.

The dimensions given in the Tables show that swallows prefer a box that is a bit wider and not quite so deep as the one for bluebirds. If you build some just for swallows, use the dimensions given for that species. If swallows display interest in a standard bluebird nesting box, you can make the box a bit more suitable by slipping a square of wood an inch thick inside the box to elevate the floor.

While Tree Swallows use a box with a circular entrance, a modified entrance (Table 2) may increase production by preventing starvation of weaker young. After the young have grown enough to reach the entrance hole, the parents discontinue entering the nesting cavity, but

feed the youngster who appears at the entrance, instead. The smaller or weaker one may never get a chance to be fed.

The late Charles Broley made a 1½" x 3" slot for an entrance on the 50 Tree Swallow boxes he had on his Canadian island retreat. Three youngsters could be at the entrance hole to be fed when the parent returned. He felt that the modified hole design increased the number of fledglings. Terres (see literature cited) offers designs of swallow nesting boxes that employ multiple entrance holes for this purpose.

SAWDUST SOMETIMES HELPS

Most birds bring the nesting material they need into the cavity. These nests should be removed after use so that fresh material can be used for subsequent nestings. However, certain species rely solely on wood chips created by the excavators of natural cavities, and use little or no other material. They will avoid cavities not containing a supply of chips or sawdust, or they may have difficulty incubating eggs laid on the bare floor. Avoid the use of very fine sawdust, for once wet it takes a long time to dry out. Small chips are best (1/16 to ¼ inch across).

If there are no chips in the bottom of a nesting box, woodpeckers may damage the wall of the box while attempting to fulfill their needs. The Table indicates which species require chips, sawdust or grass placed in the box for them.

NESTING PLATFORMS

In addition to nesting boxes, open shelves or platforms can be put out for certain other species. Birds that formerly nested on sheltered overhanging rocks or cliffs have frequently built their nests in or on buildings that provide some protection from the rain. Such birds can be induced to use platforms that are placed in the right location.

The Barn Swallow and phoebes often nest in old barns, open sheds or under bridges. Their nests contain a good bit of mud and are placed on beams or on the walls where there is some support. The Cliff Swallow builds a gourd-like nest of mud. Frequently, it will use the outside of a barn or house near the eaves. Even the Cave Swallow which nests on buildings and in

culverts in southwest Texas may use platforms placed for them.

For such birds, an open shelf such as shown in Figure 4(A) can be mounted beneath the eaves of a house, garage or farm building. Make it about seven inches square and be sure it is sheltered from the rain. Birds that will use such a shelf include robins, phoebes and several swallows. If there is no overhead shelter, a shelf with a roof as shown in Figure 4(B) can be utilized.

Cliff Swallows have constructed their nests on long two-by-fours that were nailed to the side of a barn in a sheltered spot. They seem to need only something to which they can fasten their mud nest. One barn years ago had 800 Cliff Swallow nests on it where the owner had nailed strips of wood for support.

The old wooden bridges and steel beam supported bridges provided fine sites for the phoebe and mud-nesting swallows. Whereas the old bridges had beams on which nests could be located, the modern cement bridges and large metal culverts have no such spots. As a result, many sites formerly used by these birds are now unacceptable to them. Gene Whitaker, a biologist for the Soil Conservation Service in Maryland designed a platform to be mounted in the modern culverts for these birds whose former homes had been removed by "progress."

His design is shown in Figure 4(C). A seven-inch shelf of one-inch wood is nailed to the bottom of a two-by-six that is two feet long. The structure is mounted inside the culvert at the top. Angle irons are used and expandable anchors hold them to the pipe. The pointed end of the shelf faces upstream so that debris will not catch on it if there is a severe flood. Twenty-six were installed in Delaware by the State Conservation Department. They were an immediate success. Nineteen were used that first year.

RAPTOR PLATFORMS

Several raptors are known to make frequent use of platforms erected for them in suitable locations. Great Horned Owls, Barn Owls and Osprey are three species you may wish to assist if they nest in your area. As noted in Table 1, the Barn Owl will also use a nesting box of the standard design, and the nesting box has a better

chance of being used if it is mounted out-of-doors.

However, in barns, silos or large sheds under roof, the Barn Owl will utilize a platform about 16" x 24" having sides about 10" deep. This open-topped box can be mounted on a high rafter, nailed high on the wall, or fastened to the top rung of a silo. These owls will bring various items of debris to line the nest.

Great Horned Owls normally use the old nests of crows, hawks, squirrels and even those of Ospreys, Bald Eagles and Great Blue Herons. They do not make a nest of their own, but begin nesting very early during the winter before other species return to their nest sites. Frequently the borrowed nest falls apart from wear and tear and the effect of storms before the young are ready to fledge.

A secure nesting platform for Great Horned Owls can be made starting with a frame of 2 x 4s two feet square and eight inches deep. Slats of one-inch lumber can be spaced 1/2" apart to form the floor of this nesting tray while providing for drainage. Since the tray must be hauled into position high in a woodland tree, it is usually more convenient to pack the nesting material into the tray after it is wired into position. Put it in a sturdy crotch at least 20 feet above the ground (40 ft. is more typical of a natural site).

Collect twigs and sticks 3/8" to 1" in diameter and arrange them around the inside of the tray and on the bottom. Mix in leaves, straw and pieces of bark as you build up the center. When it is completed it will resemble a hawk nest with sticks showing around the edges and a lot of natural debris in the center. The tray will be filled to the rim and there will be a slight depression in the center (no more than one inch lower than the sides). Since the Great Horned Owls start to nest while it is still very cold, it is important that the nesting material be packed at least six inches deep to provide insulation from below during incubation. It does not matter that the wooden edges of the tray are visible to the owls.

Some successful nests have been constructed by piling straw and sticks into a bowl of chicken wire fastened into the crotch. However, it seems to be better to

have a tray or box that has firm edges to keep eggs from rolling out and to give the young owls a firm edge to grip. If the edges of the nest are soft and slope to the outside, a young owl venturing near the edge may slip off and tumble to the ground prematurely. Nailing a one-inch limb along each edge of the box provides a firm foothold.

The nest should be checked in the fall or early winter and nesting material added if necessary.

OSPREY PLATFORMS

Ospreys offer a special challenge to conservationists. This species was badly depleted in most areas within its range during the 1950-1970 period when the wide-scale use of chemical pesticides had a drastic effect on the reproductive cycle. Today the Osprey is making a slow comeback from the brink of extinction with the help of egg transplant projects and the erection of many nesting platforms for their use.

At many coastal and lakeside areas, human use and development have usurped nesting territories and eliminated many potential nest trees. Many shipping channel marker buoys that previously offered nesting platforms have been replaced with modern devices whose design precludes use by Ospreys. Where Ospreys have built their bulky nests on

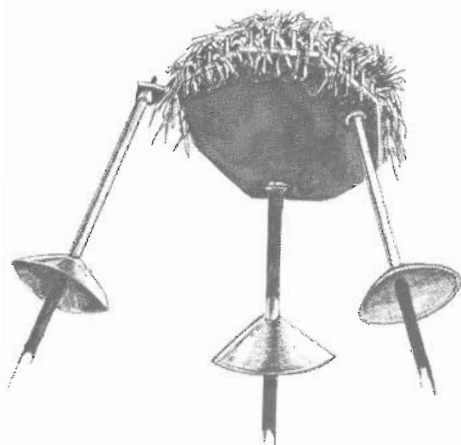


Figure 8. Osprey nesting platform with tripod support system. Vertical dowels or perimeter of wood is used to prevent nest slippage due to high winds or tilt of platform.

power pole crosstrees, power companies have had to tear them down to prevent fires and short circuits. A number of nesting sites have become so subjected to traffic from pleasure boaters that sufficient isolation is no longer available.

Ospreys seem to prefer over-water locations but will often nest over land not far from water. Since their nests are bulky and heavy, a very sturdy mounting method (Figure 8) is required. A pole mounted in water should be high enough to put the nesting platform above the reach of pleasure boaters. A pole set in the mud of a shallow marsh will make the work of erection difficult, but will often serve to make human harassment of the nest equally difficult.

The platform can be made from a four-foot-square piece of exterior grade plywood, $\frac{3}{4}$ " thick. One-half inch holes should be drilled through the plywood to provide drainage. A perimeter of 2 x 4 lumber will serve to prevent the nest from sliding off in high winds. It is not necessary to construct a nest, because the Osprey will build its own. However, you might start it off for them by arranging a few sticks about the platform.

Make sure the platform is securely fixed to the mounting pole, and that the mounting pole itself is securely braced from several directions. If the pole is mounted over marshland, some form of raccoon proofing may be necessary.

