

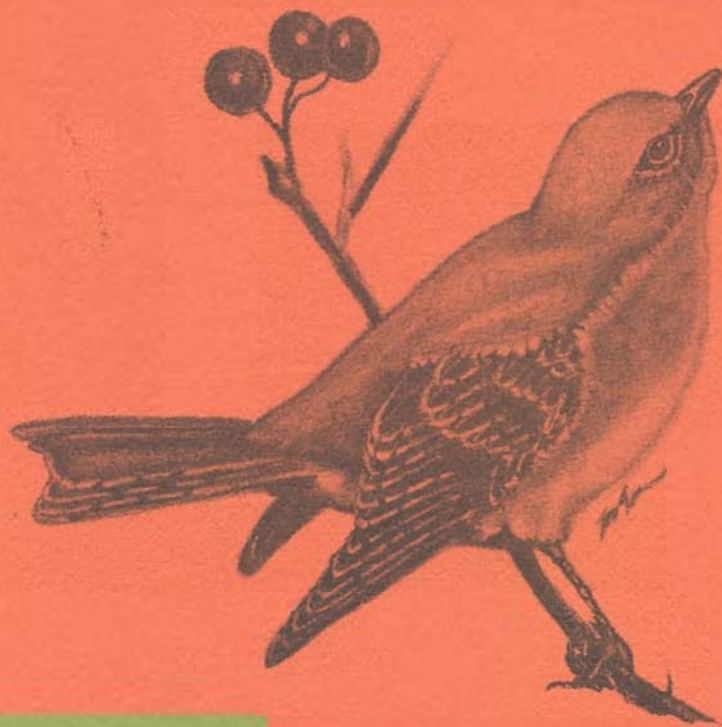
# *Sialia*

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Volume 1, Number 2  
Spring, 1979  
Pages 41-92

*The Quarterly Journal  
Of  
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-ah, 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 2**  
**SPRING, 1979**  
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**EDITOR**  
Jon Boone

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## Cover

The first bluebird of spring! The editor sketched this Eastern Bluebird an hour after he observed a male of the species attempting to attract two females of the species into his chosen nesting box. We encourage charcoal or pen-and-ink drawings of bluebirds in the hope they might be selected to adorn the cover of this journal. Finished drawings not selected will be returned.

**Ver Aeternum!**

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?

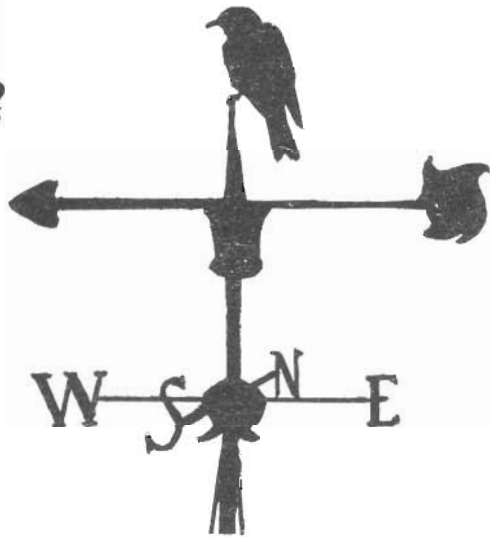
Robert M. Patterson

By the time you receive this second issue of *SIALIA* bluebirds will have returned to nesting territories throughout much of North America. Weather and other quirks of nature permitting, those persons who have been aiding bluebirds over the years will enjoy the fruits of their labors—bluebirds in greater numbers on their nesting box trails. You'll understand if those of us who spent the last few months at typewriters, licking stamps, stuffing envelopes and wrapping packages in the Society's service sneak away for a few hours to enjoy the glorious sight and sound of *Sialia sialis* in the Washington, D.C. metropolitan area.

Much has been happening during these last weeks. Membership is nearing the 1,000 mark and still climbing. Many individuals and groups have joined the bluebird cause and are mounting their first nesting boxes this spring. Early members of the Society are spreading the word about bluebird conservation in sterling fashion, and we are on-target toward our goal of self sufficiency—2,000 members by the end of our first year.

Work has started on a computerized mailing list, courtesy of the NASA-sponsored Technology Explorer Post. Scouting volunteers are providing this service and are expected to play an important roll in computerizing the results of our population studies program. First Brood Nesting Report forms and those for the Nesting Box Record Card program are included with this issue of *SIALIA*, and have been mailed to members who responded to the membership survey sent with the last issue. All members who can do so are urged to participate in these research projects. For the time being, additional record forms are available for the asking.

Funds have been established for contributions to support research grants and the creation of narrated slide programs



for fall distribution. Several members have already contributed color slides that will help tell the bluebird story throughout the continent. More are still needed, especially scenes of bluebirds away from the nest.

Work has already begun on a second slide program about plantings for wildlife, with special attention paid to the needs of bluebirds. Mr. & Mrs. George N. Grant of Canastota, NY have kindly volunteered to expand their fine collection of color slides of berry bearing shrubs and trees of the northeastern states, and to become the "producers" of this very important educational slide program. They can use your help. Good color slides showing shrubs and trees in full foliage, with close-ups of the fruit are needed from all areas of the continent, especially those areas where bluebirds spend the winter months. Information about cultivation, sources of supply for young plants (commercial nurseries and state agencies that distribute desirable plants) and tips about management are needed. We expect to develop this information into regular features in *SIALIA*, and there is also the possibility of preparing a booklet on the subject for broader distribution. If you would like to give George and Marilyn Grant a helping hand with this project, please drop them a line at RD #3, Box 153B, Canastota, NY 13032.

Another regular feature expected to

begin with the next issue of SIALIA is an article about nesting box construction and mounting tips. This will be a "how to" column, and will attempt to answer reader's questions. It will draw heavily upon the experience of our members, and share "secrets" of successful bluebird trail managers. The topic for the next issue will be "poles and posts: where to get them and how to use them. Many people have their favorite type of mounting arrangement or source for materials. Share them with us now so we can present an informative article for the benefit of other readers. Send your tips to Mounting Poles, Box 6295, Silver Spring, MD 20906.

### Membership Survey Results

With the winter issue, a four page membership interest survey was sent to 600 members. 121 returns (20%) were returned and tabulated. Six other returns submitted by officers and office volunteers were excluded from the tabulation so as not to influence the results of "unbiased" members.

About half the membership learned about the Society through direct mail efforts, and one-third were informed through a notice in some publication. Ninety members listed memberships in a total of 250 other conservation or birding organizations for an average of almost three such memberships per person. About 110 individual organizations were so listed with various Audubon chapters leading the way (about 73 members are in 64 different Audubon groups). Various ornithological societies, birdwatching and

feeding groups (35 groups) accounted for 85 memberships. The remaining 22 groups ran the gamut from fish conservation to big-game wildlife, with the National Wildlife Federation claiming 26 members. Various garden clubs (10) The Nature Conservancy (7) The Wilderness Society and Sierra Clubs (5 each) and the National Rifle Association (2) were among the others.

Very few organizations that members belong to have existing bluebird programs in operation, but a number of garden clubs and Audubon societies report starting projects this year.

45 respondents indicated they occasionally give nature talks or slide shows and 58 (an amazing 50%), report a willingness to serve on the Society's volunteer speaker's bureau. 38 of these persons are willing to travel upwards of 50 miles to talk about bluebirds with another 7 willing to go up to 100 miles. Our champion bluebird travelers included Clay Murray of North Carolina and C.D. Doezema of Michigan who listed 200 miles, and Dr. Richard Field of Mississippi and David Pitts of Tennessee who listed 250 miles as the distance they were willing to travel. Between the four of them, a good part of the Eastern Bluebird's range is take care of!

Table 1 gives the results of opinion expressed about the first issue of Sialia. Good marks were earned on all topics but readability (type size) and the quality of photographs. With this issue the type size is being enlarged for most of the text, and photographs will improve with practice. One problem with photos is that quite a bit of quality is lost when converting 35mm color slides to black and white prints.

Table 1. Opinions of 114 respondents regarding first issue of SIALIA. Not everyone voiced an opinion on each topic.

Number Voting	Question	Very Good	Good	Fair	Poor
113	A. Overall quality, design	64	44	5	0
113	B. Readability, type size	38	46	20	9
110	C. Thoroughness of articles	63	45	2	0
105	D. Technical level	57	44	4	0
109	E. Amount of material	54	47	7	1
108	F. Illustrations, photos	37	43½	23½	4

We'll try to be more selective about this in the future.

Regarding advertising policy, 23 of 111 respondents (21%) indicated that advertising should be restricted to that of the Society. 88 persons or 79% of those answering the questions felt that other types of advertising should be permitted including books and other materials, 68 (61%); tours and field trips, 71 (64%); clothing and other products, 15, (13.5%). There were no comments that there should be no advertising permitted.

87 persons marked the box to indicate whether materials other than books and nesting boxes should be sold by the Society. The kinds of products desired in order of preference were: Stationery items, 75 (86%); badges, decals, 61 (70%), fine art prints, 52 (60%); ceramic decor items, 33 (38%); ties, T-shirts, 30 (34.5%); jewelry, 28 (32%). In addition, there were 17 write-in suggestions with calendars, books and bumper stickers leading the list.

44 members cited a need for hand-out literature, with virtually all suggesting a simple fact sheet and nesting box plans. A packet of two color brochures and 25 plans sheets including details about habit and monitoring has been sent to all who requested the material.

66 individuals, a startling 54.5%, agreed to be interviewed for newspaper articles. As a result, a membership promotion campaign centered around Charter Members has been initiated, with members being sent a prepared press release and photograph for use by local newspapers. The Society will follow up with releases being sent to newspapers in areas where it does not presently have members.

About 15 persons offered the use of their colored slides to help create an extensive slide program about bluebirds, and slides have already been received, duplicated and sent back to several people. Additional color slides are still needed, especially scenes of bluebird adults and young away from the nest in feeding situations and in family groups. If you have such scenes on film, please write the Society with details.

55 individuals offered to contribute their services to the Society in one manner or another. This outpouring of

volunteerism is greatly appreciated by the totally volunteer staff of the Society and its journal. You won't have to wait long to be contacted!

There were 103 respondents who indicated they have already erected nesting boxes. A total of 104 trails were reported, with about 4,350 (average 42+) nesting boxes being tallied. The size of the 104 trails were grouped as shown in Table 2.

Table 2. Number of Nesting Boxes per Trail.

1 to 3 Nesting Boxes	15
4 to 9 Nesting Boxes	23
10-24 Nesting Boxes	24
25-49 Nesting Boxes	19
50-99 Nesting Boxes	12
100-200 Nesting Boxes	8
over 200 Nesting Boxes	3

Of the 103 trails mentioned above, 58 or 56% reported the number of nesting boxes would be increased during 1979 by a total of about 725 boxes. This is an increase of about 17% over the total number of 1978 boxes in the survey and averages about 12½ boxes per trail being enlarged this year. Interestingly, 8 persons not having a trail previously announced plans to mount 87 nesting boxes in 1979, also an average of 12½ boxes per new trail.

In addition, three individuals who avidly build and distribute nesting boxes through school groups and garden clubs reported having placed 3,400 boxes through these means during 1977 and 1978. They estimated that another 1,400+ nesting boxes would be distributed during 1979, mostly to individuals who would mount them on residential property and suburban golf courses.

Last but not least is the report from Edinburg, Texas, where Mr. Charles R. Strong has a 65-box trail. Mr. Strong apologized for not being able to take part in the Society's bluebird population studies due to the fact that bluebirds simply don't nest along the lower Rio Grande valley where he is situated. He said that if bluebirds began nesting in his area he'd see to it that bluebird nesting boxes were put up right away. His nesting

box trail you might like to know, is for owls! He promptly received a letter asking for an article about owl trails for Sialia. Stay with us.

Regarding population studies, 86 members reported they keep some sort of records about bluebird nesting activity, and that of these, 51 maintained records for each nesting box while 15 kept a summary of the year's activity. Many persons noted they did not keep full records only because no one had ever requested that they do and that they wouldn't have known what to do with them. 36 trail operators have records going back two or more years, with Mr. William Highhouse of Warren, Pennsylvania holding the longevity honors with 22 years of trail history. Nine persons have records of four or five years, ten have kept notes from six to nine years, and five more in addition to Mr. Highhouse have maintained records for ten years or more.

### Research Grant Applications Invited

Your Society plans to support research on any aspect of bluebird biology, especially research directed toward increasing bluebird populations. The grant(s) will be made for one year with renewal possible. The amount of the award(s) will be in the range of \$250 to \$500.

The North American Bluebird Society reserves the right to publish research resulting from the grants in SIALIA. Deadline for submission of applications is June 1, 1979. Awards will be made by the Society's board of directors for research projects recommended by the Scientific Advisory Committee.

Application forms may be obtained by writing the Committee's Chairman, Dr. Eugene S. Morton at 102 Bay Avenue, Severna Park, MD 21146.

The number and amount of research projects to be funded will depend upon the funds available for this purpose at the time of award-making. Members and friends of the Society are invited to make tax-deductible contributions to the RESEARCH FUND for the support of this work. Contributions should be marked "Research Fund" and mailed to Box 6295, Silver Spring, MD 20906.

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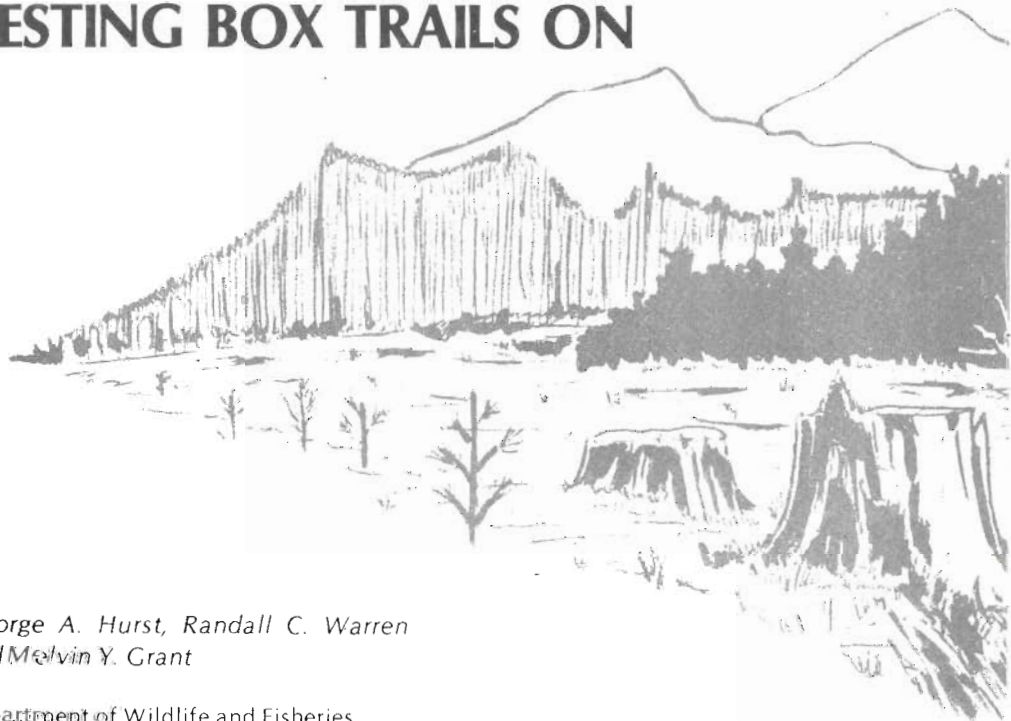
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# NESTING BOX TRAILS ON



George A. Hurst, Randall C. Warren  
and Melvin Y. Grant

Department of Wildlife and Fisheries  
Mississippi State University

The Eastern Bluebird is a very popular species, but its numbers have markedly declined in the last 50 years. The decline has been brought about by various factors, but the loss of nesting cavities and competition from House Sparrows and Starlings are thought to be most important (Zeleny 1978).

The South is the "wood basket" of the United States and about one million acres per year are being prepared for planting of pine trees (Mann 1975). About 50 million acres of mixed pine-hardwood forests in the South will be converted to pine forests in the future (Walstad 1976). Intensive forest management, including clear-cutting, site preparation and planting of pine seedlings, is a widely accepted practice in the South.

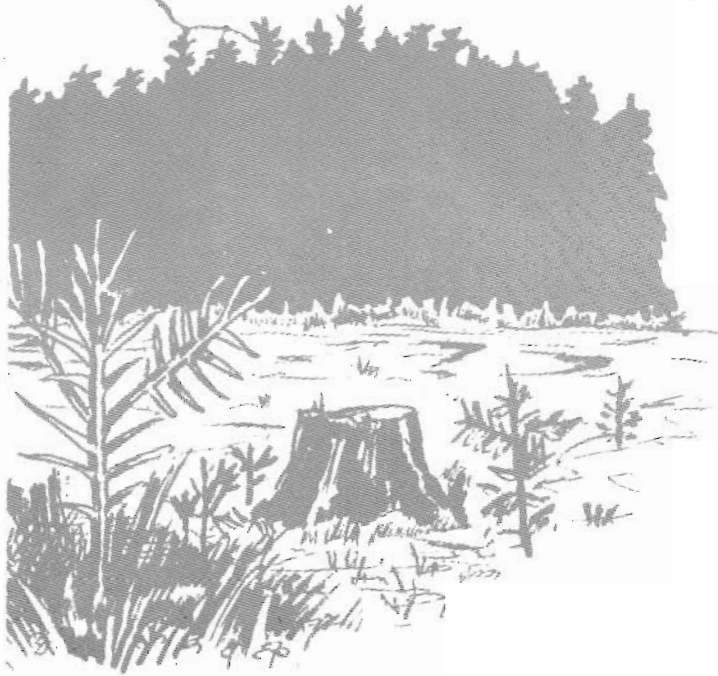
Most site preparation methods such as discing, bedding or tree-crushing remove all the vegetation from a tract, therefore eliminating all natural cavities (Pinkowski 1976). Less labor-intensive methods such as mist-blowing (applying a fine spray of herbicide) and/or tree injection (direct

application of herbicide into a tree), or just burning, leave dead trees containing cavities (Connor and Adkisson 1974, Perkins 1973). Clear-cutting combined with site preparation techniques promotes early stages of plant succession. The first-stage grass/herb plant community should be suitable habitat for several years for bluebirds. Over time, as forested areas are harvested and regenerated under management programs, as much as five million acres of pine production areas will be available for exploitation by bluebirds and bluebird conservationists.

Bluebird nesting box trails placed on pine plantations offer the opportunity to increase bluebird populations in the South, in areas that are expected to remain primarily agricultural and forest management zones. These areas have relatively low populations of Starlings and House Sparrows, diminishing the prospects of competition for nesting cavities by these two foreign competitors. This article describes the early results of



# CLEARCUT PINE PLANTATIONS



## THE SOUTH'S BLUEBIRDS SHALL RISE AGAIN

nesting box use by bluebirds on two young pine plantations.

### Study Areas

Two clearcuts located in Oktibbeha County, Mississippi were investigated. Area I is about one mile west of Longview, and within a 160-acre clearcut area, about 38 acres were managed for bluebirds. Area II is about three miles south of Longview, and within that 160-acre clearcut, about 52 acres were managed for bluebirds. Both areas are in the Interior Flatwoods Region of the Hilly Coastal Plain Province (Hodgkins et al. 1976). \*\* The Interior Flatwoods are flat, poorly drained, mostly forested, and have clay-acid soils. Annual precipitation averages 50-60 inches and the frost-free period is 200-230 days (Pettry 1977).

Both areas had about 50-year-old mixed pine-hardwood forests before clear-cutting occurred in the summer and fall of 1976. All sawtimber and pulpwood was removed and the areas were site pre-

pared. All other plant material was sheared, raked into windrows and burned. Then the areas were bedded, a process that forms parallel rows of elevated mounds about 14 inches high. The areas resembled plowed agricultural fields. Loblolly pine, *Pinus paeda*, seedlings were hand-planted, with a spacing of seven by eight feet in late March 1977. Uncut mixed pine-hardwood forests surrounded both study areas.

### Methods

Wood nesting boxes of seven different sizes and with three different sizes of entrance holes were placed on the young pine plantations. Nesting box dimensions were taken from Grussing (1977). Nesting

\* \* Editor's Note: The study areas are in northeastern Mississippi in region number four as mapped by Mr. Bystrak on page 76. The designation used by the U.S. Fish & Wildlife Service is "Upper Coastal Plain."

containers made from one-gallon milk jugs were also placed on the areas using plans described by Stewart (1976).

Five rows of nesting boxes, each row having nine boxes or jugs, were mounted in each study area in mid-March, 1977. The nesting box dimensions and number per area are presented in Table 1. The wood boxes were made of weathered, untreated sweetgum boards about one inch thick. The jugs were painted black to darken the inside, and received a second coat of white paint to reflect solar heat. The wooden boxes were not painted. The boxes were attached to seven-foot-long creosoted posts, about 3-4 inches in diameter. The posts were driven into the ground about two feet. The plastic jugs were wired to 1"x2" stakes which were driven into the ground so that the entrance hole was about five feet from the ground. Creosote was poured down the posts and stakes so as to saturate the posts, stakes and ground around the posts or stakes as a means of deterring snakes. No snake predation was noted during the study period. No nesting material was placed in the nesting boxes by the investigators.

The nesting boxes were placed mid-way between the burned windrows. The distance between rows of boxes was about 180 feet, and the distance between boxes within each row was also about 180 feet. For a diagrammatic layout of the study areas, see Figures 1 & 2.

The nesting boxes were visited periodically in the early morning or late evening from mid-March through September. They were monitored by lifting the front panel in 1977, and by peering through the entrance hole with the aid of a pen-light in 1978. No adults or nestlings were handled. In 1977, visits averaged every 14.8 days in Area I and every 17.4 days in Area II. In 1978, the average time between visits was decreased to 8.5 days (Area I) and 9.7 days (Area II).

The boxes or jugs were repaired or replaced as needed. The boxes were cleaned of all nesting material between the 1977 and 1978 nesting seasons. However, nest material was not removed during the nesting season. Wasps and their nests were sprayed and removed when encountered (Zelenvy 1976).

## Results

Only bluebirds used the nesting boxes or jugs during the study period. Six nests produced 22 young on Area I and seven nests produced 28 young on Area II in 1977. In 1978, Area I had five nests producing 21 young, and Area II had nine nests that produced 36 young. Average clutch size was 4.2 (1977) and 4.6 (1978) for Area I and 4.2 in both years for Area II. Average fledging rate varied from 3.7 to 4.2 per successful nest. In 1977, three nests with a total of eight eggs were abandoned in late June and July. Two nests

Table 1. Number and type of nesting boxes placed on pine plantations and the number used by bluebirds during 1977 and 1978. All measurements are in inches.

Nesting Box Dimensions & Hole Diameter	No. of Boxes Placed				No. of Boxes Used			
	Area I		Area II		Area I		Area II	
	1977	1978	1977	1978	1977	1978	1977	1978
Gallon Jug, 1½"	5	6	5	14	2	0	2	2
4 x 4 x 8, 1¼"	8	8	20	15	0	0	0	0
4 x 4 x 8, 1½"	7	7	4	3	1	3	1	2
4 x 4 x 10, 1¼"	5	5	5	5	0	0	0	0
5 x 5 x 8, 1¼"	6	6	4	2	0	0	0	0
5 x 5 x 8, 1½"	9	8	2	1	2	2	1	0
6 x 6 x 15, 1½"	0	0	3	3	0	0	1	5
6 x 6 x 15, 2"	5	5	2	1	1	0	2	0
Totals	45	45	45	44	6	5	7	9

that fledged bluebirds also contained a total of three infertile eggs on Area I. Area II did not have any nest desertions, and only one infertile egg was found. No abandoned nests or infertile eggs were noted in 1978.

In 1978 three boxes were used twice and one was used three times. Apparently the same pair used the same nest three times producing a total of 12 young (5-4-3). The limited field observations and pattern of box use indicated there were four pairs of bluebirds in 1977 and two pairs in 1978 on Area I. Area II appeared to have three pairs in 1977 and four pairs in 1978.

Bluebirds were seen on the Areas in winter. Nesting began in early to mid-April on both areas in 1977 and 1978, and ended in late July (1977) and early August (1978) on Area I. The last bluebirds fledged on September 26, 1977 and September 1, 1978 on Area II. No loss of eggs or nestlings was detected; however, actual fledging was not observed. If fledging was due on a certain date and the nest was found empty, we assumed fledging had successfully occurred.

Most nests were constructed of pine needles, but some small roots and a little grass was used. One nest was made entirely of small roots. Raccoons were seen on the Areas. Nest competitors such as House Sparrows and Starlings were not seen.

## Discussion

The facts that most nesting boxes were placed less than 60 yards apart, and that many had entrance holes of only 1¼" diameter, may have reduced the rate of use by bluebirds. However, if the assumed number of pairs of bluebirds is accurate, the density of use of the Areas in terms of territory size may have been about 9.5 acres per pair for Area I and about 13 acres per pair for Area II. These densities fall near the maximum experienced by many nesting box trails and may indicate near-maximum exploitation of the food resources available. Also, the tendency of the bluebirds to use nesting boxes at or near the perimeter of the Areas would seem to support this theory. The nesting boxes have been moved farther apart and more entrance holes have been bored to 1½" diameter. Perhaps they will use more of the centrally located boxes as revegetation and food resources increase on the pine plantations.

The total lack of competitors might be due to the fact that the areas were essentially forested, a condition not conducive to House Sparrows or Starlings. However, House Wrens, Carolina Chickadees, Tufted Titmice and woodpeckers were present on the study areas prior to clear-cutting, and remained present in the adjacent woodland through the study period. The

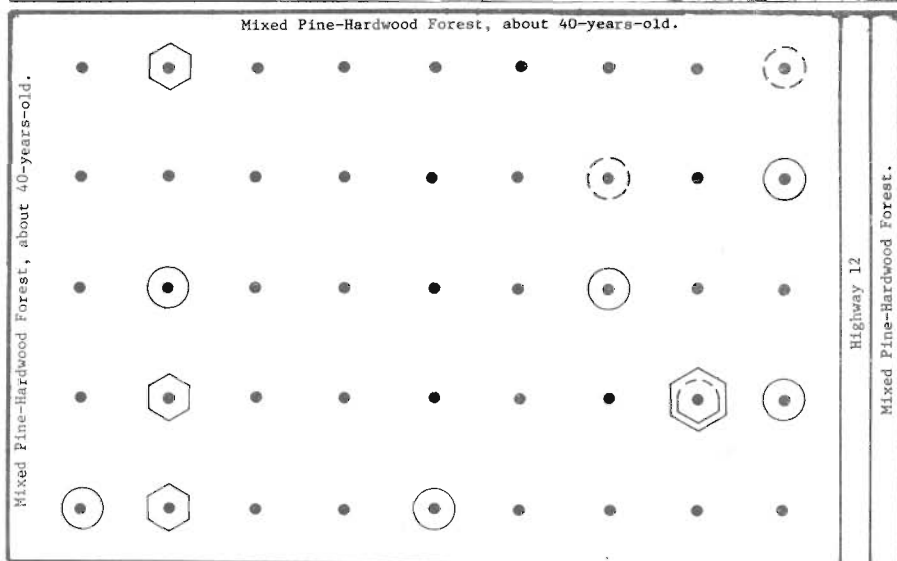


Figure 1. Study Area I, Oktibbeha County, MS. Dots represent nesting box locations. Circles indicate 1977 nestings, with broken circles showing abandoned nests. Hexagons indicate 1978 nests. All of land to west (bottom) was more young pine plantation, then forest. North is to left.

extremely open area after clear-cutting may not have been to the liking of these species and the distance of about 50 feet from the woodline to the closest nesting boxes may also have been a factor involved.

Young pine plantations can be productive areas for bluebirds. It is not known how long the plantations will be attractive to the Eastern Bluebird in the South. Probably when the pine trees become large enough to achieve a closed canopy, perhaps five to eight years after replanting, the areas will no longer be used. At this point in time, perhaps even for a few years leading up to this time, it may be well for the nesting box trail operator to begin moving nesting boxes to newly-cleared areas nearby. Thus, as man continually reaps the forest products he needs, homes for bluebirds can be sowed within the continually productive pine plantations. This study will be continued and expanded to determine how long bluebirds will use nesting boxes on these plantations.

The early stages of plant succession found on clearcuts certainly produce enough insects for bluebirds to successfully rear young (Hurst 1972). The young pine plantations also produce various types of plants producing fruit eaten by bluebirds. Bluebirds were seen eating pokeweed (*Phytolacca americana*) in late

summer and American beauty-berry (*Callicarpa americana*) in October. The nesting boxes might also prove to be valuable as roosting boxes in winter (Zeleny 1977).

Land upon which to erect bluebird nesting boxes is virtually unlimited. Young pine plantations will be present in the South in ever-increasing total acreage. The forest industry will gladly permit nesting boxes to be placed on its land, and in most cases will supply nesting box materials. If the early results of this study (a breeding density of about one pair of bluebirds per 10-15 acres) could be repeated on young pine plantations throughout the South, the five million acres previously mentioned might be capable of producing 30 million young bluebirds each nesting season. If, as the authors believe, improvement in management techniques results in greater bluebird production, then the total acreage might play an even greater role in the recovery of the dwindling population of Eastern Bluebirds.

One way to test this hypothesis is for bluebird conservationists to begin making Clearcut Bluebird Nesting Box Trails.

#### Acknowledgements

The authors wish to thank Weyerhaeuser Company for their financial support, and Mr. Ben F. Hilbun for allowing us to

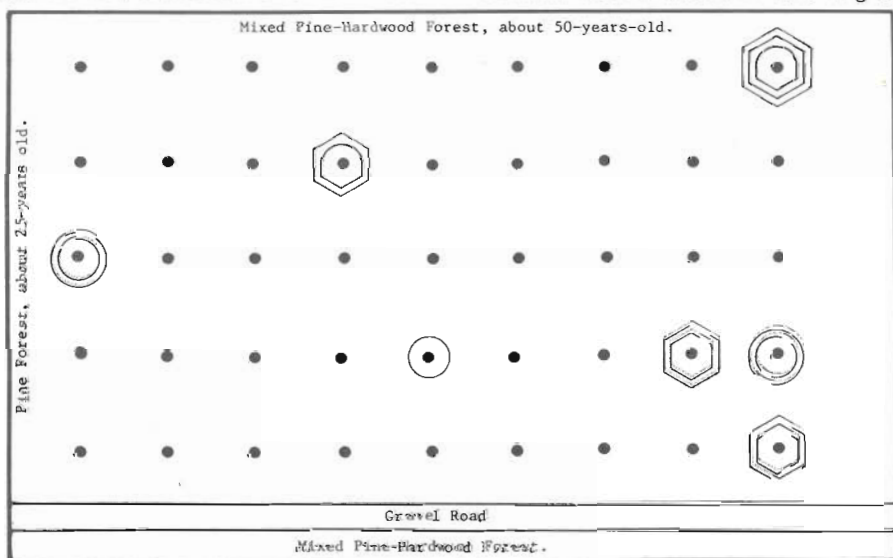


Figure 2. Study Area II, Oktibbeha County, MS. Legends as in Fig. 1. All of land to the right (west) was more young pine plantation, then forest. North is toward bottom of diagram.

use his property. We also thank Foster Dickard and Timothy Willis for their help.

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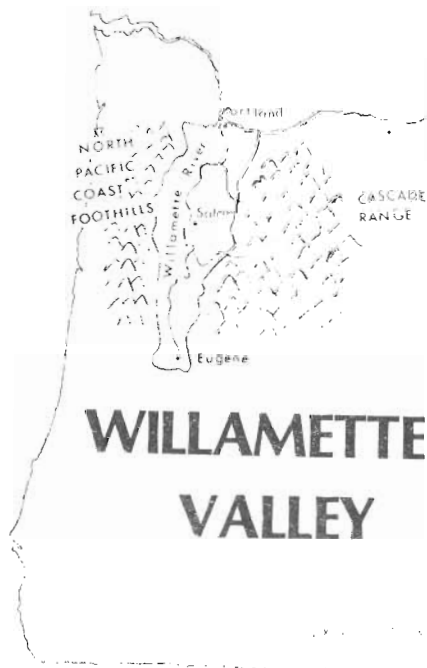
### Editor's Note

We thank Dr. Hurst and his colleagues for this valuable and informative article. On one small point we would tend to disagree, and that is over the number of pairs of birds probably using the Areas in 1977. The authors believed there to have been seven pairs while we think there might have been nine. While this is a small point of debate about an excellent study, it points out the need for very careful and frequent observations (monitoring) and the use of Nesting Box Record Cards to aid analysis. Also, the inclusion of banding as a part of the study would have been helpful in deciding certain issues, and we are glad to hear that Dr. Hurst will begin banding this year.

We would also be remiss if we did not point out to readers that the subject of clear-cutting and the institution of monoculture forests has aroused strong debate among environmentalists, academicians and politicians (to say nothing about birders). The benefit of pine plantations to bluebirds is inevitably offset, to a degree that may depend upon your personal bias, by the harm through loss of habitat to those species dependent upon hardwood or mixed forests. In these areas certain species will prosper after the work of man, while others must surely lose ground.

While the Society takes no position on the issue of monoculture after clear-cutting, we want our readers to realize there is an argument over the practice and that we are cognizent of it.

One further point not brought out by the authors. The apparent first-year single nestings and several cases of abandonment and the generally late nesting starts in 1977 tend to point to the study areas being colonized by first-year breeding birds. In the second year, successful nesting began earlier, continued later and involved more multiple uses of nesting boxes.



*Hubert W. Prescott*

**B**oth the Western Bluebird and the Mountain Bluebird occur in the Pacific Northwest, the former being found generally throughout this region while the latter, except for occasional strays, keeps to the east side of the Cascade Range.

Drastic declines of both bluebird species have occurred during the last thirty or more years in certain of the major agricultural valleys of the Pacific Northwest, notably the Western Bluebird in the Okanogon Valley of British Columbia, the Mountain Bluebird in the Spokane Valley of Washington, and the Western Bluebird in the Willamette Valley of Oregon. This report is limited to an examination of the selling of the severe decline of the Western Bluebird in the locality of the writer's most intimate acquaintance, the Willamette Valley of Oregon.

The Willamette River from Eugene where the valley bearing its name begins, flows 150 miles north as a calm placid stream until it empties into the Columbia River about ten miles north of the city of Portland. The only place where this stretch of the River deviates from its tranquil character is a short distance south of Portland where it roars over an



escarpment down to upper tidewater level forty-one feet below. It then resumes its unruffled demeanor for the rest of its journey as though nothing unusual had happened.

The Snake River, originating in Wyoming's Yellowstone Park, and Oregon's Willamette River are the two major tributaries of the Columbia. Beginning in the late 1800's and continuing into the 1920's paddle-wheel steamboats used to ply the Willamette River on a regular schedule between Portland and Salem, about midway up the Valley, negotiating the falls by means of a canal and navigation locks. Occasionally small shallow draft paddle-wheelers went as far as Eugene at the southern extremity of the Valley. This was possible, however, only after a treshet had temporarily raised the upper river level sufficient for the occasion.

The Willamette Valley is sandwiched between two parallel mountain ranges, both extending in a north-south direction as does the Valley itself. It is bordered on the west by the foothills of the relatively low Coast Range, the main axis of which is about twenty miles inland from the Pacific Ocean. Mary's Peak, with an

elevation of 4097 feet, is the range's highest point. On its east side the Valley is bordered by the foothills of the much higher Cascade range, the main axis of which is about 100 miles inland. The Cascade Range, directly east of the Willamette Valley, as well as along its entire length, is distinguished by peaks of dormant volcanoes, the more conspicuous ranging in elevation from around 8,000 to over 11,000 feet.

The Cascade Range divides Oregon both geographically and climatically into two distinct segments. These include a western third, locally referred to as "western Oregon" which includes the Willamette Valley; and the remaining two-thirds of the state, locally referred to as "eastern Oregon." These terms will be employed hereafter in this paper in reference to these two areas.

The proximity of the Pacific Ocean has a moderating influence on both winter and summer temperatures of western Oregon which of course includes the Willamette Valley. The prevailing southwest winds as well as the warm Japanese Current, which flows close to Oregon's west coast, tend to accentuate this moderating influence. Distance and the intercepting Cascade Range, however, deprive eastern Oregon of these moderating influences with the result that this large segment of the state undergoes greater extremes of both summer heat and winter cold. Further contributing to eastern Oregon's winter cold is the fact that a large percentage of its terrain is high plateau averaging about 4,000 feet in elevation. By contrast the Willamette Valley at its highest southern extremity at Eugene is only 422 feet in elevation and at its northern portion near Portland only 76 feet. The Valley from Eugene to Portland is 112 miles long and the river, excluding its 41 foot plunge at Willamette Falls by Oregon City, drops an average of two and seven-tenths feet per mile during its journey down the length of the Valley.

In addition to the climatic influences above cited the Cascade Range causes rain or snow bearing clouds coming in from the southwest to precipitate more heavily in the Willamette Valley and other areas west of the Cascade divide than in eastern Oregon. Average annual precipitation for the Willamette Valley is

around 46 inches. This is several times the average amount of precipitation received by eastern Oregon which varies by locality, but ranges somewhere between eight and twelve inches. Reflecting these climatic differences, western Oregon tends to be humid and highly verdant. Excluding the Blue Mountain area of Oregon's northeast quadrant eastern Oregon tends to be arid or semi-arid. Thus Oregon's general reputation as a wet state did not derive from people who have traveled widely over its varied landscape.

Another major boon that the Cascade Range confers upon the Willamette Valley in particular, and also to a lesser degree to some contiguous areas on the east side of this range is an abundance of spring and summer melt-water from the winter's accumulated snow-pack and from glaciers on several of the major peaks. This melt-water feeds down into many major tributary streams during the drier months of the year when it is most needed, both for irrigation and to firm up hydroelectric power.

The 135-mile-long Willamette Valley averages about 25 miles wide from the foothills of the Coast Range to those of the Cascades, but all of this is not by any means of true valley character as commonly conceived. For instance, the River runs through the very heart of Portland. For that reason, demographers and census takers, as well as the general public, consider Portland as within the Willamette Valley. Yet the only true bottom lands the city impinges upon are those of the Columbia River some of which the city's extreme eastern limits include. Yet the general aspect of the Portland area, from the low undulating hills on the east side of the Willamette to the high broken hills of much of the west side, is suggestive of anything but valley-type terrain. So it is for about twenty-five miles of the river's lower course from Aurora through Portland. In addition the approximate northern half of the Valley is interrupted by several intrusions of hills and mini-mountain chains. One of the more pronounced of these is the fourteen-mile-long Chehalem Mountain which attains an elevation of 1600 feet at its highest point and, like many of the others, affords a grand view of snow capped mountain peaks in the distance and the surrounding

valley flatlands below. In two places the Willamette Valley flats are almost completely bisected by these hilly intrusions.

Many extensive flatlands do occur along the course of the River, however, some giving an unobstructed view over a twenty-five mile expanse, all the way from the Coast Range foothills to those of the Cascades.

The wealth of the Willamette Valley, in terms of both resources and opportunity for a livelihood, is underscored by the fact that, although it contains less than one-twentieth of Oregon's total land area, it has more than three-fourths of Oregon's population. Eight out of twelve of Oregon's largest towns and cities are within the Willamette Valley with Portland at the extreme north and being the largest with an incorporated population of 375,000. It is, however, the nucleus of a metropolitan area of more than a million inhabitants. At the south end of the Valley are Eugene and Springfield, separately incorporated but grown together as one physical unit, with a combined population of 129,000. Halfway down the length of the Valley is Salem, Oregon's capital and third largest city with a population of 76,000.

The Willamette Valley, with its rich alluvial soils and water availability became transformed over the decades from a rustic rural landscape in which farming, the dominant activity, was largely limited to the raising of wheat and livestock. The change was to a highly intensified and greatly diversified farm practice in which physical manpower and horsepower were displaced by increasing mechanization. The interaction of several factors brought about this change. Among these were a continuing increase in population and transportation facilities, a burgeoning demand for farm produce, and a consequent expansion of markets from local, to national, to international. Permeating this amalgam was the introduction of a continuing flood of innovative farming techniques in such categories as plant genetics, chemical fertilizers, pest control, and numerous others. Giving impetus to this general trend were two world wars and their aftermaths. Following the second world war our nation was described as "the bread-basket of the world." The above

picture of course is familiar to all no matter from what part of the country they hail.

One result in the Willamette Valley, derived from this revolution in farming methods, was that the stick of escalating costs in farm operation, combined with the carrot of escalating prices offered for farm produce, caused farmers to reduce greatly the proportion of their acreage in pasture and idle land in order to gain more acreage for production of farm crops. New irrigation techniques assisted this process, becoming economically feasible when, beginning around 1940 cheap hydroelectric power from the new Bonneville power system became increasingly available. Electric powered water pumps then came into widespread use for the first time in the Valley, making possible the irrigation of large expanses of farmland to augment the production of farm crops.