WATERFOWL NEEDS

One of the shining examples of American wildlife conservation involved the restoration of Wood Duck populations in the early part of this century. Nesting boxes mounted in suitable habitat were the answer then as they are today. Table 1 gives the dimensions for a Wood Duck nesting box using the standard nesting box design. These boxes can also be used by Buffleheads and Hooded Mergansers if you are fortunate to have them breed near you.

However, research has shown that in certain areas Wood Duck boxes of the standard vertical design are frequently taken over by—you guessed it—Starlings. Work done by investigators at the Patuxent Wildlife Research Center has shown that a

nesting barrel mounted horizontally is the best answer. Starlings seldom use it. The barrel is made of sheet metal or stove pipe with wooden ends. When the barrel is mounted with a closed back it is acceptable to mergansers and Wood Ducks. When both ends are left open, Mallards and Black Ducks will use the device. Figures 9 & 10 provide details regarding construction and mounting. After erection, the barrel is half filled with dry grasses or straw.

Lastly, larger waterfowl such as swans and Canada Geese will utilize straw-filled wire baskets mounted several feet above the water. The three-foot-square platforms are created by securely sinking four pipes or poles into the bottom of a pond or lake, away from human disturbance. A framework of pipe, angle iron or 2 x 4 lumber is mounted to the uprights and a basket of stout chicken wire or cattle

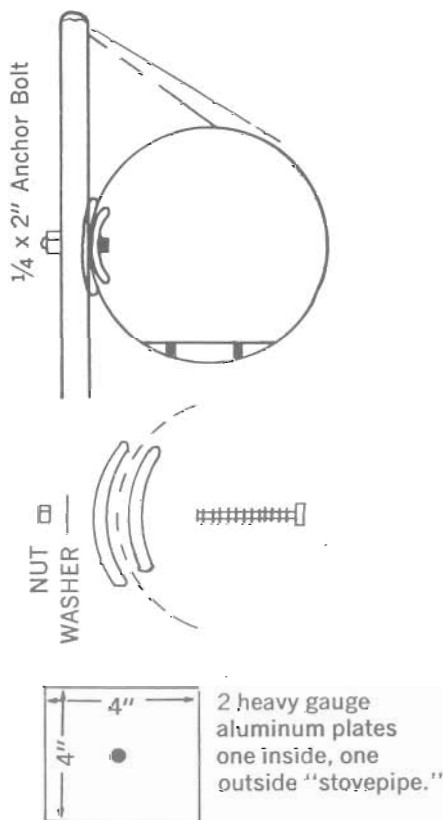


Figure 9. Mounting details for waterfowl nesting barrel.

fencing is suspended from the framework. The basket is filled to overflowing with straw to a depth of six or eight inches. The swans or geese will handle it from there. The uprights should be greased to repel raccoons. Figure 11 illustrates construction techniques.

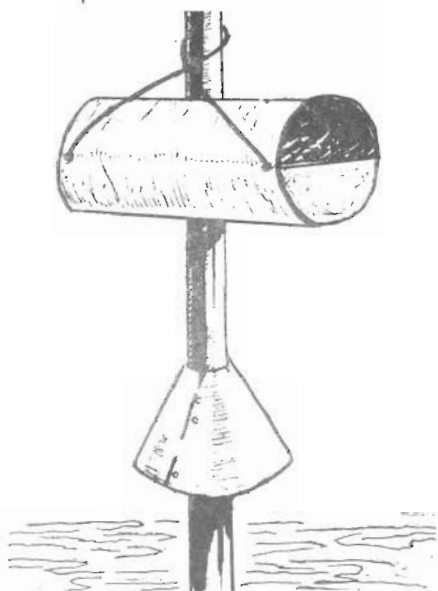


Figure 10. Waterfowl nesting barrel mounted horizontally on post or pipe over water. Barrel is constructed from sheet metal or from 12" diameter stovepipe, 24" long. Ends are made from sheet metal or wood. See text for additional details.

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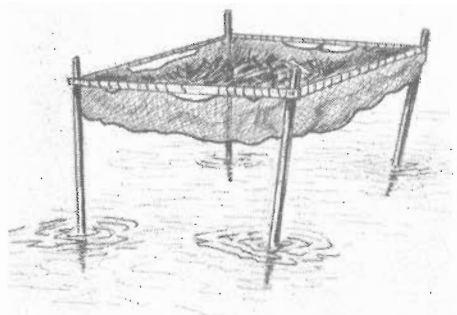


Figure 11. Example of waterfowl nesting platform used by geese and swans. See text for construction details.

EDITOR'S NOTE

Benjamin P. Burt is professor of chemistry at Syracuse University. His side interest in birds has flourished for over 25 years and has led to his writing of a weekly column on birds for the Syracuse Herald-American for almost as long a period. A licensed bird bander, Dr. Burt also has the distinction of having held the National Collegiate Individual Dueling Sword Championship.

In addition to his busy teaching and writing schedule, Dr. Burt finds time to serve on the administrative board of the Cornell Laboratory of Ornithology, and to maintain some Great Horned Owl nesting platforms near his home in Jamesville, New York.

We thank Dr. Burt for this highly informative article which will be available for distribution in reprint form shortly.

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INFORMATION ABOUT NESTS, EGGS AND NESTING HABITS FOR SELECTED SPECIES OF NESTING BOX USERS.**

	Eastern Bluebird	Carolina Chickadee	White-breasted Nuthatch	House Sparrow	Tree Swallow	Tufted Titmouse	House Wren
Time required to build nest	4 - 7 days	3 - 4 days	3 - 4 days	Can build in one day repeatedly	2 - 14 days	3 - 7 days	F sticks, several days M feathers, cup lining.
Nesting Materials	Grass cup or pine needles	Moss, lined with fur or hair	Bark shreds, twigs, grass hair, fur, etc.	Grass, paper, feathers, with canopy	Grass with many feathers	Moss, hair fur & wet leaf parts	Sticks and thorns with feathers
Eggs	Pale blue, sometimes white	White, pink heavy brown spots	White with brown spots	White, green, with gray or brown spots	Glossy white	White, with small dots	White, with reddish or brown spots
Clutch Size	3 - 7	5 - 9	5 - 9	3 - 7	4 - 6	4 - 8	5 - 12
Broods per year, early nest dates	2, sometimes 3 Early April	1 Mid-April	1 Mid-April	Too many!!! Early April	1 Late May or June	1 Mid-April	2 Mid-May
Incubation Period	F 12 - 16	F 11 - 13	F & M 11 - 13	F & M 12 - 13	F, M at time 13 - 16	F 12 - 14	F 12 - 15
Nesting Period	15 - 20	16	14	10	16 - 24	15 - 16	12 - 18
Other Notes	Open areas, Scattered Trees, perches	Very protective of nest	Hard to attract, likes rough box	Likes buildings	Likes water nearby	Easy to photograph	Likes brushy areas

** Much of the information concerning nest building, number of eggs and incubation and nesting periods is generalized for "average" situations. Weather, food supply, nesting territory and geographical area all influence individual nesting circumstances. This chart is intended to serve as a guide only. F = Female M = Male

PLANTINGS FOR BLUEBIRDS AND OTHER WILDLIFE

Winter Food Is Important Too

George Grant

The featured planting for this issue is the American Holly, *Ilex opaca*. Not only does it have great value to the bluebird as a winter food, but it is a very beautiful landscaping plant as well. Plants begin producing bright red berries at an early age, so you won't have to wait a long time to begin producing fruit for bluebirds. Coupled with the fact that Starlings rarely take the berries, there are adequate reasons to plant American Holly on your property and to encourage others to do likewise.

Also featured is part one of a listing of plants important to wildlife. This material is taken from a New York State Department of Environmental Conservation educational leaflet entitled "Some Shrubs and Vines for Wildlife Food and Cover," written by Arthur W. Holweg, Supervisor of Game Management. This excellent article first appeared in the Oct.-Nov. 1964 issue of *The Conservationist*, the outstanding New York State magazine. Part two of Mr. Holweg's material will appear in the Winter 1980 issue of *Sialia*, with an in-depth study of the Multiflora Rose, perhaps the most important plant of all for bluebird survival.

Conservationists need to learn more about bluebird feeding habits, especially with regard to berry-producing plants used by these species. Bluebird lovers are encouraged to make detailed observations when observing bluebirds feeding on plant foods and to report their findings. Whenever possible, the Society would like to receive good 35mm color slides of bluebirds actually feeding on fruit, as well as slides of the plants at various stages of the growing season.

If readers are able to contribute slides



for the Society's use, they are invited to first write to George N. Grant, RD 3 Box 153B, Canastota NY 13032, coordinator of the Society's plant education project.