The final result of all the above innovations is that Willamette Valley farms have now lost most of their former pastoral aspect and have come to take on more of the semblance of highly mechanized, if not computerized, industries. Farm produce is now highly diversified. Large food processing plants have sprung up throughout the length of the Valley, as have large retail farm implement outlets. Following these many less farm-related industries have sprung up in the Valley. Willamette Valley farms now go in for, among other things, large acreages of row crops such as sweet corn, potatoes, broccoli, and beans. Berry crops, including strawberries, blackberries, and raspberries also play an important role. There are also large acreages of such items as cucumbers, squash, and mint. Nut and fruit orchards are a conspicuous aspect of some parts of the Willamette Valley landscape. These include especially cherries, prunes, walnuts, and filberts. The Willamette Valley has put Oregon at the top as one of the leading states of the nation in the production of vetch and grass seed.

But the metamorphosis of Willamette Valley farming to its present phase has had its side effects. In addition to vast reductions in pasture and idle land acreages there was the riddance of a major proportion of the grand old cavity-bearing oaks and broad-leaf maples that



## BLUEBIRD NESTING BOX DATA

## WARREN COUNTY, PENNSYLVANIA

## SECOND NESTING

## FIRST NESTING

YEAR	FIRST NESTING					SECOND NESTING					
	BOXES	OCC'PD	EGGS	YOUNG	FLEDGING	BOXES	OCC'PD	EGGS	YOUNG	FLEDGING	
1957	74	24	120	100	80	74	14	60	50	40	
1958	80	34	150	120	100	80	17	100	80	60	
1959	100	65	307	220	189	100	33	139	120	100	
1960	100	48	221	167	160	100	18	75	51	51	
1961	101	53	245	194	181	101	25	100	76	86	
1962	94	62	297	265	265	94	51	210	167	167	
1963	100	70	318	215	188	100	43	176	144	128	
1964	150	97	448	394	357	150	80	337	283	263	
1965	150	103	520	431	408	150	64	243	182	182	
1966	145	94	409	301	286	145	48	198	154	145	
1967	200	120	500	450	435	200	50	230	200	180	
1968	200	150	730	600	420	200	97	415	345	345	
1969	225	148	630	565	520	225	79	310	260	255	
1970	290	150	625	550	500	290	75	300	260	250	
1971	275	165	770	725	600	275	96	385	333	330	
1972	367	183	845	710	680	367	147	545	405	340	
1973	400	256	1020	840	735	400	100	390	296	296	
1974	400	209	906	707	661	400	109	407	289	206	
1975	350	158	735	630	590	350	80	350	314	210	
1976	300	150	650	525	500	300	75	350	275	250	
1977	300	110	500	420	380	300	50	200	150	140	
1978	250	90	390	360	350	250	42	164	139	125	
						-----	-----	-----	-----	-----	
						2,467	11,336	9,489	4,573	4,150	
						AVERAGE = 4.6		AVERAGE = 4.06		AVERAGE = 3.28	
										= 2.98	

AVERAGE = 4.6 = 3.84 = 3.48

AVERAGE = 4.06 = 3.28 = 2.98

formerly graced farm lands, and which old-time farmers didn't mind farming around. By now there is too much at stake in the money invested in modern-day farming to allow these nostalgic symbols of yesteryear to stand in the way of the plow, the planter, the windrower, or the harvester. The pathetic few old oaks still seen standing along some driveways, fence lines, roadways, and around farmstead buildings bear mute testimony to the fact of their one-time prevalence on the large expanses of open farm acreages themselves. Such is the face of progress.

With the swallows it doesn't matter because they catch all of their food out of the vast undiminished spaces of the open air. But with the bluebirds it is different. They have a specialized prey-hunting technique. This is to perch on some elevated object — a post, a tree limb, or an electric wire, and scan the ground below for movement. When an insect or other savory arthropod reveals its presence by movement, the bluebird swoops down to effect the capture. This technique requires a short or sparse vegetative ground cover for good bluebird foraging habitat, particularly when a nestful of hungry young necessitates a high prey capture rate.

The factor of safety and economy of time do not allow the parent bluebird to fly much more than three or four hundred feet from its nest cavity in search of food for its young. With the great reduction in pasture and idle land acreage, as well as the elimination of a preponderance of the old cavity-bearing trees in the process of Willamette Valley farm modernization, it would be a rare coincidence indeed to find a suitable nest cavity in close proximity to good bluebird foraging ground. This is why the reversal of the bluebird decline while there are still some bluebirds left requires the searching out of good bluebird foraging terrain and the placement of nest boxes relatively close to it.

In the vast expanses of the Willamette Valley plains the Western Bluebird now seems to be absolutely missing except for the possibility of occasional transients. So far the only "Valley" bluebirds we have seen or heard in several years of intensive work with them were in the hilly areas surrounding or intruding into the valley.

Testimony of old inhabitants of the Valley plains leaves little doubt, however, that in their younger days the bluebirds were fairly prevalent throughout the Valley as a whole.

Now most of our efforts have been directed toward saving the bluebird population remnants in the Valley's hills where evidence of their decline, and in some cases actual disappearance, has been reliably recorded in fairly recent times. In this effort, by comparison with bluebird programs in parts of the East, we have both an advantage and a disadvantage. Our advantage is that in these parts snakes enter nest boxes with such extreme rarity as to be considered no problem. I know of only one instance of a snake being found in a nest box since 1973 when bluebird nest box projects were first started in the Willamette Valley. This fact allows us to mount our nest boxes on wooden fence posts, poles, and tree trunks without fear of snake predation. Our disadvantage is that we have two species of cavity-nesting swallows, the Tree Swallow and the Violet-Green Swallow, that usurp a higher percentage of our nest boxes than all other avian nest box competitors combined. This, of course, would not be the case if the problem of Starling usurpation were not already solved and that of House Sparrow usurpation greatly mitigated by placement of nest boxes as far as possible from man's sparrow infested buildings. Even so the swallows are quite a problem. Our records show that for every five of our nest boxes occupied by bluebirds, three are occupied by swallows. This fact alone would not be so bad, but the swallows do not just take over empty nest boxes. Though considerably smaller than the bluebirds by weight they are able without engaging in direct physical combat to cause the bluebirds to give up their nests, even when these contain bluebird eggs and young. The process by which the swallows achieve this result is not entirely understood and is but one of several puzzling aspects relating to these interesting birds.

The very abundance of the swallows is a mystery. Both the Tree Swallows and the Violet-Greens seem to be several times more numerous all throughout the

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# MOUNTAIN BLUEBIRDS IN NORTHEAST OREGON

## NATURAL NESTING SITES INVESTIGATED

D.C. McCluskey

Bureau of Land Management  
Salt Lake City, Utah

This paper reports on some incidental data collected on nest site selection by Mountain Bluebirds in Union and Wallowa Counties, Oregon, during the spring and summer of 1974 and 1975. Bluebird nest sites were located by searching areas where bluebird activity was observed. In all cases, this was along the forest-grassland edge of the mixed conifer forest type as described by Franklin and Dyness (1973).

A total of 25 natural nest sites were located during the two breeding seasons. Of these, 18 (75%) were located in trees while seven (25%) were located in man-made structures such as out-buildings, stone fence supports (rock jacks) and storage boxes. No bluebird nesting boxes were involved in the study.

Tree species selected as nesting sites included Ponderosa Pine, *Pinus ponderosa* (13), Grand Fir, *Abies grandis* (4), and Douglas Fir, *Pseudotsuga menziesii* (1). All nests located in trees were found along the forest-grassland edge or in single-standing trees in natural openings. No nests were located in tree stands with a canopy cover greater than 40% nor more than 49 feet from a natural opening 1.3 acres in size or larger.

Ground vegetation surrounding each nest site was categorized into one of two types, arid or moist. Arid sites were



characterized as having shorter vegetation with considerable spacing between individual plants. Moist sites characteristically had tall grasses with very little space between plants. Of all nest sites investigated, all were located in arid areas.

Bluebirds generally nested in dead trees. Eleven of 18 nests were in dead trees while six of the seven nests in live trees were located in dead branches of those trees. Closer examination showed the dead portion of the tree was caused by porcupine girdling near the crown of the tree (the tree bark is eaten by the porcupine, especially the inner bark—see Lawrence et al. 1961).

14 of the 18 tree cavities were excavated by woodpeckers. Physical evidence such as cavity and entrance hole size indicated that 13 of the 14 cavities were created by Common Flickers (Jackman 1974).

Physical characteristics of individual nest trees is reported in Table 1. The Average diameter at breast height (DBH) of both live and dead trees was 17 inches. A majority (78%) of the nests was located in trees of 12-inch DBH or larger.

Cavity height was generally higher than reported by Headstrom (1970), but coincided closely with reports by Jackman (1974) and Taylor (1969). The average cavity height for nests in trees was almost 19 feet, while nests located in man-made

structures were generally lower, averaging about 9½ feet (Table 2).

### Discussion

Mountain Bluebirds in northeast Oregon are dependent, to a large degree, on excavators such as woodpeckers for their nesting cavities. Where cavities are either lacking or in insufficient supply, there is evidence that indicates that bluebirds will utilize man-made structures providing they are located in suitable habitats and have not been usurped by more aggressive species such as Starlings and House Sparrows.

Mountain Bluebirds may prefer to nest in Ponderosa Pine snags; however this indicated preference is probably more a function of relative abundance of this tree species along the forest-grassland edges, than to a preference by Common Flickers for Ponderosa Pine for nest sites. Because of the wide variability in diameter of nest trees, it appears that tree size is of little significance to bluebirds.

In order to maintain or improve populations of Mountain Bluebirds in this area, it is necessary that forest management practices be altered to enhance nesting opportunities for primary cavity excavators such as woodpeckers. For bluebirds, it is particularly important that dead trees be left standing along forest-grassland edges. Forest management practices which provide suitable habitat conditions for primary excavators, will simultaneously benefit secondary cavity users such as Mountain Bluebirds.

### Acknowledgements

Appreciation is expressed to Dr. Jack Ward Thomas, U.S. Forest Service Range and Wildlife Habitat Laboratory, La Grande, Oregon, for his support of the research and review of the manuscript.

This work was carried out as part of a grant from the U.S.D.A. Forest Service, Region 6 to monitor impacts of DDT spray on cavity nesting birds. Work was

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**Table 1. Physical characteristics of natural nest sites used by Mountain Bluebirds in Union and Wallowa Counties, Oregon.**

Tree Species	DBH (inches)	Tree Height (feet)	Nest Height (feet)	Percent of Bark Present	Tree Condition (alive/dead)	Excavator
<b>Ponderosa Pine</b>						
1	18	24	9	50	D	WP
2	14	25	18	95	D	WP
3	15	?	9	?	A	WP
4	18	3	2	20	D	N
5	11	5	4	20	D	N
6	12	7	7	97	A	WP
7	20	50	45	70	A	N
8	12	38	11	98	A	WP
9	12	23	14	97	A	WP
10	26	5	3	0	D	WP
11	15	8	5	15	D	WP
12	14	6	4	0	D	WP
13	30	79	70	80	A	WP
<b>Grand Fir</b>						
1	26	79	71	90	D	WP
2	24	?	20	?	D	WP
3	10	21	10	97	D	WP
4	30	60	50	95	A	WP
<b>Douglas Fir</b>						
1	10	24	15	95	D	WP

# BLUEBIRD TALES

Mary D. Janetatos



When the North American Bluebird Society came into existence, numerous people across the continent had been working for years on behalf of the bluebirds. Most of these joined their resources with the new Society and became the backbone of this new conservation organization. For these people, working for bluebirds has long been a labor of love. As space permits in each issue, their stories will be told.

Some reports given at the First Annual Meeting were not included due to limited space in the article on the meeting in the last issue. *Pat Soehnlan* and *Pauline Wasserman* reported on the devastation of bluebirds during the past two winters in the Navarre, Ohio region. *Richard Tuttle* told of his Nature Center work near Delaware, Ohio. Richard's "bluebirding" was also the subject of a story in the new publication "Bird Watchers Digest", January-February '79 issue.\* *Tom* and *Joe Tait*, the twins who work together for bluebirds while off duty from their Washington, D.C. firefighting and rescue jobs, told of putting up many bluebird houses on golf courses in Maryland. *J. Mark Martin* spoke of his work with his Warrenton, Virginia Lions Club to enlist their help for bluebirds. This is the only instance we know of the "big cats" helping the little birds. *Meade Flinn* has persuaded his local Public Library in Alberta, Virginia, to purchase several copies of "The Bluebird". He also wrote a "Letter to the Editor" of the local newspaper telling of the bluebirds' need of human help, and giving the name and address of the Society. New members from Alberta, Virginia, have joined through Meade's untiring efforts. How wonderful it was to be able to meet personally this true friend of bluebirds. We did so because *Ray* and *Clare Brinser* of Richmond, Virginia, decided the morning of the meeting to make the drive

of two hundred miles and bring with them Meade and *Mary Frances Flinn*.

In recent news, *Dr. Richard S. Field* of Centreville, Mississippi, has given gift memberships to some of the folks in Centreville. *Lynn Peterson* of Bemus Point New York, taught a course in January at the local Community College entitled "Support your Local Bluebird". *R.B. Layton* wrote an article for a Jackson, Mississippi newspaper which has attracted new members. *Olympia LeBeau* of Springfield, Vermont, wants to alert the folks in Vermont to the bluebird's plight via the *Audubon Newsletter* there. This has also been done in other localities. *Sister Barbara Ann* of Catonsville, Maryland, had her fall bluebird housecleaning enlivened by an encounter with a Copperhead snake in the convent tool house. After hospital treatment for snake-bite, she and novice *Sister Mary Sylvia*, who had driven her to the hospital, traded African snake stories in graphic detail while in the waiting room. The emergency room staff feared for the peace of mind of the other patients, so the Sisters were excorted to a more secluded waiting room....

Evidence of the hard winter faced by bluebirds and other birds abounds. In one instance, *Larry Zeleny* again came to the rescue of a bluebird in peril. An office worker at the Beltsville Agricultural Research Center (where Larry maintains his bluebird trail) saw an adult, male bluebird outside her window which had

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# 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!



We are very pleased with the reception you gave to the initial issue of SIALIA. Many of your thoughts will be incorporated in this and future issues. We received several outstanding letters, some of which will be excerpted so that you may share in the ideas and sentiments presented.

Before doing so, however, we ask that you recall some of your more unusual experiences about bluebirds and send them along to us. These may appear in *Bluebird Tales* or may be expanded into an article. Most of us have had these experiences along the bluebird trail. For example, my brother and I once witnessed an American Robin coming to the aid of an Eastern Bluebird family. One of the bluebird fledglings was under attack by a Common Grackle. Both parent bluebirds were diving at the invader, sounding alarm notes and snapping their beaks. But the grackle seemed unruffled at this display and edged ever closer to the helpless young bird. At the last minute a robin appeared from the woodline and, in concert with the adult birds, helped drive the grackle away. Perhaps others have witnessed similar kinds of inter-specific cooperation.

In response to Mr. Patterson's article in the last issue of SIALIA (1979 Experimental Nesting Box Program), James L. Williams of Ware Neck, Va., wrote a lengthy but incisive reply. Among many of his thoughts were these:

1. Bluebird nesting box holes "must be round and exactly 1½ inches."
2. The boxes should be "made easily and inexpensively." Toward this end Mr. Williams suggests that "punched" aluminum or the plastic covers of coffee cans (after they have been properly drilled) could serve to replace the hardware cloth screen used in the open-top and raised-top experimental designs. As a result, the Society has switched to the use of expanded aluminum rain

gutter cover material which is both less expensive and much easier to work with while offering eye appeal as well.

3. Instead of sending Christmas cards, give bluebird nesting boxes to friends. *This is an outstanding idea. Mr. Patterson has asked Mr. Williams to describe this idea more fully in a future article for SIALIA.*

4. He recommends that the Society ask manufacturers of products such as soap powder and bleach to package their products in such a way that the empty containers could easily be converted into a bluebird nesting box. His concept is an excellent one, although the design has not yet been worked out. His dream is to saturate many states with inexpensive nesting boxes and that this "would do more for bluebirds than all our fussing over good design can ever accomplish."

*Editor's Note: Mr. Williams is now recovering from surgery. The prognosis on his health is very good. We at SIALIA hope for a speedy recovery and send our best wishes to him and his family.*

Mrs. Norah Lane carries on her husband's work. Last February, she "was very busy ... judging at science fairs in the local schools and writing, by request, an article for a conservation column of the Provincial Department of Agriculture. At the same time (she) was preparing a presentation for the Brandon Natural History Society. A great deal of phoning and checking was required because (she) involved eight members from the group, *The Friends of the Bluebirds*. The presentation was given to nearly 100 people, with the outdoor temperature holding at a moderate 35° below zero."

*Norah Lane. She is simply astonishing. We are very pleased she and her family enjoyed the Profile on her husband, John.*

Dear Editor:

Please increase the size of type used in printing *Sialia*. These old eyes can't handle the small print too well.

Many Readers

Dear Many:

*Our not-so-old eyes agree with you. Hope this issue reads better.*

Dear Editor:

Do bluebirds readily accept the added thickness of entrance hole when raccoon guards are added to the front of the nesting box? Has this been tested?

Mr. & Mrs. George Grant  
Canestota, NY

Dear Mr. & Mrs. Grant:

*Raccoon guards have been widely tested by many persons without affecting the bluebird's choice of nesting boxes. They will use containers with a wall thickness of from 1/16" (milk jugs) to several inches thick.*

*Dr. Pinkowski experimented with this type of raccoon guard in Michigan, adding layer after layer until a tunnel over seven inches long had to be crawled through to reach the nesting chamber. Bluebirds used the nesting box.*

Dear Editor:

Do you have actual statistics that show that any direction is OK for facing of the entrance Hole? I thought that east to north was preferred.

Robert E. Wallace  
Portola Valley, California

Dear Mr. Wallace:

*Dr. Zeleny's extensive personal experience and correspondence with trail operators indicate no strong preference by bluebirds for any particular direction for the facing of nesting boxes. Dr. Pinkowski examined a number of natural cavities in Michigan and reported a slight tendency toward southeast, but that the tendency was not statistically significant.*

*There are two points to consider. First, many "natural" cavities have their direction predetermined by some species of woodpecker, not bluebirds. Second, many bluebird trail operators influence or "bias" the bluebird's choice by their own conception of which direction is best for the birds.*

*A southeasterly direction may be best on two*

*counts: reducing exposure to the afternoon sun, and facing away from prevailing storm winds. However, woodpeckers apparently do not strongly favor any direction, and cavities created by broken branches, etc., almost certainly occur randomly.*

*Current opinion seems to favor a factor deemed more important than direction by compass point. That is, helping to ensure a safe landing zone for young birds on their first flight. According to Dr. Zeleny, this factor far outweighs any possible benefit of compass direction.*

*In situations where there simply are no nearby trees, fences, etc., it would seem to make sense to face the nesting box so the entrance hole is shaded in the afternoon sun or away from prevailing summer winds.*

Dear Editor:

I'm only interested in reporting active bluebird nests. Looking in on broods can cause deaths. I stopped banding after several years. If you can convince me it's worthwhile, I can start again. Doesn't this scare the incubating females away?

Several Readers

Dear Readers:

*Banding activities improperly conducted can cause abandonment of a nest. Also, human activity near nesting boxes can lead to increased predation by snakes and raccoons that follow scent trails.*

*However, proper banding procedures will not affect the outcome of nesting, nor will proper monitoring techniques. In fact, the knowledge derived from these activities can only help humans to further help bluebirds. The timing of banding is important, especially if trapping the female is involved. It should be done very late during the incubation period or, even better, after the young have hatched and the female is brooding. She will not abandon the nest under these conditions. The young are best banded between 8 and 12 days of age. Later banding may encourage them to become excited and leave the nest prematurely. During the proper period, banding has no such affect.*

*The best guard against predators is to mount your boxes on predator-proof poles. However, some people have experimented with scent masking techniques, using moth crystal of para-dichlorobenzene or naphthalene. Little work has been done to determine the amount of crystals to be used on a square-yard basis, so use of these chemicals should be considered experimental until more is known. Greater discussion of this topic is found in the instructions for use of Nesting Box Record Cards.*

Dear Editor:

I write a weekly nature column for our local paper. Would it be possible for me to obtain permission to quote portions of the Bluebird Prayer delivered by The Rev. Raymond Prybis, if I give proper credits in the article?

How about quotes from other articles written in *Sialia*? It would in a small way help in publicity of the Society

YuLee Lerner  
Staunton, Virginia

Dear Mrs. Lerner:

*Do bluebirds have wings? Of course you may quote anything you wish from Sialia, and the offer of credit is appreciated. It was surprising to discover that a number of members are nature writers and outdoors columnists.*

*The help to the Society is in no way "small." By now you have probably received a mailing sent to all Charter Members asking that they help us to have articles printed in local papers. Such articles often result in hundreds of requests for additional information and many new memberships. They are very effective.*

The most popular question in *Sialia's* mail-bag has to do with Tree Swallows (Violet-green Swallows in the northwest and western Canada), and what might be done to reduce competition from these species.