HARDINESS ZONES

This hardiness map was developed by the Agricultural Research Service of the U.S. Dept. of Agriculture. The hardiness zones 1 - 10 are based on the average annual minimum temperature for each zone and divide the United States and Canada into areas where specific plants would perform best as to winter hardiness. Many factors such as altitude, length of growing season, exposure, moisture, soil types, etc., can create variations within zones, but adhering to your specific zone will generally give you the best results.

ZONE 1	BELOW -50°	ZONE 6	-10° TO 0°
ZONE 2	-50° TO -40°	ZONE 7	0° TO 10°
ZONE 3	-40° TO -30°	ZONE 8	10° TO 20°
ZONE 4	-30° TO -20°	ZONE 9	20° TO 30°
ZONE 5	-20° TO -10°	ZONE 10	30° TO 40°

American Holly

Ilex opaca

Native - East & Gulf Coasts from Mass. to Tx., inland to S. Ind., Ill. & Mo.

Hardiness - Zone 6 to 9, possibly lower zone 5 with protection.

Growth Rate - Medium in young, slow in older plants.

Habit - Evergreen. densely pyramidal in youth, branches to the ground - open, irregular picturesque in older trees - 20 to 50 or more feet - leaves thick and leathery 2-4" long, dull, dark green above, light green below with spiny edged leaves.

Flowers - Small 1/4" white flowers, male and female on separate plants in May depending on latitude; recommend 1 male within 100 feet for each 2 to 10 females for heavy fruiting on current season's growth.

Fruit - 1/4" red berries borne singly, but in clusters of several berries from Oct. to late winter if not taken.

Habitat - Grows normally on moist, but well drained sites on the borders of swamps and on rich bottom lands.

Landscape Value - Favored planting in its range - most Christmasy of Christmas greens - beautiful and attractive all year - available at garden centers or mail order.

Culture - Grow in full sun for greater fruiting. Transplant container grown or balled and burlap in spring and fall only in good, moist, loose, slightly acid to acid, well drained soil - avoid dry, windy, unprotected sites or wet sites and mulch around base of plant.

Undesirable Traits - None.

Diseases and Insects - Affected by several such as holly leaf miner, scales, whitefly, mites, mealy bugs, aphid, and beetles.

Similar or Related Species - There are more than 300 cultivars with one var. *xanthocarpa* producing yellow fruits. Hopefully some of cultivars will eventually allow more northerly growth. English Holly-

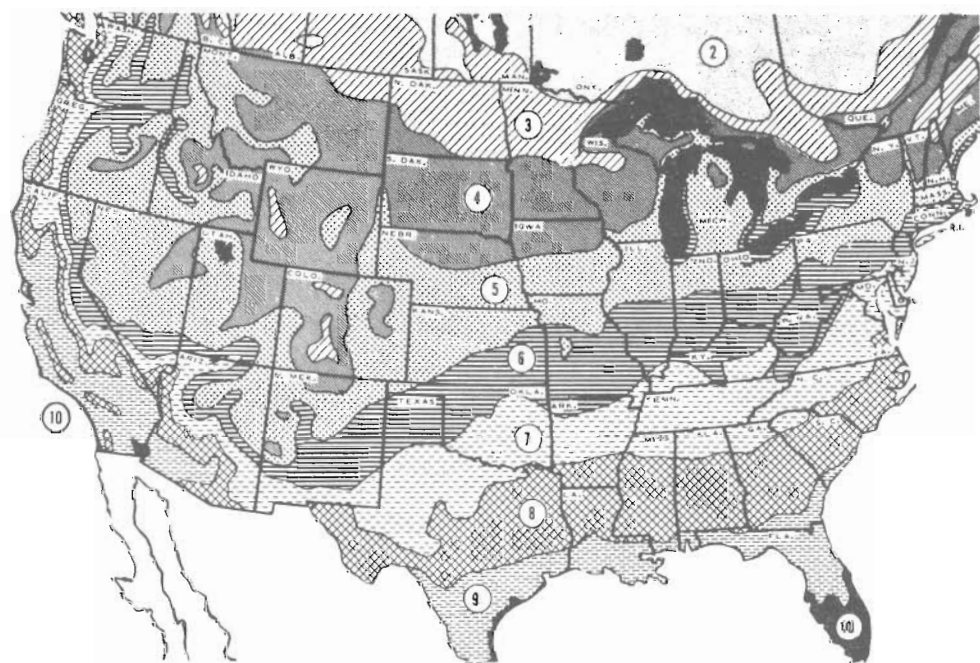


Figure 1. Hardiness Zone for the United States and southern Canada. When no zones are mentioned with the plant description, plants are hardy anywhere. If a zone is given, it indicates that plants are hardy within the zone and in all areas south of it.

Ilex aquifolium is most similar to American Holly but less hardy and most often used for Christmas decorations.

Propagation - Cuttings with special treatment root readily, seeds require up to 18 months for germination in most cases.

Uses by Wildlife - Known to attract nearly 50 species of birds particularly beneficial to and liked by **bluebirds**, Red-headed Woodpeckers, Mockingbirds, Cedar Waxwings, Robins, Northern Flickers, Gray Catbird, Brown Thrashers, Towees, Bobwhites, and others plus the fact Starlings rarely eat the berries.

Cover and Nesting - Exceptionally good - evergreen foliage provides good cover, used extensively by early nesting species.

Special Uses - Evergreen leaves and bright berries are used in immense quantities for holiday decorations. Unfortunately many trees are relentlessly attacked and decimated in the wild, protected or not.

Tree Rating - General overall-excellent; Landscaping-excellent; Wildlife-excellent; Bluebird-excellent.

Bittersweet

Celastrus scandens

Zone 3

Bittersweet is a twining vine usually having the staminate and pistillate flowers on different plants. Since the sexes are separate, plants of each type should be reasonably close together to ensure good fruiting on the pistillate form. The flowers appear at twig ends and are yellow until the orange-red berries are revealed with the bursting open and peeling back of the yellow husks. The leaves turn yellow before dropping in the fall. It does well in sunny locations either on banks or where some support is at hand for the vines to reach the light, thus inducing good fruiting. It is a good food source for grouse, pheasants, quail, turkeys, as well as a number of songbirds. Cottontails and squirrels relish the fruits and the former prunes the young vine where it can reach it.

CORRECTION

In the Summer 1979 issue on page 121, an error crept into the Table shown. Pokeweed was given as a second common name for Inkberry, *Ilex glabra*. Pokeberry, fruit of the Pokeweed, also goes by the common name Inkberry in some localities. However, its botanical name is *Phytolacca americana*, and was meant to be listed in Table 2 on page 122. A perennial herb, Pokeweed fruits abundantly in late summer and the fruit is enjoyed by all thrushes and many other songbirds. The editorial error points out the wisdom of the use of botanical names to keep things straight.

Washington Hawthorn

Crataegus phaenopyrum

Zone 4

Washington hawthorn is a native of a more southerly climate but does well enough in our harsher temperatures. It bears numerous white blossoms in June well after frost danger and each year carries a good crop of small, bright red apples that persist through the winter. The fruits are available as a late winter or early spring food for wildlife. Evening Grosbeaks and Cedar Waxwings, as well as the robins and catbirds, eat the apples. The Ruffed Grouse, pheasant and wild turkey are all fond of hawthorn fruits. Its thorny branches offer protection for songbirds against molestation and are used for nesting.

Highbush Cranberry

Viburnum opulus

Zone 3

Highbush cranberry is a tall, handsome shrub with opposite leaves which resemble those of the red maple. It has flat-topped clusters of white flowers with showy sterile florets at the outer rim. Its red, glossy, juicy but sour fruits ripen in September and usually persist until spring unless eaten by birds before the winter is over. It is well adapted to moist sites and although doing best in sunny locations, will stand moderate shade. The fruits are a winter and early spring food for grouse, pheasant, turkey and songbirds.

Hobblebush

Viburnum alnifolium

Zone 3

Hobblebush goes by numerous names which indicate its tendency to root at the ends of its straggling long branches. It is interesting and has handsome foliage, flowers and fruits. In common with some other viburnums, it has flat, flower clusters, with conspicuous sterile flowers rimming the fertile ones. The fruits change color from coral and crimson to purple and almost black. The foliage turns reddish in autumn. It is outstanding in moist, shady, wooded areas, and this, its natural habitat, explains its usefulness as a browse species for deer. It is browsed heavily, especially in deer concentration areas, during the late fall, winter and early spring, and offers food for varying hare, also. The berries are eaten by Ruffed Grouse and various woodland songbirds. Where cool, semi-shady, moist conditions exist, this or the Maple-leaved *Viburnum* could be established near the home.

Sargent Crab Apple

Pyrus sargentii

Zone 4

Sargent crab apple is a low-growing crab apple that qualifies for the shrub group. Its white, fragrant flowers appear in late May and early June followed by small, reddish apples about three-eighths of an inch in diameter, ripening in early fall. If not removed by robins and squirrels before winter, the fruit will persist well into the coldest part of the late winter. It does best on good well-drained soils and makes an excellent specimen plant. Because of its low stature, it should stand in front of taller trees. The fruits and seeds are eaten avidly by birds, including grouse, pheasants, quail, many songbirds, red fox, cottontails and raccoons as well as by squirrels. While getting established, the trunk should be protected against mice, cottontails and woodchuck. In addition to this shrubby form of crab apple, the great majority of the numerous tree forms have wildlife value and this is especially true of those which retain their fruits into the winter.

Nannyberry

Viburnum lentago

Zone 3

Nannyberry is a large shrub whose flat clusters of small, white blossoms appear in late May and early June. It ripens its sweet but large-stoned blue fruits in September. It grows best in moist, deep, fertile soils and does well if planted in such sites. It is useful as a screen and as a background plant. It does well in proximity to woodland. Its shiny-green leaves assume a purplish red color in the autumn. Its twigs are browsed by deer and cottontails and its berries prove desirable food for Rose-breasted Grosbeaks, Purple Finches, robins, the Ruffed Grouse and others. Its

Japanese Barberry

Berberis thunbergii

Zone 4

Japanese barberry is a very handy shrub that withstands dry soil conditions well and prospers under adversity. Its blossoms in June are inconspicuous yellow flowers that develop heavy crops of scarlet berries. The combination of foliage which turns scarlet in the fall and the red berries which remain even after the leaves have gone make a striking picture, especially on specimen plants. Because its fruit is little eaten by birds resident in summer or by fall migrants, it remains available for such winter resident birds as the Ruffed Grouse and cardinal. Its thorny twigs create a fine haven for such nesting birds as the catbird and Song Sparrow, and a protective cover for birds during the winter.

Coralberry

Symphoricarpos orbiculatus

Zone 3

Coralberry is a low, multiple-stemmed shrub usually less than four feet tall. It spreads by underground runners and by layering. The fruits ripen in the fall and assume a purplish-red color when ripe. Their habit of studding the stems in close files is very characteristic. It grows in a wide variety of sites but requires fairly good drainage. It is used especially in gully and road bank control. Its persistent fruits have some value to grouse, pheasants, quail and songbirds

Partridgeberry
Mitchella repens

Zone 3

Partridgeberry is a low, evergreen plant with trailing stems which frequently root at the leaf nodes. It is a ground cover plant of semi-herbaceous nature. It has a very wide distribution in woodlands. The small, tubular, white flowers are borne in pairs at the end of the branchlets and precede scarlet, paired berry-like fruits which persist for many months unless eaten. The fruit is insipid to human palates but is relished by grouse which eat it whenever it can be found. It is eaten, also, by Bobwhite and the wild turkey but is of no great significance to any of the wildlife species.

Common Chokecherry
Prunus virginiana

Zone 3

Chokecherry a medium to tall shrub, grows usually in sunny locations in fence rows and along waysides. The profusion of early season flowers in May, which precede the clusters of attractive fruits ripening in July and August, make it a valuable addition to a planting. Ruffed Grouse, Ring-necked Pheasant, wild turkey and quail, among the game birds, find the fruit to their liking, as do many animals, including the bear, raccoon, rabbit and squirrel. Cottontail and deer feed on the leaves and stems.

Highbush Blueberry
Vaccinium corymbosum

Zone 3

Blueberry grows well in sun or shade but, like other members of the heath family, needs an acid soil condition to thrive. Its summer fruits appeal to a wide variety of birds including the Scarlet Tanager and bluebird and the nectar of the small, waxy, urn-shaped flowers attracts the hummingbird. Grouse and the black bear, among game species, find the fruit an important item of diet. Deer and rabbits browse considerably on the twigs. This medium-sized twiggy shrub is outstanding for its glowing crimson fall color. Also, Lowbush Blueberry, *Vaccinium angustifolium*, is equally desirable.

Virginia Creeper
Parthenocissus quinquefolia

Zone 4

Virginia creeper, or woodbine, is a woody vine which trails or climbs and has tendrils with small, adhesive discs. Where it occurs in open areas it will cover fences and rockpiles, or in wooded areas will climb well into tall trees to reach the sun. It is very colorful in the late summer and fall with the leaves taking on crimson hues. The fruits ripen in the fall and are eaten by many species of birds, including the bluebird, flicker, and Crested Flycatcher. This vine may be confused with the poison ivy, but the latter has three leaflets and whitish fruits in contrast to the Virginia creeper's five leaflets and black berries.

Bayberry

Myrica carolinensis

Zone 3

Bayberry is a shrub, usually up to six feet, primarily found along the sand dunes and sandy coastal regions. However, it ranges inland in the region of the Great Lakes. It is very adaptable and able to grow in dry and quite sterile soils but will do well in garden soils on the acid side. Its fragrant semi-evergreen leaves, which bronze handsomely during the fall and winter, together with the waxy, white fruits, all combine to make the compact bayberry a fine specimen plant. It is suitable, also, for planting in hedges. A number of wild birds, including the Tree Swallow, Myrtle Warbler and Carolina Wren, eat the fruits.

American Elderberry
Sambucus canadensis

Zone 3

Elderberry is a common, tall shrub along streams, country roadsides and ditch banks—any place where there is good moisture. The attractive flat clusters of flowers in late June or July, result almost always in good fruit production starting in late August, and berries continue to ripen into the early fall. (They make excellent pies!) Game birds as well as robins and catbirds eat the fruits, and the leaves and twigs are browsed by game animals including deer and cottontail rabbits.

Sialia, Autumn 1979

TURN BUT A STONE, AND START A WING!

In early summer we found a bluebird family
inhabiting a fence post hollowed by flickers.
We counted five gluttons — we thought —
then kept our distance, using binoculars.
I was merry in a young son's surprise
as each parent thrust a morsel into the post
and flew away with a globule of waste.
We saw the first airlift, second, third, and
fourth

till then unaware of prickly ash along the fence.
Several days they sheltered there,
then all four were in the maple overhead,
and only the mother returned to her nest.

They were gone one afternoon.
At the porthole cautious counsel was held:
We lifted the weakling in a vine-snare
from the wooden tomb, wrapped it in wool,
nurtured it on meal worms and jars of junior
meat.

August. This dark, speckle-breasted, balding
creature few believed to be a bluebird —
and the boy resented such homage withheld.
Wintertime it sought the warmth of us,
with coverts and scapulars
wrote in flight Lowell-lines through every
room

In March when we offered live insects
memory spoke from its throat,
as from sea shells or from children's eyes,
a bluebird call that cheers the winter's going.
Soon, through opened window it went,
returned

at will, then left — left in us the taste
of all the partings gone and partings yet to
be.*

Edna Meudt

*The title & final line
are from Francis
Thompson's IN NO
STRANGELAND.



Bluebird, bluebird, flying high—
Top of the tree, so close the sky—
Winging, singing, "PURE, PURE,"
Hoping that a mate you'll lure
To nesile in some tree nearby.

Purest "Maxfield Parrish" blue
(He COULD have borrowed it from you!)
Loving, gentle creature, dear
To all entranced, who listen, hear
Your lovely family flying through.

Oh! Come to us in Spring again,
For we will sorely miss you when
The sun does not reflect your blue
Against the green of pasture's hue.
God love and guide you until then!

Katharine M. Braun



NEW BLUEBIRD TRAIL

So gossamer the fragile chain which linked
Us to this Earth, so terrible the fear
That as our numbers dwindled year by year
Our line would vanish, soon become extinct,
That while today it seems the tide has turned,
We hesitate, unable to believe
That fate has granted us a real reprieve
And we are safe at last. Too dearly learned
The lesson that experience has taught:
Unceasing vigilance on Bluebird Trails
Is still essential, lest our project fails
As vandals bring our efforts all to naught.

Now instinct bids us soar on southward wing,
With hope that we'll be welcomed back next
Spring.

Helen Wohl Patterson

Winter Banding and Roosting Boxes

A Key for Increasing Migration Data?

Robert M. Patterson

The United States Fish and Wildlife Service began recording information about bird banding activities in 1922. In that year seven bluebirds were banded about which information was later discovered. These historic records were generated by W. I. Lyon in Illinois and Ohio, Dr. Josselyn Van Tyne in Rhode Island, Fr. Damian Smith in New Hampshire, Bessie P. Reed in Kansas, and by Rev. George E. Allen and A. Whitman Higgins, both in Massachusetts.