Dear Readers:

*The issue raised is complex. Swallows are desirable species protected by law. Like bluebirds, swallows are extremely beneficial devourers of insects. However, they do at times compete all too successfully with bluebirds for natural cavities or nesting boxes. Usually bluebirds can hold their own if enough cavities are present.*

*The best answer at this time is to provide more nesting boxes. Swallows are territorial, like bluebirds, and will not tolerate another of their own species nesting too close. Place two or three nesting boxes within 25 or 50 feet of each other. The swallows can only defend one box.*

*There have been cases reported where swallows and bluebirds nested in separate boxes mounted on the same pole or post. Enjoy all the birds. You may be able to have both species on your property if you try hard enough.*

*We have no conclusive evidence yet, but the open-top nesting box may discourage swallows as it does House Sparrows. Mount one or two of this design and report your findings on Nesting Box Record Cards.*

(Continued on page 88)

(Continued from page 58)

done under the auspices of the Forest Services Range and Wildlife Habitat Laboratory, La Grande, Oregon.

**Table 2. Physical characteristics of man-made structures used for nesting by Mountain Bluebirds in Union and Wallowa Counties, Oregon.**

Structure	Structure	Cavity	Excavator**
	Height Ft.	Height Ft.	
Storage Box	4.0	2.6	N
Outbuilding	7.2	5.9	WP
Outbuilding	8.2	8.2	BS
Outbuilding	4.0	3.3	N
Outbuilding	26.5	25.5	N
Outbuilding	12.7	12.7	N
Fence Support***	3.6	1.0	N

\*\*N = naturally occurring cavity, such as breakage, decay, fire, etc.

WP = woodpecker cavity; BS = Barn Swallow nest

\*\*\*Fence supports are pyramid-shaped rock piles used to brace fences.

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## SUGGESTIONS FOR ORGANIZING A SAVE THE BLUEBIRD COMMITTEE

The North American Bluebird Society wants many persons to become involved in projects to save the bluebird. This can most effectively be done by establishing bluebird nesting box trails in suitable habitat.

Many persons may wish to operate their own nesting box trail on their own property, or to make arrangements to use private or public land. However, for many people the best way of participating in this conservation movement will be through a SAVE THE BLUEBIRD COMMITTEE in their community.

These guidelines were prepared to assist individuals and groups to organize a save the bluebird committee. These are only suggestions. Circumstances in your community may require slightly different techniques. In most cases however, following these suggestions will make your job easier, and your efforts most effective in helping bluebirds. The material has been grouped into short chapters for easy reference:

1. Organizing Your Committee
2. Background Material: Educate Yourself
3. Publicity: Educate the Public
4. Bluebird Trails: Route Selection
5. Property Owners: Get Cooperation
6. Nesting Boxes: Making or Buying Them
7. Experimental Work: Research Values
8. Mounting Boxes: A Group Activity
9. Monitoring: Assigned Responsibility
10. Banding: A Chance to Learn More
11. Recording & Reporting: What We Learn
12. Publicize Results: Get New Members
13. Prepare for Next Year: Evaluation
14. Go Back to #1: A New Beginning

### ORGANIZING YOUR COMMITTEE

On the theory that ten, twenty or fifty people working together will accomplish more than when they work separately, the first suggestion is to find other people interested in bluebirds and organize a SAVE THE BLUEBIRD COMMITTEE. This can be done in one of two ways:

1. Start by yourself, perhaps working with one or two friends.
2. Get the support and backing of an existing group in the community. This could be a local chapter of the National or State Audubon

Society, a bird club or ornithological society or a natural history group.

You may get the backing of a local service club such as Rotary, Lions, Ruritan or a veteran's organization. Garden clubs, youth groups, farm organizations and businessmen's associations or chambers of commerce may become interested if asked.

Camp Fire Girls and their junior members called Bluebirds, scouting units, 4-H, Explorers, YWCA, and YMCA, school science clubs and others are often looking for creative and worthwhile activities for their members.

And don't overlook groups such as Izaak Walton Leagues, Sierra Clubs, Wildlife Federations, nature centers, parks departments and other government agencies, rod and gun clubs and other sportsmen's groups such as chapters of Ducks Unlimited.

Once you decide whether to start on your own or as a unit of an existing organization, you must still organize your SAVE THE BLUEBIRD COMMITTEE. You need members. You need leaders such as president or chairman, treasurer and secretary. If you have enough volunteers from the outset you ought to have a publicity chairman, and chairmen for other specific tasks such as trail selection, monitoring, recording and reporting.

If you organize on your own, you must make some very basic decisions such as whether to incorporate, obtain insurance, set membership dues, establish a constitution and by-laws, seek tax-exempt status and so forth. If you become a unit of an existing organization, these matters will probably have been decided previously and you will subscribe to that organization's policies and procedures.

But you must still organize, establishing your goals and priorities. You need all the informed committee members you can find if you are really trying to SAVE THE BLUEBIRD, and you might begin by educating yourself.

### BACKGROUND MATERIAL: EDUCATE YOURSELF

You or someone else in your community or conservation group may be familiar with bluebirds, having had experience with a Bluebird

nesting box trail. However, most people are not knowledgeable about this subject and many of your committee members will want to learn more.

The North American Bluebird Society offers literature to help people learn about the blue bird problem and what they can do about it. In addition to a colorful information and membership brochure there are nesting box plans sheets, nesting box record forms, books, a quarterly journal and reprints of important articles. A reference bibliography is maintained listing all important information in the literature. These are all available at very modest cost.

Get of Copy of Dr. Zeleny's book "The Blue bird," the most comprehensive work about bluebirds published to date. The Society's quarterly journal, "Sialia," publishes articles that expand our knowledge about nesting box design, population studies, food habits and preferences, parasites and predators and much more.

As an information gathering and dispensing organization the Society will be continually developing educational aids such as posters, displays, slide shows and films. There will be an ongoing program of testing new nesting box types and for gathering reports from all over the continent on successes and failures. There will be at least two annual population studies dependent on information supplied by members and cooperators. Announcement of all these projects will be publicized in Sialia.

At the present time the Society offers the following literature:

1. A four-color information and membership brochure @ 15¢ or \$12 per 100 plus shipping.
2. Nesting box plans with instructions for mounting @ 5¢ or \$3.50 per 100 plus shipping.
3. "The Bluebird" by Lawrence Zeleny (170pp paperback) @ \$5.50 postpaid or in quantities of 10 or more at \$4.75 postpaid.
4. SIALIA is included with all classes of membership in the Society. Individual issues are available @ \$2.50. Non-member subscriptions are \$8 per year. Bulk mailings in quantities of 10 or more subscriptions are available @ \$7 per year.

In addition to the membership classes shown in the Society's literature, there are three basic types of group memberships:

#### **YOUTH GROUP MEMBERSHIP**

This membership category is designed for groups whose members each desire a North American Bluebird Society membership card, but where it is not necessary for each member to receive Sialia. The group leader, or any designated person, receives the group's copy of Sialia, and all group members receive a membership card. The cost of this membership is \$7.50 for the group (including the member who receives the copy of Sialia) plus 50¢ for each

additional member. Thus, for a group having a leader and seven members, the cost would be  $\$7.50 + \$3.50$  or  $\$11.00$  total per year. The group will receive a copy of all materials sent to members, and will be entitled to one vote at meetings of the Society.

#### **SUPPORTING GROUP MEMBERSHIP**

This membership category is designed for groups wishing to support the work of the Society, and who wish to receive a copy of Sialia for their library or to circulate among members. The minimum membership dues is \$10, and any greater amount will be very much appreciated. Groups such as bird clubs and garden clubs often designate their SAVE THE BLUEBIRD COMMITTEE chairman, conservation chairman or newsletter editor to receive Sialia and report to the membership the latest information about bluebirds. The group is entitled to designate one member to represent the group and to cast one vote at meetings of the Society.

#### **ACTIVE GROUP MEMBERSHIP**

This membership category is designed for groups having no other formal group affiliation, and that are organized solely for the purpose of working for the benefit of bluebirds and other cavity nesting birds.

The group must number at least five individuals who become members of the North American Bluebird Society and who establish, monitor and report data to the Society about a bluebird nesting box trail of at least 10 nesting boxes. Each member of the group will receive all benefits available to members of the Society.

In addition, the Society will notify all of its members in the county or general area represented by the group, urging participation in the group's activities. The group will remain an independent organization without any obligation to the North American Bluebird Society except for maintaining minimum membership and nesting box trail requirements. Members of this group will be entitled to a 10% reduction in individual annual dues for membership in this Society.

#### **PUBLICITY: EDUCATING THE PUBLIC**

In seeking publicity you have two basic objectives:

1. To build your committee's membership.
2. To obtain offers of locations for bluebird nesting box trails.

There are possibly three major types of publicity outlets in your community that cost little or nothing to use. They include the daily or weekly newspapers, radio and TV stations. Even though these publicity sources are not located in your town or village, they still serve your area

and are interested in what groups are doing. Don't be afraid to approach them.

A newspaper won't automatically give you news space if you simply mail a story to the editor. Telephone or, better yet, drop in and talk to an editor. Let the newspaper write a story for you if they are really interested. They may want to send a photographer to one of your meetings or to one of your nesting boxes for a "human interest" photograph. The Society can provide you with one or more sample press releases that you can adapt to your situation.

Whatever the newspaper does for you, be sure to write a letter to the editor thanking them for their cooperation. Such letters often find their way into print and give you further publicity. Make sure that letter states where your next meeting will be. Every little bit counts!

Radio and TV stations publicize local groups, either as part of their local programming, or to satisfy their licensing requirements by airing free public-service advertising. Again, drop in and talk with the programming director. It's much more difficult for them to turn you down in a face-to-face meeting.

If one of your members is really knowledgeable, try to get on the schedule for a "talk show," if the station has one that would include nature subjects. You will also qualify under such headings as conservation, environment, public service and, depending upon group affiliation, as a youth group, senior citizen group, etc. If you do not have a qualified speaker, write to the Society. We may be able to provide help from our speaker's bureau.

Posters mounted in store windows or at your library, schools, nature center, etc., will also help to bring people out to your meetings.

Okay. You've publicized the fact you are starting a SAVE THE BLUEBIRD COMMITTEE, and announced the date, time and place of the first public meeting. In all your publicity efforts you should also advertise phone numbers and addresses for those who can't wait or who can't attend the meeting to contact you. Now it's up to your organizing committee to provide a good show and convince many who attend to enlist in your cause.

Do you have a member who can provide a slide show and talk? There should be some entertainment and not just literature, maps and discussion. If you don't, ask the Society. We can provide a narrated slide program at very modest cost if given enough notice (about one month, please). We might be able to arrange for a speaker as well.

At this meeting and in all your publicity efforts, remember there are four basic points to be communicated to your audience as simply and effectively as possible. Those points are:

1. State the problem (bluebirds are in trouble).
2. List the causes (Starlings, cavity shortage,

environmental factors).

3. Explain the remedy (Nesting box trails, monitoring, protection).

4. Call for action (Invite people to get involved; *sign them up!*).

Communicate this message politely, with humor and in an interesting manner, and you will find enough people to do the job in your community.

## BLUEBIRD TRAILS: ROUTE SELECTION

Suitable bluebird habitat is adequately described in the Society's literature and in the book, "The Bluebird." Many individuals and groups are interested in establishing trails that interconnect with those of others, in effect creating one very large trail. Some Audubon chapters and Camp Fire groups have started trails with the goal of eventually linking up with trails in neighboring counties. The Society encourages systems of state-wide, even national trails. One trail in Canada includes a system of 2,500 miles of main and side trails, containing many thousands of nesting boxes. Such a system requires advanced planning and group-to-group cooperation.

First, contact groups in adjacent areas and agree on points where individual trails will meet. This can be done through state ornithological societies, Audubon Councils, Camp Fire leadership staffs, scouting roundtables, etc. With an in-state organization sponsoring a coordination meeting, the Society can notify all of its members in the state and a large number of birding organizations, urging that they attend and participate in the planning.

Try to map the locations of all known bluebird trails in the state or region. Doing this will aid in determining where existing centers of activity are located, and may help in planning a logical route. Consult the Society. We have many trail locations already mapped.

Look over topographic and aerial survey maps showing rights-of-way for powerlines, pipelines, railroads, etc., and that show where prime agricultural and open space areas are located. Such maps are often found in libraries, at county roads departments, state roads and wildlife administrations, and at colleges and universities. Excellent maps are available from the U.S. Geological Survey, but they are expensive, and might cost \$100 or more for a set that would cover an entire county. If you are unable to find suitable maps, write to the Society. We'll try to help.

After making a preliminary plan from maps, your basic and alternate routes must be evaluated by on-site inspections. This is sometimes called "proving ground truth." Conditions may have changed since the maps were made, or they might be in error. Access to property may be too difficult. You may learn something

about pending developments along the route that would force you to move the trail in future years. It is better to select a route where land use will remain stable, and that offers the prospect of little vandalism.

Make certain trail sites are selected so the trails will be monitored each year. Don't invest time, effort and materials in a project that will deteriorate because the work becomes too difficult. Remember, the trail that looks easy to patrol and monitor today may be more difficult in the future when your legs are a few years older!

Finally, check with local people to find out where bluebirds are known to nest. Bird count compilers, avid bird listers, local naturalists and farmers are apt to know. You may want to start your trail where you know the birds are, and extend into new areas as your resources allow.

### PROPERTY OWNERS: GET COOPERATION

There are four ways to receive permission from a property owner before running a bluebird trail along or through his land:

1. Have the property owner volunteer use of his land in response to your publicity program. Perhaps they will join your committee.
2. Make a mailing to all property owners along the proposed route, providing information about the project, about the bluebird cause, and inviting participation.
3. Telephone each property owner, doing as outlined above.
4. Make personal visits to all property owners.

Items 3 and 4 are logical follow-ups to item 2. At some point in time, all property owners will be visited anyway. Calling on them early is best.

### VOLUNTEERING LAND

Part of your "pitch" when planning newspaper or other media publicity should be an enticement for landowners to write or telephone you with offers of cooperation. This could include the property owner becoming directly involved in the project as an active participant. Or the owner may simply become a passive bluebird landlord of a portion of your bluebird trail. Such offers will play an important part in your route selection process.

### MAILINGS TO PROPERTY OWNERS

Develop a publicity package for mailing directly to property owners. This could include a copy of the Society's colorful brochure and a copy of the nesting box plans sheet. If you have had a story printed in a local paper, include a clipping or a Xerox copy. A map showing the route of the proposed trail through the community would be nice to include and there

should be a cover letter from your committee. The letter could be a form letter, but individually written letters are more effective.

### PERSONAL CONTACTS

Phone calls and personal visits to explain your project are the best form of communication with a property owner. You may need several persons to handle this job. Make sure they are knowledgeable and are able to make an effective presentation. You might want to hold a workshop to "train" these salesmen before sending them out to "close deals."

### LOCATING PROPERTY OWNERS

Most counties have tax maps showing who owns what land. These are public records open for inspection. Usually the public official will be most helpful in providing copies of maps, and may be able to furnish mailing addresses. If addresses cannot be obtained from the tax office, almost all can be obtained through the telephone company or by driving along the route checking mailboxes. In some cases there may be absentee landlords of tenanted property. Get the cooperation of the tenant, and follow up by contacting the out of town owner.

You may wish to get permission from the largest landowners along your trail route first. Utility companies and government agencies are usually quick to cooperate. Fill in the gaps between large properties later.

Remember, you need permission from power companies before mounting nesting boxes on their poles. Get this permission in writing, and establish a procedure for the company to notify you when one of your nesting boxes must be moved. Designate a committee member who is readily available as your liaison. Keep a record of your nesting boxes by power pole number and location. The time may come when you must remove and remount an occupied nesting box during some emergency or pole replacement program.

One other point about using utility rights-of-way. Usually, permission to use utility poles does not give you permission to travel across private property. The easement granted to the utility company probably does not extend to your committee. Always get additional permission from the property owner.

### NESTING BOXES: MAKING OR BUYING THEM

Nesting box plans are available from the Society. Nesting boxes are too, at moderate cost. However, most SAVE THE BLUEBIRD COMMITTEES will want to make their own nesting boxes to keep costs to a minimum. Here are some tips.

Local service groups, clubs or schools will

often make these items as a charitable contribution to conservation, or for the cost of materials involved. For instance, a school woodshop instructor might have each student make a nesting box as a way of learning to work with various tools. Approach the shop teacher about this possibility. Your committee might supply the wood, or arrange to have it donated.

Schools are always looking for interesting projects to include in the curriculum. It offers an opportunity to combine several subjects into one. For instance, science or biology teachers might use this opportunity to discuss ecology or reproduction. English teachers may encourage writing assignments about bluebirds or the making of nesting boxes. You can approach these possibilities through the school PTA or by contacting the principal or individual teachers. A nesting box trail might be mounted at the perimeter of school property if it seems appropriate. Or your committee could select the trail route and host school field trips during the nesting season, as a way of building enthusiasm for continuing the bluebird curriculum year after year.

In most communities, retired persons are only too willing to provide their skill and labor for projects that can be done in their home workshop. It's a labor of love, and many retired persons are superb craftsmen.

If you describe your purpose many lumber yards, building contractors, furniture makers, fencing companies and other manufacturers will be glad to put aside scrap materials for you. Demolition of buildings and collapsed barns offer an opportunity to obtain material at little or no cost.

A classified ad in a local paper or a request in your publicity notices will probably result in the offer of used materials or the leftovers from home renovation projects. Don't be afraid to ask.

Many businesses bury shipping crates in landfills. Glass dealers, furniture stores, printing plants, contracting firms, wholesalers and many others receive goods packed on skids or in crates. Once emptied these are often thrown away. It simply costs too much to ship them back for reuse. Ask for them!

Finally, if you'd rather, ask the Society. We'll be glad to sell them to you with a good discount for quantity purchases. Also, don't forget to include a percentage of experimental nesting boxes in your nesting box trail planning. It is only through widespread testing that better ways are found for doing things.

#### **EXPERIMENTAL WORK: RESEARCH VALUES**

What nesting box design is the best to:

1. Reduce predation by raccoons and snakes?
2. Eliminate competition by House Sparrows and even desirable species that at times

compete too well with bluebirds?

3. Avoid problems caused by wasps, blowflies and other insect pests?

4. Prevent overheating in summertime and reduce exposure during wet, chilly spring periods?

5. Assure maximum production of healthy young birds?

To be honest, we're not sure.

The Society is currently testing new nesting box designs in the hope of answering some of these questions. Testing programs require years of work, and the participation and reporting of data by hundreds of volunteers from all parts of the continent. What works in one area may cause some unthought-of problem in another.

Is there a design idea or management technique lurking in the back of your mind? Experiment! If you have an idea, try it. If it seems to work, write up your results and send a report to Sialia for publication. Together we can get your idea tested throughout the continent, and with the help of many other minds "work the bugs out," modify it, retest it, and perhaps come up with something even better.

#### **MOUNTING BOXES: A GROUP ACTIVITY**

If there is one chore about bluebird trails that tends to become work, it is the task of actually erecting the nesting boxes. Let's face it: there is a lot of hauling, digging, nailing and other work to be done, depending on your trail layout. Break up the task into small segments, each handled by one or more people. With a little teamwork the job can be a lot of fun. Make it a group activity.

You'll need a secretary who will keep vital statistics on each nesting box. Date of mounting, location, box number, design type, direction entrance hole faces, height above ground to entrance hole; you name it, the data may be valuable. The Society has nesting box record forms available at modest cost. Or you may make copies of samples provided without charge. If you use the Society's forms, or at least that format, your data will be compatible with that of thousands of others' throughout the continent.

While you are at work mounting nesting boxes, the secretary could be keeping a list of all birds seen during the day. It's a great way to record much about the birdlife of your area. Working your way along the bluebird trail as a group, some members can be moving cars and supplies to the next roadway, or to the other side of the pasture. Real efficiency can be maintained. Lunch can even be on hand at lunchtime!

A few backpacks, or pack frames may come in handy. Maybe you can get a scouting unit to hike your supplies ahead of you, with one of your committee to show them where to leave

nesting boxes, posts and other equipment.

Want to make a leaf collection or do a botany survey along the way? Collect insects? Take photographs (especially some of the trail work for later slide programs)? Take time to show the property owner what you are really up to? Collect litter as you go? It doesn't have to be boring while you work.

Make sure someone has a first aid kit. Insect repellent in season is a good idea. Who has the thermos of coffee? Now you're getting the hang of it!

Remember, if you are just starting your trail, the earlier the better. Set a target date for completion. Allow plenty of time and pick rain dates. Stick to it and get the job done.

## MONITORING: ASSIGNED RESPONSIBILITY

Without monitoring, a bluebird trail cannot produce its potential of young bluebirds. *They need your assistance.* Vandalized boxes need repair, and probably removal to a less conspicuous place. Sparrows need to be displaced, discouraged or done away with. Maybe the nesting box should be moved to a less sparrow-prone location.

Remember, all native species using your nesting boxes must be allowed to complete their nesting cycle. However, if you want to discourage native competitors, keep careful notes in your nesting box records and move the box to a better location after the wrens or titmice are done with it.

You should learn how to tell the age, within a day or two, of the nestlings. At the appropriate time you can have them banded. Through careful monitoring you will be able to know with a fair degree of accuracy, whether your bluebirds really fledged or whether something else happened. Your data will be only as valuable as you care to make it. Estimates at the end of the season that your boxes produced an average of five young ones does not constitute data. It is guesswork.

Proving that your trail produced 25% more (or fewer) young per pair of adults than it did the year before might tell you some thing really significant. What are you doing right? Was predation a factor? Was there extensive pesticide use in nearby crop areas? Maybe you'd better ask the farmer about his crop rotation, and rotate your nesting boxes according to his schedule and the needs of your birds.

Is there organic farming being done in your region? What an opportunity to study the difference in bluebird production between a trail in an organically farmed area and one on a farm where pesticides and synthetic fertilizers are used. This might be a good study project for a serious high school or college student who could monitor a number of your nesting boxes each year. Why not discuss this with a local college professor?

Frequent monitoring will tell you where your problems are and why you are successful. Once you understand a problem you can do something about it. Without monitoring, you'd have to be an awfully good sign reader to be sure of anything.

Assign areas of responsibility among most or all of your committee members. Require all monitors to make timely reports. Don't accept excuses for lack of responsibility. Try to improve the performance of those who fail to perform. Or find someone else to do the job. While this may sound tough, how else can you get the job done and have a successful project?

## BANDING: A CHANCE TO LEARN MORE

Would you like to know the answers to such questions as:

1. Where do my bluebirds go in winter?
2. Where did the pair from box 27 raise their second brood?
3. Did the four birds fledged from box 13 have any luck making it through the winter? Did they find mates?
4. How many of our young birds from last year are nesting on the trail?

There is only one to find out. Band and recover!

First a word of caution. It is against the law in North America to band any migratory bird without a license issued by either the U.S. or Canadian governments. Bluebirds are migratory birds. Only a licensed bird bander or someone working under the supervision of a licensed bird bander may band bluebirds. Period.

Secondly, the proper handling and banding of bluebirds by qualified persons does no harm to the bird, neither shortening or lengthening its life expectancy. The trauma and small incidence of injury sometimes experienced at banding stations where mist nets are used does not occur at bluebird nesting boxes. Banding done at proper stages of the nesting cycle do not frighten adults from the territory and do not cause young birds to fledge prematurely.

If there is not a licensed bander in your Audubon chapter or bird club, the Society may be able to refer you to someone willing to work with your committee. Many banders want to work with bluebirds because box-reared birds offer a stable situation for research, and many times the rate of returns obtained from open nesting species. Even so, the amount of hard evidence about bluebird migration is probably small, and the only way to increase our knowledge is through banding.

Licensed banders will often help others train to become licensed. It is not a quick or easy proposition, and it should not be. You must know your stuff. Sometimes licensed master banders will permit knowledgeable, careful and serious individuals to become sub-permittees, under the licensed bander's wing so to speak.

Just remember, you have to earn your way to a pair of banding pliers. To many people it is worth the effort.

Let's go back to those two bluebird trails. One is on that organic farm, the other on the chemically treated farm. Would you like to know if there is a difference in the lifespan of the bluebirds spending the breeding season in the two areas? How will you ever know without banding the birds and following their progress through successive breeding seasons?

With an expanded program of building and placing winter roosting boxes, we may be able to double or triple the number of winter recoveries if there is a large population of banded birds to work with. We won't take space to discuss roosting boxes now, but you should plan to have some on your trail before next winter.

## **RECORDING & REPORTING: WHAT WE LEARN**

We have touched on this subject a few times already. Recording information about your bluebird trail and submitting your data for analysis, compilation with other trail reports, and publication should be among your primary objectives. Research and information mean nothing if others do not have access to it.

The Society has a program of population studies published four times each year. They include a first-brood nesting report, a post-nesting production report, and analysis of data from the annual Christmas Bird Counts and Breeding Bird Surveys.

The Society asks that, as a minimum, all bluebird trail operators keep the kind of information provided for on the Society's standard nesting box record forms. These forms are available from the Society with instructions for their use. Your data will be entered into a computer and combined with the data from hundreds or thousands of other bluebird trails throughout the continent. Reports printed in *Sialia* will enable you to know the difference between your trail's results, and those of other trail operators in your geographic region, and those of trails in other regions of the continent. These data will provide a picture of how your trail operation performs in relation to the potential for your area.

This brings up a point about the geographic location of your bluebird trail. Bluebirds and all other birds, plants and living things do not respect county or state lines. Therefore, analysis of data about bluebirds must be based on a more natural system of geography. You've undoubtedly heard of terms such as biogeography, stratification, physiographic regions and so forth. They all relate to the same thing, dividing up a land area into meaningful components for the study of wildlife. The Society follows the system employed by the U.S. Fish & Wildlife Service for analysis of Breeding Bird

Survey data. This system has been fully described in *Sialia*. To give a brief illustration, in the State of Maryland there are four distinct physiographic regions. They are the Upper Coastal Plain, the Northern Piedmont, the Ridge & Valley Section and the Allegheny Plateau. Throughout the United States and southern Canada, there are about 60 such regions.

Within each region there are various habitat and climatic factors that influence the density of breeding bluebirds. Certain regions may never achieve the breeding density of other regions. In analysing your bluebird trail data, it is very important to know in which region or regions your trail is located. Your secretary or record keeper should provide the Society with a detailed map of your proposed trail so that physiographic region boundaries, if they occur in your area, may be shown. This information can then become part of your permanent records, and the appropriate data entered on nesting box record cards.

## **Publicize Results: Get New Members**

Depending upon the willingness of newspaper editors, you should get as much publicity for your committee as possible. Each step along the way can be written up, and each item of publicity will bring you new members or offers of locations for trails. Some of the opportunities you might exploit include:

1. Membership meetings. Announce the date a week or two in advance. Tell what your topic is and who the speaker will be. Mention how many members you have and some interesting project you are presently involved in. Whenever possible, offer a good black and white photograph, with caption, for publication.

2. Trail selection. In addition to an article about this, prepare a map of the community showing about where the trail will be. Mention some of the property owners who are cooperating with you, especially prominent persons. Be sure to mention state or local agencies, utilities and businesses giving aid of one sort or another. Check with the editor before making this map. Be sure it will meet their reproduction requirements.

3. Making nesting boxes. You might hold a workshop at which committee members and friends pitch in to make a quantity of nesting boxes. Have someone take black and white photos and write a story about the event. Announce the next meeting, etc. Always try to work a phone number into your press releases for interested persons to call.

4. Mounting nesting boxes. Take photographs. Work children into the pictures if possible, or a property owner helping to mount a nesting box. You might get that prominent person or a businessman who regularly advertises in the newspaper into the scene. Editors

are often persuaded to use this material.

5. Monitoring and banding. A bird in the hand is worth a photograph in the newspaper. Inform readers how many bluebird "babies" are being raised due to your efforts. Announce field trips for the public the next weekend. Recruit new participants.

6. Year-end report. Let the public know how your work has paid off this year. Mention names of property owners and how many bluebirds they were host to. You might hold a formal meeting and present certificates of appreciation to all those who gave support, including your cooperative newspaper.

7. All of these things can be aired on radio and TV. If your area has a special program for farm or agricultural news, you stand a good chance of getting regular mention.

8. Be sure to keep other organizations such as bird clubs, conservation groups, 4-H and Camp Fire, etc., completely posted on your activities. Even if they don't join your effort at the outset, keep working on them patiently.

#### PREPARE FOR NEXT YEAR: EVALUATION

Okay, it's September now and the birds are gone. However, you are by no means finished. Get your **SAVE THE BLUEBIRD COMMITTEE** back to work!

First of all, review all data collected during the nesting season, check over all your nesting box record cards, doublecheck any unusual notations, and proofread any transcripts or copies made from original record cards. Get your record cards in the mail to the Society by October 1. Please. At the same time, send a post-season, success story to your local newspaper. Now's the time to start giving yourself a little pat on the back.

With record keeping finished, set a date for your next membership meeting. Invite the public. You should have a pretty good slide collection of local scenes by now, telling the story of your bluebird conservation program. Start building enthusiasm for next breeding season.

Set dates for repair of nestingboxes. You may wish to do this during the fall while the weather is still nice. If you have started that leaf or

insect collection, now's the time to add to it. Keeping an eye on your local bluebirds during this period will tell you something about their movements. Besides, fall migrants are moving through and birdwatching is excellent.

Make plans for expanding your nesting box trail. Establish some sort of goal such as ten nesting boxes per member. Some members will want to do more. Set dates for another nesting box workshop and for mounting new boxes.

Now is the time to make some roosting boxes and set them out. You may get a lot of enjoyment by holding "flashlight tours" of the trail around year's end to see if bluebirds are using the roosting boxes or regular nesting boxes. You might plug up ventilation and drain holes in regular boxes to make them warmer for the winter months.

Set up a reporting system or hotline for members and the public to report all wintertime bluebird sightings. You may wish to mount nesting boxes in some of these areas, and interest in bluebirds will remain keen through the winter. Give some thought to plans for plantings to attract bluebirds and other wildlife. Take your slide program and give talks to garden clubs and school groups.

Remember, you are going to need people to keep this activity going year after year. Some of your members will move from the area or lose interest. You can't expand or even maintain the same activity level without recruiting new members. You've got more time available during the winter months for recruiting and other activities.

Do you need funds? Make nesting boxes of several types for sale at fall festivals and holiday bazars. Make arrangements to sell wild bird seed throughout the winter. With each sale you can publicize your bluebird work with a leaflet.

Continue to gather raw materials during this period for nesting boxes. Be prepared for your box-making workshop when the date arrives, and start the season with good momentum.

When you have reached this point, the North American Bluebird Society would like to say **THANK YOU**. Your committee deserves words of praise. Now, would you please go back to page one and do it again?



**North American Bluebird Society**  
P.O. Box 6295  
Silver Spring, MD 20906



PROFILE

## WILLIAM HIGHHOUSE



### BLUEBIRDS COME TO HIM

**B**ill Highhouse is a happy man today. Always was, really. Perhaps the serecure provided by his beloved Warren County has a lot to do with it. Warren County is a bit of America tucked into a 850 square mile corner of northwestern Pennsylvania, not far from Lake Erie and only a few seconds south of Jamestown, New York, if one chose to move at the speed of a Peregrine Falcon in stoop flight. Small towns — Tidioute, Irvine, Starbrick — meander upwards along the Allegheny River, culminating at Warren township, home of one-quarter of the County's 48,000 citizens, where Bill Highhouse has lived for nearly all of his 64 years. The Allegheny National Forest cradles the southern portion of the County, while orchard and dairyland serve as the northern lid. Winters are customarily harsh, and the damp and cold often linger well into the month of June. Living in this region mandates that people learn to accept, if not appreciate, the environment. Bill Highhouse appreciates.

His fourth grandchild was born last month. That makes Bill even happier. He seems rather devoted to his family, and quite proud of his three daughters. This October, he and his wife, Irene Albright, will celebrate two score and one years of marriage. Bill and Irene met on a blind date in 1935, while Bill was attending Penn State University. They married the year after he graduated with a B.S. Degree in Forestry in 1937. Irene, who lived just south of State College, in Saxton, went on to complete here degree at Juniata College. After his graduation, Bill began a long affiliation with Struthers Wells Corporation, a firm which designed and engineered heat transfer equipment. During the war years, the company was engaged in research for the Manhattan Project and Bill joined in. Irene was engaged in raising their girls. She returned

to teaching home economics in 1962. Bill later worked for National Forge at Irvine, retiring in 1977. He enjoys his retirement.

But Highhouse is best known in Warren for his 22 year crusade for bluebird conservation. Funny thing, though, Bill Highhouse can't really recall why the bluebird became a favorite. Probably the result of serendipity. He does remember the first time his father took him fishing. Bill was four. He still does a lot of fishing and this activity, together with the Warren County ambiance, conspired to instill in him a thorough respect for wildlife conservation. He claims Irene is tolerant of this respect.

In any event, 1956 seems to have been a watershed year for Highhouse and bluebirds. While leafing through an Audubon magazine at the time, he noticed an article about the population decline of the Eastern Bluebird, telling why this species needed help. A note in the article directed him to contact William G. Duncan of Louisville, Kentucky, for more concrete information. He made the contact. Mr. Duncan, one of this continent's genuine pioneers in the field of bluebird preservation, responded — inundating Highhouse with advice, accurate information, and an infectious enthusiasm which, through the early years of the Highhouse project, was essential to its ultimate success.

Mr. Duncan recommended making nesting boxes, with a 1½ inch diameter entrance hole and a 5 x 5 inch floor, then placing these boxes around the back roads of the County — a real bluebird trail. Highhouse was already an active participant in Christmas Bird Count programs. Another active participant was (and is) Harris Johnson who, in Highhouse's words, was the "best bird man in the region." Today, Mr. Johnson is the Director of the Jamestown (N.Y.) Audubon Society. Highhouse and Johnson formed the nucleus of a small group of birders, mostly from Warren and Jamestown, who, in 1957, placed 74 nesting boxes around Warren County. Most of these were wired to creosote-coated utility poles and positioned along secondary roads near orchards and open farmland.

However, despite this effort, Bill Highhouse was still somewhat indifferent to

the bluebird. While he appreciated its beauty and gentle ways, he was beginning to learn the names and mannerisms of many other birds, especially wood warblers and birds of prey. But when bluebirds began, almost immediately, to use the boxes, a kind of bond was formed. Bluebirds came to him and just wouldn't go away. And, of course, there was the ubiquitous Bill Duncan, shouting encouragement from Louisville. Highhouse's own account is instructive:

*The project actually started in 1956 when 4 nesting boxes were placed on Harry Robinson's farm near Lander. Before leaving the farm, on a sunny April 7 afternoon, a male bluebird was seen sitting on top of one of the boxes. A very encouraging sign. At this time an established breeding population existed in Warren County utilizing old orchards and old fence posts which were still quite common.*

Every Saturday, during the spring and summer of 1957, Highhouse climbed aboard Harris Johnson's jeep, and together they monitored the bluebird trails. These men continued this ritual for the next 20 years. And, with Johnson's expertise, Highhouse discovered that the process of checking the nesting boxes increased his understanding of the flora and fauna of the County. Because the boxes were located in a wide variety of habitat, he has seen hundreds of bird species, ranging from Goshawks to Hummingbirds. He especially enjoys the surprises which continually occur during the peak of the warbler migration.

The sense of aiding the bluebird's recovery, the joy of learning the habits and songs of other species, the camaraderie of good friends and the good, clean air of Warren coalesced to make Bill Highhouse a bluebird devotee for life. He gradually increased the number of boxes, reaching a peak of 400 in 1973 and 1974. Ninety percent are affixed to utility poles.

Initially, Highhouse made the boxes from old lumber he found around his place of employment. He cleared the wood, cut it into proper proportion,

nailed it together, then coated the finished box with paint. After the first few years, most of the actual construction was fashioned by a group of retired men determined not to allow the severe winter to dampen their productivity.

As word spread of the success of Warren's bluebird trails, other people from the region volunteered to place additional boxes, monitor them, and report results to Bill Highhouse. In the peak years, there were nearly 100 such volunteers. Today, the number is lower. But interest remains high.

Curiously, Mr. Highhouse reports he has never had significant problems with snake or raccoon predation. He attributes this to the climate of the area and the relative scarcity of large constricting snakes, such as the Black Rat Snake. He does lament the fact that Tree Swallows use his "bluebird" boxes more frequently than bluebirds themselves. He also maintains the escalating costs of gasoline will probably reduce the number of volunteer monitors, thereby reducing the scope of his project. He is also saddened by the shifting habitat. Small farms, abundant 20 years ago and each with their own apple orchard, are fast disappearing, replaced with trailer communities.

Nonetheless, Bill Highhouse is very pleased with his bluebird project. He has established no records and produced no real surprises. Bluebirds almost always arrive in his area by March 21, and produce two nestings. All of the young are fledged by mid-August. In 1964, "A very aggressive male bluebird and his partner fledged 7 young in their first nest attempt followed with 6 young in the second — a record that still stands." His trails have fledged more than 12,000 bluebirds, many of which were banded. This achievement speaks for itself.

In retirement, Highhouse tills a large garden, enjoys housework, and swims one-half mile each week. Ten years ago, he had a disc in his back removed. His doctor recommended swimming as therapy. Since that time, Bill has logged at least 500 miles in the local YMCA pool. He is very active in the North Allegheny Conservation Organization. Currently, that group is concerned about preserving a Great Blue Heronry. Not surprisingly, considering his versatile interests, he

consults with the Game Commission to guard against rattlesnake extinction in Warren County. "Rattlesnake Roundups" are very common there. He says he is "half an expert" on raptors, spending long hours in search of such finds as a Cooper's Hawk. He has also helped place 24 American Kestrel nesting boxes, from which 100 Kestrels have fledged in eight years. He is the local compiler for *American Birds*, and has contributed data to *Eastern Bird Banding* and the *Kingbird*.

His health is excellent. He sets aside at least two days each week "just for birding." He tries to make an annual pilgrimage to Cape May for the obvious reasons. He talks only informally about his work. But the word has gotten around.

Thanks Irene Highhouse for your tolerance. Thanks Bill Duncan for your informative enthusiasm. Thanks Harris Johnson for your friendly expertise. And, Bill Highhouse, thank you for the example you have set for others, for the 12,000 bluebirds you have given a chance for life, and for following through on a hunch, allowing bluebirds to come to you.

Yes, bluebirds help make Bill Highhouse happy, too.

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(Continued from page 59)

become trapped by ice on a tree branch after a sub-zero night. Seeing the bird flapping its wings but unable to free itself, she enlisted the help of a co-worker who, using a tall ladder and a long pole, was able to release the bird. After it fell to the ground she gave it temporary shelter and called the United States Fish & Wildlife Research Center in nearby Laurel, MD. They in turn, called Larry who immediately agreed to take in the injured bird. He brought it home and he and his wife Olive helped the bird to recover. The bird's legband showed it to be one that Larry had banded as a nestling last May!

We look forward to hearing YOUR bluebird tales! Write to the North American Bluebird Society, in care of **BLUEBIRD TALES** and tell us what YOU have done for the bluebirds!

\* The same issue of *Bird Watchers Digest* printed a story called "Help the Bluebird: Build Nesting Boxes" by Larry Zeleny, which mentioned the North American Bluebird Society.

# THE BREEDING BIRD SURVEY



Danny Bystrak

People have long speculated about the reasons some species of birds were able to increase their numbers significantly, while other species declined in population—many to the point of extinction. Why has the Starling prospered? What happened to the Passenger Pigeon? What is now happening to bluebirds?

Widespread or local weather patterns, habitat destruction, pesticides and many other factors affecting bird populations, as well as normal biological cycles, have always been mysterious, difficult to measure forces, greatly confounding conjecture. The Breeding Bird Survey (BBS), sponsored by the U.S. Fish and Wildlife Service and the Canadian Wildlife Service, is designed to take as much of the mystery as possible out of bird population fluctuations and their possible causes.

In the past three decades we've had drastic change in land use, agricultural practices and environmental pollution. With expanding human populations we can anticipate even greater intensity of land use and alteration of wildlife habitat, making the gathering of baseline population data even more important. These data are crucial if we're to obtain an understanding of what the usual,

or normative, bird populations are, as measured uniformly over a period of time. By knowing what is normal, we can infer that which is abnormal, and hence increase our ability to predict the factors mitigating for or against survival of many bird species. With the help of about 1200 volunteer observers this survey has been producing the only index of song bird populations ever attempted throughout North America.

The word survey is appropriate because the BBS attempts to establish a sample index, not a total count of bird populations. No effort is made on a BBS route to count as many birds as possible, as on Christmas Bird Counts or spring Big Days, or even to determine exact breeding populations as in the Audubon Breeding Bird Census. Because of the increased interest in all of these techniques, it is important to refer to each one properly. In any "survey" the valid negative data are as important as the positive. Statistical analysis of the data is possible because strict adherence to the rules provides comparable samples over a large area. Since these results are frequently used in policy making and environmental impact assessments, it is extremely important that the rules be followed closely.