Of the seven birds, two were determined to be adult females and five were listed as being immature or juvenile at time of banding. Information was obtained about these birds at dates ranging from three days (dead of unknown cause) to one year later (two birds, returned to general area in which banding took place). Of the other four birds, one was killed by an auto four days after banding, one died of unknown cause one month later, one lived seven weeks before a cat took its life, and one of the adult females was retrapped three months later. Thus, the first-year bluebird banding effort resulted in seven bits of information. Everything that was learned took place within the same ten-minute block in which banding occurred (an area defined by latitude and longitude containing about 100 square miles at the latitude of Washington, D.C.). No information about migration was obtained.

By way of comparison, of bluebirds banded during 1970, there have been 32 returns of information regarding 31 individual birds. One bird was recovered twice. Two of John Lane's birds banded in Manitoba were recovered the following winter in Texas and Oklahoma, the one in Texas found dead, the one in Oklahoma trapped and released but not heard from again. Three birds were later found in nearby states, in each case two years later in breeding season. A New Hampshire

bird turned up in Massachusetts, and single birds banded in Pennsylvania and Ohio were discovered in New York. Seven birds were recovered within the state where banding occurred, but at least several 10-minute blocks removed from the point of banding. In four of these cases, recoveries occurred a year or more after banding took place. In another four cases, the bird was recovered in the adjacent 10-minute block to where it was banded, and in two of these cases the recovery occurred a year or more after banding. In 16, or 50% of the cases, the bird was found in the same 10-minute block in which it was banded, and in 14 of these cases, the bird was retrapped during the same breeding season. In fact, all 14 birds were females found within nesting boxes by the bander.

No bluebird from the class of 1970 bandings was recovered more than two years after banding took place. However, in 11 of the 17 cases not involving sitting females, recovery took place at least one year later and of these, one was injured, one sickly, one healthy and the rest were dead from various causes. Because of the much larger number of bluebirds banded in 1970 (and because better records were kept) than in 1922, much more was learned about the wanderings and longevity of the species. Yet, except for the two Manitoba birds, nothing was learned about bluebird migration.

In fact, to this day, there have been no Western or Mountain Bluebirds banded in the United States that were recovered outside the State in which banding took place. Of course, the western states are relatively large and sparsely settled so that birds have to travel further to cross state lines, and the odds of recovering a bird are not as great where human densities are less.

Traditionally, most banding of bluebirds has occurred at nesting boxes, and has been limited to banding of nestlings.

Sialia, Autumn 1979

To a lesser degree incubating or brooding females are trapped and banded, and to a much lesser degree adult males are caught and banded. Bluebirds are rarely caught in mist nests at typical migratory banding stations because the nets at those stations are usually situated so as to catch large numbers of warblers, sparrows and other species whose habits during migration are quite different from those of bluebirds. There has been very little done in the way of winter banding of bluebirds.

As a result, almost all bandings of bluebirds occur at or near the nesting box, and almost all recaptures occur there as well. A great deal of local information about these species is generated, but little is learned about the timing, distance and other factors regarding migration. Long distance recoveries occur infrequently when such things as cats or cars are involved, and when humans are around to notice. In the Western States there simply has not been enough banding work done for the slim odds for recoveries to have generated much data.

Another factor inhibiting long-distance recoveries of banded bluebirds is the fact that the vast majority of bandings take place on nestlings. Many authorities have suggested that the mortality rate for this class of birds is as much as 50% during the first 90 days after fledging, and would suggest their demise before long migration flights have occurred. Birds banded before August 1 would probably still be close to their place of banding on November 1 in many parts of the breeding range.

Taken together, all of these factors

concerning traditional bluebird bandings and recoveries suggest that intensive wintertime banding of these species may be more productive of data regarding migration patterns than are current methods. The capture of living bluebirds in their winter range will result in some already-banded birds being found. Perhaps more importantly, many bluebirds will be banded that will later be recovered in their breeding range. Bluebirds banded in winter will have already survived the greatest hazards to longevity: the period between fledging and independence, the first leg of migration and early winter storms.

Winter banding of bluebirds can be accomplished by locating birds that are using nesting boxes or specially constructed roosting boxes for overnight roosting. This may not be the most pleasant of tasks, for bluebirds are not known for using cavities to roost in every night. Most reports say the use of roosting

Table 1. Eastern Bluebirds Banded In

Were Recovered In	New Hampshire	Massachusetts	Connecticut	New York	New Jersey	Pennsylvania	Total Recovered
Virginia		1	1	1			3
North Carolina	1	5		3		1	10
South Carolina		1	1	1			3
Georgia		1			1		2
Florida				1		1	2
Total Banded	1	8	1	6	1	5	22

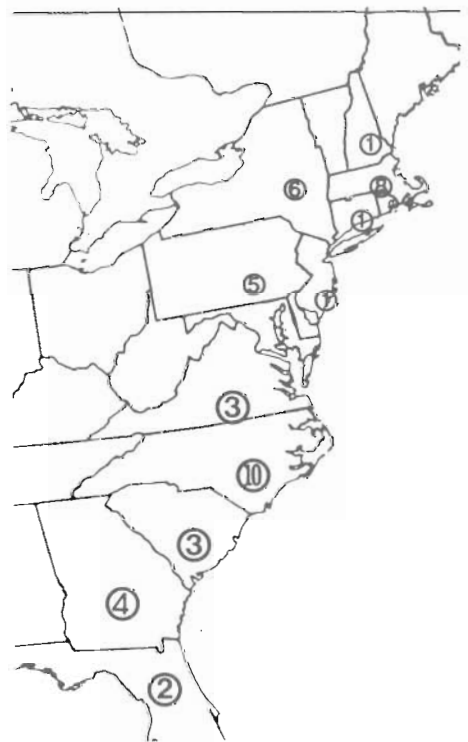


Figure 1. Eastern Bluebirds banded north of the Mason-Dixon Line recovered south of the Potomac River.

boxes occurs during severe weather, although Krieg (1971) found fairly regular use of nesting boxes on his research trail in New York. Michael D. Smith (1977) has found that bluebirds regularly use his log-type nesting box in a residential area in Maryland after the onset of prolonged cold or stormy weather in December or later in winter, with as many as 17 bluebirds packing into the cavity in layers. In one instance he found a dead bird in the cavity the next morning, with suffocation presumably the cause. Ralph K. Bell (pers. comm.) found that bluebirds used nine of his nesting boxes to roost in during the winter of 1978-79 in southwestern Pennsylvania, including a total of 10 dead birds found in four of the boxes. However, Mr. Bell reported that bluebirds normally roost under the eaves of his chicken house, even in sub-zero weather, though a snug nesting box is available about 20 yards away. Eventually, he explains, they do move to nesting boxes to roost, but sometimes only under the most severe of conditions.

Pitts (1979), reporting on the cold weather feeding habits of Eastern Bluebirds in Tennessee, observed bluebirds using nesting boxes for roosting only on nights when the temperatures fell below 14° F (-10° C).

Many nesting box trail operators have reported finding dead bluebirds in their nesting boxes when cleaning the boxes in late winter. Frequently more than one dead bird is found in a box, suggesting the

birds succumbed to cold or starvation, rather than suffering from illness. This possibility brings up both a risk and an opportunity involving winter banding. That is, improper handling of roosting birds during cold weather could contribute to the bird's death, and at the same time, locating suffering birds during such periods could be a means to their salvation.

Until much more is known about handling bluebirds at night in extreme weather, the responsible bander and trail operator must consider doing only those things that will cause the least possible amount of excitement or trauma to the bluebirds. Opening of nesting or roosting boxes and handling of struggling birds will cause a level of excitement among the birds that is certain to make them expend valuable stores of energy, energy that may be necessary to carry them through the night. It has been strongly recom-

Table 2.

Were Recovered In	Eastern Bluebirds Banded in					Total Recovered
	Ontario	Wisconsin	Michigan	Illinois	Indiana	
North Carolina						1
Tennessee			1		1	3
Georgia	3		1		1	5
Alabama		1	3	1	3	9
Mississippi		3		2		5
Arkansas		1		1		2
Louisiana		2	1	4		7
Texas					5	5
Florida	1		2			3
Total Banded	4	7	7	14	4	40



Figure 2. Eastern Bluebirds banded north or the Ohio River recovered south of latitude 36°30' N.

mended by experienced bird banders that the proper technique to be used should involve the locating of roosting bluebirds shortly after dark, plugging the entrance hole for the night, and conducting banding operations at sunrise the next morning with immediate release of the birds after banding.

A quick inspection of boxes on a bluebird trail can be made in the early evening by using a small mirror and penlite type flashlight to look through the entrance hole to determine if bluebirds are inside. Bell pushes a piece of plastic screen in the hole to trap the birds until morning. Almost any type of plug for the entrance hole will suffice to hold the birds, and one that cannot be easily removed by a predator such as a raccoon should be considered. The type of plug used must allow for some ventilation unless alternate ventilation holes or cracks supply air.