## History

In 1965 the Breeding Bird Survey idea was tested along 50 roadside routes in Maryland and 10 in Delaware to determine if the technique was feasible. Based on this pilot effort, the decision was made to sample the U.S. and Canada east of the Mississippi River. In 1966 about 600 routes were run in this area

Coverage was expanded to include the Great Plains states and provinces in 1967 and the entire continent in 1968. Coverage has slowly grown to a level of approximately 1850 routes per year

**Methods**

In order to apply statistical methods of analysis, the data to be analyzed must be gathered in accordance with certain standards. Probably most important of these is that there be no biases in the data. All habitats should be represented in proportion to their occurrence in North America, good birding areas should not be intentionally over-sampled. Random selection of routes before-hand is essential to minimize this and other potential biases. Because any data being gathered are subject to natural variability and sampling error, a large sample size is needed to average out local variations and reduce the effects of sampling error. Other obvious requirements are a consistent sampling method, comparable observer expertise and similar weather conditions. The Breeding Bird Survey was established with all of these goals in mind.

A sampling scheme based on lati-longs

(blocks of one degree of latitude and one degree of longitude—about 50 by 70 miles) was devised for the selection of survey routes. Throughout North America the number of routes per lati-long varies according to availability of qualified personnel but is uniform across a state or province. There is one route per lati-long in most of the western states and provinces, two in the central and southern states and four from Tennessee and Virginia northward. There is more intensive coverage in those states or provinces that have a high number of qualified birders. In such areas the sampling density can be increased once all established routes are being run.

The routes were randomly drawn by picking starting points and direction of travel from a table of random numbers. Approximately 2300 routes have been drawn this way and every effort is made to see that as many of them as possible are run each year to ensure a large sample size. The routes are on secondary roads in order to minimize interference from traffic noise and danger to observers. Unfortunately, increased traffic on secondary roads has necessitated relocation of some routes.

Qualified observers are recruited in each

U. S. FISH AND WILDLIFE SERVICE  
LAUREL, MARYLAND 20811

SUMMARY SHEET, BREEDING BIRD SURVEY

(1) STATE-PROV. **67**

(3) ROUTE NO. **002**

(6) ROUTE NAME **BIRDVILLE**

(18) COORDINATES **3445-09546**

STATION **19** (40)

(91) TOTAL SPECIES **64** (30)

ASSISTANT: **Myrtle Bullock**

Observer (please print) **WRENN** Dr. Mr. Mrs. Miss (for female)  
(23) **WRENN** **Phoebe** **A**  
Last Name First Name M. I.

USE ONLY NUMBERS—ONE DIGIT PER BLOCK

Start Finish

(42) TEMP. (F) **70** **78**

(46) WIND (SPEED) **1** **1**

(48) SKY **2** **1**

(50) DATE **060478**  
Month Day Year

(56) TIME **05350950**  
Start Finish

Species	ROUTE	Page Totals					Total	Steps per Stop
		1	2	3	4	5		
GREAT BLUE HERON	194			1	1	2	2	
GREEN HERON	201							
LETTUCE BLUE HERON	206		1			1		
CATTLE EGRET	207							
CANADA GOOSE	172							
MAZARD	182							
BLUE-WINGED TEAL	140							
WOOD DUCK	144							
TURKEY VULTURE	225			1		1	1	
BLACK VULTURE	226							
SHARP-SHINNED HAWK	212							
KAWONIA'S HAWK	203							
RED-TAILED HAWK	157							
RED-BLIZZARD HAWK	253			2		2	2	
BROAD-WINGED HAWK	243							

Species	ROUTE	Page Totals					Total	Steps per Stop
		1	2	3	4	5		
WOODPECKER	130					1	1	
WREN	100							
RED WINGED BLACKBERRY	108		1	2	2	5	5	
INDIAN CHATWATER	101	3	2	6	7	18	20	
CRANE FLAPPING	073							
ROCKY MOUNTAIN WREN	045				4	4	5	
WHEAT-EYED WREN	041		3	2	2	7	9	
WHEAT-EYED WREN	045			1		1	1	
WHEAT-EYED WREN	045							
WHEAT-EYED WREN	045					3	3	
WHEAT-EYED WREN	045							
WHEAT-EYED WREN	045					2	2	
WHEAT-EYED WREN	045							
WHEAT-EYED WREN	045							

Figure 1. Portion of properly completed Breeding Bird Survey Summary Sheet.

state or province by a volunteer coordinator who is usually in contact with a large portion of the birding community. The coordinators receive copies of each year's results for their respective areas and often prepare summaries for publication. These dedicated people, many of whom also run several routes, deserve a great deal of thanks.

Observers are supplied with rules and all necessary forms and maps and are instructed to pick a day in June that is as close as possible to previous runs and that has good weather conditions. Each observer starts exactly ½ hour before local sunrise, counting and recording all birds detected in 3 minutes at the starting point. The counting is repeated at 49 more stops, each ½ mile apart. Only birds counted during the 50 3-minute stops are included in the totals. A route should take from 4 to 4½ hours to complete. It is important to finish in this time-frame because on most mornings bird song decreases rapidly after the first 4 hours.

### Processing and Quality Controls

When the routes are completed, the summary sheets (Fig. 1), field sheets and other

data are sent to the Nongame Section of the Migratory Bird and Habitat Research Laboratory in Laurel, MD. Biologists and clerks edit the forms very carefully, comparing field sheets to summary sheets and questioning observers on any discrepancies or unverified observations of rare species. At this stage a code is entered to distinguish routes that, for one reason or another, cannot be used in statistical analyses, but are still retained for their distributional data. All data are transferred to magnetic tape and subjected to computer edit checks. The observers retain copies of their results to verify against computer print-outs which are sent to them for each route run. After the final corrections are made, three listings are produced, one sorted by individual route, one by state and province and one by species. These listings are available to the public and use of the data for appropriate research is encouraged.

### Ecological Stratification

To detect small changes in the population of a species between years, it is helpful to group data for areas where the populations are fairly similar. These small, usually ecologically similar units can be combined into

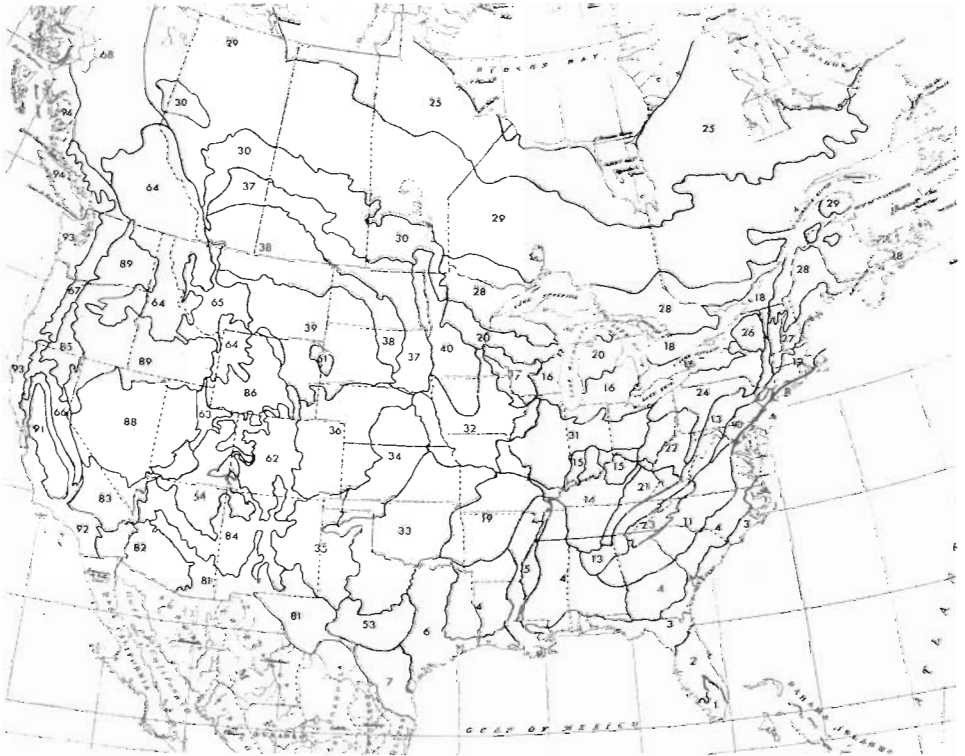


Figure 2. Ecological Stratification of North America as used in Breeding Bird Survey analyses.

regions such as coastal plain, piedmont, and mountain, which in turn can be combined to obtain figures for a continental population index. Better measurement of change can be obtained by the use of ecological regions than by combining data on a state or province basis, because many species vary greatly in abundance in different parts of the same state or Province

Although it is difficult to subdivide the continent into ecological regions whose boundaries precisely define the distribution or abundance of a large number of bird species, an initial attempt has been made. The stratification plan used for the BBS analyses is shown in Figure 2. This plan is based on several published sources and seems to be an effective ecological stratification. It should be considered by anyone working with bird studies covering large areas of North America.

### What Does The BBS Tell Us?

Access to a computer facility is extremely important to an effort as large as the Breeding Bird Survey. Not only does it permit the handling of an otherwise unwieldy amount of data, but it also permits the data to be examined in a wide variety of ways. Because each species of bird differs in detectability and preference for roadside habitat, it is not possible to compare BBS data between or among species. However, the main purpose of the BBS is to detect changes in populations of all bird species encountered along the routes by establishing a yearly index which can be used to determine trends. It is hoped that, by detecting trends, we can determine if, and to what degree, a species is declining, and management techniques can be employed before it becomes threatened or endangered.

Because changes in bird populations are almost always gradual, the change from one year to the next is rarely significant. By analyzing population changes over a period of years, it is possible to determine if any gradual trend is statistically significant. Analysis of the BBS data has shown that most species experience population fluctuations from year to year. However, these ups and downs do not indicate a long-term trend. On the other hand, many species appear to be increasing or decreasing at a significant rate when a decade or more of data are examined. Not only does BBS data tell us

how these dynamic populations are changing, but it also serves as a baseline for the more stable species in case a sudden change occurs. Although the population appears lower for Eastern Bluebirds than it was 30 years ago, the BBS shows it to be remarkably stable despite some severe weather setbacks and competition for nesting sites from introduced species. Figure 3 shows that the bluebird displays the up and down pattern of a species well capable of recovering from periodic population decreases. The last two years give the impression of an overall downward trend, but the highly significant decrease in 1977 and the less severe one in 1978 can be attributed to two harsh winters in the East. Significant changes that do take place between any two successive years are almost always a result of abnormal weather.

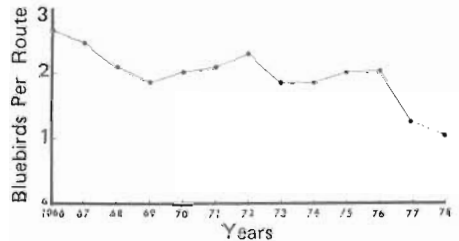


Figure 3. Population Index of Eastern Bluebird for North America east of the Mississippi River from BBS data.

When the controlling factors of a bird's population are suspected, the BBS data can be used to show if a correlation exists. One of the strongest correlations in the bird world is that between winter weather and Carolina Wrens. Figure 4 shows the BBS population index of Carolina Wren east of the Miss-

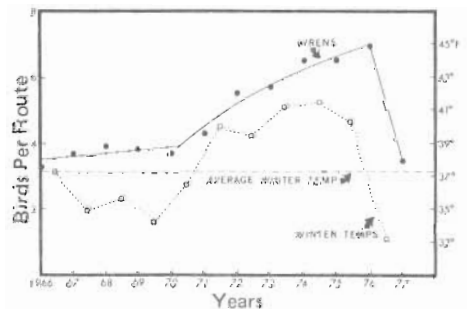


Figure 4. Population Index of Carolina Wren for states east of the Mississippi River from BBS data plotted against winter temperatures for Washington, D.C.

issippi River for a 12 year period plotted with the average winter (December, January, February) temperatures for Washington, D.C. for the same period. When the winter temperatures were near normal, the wren population increased only slowly, but when the winter temperatures stayed well above normal for 5 years, the population grew rapidly. This was expressed not only by larger populations in the central states, but also by considerable northward expansion of the range. The winter of 1976-77 was very severe in the East, with temperatures well below normal, resulting in extended snow and ice cover. These conditions cut short the wren's rapid increase, and, in fact caused a drastic drop in population reflected on the 1977 BBS.

Few attempts have been made to map the distribution of North American birds

precisely. This is regrettable, because such maps would have many uses, not only to birders but to biogeographers, taxonomists and population biologists. With the BBS data and the versatility of the computer, not only can most of the range of a species be mapped but, by using long-term averages, the relative breeding densities also can be deduced. A good example of the potential management use of these maps is the Eastern Bluebird map (Fig 5), which shows areas within the normal breeding range that have very low populations, such as the area from Wisconsin through Ohio. This scarcity of bluebirds is related in part to a lack of good habitat and nesting sites in this area, but possibly also to nest site competition from the great density of House Sparrows and Starlings in the same area. Perhaps a concentration of well-monitored nestboxes

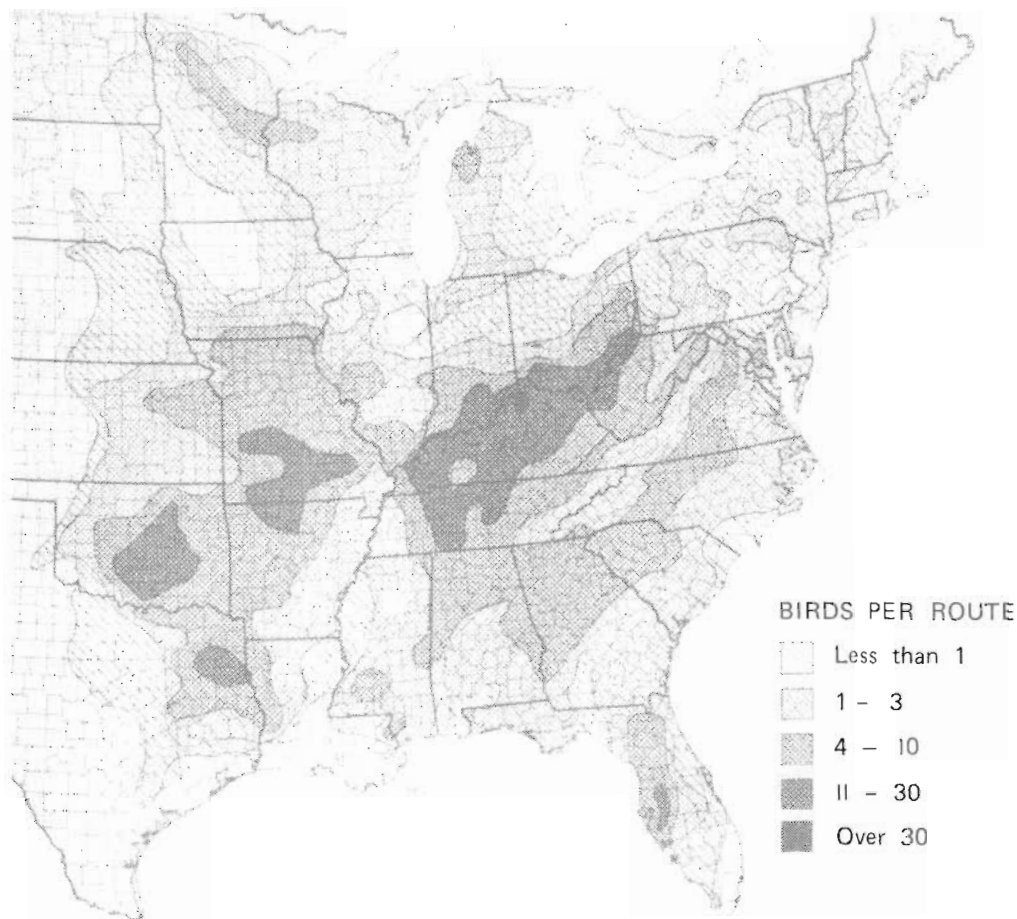


Figure 5. Eastern Bluebird breeding range as determined from BBS data, showing relative abundance.



in these areas would be more beneficial than in others.

Birds are constantly appearing outside their normal ranges, and in many cases these are preludes to legitimate range expansions. The BBS is an excellent tool to keep track of both the increases in numbers and the current ranges of expanding species. The two most conspicuous recent additions to North American birdlife are the Cattle Egret and, in the East, the House Finch. Both are increasing and spreading rapidly. The BBS will provide a fairly precise measure of the increases of both species. As dramatic as either of these, though probably less well known, is the southward spread of the Barn Swallow breeding range (Fig. 6), which between 1966 and 1973 progressed about 150 miles south. This expansion is continuing and will probably result in Barn Swallows breeding over the entire Southeast.

Population changes within a smaller area, such as a state or group of states or ecoregion can be determined and compared to trends for larger areas. Comments from bluebird enthusiasts in the Midwest that populations were down drastically after the winter of 1977-78 were supported by the BBS. States and provinces showing a 50% or greater drop in 1978 (Table 1) form a core where bluebirds apparently suffered more in the second of two hard winters, despite the fact that the entire eastern population dropped more the first winter (Fig. 3). Not only did the remainder of the range remain stable the second winter, but some states even showed increases.



**Figure 6. Invasion of the southeastern states by nesting Barn Swallows. BBS data show southern limits of breeding range in 1966 and in 1973.**

**Table 1. Eastern Bluebird totals for several midwestern states and Ontario using only BBS routes run all four years.**

	1975	1976	1977	1978
Illinois	98	117	31	1
Indiana	35	41	15	4
Kentucky	289	210	116	45
Michigan	25	37	13	4
Ohio	134	123	64	35
Ontario	11	13	3	0
Tennessee	281	286	190	73
	873	827	432	162

Populations of many species cannot be subjected to most forms of analysis because of small numbers or limited BBS coverage over the range of the species. For example, the sparse coverage over much of the West makes it difficult to analyze species such as Mountain and Western Bluebirds, whose entire range is in the West. It is hoped that a gradual increase in coverage of western birds will contribute a sufficient amount of reliable baseline data to allow observation of long-term trends.

An interesting side-line of the BBS is the contribution it has made to distributional records by getting a large number of birders out in areas not otherwise visited, especially in June, when most birding seems to cease. At this time, BBS surveyors have accounted for many unusual records within states. At least three "State firsts" have been recorded: a Gray Kingbird in Maryland, a Great-tailed Grackle in Arkansas and a Cassin's Sparrow in South Dakota.

**Help is Needed**

BBS coverage is poorest in the least populated parts of North America; Nevada, Utah, Idaho, Wyoming and parts of adjacent states are and probably always will be most desperately in need of increased coverage. There are also many smaller areas of sparse coverage throughout the continent, and replacements are continually needed for observers that drop out for one reason or another. Research projects and summer vacations often put qualified observers in areas where help is needed during June. It is desirable, of course, that each route be run for several years, but even one year is better than none.

Routes can be run by anyone satisfying the necessary qualifications. Observers

(Continued on page 87)

# A BLUEBIRD FEEDER

Col. W.R. Robertson, USAF-Ret.

For the last sixteen years, since my retirement, my wife and I have longed to have bluebirds nest in our yard and to have them visit our bird feeder. The first wish was relatively easy to attain. As subscribers to the *Purple Martin Capital News*, Griggsville, Ill., we read Dr. Lawrence Zeleny's instructions about building nesting boxes for bluebirds. Since 1964 we have regularly had bluebirds nesting in our yard. We live just north of Atlanta, Georgia.

But attracting these birds to a feeder was quite another matter. At first, we did not know that lots of birds have soft bills and that quite a few of them cannot eat mixed grain or sunflower seeds. We never could attract bluebirds, Mockingbirds, wrens, juncos, Brown Thrashers, or any of the warblers with this fare.

Next, we tried feeding suet and corn bread. The suet brought in woodpeckers, nuthatches, and chickadees; but we did not know how long it took for some wild birds to get used to a new feeder or a strange dish. The corn bread spoiled long before it attracted new birds. We quit weeks or months too soon.

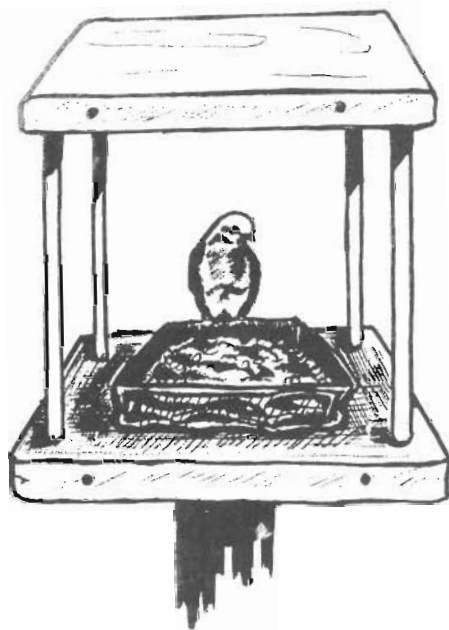
Finally, three years ago I delivered a nesting box to an Atlanta resident who was actually feeding bluebirds. She called them in with a bluebird-like whistle and fed them a mixture of peanut butter, one part, and plain raw corn meal, two parts. She used an open basket hanging from an eight foot high gutter with a small dish inside to hold the mixture. (Using an electric hand-held mixer the peanut butter and corn meal soon became a uniform and crumbly mixture.)

Now we are happily feeding the following long list of birds on our high back porch, just outside our breakfast room window:

Note: \* The asterisk indicates winter residents here or migrants passing through.

Eastern Bluebird  
Cardinal  
Carolina Chickadee  
Purple Finch\*

American Goldfinch\*  
Common Crackle\*  
Blue Jay  
Slate-colored Junco\*  
Golden-crowned Kinglet\*  
Ruby-crowned Kinglet\*  
Mockingbird  
Pine Siskin\*  
Chipping Sparrow  
House Sparrow  
Field Sparrow  
White-throated Sparrow\*



Starling  
Brown Thrasher  
Tufted Titmouse  
Magnolia Warbler\*  
Pine Warbler\*  
Downy Woodpecker  
Red-bellied Woodpecker  
Carolina Wren

Our Rufous-sided Towhee does not visit our feeders, but picks up much of the food dropped on the ground under the feeders.

As a feeding dish I recommend using the small tray that meat is packed in by

your favorite supermarket. Mount this on a wide board base about 7½ inches wide by 11 inches long with thumb tacks or push pins. Punch drainage holes in the dish to let rain water leak out. This arrangement can be hung from the gutter or under the eaves using suitable galvanized wire and screw eyes. If the gutter or eaves are too high and wind causes the feeder to bang against the house, try using a shelf, or hanging-basket, bracket attached to the house above your favorite window. (My feeders have a second board mounted on 3/8 inch diameter towel pins about 7 inches above the base board. This cover keeps off most of the rain and may provide shelter from attack by small hawks.) The feeder should be at least five feet above the ground or porch to prevent house cats from attacking the birds. With no support under the feeder it may be safe from squirrels.

I like to use galvanized stove pipe as a squirrel guard mounted around a support pipe and below the feeder. The three inch diameter stove pipe may need to be greased to keep squirrels off but the four and five inch sizes are too large and smooth for squirrels to climb.

The bluebirds that were raised in our nesting box are almost certainly our principal bluebird visitors. There are eight of these birds and they come in at least four times a day. This has been going on all fall and into January. We are thrilled every time these beautiful birds come to feed.

Give yourself a treat. Install a bluebird nesting box more than 60 feet from any building (to discourage House Sparrows) and start feeding peanut butter and corn meal. With any luck you will be very glad you did.

## MAY

*Like drifts of tardy snow  
On leafless branches caught,  
The cherry blossoms blow  
That May has brought.*

*On banks which face the sun,  
Still shy in pretty doubt,  
White violets have begun  
To look about;*

*Along the meadow's edge  
New grass has just been seen,  
And on the hawthorn hedge  
Rose hides the green*

*Sunshine lies warm and still;  
Cloud shadows idly drift;  
Light cups, for dews to fill  
Wind-flowers lift:*

*Oh, sweet, fresh world, and young!  
A bluebird flashes by,  
And singing joy is flung  
Through all the sky!*

Margaret DeLand

Published in *Bird and Bough* by  
Houghton, Mifflin & Co., New York, 1891

(Continued from page 56)

Valley than are the bluebirds. Yet they depend upon cavities for nesting just as do the bluebirds and are much less able to defend themselves against House Sparrows in any contest for possession of a nest cavity than are the bluebirds. Furthermore they have but half the breeding potential of the bluebirds with but a single brood a year against the bluebird's two, and in a situation where egg clutch sizes are about equal. Just where are the swallows finding sufficient nest cavities to maintain their thriving population? We have work to do to find the answers.

One has little trouble deciding what to do with the nests of the chattering House Sparrows one finds in one's bluebird nest boxes. But what does one do with those of such beautiful and beneficial birds as the swallows? Often we put up extra nest boxes for the swallows so they will leave those of the bluebirds alone. But this raises the question of whether such actions only multiply our future problems with the swallows. We are not yet quite ready to trade our swallows for the snakes that plague bluebird nest boxes in the East, but given a little more time who can tell what our mood may be?

# NESTING BOX RECORD CARD PROGRAM

## NORTH AMERICAN BLUEBIRD SOCIETY

These instructions will serve to guide persons participating in the nesting box record card program in proper use of the record cards. Please keep in mind that the value of the record cards for research purposes is totally dependent on accurate reporting of data.

Please read these instructions carefully. Understanding the system will make your job much easier. Information about the nesting box trail (location, habitat type, nesting box type, mounting, etc.) can be filled in at the beginning of the season. Please be sure to take individual measurements at each nesting box rather than assuming that entrance hole size, mounting height, etc., are uniform for all your nesting boxes.

The following instructions are numbered to relate to numbered sections on the nesting box record card forms. If you have an unusual situation not covered by these instructions, please write the Society for a prompt answer to your specific problem. If you submit a record card where a question exists about proper reporting of data, please attach a note that includes the nesting box number prominently displayed at the top of the note.

### INSTRUCTIONS

1. Nesting Box Trail Number. This code is determined by the Society. It includes a two-digit code for the State or Province, a two-digit code for the physiographic region or strata in which the trail is located, and a four-digit code for the trail number assigned to the person monitoring the trail. Trail numbers are assigned by State or Province in the sequence in which the monitor registers the trail with the Society. A sample of the 8-digit code will be furnished at time of trail registration. These 8-digit codes are not transferable, and apply only to the trail for which they were issued. If a trail is expanded in length, the monitor must notify the Society to determine in the same trail code will apply to the trail extension. In some cases, such extensions may enter into a new physiographic region or strata, requiring a new trail code for that portion of the nesting box trail. A list of States and Provinces and a list of physiographic regions follows, with the numeric codes applying to each:

### STATE & PROVINCE CODES

02 Alabama	97 Bermuda
03 Alaska	11 British Columbia
04 Alberta	12 British Honduras
06 Arizona	14 California
07 Arkansas	17 Colorado

18 Connecticut	55 Nevada
21 Delaware	56 New Brunswick
22 District of Columbia	57 Newfoundland
25 Florida	58 New Hampshire
26 Franklin, Northwest Territories	59 New Jersey
27 Georgia	60 New Mexico
29 Guatemala	61 New York
32 Honduras	62 Nicaragua
33 Idaho	63 North Carolina
34 Illinois	64 North Dakota
35 Indiana	65 Nova Scotia
36 Iowa	66 Ohio
38 Kansas	67 Oklahoma
95 Keewatin, Northwest Territories	68 Ontario
39 Kentucky	69 Oregon
40 Labrador	72 Pennsylvania
42 Louisiana	75 Prince Edward Island
43 Mackenzie, Northwest Territories	76 Quebec
44 Maine	77 Rhode Island
45 Manitoba	79 Saskatchewan
46 Maryland	80 South Carolina
47 Massachusetts	81 South Dakota
48 Mexico	82 Tennessee
49 Michigan	83 Texas
50 Minnesota	85 Utah
51 Mississippi	87 Vermont
52 Missouri	88 Virginia
53 Montana	89 Washington
54 Nebraska	90 West Virginia
	91 Wisconsin
	92 Wyoming
	93 Yukon

Physiographic Region or Strata Designations. Unused numbers have been reserved for possible future subdivision of stratum.

01. Sub-tropical
02. Floridian Section
03. Lower Coastal Plain
04. Upper Coastal Plain
05. Mississippi Alluvial Plain
06. West Gulf Coastal Plain
07. Nueces Plain
08. Glaciated Coastal Plain
10. Northern Piedmont
11. Southern Piedmont
12. Southern New England
13. Ridge and Valley
14. Highland Rim Section
15. Lexington Plain
16. Great Lakes Plain
17. Wisconsin Driftless Area
18. St. Lawrence Plain
19. Ozark - Ouachita
20. Great Lakes Pine Belt

21. Cumberland Plateau
22. Kanawha Plateau
23. Blue Ridge Mountains
24. Allegheny Plateau
25. Open Boreal Forest
26. Adirondack Mountains
27. Northern New England
28. Spruce-Hardwood Forest
29. Closed Boreal Forest
30. Aspen Parkland
31. Till Plains
32. Dissected Till Plain
33. Osage Plain
34. High Plains Border
35. Staked Planes - Pecos Valley
36. High Plains
37. Prairie Pothole Section
38. Missouri Plateau-Glaciated
39. Missouri Plateau-Unglaciated
40. Black Prairie
53. Edwards Plateau
54. Colorado Plateaus & Canyonlands
61. Black Hills
62. Southern Rocky Mountains
63. High Plateaus of Utah
64. Central Rocky Mountains
65. Dissected Rockies
66. Sierra-Trinity Mountains
67. Cascade Mountains
68. Canadian Rockies
81. Mexican Highlands
82. Southern Sonoran Desert
83. Northern Sonoran Desert
84. Pinyon-Juniper Woodlands
85. Klamath-Pitt Plateau
86. Wyoming Basin
88. Great Basin
89. Columbia Plateau
91. Central Valley
92. California Foothills
93. Southern Humid Coastal Belt
94. Northern Humid Coastal Belt
95. Southern California Mountains

2. **Nesting Box Number.** This number is designated by the trail monitor. Normally the numbering of boxes follows the route used to monitor the trail. Boxes are numbered starting with 0001 and proceeding to 9999. There is no number 1, etc. If your trail is segmented, allow space in your numbering sequence for additions to the trail. Thus, your first segment of trail may have box numbers 0001 through 0010, the second segment 0050 through 0060, the third 0090 through 0100 and so on. The nesting box number should relate to its location. If you move a box to a new location, more than just a few feet from its original site, renumber the box in an appropriate manner. Don't add a suffix number or letter such as 0001-A. The Society's computer system will not be able to handle such designations. Numbers do not need to be consecutive throughout your trail. If you decide to place a new nesting box between two existing

ones, simply choose an unused number for that box. If you discontinue a nesting box site, do not reuse that site's number anywhere else on your trail. One of your objectives should be to evaluate specific locations on your trail, and moving nesting box numbers around will be confusing.

Once you have your boxes and record cards numbered and checked for accuracy, prepare a map showing where each box, by number, is located. Please furnish a copy of the map to the Society for permanent trail records.

3. **Observer's Name.** This is the name of the "owner" of the nesting box trail. It could be an individual or a group. If your Audubon chapter or local SAVE THE BLUEBIRD COMMITTEE is the nominal owner and you work and report through that group, use that group's name such as **A P P A L A C H I A N A U D**. Or the name might appear as **B R O O K S B I R D C L U B**. If you operate as an individual, please follow the example on the sample form.

2A. **LAT-LONG 10' Block.** Filling in this information requires precisely locating the position of your nesting boxes on a good map having latitude and longitude grid coordinates. The map must be further gridded into 10-minute blocks (six subdivisions within one degree of longitude or latitude). The LAT-LONG designation for a particular nesting box is the proper designation for the coordinates of the southeast corner of the 10-minute block. The Society will grid the map you submit for you, returning a copy showing the LAT-LONG 10' Blocks for your nesting box trail. Your official map must be a printed map, not a hand drawn one. If you are able, please use a map prepared by the United States Geological Survey.

4. **Land Use Designation.** Deciding which choice to mark will often be a matter of judgement. To assist you, please consider the following examples.

**URBAN.** Continuous human habitation, commercial and industrial areas, with little or no open space of any significance. May include local parks and greenbelts along streams or rivers. Possible bluebird habitats restricted to yards, small parks or campuses of educational or commercial institutions. A farm would be included only if it is surrounded by residential or commercial development. There may be large estates, golf courses, etc., within the urban area, but these inholdings are the exception to virtually total dense land use by humans.

**SUBURBAN.** Usually the outer fringe of urban areas, where more open space, farming and greenbelts exist. May become urban in the future, but the density of land use does not presently preclude many species of local wildlife. Suburban areas usually border on or are surrounded by rural areas.

**RURAL-OPEN.** Human habitations usually surrounded by large lots, farming areas, woodlots or forests and fields. Would not include "tract homes", mobile home parks, or intensely developed areas. Two to ten acre lots might be the rule, and except for occasional stores or businesses a general lack of development is apparent.

**FARM LAND.** Working farms are the rule, but might include roadside strips of residential use, bordering on working agricultural land.

**PARKLAND.** Could occur in any of the above areas. Designates a use by humans that could be disruptive to wildlife. Could include woodland, camping areas, ballfields, playgrounds, picnic groves, horseback riding trails and other outdoor recreational uses. Could be a city park, suburban recreation center, rural conservation area or Scout summer camp, or National Forest containing various human use zones.

If you are uncertain about these designations, attach a note to your report and let the Society help you with the decision.

5, 6, 7. **PASTURE, PLANTED FIELDS, EDGE TYPE.** The nesting box may be mounted between two possible choices. If this is the case, mark both choices.

8. **CLEARCUT AREAS OR FALLOW FIELDS.** The "age" of the area is the number of growing seasons since harvest last took place. A field cropped in 1978 and fallow in 1979 would be a first-year field. A burned area would be dated from the year of burning.

9. **NESTING BOX TYPE.** The types listed are pictured in the Society's literature, and refer to design type, not to precise dimensions.

10. **MATERIAL.** If "Other material" is marked, provide a description in the space provided.

11. **SIZE.** If the floor area falls between sizes shown, use next larger size indicated.

12. **ENTRANCE HOLE DIAMETER.** Be precise. Weather, other animals and birds increase hole sizes over time. Hole size should be measured at beginning of season, and periodically through the season, especially if predator/competitor problems arise. Note any change in hole size under the remarks column.

13. **DEPTH.** This measurement should be taken from the bottom of the entrance hole to the top of the floor of the box before nesting material is placed on the floor.

15. **Bottom of Hole to Ground.** Don't make adjustments for sloping ground. Height is the distance a predator would have to climb, so measure from base of post, pole or tree.

16. **Direction of Entrance Hole.** Be precise. Compass is required because guesses are frequently off by up to 45°. Compasses are divided into 360°. For the purpose of record cards, North (which is 360° or 0°) covers ½ the distance to NW and ½ the distance to NE, or

from 337.5° to 022.5°. The degree equivalents covered by the eight compass points recognized by the Society are:

N.	337.5 to 22.5
NE	22.5 to 67.5
E	67.5 to 112.5
SE	112.5 to 157.5
S	157.5 to 202.5
SW	202.5 to 247.5
W	247.5 to 292.5
NW	292.5 to 337.5

17. **Nearest Tree or large Shrub.** This should be a tree or shrub visible from the entrance hole by young birds prior to their first flight. It is more important to face the nesting box toward such a target than worrying about compass direction.

18. **Bottom of Hole/Top of Eggs.** Be gentle as well as precise. If measurements cannot be taken for some reason, simply leave this area blank. This measurement is important in determining the effectiveness of certain nesting box design features, including devices to protect the nest from opossum and raccoons. In taking this and all other measurements, use a solid ruler, folding carpenter's rule, a metal measuring tape. Do not use cloth or paper measuring tapes. They shrink and stretch and are not reliable for statistical work. Measurements on the even inch (say 5") belong in the next higher bracket, in this case, 5" to 6".

20. Provide information about what the nesting box is mounted to, not how it is mounted. This information will be helpful in assessing predator control methods.

21. Information about protective devices is provided in *Sialia* and in the book "The Bluebird." If you use some other device, please tell about it.

22. Information about other types of post/pipe lubricants found to be effective would be appreciated. Effectiveness after being washed by rain should be determined.

23. **AS AN EXPERIMENTAL METHOD** of predator control, some investigators add hot red pepper to lubricants on posts & pipes. Moth crystals (paradichlorobenzene and naphthalene) are also being investigated, but little is known about possible harm to the birds if vapors are transmitted into the nesting box. Research into this form of snake and mammal control should involve careful and cautious procedures, to determine the effective rate of use of crystals (weight per square yard) applied to the ground about the nesting box. Data should be kept regarding temperature, rainfall, and any other factor tending to dilute or destroy the crystals. If you want to experiment with this material, begin by using very limited amounts of the crystals well away from the nesting box. If predator control is not obtained, move closer to

23. Nest record data Use one card for entire season Record every visit

North American Bluebird Society — Box 6295, Silver Spring, MD 20906

Date Month/Day	No Eggs	No Young	Build ing	Adult on	Comments Use codes when possible Eggs warm/cold, age, problems, etc.	Date Month/Day	No Eggs	No Young	Build ing	Adult on	Comments Use codes when possible Eggs warm/cold, age, problems, etc.
4 1			✓			6 16			✓		NEST COMPLETE (04)
4 8	2				(04)	6 21	4			X	FEMALE FROM 1st BROOD
4 15					(11) (14) HOUSE SPARROW	6 30				X	
4 16		TRAPPED			SPARROWS - CLEANED BOX	7 6		4		X	CA 4 DAYS OLD
4 22			✓			7 13		4	ALL	MALES	BANDED 105-124 891-894
4 29	5	5			(04)	7 20	CLEANED	BOX		(06) (03)	
5 5	5	5		X	BANDED FEM. 105-124 879	8 3					NO ACTIVITY
5 12	4	1		X	2 EGGS PIPPED	8 10					"
5 19		4			(04)	8 17					"
5 26		4			REMOVED 26 BLOWFLIES - BANDED	8 24					"
6 2	2	CLEANED	BOX		(05) (03) 4 FLEDGED						
6 9			✓								

26. Recording codes. Use whenever possible for clarity.
01. Outcome unknown, except as noted
02. Young seen leaving box.
03. Young seen nearby.
04. Parent(s) excited nearby.
05. Nest empty, intact.
06. Nest empty, damaged.
07. Raccoon sign noted.
08. Snake sign noted.
09. Nest deserted.
10. Egg(s) pierced.
11. Egg(s) on ground.
12. Egg(s) broken.
13. Cowbird egg(s) found.
14. Failure due to competition from other bird species.
15. Failure due to human:
- 15a. Vandalism
- 15b. Activity nearby.
- 15c. Unintentional.
16. All young dead in nest.
- 16a. Female adult dead in nest.
- 16b. Male adult dead in nest.
- 16c. Both adults dead in nest.
- 16d. Suspected cause if any.
17. Failure due to mammals:
- 17a. Squirrel
- 17b. Oppossum
- 17c. Raccoon
- 17d. Chipmunk
- 17e. Cat
- 17f. Horse or cattle.
- 17g. Other \_\_\_\_\_
18. Failure due to insects:
- 18a. Polistes wasps.
- 18b. Blowflies.
- 18c. Other: \_\_\_\_\_
19. Failure due to weather:
- 19a. Extensive rain
- 19b. Snow
- 19c. Ice
- 19d. Extended cold
- 19e. Heat
20. Failure due to structural:
- 20a. Damage (vandalis)
- 20b. Failure (came apart)

TO AVOID PROCESSING DELAYS: Return this record card to N.A.B.S. by October 1st, if possible. Any special discussion about this nesting box should be on a separate sheet of paper with the trail number and box number clearly indicated. Refer to instruction manual in all cases of uncertainty over which codes to use.

1. Nesting Box Trail No 46047027 2. Box No. 00212a Lat-Long 391 N 076 S W

3. Observer: Mr. R. M. J. E. F. F. F. F. Office Use Only    

4. Land Use:  Urban  Roadside  Deciduous Woods  Pine Woods  Farm land  Orchard  Golf Course  Cemetery  Parkland

5. Edge type:  Dairy  Horse  Beef cattle  Mixed  Fallow  Other

6. If pasture:  Tobacco  Corn  Wheat  Soyabean  1st year  2nd  3rd  4th

7. If cropland:  burned area or clearcut  First year  2nd  3rd  4th

8. Age of fallow field, burned area or clearcut:  NA B.S. Standard  EX-1 Open-top  EX-2 Raised-top  EX-3 PVC box

9. Nesting box type:  4" x 4"  5" x 5"  6" x 6"  4" diam.  5" diam.  6" diam.

10. Material:  3/4" Cedar  3/4" Pine  3/4" Plywood  6" x 6"  4" diam.  5" diam.  6" diam.

11. I.S. Floor area:

12. Entrance Hole

13. Depth: Bottom of hole to ground:  Less than 3 ft.  3 ft. to 4 ft.  4 ft. to 5 ft.  5 ft. to 6 ft.  6 ft. to 8 ft.  8 ft. to 10 ft.  10 ft. to 12 ft.  Over 12 ft.