During the banding operation at sunrise the next morning, the bander may discover one or more birds in weakened condition. Usually, it will only be necessary to warm a weakened bird to restore its vitality, after which release should be immediate. In a rare instance, it may be found necessary to hold an extremely weak bird beyond the warming stage, and to provide sustenance for a day or two prior to release.

Nesting box trail operators are cautioned that the handling and banding of bluebirds (in fact all birds except Starlings, House Sparrows and Rock Doves) is regulated by the United States and Canadian Governments, and such activities are allowed only by licensed bird banders and persons under their direct supervision. Frivolous nighttime sorties to find bluebirds not only would expose the birds to the possibility of great harm, but would be illegal as well.

This does not preclude the possibility of a group such as an Audubon Chapter or local bird club from scheduling a bluebird search or flashlight tour of nesting box trails. However, such an event would require having a licensed bander in attendance, and that persons doing the searching be instructed in proper procedures to be followed.

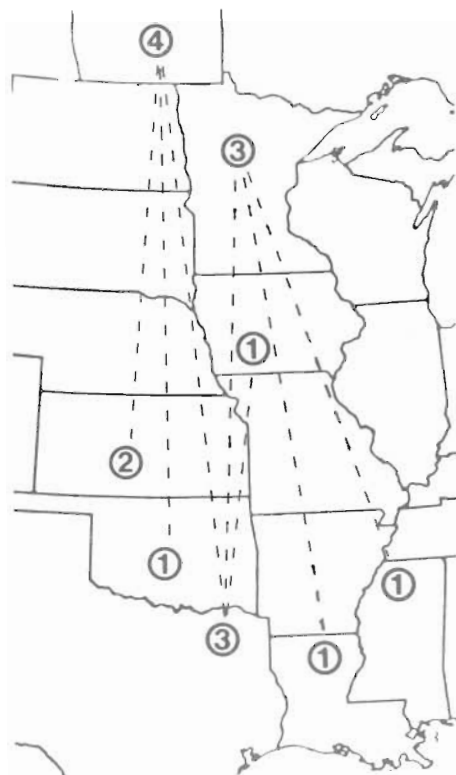


Figure 3. Eastern Bluebirds banded west of the Mississippi River recovered in southern states.

Design of Winter Roosting Boxes

Little is known about the most efficient design of roosting boxes from the standpoint of retention of the bird's body heat and to conserve against loss of entrapped daytime air temperature. The popular literature has, over the years, pictured a variety of roosting box designs. These have usually featured an assortment of dowels mounted horizontally inside the chamber for perching. Some designs have shown an entrance hole near the top of the box while others have placed the entrance near the floor on the theory that entrapped heat rises and will remain in the box longer.

Smith (1977) has discovered through nighttime photography of roosting birds in Maryland that they cram together as tightly as possible on the floor of his box. If too many birds are in the box at one time, they assume an almost upright position so

that more bodies can pack into a given space, or they start a second layer of bodies on top of the first.

Mrs. T. Deale Reese of Jacksonville, Texas reports that bluebirds have roosted in standard nesting boxes on her property during very cold weather, while disregarding two roosting boxes supplied with roosting pegs and having entrance holes near the bottom (pers. comm.).

Krieg (1971) and Pinkowski (1974) have observed bluebirds, in caged research situations, simply sitting on the floor of a standard nesting box during roosting periods. And logic dictates that bluebirds who use natural cavities for roosting also do so without the use of perches. Similarly, almost all natural cavities have entrance holes well above floor level, not at the bottom of the chamber—although this is not reason enough to dismiss the idea of a low entrance hole. The best design ought to be that design the birds will use that provides the warmest situation.

During severe winter weather little, if any, heat will be stored in any cavity, natural or man made. Air temperature within the cavity is bound to be sub-freezing. Therefore, the birds must depend upon their own body heat and the insulating quality of their feathers to protect them from the cold. The best protection the birds can have is to expose the least possible amount of body surface area to the cold air. Thus, as Smith's photographs show, by packing tightly together on the floor of the roosting chamber, each bird need only expose a small portion of its body (principally head and neck) to the air. The rest of the bird is further insulated by its neighbor or by the wall or floor of the cavity, both of which are efficient for the task.

On the other hand, birds sitting on perches (if they chose that method at all), would at most have only a small portion of the wing protected by a neighbor or by the adjacent cavity wall. Up to 100% of the bird's body surface would be exposed to the air without any additional protection.

If the entrance hole of a roosting box is located at or near the floor of the cavity, and if the bluebirds pack themselves together on the floor, at least one of the

birds must be immediately adjacent to the entrance hole and thus exposed to the elements. Also, in Smith's situation of having 17 birds use the box at one time, one is left to wonder if additional birds could claw their way into the box once the first ten or so had the floor pretty well packed.

When considering these points it becomes fairly obvious that bluebirds may be best protected by a roosting box having a fairly small floor size so they can pack together, and by having the standard 1½ inch entrance hole near the top of the cavity. This description pretty well fits the standard nesting box.

As in the nesting season, other factors become important such as predator controls. Raccoons and other mammals are present and hungry, although snakes are not a problem in winter. Roosting boxes may still be mounted on poles, although in



Figure 4. Mountain Bluebirds banded in Canada showing distant recoveries. No U.S. records exist for recoveries of Western or Mountain Bluebirds outside the State in which banding took place.

very cold weather, lubricants on the poles will freeze and become ineffective against climbing predators. Also, where deep snow may be present, boxes mounted at low elevations may actually become easier targets than in summer. Probably the best defense against raccoons is the wooden guard that adds thickness to the dimension of the box around the entrance hole, coupled with extra depth to prevent the animal from reaching in and down to the birds.

Most important, however, is provision for making the roosting box as warm as possible. Simply put, this means a tight box with a tight roof, and with as much protection from wind, snow and rain as possible. Boxes made of thick wood (2-inch lumber equals about 1½ inch actual dimension) is not a bad idea. The same box will offer more protection from summer heat when used for nesting. However, the additional ventilation usually provided for nesting birds works to the detriment of birds seeking shelter from cold. Roosting boxes should have no ventilation or drain holes to admit air drafts, and should have good protection against the elements penetrating the entrance hole. This means a generous depth of raccoon guard (an extra 1½ inch thickness), and/or a very generous overhang at the roof. Also, boxes should be faced away from prevailing winter winds.

Before rushing out to plug up drainage holes, it should be noted that some provision must be made so that the bluebirds will not be forced to roost on the bare floor of a box that may become damp or wet. There have been reports of birds frozen to the floor of a box when moisture accumulated at the bottom (L. Zeleny, pers. comm.). This problem can be avoided by making sure that a layer of absorptive material is in the box. This layer could be in the form of an old nest, or could be arranged by placing about one inch of dried grass, pine needles or wood chips in the box during the fall of the year. The best assurance of dryness, however, is the combination of tight box construction, use of weatherstripping noted below, use of a raccoon guard at the entrance hole, and facing the hole away from prevailing

winds.

Converting Nesting Boxes

Most bluebird trail operators can simply convert their wood nesting boxes to effective roosting boxes by plugging up all ventilation and drain holes, and by adding raccoon guards if they are not already provided. A long lasting weatherstripping sold in all hardware stores can be used to plug any drain or vent holes, and can be placed between the roof and the sides of the box on top-opening models. The same material can be used on front or side-opening models so that the door closes against the weatherstripping tightly. This weatherstripping is sold under many brand names and in various types of packages, and is generally referred to as "sponge weatherstrip." It often is sold by the roll, with one side of the tape having a sticky surface, and is of an open-celled or spongy design. Some manufacturers call it "foam weatherstrip" and it may be made of cellulose, vinyl, neoprene or other material. When compressed it effectively seals drafts and is impervious to water.

The same weatherstripping protection of the box may possibly be of benefit to nesting birds during the first-brood period. At this time of year (April to mid-May), wet, chilly weather frequently takes a high toll of nestlings. However, trail operators who elect to keep the weatherstripping on their boxes during this period must be prepared to immediately remove the material when maximum shade temperatures are expected to reach 80° F. Failure to do so may imperil eggs or young birds if nesting boxes in direct sunlight are allowed to overheat (Zeleny 1968).

Reporting Findings

Licensed bird banders and nesting box trail operators are encouraged to submit data to the Society about their banding work during the winter of 1979-80. Based upon such data, the society will be in a position to prepare a standardized reporting form for use in future years, and to enable the data to be entered into retrieval systems and made available to all who wish to work in this field.

(continued on next page)

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SPEAKER'S BUREAU

Many members of the Society have volunteered to present a slide program about bluebirds and nesting box trails throughout much of the United States and Canada. The Society now has available a 150-slide program accompanied by narrated and printed script. The program is suitable for presentation to school and youth groups, garden clubs, conservation and birding groups. A small handling fee is charged to offset shipping and handling costs.

If you would like to have a slide program presented in your community, or if you need to borrow the Society's program to make a planned presentation about bluebirds, please write the Society giving two or more dates if possible for scheduling. Inquiries should be addressed to:

Speaker's Bureau
c/o Executive Director
North American Bluebird Society
Box 6295
Silver Spring, MD 20906

COME BACK LITTLE BLUEBIRD

The eight-panel brochure enclosed with this issue of *Sialia*, "Come Back Little Bluebird," was graciously supplied for the Society's use by Homes for Bluebirds, Inc. Mr. Jack Finch, one of the Society's charter members, donated the brochures to "Help deplete our present supply, so the brochure can be updated and reprinted." Thanks, Jack.

Following last issue's insertion of "Hit the Trail for Bluebirds" published by the Ohio Department of Natural Resources, *Come Back Little Bluebird* is another example of how local groups might prepare an effective method of communicating the bluebird story in their community or region.

An effective brochure contains four important elements. (1) A statement of the problem: Why bluebirds need help. (2) An explanation of how the problem can be remedied: Methods used to help bluebirds. (3) Information about groups that help bluebirds and welcome new members: Your local group and the North American Bluebird Society. (4) A call to action: Invite the reader to take positive steps to help bluebirds through individual action and group affiliation.

With the passing of the 1979 nesting season, many Society members will now have time to concentrate on matters not focused on the nesting box trail. The next few months offer an opportunity to plan for the 1980 nesting season.

The sample brochures you have received contain excellent ideas. You can adapt them to serve your local needs without great difficulty. The Society's "Suggestions for Organizing a Save the Bluebird Committee" appears in the Spring 1979 issue of *Sialia*, pages 63-70. If you have misplaced your copy or have recently joined the Society, a copy of the Spring 1979 issue is available for \$2.50, or a reprint of the "Suggestions" article is available for 50¢. Simply write the Society at Box 6295, Silver Spring, MD 20906.

Sialia, Autumn 1979

THE SPARROWS WON THE WAR!

Neil A. Case

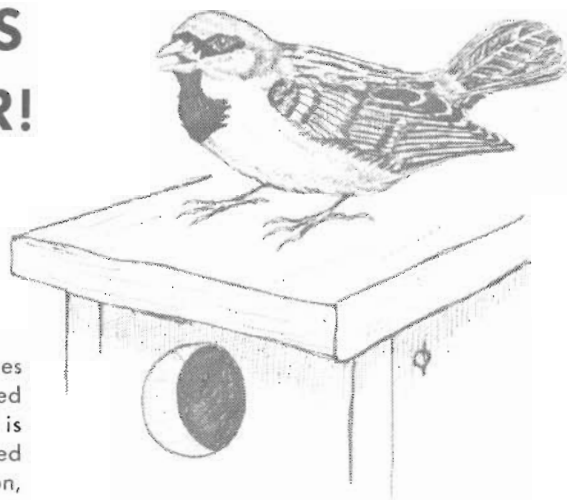
John James Audubon painted pictures of the birds of North America. He earned fame and fortune and his fame is perpetuated by having his name applied to the national bird watchers organization, the Audubon Society. But Audubon's paintings are incomplete. He omitted one of our most common birds. His paintings contain no house sparrow.

I admit to considerable pleasure at this discovery. I don't like house sparrows. Or if you prefer the old name, English sparrows. They are noisy. Their nests are large and messy and clutter the eaves of houses and lofts of barns. They roost in my garage and decorate my car. Where they are numerous bluebirds and house wrens, favorite birds of mine, are scarce and I blame the sparrows. Thus I was pleased that Audubon had omitted them. I felt my dislike was justified if the great John James Audubon had disliked them enough to leave them out of his *Birds of North America*.

But Audubon may never have seen a house sparrow in North America. House sparrows were introduced, not native to North America. What if they were introduced after Audubon's time? Then his omission would not have been the result of prejudice. I decided to find out.

House sparrows I read were first introduced to North America in Brooklyn in 1850. Those first birds disappeared and the introduction failed. Audubon died in 1851, before any successful introductions were made.

This was unbelievable. I have lived in Iowa, California and New York. House sparrows were common in all three states. Yet just one hundred twenty-five years ago



there were none in the entire country.

Now completely interested I read further. I found that the Brooklyn importers tried a second time in 1853. Other New Yorkers also tried and between 1860 and 1864 hundreds of house sparrows were released throughout New York City. Those people didn't just import and release the birds, they coddled them. They built large flight cages, equipped the cages with nesting boxes and hired attendants to look after their sparrows. As the birds multiplied some were released. Even then the coddling continued. They put out food for the birds, built and put up nesting boxes. When neighbors' cats caught some of the birds one wealthy landowner gave instructions to his coachman to "take care of the cats." The Coachman obligingly shot eight neighbors' cats the next day and presented them to his employer in the evening. That may have raised the first objection to the sparrows.

In those days the birds were called English sparrows because most were imported from England. Many people still call them English sparrows. But they are common across most of Europe, Asia and North Africa. In Europe and England they are called house sparrows. So the American Ornithologist Union, which prescribes official names for North American birds, adopted the name house sparrow.

Regardless of whether they were called English or house sparrows, however, they were a popular import, and not just in New York. They were also imported and liberated in Portland, Maine, in 1854 and in 1858, in Boston in 1868 and in Philadelphia in 1869. Westerners even got into the play and released sparrows in Salt Lake City, Utah, and in Galveston, Texas. These were just the major points of release. There were many others.

There were no laws against such importations then. People were free to introduce anything they desired. North America had over six hundred species of native birds. But people wanted more. They imported gray partridge, ring-necked pheasant, black grouse and the giant capercaillie of Northern Europe in efforts to improve hunting. They brought in sky larks and nightingales for their songs. They liberated European robins and goldfinches. And they released house sparrows.

The reasons for importing house sparrows were given by Dr. Thomas Mayo Brewer, a Boston physician and ornithologist and leading advocate of the importations. He claimed that house sparrows would rid American cities of "caterpillars, cankerworms, and other pestiferous larvae." He described the bird in an article published in the **Atlantic Monthly** in 1868 and predicted, "the house sparrow will ere long become one of our most common and familiar favorites."

Doubtless there was another, unwritten reason for importing house sparrows. They were reminders of home to thousands of European immigrants. American tourists who visited Europe saw the birds in cities all across the continent. There were no similar birds in New York and other growing American cities.

At first no one disagreed with Dr. Brewer and the other sparrow fanciers. At least I couldn't find a record of any, not even the neighbors of the cat killer. But in 1874 things changed. That year another physician and ornithologist, Dr. Elliott Coues, questioned the value of the house sparrow. Writing for the *American*

Naturalist, Coues accused house sparrows of driving away robins, bluebirds and native sparrows. "There is no occasion for them in this country," Coues wrote. "The good they do in destroying certain insects has been overrated. I foresee the time when it will be deemed advisable to take measures to get rid of the birds, or at least to check their increase."

By that time even some of the importers were having second thoughts. The man who had precipitated a neighborhood crisis by having his coachman "Take care" of the neighbors' cats decided he had enough sparrows. Not only that, he no longer had purple martins, tree swallows and house wrens on his estate. The sparrows had taken over all the nest boxes. So he ordered the coachman to reduce the number of sparrows. The coachman complied by digging a shallow trench and filling it with grain. When sparrows congregated in the trench to feed the coachman fired his shotgun down its length killing dozens of sparrows at a blast. But he couldn't eliminate all the sparrows and the martins, swallows and wrens never returned.

Dr. Brewer remained loyal to house sparrows, however. He rose verbally to refute Coues' charges. The editorial battles that followed became known as the sparrow war.

Being prejudiced against house sparrows I applauded as I read Coues' sallies. He called house sparrows wretched interlopers, thoroughly undesirable birds and animated manure machines. Writing of them in Washington, D.C., he called them "rowdy little gamins (that) squeak and fight all through the city, to our great disgust." He claimed that "House sparrows molest, harass, drive off, and otherwise maltreat and forcibly eject and attempt to destroy various kinds of native birds, which are thereby deprived of certain inalienable rights to life, liberty and the pursuit of happiness after their own rights." Coues rejected Brewer's claims for the house sparrow saying they consisted of "Bostonese idiocy." Coues attacked Brewer writing that he was "a narrow-minded,

prejudiced, and tactless person (who made a fool of himself about sparrows."