14. Roof shape:  Flat  Sloped  A-roof

15. Bottom of hole:  Less than 3 ft.  3 ft. to 4 ft.  4 ft. to 5 ft.  5 ft. to 6 ft.  6 ft. to 8 ft.  8 ft. to 10 ft.  10 ft. to 12 ft.  Over 12 ft.

16. Compass direction hole faces:  North  Northeast  East  Southeast  South  Southwest  West  Northwest

17. Nearest tree or large shrub:  Less than 25 ft.  25 ft. to 50 ft.  50 ft. to 100 ft.  100 ft. to 200 ft.  More than 200 ft.

18. Bottom of hole to top of eggs:  Less than 4"  4" to 5"  5" to 6"  6" to 7"  7" to 8"  8" to 9"  9" to 10"  More than 10"

19. Opening style:  Top opening  Side opening  Front opening

20. Mounting method:  Metal pipe  Wood post  Power pole  Wire fence post  Wood cone shield  Metal post  Chain link fence  Side of building  Trunk of tree  Hanging free

21. Protective devices:  Wood raccoon guard:  3/4" thick  1 1/2" thick  Metal cone shield \_\_\_\_\_" diameter  Creosote on post  Grease on pipe  STP brand oil treatment  \_\_\_\_\_

22. Frequency of lubrication:  Once each week  Every two weeks  Once in spring

23. Scent masking method?  None  (specify) \_\_\_\_\_

24. Banding data: Date 6-26 1st BRood (2D BRood 2N SACR) Sex, if known: M  F   
Age 13-14 DAYS  
Permit No. 10379  
Band numbers: 1. 105124 882  
2. 883  
3. 884  
4. 885  
5.      
6.



the box with small amounts of crystals, or increase the rate of use while remaining some distance away. At all times, carefully look for any affect whatsoever on the birds.

24. Banding data. *This is not a substitute for records required by the Bird Banding Laboratory, USF&WS, or by the Canadian Wildlife Service.* Only licensed master bird banders or persons working under their direction may band bluebirds. These data are desired to assist in the Society's population studies, and to allow a quicker response when the Society receives information about banded bluebirds.

25. Monitoring Entries. One record card is used per season unless the number of visits exceeds the number of lines on the form. Do not use separate forms for second or third broods, but continue listings without interruption.

26. Try to keep entries as brief as possible, using numeric listings in the comments column whenever possible. However, don't avoid reporting findings for which there is no numeric code. Everything noted is important. See sample form for guidance.

The Society does not consider a nesting attempt to have been made unless at least one egg has been deposited in a nest. Therefore, if a nest is built and vacated, and no egg is known to have been laid, the outcome would be (10), not failure to some other cause, *unless some specific cause is known* (such as occupancy of the nesting box by another species).

Please address specific inquiries about nesting box trail management, problems you experience along the trail, anecdotes of humorous and pleasurable experiences working with bluebirds, and notes about other species using nesting boxes to the Society Box 6295, Silver Spring, MD 20906. Please mark your envelope "TRAILS DEPARTMENT," to help us process your inquiry. If a reply is desired, a stamped and self-addressed envelope would be appreciated. The Society will try to use this material as the basis for columns and articles in SIALIA so that others may benefit from your experiences.

All nesting box record cards should be sent to the Society marked "RECORD CARDS," by the first of October if at all possible.

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(Continued from page 79)

should, of course, have a full knowledge of bird identification and distribution in their area. Knowledge of bird songs and calls is the most crucial factor as the short time spent at each stop means that most birds recorded on the BBS are heard and not seen. Severe hearing deficiencies brought on by advanced age or medical problems can render the results of a route unusable. As mentioned earlier, valid negative data are an important part of the BBS, thus zeros generated by an observer's lack of knowledge or inability to hear can seriously affect the results.

Generally, state and provincial coordinators find qualified people and refer them to the BBS office. A qualified person can also contact the BBS office directly to find out if a route is available within a reasonable distance. A person of uncertain ability may want to ask about routes already being run nearby on which it is possible to accompany the observer. Interested persons in either category are encouraged to write to the Nongame Section, Migratory Bird and Habitat Research Laboratory, Laurel, Maryland 20811.

#### Editor's Note:

In the interest of protecting against increasing the "bias" of BBS data, Mr. Bystrak has asked us to ask you **not** to saturate a **known** BBS route with bluebird nesting boxes. Such a saturation might cause the number of bluebirds along that route to increase significantly, thereby rather mysteriously altering the historical record of the species. A sudden increase in bluebird reports can make the route highly suspect. In this situation, a dramatic increase in bluebird populations along the sample area would not mean a commensurate increase in bluebirds in the region—it would be a local phenomenon only. Therefore bluebird data along the BBS route would be meaningless.

Dear Editor:

I doubt that many of us will have enough bluebird slides to make much of a presentation. Would it be possible for the Society to make up several slide groups that might be made available to us for talks at schools, etc.?

Richard Field, M.D.  
Centreville, Mississippi

Dear Dr. Field:

The Society is working on production of a slide program right now. It will be a 45 minute production accompanied by a tape recorded narration and a printed script. Several copies are planned to avoid too many conflicts in dates requested for programs. Members of the Society's speaker bureau will get first crack at the slide programs, but they will also be available to any group for a nominal fee to cover shipping and insurance. About half our membership has volunteered to serve on the speaker bureau.

In addition to this basic slide program (which pretty much follows the outline of Dr. Zeleny's book "The Bluebird") several more specialized slide shows are on the drawing boards. One such program would deal exclusively with nesting box trails on golf courses. Another, especially for garden clubs and landscapers, will emphasize plantings for wildlife—especially to provide berries for bluebirds. Another possibility is a show about all cavity-nesting birds and those that use nesting boxes or other man-made structures. Finally, there is the possibility of a slide program especially for elementary school classes accompanied by a teacher's manual, nesting box kits, poster materials and so forth.

We hope to have the first slide program ready for distribution by late summer. Members who want to schedule fall programs should notify the Society of showing dates well in advance. Slides will be shipped in carousels for Kodak projectors, and the tape cassette will fit almost any inexpensive tape player. The Society will not furnish the machines.

After the first set of slides is assembled, it will cost the Society about \$100 per additional set in copying charges. Members who would like to help defray these costs may mark a tax-deductible contribution for the education fund.

Dear Editor:

I'm interested in becoming a licensed bird bander. Will the Society sponsor me for this project?

Several Readers

Dear Readers:

We'd love to. But have you heard about red tape lately? Here's our problem.

There are presently about 2,000 licensed master bird banders in the United States and Canada. Licenses are issued only to qualified and competent individuals and organizations. The Bird Banding Laboratory (where all records are kept) is already understaffed and overworked dealing with this number of master banders.

Master banders are allowed to sub-permit others under their supervision. The master bander is responsible for the sub's actions and for collecting and filing annual reports, records, etc. This system accomplishes two things: it reduces the paperwork load at the banding office and it assures competent supervision over neophyte banders.

The Society has requested, and the Bird Banding Laboratory has agreed, to supply the Society with mailing address labels for all licensed bird banders. A letter will be sent shortly asking banders to cooperate with Society members by banding birds on nesting box trails this year. Banders will also be encouraged to sub-permit Society members if they feel they are competent and careful.

As master bander permits are retired, sub-permittees are given the opportunity to advance to master bander status. Thus, Society members who wish to do so, may have an opportunity to work toward a banding permit while gaining experience through a sort of apprenticeship program.

Write the Society if you are interested in this program, if you did not indicate your desire on the membership survey form.

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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!

# INSTRUCTIONS FOR USING FIRST BROOD NESTING REPORT

The First Brood Nesting Report is designed to measure the number of pairs of bluebirds returning to nesting box trails during the early portion of the breeding season. For the purpose of this report, the first brood period is defined as the first five weeks (35 calendar days) after bluebirds commence depositing nesting material in the nesting box. Thus, if in your area nest building commenced on April 5, 1979, the end of the reporting period would be May 9, and only nests containing *at least one egg* by that date would be included in the report.

First Brood Nesting Reports not only measure the real changes in bluebird populations on nesting box trails, they also provide clues about winter survival rates on a region-by-region basis throughout North America. To gain this knowledge, apples must be compared with apples, not apples with oranges. It is important to compare nesting attempts in the same group of nesting boxes from one year to the next. If your bluebird trail was expanded by adding boxes either *within* the trail or by *extending* the trail, these factors should be known and taken into account.

For the purpose of this report, a nesting attempt is deemed to have taken place if, during the reporting period, *at least one egg* was laid in a nest. If a nest is built and abandoned without egg-laying having taken place, it will not be included in the report. Likewise, if a nest is built during the report period but the first egg is not laid until after the close of the report period, it can not be counted as a first-brood record and should not be included. *The only exception* to the one-egg rule is if the female is found dead during the nest-building period, and the nest is abandoned by the male.

To measure real changes in bluebird numbers, it is necessary to exclude from consideration changes brought about by management activities (enlarging or reducing the opportunities for nesting, or moving nesting boxes to substantially new

locations). Figure 1 gives an example of a nesting box trail that was enlarged *within* itself. Squares □ indicate nesting boxes available during the 1978 first-brood period. The total number of those nesting boxes is entered on line one of the reporting form (Figure 3). A line ⊗ drawn through one nesting box represents a damaged box that was not replaced (or a box moved to a new location). Circles indicate new boxes mounted after the 1978 first-brood period. A dot within a square ⊠ indicates the box contained at least one egg during the 1978 first-brood period. A cross within a square ⊕ or circle ⊕ indicates at least one egg was deposited after the 1978 first-brood period. Finally, a double line in either a square ⊞ or circle ⊞ indicates at least one egg was deposited in a nesting box during the 1979 first-brood period.

Figure 2 gives an example of an *extension* to an existing nesting box trail. It has been expanded into totally new territory away *from* (although adjacent to) existing territories. Some of your bluebirds may relocate to these new boxes, but it is more likely that these boxes will house an expanding population or will be used by bluebirds not previously housed on your trail. In Figure 2, the same system of legends have been used to measure nesting activity.

The sample reporting form gives an example of how to accurately enter the data from this nesting box trail. Using this information, analysts will compare the data with those from other trails within a specific region, and from region to region. A preliminary report will appear in the Summer issue of SIALIA.

If you have doubts about your trail situation, make a map similar to the ones shown here and mark it in a similar manner. Submit your map to the Society and a report will be constructed, with a copy returned for your records. If this is the first year of your trail operation, or if you do not have accurate data for last year, disregard the questions that cannot

be answered and provide answers only for those questions that can be accurately responded to.

A final note. Persons who have trails in widely separated locations should file

more than one trail report (unless the two locations are being linked this year). Also, while the Society is only requesting data for bluebirds, you may file separate reports for other species if you wish.

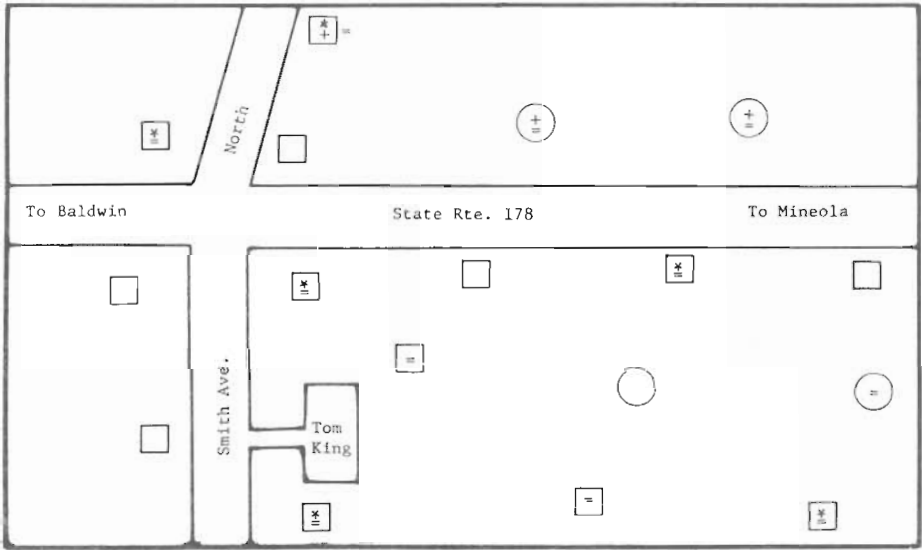


Figure 1. Nesting box trail layout showing growth within the trail, and legends indicating nesting activity.

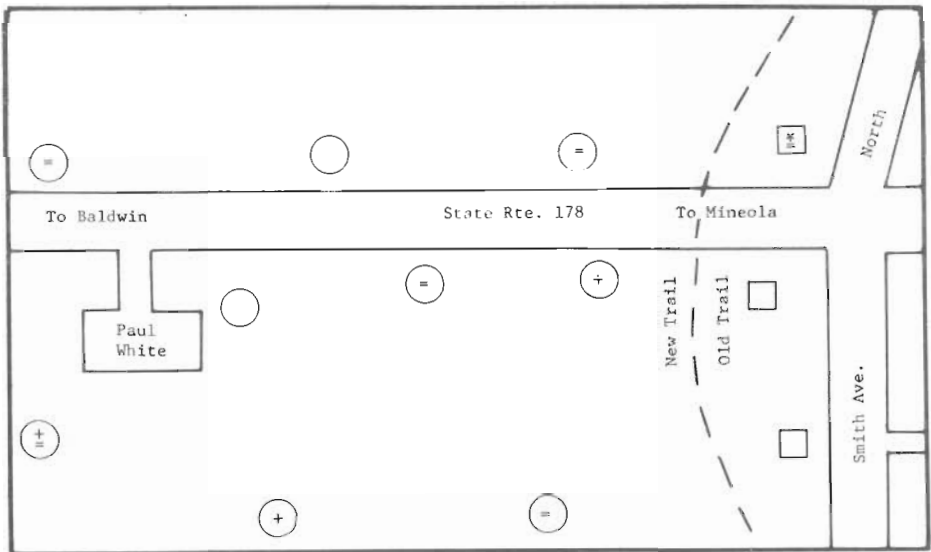


Figure 2. Nesting box trail layout showing growth outside or as an extension to the trail. Legends have same meaning as Figure 1.

# FIRST BROOD NESTING REPORT

## NORTH AMERICAN BLUEBIRD SOCIETY

Mr.

Observer: Mrs. \_\_\_\_\_

Miss

Address \_\_\_\_\_

City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

Please complete and return this form by June 1st. Your promptness will be appreciated, and will make your data available for compilation in *Sialia*, Summer issue.

**NOTICE: PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE FILLING OUT THIS FORM.**

.....

### PART ONE — 1978 vs. 1979

1. Number of nesting boxes on your bluebird trail during first-brood period of 1978 (first 35 days of nesting season). \_\_\_\_\_
  2. Number of nesting boxes containing *at least one egg* during the 1978 first-brood period. \_\_\_\_\_
  3. How many nesting boxes reported in answer number 1, or their direct replacements, were available during the 1979 first-brood period? \_\_\_\_\_
  4. How many nesting boxes reported in answer number 3 contained at least one egg during the 1979 first-brood period? \_\_\_\_\_
- .....

### PART TWO — GROWTH WITHIN TRAIL

5. How many nesting boxes were *added within* your bluebird trail after the 1978 first-brood period? \_\_\_\_\_
6. Of the number reported in answer 5, how many contained at least one egg in the latter part of the 1978 nesting season? \_\_\_\_\_
7. Of the number reported in answer 5, how many were available during the 1979 first-brood period, including direct replacements? \_\_\_\_\_
8. Of the number reported in answer 7, how many contained at least one egg during the 1979 first-brood nesting period? \_\_\_\_\_

Figure 3. Sample First Brood Nesting Report Form. Form is properly filled out to record information indicated by Figures 1 and 2. Trail and LATI-LONG Block numbers are issued by the Society, and should be left blank if the observer has not yet been issued the numbers.

### PART THREE — GROWTH OUTSIDE TRAIL

9. If you *extended* your nesting box trail since the 1978 first-brood period, how many new nesting boxes did you mount? 9
10. Of the number reported in answer 9, how many contained at least one egg during the latter part of the 1978 nesting season? 3
11. How many of the boxes reported in answer 9, or their direct replacements, were available during the 1979 first-brood period? 8
12. Of the number reported in answer 11, how many contained at least one egg during the 1979 first-brood period? 5

### PART FOUR — OTHER NEEDED FACTS

13. If dead adult bluebirds were found in nesting boxes prior to the start of nest-building this year, please show number found. 2
14. Do bluebirds *usually* winter in your area? Yes  No
15. Did you notice bluebirds in your area this past winter? Yes  No
16. Did freezing rain occur during the winter that would cause berries on shrubs and trees to be coated with ice for more than two consecutive days? Yes  No
17. Have you noticed any conditions or environmental changes in your trail area since the 1978 nesting season, that could affect the number of bluebirds using your nesting box trail? Yes  No   
If yes, please provide written details.

N A B S Trail # 46-04-0027 LATH-LONG Block 391 N 0765 W

NOTE: NESTING STARTED 10 DAYS LATE THIS YEAR  
DUE TO WET, COLD PERIOD IN EARLY APRIL.

TRAIL LOCATED ON RTE. 198 2 MILES TO 4 MILES  
EAST OF LAUREL AROUND PERIMETER OF  
AIRPORT.

Please mail completed report, before June 1st if possible, in envelope marked "FIRST BROOD REPORT" to the NORTH AMERICAN BLUEBIRD SOCIETY, Box 6295, Silver Spring, MD 20906. Thank you for taking part in this research project.

## BLUEBIRD POSTURE

### Understanding Bluebird Behavior

Figure A.

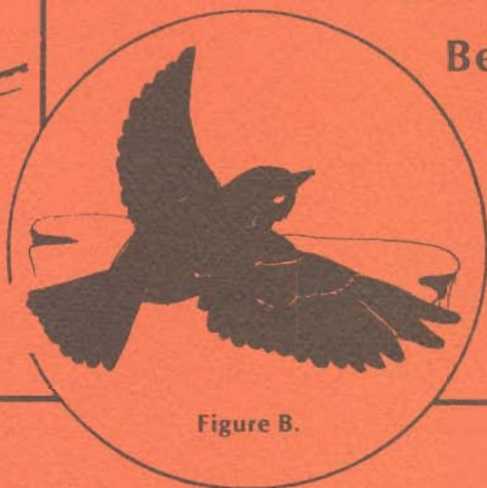


Figure B.

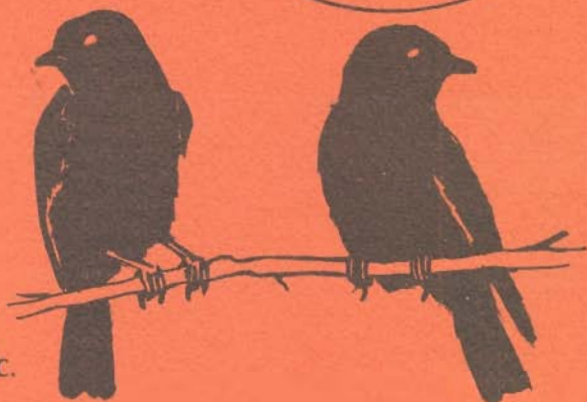


Figure C.

The postures bluebirds display are important to their survival and provide clues so that we can better understand their behavior. Figure A shows a basic maintenance activity, **BILL WIPING**. Maintenance activities occur to enhance the birds' general health, its agility and its efficiency. A **BILL WIPING** display is quite common, with the bluebird scraping the bill several times from base to tip, using both sides of the perch. The bill is kept cleaned and well-honed at the same time. With its bill a bluebird can reach, and clean, all parts of its body except the head and neck. These latter areas are maintained by the feet, which in turn are cleaned by the bill. Figure B illustrates another maintenance activity, **SUNNING**. Bluebirds usually spread both wings, turning their head to one side. Aside from the obvious contribution to body health, much evidence exists this activity, as well as most other maintenance displays, play a large part in reinforcing social bonds. For example, bluebirds on a territory have often been seen sunning together.

Figure C represents **TURNING-AWAY**, or appeasement behavior, with the bird on the right displaying a much greater degree of submissiveness. This posture is quite frequent during courtship. If, after the male feeds the female, one or both birds **TURN-AWAY** from each other, one or both demonstrate a fairly weak escape intention, giving the bird(s) a nonaggressive appearance and "quelling" any perception of attack.

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 No. 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*