The sparrows were completely unaware of the editorial battles. They were busy mating, nesting, multiplying and spreading. They were occupying a new land, much as our ancestors had, but the sparrows were doing it much more rapidly than our ancestors. By 1886, just thirty-three years after their first successful introduction, house sparrows were established in thirty-five states and five territories.

House sparrows didn't occupy all of each state and territory. They followed roads and railroads, routes of people and horses, for along these routes there was grain, spilled oats and corn. This was food. And around the buildings of men were holes and crevices for nesting.

Nesting was a primary activity of the birds. They started early in the spring and continued into the fall. Each nest had from three to seven eggs. Five was most common. It took just twelve days for the eggs to hatch, which most of them did. Two weeks after hatching the young were ready to leave the nest. For a few days more their parents would feed them, then they were on their own. The adults were free to raise a second brood and most of them did. Some pairs even raised a third brood. This meant one pair of adults might add fifteen young sparrows to the population in a year, a sensational growth potential. Coues recognized this and wrote, "The sturdy little foreign vulgarians breed during the greater part of the year—breed at a year old—keep breeding—breed mercilessly."

It wasn't just breeding and multiplying that made house sparrows so successful, however. Nearly every family had a horse, or a team of horses, at that time. Where there were horses there was straw and grain. The grain was oats and corn. It was spilled along roads and streets, dumped in troughs to feed horses and stored in non-sparrow-proof granaries. Horse droppings provided still another source of grain. It was abundant and it was available throughout the year. House sparrows flourished on it.

Straw provided nesting material.

Buildings provided nesting sites. Any crack big enough to permit a sparrow was likely to be stuffed with straw and used by sparrows to increase still more their burgeoning numbers.

The rapid increase and spread was readily observed. The birds lived in such close association with men. Too close, for as they increased they stirred up more and more antagonism. The antagonism and prejudice continues. I admit to it. So do many others. A friend of mine recently told me, "The only good sparrow is a dead sparrow."

Ironically a house sparrow, generator of all that antagonism toward sparrows, is not really a sparrow. It belongs to a family of birds called weaver finches. True sparrows, song and chipping and many more, are in a different family. But who ever heard of a house weaver finch? House sparrow it is named and house sparrow it will remain.

A common resident of North America it will also remain. Elliott Coues recognized this long ago when in exasperation he wrote, "I had proved my case (against the house sparrow) to the satisfaction of the public, and the sparrow had proven his case—which was that he had come to stay. I could whip all my featherless foes, but the sparrows proved too many for me." They are too many for me too. I wish the country was as free of them as John James Audubon's **Birds of North America**.

EDITOR'S NOTE

The foregoing article appeared in the Jan.-Feb. 1978 issue of *South Carolina Wildlife* 25:1, official publication of the South Carolina Wildlife and Marine Resources Commission. We thank the editors of **South Carolina Wildlife** for permission to reprint this article for your enjoyment.

TRAIL WORK WITH INCUBATORS AND FOSTER PARENTS

Anne Sturm

On Easter Sunday (April 15, 1979) I received a call from one of the participants on my bluebird nesting box trail. A cat had killed a nesting female Easter Bluebird, leaving five eggs unattended. "Were there any nests available for relocating the eggs?" In prior years I have used both bluebird and House Sparrow nests as foster nests in such a situation. But when that phone rang, only a few bluebird nests had clutches in progress, and no sparrows had started a nest, let alone laid any eggs. The bluebird clutches were not at the same stage as the "orphaned" eggs which were recently laid. It was a cold day and something had to be done if the eggs were to be saved.

My husband rigged up a temporary incubator. We thought we might be able to keep the eggs viable until a House Sparrow completed a clutch. Christmas tree lights were strung around the top of a cardboard box. The eggs were placed in the box and positioned at a point where the temperature remained at about 100°F. The next day we bought an incubator at a farm supply store and kept the temperature at 100°F, although the temperature in the room fluctuated a lot. The eggs were turned three times a day and water was placed in the incubator to maintain humidity.

The weather remained cold and a week went by without any sparrows nesting. Finally, a nest was begun and the sparrow laid her fifth egg on April 26, three days before the bluebird eggs were due to hatch. I have had sparrows accept (or not notice the switch of) bluebird eggs in exchange for their own on four previous occasions; so I was not really worried about acceptance. However, I was very concerned about timing. What would a female House Sparrow think of an instant family, after only three to four days of incubation instead of the more normal 13 to 14 days? Would some inner clock tell her "no, this isn't right?" All of the previous transfers I had attempted were timed much better. I had to take this chance, for

if the babies were fed by me, their chances for survival would be slim.

The bluebird eggs were exchanged for the recently completed sparrow clutch on April 26. On Friday, the nest was checked and all five eggs were warm. The female sparrow had accepted them. I revisited the nest each day, wondering if the incubated eggs would be viable and if the female sparrow would be somehow alarmed by the short period between laying her own eggs and hatching the bluebird eggs. On April 30 one bluebird egg hatched, and it was followed by another hatching the next day. The remaining three eggs did not hatch, and on later examination were found to be mushy—the embryos had not developed.

The House Sparrows fed the two young bluebirds as if they were their own. Visiting the nest on May 5, one baby appeared to be dead, the other in good condition. On May 6, both young had disappeared, leaving the three unhatched eggs in the nest. Neither the cause of death of the one baby, nor the reason for disappearance of the young were determined.

However, I did learn that some sparrows will accept bluebird eggs in place of their own, and that timing in relation to normal incubation schedules does not have to be perfect. The possibilities are exciting for people with large nesting box trails who, each year, have orphaned eggs and lots of possible foster parents.

Why use the sparrows? I have had success placing one orphaned egg in other bluebird clutches. However, the timing has to be just right. If you put a more mature egg in a less advanced clutch, it will hatch too soon. Incubation of the other eggs may cease or, even if the host's eggs hatch, the foster bluebird may get most of the food and its nestmates may perish. It is uncommon to have another bluebird nest at just the right stage of incubation when an emergency arises.

Timing is important in all cases, but using sparrows as foster parents permits the trail operator a greater degree of flexibility.

Sialia, Autumn 1979

BLUEBIRD POSTURE

Understanding Bluebird Behavior

Figure A.



Figure B.



Figure C.



The postures bluebirds display are important to their survival and provide clues so that we can better understand their behavior. The above figures show a few male bluebird courtship postures. All courtship behavior involves three incompatible tendencies—to flee, attack and mate—and all three tendencies are often expressed at the same time. Figure A depicts an **OBLIQUE SLEEK DISPLAY**, a very common posture when the male is advertising his territory, especially close to the nesting box. As the female approaches the box, the male droops his wings, raises his bill slightly and spreads his tail, thus presenting a "mass of blue" to the female. There are many variations consequent to this display.

In the **WINGS-RAISED SLEEK** posture, Figure B, the male faces the female near the nesting box and, with his body nearly horizontal, tail spread, gives strong evidence of attacking his prospective mate. Often this attack is carried out and chasing sequences begin during the early stages of courtship. Later, especially with captive birds, this posture becomes a precopulatory display.

Figure C illustrates a **WING-LIFTING POSTURE** and is a very common sight during courtship, showing an activated sexual tendency. Unpaired males rarely show this posture unless a female is in the vicinity. Once the male becomes aware of the presence of the opposite sex, he immediately begins this display, showing his ardor and making his presence much more conspicuous. A bluebird in this posture is a sure sign of Spring.

We are grateful for the work of David C. Krieg and others in developing this feature. We especially acknowledge Krieg's "The Behavioral Patterns of the Eastern Bluebird," New York State Museum and Science Service Bulletin number 415, 1971.

Founded in 1978, THE NORTH AMERICAN BLUEBIRD SOCIETY is an incorporated non-profit organization determined to increase the populations of the three species of bluebirds on this continent. Inasmuch as the populations of these birds have diminished due to the maladroit actions of human beings, as well as other natural disasters, the primary objective of the SOCIETY is to educate all who will listen about the importance of preserving these singular creatures in their native environment.

Toward this end, the SOCIETY will work, within the bounds of effective conservation, to study those obstacles impeding bluebird recovery; to publish results of those studies; to promote ideas and actions which might reduce the effect of those obstacles; and to obtain a more complete knowledge about bluebird ecology, in the hope of learning more about the ecology of humankind.

Memberships: Student (under 21) and Senior (over 60), \$7.50; Regular, \$10; Sustaining, \$30; Supporting, \$50; Contributing, \$100; Corporate, \$100; Donor, \$250. Group membership rates available upon application. Amounts over \$5 are tax deductible.

*Address: North American Bluebird Society
Box 6295
Silver Spring, MD 20906*

